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THE IRON AGE

VOL. C

JULY—DECEMBER, 1917

146694
31/7/18

NEW YORK:
IRON AGE PUBLISHING COMPANY,
239 West 39th Street

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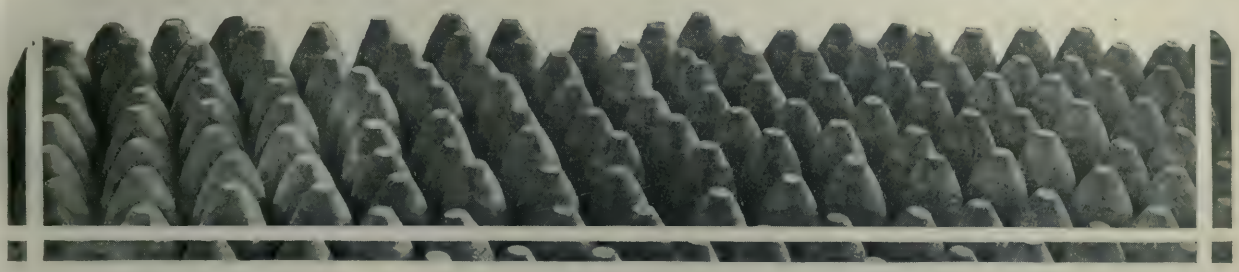
THE IRON AGE

New York, July 5, 1917

ESTABLISHED 1855 VOL. 100 : No. 1

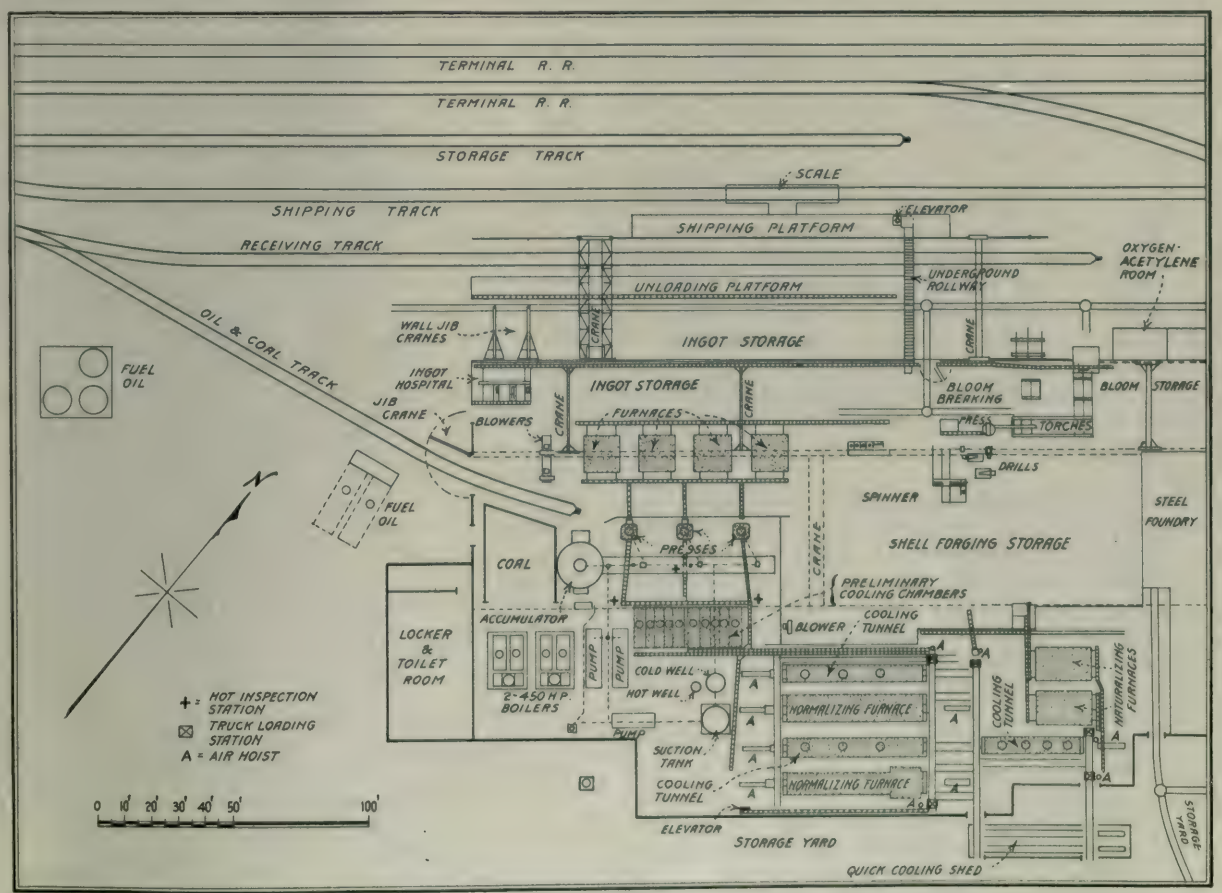
Forging Shells at Curtis Plant, St. Louis

Free Use of Patented Process Offered During the War Period — Valuable Contribution of Data on Shape of Slugs, Heat Treatment, Etc.

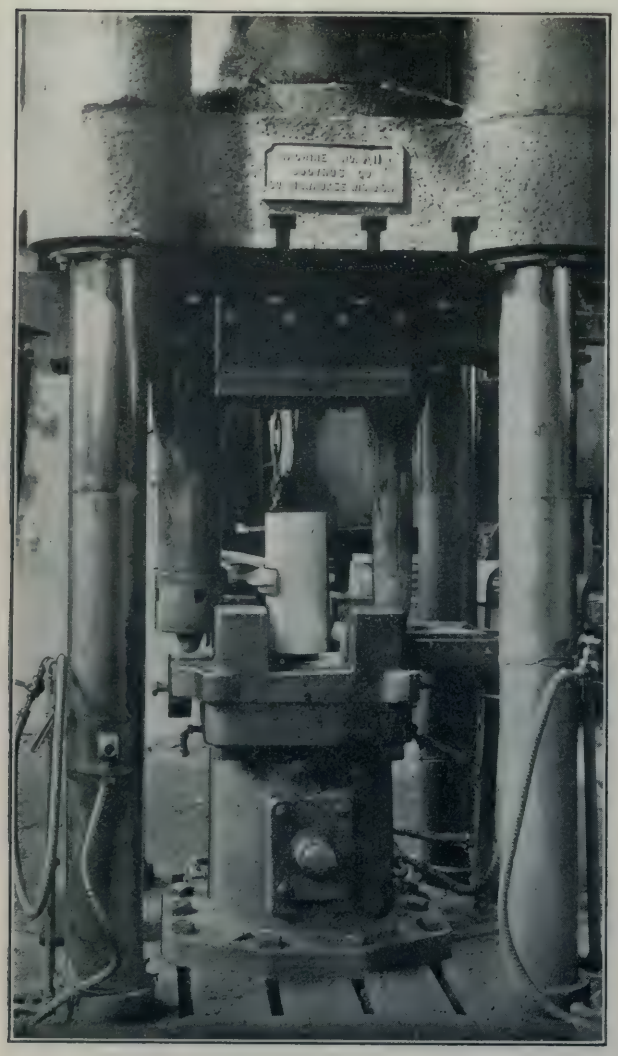


FREE use of a process of forming hollow forgings, patented by E. H. Steedman, vice-president of Curtis & Co. Mfg. Co., St. Louis, is offered to shell makers of the country with a view to expediting the production of munitions during the period of the war. Besides giving THE IRON AGE an opportunity to describe this process and to show details of the plants and equipment which it has been operating in making shells for the Allies, the company has also supplied generously a large amount of manufacturing data which are the result of searching investigations while reaching fully successful manufacturing operations.

Based upon the principle that horizontal forces acting on the piercing tool of the forging press must be in equilibrium so that uniformly concentric forgings may be obtained and that, if these forces are in equilibrium, concentric forgings must



No. 2 Plant of Curtis & Co. Mfg. Co., St. Louis



To the Left of the Hot Blank Being Received Is the Slugger and to the Right of it May be Noted the Piercer

result, Mr. Steedman claims to have developed methods and equipment which, irrespective of the shape of the bar from which the blank is taken, will produce uniformly good shells.

The press equipment embodying this principle and used in his process for the manufacture of 8 in. and 9.2 howitzer shells is shown in an accompanying drawing, all important parts being properly named. The heated blank received from a roller table leading to the press is fed into a magazine shown in one of the accompanying reproduced photographs and by it set down in the die. The blank so placed is compressed and centered by a slugger, so called; pierced by the piercing tool, and then ejected by the knock-out pin shown in the drawing.

The first essential to concentric forgings, it is emphasized, is the even and thorough heating of the blank, for otherwise no process or equipment can maintain equal side pressures on the piercing tool during the piercing stroke. The next essential is equipment, which covers the following three requirements, described in Mr. Steedman's application for the patent as the principles upon which his press is designed:

1. A compression or "setting down" of the blank so that the blank practically fills the die before it is pierced.

2. An ample size depression formed in the upper surface of the compressed blank concentric with the die to receive and center the piercing tool.

3. A true piercing tool concentric with the die.

The compression of "setting down" of the blank, which completely fills the die with metal, is done by the slugger's nose and the concentric depression in the slug is formed by the tit of the slugger nose at the same time the slug is compressed or "set down. A guide ring truly central with the die centers the slugger, and so long as the slugger fits accurately into this ring the depression in the slug will be commercially central.

The sectional drawing of the press shows the stops at opposite ends which provide lengthwise adjustment respectively to the sluggers and piercers, and the gib screws and the gibs in the top bolster, which provide means for the cross adjustment of the piercing tool. The slugger has independent cross adjustment by means of the slugger cross adjustment set screws. The piercing tool is cross adjusted first by means of the gibs and screws and the slugger later cross adjusted by its own set screws.

That the equipment is efficient in making concentric forgings is shown by the results set forth in the company's record, as follows: Out of 340,000 8-in. forgings, the total losses, exclusive of those due to bad steel, were 1.1 per cent, including only ¼ per cent due to eccentricity; out of 160,000 9.2-in. forgings, 1/20 per cent were scrapped due to eccentricity alone, with 8/10 per cent covering all forging losses except those arising from bad steel. These figures include forgings selected for tests and all rejections by the machiners except rejections for bad steel, and they are regarded as proving the importance of complying with all the conditions of forging mentioned in the foregoing and covered by the Steedman patent.

The location of the three forging presses of the company's No. 2 plant is shown in the accompanying plan where they form a part of a continuous manufacturing system by which the slug is heated, forged, inspected, cooled and heat-treated in a forward movement through the works and with minimum handling. Rollways and light overhead cranes constitute an important part of the equipment. Storage for the blooms is provided for toward one end; there they are broken into blanks by means of a press after being given preliminary oxy-acetylene cuts. At the opposite end of the plant a so-called ingot hospital is located. Here defective ingots and blanks are remedied. The storage of ingots and blanks is in the center near the unloading and shipping platforms.

The forging presses have a capacity of 60 to 100 forgings per hr.; they are operated hydraulically and are provided with rams of 36-in. diameter and 5-ft. stroke. Under each press is a pit in which a hydraulic cylinder of 7-in. diameter and 28-in. stroke operates the knock-out pin for rejecting the forging from the die. The accumulator in No. 1 plant, in which 8-in. forgings are principally manufactured, is loaded to carry 1,450 lb. pressure per sq. in. on the hydraulic system, giving a maximum of 635 net tons pressure to the presses. The accumulator in plant No. 2, devoted chiefly to 9.2-in. forgings, is loaded to 1550 lb. per sq. in. hydraulic pressure on the line, giving 675 net tons pressure. which is found ample to pierce at high speed a 9.2-in. shell forging after the blank is properly heated.

The pressure required to pierce a shell, it is explained, depends principally on two factors—the temperature of the steel and the cross sectional area of the metal pierced; and the influence of the latter was unsuspected in its practical effect. The first 8-in. forgings that were made experimentally did not have the proper exterior or interior finish near the point of the nose, and it required over 700 tons pressure to pierce the forging, and, in conse-

quence, die liners and piercing shanks broke with appalling rapidity. By adding ⅛ in. to the outside finish of the nose of a shell and 1/16 in. to the inside finish of the nose, the final maximum piercing pressure dropped to below 400 net tons with a well-heated billet or blank. More pressure per square inch of the shank area is required to pierce an 8-in., it is found, than a 9.2-in. forging. Also the pressure required to pierce an 8-in. shell within 12 in. of its full depth, it is stated, is but 500 lb. per sq. in., while the last 12 in. require 1000 lb. or 400 net tons on the forging.

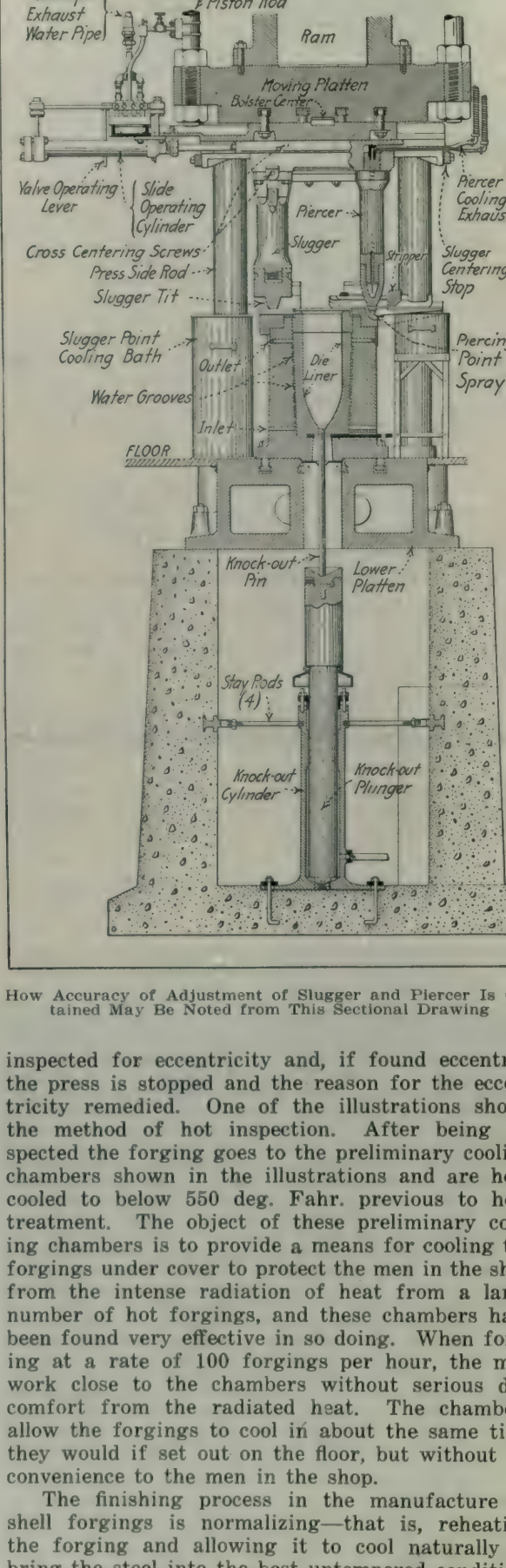
To facilitate piercing by the piercing tool about 1 cu. in. of powdered blacksmith coal is dropped into the center cone after the slug is set down, and this acts as a smoke and tar lubricant for the piercing point. As the point enters the forging dense smoke pours up around the piercing shank and as soon as the forging is removed from the press a large globule of liquid coal tar is discovered at the bottom of the pierced hole. The company advises that coal dust should be used in piercing with great caution and the quantity used must not be excessive. The British Inspection Staff, it says, considers the use of sawdust and fuel oil safer than the use of powdered coal, and if coal is used it must be used with discretion and in full knowledge of the possibility of gas pockets resulting from its use.

The die liner is made from special castings of nickel-chrome semi-steel, heat treated. The metal is the result of experiments, study of photomicrographs and physical tests to get regular results. The liner is tapered and is pressed into the holder with about 500 tons pressure, after which one or more shims, indicated in the drawing, are inserted under it to fill the space between its bottom and the floor of the die holder and so to prevent repeated forging operations from forcing it further into the holder. The average life of a die liner is approximately 1400 forgings, as shown by the records of 500,000 forgings. Some liners have run as high as 3500 forgings, while others have broken after making only one or two forgings.

The comparatively long life of the liners is attributed to four factors: The metal in the liners and its proper heat treatment; the tapered form of liner driven home with 500 tons pressure into a tapered holder, which it fits accurately, subjecting the liner to enormous initial compression, partially or wholly counteracting the great bursting pressure on the liner, due to the forging operation; the proper cooling of the die liner after every forging, so that the effect of heat treatment is not overcome by later overheating, and the use of no greater hydraulic pressure on the press than is necessary to pierce a properly heated ingot in a reasonable time. The cooling of the liner and also of the piercing point is by means of water.

The die holder and the die bolster are made from 0.40 per cent carbon steel castings. The guide ring and slugger nose are of the same material as the die liner. One guide ring outlives four liners. The life of a slugger nose is about 5000 forgings. The slugger shank is a 0.40 per cent carbon-steel casting and the piercing shank is made from nickel-chrome steel forgings of approximately 0.50 per cent carbon. The life of the piercing shank is indeterminate, as some shanks lasted for more than a year, while others were discarded in a few months. The piercing points for 8-in. forgings are made from 0.50 per cent nickel-chrome steel and heat treated to a Shore scleroscope hardness of 50 and 40 at the open end. The average life of these points is about 500 forgings, allowing for reworking those that can be reused after a grinding salvage operation.

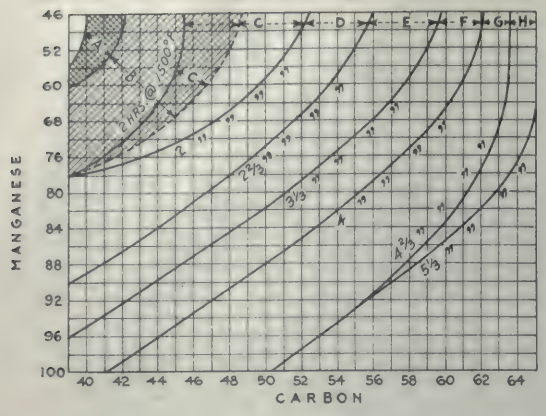
Immediately after being forged the shells are



How Accuracy of Adjustment of Slugger and Piercer Is tained May Be Noted from This Sectional Drawing

inspected for eccentricity and, if found eccentr the press is stopped and the reason for the ecc tricity remedied. One of the illustrations sho the method of hot inspection. After being spected the forging goes to the preliminary cooli chambers shown in the illustrations and are h cooled to below 550 deg. Fahr. previous to h treatment. The object of these preliminary co ing chambers is to provide a means for cooling forgings under cover to protect the men in the sh from the intense radiation of heat from a la number of hot forgings, and these chambers ha been found very effective in so doing. When fo ing at a rate of 100 forgings per hour, the m work close to the chambers without serious d comfort from the radiated heat. The chamb allow the forgings to cool in about the same ti they would if set out on the floor, but without convenience to the men in the shop.

The finishing process in the manufacture shell forgings is normalizing—that is, reheati the forging and allowing it to cool naturally bring the steel into the best untempered conditi There are, it appears, three critical zones of te perature which have to be considered in norma ing a shell forging. A lower zone of heat ab 600 deg. Fahr., below which the forgings must c after forging and before normalizing; a middle zo of about 1450 deg. Fahr., at which the grain str



Normalizing Chart for Forgings Made from Cast Steel Slugs. Zone A—Temperature held at 1500 deg. F. 2 hr., forging cooled, reheated to 1650 deg. F. and after 10 min. rapidly cooled under cover. Zone B—Temperature held at 1650 deg. F. 10 min., cooled normally on floor. Zone C'—Method of either zone B of C may be used. Zone C and D in proximity to C cooled normally. Zones E, F, G, H, and zone D in proximity to E cooled in chamber as slowly as possible

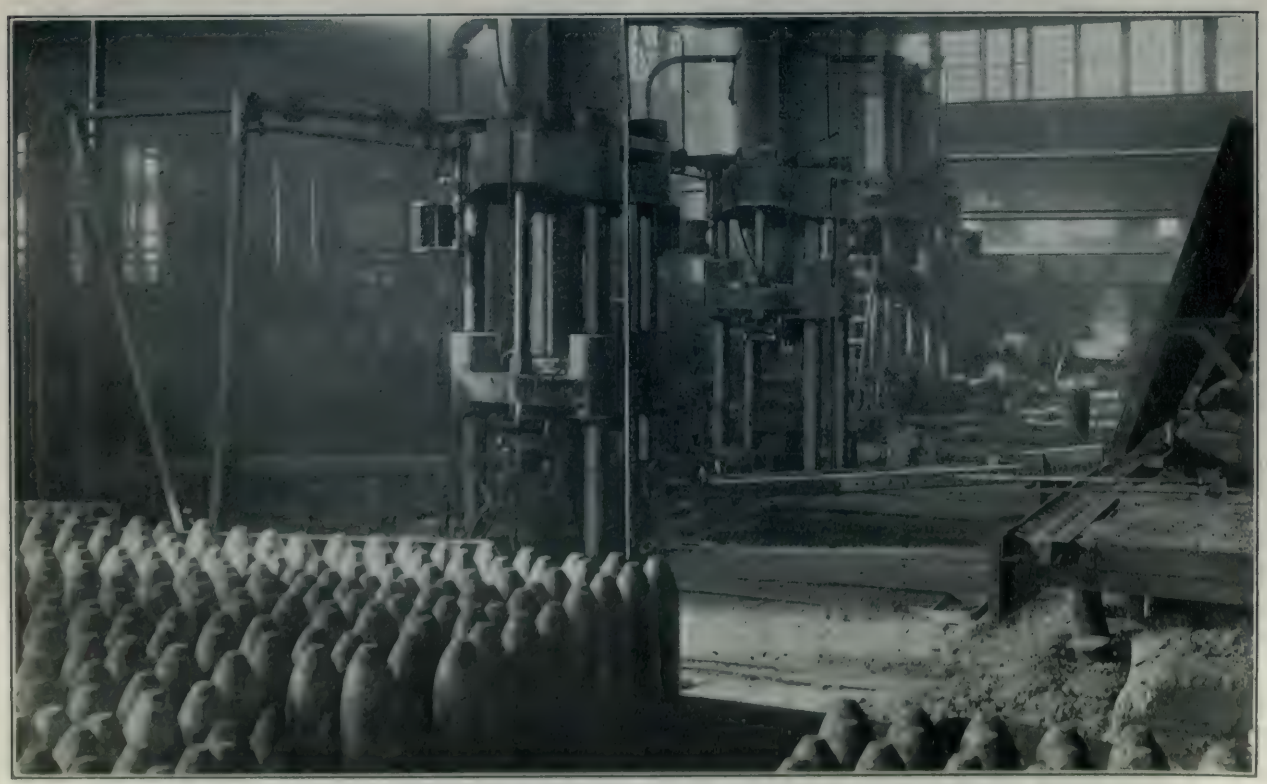
ture of the steel refines if the steel is held at that temperature, and a third zone of about 1650 deg., above which the grain structure enlarges and carbon conditions change.

The exact temperatures of these three heat zones and the time which the steel must be subject to these temperatures vary with the analysis of the steel, and the company has found that the time and temperature factors for bar steel differs from the similar factor for cast steel of identical analysis. Steel with carbon from 0.45 to 0.60 per cent is normalized by rapid heating to 1500 deg. Fahr., holding it at that heat from two to five hours, according to chemical analysis, and then allowing it to cool naturally at a fast or slow rate, according to chemical contents. As most of the steel used comes in the range of carbon of 0.45 to 0.60, the name normalizing has been appropriated to specifically apply to the method used for this range of carbon. Steel with carbon from 0.40 to 0.45 is normalized by rapid heating 1650 deg. Fahr., holding it at that temperature only long enough to be heated through and through and then allowing it to cool naturally at a fast or slow rate, according to the chemical analysis. The name naturalizing has been given to identify the process used for normalizing such low carbon steel.

Normalizing results of course in refining the grain structure of the steel, and increasing considerably the elongation without materially lowering the elastic or ultimate limits. Naturalizing results in considerably increasing the elastic limit of steel, slightly increasing the ultimate strength and slightly decreasing the percentage of elongation. The company believes that with bar steel of proper analysis, that is carbon 0.45 to 0.55, manganese 0.60 to 0.75, and silicon 0.15 to 0.25 per cent, normalizing would be necessary on but very few heats to make the steel meet the standard requirements of physical tests, but that much more regular physical results and much greater ease in machining are obtained by normalizing.

The normalizing furnaces are heated by means of fuel oil. They are of the continuous truck type, a truck load of forgings at 500 to 600 deg. Fahr. being pushed into the furnace each time a truck load of heated forgings is withdrawn. A truck holds 25 8-in. or 9.2-in. forgings. It is of cast steel covered with fire brick and is 4 ft. 4 in. square. The furnaces are long enough to take eleven trucks with a foot to spare at each end when the doors are down. A truck is loaded by means of tongs on a wire rope operated by an air hoist. The intervals of removing trucks vary from a minimum of 12 min. to a maximum of 35 min. for an eleven-truck furnace. These intervals have been determined by experiments for various analyses of steel. The accompanying chart shows the length of time forgings are carried at the normalizing temperature.

The oil burners in the furnace near the entrance end are equipped with combustion chambers and are placed low to heat the forgings up rapidly. The oil burners behind the second truck are placed high and deliver directly into the upper part of the furnace, and but little heat is required to maintain an

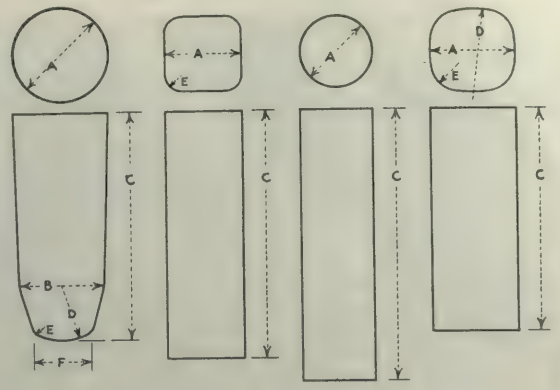


Rollways Transfer Blanks Across Furnace Fronts and Lead from the Furnaces to the Presses

even temperature to the back end of the furnace. The forgings are easily heated in the furnace, it is stated, and the results are regular. A portable pyrometer couple is occasionally used to check the temperature of the forgings and to keep the operators trained as to the proper color of the heated forgings. The temperature must be closely watched and kept within 1450 and 1550 deg. Fahr.

After the truck leaves the furnace it is transferred to the cooling tunnel, where it cools quickly or slowly, according to the chemical analysis of the forgings. The cooling tunnel is the same length as the normalizing furnace and the trucks are pushed through it by means of air hoists, so that a truck in making a full cycle will pass forward through the furnace, across through the cooling tunnel, back through the tunnel for unloading, and is then reloaded for another cycle. The cooling tunnel is brick or concrete, has light doors at each end, small side draft doors at the bottom and three stacks with dampers. In hot summer weather the natural draft of the stacks is augmented when necessary by steam jets in the stacks. High carbon heats are cooled slowly in the tunnels, but low carbon heats are cooled rapidly. The draft in the stacks over the tunnels even with the steam jets on, is but 1/3 oz. per sq. in., and with the steam jets on forgings in the cooling tunnel require a longer time to cool than if set out on the storage floor.

The appearance of the grain of the broken test specimen is a check on the proper normalizing of the heat when compared to the chemical analysis of the steel, and with a little practice it is said that a metallurgical engineer can rapidly learn to handle the normalizing of steel of wide ranges in chemical analysis if he will study at one time the five items he has at hand concerning each heat: First, the chemical analysis; 2, physical test report after first normalizing; 3, the fracture of the broken specimen after normalizing; 4, the record of time in the furnace; 5, the time of cooling of the heat. If the heat falls down on the first normalizing, it can be corrected by a second or rarely by a third normalizing, after studying the results of the first normalizing, unless the steel is out of the possible range of analysis.



Blanks Used in Making Shell Forgings
Sizes for 8-in. shells in inches

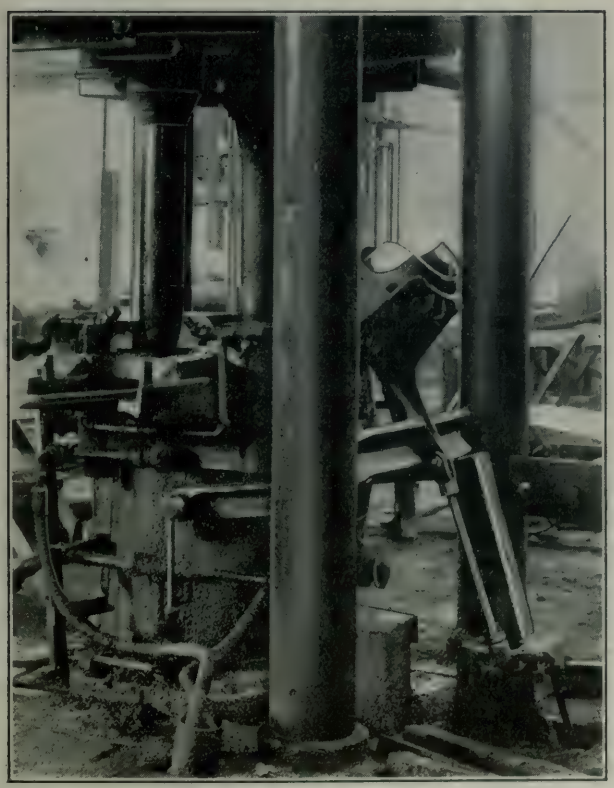
	A	C	D	E
Cast ingot*	8 5/16	20⅜	4 13/16	1¼
Round cornered	6 11/16	19	.....	1½
Round	6¼ to 8	28¼ to 16⅞	.....	.....
Gothic	7¼	18¼	8	2 7/16

Sizes for 9.2-in. shells in inches

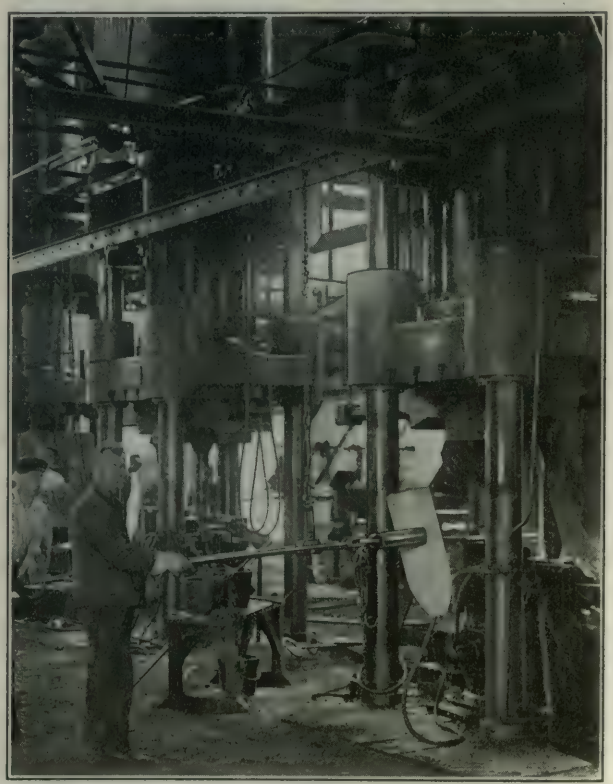
	A	C	D	E
Cast ingot*	9 25/64	21⅞	3 11/16	½ &
Round cornered	7 & 7 29/32	25½ & 19½	.....	½ & 1½
Round	8 1/16	23¾	.....	.....
Gothic	8¼	20⅝	10	3 1/16

*B for 8-in., 7⅜ in., for 9.2-in., 8½ in.; F for 8-in., 4 15/16 in., for 9.2-in., 6 1/32 in.

The furnaces used for naturalizing are similar to the heating furnaces. They are oil fired, of the same general construction, width and height, and are 20 ft. long inside. The fire brick floor is level and is corrugated with cross-saw tooth ridges to keep the forgings separate as they are rolled through the furnace. The furnaces are continuous, that is, a cold forging is rolled in the receiving end of the furnace each time a hot forging is removed from the discharging end. The cooling trucks are the same lengths as the normalizing trucks, but have only six butts, so the forgings are separated farther on the trucks and therefore cool more rapidly than



Press Showing Magazine Containing Blank and Its Air Operated Tilting Mechanism

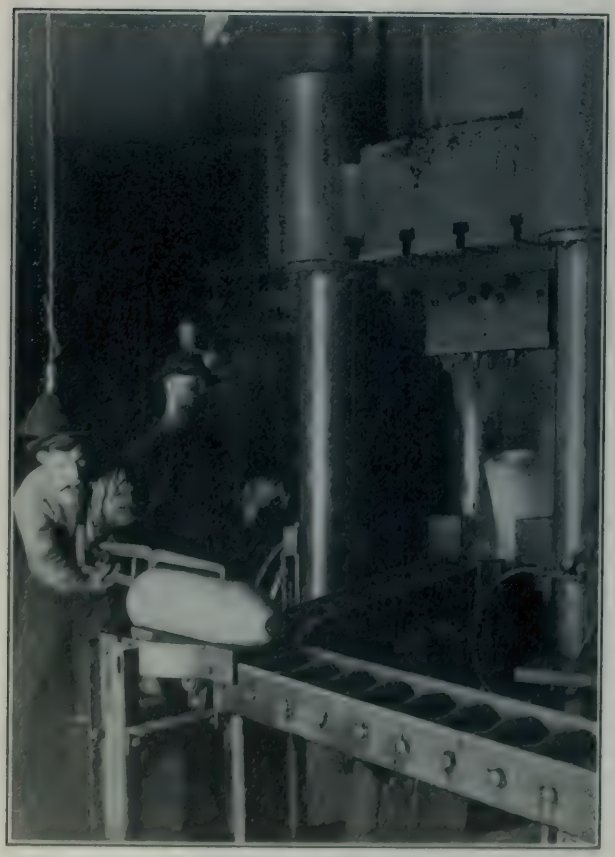


Blank Handled by Tongs and an Overhead Traveler Before the Rollways Were Installed



Preliminary Cooling Chambers and Rollway Leading from Back of Chambers to the Normalizing Trucks

in the normalizing trucks. For slow cooling six forgings are put on a truck and the truck pushed through a cooling tunnel similar to the tunnels used with the normalizing furnace, but for quick cooling only three forgings are placed on a truck, and the forgings cool naturally under a corrugated iron shed without side walls. The capacity of one naturalizing furnace is approximately 30 forgings per hour, or a total of about 600 forgings per day.



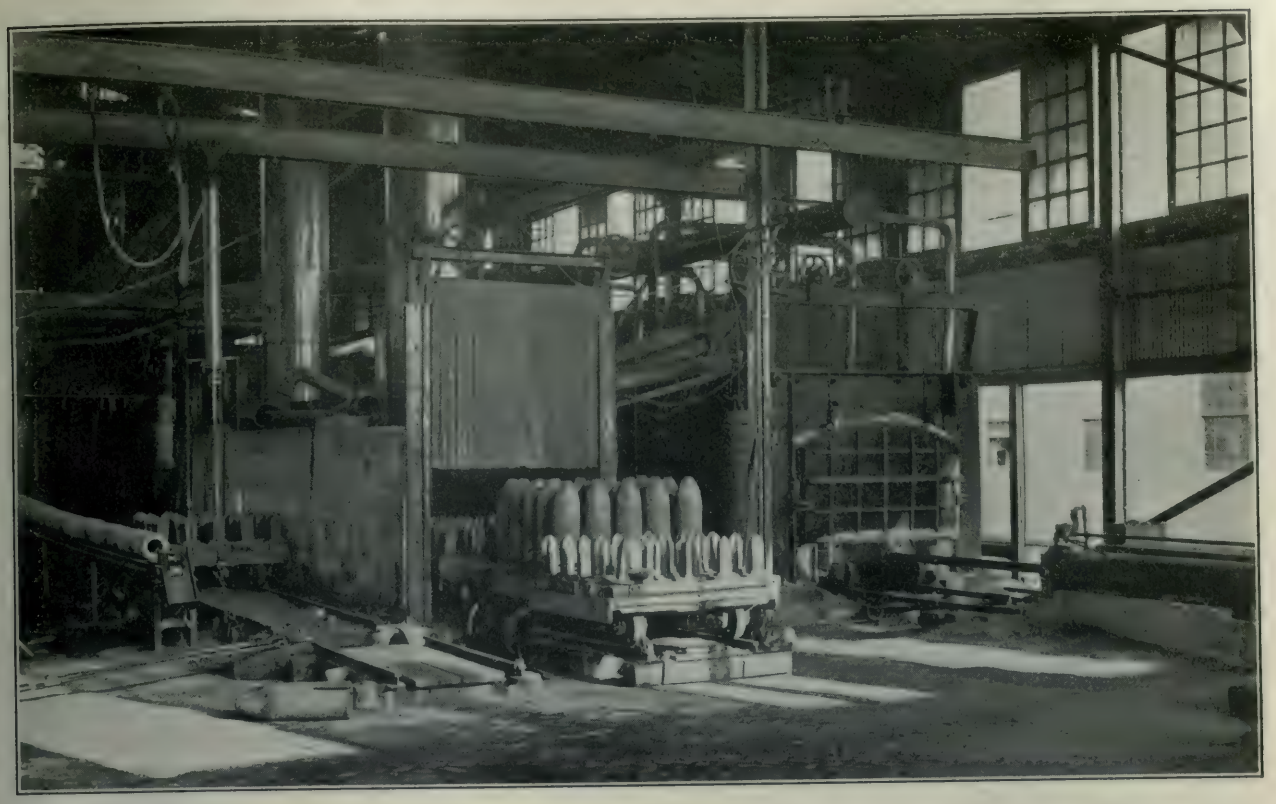
Hot Inspection of Forging on Turntables at Front of Press. Also shows Forging being ejected from Die

As intimated, the naturalizing furnaces are used primarily for steel relatively low in carbon and manganese, but they are also used for retreating heats that have been normalized and have failed on tests because elastic limit or ultimate strength was too low. Such heats can be put through the naturalizing process, cooled naturally at a rate more rapid than the cooling rate of the normalizing process and the elastic limit and ultimate strength raised.

The Curtis Company's records show that many heats of 0.42 to 0.45 carbon which had been normalized and failed in test have been later naturalized and the elastic limit raised 25 per cent, the ultimate strength raised 10 per cent and elongation reduced from 24 per cent in 2 in. to 21 per cent. in 2 in.

The point made is that naturalizing after normalizing retains nearly all the benefits to elongation imparted to the steel by normalizing and adds very materially to the elastic limit and adds moderately to the ultimate strength. If a normalized heat is later naturalized but kept too long at the temperature 1650 deg. or above, the effects of normalizing are counteracted in proportion to the time the steel is carried at the high temperature, so that the steel must be quickly brought up to the desired temperature and only held there long enough to heat through and through. Normalizing after naturalizing entirely eliminates the effect of naturalizing.

Curtis & Co. Mfg. Co. has had in operation presses designed according to the Steedman patent since February, 1916, when their first contract for 150,000 forgings was started. Since that time they have made and shipped 560,000 8-in. and 9.2-in. shells, which by the variety in shapes of blanks used show the flexibility of their process of manufacture. The first forgings were made from Gothic rolled blooms of basic open-hearth steel which were sawed into short blanks of 241 lb. each for an 8-in. forging. About 12,000 tons of this steel were used. Later the company resorted to the use of 8-in. round forged bars of basic open-hearth steel. These bars



Normalizing Furnace and Cooling Tunnel of No. 1 Forge Plant Showing Air Ram for Charging Trucks

were forged under a hydraulic hammer, and sawed into blanks of 245 lb. weight. About 9000 tons were used.

When the steel market became oversold in the spring of 1916 and the company could not obtain an adequate supply of rolled or forged bars for prospective orders, it turned to individual cast steel ingots, and these individual cast ingots are now its main and regular source of steel supply. On account of the foundry's inability to break off accurately the discard from these ingots, the average weight for an 8-in. cast ingot is specified as 250 lb., and for a cast ingot for a 9.2-in. forging 358 lb. The above weight of blanks, it is said, can be maintained low because of the greater accuracy of forgings possible by its method, which, however, requires the greatest of care in heating and in maintenance of equipment if the results are to be duplicated.

When it became necessary to resort to the use of individual cast ingots, the company undertook an investigation to compare forgings from rolled steel with those made from cast ingots, which of course have not had the work done on them that rolled steel has. This led to the following conclusions:

Compressed slugs not normalized compared favorably with rolled bars not normalized.

Compressed slugs normalized compared favorably with rolled bars normalized.

Forgings made from compressed individual cast ingots as normalized are equally as good as forgings made from rolled steel.

The company's present opinion is that forgings made from steel of equal analysis, whether from forged bars or individual cast ingots, if normalized, will give equal results on physical tests but that normalizing is essential to all forgings made from individual cast steel ingots. In its experience with about an equal number of forgings made from bar stock and from individual cast ingots, the percentage of rejections due to defective steel have been considerably less with cast ingots than with forged or rolled bars. A further advantage in favor of cast ingots, if properly made, is that the forgings from individual ingots are free from pipes and seams due to the extension by rolling of small defects in the original large ingots from which the rolled bars are made. It has discovered many rolled blanks with secondary piping, but has not found any of the small individual cast ingots with a trace of secondary piping.

For the purpose of studying the flow of metal in a forging due to the piercing process, a cast ingot was drilled through and through horizontally



Flow of Metal in Forged Shell Due to Piercing. Zebra-like lines are the Norway-iron bars

with a series of parallel horizontal holes ¾ in. in diameter and Norway iron bars were driven into the holes and riveted in place. The special ingot was then forged in the usual manner, after which it was split, polished and acid-etched. The Norway iron inserts showed up in zebra-like streaks, as here shown, indicating a comparatively small area of distortion or local flow. The weld between the Norway iron and the steel was perfect except near the outer surface, though the blank was not heated to an ordinary welding temperature.

Another experiment was made to study the probable results of accidentally forging piped ingots. A 6.4-in. diameter ingot had a ⅜-in. hole drilled axially from end to end. A ¼-in. Norway iron bar shorter than the blank was put in this hole and the two ends were then plugged up lightly with iron plugs. As the rod was ⅛ in. smaller in diameter than the hole, and the two ends of the hole were plugged, this blank was then somewhat similar to a blank with a secondary pipe, which did not show at the fractured end. The prepared blank was forged in the usual manner and the entire length of the forging was cut into horizontal sections. On the main body part of the forging no trace of the hole or the Norway iron bar could be discovered, even with the microscope after the sections were etched, and no trace of the bar or hole was discovered until a section was reached 1½ in. from the bottom of the pierced hole. The Norway iron bar was everywhere thoroughly welded to the steel, and no trace of the void or hole discovered anywhere.

DEFECTS IN STEEL INGOTS

Hot Tops Necessary Precautions—Relation Between Folds and Splits or Canties

"STEEL Ingot Defects" were discussed by J. N. Kilby before the spring meeting of the Iron and Steel Institute in London, May 3, 1917. His paper was supplementary to one that he presented at the Institute's meeting last September, an abstract of which appeared in THE IRON AGE, Oct. 12, 1916. In the present paper Mr. Kilby confined himself to the causes of certain defects in steel ingots of three tons and less. An abstract of his paper follows:

Except with special steels the use of a refractory feeder head or hot top has not been widely adopted, but that it is necessary to produce the maximum of sound steel is beyond dispute. The type of feeder head does not matter a great deal, so far as reducing pipe is concerned, provided it is of sufficient capacity adequately to fill the chill portion. Cost of production seems the real reason why such heads are not more generally used, it being supposed that the extra cost entailed is not more than covered by the saving of steel.

Savings from Use of Hot Tops

Actual works costs, based on piping steels of 0.45 per cent, carbon, show that ingots without feeder heads yield 65 per cent sound, 15 per cent doubtful, and 20 per cent scrap, whereas with feeder heads 90 per cent is sound and 10 per cent scrap. A 15-cwt. ingot would yield 1.5 cwt. more sound steel with head at a cost of 1s.; 30-cwt. ingot 3 cwt. more at a cost of 1s. 4d., and a 50-cwt. 5 cwt. more at a cost of 1s. 8d. Apart from increased yield and more reliable steel, there is the great saving in the ultimate manipulation of the ingot in the rolling mills, and it would thus appear that feeder heads are economically essential even for what are termed "ordinary" steels.

Effect of Occluded Slags

The presence in ordinary carbon steels of finely divided or emulsified solution of slag is as undesirable as in the case of special steels, though it is not so liable to influence the ordinary physical tests called for in these steels. There are two sources of "oxides" in the steel. They may be formed during the melting of the charge and not subsequently removed, and they may be introduced by excessive or erratic feeding of ore.

The first essential in acid open-hearth steel manufacture should be correct and consistent conditions at the melted stage. The two important factors up to the melted stage are quick melting and correct state of slag and bath at melting. A 2 per cent silicon basis is a good one to work to; in other words, the whole charge should have an available silicon charge of 2 per cent, taking the silicon in the pig iron and making up the difference by adding slag with the charge. The use of slag in the charge greatly reduces the amount of oxidation and gives more reliable bath conditions.

Folds from Bottom-Cast Steel

Bottom-cast steel poured at too low a temperature or too slow a speed tends to cause "lappiness" or "folds" in the ingot. Ordinary carbon steels do not suffer much from this condition, since if the steel is so cool as to "lap" badly the chances are much against the ingots filling; but chrome steels and high silicon steels (the latter up to 2.50 per cent of silicon) are always liable to lapping in a greater or less degree. Some steel makers think that the lapped portion of the steel becomes coated with the film of oxide which is embedded in the ingot by the flow of steel over it, and that this forms the beginning of a flaw in the rolled bar, taking the form of a crack or split after the bar has been subjected to pickling. But, in the author's opinion, a cavity or split in a rolled or forged bar has no relationship whatever with lapping in the ingot.

The use of comparatively large nozzles in the ladle and the small number of ingots per bed lead to spasmodic teeming; the stream from the ladle running at full force being of greater volume than is compatible with correct filling of the molds. The teemer then has to endeavor so to control the stream as to fill the molds correctly, and what is obtained is an ingot teemed at various speeds and in a good many places. The stream being momentarily cut off, trouble might be expected from such teeming and wrongly attributed to the steel having a habit of lapping.

Erosion of Runner Brick

In bottom-cast steel the flow of the metal in contact with the fire clay trumpet pipe and runner bricks causes erosion, the product of which is carried along into the ingot. The tendency of this "slag" on entering the mold is to rise to the surface and toward the sides of the ingot, but the flow of the steel carries it to its final position, and since the steel in the immediate vicinity of the mold begins to solidify on contact, the fluxed runner brick has little opportunity to reach the actual face of the ingot and become merely a surface deposit.

Apart from material actually fluxed by the flow of the steel, the jointing used in the trumpet and runner brick joints is washed off in fairly large pieces, often too large to become fused. The position taken up by these pieces of "dirt" is similar to that of a fluxed runner. Extraneous matter such as fireclay jointing may be largely eliminated by using a suction ejector down each mold and a trumpet pipe immediately before casting.

Manganese Ore Imports

Manganese ore imports into the United States in April, according to official data recently made public, were only 27,023 gross tons, the smallest in many months. This brings the total to May 1, 1917, to 172,743 tons or at the rate of 43,186 tons per month. The March imports were 56,394 tons and the monthly import rate in 1916 was 48,026 tons.

The Phoenix Mfg. Co., Cleveland, has removed its offices from 1430 West Sixth Street to larger quarters at 913-15 Engineers Building, in that city.

Automatic Press with Multiple Plungers

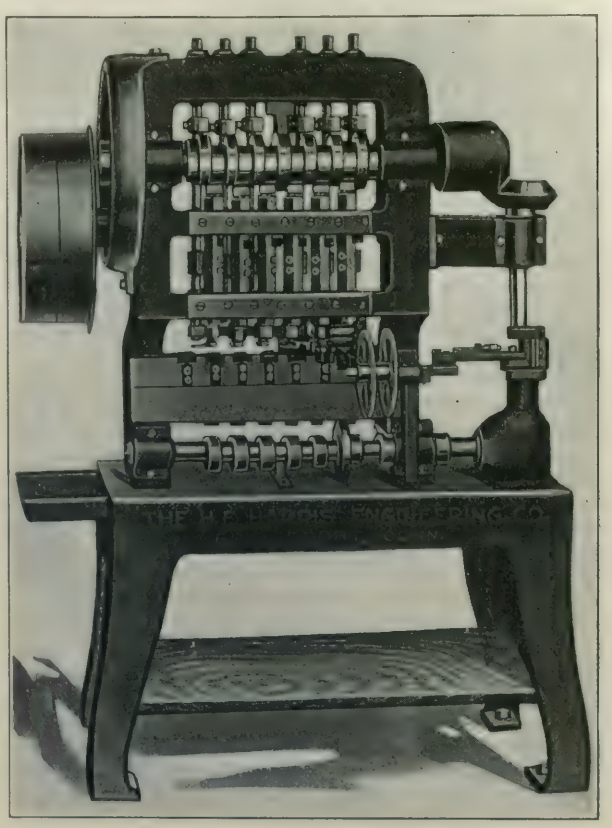
An improved form of automatic press of the multiple plunger type has been placed on the market by the H. E. Harris Engineering Co., Bridgeport, Conn. It is designed for the production of stamped, perforated and embossed sheet metal parts such as eyelets, snap fasteners, primers, percussion caps, thimbles, ferrules, automobile grease and oil cups, fuse caps, boxes and jar covers. The press is automatic in operation and will, after the blank is cut, carry the work along until the part is completed without any handling by the workman. This type of press, which is commonly known as the eyelet machine, has been in use for some time. In the new machine the frame is offset at the left end and provision is made for an extra die and a double punch to be carried by the last plunger, thus enabling the press to perform one more operation than the number of plungers. This arrangement, it is emphasized, is a special feature of the machine and enables an extra operation that might not have been thought of at the time of purchase to be performed. Another point upon which emphasis is laid is that all of the operations are simultaneous, each one of the plungers performing an operation on the parts which are going through the press at each revolution of the camshaft.

The press consists of a heavy main frame carrying a number of press plungers operated by a camshaft which rotates at rates varying from 65 to 150 r.p.m., according to the nature of the work being handled. This shaft determines the time and throw of the plungers which carry the different punches for stamping, embossing, piercing, drawing, etc. Dies designed to suit the different punches are held in the bolster fitted on the bottom part of the main frame, which also carries the transfer slide.

After the punches have operated the plungers are returned to their upper position by another set of cams on the same shaft. This movement is secured by the adjustable horizontal members above the camshaft, which is connected to the plungers by vertical lifting rods at the back of the press. The camshaft is connected through gearing to the vertical crankshaft which operates the transfer slide from right to left. The function of this slide is to carry the work along from one plunger to the other and locate a piece under each plunger before every stroke of the press is made. A roll feed on the back of the press passes the stock from a reel at the front of the machine under the first plunger, where a blank is punched out for the first operation. The size of the machine is determined by the depth of the parts to be drawn or embossed, together with the diameter or width of the blank. From three to 12 plungers are regularly supplied, although the presses most generally used have from four to seven. The weight of the machine and the throw of the cam and other details are arranged to suit the parts that are to be manufactured.

In operation the stock, which is in the form of a coiled strip, is placed on the reel at the front of the machine and passes through a lubricating pad and stripper over the blanking die to the feed roll mechanism in the back. An intermittent ratchet timed to co-ordinate with the movement of the press plunger operates the feed mechanism. While the stock is in this position the first plunger blanks out a piece and carries it through the die to a pocket in the transfer slide, the scrap stock being coiled on a reel at the back of the press after it leaves the feed rolls. The vertical crankshaft moves the transfer slide to the left through a distance equal to the center distances between the plungers, this action carrying the blanked piece in the pocket under the second plunger.

The forming punch which is carried by the second plunger descends and draws the blanked piece through the transfer slide into the first forming die. The transfer slide then moves to the right and assumes its original position. The next movement of the slide from right to left carries the cupped piece from the second position to the third, while a fresh blank is brought from the first plunger to the second. A set of



An Automatic Multiple Plunger Press Capable of Turning Out Between 3500 and 8000 Small Sheet Metal Parts in 1 Hr.

vertical ejector plungers operated by the lower crankshaft returns the work from the die into the fingers of the transfer slide. These take hold of the piece in practically the same way as the thumb and index finger of the human hand and serve to hold the part while it is being transferred for the succeeding operation. This operation is repeated at each stroke of the press, until the work has been carried along to the last plunger, when it is ejected and carried through a tube into a box or pan, provided to receive the finished parts. Miter gears on the two camshafts and the vertical crankshaft provide for synchronous operation of the upper and lower camshafts. The machine is entirely automatic in operation, all the attention required being to keep the stock reel full and to remove the boxes of finished work and any small piercings.

The output of the press varies from 35,000 to 80,000 parts per 10-hr. day, this large variation covering all classes of work. These figures, it is stated, allow time for repairs, setting up the press, sharpening tools, oiling, replenishing the stock and other legitimate stoppages. The output, of course, depends upon the kind of material used, its thickness, the depth to which it has to be drawn and other factors due to the nature of the work.

The Gschwind Furnace Company of Youngstown, Ohio, and the Star Iron Works of Gowanda, N. Y., have merged, and the name of the new organization is the Star Iron Works Company, Inc., Gowanda, N. Y. Plant, foundry, machine shop and main office are at Gowanda and a branch office at 15 Wick Avenue, Youngstown. Furnaces and supplies for the warm air furnace trade will be manufactured at the Gowanda plant. A general foundry and machine shop will also be operated. Previous to the merger the Gschwind company was buying its castings, but growth of the business necessitated arrangements whereby it could have a foundry of its own. The following are officers of the new company: Carl E. Gschwind, Youngstown, president; W. W. Watson, Youngstown, vice-president, and D. H. Foster, Gowanda, secretary, treasurer and general manager. These officers, with Edward Foster and Robert Congdon, constitute the board of directors.

American Society for Testing Materials

Specifications Drawn Up for Carbon Tool Steel and Railroad Malleable Iron Castings—Standards for Photomicrographs—Practicable Magnetic Testing

NOTABLE contributions to the progress of the iron and steel industry were made in the past year by the American Society for Testing Materials, judging from the annual meeting held last week at Atlantic City, N. J. In spite of the demands growing out of the war, some fresh specification writing had been achieved out of the committee conferences of producers and consumers, and a portentous step in testing developments was announced in a paper on the magnetic method of testing a material without requiring a specimen selected to be representative. The registration was surprisingly large and the attendance at sessions unusually well sustained, a fact commented on as indicating the especially serious consideration which is given to the society's work.

The report of the first day's sessions, Tuesday, June 26, covering some of the main iron and steel matters, was made in last week's issue. This included a review of the work of the committees on wrought iron, cast iron, micrograph making and methods of testing, and of the report of the executive committee and the address of the president. As regards the magnification scales for micrographs, it may be added that George F. Comstock, Titanium Alloy Mfg. Co., Niagara Falls, N. Y., in a written communication, questioned that there should be separate standards for ferrous and non-ferrous metals and emphasized that 75 diameters though possibly applicable to rolled non-ferrous material was not satisfactory for cast non-ferrous material. He also had objection to the scale of magnifications reported, as the scales obtainable with his apparatus, of 20, 50, 100, 200, 400, etc., modified to suit the proposed standard of 50, 100, 250 or 500, would in some cases result in loss of definition or in others unnecessarily limit the field photographed.

In the matter of the railroad malleable iron castings specifications, mentioned in last week's account, Stanley G. Fagg, Jr., explained that owing to the different requirements which malleable iron had to meet, the classification as railroad malleable iron was regarded as needed and the name was selected for the want of a better one. Some manufacturers as of driving chain demanded stiffness so as not to destroy the pitch of the chain and automobile makers desired a relatively soft material. J. H. Gibboney, Norfolk & Western Railroad, Roanoke, Va., added that a number of railroads have had to put into the malleable iron specifications of the society the improvements covered by the new standard.

In his presidential address, A. A. Stevenson, in addition to the passages referred to in the preceding issue, touched on the movement for international specifications. "Those of us who have kept in touch with the progress, or lack of progress, in so far as international specifications are concerned," he said, " have realized how hopeless the task has seemed. The different conditions existing in the several countries and the apparent feeling in some countries that international specifications would militate against their export trade, seem to be the two main difficulties in the way. In fact, universal international specifications would appear to be somewhat of an iridescent dream, although I feel we should continue our efforts in this direction."

Revising Specifications

In respect to the changing of specifications, he spoke in part as follows: As we gain more knowledge of materials and as new methods of testing are developed, there will be less necessity for a number of requirements that are now in our specifications, and as a consequence the specifications will be much shortened, though just as efficient. As better grades of raw material become exhausted, there is no doubt that changes in the requirements as to impurities will have to be given consideration. Personally I feel that time will show that many specifications have requirements covering impurities that are not necessary, and that materials with these requirements raised will be just as reliable as materials furnished under present specifications. Some of the recent literature indicates that the countries now at war, both the Allies and Central Powers, have found that to be true. In discussing the question of copper in steel with a British officer not long ago, I was told that the Germans had presented them with some shells running as high as 1½ per cent in copper.

Observations on Tensile and Other Tests

The recommended speeds for pulling tensile tests brought out some discussion from which it developed that the U. S. Bureau of Standards and the Baldwin Locomotive Works had made series of tests which had been a guide to the selection of the committee's table of proper speeds and these test results are to be supplied to the membership to indicate, for example, the differences of average results at different speeds.

An interesting observation on the progress report of the committee on corrosion of iron and steel was made by R. B. Carnahan, Jr., second vice-president American Rolling Mill Co., Middletown, Ohio, who deplored the lack of a real measure of corrosion. A metal roof is removed, he remarked, because of holes, though many parts show no corrosion at all. To describe corrosion in terms of a loss of weight in an accelerated test is fallacious. The failure of a steel plate in spots may be due, he held, to flaws resulting from steel cast in a dirty or moist mold, from some malpractice in the soaking pit, from seams produced in rolling; and many of these mill influences may be worse than chemical shortcomings.

The report of the committee on steel, A-1, was made at the session of Wednesday morning, June 27, and the paper on "Some Applications of Magnetic Analysis to the Study of Steel Products," by Dr. C. W. Burrows was presented at the same session together with a group of papers on the rôle of different alloying elements in alloy steels, such as nickel, vanadium, etc. It is planned to review Dr. Burrows' paper in a later issue together with the discussion, which was participated in by Dr. J. C. Unger, Carnegie Steel Co., Ralph P. Devries, Dr. Henry M. Howe and others. Also a study of the alloy steel papers will be carried over to a later issue; these were presented by the following authors: Dr. Howe, on manganese; Robert R. Abbott, metallurgical engineer, Peerless Motor Car Co., Cleveland, on nickel; Dr. W. E. Ruder, Schenectady, N. Y., on silicon; G. L. Norris, engineer of tests, American Vanadium Co., Pittsburgh, on vanadium, and F. J. Griffiths, second vice-president and general superintendent, Central Steel Co., Massillon, Ohio, on chrome vanadium. In connection with the steel committee's report, the review of which follows, it was announced that Chairman C. D. Young has resigned because changes in duties compelled him to do so.

Report of Committee on Steel

The committee on steel, A-1, submitted one new specification, to be published as tentative for one year under the present regulations before it is put to a mail vote of the membership; it revised two tentative specifications with a recommendation that these tentative

standards should be continued as such for another year; it revised ten existing standards, which revisions will stand in abeyance under the rules for one year, and it recommended that four other tentative specifications should be continued as tentative. Thus a carbon tool steel specification represents the fresh specification writing in steel lines this year, the work of a new sub-committee, and none of the six new specifications submitted last year were regarded as ready for final presentation to the membership, although, as noted above, in only two were revisions made, those for steel tie plates and for boiler and firebox steel. The specification for tie plates was thoroughly revamped, but met with considerable adverse discussion in the meeting, though in its new form still tentative, and some adverse criticisms were leveled at the carbon tool steel specification. A new sub-committee has been added to A-1 this on deep drawing steel stock, making in all eighteen sub-committees. On steel castings, the committee reported it as "undesirable at the present time" to prepare specifications for alloy steel castings.

Carbon Tool Steel Specifications

The tool steel specification divides the steels into three grades, as noted on the accompanying table showing the chemical composition of the grades. It is stipulated that the steel shall be made by the crucible or electric process, with the exception of grade C, which may be made with the open-hearth process.

Elements Considered.	Class No.	Grade A.	Grade B.	Grade C.
Carbon, per cent	1	0.45 - 0.60	(Same as Grade A)	(Same as Grade A)
	2	0.60 - 0.75		
	3	0.75 - 0.90		
	4	0.90 - 1.05		
	5	1.05 - 1.20		
	6	1.20 - 1.35		
	7	1.35 - 1.50		
	8	1.50 - 1.65		
	9	1.65 - 1.80		
	10	1.80 - 1.95		
Manganese, max., per cent		0.40	0.45	0.60
Phosphorus, max., per cent		0.02	0.025	0.035
Sulfur, max., per cent		0.02	0.035	0.04
Silicon, max., per cent		0.35	0.35	0.25

Carbon Tool Steel Graded According to Chemical Composition

In the active discussion which this part of the report developed much was said against the stipulation of a chemical qualification only for the tool steel. Complaint was made of the considerable amount of segregated steel which had been obtained in the last few months, and N. B. Hoffman, Pittsburgh, pointed out how with the so-called melting bar, steel could be obtained in the crucible process of materials not nearly so expensive as steel based on muck iron, which gave a much better tool, against material in which the phosphorus and sulphur have been reduced in the open-hearth furnace. J. M. Darke, General Electric Co., Lynn, Mass., admitted the inability of determining quantitatively excessive segregation, but intimated that if the specifications covered the matter of oxides, the point might be met in part. He explained that in his company's specifications there is a clause providing that slag or oxide material be determined microscopically. Considerable stress was also laid on the fact that it makes little difference relatively what are the chemical constituents of tool steel, as no control is exercised over the heat-treating. From a situation in which it seemed that the specification would not meet the approval of the meeting, even to the extent of having it supported as a tentative standard, it was finally accepted as tentative after some closing remarks made, for example, by Guilliaem Aertsen, Midvale Steel Co., Philadelphia, who called attention to the fact that the specification was merely one covering bar steel for tools and was not one on heat treatment of the bars; by Dr. Henry M. Howe, who said, "We have got to crawl before we can walk. The standard is one which may be elaborated as time goes on"; and by S. S. Voorhees, Bureau of Standards, Washington, who observed that the specification covers the raw material which will produce certain results under proper treatment.

Steel Tie Plates

The revision of the tentative specifications for steel tie plates now allows for the use of Bessemer as well as open-hearth steel. A sliding scale of percentage of elongation has been adopted for both the 2-in. and 8-in. test specimens, being 1,500,000 ÷ tensile strength, but not less than 18 per cent, for the 2-in. specimen; and 1,400,000 ÷ tensile strength, but not less than 16 per cent, for the 8-in. specimen. The limit for tensile strength of material of ⅝ in. in thickness has been omitted. A reduction in area of 25 per cent is stipulated as a substitution for the bend test, now omitted. Provision has also been made for the purchase of tie plates according to following minimum carbon content: corresponding to 64,000 lb. tensile strength, 0.12 per cent carbon for Bessemer steel and 0.20 for open-hearth steel, and corresponding to 55,000 lb. tensile strength, a minimum carbon of 0.08 for Bessemer and 0.15 for open-hearth steel.

Capt. Robert W. Hunt interposed strenuous objection to the tentative acceptance of the tie plate specification, regarding it as unfortunate that such a standard should go before the world, as it is, he claimed, altogether impracticable. The limit of variations is contrary to practice, he said, and as munitions class of steel was being adapted to tie plates, he held that the limitation of the physical tests is not required. F. E. Abbott, Lackawanna Steel Co., Buffalo, said the specifications called for more testing than the user cares for. Partly because it became clear that a considerable amount of time had been paid to the subject in committee and that the chief objector in committee was willing that the specification be set up as tentative, it was voted to adopt the recommendation of the committee.

General Rail Matters

On the general rail situation the committee report reviewed the publications of the Interstate Commerce Commission and the American Railway Engineering Association, including the indication of the annual reports of rail failures, which show a decreasing tendency in number per 100 miles of track of rails rolled in recent years.

An investigation has been conducted by the Pennsylvania Railroad System to develop the possibilities of a quick bend test as an alternate or substitute for the present drop test. The results obtained on an experimental machine at Altoona have shown such encouraging results that a special machine has been designed and will be used in the near future at the different rail mills to obtain definite comparative data of physical properties indicated by this machine and the regular drop test.

The committee reports a decided tendency toward the use of heavier rail sections. Rails up to 130 lb. per yard have been ordered by one of the leading railroads in considerable quantities. The rail committee of the American Railway Engineering Association has finally adopted standard sections for rails over 100 lb. per yard.

Billets for Forgings

To cover alloy-steel forgings an addition was made to the specifications for blooms, billets and slabs for carbon-steel forgings. This stipulates the chemical requirements, and groups according to the carbon content into seven classes, with the proportions of the other elements as given in the accompanying table. The carbon ranges are as follows: 0.10-0.20; 0.15-0.25; 0.20-0.30; 0.25-0.38; 0.30-0.43; 0.35-0.50, and 0.45-0.60 per cent.

The carbon ranges for carbon-steel forging billets have been changed, as immediately subjoined, and the manganese is to range from 0.50 to 0.80 per cent for all the carbon ranges, with emphasis on this note that: "When the steel is to be used for case-hardening purposes, the manganese should be specified not to exceed 0.50 per cent. When the minimum carbon specified is

Other Elements Than Carbon in Billets for Alloy Steel Forgings

Elements Considered	Nickel Steel	Chrome-Nickel Steel: 1.00–1.50 Per Cent Ni.	Chrome-Nickel Steel: 1.50–2.00 Per Cent Ni.	Chrome-Nickel Steel: 2.75–3.25 Per Cent Ni.	Chrome-Nickel Steel: 3.00 Min. Per Cent Ni.	Chrome-Steel	Chrome-Vanadium Steel
Manganese, per cent	0.50–0.80	0.50–0.80*	0.30–0.60	0.45–0.75*	0.30–0.60	0.30–0.60	0.50–0.80*
Phosphorus, max., per cent	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Sulfur, max, per cent	0.045	0.045	0.045	0.045	0.045	0.045	0.045
Nickel, per cent	not under 3.00	1.00–1.50	1.50–2.00	2.75–3.25	not under 3.00	....	....
Chromium, per cent	....	0.45–0.75	0.90–1.25	0.60–0.95	not under 1.00	0.60–0.90	0.80–1.10
Vanadium, min., per cent	....	....	....	....	....	....	0.15.

*When the steel is to be used for case-hardening purposes, the manganese should be specified not to exceed 0.50 per cent. When the minimum carbon specified is 0.35 per cent or over, the manganese range may be specified 0.30-0.60 per cent.

0.35 per cent or over, the manganese range may be specified 0.30-0.60 per cent." The carbon ranges are 0.05-0.15; 0.15-0.25; 0.20-0.30; 0.25-0.40; 0.30-0.45; 0.35-0.50; 0.40-0.55, and 0.45-0.60 per cent.

In the matter of specifications for alloy-steel forgings themselves, the committee has withdrawn its table in last year's specifications covering chemical composition for certain type of machinery forgings, as it "feels that it is undesirable at present to attempt to correlate the chemical and physical properties of these forgings. Moreover, the recommended chemical compositions for blooms, billets and slabs for alloy-steel forgings previously referred to will meet the requirements."

In revision of the locomotive and car axle forgings specifications, some changes were noted in impact proof testing over the methods appended to the 1916 standards. For tests under the specifications for carbon steel axles, a 2-in. test piece is favored for the larger axles as against the drop test.

Steel Tubing and Pipes

In the revision of boiler tubes specifications a change is made in the flange test to express the size of the flange as a percentage of the outside diameter of the tube, with a maximum limit, instead of as a fixed dimension of sizes between certain limits, thus: "For all tubes under 6 in. in diameter and having a thickness less than 9 per cent of the outside diameter, a test specimen shall have a flange turned over at right angles to the body of the tube without showing cracks or flaws. This flange, as measured from the outside diameter of the top, shall not be less than 15 per cent of the outside diameter (10 per cent for wrought iron), but the flange shall in no case exceed ½ in. in width."

The revision of the requirements for the flattening test is to bring this test into agreement with that of the American Society of Mechanical Engineers, the Master Mechanics' Association and the Master Car Builders' Association, and the Birmingham wire gage has been recommended as standard, which involves slight changes in the table of standard weights.

In the case of tubes for stationary boilers, a formula is given for determining the test pressure when the pressures specified give a fiber stress greater than 16,000 lb. per sq. in. This is

$$P = \frac{32{,}000t}{D}$$

in which P = the pressure in pounds per square inch, t = the thickness of wall in inches, and D = the inside of tube in inches.

The manganese requirement of boiler tubes has been changed from 0.30 to 0.50 per cent to 0.30 to 0.60 per cent.

In marking it is specified now that the pressure in pounds at which the tube was tested must be stenciled on each tube.

A change in the pipe specifications reduces the tensile requirement for wrought iron pipe from 45,000 to 40,000 lb. per sq. in. Revisions in the flattening test for steel pipe provide for harmonizing the A. S. T. M. requirements with those of the Master Mechanics' and Master Car Builders' associations. They stipulate that: "For sizes over 2 in. in diameter, a section of lap-welded steel pipe 6 in. long shall be flattened until the distance between the plates is one-third the outside diameter of the pipe with the weld located 45 deg. from the line of direction of the applied force, without developing cracks.

"For sizes over 2 in. in diameter, a section of butt-welded steel pipe 6 in. long shall be flattened until the distance between the plates is one-half the outside diameter of the pipe with the weld located 45 deg. from the line of direction of the applied force, without developing cracks."

In the bend test for steel pipe it is now required that 2-in. or smaller pipe must stand bending cold through 90 deg. against 180 deg. under the former specification, but around a mandrel of 15 pipe diameters against 18.

Automobile Steels

As regards the automobile steel specification a revision was made to make the chemical requirements for screw stock agree with the society's general screw stock specifications. The committee has formally advised the Society of Automobile Engineers that "it will recommend these revisions for adoption as standard a year hence, and has requested that society to consider the revision of their specifications as to the requirements for screw stock so that the specifications of the two societies may still agree."

Structural Steel for Ships

The consideration of special requirements for permissible variations in weight and thickness of sheared plates for ship use has not yet been taken up, as it has been felt desirable to permit shipbuilders to become acquainted with the permissible variations proposed and adopted last year, before proceeding with the preparation of special requirements for ship use.

Acceptability of Electric Steel

The committee has ruled that electric-steel billets should be acceptable under the specifications covering billet-steel concrete reinforcement bars, but will not recommend it for consideration until other more important changes may be in view. The committee believes that electric steel may always be sold acceptably in place of open-hearth steel wherever the latter is specified in A. S. T. M. specifications.

Reinforcement bars manufactured from discarded steel axles are not acceptable, as test by heat lot is required.

Boiler Steel

The only recommendation which the committee made this year with reference to boiler steels was the elimination of the requirement for copper in firebox steel for both locomotives and stationary service.

Order of Reporting Physical Properties

The committee recommends that the order of reporting physical properties of steel shall be as follows: Elastic limit, proportional limit and yield point; tensile strength; percentage of elongation, and reduction of area.

Metal Primer Tests

In a session devoted to preservative coatings, Thursday morning, June 28, a paper was read by H. A. Gardner, assistant director Institute of Industrial Research, Washington, describing a series of exposure tests made

on paints applied to large-size metal plates, 24 x 36 in., with the object of determining what grade of pigment is best suited for use as a priming coat. After three years' exposure, the panels to which had been applied a single coat of red lead containing a substantial percentage of litharge were in better condition than the panels painted with a single coat of highly oxidized red leads or iron-oxide paints. Those portions of the panels to which had been applied two coats of paint, gave substantially the same relative results, much greater durability being shown as compared to the single-coated surfaces. The paints used were reserved, examined and analyzed after storage for three years. The highly oxidized red leads in general were not in superior condition to the others, except in one instance where a red lead of low specific gravity was used. The other paints were soft and in excellent condition.

A. W. Carpenter, assistant valuation engineer, New York Central Railroad, New York, told of experiences with 82 to 94 per cent red lead paints and how he came to the conclusion that the proportion of litharge was not so important as represented and he could hardly see why iron oxide paints should not be used particularly with red-lead paints 300 per cent higher in cost.

Misrepresentation of the Chamber of Commerce of the United States

In very vigorous language, the Chamber of Commerce of the United States, through its executive committee, of which Joseph H. Depew is chairman, has denounced allegations recently made by the One-Cent Letter Postage Association, which has its headquarters in Cleveland. In one of its circulars, the association stated that the chamber's committee on war finance was threatened with active newspaper and magazine opposition if it dared to advocate an advance of second class rates. This statement is branded by the executive committee of the national chamber as "without the slightest basis in fact." Another paragraph of the association's circular stated that a sub-committee of the chamber's committee on war finance requested the support of the Post Office Department for the proposed advance in letter postage and was refused. This statement is declared by Chairman Depew to be wholly false. He adds that the attacks in the circulars issued by the National One Cent Letter Postage Association upon directors and officers of the National Chamber "are so contemptible that they must fall of their own weight, and the officers desire to make no response." The by-laws of the chamber provide that it cannot be committed to or support any policy except after a vote of its membership. The referendum recently completed by the National Chamber indorsed the plan of increasing first class letter postage to three cents as one of several means of raising the required funds to meet war expenses, and on this account the One Cent Letter Postage Association has made numerous attacks on the chamber.

Companies Consolidated

The Riverside Engine & Machine Co., Oil City, Pa., and the Pittsburgh Filter Mfg. Co. of Pittsburgh have consolidated, and the name of the concern in future will be the Pittsburgh Filter Mfg. Co. The Oil City plant will be operated as heretofore, its principal products being lathes and oil engines. The Pittsburgh Filter Mfg. Co. makes industrial and municipal filtration machinery. Some of this work will be done at the Oil City plant, which will be expanded as business warrants. The officers of the new company are A. R. Fraser, president and treasurer; F. B. Leopold, vice-president; John F. Hume, general manager. The general office and sales department will remain in Pittsburgh.

The Columbian Facing Mills Co., Seneca and Bailey Streets, Buffalo, has been formed by Harry and Max Hainsheimer. At present space in the Progressive Structural Steel Co.'s building is being utilized but a new plant at Stone and Green Streets is being erected. Facings and foundry supplies will be manufactured.

MILLIONS FOR AIRPLANES

Preparations for Manufacturing on Large Scale Being Hurried

Orders for $20,000,000 worth of airplanes have been placed with the Curtiss Aeroplane & Motor Corporation by the United States Government and the Allied Governments during the past few months. This announcement was made following a meeting of the directors in New York last week. John N. Willys of the Willys-Overland Co. was elected a member of the voting trust, succeeding James Imbrie of the banking firm of William Morris Imbrie & Co. J. E. Keeperley was made a director of the Curtiss corporation, succeeding G. Meyer. Mr. Willys will become president of the Curtiss Aeroplane & Motor Corporation.

An increase in the capital stock of about $2,000,000 was authorized, the money realized from the sale of 63,000 shares of common stock at $35 a share to be devoted to plant extensions and equipment. A new airplane engine factory will be erected by the Willys-Overland Co. at Toledo, Ohio, in close proximity to the automobile factory. This plant, however, will not cost $3,000,000, as at first reported. Additional space has been taken by the Curtiss corporation in Buffalo. The Willys-Overland factory at Elmira, N. Y., as previously announced, has been given over to manufacture of parts of airplane engines. Orders for machine tools aggregating several hundred thousand dollars were placed last week for the Willys-Overland plants.

Other plans of the Aircraft Product Board to carry out the Government proposed $600,000,000 airplane program are showing progress. The newspapers have announced the safe arrival in London, England, of 125 aircraft experts, who will study the manufacture of airplanes in England and France and their operation at the battlefront. Orville Wright, who is busy making experiments on improvements in airplane manufacture at his laboratory at Dayton, Ohio, announces his belief that 10,000 airplanes released on the battle line would end the war.

The Aircraft Production Board, which is the sole organization charged by the Government with the work of getting together the required number of airplanes, being responsible only to President Wilson and the Cabinet, are Howard E. Coffin, chairman; E. A. Deeds, formerly vice-president and general manager of the National Cash Register Co., Dayton, Ohio, and now at the head of industries in Dayton doing an annual business of $80,000,000; Sidney D. Waldon, formerly vice-president of the Packard Motor Car Co., Detroit, and Robert L. Montgomery, senior partner of the banking firm of Montgomery, Clothier & Tyler of New York and Philadelphia. The Army is represented on the board by Brig. Gen. George O. Squier and the Navy by Rear-Admiral David W. Taylor.

Owing to the backwardness of this country in airplane development along manufacturing lines, it will be necessary to call upon the automobile industry for a large part of the manufacturing.

Canadian Bounties

According to the latest report issued by the Department of Trade and Commerce at Ottawa, Ont., the following trade bounties were paid out in one year:

Metal	Amount, Tons	Bounty
Pig iron	5,431,547	$7,097,041
Puddled iron bars	42,812	113,674
Steel	4,448,780	6,706,990
Manufactures of steel	499,312	2,868,122
Lead (pounds)	1,187,083,350	1,979,164
Manila fibre (pounds)	108,048,641	367,962
Crude petroleum (gallons)	169,134,123	2,537,012
Total bounties paid		$21,669,965

The Lincoln Electric Co., Cleveland, manufacturer of polyphase motors, arc welding machines and battery charging plants, has opened an office at 10 High Street, Boston, under the direction of W. A. Blachford.

RATE DECISION RENDERED

Coal, Coke and Iron-Ore Freights Are Advanced in Some Sections

WASHINGTON, July 2.—The petition of the railroads of the United States for a horizontal increase of 15 per cent in freight rates was denied by the Interstate Commerce Commission in an elaborate opinion handed down June 29. This denial was somewhat tempered by an expression of the commission's willingness to increase class rates in the Eastern district about 14 per cent, which, in view of the fact that more than one-fourth of the freight handled is moved under class rates, allows the Eastern lines approximately 4 per cent increase in their gross freight revenues. Increases on coal, coke and iron ore have already been permitted in the Eastern district, as heretofore stated in the IRON AGE, and the commission states that similar increases will be allowed in the Southern districts on coal, coke and iron ore, and in the Western districts on coal and coke, these concessions being made to preserve the rate relationships between the several districts.

The refusal of the commission to increase rates is based chiefly upon the conviction on the part of the commission, as stated in its report, that the railroads are now so prosperous that they do not need the higher rates sought. It is admitted that the roads are facing higher costs of operation as the result of war prices for materials and labor, but, on the other hand, it is contended that, generally speaking, war conditions have aided the roads more than they have injured them and that especially the mobilization of troops and the moving of war supplies have enabled the carriers to secure extra profits.

In dealing with the great volume of statistical matter upon which the roads based their pleas for an advance, the commission calls attention to the fact that the comparisons instituted by the carriers have been chiefly with the statistics of 1916, which was an extraordinary year in railroad earnings. The proceedings under review were brought last March at a time when the February returns had just been made covering one of the worst months in railroad history. In March and the succeeding months, gross and net revenues showed very satisfactory increases, while expenses did not equal the pessimistic expectations of the carriers. The decision of the commission is in part as follows:

"We are led to the conclusion that no condition of emergency exists as to the Western and Southern carriers which would justify a general increase in their rates to become effective. In the Eastern district, increased rates have recently been permitted to become effective generally on bituminous coal, coke and iron ore. We think that similar increase may properly be permitted in the Southern district on coal, coke and iron ore, and in the Western district on coal and coke. This will preserve rate relationships between the several districts.

"In the Southern district, the proposed increased rates on coal are on the basis of 15 per cent, with a maximum of 15 cents per ton. These tariffs we shall permit to become effective. In the Western district, the increases are based upon 15 per cent, with a minimum of 15 cents per ton. These tariffs will be suspended, but the Western carriers may, if they so elect, file new tariffs carrying increases in rates on coal and coke not exceeding in any case 15 cents per ton.

"All of the tariffs included in this proceeding of the Western lines will be suspended. All of the tariffs included in this proceeding of the Southern carriers will be suspended, excepting those applying on coal, coke and iron ore.

"For reasons indicated in this report, we shall suspend all of the tariffs before us in this proceeding of the Eastern carriers excepting those applying on iron ore. As has been indicated, however, the conditions confronting the Eastern carriers are substantially different from those confronting the Southern and Western carriers, and we are persuaded that they are entitled to increased revenue beyond and above that which they are securing and will secure from the increased rates on bituminous coal, coke and iron ore."

World's Tallest Chimney Erected in Japan

The highest chimney in the world was completed in December last by the Weber Chimney Co., Chicago, for a copper smelter at Sagonoseki, Japan. It is constructed of concrete, 570 ft. high, 26¼ ft. inside diameter at the top, and 42 ft. in diameter at the base. Its purpose, of course, is to carry the fumes from the smelter to an altitude that will so far as possible avoid the killing of surrounding vegetation. It sets on a hill 430 ft. above the furnaces and its top is therefore 1000 ft. above the copper plant.

The foundation, which is 95 ft. in diameter, contains 2700 cu. yd. of concrete and required 30 days to build. It rests on gravel, and supports 6000 lb. per sq. ft., figuring the weight of the chimney and the force exerted by the wind. For 150 ft. the chimney is reinforced by a concrete lining separated from the outer wall by a 5-ft. air space. The opening at the base is 31 ft. high and 20 ft. wide. The flue connecting the furnaces and chimney is 30 ft. in diameter and 2500 ft. long, and is provided with openings to enable the cleaning of the big tube.

In the construction of the chimney 400 tons of steel was used. All wind stresses are cared for by vertical reinforcing rods, mill lengths being used. The temperature and shearing stresses are cared for by horizontal rings encircling the vertical bars. Under the maximum strain the stresses are figured not to exceed 16,000 lb. per sq. in., and the compression on the concrete at 550 lb. per sq. in. In erecting, all scaffolding was on the inside. The contract was closed in February and the work completed in December.

Construction work was directed by Charles P. Woodworth, vice-president Weber Chimney Co., assisted by five Americans who gave directions to native labor and set the forms. The fittings for the forms were sent from the United States, but the lumber was purchased in Japan.

Uranium Steel for Gun Linings

The production of ferrouranium from the uranium oxide obtained as a by-product in the extraction of radium from its ores is to be investigated by the Bureau of Mines. Ferrouranium is used in making uranium steel, used in Germany for the linings of big guns, which, it is claimed, stand up at a rate of fire so rapid that other steels fail. Work will soon be begun on the production of sample lots of uranium steel and other special steels, for test by the Bureau of Ordnance of the War Department as to their suitability for use in guns. The work on gun steel will also require the use of electric furnaces. It has not yet been decided whether this work will be done at Cornell or at one of the other universities which have offered facilities.

The Irwin Auger Bit Company, Wilmington, Ohio, has announced that an insurance policy of $500 will be carried free for each man in its employ that enlists for the war. The company for some time since has been carrying a policy of $1,000 life insurance on each employee and the extra $500 for those who go to war will make a total amount of insurance for them of $1,500.

The June meeting of the Pittsburgh Foundrymen's Association took the form of an outing, which was held at the Westmoreland Country Club, near Pittsburgh. Entertainment was provided, and a dinner was given in the evening. No meetings of this association will be held in July and August, the first of the fall and winter meetings to be held on Sept. 17.

Japan's pig-iron output in 1916 was 65,014 tons, against 64,897 tons in 1915, according to the Imperial Department of Mines. The copper output was 81,240 tons in 1916 and 75,415 tons in 1915.

CASE-HARDENING BY BORON*

Successfully Applicable to Machine Parts Where Much Wear Is Involved

BY PROF. N. TSCHISCHEWSKY

ON an inspection of the diagram of iron-boron alloys (THE IRON AGE, Aug. 24, 1916), it will be seen that on cooling these alloys the boron is not wholly combined in the form of borides of iron, but a proportion of it is left in the form of a hard solution. This phenomenon suggests the possibility of case-hardening steel by boron, similarly to the case-hardening of iron by carbon. Alloys of iron with boron are remarkably hard, so that they can scarcely be treated on an emery-wheel. The technical application of case-hardening by boron suggests itself therefore as a feasible industrial operation.

The complete cementation that takes place in carbon steel is not the type of operation the author has in mind, but a surface cementation. It is more convenient to obtain a ferroboric alloy by melting on account of the high price of boron, and also to secure its complete use without wastage.

The use of boron is not perhaps suitable for armor plates, because of its comparative scarcity, but for some machine parts and, generally speaking, where much wear occurs, boron can be applied with success. While annealing is necessary in order to confer the necessary hardness on articles case-hardened by carbon, boron confers hardness without the necessity of any special heat treatment.

To ascertain the conditions of case-hardening by boron, the author took a sample of iron of the following composition:

	Per Cent
Carbon	0.12
Silicon	0.02
Manganese	0.16
Phosphorus	0.06
Sulphur	0.04

And as a case-hardening powder, pure amorphous boron and a finely powdered rich alloy of iron with boron containing about 19 per cent of boron were taken.

The pieces of soft iron used were in the shape of cubes, holes being drilled in the center to a depth of about half their length. These holes were filled with fine amorphous boron, or with powdered ferroboron. The holes were closed by stoppers made from iron of the same quality, these stoppers being pressed home by means of a hydraulic press. The powder being thus compressed, a good contact was secured between it and the sides of the sample, which was thus hermetically sealed. Specimens prepared by this method were heated in a Heræus furnace in a silica tube. The temperature was measured by a Le Chatelier pyrometer, of which the thermo-junction was placed close to the specimen. In order to eliminate the influence of a gaseous medium, the whole of the air from the silica tube was removed by means of a mercury pump. The samples after heating during several hours showed no trace of oxide on the surface.

Fig. 1 shows two samples which were heated for two hours at 950 deg. Specimen I contains amorphous boron, and specimen II powdered ferroboron. Both samples were cut across longitudinally by means of a steel saw, and the cut surfaces polished.

At the lower part of Fig. 1 are seen the stoppers, which are sometimes marked with thin bands, resulting from the contact with the cement powder left on their sides. The dark area over the stoppers represents the compressed cementing powder. The volumes of the compressed powders decrease partly on account of nodulizing, partly owing to absorption by the sides of the specimens. The bands represent an alloy of iron with carbon, and can clearly be seen in the vicinity of the spaces containing the compressed boron or ferroboron. Under the conditions of the experiment (950 deg. and two hours' heating) the boron penetrated the iron to the depth of 1 millimetre.

From the experiment it was ascertained that cementation by powdered ferroboron proceeds more easily and quickly than with amorphous boron. Microscopical examination shows that the hard white layer of the case-hardened part of the specimen consists of compact boric pearlite, with a twin crystal structure.

The photomicrograph of this portion is shown in Fig. 2. The edges of this layer contain a sub-eutectic alloy of ferrite-pearlite, Fig. 3.

The ferrite in this instance contained the boron in hard solution, this being explained in the author's paper dealing with the diagram of iron-boron alloys previously referred to.

Case-hardening at a lower temperature yields an alloy of iron containing less boron. This alloy is not so hard and brittle as that already described. In order to render the process of case-hardening by boron suitable for industrial purposes, it would be necessary to carry out a series of experiments on the conditions most suitable to the particular purpose in view.

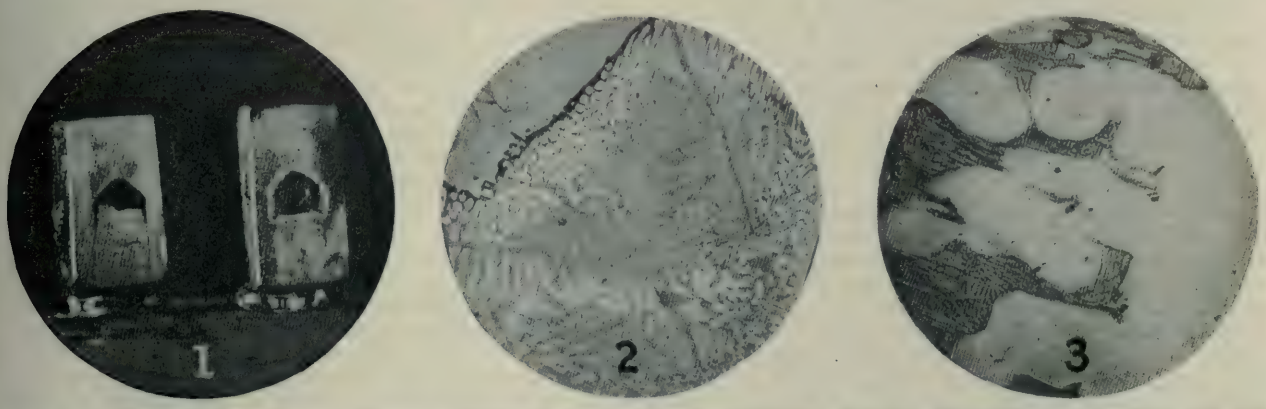


Fig. 1 Shows Cubes of Iron: I Containing Amorphous Carbon and II Containing Powdered Ferroboron. The illustration was taken at about 350 diameters. Fig. 2 represents boric pearlite of twin crystal structure. Fig. 3 shows the subeutectic alloy of ferrite-pearlite

*From a paper presented at the Iron and Steel Institute, London, May 3, 1917. The author is a professor at the Tomsk Institute of Technology, Tomsk, Russia.

Austria-Hungary's Steel Output in 1916

The steel output of Austria-Hungary in 1916 exceeded that of any previous year. The total was 3,336,607 metric tons, against 2,686,226 tons in 1915 and 2,200,000 tons and 2,700,000 tons in 1914 and 1913 respectively. The 1916 increase is about 24 per cent over that of 1915. The comparative output in the last two years is as follows in metric tons:

	1915	1916
Bessemer steel	241,690	343,714
Open-hearth steel	2,370,947	2,893,409
Forge iron and steel	23,543	18,204
Crucible steel	26,151	34,033
Electric steel	23,895	47,247
Totals	2,686,226	3,336,607

The increase in the output of electric steel is noteworthy—over 100 per cent under war conditions. The increase in open-hearth, Bessemer and crucible production is large. Austria produced 2,501,070 tons of the 1916 total and Hungary 813,433 tons.

Boiler Makers' Meeting at Pittsburgh

Progress of Movement to Get Nation-Wide Uniform Specifications—Why Further Modification of Marine Boiler Inspection Laws Is Necessary

PROGRESS toward the establishment of a uniform boiler code was made at the annual convention of the American Boiler Manufacturers' Association held in Pittsburgh at the William Penn Hotel, June 25 and 26. Resolutions were passed requesting the United States Board of Supervising Inspectors of the Steamboat Inspection Service and the Massachusetts Board of Boiler Service to modify their rules and regulations to accord with the boiler code of the American Society of Mechanical Engineers. Other notable features of the meeting were noted in last week's issue of THE IRON AGE.

E. R. Fish, vice-president and secretary Heine Safety Boiler Co., St. Louis, emphasized that the requirements of the Board of Supervising Inspectors for boiler plates and details of manufacture are not according to accepted practice and that steel mills have invariably asked higher prices for marine plate than for other grades of material. The conditions which have arisen because of the war, he held, require a change in practice, and the Shipping Board, he said, seems perfectly willing to accept that A. S. M. E. code as the basis for the construction of boilers. He also pointed out that boilers constructed for the Shipping Board would eventually pass into private ownership and come under the supervision of the United States Inspectors and in anticipation of this, the Steamboat Inspection Service amended its rules, changing the requirements of boiler plate substantially to those of the A. S. M. E. code, the principal difference remaining being that in regard to the minimum tensile strength permitted. However, he explained, steel mills are inclined to regard plate rolled under the amended rules as marine plate and charge accordingly. In his opinion, the requirement of the United States Inspection Service making 58,000 lb. per sq. in. the minimum tensile strength is unjustified and he pointed out that Lloyd's authorities accept plate as specified by the A. S. M. E. code, basing their calculation of pressure upon the minimum tensile strength shown by test. The present regulations of the Inspection Service, he continued, made it difficult and expensive to obtain plate and manufacture boilers.

Conditions After the War

That the United States is going to build sufficient ships to replace losses and establish a merchant marine by the end of the war was claimed by Hon. E. S. Sweet, assistant secretary of commerce, Washington, speaking on "Industrial Co-operation in the War." He emphasized the point that the present war offers problems of science and industry in shipbuilding and that the manufacturers of the country are going to be an important factor in the final decision. He pleaded for co-operation by the boiler makers and the Government. Outlining the work of the Bureau of Commerce, he stated that the increase in exports between 1913 and 1916 were partly due to the work of the Government which had sent out eight commercial attaches to Europe for the purpose of stimulating export trade. After the war, in his opinion, friendship will play an important part in the trade of nations and he hoped that after the war the feeling of the American people to the German people will be friendly and that the United States would be influential in establishing an international trade commission for the promotion of a spirit and good will between nations in trade.

Misuse of Boilers

S. F. Jeter, chief inspector of the Hartford Steam Boiler Inspection & Insurance Co., told how boilers are frequently damaged in shipment previous to their installation and after having been properly inspected in the shop. In one instance a boiler was used for straightening an I-beam; the boiler was suspended by chains from a crane and used as a hammer. This occurrence, he admitted, was exceptional, but shows the extent of rough treatment that may be given a boiler previous to installation. The shop boiler inspector, he pointed out, must be a high grade of man and that if he is he serves equally well the manufacturer and the consumer.

D. M. Medcalf, chief inspector, Toronto, Ontario, stated that boiler shops in Canada are making shells as well as boilers but are handicapped in their work because of the shortage of material and labor conditions. Good boiler makers, he stated, cannot be obtained and conditions are such that new equipment is scarce and second-hand boilers are being readily accepted. The demand for marine boilers, he stated, is extraordinary and Ontario has undertaken the establishment of plate mills to aid in supplying sufficient plates.

Specialization in Manufacture

Quoting Charles M. Schwab saying: "We are entering an era of co-operation where we are beginning to see that the success of any business does not consist in the failure of its competitors," W. H. S. Bateman, Champion Rivet Co., Philadelphia, pleaded for closer co-operation of boiler manufacturers and the elimination of unfair and unscrupulous competition so common during normal times. He also pointed out the necessity of specializing in the boiler business. The present tendency to this end, he said, is shown by boiler mnaufacturers in some cities dong only marine work, while others build water-tube boilers and special type boilers. Still others devote their time and plant to return tubular boilers.

He emphasized that boiler manufacturers cannot efficiently manufacture both tanks and boilers and should devote their plant to either one or the other. Many of the boiler building concerns, he stated, which are operating shops five or six times as large with more and heavier machinery than they ever thought of using for boilers, are devoting their entire attention and efforts to the building of tanks and general plate construction.

National uniform boiler inspection laws, in his opinion, were an urgent need and would operate as well as the federal locomotive boiler inspection laws are said to operate. No state with uniform boiler inspection laws in force, he pointed out, could with its own special laws keep the manufacturer of another state from coming in and taking boiler business, provided the requirements are met. He made a plea for the use of uniform specifications and the frank discussion of standards, methods of production and labor cost involved in the manufacture of boilers to the enlightenment of all the members.

Officers for Ensuing Year

Officers were all re-elected except one member of the executive committee, whose place has been taken by E. R. Fish; they are as follows:

President—M. H. Broderick, Broderick Mfg. Co., Muncie, Ind.

Vice-President—C. V. Kellogg, Kellogg & Mackay, Chicago.

Secretary and Treasurer—H. N. Covell, Lidgerwood Mfg. Co., 191 Dikeman Street, Brooklyn, N. Y.

Executive Committee—W. C. Connelly, D. Connelly Boiler Co., Cleveland; G. S. Barnum, Bigelow Co., New Haven, Conn.; E. C. Fisher, Wickes Boiler Co., Saginaw, Mich.; E. R. Fish, Heine Safety Boiler Co., St. Louis; Louis Mohr, John Mohr & Sons Co., Chicago.

Visit to National Tube Works

Wednesday morning, June 27, the boiler manufacturers visited the National Works of the National Tube

Co. at McKeesport, Pa., inspecting the 42-in. universal skelp mill, the 13-in. skelp mill, the 16-in. skelp mill and the lap weld and butt weld tube mills. W. A. Cornelius, manager of the National Works, and A. M. Saunders, superintendent Upper Works, directed the party. The noticeable features of the plant were the safety measures and the cleanliness; also the process of spelerizing and methods of testing tubes by hydraulic pressure and crushing. The boiler manufacturers were also interested in a fence, part of which was made of steel tubing and part of iron tubing. This fence has never been painted, has been up approximately ten years and is used to determine the relative extent of corrosion between iron and steel.

The afternoon was finished by a drive to the Youghiogheny Country Club, where luncheon was served.

ENGLAND'S WAR SUPPLIES

Minister of Munitions Makes Interesting Statement to House of Commons

Great Britain's gigantic war supply business was graphically presented to the House of Commons June 28 by Dr. Christopher Addison, Minister of Munitions, speaking on the estimates for his department. Dr. Addison declared incidentally that negotiations were now in progress for the consolidation of American and British interests, which should add greatly to the resources of the Allies and effect material economies in purchasing. Dr. Addison said 1,500,000 tons of material for his department were shipped monthly from the United States and Canada. Of this amount the total loss from the submarines since the ruthless warfare began reached only 5.9 per cent. Up to March last, the production of explosives in England had quadrupled in a year, and the increase over March, 1915, had been 28 times. More than 2000 miles of railway track had been laid back of the fighting front, mostly track pulled up in England, Canada and Australia, and nearly 1000 new locomotives were at work. The annual production of steel had been raised from 7,000,000 to 10,000,000 tons, and would reach 12,000,000 tons. A million and a half steel helmets had been distributed in six months. And in all this work a saving of $215,000,000 had been effected. From 60 to 80 per cent of the machine work on shells, fuse and other supplies is done by women.

He paid tribute to Kenneth Quinan, a California engineer, who designed and equipped the new factories.

"He is not the only American citizen who has assisted the Ministry of Munitions throughout its career," said the minister, "but in the great work at Queensferry, Gretna and other places we come possessed through his genius of factories which to a very large extent will be of permanent value to peace industries."

The Ministry had recently reached such a state of production with respect to gun munition, he said, that it was able to divert certain national factories to assisting other sections of the munitions program.

Munitions Efficiency Proved

The requirements regarding the accumulation of a great reserve of field gun ammunition would be met in good time, he said, and, despite the enormous expenditure in the first nine weeks of the offensive, the stock of filled shells had only fallen off 7 per cent. Field Marshal Haig had enthusiastically reported on the accuracy and fine detonating quality of the ammunition.

The output of machine guns and rifles was fully equal to the demands, while for railway purposes tracks pulled up in England, Australia and Canada had been utilized. Canada had arranged to pull up 800 miles of track and ship it complete when wanted. One thousand locomotives had been sent from the colonies, apart from hundreds supplied by the railways.

The demands for steel were so many that the control had been very close, and, despite all the help from Canada and the United States, he could not offer any immediate prospect of relief. Notwithstanding the cost of material and labor, the Government was obtaining steel plates in this country at less than half their cost in the United States, while shell steel cost 30 per cent less.

Referring to salvage operations at the front, the Minister said it was now possible to re-form hundreds of thousands of 18-pounder cartridge cases weekly at a cost of four pence each, compared with seven shillings for new cases.

The work of the Ministry, he said, had almost doubled within the last 12 months. The aircraft supply alone at the beginning of the year required an additional 10,000 workers, and that which applied to the aircraft applied also to shipbuilding, gun making, tanks, agricultural implements and other necessaries of war.

The widespread employment of women had been attended, singularly, with little difficulty. From 60 to 80 per cent of the machine work on shells, fuse and trench warfare supplies was done by women.

Shipbuilding in Canada

TORONTO, ONT., July 2.—That there has been wonderful development in shipbuilding in Canada is evidenced by some figures on the amount of shipbuilding going on in the Dominion at the present time, Hon. J. D. Hazen, Minister of Marine and Fisheries for the Dominion, has announced. Perhaps the most remarkable achievement is the number of wooden sailing vessels, before the war thought to be obsolete, now being built. At present, 57 of these vessels are under construction for Atlantic service. On the East coast, Mr. Hazen stated, there are 13 steamers being built, two of them cargo vessels of steel construction. On the Great Lakes, 22 steamers are under way, one of which will be 7360 tons, of steel construction.

Among the more important of the steel shipbuilding companies can be enumerated the Port Arthur Shipbuilding Co., Port Arthur, Ont., with a capacity of eight 261-ft. boats a year; the Collingwood Shipbuilding Co., Collingwood, Ont., with a capacity for another eight; the Thor Iron Works and the Polson Iron Works, Toronto, with a capacity of four and eight respectively; the Kingston Shipbuilding Co., Kingston, Ont., two ships; the Canadian Vickers, Montreal, 10 or 12 a year; the Davis Co., Quebec, three, and the Nova Scotia Steel Co., Pictou, N. S., four a year. The shipyards located at ocean ports are naturally building the larger type of ocean-going freighters. To encourage shipbuilding in Nova Scotia, Premier Murray has introduced a bill in the Legislature providing for the appointment of a shipbuilding commission of five members and a secretary, to provide ways and means of developing the industry.

To the Polson Iron Works, Toronto, goes the honor of launching in one day from one set of ways four fishery protective vessels, a feat never before known in the history of the shipbuilding industry on either side of the Atlantic. The Polson Iron Works is also constructing 10 3500-ton steamers, all of the same type and built to British corporation specifications highest class for ocean service. The last of these boats is to be completed before the close of navigation in 1918. The plate and material has been purchased and is being delivered.

There are at the present time under construction in Canadian shipyards merchant steamers totaling approximately 150,000 tons carrying capacity. The cost of producing this tonnage will be in the neighborhood of $25,000,000. In addition there are under construction in Canada's shipyards wooden vessels aggregating a total carrying capacity of about 30,000 tons.

The American Forging Co., Clifton, N. J., will commence hammering commercial forgings July 1 and will be able to make anything up to 5000 lbs. to Sept. 1, when larger tools will be installed.

FORTIFYING ITS POSITION

American Car & Foundry Co. Report Shows Conservative Policy

The American Car & Foundry Co. is using its very large earnings to a large extent to improve its financial condition. The annual report of the company for the year ended April 30, 1917, shows that the net earnings for the year, after renewals and repairs, amounted to $10,310,871, as against $2,816,018 in 1916, $2,330,936 in 1915, and $9,347,084 in 1907, the next best year to 1917. The large net earnings of the year remained after writing off the entire cost for special equipment for the production of munitions. After paying dividends of 6½ per cent ($1,950,000) the remainder of the net earnings was disposed of as follows: Added to reserve for general overhauling, improvements and maintenance, $2,500,000; special reserve for improving working conditions of employees, $500,000; added to reserve for dividends on the common stock, $2,250,000, making in this reserve with the balance carried over from preceding year a total of $2,400,000, equivalent to 8 per cent on the entire common stock. After making all these deductions, $1,010,871 was added to surplus account.

The net income for the year ending April 30, 1917, and preceding years has been as follows: 1917, $10,310,871; 1916, $2,816,018; 1915, $2,330,936; 1914, $3,757,971; 1913, $3,328,593; 1912, $2,839,232; 1911, $4,234,789; 1910, $4,089,478; 1909, $2,895,831; 1908, $8,961,380; 1917, $9,347,084.

President W. H. Woodin in his report said in part:

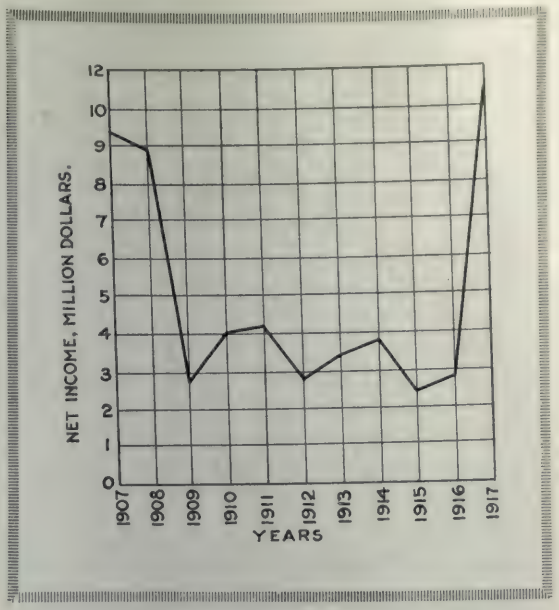
"Your company was among the first to place its facilities unreservedly at the disposal of the Government, to be put to such use as might best suit the national needs. Already some portion of the work which our country has taken upon itself as its part in the righteous war in which we are engaged has been allotted to your company, and it is a fair assumption that we shall hereafter be called upon to play an increasingly greater part in the struggle that lies before us. Our Government, and the stockholders, may be assured that this company will give of its best—in experience, in organization, in production—to insure the making of that lasting peace short of which the United States and its allies will not stop.

"From the viewpoint both of operations and results, the year has been a satisfactory one. The performance of your company in the production of munitions has been gratifying, not only as to quality, but also with respect to volume and speed of production, and has not been excelled by any other company in the United States. The representatives of the governments for which your company has been producing munitions have been unstinted in their expressions of approval of its organization and methods. The experience acquired in this branch of industry will without doubt prove of very great value to our Government, enabling your company quickly and economically to meet what promises to be a very large demand for such supplies.

"A fair share of the year's earnings resulted from the conduct of your company's ordinary business in the manufacture and sale of cars and miscellaneous supplies. Material costs have been high, and are likely to continue so. This, together with the increased cost of operating, coupled with an inability to obtain a corresponding augmentation of revenue, makes it growingly difficult for the railroads to finance the purchase of new equipment in quantities sufficient to meet the normal traffic requirements of the country. The need of means of transportation, both for domestic and for foreign use, is so great, however, that it is reasonable to expect that, with the advent of more propitious conditions, your company's facilities for this line of production will continue in fair demand.

"At the close of the year your company had on its books for construction a greater number of cars than at the beginning.

"The wisdom of strengthening at this time the reserve for general overhauling, improvements and maintenance, and the reserve for dividends on common capital stock, is apparent. This latter reserve will be drawn upon as occasion may require, for the paying of dividends on the common stock as and when such dividends shall be declared."



Net Earnings American Car & Foundry Co., 1907-17

To Improve Express Service

Manufacturers of steel castings and many other kinds of products have been much annoyed for a long time by articles being lost when shipped by express and there are now in the offices of express companies, many thousands of pieces from which the addresses have been lost. In order to improve the service the Express Traffic Association has been formed by leading express companies with headquarters at 61 Broadway, New York. F. J. Airy is secretary and vice-presidents of a number of express companies assist in the management. Numerous iron and steel shippers are co-operating with the association and it is hoped that many more will do so. To prevent losses in shipment, shippers are being asked to give all material shipped two sets of markings, one to be the customary shipping tags and the other a special marking to be used for emergency when the former marking becomes disfigured or lost. This, to a large extent, will be left to the judgment of the individual assembler. In the case of rivets, for example, an additional tag will be put inside the bag in addition to the tag attached to the outside. For bars, in addition to the stenciling or tagging where the section of the bar is too small to stencil, a paster or tag will be put on the bar, which will be wrapped in burlap and thus kept clean and not detached.

Refining Hot Metal in Electric Furnaces

Duplexing hot metal from open-hearth into electric furnaces will soon be the practice of the Charleston Steel Co., Belle, W. Va. The company has nearly completed one 8-ton open-hearth furnace, which will be delivering hot metal to the electric furnaces in about two weeks. A 15-ton open-hearth furnace will also be erected, work on it to start about July 15. The Rennerfelt electric furnaces, originally installed at this plant, have been modified by introducing the three electrodes through the roof. H. G. Scott is the president and Charles A. Swan, manager.

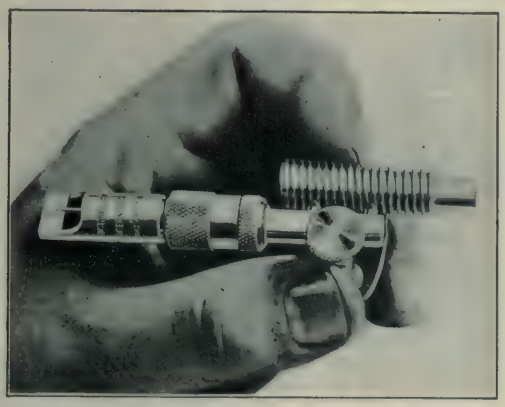
Park & Williams, Philadelphia, dealers in iron and ores, have taken out incorporation papers in Pennsylvania, capitalization being $25,000. The firm will shortly move its headquarters from the fifteenth floor of the Real Estate Trust building, to the seventeenth floor.

Indicator for Lead on Screw Threads

A device for testing the lead on external and internal screw threads has been brought out by the Bicknell-Thomas Co., Greenfield, Mass. Screws of any of the customary diameters can be measured and the smallest size of tapped hole that the indicator will enter is ½ in. in diameter. This, it is pointed out, enables the lead of the thread on the small sizes of screws and the tapped holes in which they fit to be tested.

The device consists of two points which are capable of adjustment for various leads, mechanism for transmitting the motion of these points to the indicating needle and a set of graduations to show the departure of the lead from the normal amount. A table on which the screw rests when being tested is provided. This can be adjusted to accommodate various diameters of screws and when internal threads are being measured the thumb screw holding the table in place is loosened and the latter removed. A master is furnished with each gage to enable the operator to make certain that the needle point is on the zero mark when the gaging points are properly spaced. If it is necessary to test threads having odd pitches, such as 13 threads to the inch, a master can be furnished for adjusting the indicating needle.

In use a screw is placed on the indicator which is held in one hand, preferably the left, and is pressed against the two points which are spaced ¼, ½ or 1 in. apart, as may be desired. The indicator needle will remain at the center graduation, which is zero, if the lead of the thread is normal, moving downward toward the plus side if the lead is long and in the opposite direction if the lead is short. The exact amount of discrepancy is indicated by the graduations, each of



Any Variation from the Proper Lead of Internal and External Screw Threads Is Indicated by the Pointer and Graduations at the Left

which corresponds to 0.001 in. For internal threads the procedure is the same except that the table is removed as mentioned and the indicator is inserted in the tapped hole.

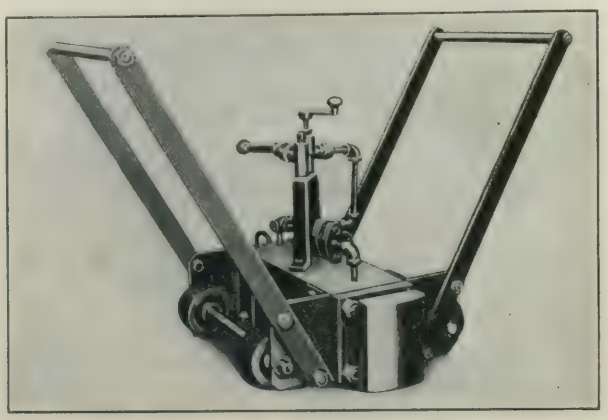
Ferguson Steel & Iron Co. Additions

Completion of additions within a month will make the plant of the Ferguson Steel & Iron Co., Buffalo, N. Y., ten times larger than it was at the inception of the company four years ago. The fabricating shop, which is nearing completion, is 760 ft. long and 130 ft. wide. It contains about 850 tons of steel. The warehouse, which has heretofore been used for fabricating, is being stocked heavily with steel. From one end to the other the two shops measure 1300 ft. in length. An addition 40 by 30 ft. and two stories is under construction and will house a part of the drafting department. Another addition 40 x 50 ft. is being made to the main office building, due to the unusual increase in the office and sales forces, which now number about 85 men.

Wheelock, Lovejoy & Co. of Cambridge, Mass., and New York, have opened a warehouse and office at 1800 Columbus Road, Cleveland, carrying a stock of their machinery steel.

Bending Machine for Ship Material

For bending heavy structural steel shapes used for ship frames, deck beams, etc., the Watson-Stillman Co., 190 Fulton Street, New York, has developed a portable



Heavy Steel Shapes Can Be Bent for Ship Frames, Deck Beams, etc., by This Portable Hydraulic Machine, Which Develops 18 Tons

machine. It is operated by hydraulic power supplied from a pump or accumulator. The construction is compact and an effort has been made to keep the weight as light as is consistent with the work that has to be performed. It is intended, of course, to do the bending without reheating of the material and with a minimum amount of labor.

The machine, which is mounted upon broad rollers enabling it to be moved over the bending slabs by handles at either side, consists of a cylinder, ram and operating valve. A loose pin is provided that fits into the holes in the bending slabs and serves as an abutment for the machine. The ram which in the machine illustrated has a 10-in. stroke, is double-acting and provision is made to control the movement in either direction at all times as well as preventing overstroke. A screw stem stop and release valve is provided ordinarily, but a single lever operating valve can also be supplied.

A pump can be employed to provide the power which, in the case of the machine illustrated, is 18 tons at a pressure of 1500 lb. per sq. in. and 20 tons at a pressure of 1750 lb., although an accumulator is the source of supply recommended by the builder.

The machine can be built with the axes of the rollers and the ram all parallel as illustrated, or with the ram axis at right angles to the rollers. The weight of the machine is 750 lb.

Buying Munitions in Canada

Sir Thomas White, Minister of Finance, Ottawa, Ont., has arranged to make a further advance of $75,000,000 to the Imperial Government to be used for the purchase of munitions and supplies in Canada. The advances will be made at the rate of $25,000,000 a month during June, July and August. For a certain type of shell the British military authorities principally depend upon Canada's industrial establishments, whose output has contributed in no small measure to the recent successes at the front. These munitions can be purchased in the Dominion only, if Canada provides the money by way of loan to the Imperial Treasury. Up to date, the Dominion Government has found $250,000,000 and the banks of Canada $100,000,000 for war purposes. The credits now established by the Government insure continued munition orders for months to come.

The Association of National Advertisers, Inc., has issued a very interesting statement showing that advertising is not as expensive as is generally supposed. The cost of advertising of some leading advertisers is given as follows: Leading paint manufacturers, 3½ per cent of total sales; leading automobile manufacturers, 2 to 3 per cent; prominent department stores, 3 per cent.

Government to Buy British Machinery

Nearly $10,000,000 Worth for Manufacturing Enfield Rifles—Differences of British and French Guns and Ammunition

WASHINGTON, July 2.—The War Department has perfected plans for purchasing from the British Government approximately $10,000,000 worth of machinery for the manufacture of the Enfield rifle, with which to equip the new National Army to be sent to France. This machinery is now installed in several private plants in this country, having been built to the British Government's order more than a year ago and utilized in turning out a large number of Enfields for the equipment of the British forces on the western war frontier. This announcement, which the correspondent of THE IRON AGE is able to make on the authority of the Ordnance Bureau, serves to explain Secretary of War Baker's recent communication to the Speaker of the House of Representatives urging an appropriation of $9,500,000 "for the purchase or manufacture of machinery and other facilities for the manufacture of rifles including the necessary buildings, etc.," and in which he said that "the imperative necessity for the submission of this estimate arises from the fact that there is no other way than by the procurement and use of this machinery by which the forces it is contemplated to raise in connection with the European war can be armed at the proper time."

Why Springfield Rifles Are Out of the Question

This interesting incident serves again to illustrate forcibly the disastrous folly of the policy pursued by Congress during the past three years in ignoring the reiterated recommendations of War Department officials for generous appropriations for the purchase of gages, jigs, dies, automatics and other equipment to be installed in private plants to fit them up for the manufacture of service rifles. Under pressure from a small contingent in both houses, influenced by certain labor leaders who desire to expand the arsenals so as to provide a maximum amount of employment under the superior labor conditions existing therein, Congress systematically ignored these recommendations, yielding only when it was too late to make any substantial progress in purchasing and installing the desired machinery and devices. When the declaration of war came, therefore, the War Department was reduced to the humiliating expedient of abandoning its long cherished project of arming its forces with Springfield rifles, believed by American ordnance experts to be superior to any small arm in the world, and to provide for the equipment of a large part of the army with Enfields. As the use of the Enfield rifle was never contemplated the arsenals are without equipment for its manufacture and as the private plants have never been fitted up for the production of Springfields the output of the arsenals cannot be supplemented by contracts. Thus the Ordnance Bureau must utilize two types of rifles, and in order that the ammunition may be interchangeable—an absolute essential under service conditions—it has been obliged to provide for the rechambering of all the Enfields manufactured to reduce them to the Springfield caliber.

Great Britain's Better Policy

The course pursued by the British Government under similar circumstances is in marked contrast with the policy of the American Government as dictated by Congress. Immediately after the outbreak of the war with Germany contracts were placed in the United States for a large number of Enfield rifles at prices which included liberal allowances for the installation of equipment for their manufacture and for the amortization, in whole or in part, of the plants engaged in making the arms. At that time the facilities for the production of gages, jigs, dies, etc., were not fully engaged and as a result within six or eight months complete equipment for making the Enfield rifle was in place. Under the terms of some, if not all, of these contracts, the equipment became the property of the British Government and it is a part of these installations that the War Department is now proposing to purchase. It may be assumed that the plants in which these special installations have been made will not delay work upon the orders of Enfields for the National Army until Congress appropriates the money requested by the Secretary of War, but it is understood that the orders given by the War Department are conditioned upon the ultimate acquisition by the United States Government of such of the equipment employed as now belongs to Great Britain.

Features of British and French Guns

The Secretary of War has forwarded a letter to the Senate in compliance with a resolution passed by that body on June 15, in which he supplies some exceedingly interesting information with reference to the difference in types between the rifles, machine guns, field artillery and ammunition therefore, of the United States Army and those of the English and French Armies. This information will be of special interest to manufacturers who are following the development of the Government's project for equipping private plants for the manufacture of arms and ammunition of all calibers. The Secretary's communication, which is in the form of a series of questions and answers, is as follows:

First question. Has the British Enfield rifle been adopted for the American Army, and, if so, are such rifles being chambered so as to fit the American type of rifle cartridge?

Answer. It is intended to retain the American rifle of the model of 1903—sometimes called the "Springfield rifle"—for the use of the United States troops, and to increase the number available as rapidly as the manufacturing capacity of the two Government armories, at Springfield and Rock Island, will permit. The 500,000 and more of these rifles available for use in the war with Germany which are on hand in the United States, and over 200,000,000 of ammunition therefor, will thus be fully utilized. Because troops will probably be raised faster than they can be supplied with rifles of the model of 1903, with the above stated production, Enfield rifles of the model of 1914, manufactured in the United States, with different chambering and other modification to fit them to use the regular United States ammunition, will be newly made by the three establishments in this country which have made them for England, and used to supplement our own supply. We shall thus probably have two models of rifles in the field, but, and much more important, we shall have only a single model of ammunition, so that there will be no danger of confusion of ammunition supply.

Second question. Are machine guns for the use of the American Army using the same type of rifle carriage as the army rifle used by the American Army?

Answer. Yes.

Third question. Do the American cartridges for use in rifles and machine guns differ in size or otherwise so as to prevent their being used in the rifles and machine guns of the English or French? If so, what is the character of the difference and what advantage is gained thereby?

Answer. The American cartridge for use in rifles and machine guns cannot be used in the rifles and machine guns of either the English or French. As the English and French cartridges differ from each, the American cartridge would have to differ from at least one of them. Aside from the difference in dimensions, the American cartridge is a rimless cartridge, while the British and French cartridges are rim cartridges. The use of the rimless cartridge minimizes the risk of jamming in the magazine, and it is otherwise superior to the rim type.

Fourth question. To what extent does the field artillery of the American Army differ in caliber and character of ammunition used from that of the French and English armies?

Answer. In the field artillery of the American Army are cannon of somewhat similar calibers to those used in the French and English armies. The field artillery of these two armies, even the cannon of approximately the same caliber,

differs materially in the size of the chamber, muzzle velocity, weight of projectile, and type of fuse; that of the American Army would therefore necessarily differ from one or the other.

Fifth question. Can the ammunition of the English or French armies be used in the field artillery of the American Army?

Answer. The ammunition of the English or French armies cannot be used in the field artillery of the American Army.

Sixth question. If the American ammunition for rifles, machine guns and field artillery is not interchangeable for like British or French guns, what advantage is gained by having it differ from that of the English or the French Army?

Answer. The ammunition for rifles, machine guns and field artillery of the American Army, like that of the English and French armies, is the result of development along independent lines, the type of one country usually having been fully developed and in process of manufacture before the details of that of another country became known. In case of an enemy this lack of interchangeability of ammunition may be of material advantage, but in case of an ally it is a decided disadvantage. With reference to the present situation, it would be highly advantageous if our ammunition were interchangeable with that of those allies with whom our troops will directly operate, and with whom they could share common sources of supply. For operating with the French the disadvantage of not having our rifles and machine guns fitted for the English ammunition is small, and is more than counterbalanced by the ability to use the quite material supply of rifles and ammunition on hand, as set forth above in the answer to the first question. The French rifles and machine guns are not, and have not been, manufactured in this country; hence, through lack of manufacturing facilities, the question of the use of the French ammunition for rifles and machine guns could not be considered. With respect to artillery ammunitions, it may be stated that the present plans contemplate the eventual use of ammunition of the French type for most of the calibers, which the conditions of supply and manufacture render practicable.

Supply of Automobile Trucks Ample

The supply of military trucks necessary for the new army will be ample, according to the June issue of the *Bulletin* of the Society of Automotive Engineers. This was demonstrated by the fact that the 73 truck makers who submitted bids to the Government early in June pledged that they would produce over 100,000 trucks within a year, whereas it is unofficially estimated that not over 42,000 trucks will be required for the first army of 1,000,000 men. The Government has heretofore given assurance that there will be no necessity to commandeer private trucks, and so hamper industries, but the present bids indicate that not only will the taking over of private trucks not be necessary, but in addition to the war demands there will be practically as many trucks remaining for commercial use out of the 1918 production as were sold to the industries during the present year, provided sufficient material for the whole production is forthcoming. There will be enough trucks to supply the army and industries as well.

Buildings for Cantonments

The Trussed Concrete Steel Co., Youngstown, Ohio, will furnish large quantities of its products for the cantonments, to be built by the Government as training quarters. This company manufactures buildings, which have proven very satisfactory for Government purposes. Owing to the nature of their construction, these buildings can be made almost any length desired, and can be used for officers' headquarters, supply buildings, barracks, and the numerous structures which will form part of a camp.

That metals such as nickel or cobalt can be hardened by the addition of zirconium is the claim in a patent (U. S. 1,221,769) granted to Hugh S. Cooper, Cleveland. An alloy of 2 to 10 per cent zirconium and the remainder nickel is stated to take a fine cutting edge. With 8 to 15 per cent zirconium and the remainder nickel or cobalt the melting point is decreased below that of nickel and the electrical resistance increased. With 16 to 30 per cent zirconium the hardness is greatly increased and the alloy is useful for cutting tools.

England's Need of Copper

Discussing the need of copper in England, the London *Ironmonger* of June 9 says editorially:

"When will manufacturers be allowed more copper for the carrying on of private industry? There is plenty of copper in the United States, and the space required for so much of it as would set most of our private engineering trade on its feet again would make no practical difference to the Atlantic transport problem. Efforts are being made to secure to the cotton trade a sufficiency of its natural aliment; and one-tenth or perhaps one-twentieth of the shipping space required for cotton would solve the copper difficulty.

"There is little room for doubt that enough copper is now being produced to keep going all the metal and mechanical industries outside the Central Empires, besides satisfying the war requirements of the Allies, and if that surmise is correct the time has come to press this fact upon those in authority. Much wealth is being lost through the holding up of such a great part of our engineering industry, and this at a time when the nation should be earning and saving every penny it can make, for the apparent prosperity the industrial nations are enjoying is mostly an illusion. We are living on our hump, like the camel, and our hump is getting small. Hard times are in store for the world, and every measure that tends to the restriction of trade will aggravate that hardship.

"The plea for more copper is only one of many that might be put forward in the metal trade. The supply of lead also calls for serious consideration by experts, and in a comparatively short time there may be need to plead the cause of consumers of foundry iron. Man does not live by war alone. The country has to live through the war and will have to live when peace returns, and it can live only by productive industries and by commerce."

Women in the German Metal Trades

Women now employed in the German metal industries number 266,530, compared with 63,570 before the war, is a statement in the London *Ironmonger* of May 26, 1917. In the section of the industry devoted to war materials the growth is from 35,425 to 227,186. Most of the war work on which women are engaged is described as too hard, and physically harmful for them. Only in one-fifth of the works are the regulations protecting women workers in force. The working day is long; a week of 60 hours is not uncommon, while Sunday work and overtime bring up the working week for several thousand women to over 70 hours. In 364 works 34,742 women work on Sundays. Of the total number of women coming under review, 81,233 worked on time wages and 96,480 at agreed rates. Only in 278 factories did the women receive the same pay as the men. Time wages varied from 11 pfgs. to 65 pfgs. per hour. (= 1¼d. to 8d.); piece workers earned from 16 to 75 pfgs. per hour (= 2d. to 9d.). Daily piece wages ranged between 2 m. and and 10 m.; daily time wages between 1.20 m. and 7.50 m.

Edgewater Steel Co. Additions

The Edgewater Steel Co., whose plant is at Oakmont, Pa., about 10 miles from Pittsburgh, which now has one 25 and one 75-ton open hearth steel furnace, is adding a third 75-ton furnace, which will be completed in about 60 days. At present this company is making ingot molds, and also open hearth steel ingots, 20x22 in. square and 6 feet long, which it is furnishing to other concerns for re-rolling, and is also making a full line of steel castings up to 25 tons in weight. However, the company is installing as rapidly as possible under present conditions, equipment for the manufacture of locomotive and car wheel tires, rolled steel wheels for passenger and freight service, roll shells, ring dies, turbine rings and gear rims. These products, together with steel castings, will be the output of the company when the equipment now being installed is all in place and ready for operation.

Exporters Discuss Post-War Prospects

Metal Trades Day at Springfield Industrial Exposition and Export Conference Draws Large Gathering—Experts Analyze the Future of Machinery and Metal Goods in Foreign Fields

What is intended to be the first of an annual series of industrial expositions and export conferences was held at the Eastern States Exposition Grounds, Springfield, Mass., June 23 to 30. Thursday, June 28, was set apart as "Metal Trades Day" and the morning conference devoted to machinery and metal goods was presided over by Charles E. Hildreth, president Whitcomb-Blaisdell Machine Tool Co., Worcester, Mass., and general manager of the National Machine Tool Builders' Association.

The subject of the first paper, read by C. O. Smith, sales manager Norton Grinding Co., Worcester, was "After the War—What of Machinery Export?" "American Tools in Foreign Markets" was discussed by Oren O. Gallup, export manager Simonds Mfg. Co., Fitchburg, Mass., and Adolph W. Gilbert, president Chapman Valve Mfg. Co., Indian Orchard, Mass., had as his subject "Metal Fittings in Overseas Markets."

Over 400 members of the National Metal Trades Association and representatives of Employers' Associations in New England attended the session and enjoyed a sheep bake at the luncheon hour.

Each day of the conference was set apart for specific industries and many of the speakers at the various sessions were recognized leaders in their respective industries. Monday was "Paper Day"; Tuesday, "Textile and Financial Day"; Wednesday, "Leather and Rubber Goods Day"; Thursday, "Metals Day"; Friday, "Office Appliance Day"; and Saturday, "Chemical Day."

The chairman of the general committee of the Conference was Frank H. Page, president of the National Equipment Co., Springfield, and a number of men well known in the steel and machinery field were on the Advisory Council, among them the following: Walter H. Fish, manager General Electric Co., Lynn, Mass.; Louis A. Collidge, treasurer United Shoe Machinery Corporation, Boston; E. M. Herr, president Westinghouse Electric & Mfg. Co., New York; W. W. Nichols, Allis-Chalmers Mfg. Co., New York; Maurice Coster, managing director Westinghouse Electric Export Co., New York; Charles M. Muchnic, vice-president American Locomotive Sales Corporation, New York; A. L. Humphrey, president Westinghouse Air Brake Co., Pittsburgh; Winchester Bennett, president Winchester Repeating Arms Co., New Haven, Conn.; F. J. Kingsbury, Bridgeport Brass Co., Bridgeport, Conn.; and Charles Glover, Corbin Screw Corporation, New Britain, Conn.

Excerpts from the principal papers of "Metal Trades Day" follow.

After the War—What of Exports?

BY C. O. SMITH

Sales Manager, Norton Grinding Co., Worcester, Mass.

Up to the present time, England and Germany have been the most potent and, I might almost add, the exclusive competitors of America in the machinery market. It is a reasonable premise that the nations now at war will later, in large measure, co-operate with their present allies along economic lines. Further, it is not unreasonable to expect that, for a considerable period at least, the products of Germany will find little if any favor among the so-called Allies, with the possible exception of Russia; it would thus appear that for some time to come we may reasonably anticipate having only England as a serious competitor; later, we may expect to see Canada a considerable factor in the machine tool industry.

Although the enormous demands on the resources of Europe have naturally encouraged in England the highest possible development of those classes of machinery which have a direct bearing on the war, the probability is somewhat remote that there has been a similar concentration of effort on automatic and other types of machines which until within a comparatively few years were peculiarly American. Therefore, in many of these lines, especially where we are economically manufacturing in large quantities, we may anticipate finding ourselves occupying a commanding position in the industry.

Attitude of Labor

Another factor which will loom large in our machine tool destiny is the probable attitude of foreign labor. The coming of peace will find Europe's labor supply seriously depleted; this shortage, combined with the assured high cost of living, an excessive burden of taxation to meet interest on national debts, and replace the wastage of war, together with the spread of socialistic doctrines, will necessitate very material advances in the remuneration of European labor as compared with wages prevailing prior to the war, whereas unless the war continues beyond our reasonable expectations, there will not be a proportionate advance in our labor costs. Therefore, while we may not be justified in looking for a reduction in wages in this country for a number of years, we are practically assured that wages abroad will so increase as to materially aid our export business.

Let us now consider what may be the field for our product. Confining ourselves to the nations with which we are allied, we can safely count on England, with her industries intact, being in position to produce all the equipment she requires with the possible exception of such automatic or special purpose tools as can be more favorably purchased in America. On the other hand, Belgium, essentially a manufacturing country, has been laid waste. The machinery that has not already been removed to Germany and Austria, and thus will probably never be recovered, has already been or doubtless will be totally destroyed as the German army is withdrawn. A similar condition prevails in Northern France as well as in the manufacturing districts of Poland. Further, if the war continues, as has been variously predicted, from one to five years, it is quite reasonable to assume that a large part of the equipment in munition factories of England, France and Italy will be fit only for the scrap heap. I mention this because frequent statements are heard to the effect that after the war the extensive equipments of munition factories will be available for legitimate manufacture, thus creating a surplus which will require many years for its assimilation. In some classes of work, this second-hand machinery can be advantageouly employed, but for better grades such as precision tools, automobiles, motor trucks, aeroplanes, engines, etc., the most up-to-date machinery will be absolutely essential to meet the intense competition which will surely follow the return to peace.

Labor Saving Equipment

This reasoning logically leads to the conclusion that a vast amount of labor saving equipment such as America is most efficiently prepared to furnish will be required if the above sections of Continental Europe are to be restored to their former industrial activity, which restoration seems a prime necessity, if they are to enter the coming economic struggle with any degree of success.

Should the present crisis continue till we as well as our allies are financially exhausted, we may well contemplate the future with deepest concern; recent developments, however, would seem to indicate that, while our people must dig deep into their resources before

the desired end is attained, our country will still be capable of supplying the sinews whereby the ravaged countries shall again be made habitable and prosperous. Indications are not lacking that Europe contemplates an eventual industrial development far beyond that attained prior to the war, thereby utilizing a large proportion of that great army of metal-workers which during the present crisis is so valiantly supporting the armies at the front.

Heavy purchases of machinery have been and are being made, largely for use after the war and providing for production far in excess of what has been a normal output; this applies particularly to the automobile and motor truck industries. This may very properly be construed as a step in anticipation of a serious shortage in transportation facilities as one of the outcomes of this war.

Assuming that the views expressed in this paper as to the immediate future in Europe are far too optimistic, are there other fields wherein we may hope to discover and devolp an outlet for our surplus product? The answer is most emphatically, yes.

Canada our northern neighbor has but recently experienced the prosperity which comes from intensive industrial effort; nothing short of continued development along industrial lines will satisfy these "Yankees of the North." South America, which in the past has purchased so heavily of German goods, has been for three years free from Germany's direct commercial and financial influence and intercourse with other European sources of supply has been seriously curtailed.

The door has thus been thrown wide open to American enterprise, and as many of the South American states are co-operating with us in the world war, we have reason to believe this channel of trade will remain open to us. Just how long depends almost entirely on the efficiency with which we marshal our forces in the effort to win that which is logically our birthright. There is ample evidence that the trail of this development is already being blazed. Large orders for machinery have recently been placed in New York and export offices are continually receiving machine tool specifications of large proportions.

This demand will continue and probably increase in volume. It therefore behooves us to put our shoulder to the wheel and so far as export business is concerned, let our slogan be "the Americas for Americans."

Progress Being Made

Compared with the program developed by Germany the export business of this country has been conducted in a most inefficient manner, as only recently have our bankers given American exports the attention they deserve. Progress is now being made in the co-ordination of industrial and financial interests which bid fair to introduce thorough and effective co-operation which will bear comparison with the system, which prior to the war, was so efficiently fostering Germany's foreign trade.

This statement refers particularly to South America, where when suitable arrangements have been made for accommodating the customer with the long credits to which he has been educated, and the proven merit of our goods has secured the confidence and support of the market, American business ability may safely be entrusted to so cement this good-will as to make our export future reasonably secure.

Humanity is much the same the world over; the foreign user of machinery will, with very few exceptions be loyal to his source of supply so long as he at all times is given value received in the goods purchased and the attention necessary to produce the results to which he is entitled.

American Tools in Foreign Markets

BY OREN O. GALLUP

Export Manager, Simonds Mfg. Co., Fitchburg, Mass.

As one investigates the hardware markets of Europe, of South America, of Australasia, of any part of the world in fact, New England tools of quality and reputation are found. Not only are these in stock in the stores but they are giving efficient and satisfactory results in actual work and in competition with the makes of all foreign countries. A careful study of manufacturing and economic conditions shows that those manufacturers who have a steadily increasing export trade are doing this work because they have foresight, because they can see that later when export trade is essential to the prosperity of their business, these foreign markets cannot be won in a week, a month or even a year.

Those of us who have been regularly competing in foreign fields are of course planning for the future, working out definite policies for increasing the sale of our products in world markets. But how about the manufacturers who have never taken any interest in this class of trade? These firms are doing export business now. They have had it forced upon them by conditions existing. Of course, much of this business is handled by New York exporters, so that the manufacturer has been able to receive any terms he desired to dictate and has been able to avoid any of the details usually so necessary to the proper conduct of foreign trade. Nevertheless it is export business. Demand and reputation are being established by the goods now being sent abroad under such attractive conditions. For these manufacturers, the war has accomplished the same results as several years of endeavor and expense have done for many of us in the past.

Trade in Competing Countries

Foreign markets can be divided into two general classifications—competing and non-competing countries. The former are those which actually manufacture goods competing with those you wish to sell. For hardware tools and steel products the competing countries are principally England, France and Germany. Can our tools be sold in these countries—the homes of our competitors? Most emphatically, yes. This is not an expression of personal opinion but a statement of fact. Go to these countries; look in the hardware, supply and ironmonger stores and see the quantities and different styles of American tools which are stocked and in demand. It will be a decided surprise to those whose impression of American commerce abroad is derived from the publications and preachings of your teacher and tourist critics. How has this sale and demand been created? Have American manufacturers met these extremely low prices of European manufacturers as always advised by our critics? In a few cases, yes. Some instances have been found where the American manufacturer has been able, through improved methods, use of automatic machinery, standardization of product and efficiency measures, to make his products at a price to compete against goods made by the low-priced European labor.

How to Meet Europe's Low Prices

To most of us, with our comparatively high costs of manufacture, it is a more difficult problem. How can we possibly meet these low prices? My answer would be—do not meet them. You can only do it by cheapening the quality of your goods, which is the last thing you should do. There is a better basis on which we can compete. If your products are higher in price, then make goods that will be worth more and give enough value for the higher cost to make it an object for the consumer to buy. Practically all the American tools sold in these "competitive countries" are high quality, high priced articles for which a demand has been created upon this basis.

Do not let "European low prices" frighten you in advance. They can only eliminate your product when your goods are only equal to the low priced goods manufactured abroad. Make your quality higher and your price fair and you have the same fighting chance to get business that you have in your domestic market. You have to work to maintain your business here and you

can rest assured that the export trade is not going to be handed to you without any effort on your part.

American Saws in Sheffield

Our firm has found it impossible to anywhere near meet the prices of European manufacturers, yet we are able each year to increase our business in the competing countries. As an example, consider the saw competition in England. There are congregated in Sheffield more than twice as many saw manufacturers as there are in our whole country. They manufacture at extremely low prices. To sell some in Sheffield is like taking coals to Newcastle. Yet we have sold and are regularly selling Simonds saws in Sheffield to users who are willing to pay double the Sheffield price for the increased results and efficiency procured from our goods.

If success can be obtained in these markets that are considered so difficult, then in the non-competing markets if we are not successful the fault lies with ourselves or our methods. Some of these markets are slower to respond to quality goods than others but all will respond in time to a well planned and consistently handled selling campaign.

Europe Our Largest Customer

In considering export trade there has been a great tendency in our country to think only of Latin American trade. Conceding the importance of this trade and the need of its careful consideration, I call your attention to the fact that Europe has been, is, and will be for a long time our leading customer for tools and hardware. Even outside of the competing countries, consider the markets available. There is Russia, an immense consuming country, the greatest undeveloped section of the world, already consuming great quantities of our goods—a constantly increasing business. The possibilities of this market alone are wonderful.

Then there are the Scandinavian countries, Norway, Sweden and Denmark. With these should be included Finland, which, while politically part of Russia is geographically a Scandinavian country. These countries have many skilled and educated workmen who naturally demand quality tools. Then, too, there are in these Scandinavian countries many workmen who have worked at their trade in our own country and in returning to their native land continue to buy the tools which their experience has taught them to be best for their work.

Holland is so situated in relation to the competing countries that the same policies and methods adapted for this group of countries should be used in working up a considerable business. In fact, you must consider that the various countries of Europe bear the same physical relations to each other as the different States of our own country. These countries are comparatively small in area and very easy of access of each other to such an extent that the European manufacturer in considering his export trade classifies his continental trade as being entirely a separate and distinct proposition from the overseas trades.

In the southern part of Europe we find Spain and Portugal somewhat slower to respond to the benefits of high quality, high priced goods than some of the other sections. Our progress in these countries is quite slow, but there has been a steady increase from year to year in the volume of business received, which would indicate that gradually our high quality goods are becoming established and a sale and demand created.

Displacing German Products

In Italy the demand for goods of quality was steadily increasing before the war. Germany, however, had a very firm hold upon certain classes of the hardware and tool trade which made aggressive selling methods necessary to procure any volume of business. The war, of course, changed conditions and eliminated German goods. The results have been that very large quantities of American tools and hardware of the highest squality has been purchased and consumed in Italy during the past months. The users have become educated to the advantages of our superior articles and it is my personal opinion that a very large percentage of this trade now being worked up will be retained by our manufacturers if the business is properly handled upon a basis which will give the buyers confidence in us.

In Italy as well as in Greece the returning emigrant is also a factor in the demand for American tools. Of course, in Greece the obstacles to shipping and interchange of commerce have interfered greatly with the business obtained. As these conditions improve, and present indications are that they will, a similar demand to that which has existed in Italy will be found and the same opportunity to establish a business that will last after the war.

If in the European market we can work up a successful export business in tools, hardware and steel products, there is no reason why we cannot be very successful in the other markets of the world, if we conduct our export business upon the proper basis. It has been shown, and the export figures issued by our Government will confirm, that our manufacturers have been more successful in Europe than any other market. To the manufacturer who has not been actively identified with export trade a consideration of these conditions outlined as regards the European trade will show that he is not justified in presenting as an excuse that he cannot compete with "European low prices." Except in a few individual cases the American tools and hardware can be sold in Europe or any other market if the selling effort is based upon the same study of local conditions and the use of the same common sense in business methods which you have applied in connection with your domestic efforts.

Proud as I am of American export trade and the fact that American goods are becoming so favorably known for their quality and reliability in all parts of the world, I am not making a plea for the American manufacturer to enter the export trade for patriotic reasons alone. It is a duty which you owe the economic development and prosperity of our great country. It will be a necessity for the future growth of your business and even the maintenance of present production. Plan and prepare now.

Metal Fittings in Overseas Markets

BY A. W. GILBERT

President Chapman Valve Mfg. Co., Indian Orchard, Mass.

As the United States possesses the greatest mines in the world, the greatest inland transportation system in the world, handling freight at the least cost per ton per mile, as we possess the wealth and inventive genius and the greatest proportion of high-powered mechanics, it would seem that our problem of supplying foreign countries with our product of metal fittings resolved itself down to three factors—labor, sea transportation and finance. There is no question that we can make pig iron at the furnace cheaper than it is made in any other country in the world. There is no question but that we make ingot copper cheaper at the smelter than any other manufacturing country. There is no question that we can transport either of these to a seaport or to large manufacturing centers more cheaply than it can be done in any other country.

There is another factor not so commonly appreciated, and that is that our factories in this country have a much larger percentage of what we might term high powered and high class foremen and managers. These men are constantly studying and applying new and efficient methods of factory practice. Their intelligent work, together with the increase in average intelligence of the worker, brought about by the liberty of individual action and thought, made possible by our free democracy, enables American factories to produce greater tonnages and greater values per man employed than are the case in any other country.

The Ocean Problem

As to the lack of merchant marine, which has been a national handicap, I think we need have no fear for

the future. Ever since this great war began, the actions of the fighting nations have made more and more certain the fact that in all future years the United States must and will occupy a prominent if not the most prominent place in sea transportation. More ships are now building in this country than ever. Still more orders for ships to be built here are awaiting facilities. Events since Aug. 1, 1914, warrant our feeling sure that the United States will have the largest and most efficient merchant marine operating to overseas markets of any country in the world with the possible exception of England, and we shall never again consider England and France as foreign countries.

Foreign Labor Costs to Be Higher

A second handicap of the United States has been the high cost of labor. In view of the growth of democratic ideas throughout Europe, it is inconceivable that the manufacturers of this country will ever again contend with the former low wage scale or the long hours in those countries; but they will have to contend in a more or less remote future with added intelligence of foreign factory labor, since democracy tends to raise the brain power of the individual. Another feature in the competition of foreign factories is the decreased supply of labor because of death and incapacity due to the war. By some that is considered a very great factor; others minimize it because of the increase of female labor and the decrease of immigration. The question of immigration is an uncertain factor and admits of wide discussion; but the question of greater democracy, of greater power and freedom of the individual and of better compensation and living conditions for the worker does not admit of discussion.

I want to impress upon you what I firmly believe—that this war will lay forever the great bugaboo of cheap foreign labor and long working days in foreign factories; but I warn you that in laying this danger you cause to rise out of the great struggle a new danger to factories in this country seeking a foreign market for metal fittings. You bring in as your competitor the power arising from the increased intelligence of the high powered and the low powered worker, which will be backed and urged on by extreme necessity.

American Advantages in Export Trade

With the advantage of higher intelligence in American factories, every large or small concern in metal fittings that I know of in this country, that has consistently and persistently sought foreign markets, has found this asset great enough to assure success. As intelligence increases in foreign factories, it becomes more necessary than ever for manufacturers of metal fittings in this country to use all energy and perseverance in obtaining and retaining a place in world markets. We must have organization and co-operation. That does not mean co-operation and organization among manufacturers alone. It means intellligent co-operation and organization between employer and employee—a recognition on the part of the employer of the position and the difficulties of the employee. The time is past when the son who inherits a mill property in New England also inherits the people working in the mall. The fact that many who inherited control of manufacturing property in New England acted as if they also inherited the workers has caused many a failure in business and today makes many New England mills afraid of competition in other States and abroad.

A third handicap we had before the war was lack of American banking and financial help in foreign markets. This has been largely overcome and such facilities are being rapidly increased. One American banking house alone within the last two years has established 39 foreign branches and is establishing others as fast as circumstances will permit.

Our Export Trade in Metal Fittings

Let me say a few words about what I know personally of foreign sales of metal fittings: I was intimately connected with the Fairbanks Company of New York from 1899 to 1909. During that time they sold Fairbanks scales all over the world. There was no corner of the world where they were unable to make sales. In the course of business they established stocks and branch houses in England and on the Continent, these houses being stocked almost exclusively with American metal fittings. When the war broke out in 1914, their house in Hamburg, Germany, was the most profitable business they had; they were selling American metal fittings in the heart of the German manufacturing district at a profit, although they were what might be termed middlemen.

When the war broke out in 1914, 25 per cent of the output of the immense Underwood typewriter factory in Hartford was being sold in the countries that entered the war. This business was built up by persistent and intelligent selling headed by John Underwood personally and supported by the magnificent factory conditions they have at Hartford.

The Singer Sewing Machine Co. for many years has enjoyed an immense trade in foreign countries.

The United States Steel Corporation, when the war broke out, was fast getting to a place of large importance in the steel markets of the world.

I had a friend who was located officially several years at one of the largest receiving ports in Russia, who advised me that from 20 to 80 per cent of the carrying capacity of every ship which arrived at that port from America was occupied by machinery made by the International Harvester Co.

Meeting German Competition in England

In the spring of 1915 our company sent a very bright young man to England, where we had made some sales in the many years preceding. He examined carefully the English market—the first time we had ever attempted such an examination. We found that there was a line of our material that had come into large demand in the previous ten years, which was not made extensively in England. German factories had covered the market and nearly all the valves of that line sold in England were brought from Germany. We found that at the prices prevailing in England before the war and at the cost of sea transportation prevailing between New York and London, our company could deliver this same line of valve in England and compete with German manufacturers. We were able to establish a very fine business in London and have recently developed a larger business in France, receiving large orders from that country at this time. This increase we attribute to war conditions in Europe, but nevertheless investigations we have made since the war began convince us that with an American owned merchant marine and under conditions of peace throughout the world and with banking facilities friendly to American manufacturers, we can compete with any prices that we are aware of at this time or that prevailed previous to war conditions, where shipments had to be made into other countries by our foreign competitors.

The Argentine Cast-Iron Pipe Contract

In the summer of 1915 we joined with the United States Cast Iron Pipe & Foundry Company in sending a very intelligent man to South America. This man was of Spanish descent and had spent nearly all his business years in the United States, and was thoroughly conversant with our conditions. He had spent two years in Havana in an important executive position. He understood the Latin language and the Latin people practically as well as the natives and in many ways he was most excellently equipped to enter the South American countries as a salesman. He reached Rio, Brazil, in December, 1915, and Buenos Aires in March, 1916. In October, 1916, he made a bid in behalf of the United States Cast Iron Pipe & Foundry Company for the delivery of 60,000 tons of cast-iron pipe, a contract that involved $3,500,000. He had English firms as his competitors. The bids were very close indeed; in fact, so close that the directors who had the awarding of the contract took a week or ten days to consider them. At the end of that time they awarded the contract to the United States Cast Iron Pipe & Foundry Company because the board figured that its bid was $60,000 less than the lowest English bid. I mention this fact to show how fair and honest the Buenos Aires board was in awarding to practically unknown parties on a $60,000

margin a contract which involved $3,500,000, whereas for years they had previously purchased all of this material from English firms.

Valve Contract Won by 1½ Per Cent

The same department in Buenos Aires was in the market for valves to be used in connection with the pipe they had purchased, and they issued their specifications in November for bids to be opened the last of February. At that time the company I represent was awarded the contract for about $200,000 worth of valves, the next highest bidder being only $3,000 above us. I give these figures and cite these circumstances because I want to impress upon you the fact that American manufacturers received the highest consideration without any influence political or otherwise being brought to bear upon the decision of the Argentine Department, and solely on the work and representation of one man, backed, however, by the helpful words and efforts of the Buenos Aires branch of the National City Bank of New York.

Our work in South America shows that the English people, backed, we believe, by the admiralty as long as they could give them any assistance in the way of sea transportation, have held on to their foreign markets with the utmost persistence and success.

The only reason we do not have a good business in Japan, Australia or China is that we have not made the necessary connections and given this business the necessary attention, as has been done for years by English and continental firms.

The foreign market cannot be used as a dumping ground with any success. You must not enter it because you have a surplus of manufactured product or a dull market at home and withdraw your selling organization when conditions change in this country. If you want the foreign market, you must seek it with the same persistence and honorable endeavor with which you seek your home market; and if you do this, you will be surprised at the business you will be able to build up in metal fittings.

Chromium, Copper and Nickel Alloys

"A Preliminary Study of the Alloys of Chromium, Copper and Nickel," by D. F. McFarland and O. E. Harder has been issued as Bulletin No. 93 by engineering experiment station of the University of Illinois, Urbana, Ill. The purpose of the investigation is stated as follows:

The growing interest in special acid-resisting alloys and the many uses found for them have stimulated both the search for efficient materials of this nature and the study of the causes underlying their inertness. The alloys developed by Prof. S. W. Parr for use in calorimeter construction have shown this quality of high resistance to corrosion to a marked degree. The almost perfect insolubility of these alloys in nitric and other acids seems to be conditioned upon a proper mixture of chromium, copper and nickel, together with smaller quantities of such added metals as tungsten or molybdenum. These additions have so marked an effect in improving both the acid-resisting properties and the casting qualities of the alloys that it has seemed desirable to study their effects more systematically in order that they may be used to the best advantage. The complexity of the mixtures used, however, has made the problem a very difficult one and has shown the necessity of first obtaining a more complete knowledge of the ternary alloys of chromium, copper, and nickel, and of the binary alloys of copper and nickel, copper and chromium, and chromium and nickel. With this information in hand it should be possible to understand better the effects produced by additions of a fourth metal.

Excellent photomicrographs appear, illustrating important points.

The Danville Iron & Steel Co., Danville, Pa., has been formed to succeed the Danville Foundry & Machine Co., and Miller & Curry, both of Danville. A general scrap iron business will be conducted in connection with the foundry and machine shop formerly operated by the Danville Foundry & Machine Co., and the manufacture of refined iron bars will be begun in the near future.

American Machinery in Russia

An American mechanic, who has spent three years in Russia, travelling and setting up machines over a large part of that country, and who has been in touch with many purchasers of American machines, makes the following report to Commercial Attaché William C. Huntington of Petrograd:

The machines that chiefly came under my observation were steam shovels, dredges, drag lines, and excavating machinery of all kinds. I have seen also tractors, of which there are many in Russia, and several cotton mills and air compressors of American makes. In most cases the purchaser was not satisfied with his machine. Sometimes the trouble was trifling and I was able to explain and adjust it in a very short time. In other cases it was serious because purchasers had not obtained spare parts, and it was very expensive and sometimes impossible to replace them in Russia. As a rule, the machine had been guaranteed to do a certain amount of work, but had fallen short in the performance because it had been operated by unskilled labor. The purchaser then thought the machine was no good. In one case I called on the agent who represented the American company and explained why the machine was not giving satisfaction. His reply was that the machine was all right when it was sold and the firm had nothing more to do with it.

American machines are new in Russia, and you cannot expect a man who has never seen a machine work to get good results. Sometimes 15 or 20 per cent of the purchase price is held back until the machines are properly demonstrated and in a few cases the last payment was never made because the machines did not do what they were guaranteed to do. If American manufacturers intend to introduce their machines in Russia, they should have representatives in the country who will not only sell the machines but will go around to see how they are working and give any assistance that may be necessary. It is essential also to keep a full supply of repair parts, as it is almost impossible to duplicate some parts, and the delay in getting them is a frequent cause of dissatisfaction.

Russia offers a large field for all kinds of excavating machinery. Railroads and canals are to be extensively developed. Irrigation and drainage work is only started, and there is an immense area to be improved in this way. In all this development work machinery will be used to a much greater extent than it has been in the past, because a shortage of labor is to be expected. Now is the time to advertise American machinery in Russia, and the best advertisement is a satisfied customer.

Chemical and Dye Concerns Amalgamate

The amalgamation of the coal-tar, color, intermediate and raw material manufacturing concerns of the Schoellkopf Aniline & Chemical Works, the W. Beckers' Aniline & Chemical Works, the National Aniline & Chemical Co., the Benzol Products Co. and certain plants and properties of the Barrett Co., the General Chemical Co. and the Semet-Solvay Co., under the title of the National Aniline & Chemical Co., Inc., has been accomplished. The capitalization of the new company will be 200,000 shares of 7 per cent preferred stock of $100 par value and 350,000 shares of common stock without par value. William H. Nichols of the General Chemical Co. is chairman of the board; J. F. Schoellkopf is president; W. Beckers, first vice-president; I. F. Stone, second vice-president and treasurer; C. P. Hugo Schoellkopf, third vice-president, and W. T. Miller, secretary. The company will manufacture and consume large quantities of benzol and toluol.

Will Rebuild Plant

The General Foundry & Mfg. Co., Youngstown, Ohio, states that its plant at Girard, which was recently destroyed by fire at a total loss of about $60,000, will be rebuilt on a larger scale as soon as the insurance is adjusted. The company will be in the market shortly for considerable equipment for its new foundry.

Last week, an ore bridge at the steel plant of the Youngstown Sheet & Tube Co., East Youngstown, Ohio, was destroyed by a tornado, and will be replaced at once. The bridge was about 100 ft. high and 327 ft. long. The company has two other similar ore bridges, and has not been seriously inconvenienced by the loss of the third one.

Government Control of Industries

Food Bill Changed to Extend Complete Regulation of Iron and Steel and Other Lines of Manufacture—An Amazing Program

WASHINGTON, July 3.—Under the deceptive guise of a bill to enable a proposed food administrator to secure the equitable distribution of the food supply of the country and to prevent its hoarding by speculators or the exaction of extortionate prices, a bill has been reported to the Senate and is now under debate in that body, which in certain respects is the most extraordinary legislative measure ever presented for the serious consideration of Congress.

Dragnet Control of Leading Industries

Designed at the outset to deal solely with food products, it has been amplified so that it places within the hands of the President of the United States, or of any agent or agency he may designate, absolute power to regulate in all particulars the great industries engaged in the production of iron and steel, copper, lead, coal, petroleum and all other fuel, lumber, fertilizers, vegetable fibers used in the manufacture of binding twine and for other purposes, farm implements and machinery. Incidentally, the measure carries a "rider" imposing prohibition in the most drastic form upon all the people of the country, forbidding the manufacture not only of all forms of distilled spirits, but even of malt liquors carrying a minimum alcoholic content.

Under ordinary conditions such a bill would stand little chance of receiving any attention at the hands of either house, but under existing conditions it is quite within the bounds of possibility that it will be accepted by both houses and become a law within the course of a few days. That it will encounter vigorous opposition goes without saying, for it has already been sharply attacked by some of the ablest men in the Senate, but no one here ventures a prediction as to the form in which it will ultimately become a law, although its passage is generally conceded.

The basis of this extraordinary measure was a bill framed by administration officials, introduced in the House by Chairman Lever of the Committee on Agriculture, and passed by the House after brief debate. It provided for Government control, for purposes of equitable distribution, of foods, feeds, fuel and articles required for their production, these things being denominated "necessaries" as a justification for the proposed delegation of control to the Executive. After passage by the House the bill was forwarded to the Senate Committee on Agriculture and Forestry, by which the measure was practically rewritten by a handful of Senators posing as the special friends of the farmer. The category of things to be controlled was expanded by this committee to include "foods, feeds and containers therefor, fuel, including petroleum and its products, iron and steel and their products, copper and its products, hemp, jute and sisal and their products, lead, timber, lumber, farm implements and machinery, and fertilizers." These articles, by the terms of the bill, are to be brought under "governmental control during the war" and the President in the exercise of this control "is authorized to enter into any voluntary arrangements or agreements, to create and use any agency or agencies, to accept, in his discretion, the services of any person without compensation, to co-operate with any agency or person, to utilize any department or agency of the Government, and to co-ordinate their activities."

Steel Manufacturers Barred

Having thus clothed the President with broad powers which he may delegate to any one in his discretion, the Senate Committee proceeded to eliminate from the Council of National Defense and generally from the councils of the Government practically all the prominent industrial leaders who have so freely given their services to assist the Administration in meeting and solving the grave business problems resulting from the war. This has been accomplished by the incorporation in the House bill of the following provision:

> Sec. 3. That it is hereby declared unlawful for any person acting either as a voluntary or paid agent or employee of the Government in any capacity, including an advisory capacity to any commission, board, or council of the Government, to procure, attempt to procure, or make any contract for the purchase of any supplies for the use of the Government either from himself, from any firm of which he is a member, or corporation of which he is an officer or stockholder, or in which he has any financial interest. Any person violating this section shall, upon conviction thereof, be punished by a fine not exceeding $10,000, or by imprisonment for not more than five years, or both, in the discretion of the court.

By another section of the bill a new series of criminal offenses has been created far more comprehensive than those sought to be reached by the Sherman anti-trust law or any of the acts amendatory thereof. This section is as follows:

> Sec. 4. That it is hereby made unlawful for any person wilfully to destroy any necessaries for the purpose of enhancing the price or restricting the supply thereof; knowingly to commit waste or wilfully to permit preventable deterioration of any necessaries in or in connection with their production, manufacture, or distribution; to hoard, as defined in section six of this Act, any necessaries; to monopolize or attempt to monopolize, either locally or generally, any necessaries; to engage in any discriminatory and unfair, or any deceptive or wasteful practice or device, or to make any unjust or unreasonable rate or charge, in handling or dealing in or with any necessaries; to conspire, combine, agree, or arrange with any person (a) to limit the facilities for transporting, producing, harvesting, manufacturing, supplying, storing, or dealing in any necessaries; (b) to restrict the supply of any necessaries; (c) to restrict distribution of any necessaries; (d) wilfully to prevent, limit, or lessen the manufacture or production of any necessaries in order to enhance the price thereof, or (e) to exact excessive prices for any necessaries. Any person who violates any of the provisions of this section shall be deemed guilty of a misdemeanor, and, upon conviction thereof, shall be fined in a sum not exceeding $10,000, or by imprisonment not exceeding two years, or both.

In considering the foregoing section and especially those provisions relating to the exaction of excessive prices, etc., it should be borne in mind that the House bill contemplated only food products, while the Senate measure, as already stated, has been broadened in scope to include both raw materials and finished products of nearly all the leading industries of the country.

Exemption to the Farmer

For the purpose of enabling the President to "control" the necessaries embraced in the provisions of the bill he is authorized by the Senate measure to adopt a system of licenses which, after a proclamation to that effect, will be required for "the importation, exportation, manufacture, storage, mining, or distribution" of any of the enumerated articles. No person may carry on business with reference to any of these articles

unless he shall first secure a license and whenever the President shall find that any storage charge, commission, profit, or practice of any licensee is unjust, or unreasonable, or discriminatory and unfair, or wasteful," and shall order such practice to be discontinued, the licensee must obey such order or render himself liable to a fine of $5,000 or imprisonment for not more than two years, or both. Realizing the drastic character of the provisions of this section the committee has thoughtfully provided an exemption for farmers, as follows:

> Provided, that this section shall not apply to any farmer, gardener, co-operative associations of farmers or gardeners, including live stock farmers, or other person with respect to the products of any farm, garden, or other land owned, leased, or cultivated by him, nor to any retailer with respect to the retail business actually conducted by him.

For the purpose of the proposed law a retailer is deemed to be a person, co-partnership, firm, corporation, or association not engaging in the wholesale business whose gross sales do not exceed $100,000 per annum.

Hoarding Penalized—Unless by Farmers

Prohibition against the hoarding of 'necessaries" is held by the Senate bill to have been violated when they are "held, contracted for, or arranged for by any manufacturer, wholesaler, retailer, or other dealer in a quantity in excess of the reasonable requirements of his business for use or sale by him for a reasonable time, or reasonably required to furnish necessaries produced in surplus quantities seasonably throughout the period of scant or no production; or withheld, whether by possession or under any contract or arrangement from the market by any person for the purpose of unreasonably increasing or diminishing the price." By another proviso, however, "any accumulating or withholding by any farmer, gardener, co-operative association of farmers or gardeners, including live stock farmers, or any other person, of the products of any farm, garden, or other land owned, leased, or cultivated by him shall not be deemed to be hoarding within the meaning of this act."

Comprehensive authority is granted the President by the Senate bill to requisition all the "necessaries" covered by the measure "to the support of the army or the maintenance of the navy or any other public use connected with the common defense, the compensation therefore to be determined by the President. In the event of dissatisfaction on the part of the owner of requisitioned supplies the President is authorized to pay 75 per cent of the tendered price, whereupon the owner will be entitled to sue the United States to recover any additional amount claimed.

President May Take Over Plants

But broader powers are conferred upon the President than merely to requisition material. Under the terms of a provision added by the Senate Committee, whenever he shall find it necessary to secure an adequate supply of any of the articles enumerated in the bill for the support of the Army or the Navy, or for any other public use connected with the common defense, he is authorized to take over any factory, mine or other plant "and to operate the same." This section of the bill goes much further than any legislation heretofore favorably acted upon by either house. A proposition originating in the House Naval Committee empowering the President to take over shipyards and draft their employees was promptly abandoned because of a strong protest that arose from the labor leaders. The new bill, however, authorizes the President "to prescribe such regulations as he may deem essential" for carrying out the purposes of the act, "including the purchase, sale or other disposition of articles used, manufactured, produced, prepared or mined" in any establishment taken over "and the employment, control and compensation of employees." Another proviso thoughtfully inserted gives to wage earners dissatisfied with the rates of pay fixed by the President "the right to have the reasonableness of such wages reviewed and determined by the Board of Mediation and Conciliation created by the act of July 15, 1913.

Penalties for Manipulation

Additional criminal offenses are created by a further provision of the bill and are made punishable by fines not exceeding $10,000 or imprisonment for not more than four years, or both. These offenses are defined as follows:

> That undue enhancement or fluctuation of prices of, or injurious speculation in, or unjust market manipulation or unfair and misleading market quotations of the prices of necessaries, are hereby prohibited, and whenever the President finds it essential in order to prevent undue enhancement, depression, or fluctuation of prices of, or in order to prevent injurious speculation in, or in order to prevent unjust market manipulation or unfair and misleading market quotations of the prices of necessaries, hereafter in this section called evil practices, he is authorized to prescribe such regulations governing, or may either wholly or partly prohibit, operations, practices, and transactions at, on, in or under the rules of any exchange, board of trade, or similar institutions or places of business as he may find essential in order to prevent, correct, or remove such evil practices.

By other sections of the bill the manufacture of distilled spirits and malt liquors is prohibited, but Senators representing wine-producing States were able to secure an exemption for the product of their constituents. This feature of the bill has come in for very general denunciation and will unquestionably prolong its discussion in the Senate and in conference.

Shackling Industry Not the Way

The shackling of industry as proposed by the bill has evoked strenuous protests from some of the most experienced legislators in Congress. Senator Lodge of Massachusetts, whose length of service in Congress is exceeded by but a single Senator, has denounced in the strongest terms many of the provisions of the pending bill, emphasizing the folly of a policy that would load down our leading industries with drastic restrictions while at the same time looking to them for the revenue with which to carry on the war. In an impressive speech on this measure delivered on Thursday, Senator Lodge said, in part:

The first thing that is important is that our industries should be kept at the highest point of productivity. If nobody is making any money, you will not have any excess profits. If nobody is making any money, your income tax will dwindle away, and those are the two great sources of taxation. They will supply at least two-thirds of what we raise. But in order to get the excess profits the profits must be made; in order to get the incomes the incomes must be earned or received, and out of the surplus on incomes and out of that on excess profits you have not only to pay the taxes, but you have to fill your loans. There is where you must get your money. If you paralyze business, if you frighten it, if you repress the productive energies of the country you are drying up the sources of taxation absolutely.

I see no evidence on the part of wealth or business to resist in any way full payment and doing the utmost to supply the money the Government needs. But they can not supply it unless they have it. Confiscating all great estates in the country would not last a year. You must have business going on; you must have it producing from year to year; you must have it make the profits Take what you want of the profits, take what you want of the incomes, leave enough to supply the loans, leave enough to carry on the business and extend it, but do not kill them at their sources. Do not create a condition in which business will not go on.

It seems to me that the section relating to licenses confers great power upon the President—and when we say the President we mean the agents whom he appoints to carry out the law, for he cannot carry it out. He has more things to do than any human being can do now. He cannot possible do all these things himself. He has to have agents. We are conferring on these

agents, as I apprehend this section, the power to put out of business, absolutely to stop the business, of a corporation, partnership or individual in this country. If somebody in power dislikes or is dissatisfied with some business corporation or partnership there is ample power in the bill to put it out of existence. That may be necessary, but let us consider it pretty carefully before we grant it. It seems to me possible to get all powers that are necessary for the winning of the war without absolutely putting it in the hands of a group of men to ruin any business which they can in some remote way connect with the war, any business engaged in interstate or foreign commerce as we have modified it. Under that section it seems to me that we give the power to fix prices, the maximum. The minimum is given elsewhere. The President's representatives can certainly fix the price of the products of corporations or business houses or business men coming within the description of the section.

It seems to me we can achieve the end which we all seek without these immense extensions. The fact is that in this section you are holding over the heads of the business of the country—not the food crops alone, but all the business of the country—a threat and uncertainty. There is nothing so deadly to business as uncertainty and a threat. You hold that over their heads and then you expect them to be in the highest state of productivity so that you can take millions of dollars from them in excess-profit taxes. They will not have the profits to take from if you frighten business to that extent. Do not lose sight of the fact that the whole key of our situation lies in having the greatest amount of annual earnings that we can properly get in order to supply our taxes and our loans. If you frighten business enough you will not have any excess profits or any incomes to draw on. You will not have any surplus to buy your loans.

The action of the Senate on the control bill cannot be foreshadowed, chiefly for the reason that it is impossible to measure the influence that will be exerted by the prohibition lobby, the numerous associations of farmers and the labor leaders, who are at all times in close touch with Congress. In addition, there is a large element in the Senate composed of men who lose no opportunity to assail the industries of the country and especially those in which there are large combinations of capital. The steel producers are at all times targets for attack. Nothing but the radical amendment of the pending measure will permit its passage without great delay. It is probable, in view of the influences at work in the Senate, that the bill as passed by that body will be in tentative form only and that it will receive its final shape in conference committee. W. L. C.

To Develop a Standard Airplane Engine

WASHINGTON, July 3.—The National Advisory Committee for Aeronautics makes the following announcement concerning the movement recently set on foot to develop a design for a standard engine for airplanes:

"The Aircraft Production Board, realizing the need for the development of a standard engine in various sizes, has succeeded in obtaining the co-operation of two of the foremost engine designers in the country, Messrs. Vincent and Hall. The fundamental idea of the engine is a unit cylinder by means of combinations of which any desired power may be obtained. It is proposed at first to build engines in four sizes of 4, 6, 8 and 12 cylinders, the corresponding horsepowers being approximately 100, 200, 300 and 400."

Chicago Machinery Firm Moves

Hill, Clarke & Co., Chicago, have purchased Nos. 647 and 649 West Washington Boulevard, Chicago, and at a later date will erect a model machinery show room and office building. Pending the construction of the new building, the company will occupy quarters at 625 West Washington Boulevard, having removed from 125 North Canal Street, where it has been located for years. West Washington Boulevard is rapidly becoming the machinery center of Chicago, Canal Street having formerly had that distinction.

Elected to Waiting List

The following have been elected to the waiting list of the American Iron and Steel Institute:

Leonard Colton Hanna, Jr., M. A. Hanna & Co., Cleveland.
James M. Milliken, auditor Midvale Steel Co., Philadelphia.
William P. Marseilles, engineer Latrobe Steel Co., Illinois Steel Co. and Paul Herault, New York.
Frederick C. Yeates, purchasing agent Midvale Steel Co., Philadelphia.
Turner D. Moorhead, vice-president and treasurer Moorhead Brothers & Co., Inc., Sharpsburg, Pa.
Arnold A. Schneider, raw material department, Midvale Steel & Ordnance Co., Pittsburgh.
Samuel Sigourney Wales, electrical engineer Carnegie Steel Co., Pittsburgh.
Charles R. Holzworth, general superintendent Ella Furnace Co. and Claire Furnace Co., West Middlesex, Pa.
A. T. Enlow, president Dominion Sheet Metal Co., Ltd., Hamilton, Ont.
Arch Quarrier Moffat, manager of sales Whitaker-Glessner Co., Wheeling, W. Va.
Lloyd Booth, treasurer Trumbull Steel Co., Warren, Ohio.
Arthur Austin Clement, president American Wire Fence Co., Chicago.
Everett D. Graff, assistant to vice-president Joseph T. Ryerson & Son, Chicago.
F. A. Assmann, chairman executive committee, Standard Tin Plate Co., New York.
Benjamin Wolhaupter, vice-president Rail Joint Co., New York.
Edwin Chapin Witherby, vice-president Semet-Solvay Co., Syracuse, N. Y.
Mark Workman, president Dominion Iron & Steel Co., Montreal, Can.
Richard D. Chapman, general sales manager Taylor Wharton Iron & Steel Co., High Bridge, N. J.
Harry Eugene Brubaker, assistant general manager and general superintendent Ohio Seamless Tube Co., Shelby, Ohio.
F. E. Dussel, secretary and treasurer Transue & Williams Steel Forging Corporation, Alliance, Ohio.
O. F. Transue, president Transue & Williams Forging Corporation, Alliance, Ohio.
J. E. N. Hume, commercial engineer General Electric Co., Schenectady, N. Y.
Samuel Northrup Castle, sales department General Electric Co.; expert electric steel furnace, New York.
Edgar D. Baker, purchasing agent American Steel Export Co., New York.
Robert M. Bird, superintendent rolling mills Lehigh plant, Bethlehem Steel Co., South Bethlehem, Pa.
W. Robert Shimer, metallurgist Bethlehem Steel Co., South Bethlehem, Pa.
Charles S. Vought, assistant general manager sales American Steel Export Co., New York.
A. W. Alexander, Standard Steel Works Co., Philadelphia.
Joseph W. Donner, Donner Steel Co., Inc., Buffalo.

Electric Melting of Brass

The electric melting of brass has been under investigation for several years at Cornell University through a co-operative arrangement between the university and the Bureau of Mines. The work has been done at Morse Hall, where the electric furnace equipment of the chemistry department has been utilized. Long series of experiments have indicated that the use of a suitable electric furnace might materially reduce the metal losses and avoid the use of crucibles. The Bureau of Mines is now testing an electric furnace built on the design worked out in the laboratory tests. It is of commercial size, installed in a brass foundry and is being tested with special attention to its suitability for such brasses as are used for cartridges and shrapnel cases.

Indian and Russian Manganese Ore Exports

Manganese ore exports from India for the nine months ended Dec. 31, 1916, were 466,101 gross tons. This compares with 358,336 tons for the same period in 1915. Of the total last year, 348,192 tons went to Great Britain, as against 295,640 tons of the 1915 total.

Manganese ore exports from Russia in 1916 were only 1440 tons, as compared with none in 1915 and 734,032 tons in 1914.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the DAVID WILLIAMS CO., 239 West Thirty-ninth Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: Equitable Building. Philadelphia: Real Estate Trust Building. Cleveland: Guardian Building. Cincinnati: Mercantile Library Building.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year. Entered at the New York Post Office as Second-class Mail Matter.

Plates Must Win the War

The final test of every policy in this time of revolutionary economic decisions at Washington is the question, Will it help to win the war in the shortest possible time?

The Allies of the United States have said over and over that their supreme immediate need is not men to go into the trenches, great as that need is; but ships, then more ships and still more ships. The case has even been put so strongly as this: that unless there can be a much faster replacement of the tonnage sunk by submarines than has been possible thus far, England will be brought to face a disastrous shortage of food, which may even be decisive of the war.

Too much is at stake to spend time either debating the relative values of steel vessels and wooden vessels, for both should be and are being built, or quibbling over the price to be paid for the plates to build the steel ships. Those representatives of the Government or of war boards who have said that 4.25 cents is too much to pay for ship plates or that 2.50 cents ($56 per gross ton) is all they would allow on Government plate contracts, have said at the same time that they wanted the manufacturers to make a "reasonable profit." The manufacturers on their part have contended that 4.25 cents is not an exorbitant price for plates, when in a competitive market they are offered 5 to 6 cents per pound higher for all the plates they can deliver.

The shortage of steel plates is a world shortage. The memory of man runs to no time of like scarcity in this or any other product of the rolling mill. It rests with those who buy plates for the United States to make a price that will bring out the last ton of plate output for this crucial final stage of the war.

Thus far nearly 80 per cent of the ship plates bought for Government account have come from the mills of the Steel Corporation, whose capacity in plates is less than half the total for the country. The smaller mills, buying their pig iron, would be unjustly penalized in rolling plates for the Government at 2.90 cents, or less than one-third the price of the open market.

The war is costing the Entente Allies $50,000,000 a day. Thus, in the mere money reckoning, the controversy over a matter of a cent a pound more or less for American ship plates may cost hundreds of millions, by its repression of plate mill development. For the Government is doing nothing to create new plate capacity, and if it started work to-day might be eighteen months in getting a producing mill. The more favored mills, owning all raw materials, naturally will make larger profits than the smaller ones that must buy in to-day's inflated market. But here the Government has the equalizer in its own hands, through a heavy impost of war taxes on large earnings.

It has been urged repeatedly, since the question of war taxation came up, that there must be liberal war profits if the Government is to make large war levies without crippling industry. In respect to steel plates, the argument can be made even more definite. Fair plate prices mean more plates. More plates mean more ships. And more ships mean the speedier winning of the war.

Future Steel Exports

At the beginning of the war predictions were made in some quarters that the steel exports of the United States would be greatly increased because supplies from the belligerents would be cut off. Such predictions proved erroneous because the neutral countries did not have the wherewithal to pay. Later their buying power increased, but so did steel prices and ocean freights, and at no time have they taken much steel from either England or the United States. The British exports, while maintained at quite a fair rate, have been chiefly to the colonies and to France. The American exports have been chiefly to the belligerents.

It is an attractive idea that demand for steel banks up during periods of light buying, but such a contention is hardly tenable. It is certainly out of the question to make any such assumption on the part of the neutral countries, for their requirements were increasing at such a rapid rate before the war that by now, if it is merely a question of the lapse of time, they would be inconceivably great. The rapidity of the rate of increase before the war is not generally realized. The total iron and steel exports of the three great exporting countries in 1913 amounted to more than 14,000,000 tons, against 6,000,000 tons ten years earlier. Of course, in each case there were some other exporting coun-

tries, while on the other hand there was tonnage included in the total that went from one producing country to another; but it is safe to assert that the buying by neutral countries more than doubled in the decade. At least an additional five years' record will have been made before the war is over.

As one cannot take the figures above cited as indicative of what is to occur, they can be taken only as a suggestion that if favorable conditions obtain the neutral countries can find good use for a great deal of steel after the war. It is a question of ability to finance. Now the alternations of heavy and light steel demand in the United States are due chiefly to our expanding too much at one time and by our setting our houses in order in the other time, so that we can make a fresh start. A period of economy precedes a period of activity. The neutrals are forced to pass through this period of economy now and should be in position to take hold when the war ends.

The limitation will undoubtedly be found in shipping before it is found in credit. While the British insist that the submarine cannot win the war for Germany, it must be remembered that the last resort would be the use of all the world's merchant shipping to work for the war, leaving no vessels in neutral trade, and at best the world's merchant shipping at the close of the war will be altogether inadequate for the world's normal trade. A great deal of vessel capacity will be required when peace is declared, to take the soldiers and the implements of war back home, and a long time will be required for this tremendous task. There will be no opportunity for the neutrals suddenly to make up for lost time. Rather the trade will gradually increase over a period of years. The United States will have to consume its steel itself very largely immediately after the war, the export business increasing from year to year.

Regulation of Steel Deliveries

Last week's agreement by which it was proposed to reduce bituminous coal prices more than one-third has given impetus to the thought that there will be Government regulation of prices in the iron and steel industry, a subject that was discussed in these columns last week. It is important to note, however, the wide divergence between conditions in the coal industry and those in the iron and steel industry. In the coal industry price regulation may perhaps be all that is necessary to establish satisfactory conditions, while in the iron and steel industry regulation of prices not accompanied by regulation of distribution might merely aggravate an already distressing situation.

The great difference between the two industries is that in coal order books have been relatively clear, while the order books in iron and steel are congested. As the coal operators approached the time when in the ordinary course of events contracts would be made for the twelvemonth beginning April 1 they formulated some contract prices, such as $2.75 or $3 per net ton in the case of Pittsburgh coal; but instead of there being free contracting both buyers and sellers evinced disposition to hold off and the result was that only a small proportion of the output was placed under contract. The remaining coal was not all bought and sold in the spot market, technically, because in many cases an understanding was reached whereby regular shipments were to be made and billed at prices adjusted from week to week in accordance with the spot market ruling. Thus no complications arise when a fixed price is determined upon as a basis for additional sales. The sellers cannot avoid selling and the buyers cannot avoid buying.

In the iron and steel industry conditions are totally different. The mills and furnaces are booked for various distances ahead. The blast furnaces probably have on their books a tonnage equal to the production for more than six months. The Steel Corporation's unfilled obligations are equal to its full output for more than nine months. Nearly all the large independents are booked almost as far ahead, while the smaller mills as a rule are booked for from three to six months.

In the case of coal the operators merely make a fresh start at the new prices. In the case of iron and steel there would be no start at all. Business, now on a very restricted scale, would be stopped entirely for a time, unless buyers were permitted to gamble as to their prospective requirements, in which case a limit would certainly have to be set on the distance ahead to which commitments would be permitted. If, at the outset there were no disposition to buy ahead, then there would have to be a wait of many months before the order books of producers were reduced to the condition that existed in the case of the coal industry when last week's conference was held was effected.

Meanwhile, whether or not there were forward buying at the outset, deliveries would be made to buyers in order of priority. Many of the existing contracts were made before the country entered the war. It is not to be supposed that the manufacturing consumers who are best represented on the order books of the steel mills are those whose products are the most essential for our throwing of the entire resources of the country to the one object of prosecuting the war as vigorously as possible. If so, the distribution of the steel by following the ordinary course in executing contracts, will not be to the best advantage of the country. In addition to this undesirable condition, the new purchases that might be made at prices limited by the authorities would have no rein and in many cases would be of material not needed as an aid in the prosecution of the war.

There are only two reasons, each being of the utmost importance however, why prices should, if possible, be regulated. The first is that while satisfactory prices for Government material can readily be arranged, it is impossible for us to prosecute the war with all our resources and yet draw the line, in the matter of steel products, at the steel which will eventually become the property of the Government, as in a shell, a camp stove or a ship. There must be no avoidable scarcity of cars, of locomotives, of milk cans, of agricultural implements, of a host of things which even the expert intelligence marshaled in aid of the Government cannot now inventory. The second reason is that for the best prosecution of the war all business not inimical to that end should be prosecuted as usual. The consumers of steel must be allowed to stay in business if no harm results, and their profits must not be taken away if the opera-

tion represents merely an addition to the profits of the producer.

From this viewpoint the matter of the distribution of the steel as made is at least as important as its price. Fortunately the problem of distribution, once the question of prices were settled, would be a relatively simple one. The fixing of prices is extremely difficult, on account of the multifarious forms, sizes and qualities in which finished steel is furnished to consumers. Reasonable price fixing by the manufacturers themselves would be very difficult, and by outsiders impossible, yet the authorities might not be content to leave the operation to the producers.

The case of distribution is altogether different. The steel manufacturers are entirely familiar with the uses to which customers put their products. This familiarity has greatly increased in the past few years when by constant contact beween buyer and seller the steel produced has been adapted to the particular requirements involved. A few general rules which could be formulated readily by the Advisory Commission, would give the steel manufacturers a start, sufficient to dispose of many of the questions that would arise. As others were developed, they could be referred to a central body, which would issue instructions not only to the parties involved in the individual controversy, but to all others, so that practice should be uniform throughout the industry. The mills would have no incentive but to proceed along lines best calculated to help win the war, and with their thorough knowledge of detail and such relatively simple aid as would be required from the central body they could be depended upon to distribute the steel in such manner as to throw all our material resources of this description into the contest with the Imperial German Government.

In the President's proclamation of April 15 the assistance of the Government is pledged to the farmers in, among other things, the "means of expediting shipments of fertilizers and farm machinery"; but now among many other matters lying outside the category of "Government purchases" lies not the shipment of farm machinery but its manufacture whereby the fullest possible crops in 1918 may be assured, and that is only one of many items, some less and some more pressing, but all hinging to an extent upon the proper distribution of the steel that is produced.

Another advocate of one general American engineering society has been discovered in the person of A. A. Stevenson, who in his address as president of the American Society for Testing Materials said he looked forward to the day when there shall be such an institution, "made up of the various societies as members, their individuality maintained, but the work so correlated as to give greater efficiency and better results." As men in prominent places reiterate the idea and the arguments in favor are accepted as fully overbalancing those against, a general demand will develop which must be heeded. Each society has a coterie of supporters who are jealous of the ideals for which it has stood, at least in the eyes of the nucleus about which it has grown; but combination should not be impossible, if due effort is made, particularly in view of the present woeful duplication of effort.

Orders Placed for Machine Guns

WASHINGTON, July 2.—Orders aggregating 4000 Lewis machine guns have been awarded the Savage Arms Company by the War Department. These guns will be chambered for United States ammunition, but an additional order for several hundred guns chambered for British ammunition is also about to be placed with the Savage Arms Company, licensee under the Lewis patent, for use on aircraft at aviation training schools. The American cartridge used by the Lewis gun has a muzzle velocity of 2700 ft. per second, but while the muzzle velocity of the British cartridge is only 2300 ft. it is deemed wise to chamber the aircraft guns for British ammunition in view of the probability that there will be more or less coordination between the aviation corps of the American and British armies.

It is expected that further large orders for the Lewis gun for the American troops to be sent to France will soon be placed with the Savage Arms Company, which is now fitted up to deliver a maximum of 1600 of these weapons per month and which will have an output of at least 2000 per month by September. The purchase of these guns has been decided upon as the result of the findings of the board of army officers headed by Brig.-Gen. F. H. French, which recently conducted a series of competitive tests on machine guns.

In accordance with the recommendations of Gen. Leonard Wood and other army officers, the allotment of machine guns in the new National Army will be several times as many per regiment as heretofore and will approximate 12 per thousand men or about 20,000 guns for the estimated infantry force.

To Withhold Information on Shipbuilding Plans

WASHINGTON, July 2.—The United States Shipping Board to-day published the following bulletin:

TO WHOM IT MAY CONCERN:—As a war measure, the Government has found it necessary to adopt the policy of discouraging, in every reasonable way, the publication and dissemination of information in regard to merchant marine ship construction, that might aid or influence the military plans of the enemy, in the present emergency.

To conform to this policy, the United States Shipping Board Emergency Fleet Corporation, hereafter, will not be able to give out for publication, or other use, any information relating to the number, size and character of vessels under contract, the place where they are being built, and by whom, the percentage of completion, date of final completion, etc.

In explantion of the new policy of secrecy, it was stated to-day that complaints have reached the board from new concerns attempting the equipment of yards for the construction of cargo ships for the emergency fleet that their efforts encountered obstacles placed in their way by pro-German influences. It is also stated that Secretary of Commerce Redfield advised the board to suspend the publication of bulletins regarding contracts for construction. The Bureau of Navigation, which is in Secretary Redfield's jurisdiction, discontinued several months ago the publication of periodical bulletins on merchant construction in American yards.

Pig-Iron Manufacturers Plan to Work with the Government

A number of pig-iron manufacturers from different sections met on Friday, June 29, in New York, to discuss ways and means of serving the Government to the limit of their ability, wherever pig iron might be required for use in any of its departments. There was a general discussion of methods that might be followed to the best advantage, and while no definite plan was developed, a committee consisting of representative pig-iron manufacturers in different districts was appointed, with C. D. Dyer, Shenango Furnace Co., Pittsburgh, as chairman. This committee will give the matter further consideration in the near future after having conferred with Government officials at Washington.

Controversy Over Coal Prices

WASHINGTON, July 2.—Another controversy in high official circles that involves the Cabinet, the Federal Trade Commission, and the Council of National Defense, threatening changes in the personnel of all these important bodies, has been precipitated by an attempt by Secretary of the Interior Lane, Trade Commissioner Fort, and Chairman Peabody of the committee on coal production of the Council of National Defense, to bring about an agreement among the bituminous coal producers of the country to reduce prices and increase output. At the suggestion of these officials, the coal operators, some 400 in number, undertook to forestall both the Senate and the Federal Trade Commission by announcing their willingness to make substantial cuts in their prices, both to the Government and to private consumers, the new schedule to be effective July 1, but after the producers' agreement had been promulgated, and Secretary Lane had caused to be made public a transcript of a speech delivered by him to the coal men, praising their "patriotic course," Secretary of War Baker and Secretary of the Navy Daniels denounced the entire transaction, Secretary Baker delivering a sharp lecture to his Cabinet colleague upon the usurpation of authority by the Council of National Defense, and describing the coal prices agreed upon as "exorbitant, unjust and oppressive."

Three dollars for bituminous coal, f.o.b. the mine, $3.50 for lump sizes, and a reduction of 50 cents on every ton for the Government, were the prices agreed upon at a meeting of the coal operators held here. Prices heretofore ruling ranged as high as $5.50. Secretary Daniels declared that the Navy would continue to buy from the mines as heretofore at the tentative price of $2.33 a ton, leaving the final price to be determined after the Federal Trade Commission has ascertained production costs. Secretary Baker, as president of the Council of National Defense, declared in a letter addressed to Director Gifford of the Council, that "the Council has no legal power and claims no legal power either to fix the price of coal or to fix a maximum price for coal or any other product. The coal production committee is a subordinate committee purely advisory in its character." Secretary Baker added that his letter was written "for the information of the coal production committee, and for the guidance of all other sub-committees of the council."

Progress in Priority Shipment Legislation

WASHINGTON, July 2.—The priority of shipment bill recently adopted by the Senate was passed by the House on June 29 and will probably be agreed to in conference before the end of the present week. The measure authorizes the President to require interstate common carriers to give preference in shipment to certain commodities, the transportation of which is important from a military standpoint. The House amended the bill, however, to provide that the prohibitions against interference with the operations of the railroads contained in the bill should not be construed as interfering in any way with strikes of railroad employees.

The amendment provides specifically that nothing in the proposed law shall be construed to repeal, modify, or affect either section 6 or section 20 of the Clayton act amending the Sherman Antitrust law. These provisions exempt labor organizations from prosecution as "illegal combinations or conspiracies in restraint of trade" and forbid the issuance of restraining orders or injunctions in labor disputes except under certain circumstances. The House adopted the Senate amendment limiting the operation of the measure to time of war and to commodities having military importance.

The La Salle Machine & Tool Co., La Salle, Ill., has covered all of its employees with "group insurance." The life of every employee on the payroll is so insured that if he dies from any cause his designated beneficiary will receive an amount equal to one year's wages, not to exceed $2000 nor less than $300. No employee can share in this benefit until he has been with the company for six months.

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LESS PIG IRON IN JUNE

Decline of 1200 Tons a Day from the Rate in May

A Gain of Nine in Active Furnaces, but Coke Troubles Continue

Pig-iron production fell off in June by more than 1200 tons a day from the rate in May. The total as compiled from figures reported to THE IRON AGE in unusually short time after the close of the month was 3,270,055 tons, or 109,002 tons a day, against 3,417,340 tons in May, or 110,238 tons a day. Coke shortage has been a continuing factor. More furnaces are blowing in with each month though many of them are small and on July 1, 349 furnaces were in blast, representing a net gain of 9 in June. Our estimate of the capacity of the furnaces active July 1, modified by the poor performance in June and the probability that coke shortages will continue to be a factor in July, is 112,155 tons a day as compared with 111,704 tons a day on June 1.

Owing to the short time for compilation, the steel works and merchant furnace outputs are not separated in the figures below.

The production of ferromanganese and spiegeleisen in June was 30,262 tons as compared with 37,701 tons in May.

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces in June and the three months preceding:

Monthly Pig-Iron Production—Gross Tons

	Mar. (31 days)	Apr. (30 days)	May (31 days)	June (30 days)
New York	176,550	188,547	198,111	193,198
New Jersey	6,271	6,863	9,485	14,340
Lehigh Valley	127,118	119,962	117,584	114,465
Schuylkill Valley	84,758	86,416	100,531	94,097
Lower Susquehanna and Lebanon Valley	69,152	80,673	83,985	79,989
Pittsburgh district	697,487	705,992	690,919	651,768
Shenango Valley	171,534	183,288	176,200	171,074
Western Pennsylvania	198,734	202,733	211,621	202,145
Maryland, Virginia and Kentucky	87,991	94,754	106,768	99,238
Wheeling district	125,021	129,569	129,169	125,403
Mahoning Valley	324,862	323,683	335,797	307,829
Central and Northern Ohio	279,124	283,067	276,712	278,396
Hock. Val., Hang. Rk. & S. W. Ohio	49,517	56,556	55,544	60,866
Chicago district	438,975	470,338	506,297	489,780
Mich., Minn., Mo., Wis. and Col.	120,804	124,088	122,312	118,109
Alabama	258,695	246,164	260,969	234,259
Tennessee and Ga.	34,759	32,267	35,336	35,099
Total	3,251,352	3,334,960	3,417,340	3,270,055

Diagram of Pig-Iron Production and Prices

The fluctuations in pig-iron production from January, 1909, to the present time are shown in the accompanying chart. The figures represented by the heavy lines are those of daily average production by months of coke and anthracite iron. The two other curves on

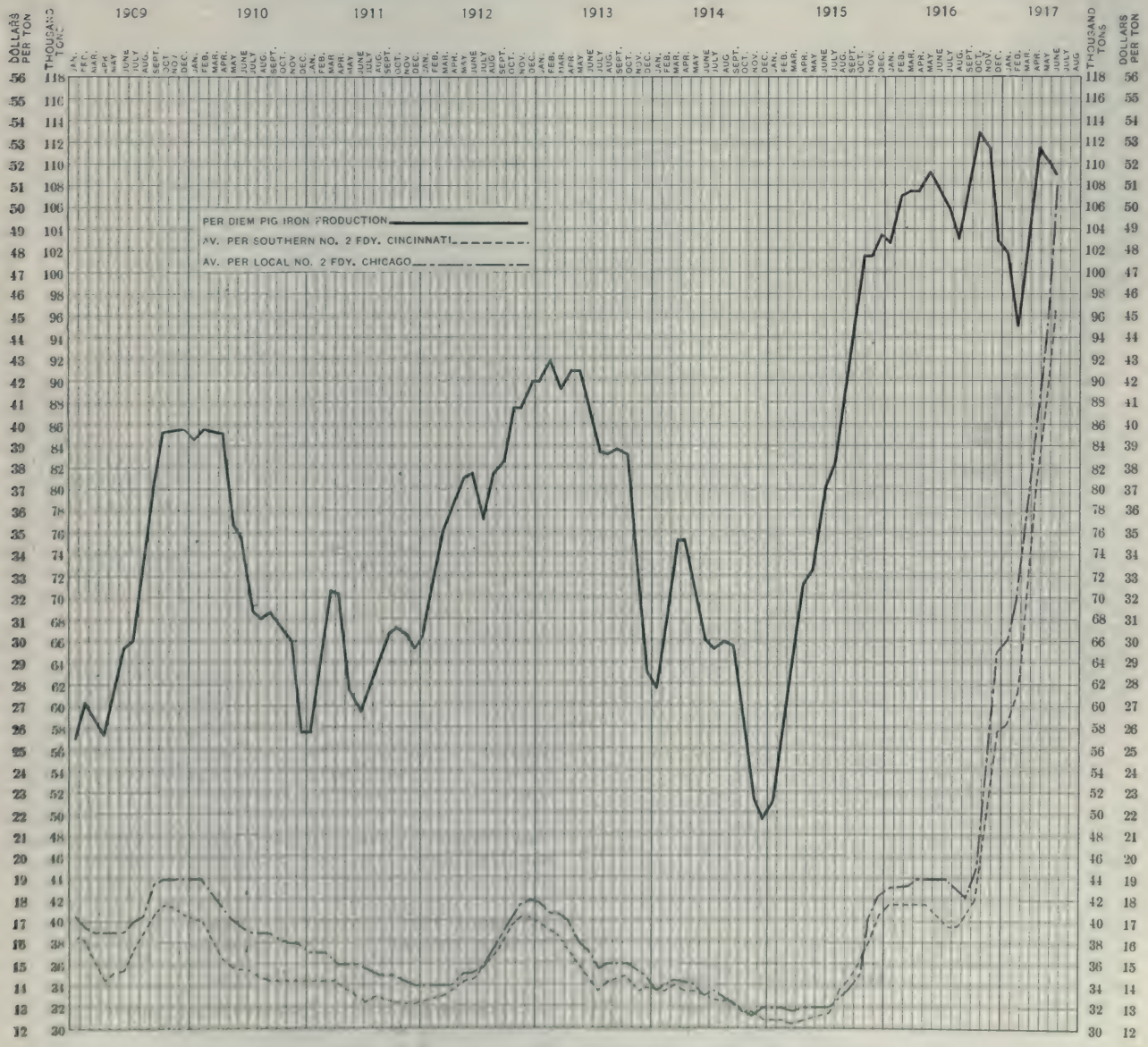


Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from Jan. 1, 1908, to July 1, 1917; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron at Chicago District Furnace

the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron at furnace at Chicago. They are based on the weekly market quotations of THE IRON AGE.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from June, 1916, is as follows:

Daily Rate of Pig-Iron Production by Months—Gross Tons

	Steel Works	Merchant	Total
June, 1916	76,526	30,527	107,053
July	74,397	29,620	104,017
August	74,617	28,729	103,346
September	76,990	29,755	106,745
October	81,639	31,550	113,189
November	80,141	30,253	110,394
December	74,264	28,273	102,537
January, 1917	72,394	29,249	101,643
February	65,280	29,193	94,473
March	73,731	31,132	104,863
April	79,031	32,134	111,165
May	77,722	32,516	110,238
June	....	....	109,002

The figures for daily average production, beginning January, 1910, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1910
Gross Tons

	1910	1911	1912	1913	1914	1915	1916	1917
Jan.	84,148	56,752	66,384	90,172	60,808	51,659	102,746	101,643
Feb.	85,616	64,090	72,442	92,369	67,453	59,813	106,456	94,473
Mar.	84,459	70,036	77,591	89,147	75,738	66,575	107,667	104,882
Apr.	82,792	68,836	79,181	91,759	75,665	70,550	107,592	111,165
May	77,102	61,079	81,051	91,039	67,506	73,015	108,422	110,238
June	75,516	59,585	81,358	87,619	63,916	79,361	107,053	109,002
July	69,305	57,841	77,738	82,601	63,150	82,691	104,017	.....
Aug.	67,963	62,150	81,046	82,057	64,363	89,666	103,346	.....
Sept.	68,476	65,903	82,128	83,531	62,753	95,085	106,745	.....
Oct.	67,520	67,811	86,722	82,133	57,361	100,822	113,189	.....
Nov.	63,659	66,648	87,697	74,453	50,611	101,244	110,394	.....
Dec.	57,349	65,912	89,766	63,987	48,896	103,333	102,537	.....

Capacity in Blast July 1 and June 1

The following table shows the daily capacity in gross tons of furnaces in blast July 1 and June 1 by districts:

Coke and Anthracite Furnaces in Blast

Location of furnaces	Total number of stacks	July 1 Number in blast	July 1 Capacity per day	June 1 Number in blast	June 1 Capacity per day
New York:					
Buffalo	18	18	5,985	18	5,965
Ferro	1	1	60	0	0
Other New York	5	2	475	3	650
New Jersey	4	3	640	3	655
Ferro	1	1	50	0	0
Pennsylvania:					
Lehigh Valley	21	14	3,695	14	3,705
Spiegel	2	2	220	2	215
Schuylkill Val.	13	11	3,175	11	3,243
Lower Susquehanna	7	6	1,610	6	1,584
Lebanon Valley	7	8	1,060	6	985
Ferro and Spiegel	3	1	45	3	165
Pittsburgh Dist.	53	47	22,150	46	22,536
Ferro and Spiegel	4	4	450	4	545
Shenango Val.	19	19	6,105	18	5,929
Western Pennsylvania	25	22	6,954	18	6,240
Ferro and Spiegel	3	2	210	3	350
Maryland	3	3	1,355	4	1,444
Ferro	1	1	100	0	0
Wheeling District	14	12	4,147	12	4,167
Ohio:					
Mahoning Val.	25	25	10,450	25	10,832
Central and Northern	26	25	9,355	23	8,686
Hocking Val., & Hang. R'k.	15	13	2,042	13	1,866
Illinois and Ind.	37	33	16,304	33	16,064
Ferro	2	1	72	1	77
Michigan, Wis. & Minn.	12	11	2,748	11	2,689
Colorado & Missouri	5	4	1,110	4	1,122
Ferro	2	1	50	1	121
The South:					
Virginia	18	12	1,515	12	1,561
Kentucky	5	4	610	4	620
Alabama	37	30	8,048	30	8,404
Ferro	1	1	75	1	80
Tennessee	15	11	1,190	11	1,204
Georgia	1	1	100	0	0
Total	405	349	112,155	340	111,704

Among furnaces blown in last month were one Niagara in the Buffalo district, Musconetcong in New Jersey, Sheridan in Lebanon Valley, one Eliza (new) in the Pittsburgh district, one Farrell in the Shenango Valley, one Earlston, Colonial and Adrian in western Pennsylvania, West End in Virginia, one Lorain in northern Ohio, Globe and Jisco in the Hanging Rock region, No. 2 Clifton in Alabama and Silver Run in Georgia. Furnaces blown out included Northern in New York, Dora in Virginia, Star in the Hanging Rock region and one Vanderbilt in Alabama.

The Record of Production

Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1913—Gross Tons

	1913	1914	1915	1916	1917
Jan.	2,795,331	1,885,054	1,601,421	3,185,121	3,150,938
Feb.	2,586,337	1,888,670	1,674,771	3,087,212	2,645,247
Mar.	2,763,563	2,347,867	2,063,834	3,337,691	3,251,352
Apr.	2,752,761	2,269,655	2,116,494	3,227,768	3,334,960
May	2,822,217	2,092,686	2,263,470	3,361,073	3,417,340
June	2,628,565	1,917,783	2,380,827	3,211,588	3,270,055
6 mo.	16,348,774	12,401,715	12,100,817	19,410,453	19,069,892
July	2,560,646	1,957,645	2,563,420	3,224,513	.....
Aug.	2,545,763	1,995,261	2,779,647	3,203,713	.....
Sept.	2,505,927	1,882,577	2,852,561	3,202,366	.....
Oct.	2,546,261	1,778,186	3,125,491	3,508,849	.....
Nov.	2,233,123	1,518,316	3,037,308	3,311,811	.....
Dec.	1,983,607	1,515,752	3,203,322	3,178,651	.....
Total, yr.	30,724,101	23,049,752	29,662,566	39,039,356	.....

Blast Furnace Notes

Earlston furnace at Earlston, Pa., owned by Joseph E. Thropp, was blown out May 16 and blown in June 27. The entire furnace was relined in 12 days. Repairs on the stoves and blowing engines delayed the starting several days.

Palmerton furnace No. 2 of the New Jersey Zinc Co. was blown out June 20 and blown in on June 27, having been relined in the interval.

Lebanon Valley furnace of E. J. Lavino & Co., Lebanon, Pa., was blown in July 2 after having been out for repairs.

The furnace of E. J. Lavino & Co. at Sheridan, Pa., was blown in June 10.

The Virginia Iron, Coal & Coke Co. blew out its Dora furnace in Virginia on June 21.

All five furnaces of the National Tube Co. at Lorain, Ohio, are now in blast. No. 5 furnace was banked 16 days in June.

Texas and Oklahoma Rolling Mill Merger

The Texas Rolling Mill Co., Fort Worth, Tex., and the Osage Iron & Steel Co., Sand Springs, Okla., have been merged in a new corporation known as George W. Armstrong & Co., Inc., Fort Worth, Tex. George W. Armstrong had been president of the Texas Rolling Mill Co. and vice-president of the Osage Iron & Steel Co. The product at Fort Worth is merchant and reinforcing bars, bolts, nuts and spikes and the annual capacity is 15,000 tons. The capacity of the Sand Springs mill is 10,000 tons a year of merchant bar iron and reinforcing steel. It is expected that improvements will be made at both plants.

May Imports of Ferromanganese Very Small

Ferromanganese imports in May were only 2187 gross tons, according to data furnished THE IRON AGE. This is the lowest in many months and is nearly a low record for the war, excepting the period soon after the war's inception when imports in the first quarter of 1915 were only 548 tons or 182 tons per month. The May imports compare with an average of 6190 tons per month to May 1, 1917, and bring the average to June 1 down to 5389 tons per month. The May receipts were through the respective ports as follows: 1018 tons at Baltimore, 1001 tons at Philadelphia, 168 tons at New Orleans; none at Norfolk or New York.

Recently the city of Pittsburgh sold about 200 tons of mixed iron and steel scrap for which it secured an average of about $30 per ton. On some of the items, the price paid for the scrap was almost as high as when the equipment was installed by the city.

Iron and Steel Markets

A CHAOTIC CONDITION

Government Policy on Prices Dominates

Further Advances in Pig Iron—Scrap Market Slumps in the Middle West

The uncertainty as to the Government's attitude on prices of the leading materials of war has been only increased by the coal fiasco and other events of the past week. Producers and manufacturing consumers of steel look for the early intervention of a deciding power that will bring an end of the present chaos, but in the interval business apart from Government wants is largely at a standstill. The possibility of Government intervention on a large scale in steel, coal, metals, and other important markets, has a widespread repressing and unsettling influence.

Meantime, new proofs of the larger place Government needs are already taking are the fact that 25 to 30 per cent of sheet mill capacity is thus occupied; that probably two-thirds of the users of cold-rolled strip steel are producing for the Government; that the Carnegie Steel Co. alone is turning out material for the one ultimate buyer at the rate of 60,000 tons of plates and 15,000 tons of steel bars per month.

With all the confusion of wide spreads in prices, and with fewer good-sized transactions to guide, definite advances, some of them very large jumps, are again to be recorded. Pig iron is generally $2 per ton higher; prompt furnace coke has sold at $16, or a rise of $3; leading makers of wrought-iron pipe have raised their prices $10 to $16 per ton; light rails have been advanced by $10 to $15, and railroad spikes and track bolts by $5 to $10, while some makers of rivets and bolts have quoted 10 per cent higher within the week.

The distress caused by delayed deliveries of materials is spreading, and more plants have been forced below a 50 per cent operating schedule. Car builders are getting barely more than one-fourth the plates they need. Complaints of labor shortage are more frequent, and arrangements are being made to admit more women in light manufacturing jobs.

Indicating the lengths it is necessary to go to make sure of material is the effort of a large electrical concern to close for first quarter for 6000 tons of basic iron, to be shipped to a steel mill for conversion into sheet bars and finally into electrical sheets.

A very considerable demand has appeared for electric steel. Three months ago there was a surplus of this product, and it was sold on open-hearth specifications. Government activity in many directions has caused a sudden change, and now makers are four months behind on deliveries.

The structural market is largely a Government affair. For the new projectile plant at Charleston, W. Va., 2300 tons are called for, and the leading fabricator has taken not far from 30,000 tons in various Government contracts. For extending its open-hearth plant at Youngstown, the Republic Iron & Steel Co. has let 2500 tons of structural steel.

The overhanging of Government control has been plainly a factor in the scrap market, which in Western districts has slumped $2 to $5 per ton. There were other influences at work also. The recent excited advance was too rapid to stand all the consequences of short selling and of the necessity some dealers were under of having to buy two tons of material in order to secure the delivery of one.

The 10,000 tons of foundry iron wanted promptly by the Government has not yet been distributed. A distribution is also expected in the case of the 60,000 tons of Bessemer iron for Italy. Only lately, due to impossible ocean freights, pig iron sent to the seaboard for export to Italy had to be resold and shipped back to the Middle West.

Bessemer iron has sold at $56 to $58, with some makers asking $60, and basic sales were made at $52 to $54, with present quotations $55 and higher. Two steel mills want 10,000 tons each of basic for the first half of 1918. In spite of soaring prices and the spectre of Government control there is steady buying of foundry and steel-making irons.

A surprising record in Lake Superior iron-ore shipments was made in June, and some of the loss caused by the late opening of navigation was wiped out. The total for the month was 9,639,991 gross tons, a gain of 132,415 tons over June, 1916. Shipments to July 1 were 16,135,135 tons, a loss of 3,480,432 tons as compared with the same time last year.

Coke troubles again limited pig-iron production in June, the total for the month falling to 3,270,055 tons, or 109,002 tons a day, against 3,417,340 tons in May, or 110,238 tons a day. The output for the first half of 1917, at 19,069,892 tons, shows an unexpected falling off from that of 19,410,453 tons in the first half of 1916. Yet 349 furnaces were active July 1, against 323 one year previous. The capacity active as July came in was 112,155 tons a day, against 111,704 tons a day for 340 furnaces on June 1.

Pittsburgh

PITTSBURGH, July 2. (*By Wire.*)

The supply of semi-finished steel in the form of billets and sheet bars to independent finishing mills is steadily growing smaller, and this is cutting down output of finished material very considerably. Steel mills are drawing the lines closer in regard to new selling, and only a small amount of new business is being put on the books of the mills at this time. The probable Government requirements of steel in various forms are growing steadily larger, and until the mills know more definitely how much of their product must go to the Government, they will not sell very freely to domestic customers. The fact that one local steel interest is now furnishing about 60,000 tons of plates per month and 15,000 tons or more of steel bars, while sheet mills are said to be furnishing 25 to 30 per cent of output to the Government, gives some idea of what the eventual Government demands will be when they are shaped up and

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	July 3, 1917.	June 27, 1917.	May 29, 1917.	July 5, 1916.
No. 2 X, Philadelphia...	**$52.00**	$50.75	$45.50	$19.75
No. 2, Valley furnace...	**55.00**	53.00	43.00	18.25
No. 2 Southern, Cin'ti...	49.90	47.90	42.90	16.90
No. 2, Birmingham, Ala.	**47.00**	45.00	40.00	14.00
No. 2, furnace, Chicago*	55.00	55.00	46.00	19.00
Basic, del'd, eastern Pa..	50.00	50.00	42.50	19.50
Basic, Valley furnace...	**52.00**	50.00	42.00	18.00
Bessemer, Pittsburgh....	**57.95**	55.95	45.95	21.95
Malleable Bess., Ch'go*.	55.00	55.00	46.00	19.50
Gray forge, Pittsburgh..	47.95	47.95	40.95	18.70
L. S. charcoal, Chicago..	57.00	57.00	50.25	19.75

Rails, Billets, etc., Per Gross Ton				
Bess. rails, heavy, at mill	38.00	38.00	38.00	38.00
O.-h. rails, heavy, at mill	40.00	40.00	40.00	40.00
Bess. billets, Pittsburgh.	100.00	100.00	95.00	42.00
O.-h. billets, Pittsburgh.	100.00	100.00	95.00	42.00
O.-h. sheet bars, P'gh....	105.00	105.00	95.00	42.00
Forging billets, base, P'gh	125.00	125.00	110.00	69.00
O.-h. billets, Phila.....	110.00	110.00	95.00	50.00
Wire rods, Pittsburgh....	95.00	95.00	90.00	50.00

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	4.659	4.659	4.159	2.659
Iron bars, Pittsburgh....	4.75	4.75	4.00	2.50
Iron bars, Chicago.....	**4.50**	4.10	3.50	2.35
Steel bars, Pittsburgh...	4.50	4.50	4.00	2.75
Steel bars, New York....	4.669	4.669	4.169	2.919
Tank plates, Pittsburgh..	9.00	9.00	7.00	3.25
Tank plates, New York..	9.169	9.169	7.169	3.419
Beams, etc., Pittsburgh..	4.50	4.50	4.00	2.50
Beams, etc., New York..	4.669	4.669	4.419	2.669
Skelp, grooved steel, P'gh	4.00	4.00	3.50	2.35
Skelp, sheared steel, P'gh	6.00	6.00	5.50	2.45
Steel hoops, Pittsburgh..	5.25	5.25	4.25	2.75

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	July 3, 1917. Cents.	June 27, 1917. Cents.	May 29, 1917. Cents.	July 5, 1916. Cents.
Sheets, black, No. 28, P'gh	**8.50**	8.00	7.50	2.90
Sheets, galv., No. 28, P'gh	**10.00**	9.75	9.00	4.50
Wire nails, Pittsburgh...	4.00	4.00	3.50	2.50
Cut nails, Pittsburgh....	4.65	4.65	4.00	2.60
Fence wire, base, P'gh..	3.95	3.95	3.45	2.45
Barb wire, galv., P'gh...	4.85	4.85	4.35	3.35

Old Material, Per Gross Ton:				
Iron rails, Chicago.....	*$47.00*	$49.00	$38.50	$18.00
Iron rails, Philadelphia..	52.00	52.00	35.00	20.00
Carwheels, Chicago	*37.00*	43.00	33.00	12.00
Carwheels, Philadelphia..	**38.00**	35.00	30.00	16.00
Heavy steel scrap, P'gh..	*42.00*	45.00	30.00	16.00
Heavy steel scrap, Phila..	**40.00**	39.00	26.00	14.75
Heavy steel scrap, Ch'go.	*36.00*	39.00	32.00	14.00
No. 1 cast, Pittsburgh...	*36.00*	38.00	26.00	15.75
No. 1 cast, Philadelphia.	39.00	39.00	30.00	16.00
No. 1 cast, Ch'go (net ton)	*30.50*	32.00	26.00	11.50
No. 1 RR. wrot, Phila....	57.00	57.00	42.00	19.50
No. 1 RR. wrot, Ch'go (net)	*40.00*	44.00	36.00	14.50

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	**$15.00**	$13.00	$8.50	$2.75
Furnace coke, future....	9.50	9.50	8.00	2.50
Foundry coke, prompt...	*13.00*	14.00	9.50	3.25
Foundry coke, future....	10.00	10.00	9.00	3.50

Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.	*31.75*	32.50	32.50	27.00
Electrolytic copper, N. Y.	*31.75*	32.50	32.50	26.50
Spelter, St. Louis.....	*9.00*	9.12½	9.37½	10.75
Spelter, New York.....	*9.25*	9.37½	9.62½	11.00
Lead, St. Louis.....	*11.25*	11.50	11.22½	6.65
Lead, New York.....	*11.37½*	11.70	11.37½	6.85
Tin, New York.....	62.00	62.00	65.00	38.87½
Antimony (Asiatic), N. Y.	19.00	19.00	24.00	16.00
Tin plate, 100-lb. box, P'gh	$12.00	$12.00	$8.50	$6.00

come to the mills. It is now believed that a statement made some time ago that 40 per cent of the output of the finishing steel mills would be needed for Government purposes was not an over statement of fact. Prices continue to advance, though not in the same ratio as several weeks ago. All grades of pig iron are up about $2 per ton, and light rails from $10 to $15 per ton. Any prices are being paid for plates, also for hoops and bands, while railroad spikes and track bolts are higher by $5 to $10. Two leading makers of iron pipe have put out lower discounts, showing advances of $10 to $16 per ton. There is an abnormal demand for prompt furnace coke, and it has sold up to $16 per net ton at oven, for shipment to Eastern furnaces. The only soft spot in the whole market is scrap, new buying of which has suddenly ceased, the high prices reached having set both dealers and consumers to thinking what may come if the Government takes hold of the scrap situation and regulates prices that shall be charged for it to the steel mills. Dealers are afraid to buy, or to sell, with the result that very little scrap is moving. The shortage in labor is getting more acute and in some light manufacturing plants women are now doing the work that was formerly done by men. The whole steel trade is in a waiting attitude and will continue so until more is known as to how large Government purchases are going to be and what prices will be paid for the different steel products. Consumers are in distress for lack of deliveries of raw materials, and their output is being cut down very much—in some cases more than 50 per cent.

Pig Iron.—W. P. Snyder & Co. report that the average price of Bessemer iron in June was $53.26 on sales of 1000 tons or more and of basic $49.15, both in gross tons at Valley furnace. These prices show an advance in Bessemer in June over May of $7.27 and of basic $7.26, the highest advances in both grades of pig iron ever known in one month in the whole history of the pig iron trade. Actual sales of Bessemer and basic iron in the past week have been light, not because of lack of inquiry, but for the reason that the pig iron cannot be had. No action was taken last week on the inquiry from Italy for 60,000 tons of Bessemer iron, but it is understood our Government will insist that this iron be furnished as promptly as possible and a local committee is now at work trying to figure out where the iron is to be obtained, and how much of the entire order each furnace will supply that is making Bessemer iron. The United States Government is in the market for 10,000 tons of foundry iron for delivery as promptly as the furnaces can turn the iron out, but the order has not yet been distributed. There have been sales in the past week of Bessemer iron at prices ranging from $56 to $58, with some sellers now quoting $60, but no actual sales have been made at that figure. Sales of basic have been made at $52 to $54, and sellers are now quoting $55 and higher at furnace. Prices on No. 2 foundry iron are $55 at Valley furnace, and some furnaces are quoting $60. The Whitaker Glessener Company, Wheeling, W. Va., is in the market for 10,000 tons of basic iron and the Erie Forge Company wants the same amount, both for delivery in first half of next year. The General Electric Company is inquiring for 6000 tons of basic iron for first quarter, and it is believed this iron is intended to be shipped to a steel mill for conversion into open hearth sheet bars, these to be rolled into electrical sheets for the General Electric Company. We note a sale of 5000 tons of basic iron for delivery over last half of this year at $52 and 2000 tons for the same delivery at $53 at Valley furnace. Sales of 500 to 1500 tons of Bessemer have been made at $56 up to $58 at Valley furnace. We note sales of 2500 to 3000 tons of No. 2 foundry iron for delivery this year at $55 Valley furnace, also a sale of 1000 tons of malleable Bessemer iron for last half delivery at $55, Valley furnace. We now quote Bessemer iron at $57 to $58; basic, $52 to $54; malleable Bessemer, $53 to $55; No. 2 foundry, $55 to $58, and gray forge, $47 to $48, all at Valley furnace

for delivery this year. The freight rate from Valley furnace on pig iron to the Cleveland-Pittsburgh districts is 95c. per ton.

Billets and Sheet Bars.—Very little is being done in billets and sheet bars, as the steel simply cannot be had. Mills that roll billets and sheet bars are refusing to sell and are cutting down deliveries of steel to regular customers. There is a great deal of activity in forging billets, which bring anywhere from $125 to $135 for ordinary carbons. Nothing has been done on the inquiry for 10,000 tons of forging billets noted in this report last week, and it is very doubtful whether they can be had.

We now quote soft Bessemer and open-hearth billets at $95 to $100 and soft Bessemer and open-hearth sheet bars at $105 to $110, maker's mill, Pittsburgh or Youngstown. We quote forging billets at $125 to $135 per ton for ordinary sizes and carbons, f.o.b. maker's mill.

Ferromanganese.—As noted in this report last week, the new inquiry for 80 per cent domestic ferromanganese for delivery over last half of this year and also in the first half of next year is active. For delivery over last half of this year, we quote 80 per cent domestic ferromanganese at $425 and for first half of next year $400 per gross ton at maker's furnaces. Small lots of 50 per cent ferrosilicon for spot shipment are still bringing $200 up to $250 per gross ton at furnace. We quote 18 to 22 per cent spiegeleisen at $80 to $85 per gross ton at maker's furnace. The new demand for Bessemer for silvery iron is only fairly active, most consumers being covered over the remainder of this year and furnaces are sold up for the same period. One sale of 100 tons of 9 per cent Bessemer ferrosilicon has been made at $95 at furnace for fairly prompt delivery, which is $6 per ton higher than what are regarded as regular prices.

We quote 9 per cent Bessemer ferrosilicon at $89, 10 per cent $90, 11 per cent $95, 12 per cent $100, 13 per cent $105, 14 per cent $115, 15 per cent $125, and 16 per cent $135. We now quote 7 per cent silvery iron at $51 to $52, 8 per cent $52 to $53, 9 per cent, $54 to $55, 10 per cent, $55 to $56, 11 and 12 per cent $57 to $58. All f.o.b. makers' furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having a uniform freight rate of $2 per gross ton for delivery in the Pittsburgh district.

Steel Rails.—Nothing is being done in new orders for standard sections, but the new demand for light rails is very active, and prices are from $10 to $15 per ton higher and very great trouble is experienced in finding any new light rails for fairly prompt shipment. The Cambria and Carnegie Steel companies are reported sold up for a year or more on light rails, with the result that rerolling rail mills are now getting as much for their rerolled light rails as is being charged for new light rails. One sale of about 75 tons of 25 to 45 lb. rerolling rails is reported at $84, maker's mill. Prices on new light rails and on standard sections are given on page 48.

Structural Material.—Very little new business is being placed and most of it is coming from the Government. The McClintic-Marshall Co. has taken about 2500 tons for extensions to the open hearth building of the Republic Iron & Steel Co. at Youngstown, Ohio. Mill prices on beams and channels up to 15 in. range from 4.50c. to 4.75c. at mill for delivery late this year. Small lots from warehouse range from 5.50c. up to 6c., depending on quantity and delivery wanted.

Plates.—It is now stated that the Carnegie Steel Co. alone is furnishing about 60,000 tons of steel plates per month to the Government, and this quantity may be increased before very long. It is impossible to quote accurately prices on plates, as each sale made depends entirely on whether the buyer is a regular customer of the mill, the quantity wanted and the delivery. No orders are being placed for steel cars, and the steel car builders cannot get plates from the mills to build cars already on their books. It is said that the two leading steel car interests are not getting more than 25 per cent of the plates they actually need. We now quote ¼ in. and heavier sheared plates at 9c. to 10c. at mill for delivery in third and fourth quarters, while small lots from warehouse for fairly prompt delivery bring 12c. and higher. Mills are quoting 10c. to 12c. on ship plates to domestic yards. The above prices apply only on domestic orders, Government purchases being at much lower figures.

Tin Plate.—Conditions in this trade are the same as noted last week. The mills now believe they will be able to meet the expected abnormal demand for bright plate to be made into containers for perishable foods and are bending every energy they possibly can to achieve this result. At the recent wage conference at Atlantic City, N. J., between tin plate mills that sign the Amalgamated scale and officials of the Amalgamated Association, the latter were sounded on the question as to whether the Amalgamated tin plate mills would work on Sundays to help out the Government demand, and the answer was that, if absolutely necessary, it was certain that the men working in the tin plate mills would be loyal enough to do this. It may be that, before long, some tin plate mills may work Sundays, if the steel can be had. On small current orders, primes are selling from stock at about $12 per base box. Nominal prices on terne plate for which the demand is dull are given on page 48.

Sheets.—More and more of the output of all grades of sheets being made by the mills is being diverted to the Government on direct and indirect business. It is said that at present 30 per cent or more of the entire output of sheets is going to the Government and that when the orders for the cantonments are placed, the percentage of output of sheet mills for Government purposes will be close to 50 per cent. Sales of sheets to regular customers are being steadily restricted and a half dozen or more of the leading sheet mills are out of the market as sellers. Premiums over regular mill prices of $10 to $25 per ton are being paid on all grades of sheets for fairly prompt delivery. Mill prices in effect to regular customers are given on page 48.

Iron and Steel Bars.—It is said the Carnegie Steel Co. is now furnishing about 15,000 tons of steel bars per month to the Government and that this amount will shortly be largely increased. Mills are drawing the lines tighter on selling and on conserving as much of their output as they possibly can for the expected Government demand. Most makers of steel bars are sold up for six months to a year ahead. Prices of iron and steel bars being quoted by the mills to regular customers are given on page 48.

Hoops and Bands.—Small lots of steel hoops for fairly prompt shipment are being sold at 5.50c. to 6c., but mill prices to regular customers range from 4.50c. to 5c. One leading maker took a contract last week for a fairly large quantity of steel hoops for indefinite delivery at 4.50c. at mill. Steel bands range from 5c. to 6c. at mill, but sales for fairly prompt delivery have been made up to 7c. at mill.

Muck Bar.—High grade muck bar, made from all pig iron is quoted at about $100 per gross ton, maker's mill.

Wire Rods.—Makers report the new domestic demand for wire rods is heavy, and there also is a large export demand, especially from Canada. We note a sale of 500 tons of soft open-hearth rods for fairly prompt shipment at $95 per gross ton, maker's mill. One leading interest covered its regular customers some time ago on soft Bessemer and open-hearth rods at considerably under this price. We also note a good demand for high carbon rods made from special steel. There would be no trouble in getting $100 and higher, per gross ton at maker's mill for soft Bessemer or open-hearth rods for export shipment, if the mills could spare them. Prices are given in detail on page 48.

Wire Products.—The order recently placed by the Government for wire nails was 41,320 kegs, of which the American Steel & Wire Co. took half and the other half was divided among six or seven independent mills. The price was $3.20 base, per keg, f.o.b. at mill, deliveries to be made in about 60 days. The demand for wire nails is fairly heavy. All the leading makers are refusing to take contracts, and instead are selling wire nails for indefinite delivery, the price to be paid to be that in effect by the mills to jobbers at the time shipments are made. In this way, the independent mills are protecting themselves in case the market should be

higher when shipments are made, and the jobber is protected should the price be lowered. There is a heavy export demand for wire nails, this coming largely from South America, Japan and Australia.

There is still some confusion among jobbers of wire and wire nails in large cities over the fact that the prices of wire products being charged to its regular trade by the American Steel & Wire Co., is $16 per ton less than the independent mills are quoting. Reports that wire nails had sold by the mills at $5 base, per keg are untrue. None of the mills is quoting above $4 base, per keg, at mill. Detailed prices on wire and wire nails in effect by the independent mills are given on page 48.

Shafting.—Makers report the new demand for shafting heavy, and some large contracts are said to have been placed lately by motor concerns which have taken contracts to build motor trucks and other vehicles for the Government. This new business is expected to more than offset the falling off in new demand for shafting from builders of pleasure cars. The implement makers are specifying at only a fair rate, but the screw stock machine people are taking in shafting as fast as it can be shipped. Local makers are pretty well covered over the remainder of this year. Deliveries of ¾-in. and smaller can be made in 60 to 90 days, but on ¾-in. to 3½-in. and 4-in. not earlier than four to five months. Discounts on cold rolled shafting are firm, ranging from list to 10 and 5 per cent off, depending on the order and deliveries wanted.

Railroad Spikes and Track Bolts.—In the railroad spike market, it is not so much a question of prices, as of where to get the steel to make them. One leading maker that has its own steel, is out of the market as a seller this year, and other makers are not getting more than 20 to 25 per cent of normal needs of steel. New inquiry is heavy, some of the leading railroads asking prices on contracts for delivery in first half of 1918. A heavy general advance in prices on all kinds of spikes has taken place, and contracts have been at 5c. per lb. on 9/16-in. and larger, and 7c. per lb. base on smaller sizes. Boat spikes to regular customers are being furnished at 7c. but there is an abnormal inquiry for boat spikes coming to local makers which they are turning away as they cannot get enough steel for boat spikes to supply regular customers.

Many former users of 5/16-in. spikes are now using ⅜ in. Prices on track bolts are also higher, due to inability of makers to get steel. The new higher prices on railroad spikes and track bolts are given in detail on page 48.

Cold Rolled Strip Steel.—It is said that 60 per cent of the users of cold rolled strip steel are furnishing material indirectly for the government. The new demand is heavy, but there is a disposition on the part of users of cold rolled strip steel not to buy too far ahead, owing to the uncertainty of the future. This also prevails with the mills to some extent and they are confining sales to delivery within 60 days and are still insisting that 50 per cent of the specification on any contract placed must accompany contracts, and the other 50 per cent must come forward in 30 days. On contracts of this kind, mills are quoting 9c. at mill, while on small current orders, prices range from 10 to 12c., at mill. Terms are 30 days net, less 2 per cent off for cash in 10 days, sold in quantities of 300 lbs. or more.

Nuts and Bolts.—Makers of nuts and bolts were in conference last week, discussing trade conditions, but made no changes in prices, the discounts on nuts and bolts as adopted on April 12 last still being in effect. The new demand is heavy, but makers of nuts and bolts report the supply of steel from the mills is getting less, and this is cutting down output of nuts and bolts very much. No attention is paid to export demand, as makers do not have the nuts and bolts to spare, and in addition it is impossible to get cars and bottoms for export shipments, discounts as adopted on April 12, last are given in detail on page 48.

Rivets.—The new demand is heavy, and the recent advance in price of $10 per ton is holding firm. Makers of rivets report they are not getting nearly as much steel as they need and the supply is getting shorter. Prices on structural rivets for delivery up to Oct. 1, only are $5.25 per 100 lb., base, and on cone head boiler rivets $5.35 base, per 100 lb., f.o.b. Pittsburgh. Terms are 30 days net, or one half of 1 per cent off for cash in 10 days.

Wrought Pipe.—The Reading Iron Co., Reading, Pa., and A. M. Byers, Inc., Pittsburgh, have issued new cards on wrought iron pipe, showing heavy advances in price. Discounts on ⅛-in. to ½-in. have been lowered 7 points, an advance of $14 per ton; ¾-in. to 6-in. 5 points, an advance of $10, and 7 to 12-in., 7 points, an advance of $14 per ton. New cards have been issued on steel pipe during the past week, and there has been for some time a very wide range in prices on steel pipe being quoted by the different mills. The National Tube Co. is still using the discounts of April 1, which are $12 per ton less than some of the independent mills, and $28 to $38 per ton less than prices being named on steel pipe by Labelle Iron Works and Wheeling Steel & Iron Co. The fact of the matter is that any sales of iron or steel pipe being made are largely at whatever prices mills care to name. The National Tube Co. is not seeking new business, and has not been for months, trying as best it can to take care of its regular customers on the April 1 discounts. Other independent mills are quoting to regular customers the discounts of May 1, while Labelle and Wheeling are quoting the discounts which these two mills recently adopted. Very little iron or steel pipe remains to be sold this year, the mills being practically covered up to Jan. 1, and several makers of iron and steel pipe have contracts to be filled early next year. This same condition applies on oil country goods, the new demand for which is abnormally heavy. Prices on oil country goods depend entirely on whether the buyer is a regular customer, how soon he wants the material and the quantity. Nearly every sale made carries heavy premium prices. On butt weld iron and steel pipe, mills cannot make deliveries in less than 10 to 12 weeks. There are still large inquiries for gas and oil lines, but these are being turned down, as the mills, in their congested condition, cannot possibly supply the pipe. The new discounts in effect on iron pipe and those on steel pipe adopted May 1, still being quoted by some of the mills, are given on page 48.

Boiler Tubes.—Conditions in the boiler tube trade show no change. Mills are sold up for 6 to 12 months, and any sales of iron or steel tubes carry very heavy premiums in prices. It is said that both iron and steel tubes have sold at $50 per ton advance over prices indicated in the nominal discount which long ago became obsolete. The Government is making very large demands on the mills for both iron and steel tubes, and these contracts are being shipped out as fast as the mills can make the material. On seamless steel tubing, one leading maker is practically sold up, not only for this year, but for nearly all of next year. Nominal discounts on iron and steel tubes, which are very much below the actual prices being paid, are given on page 48.

Old Material.—The local scrap market has quieted down very materially in new demand, and for the past week very little material has been moving from dealers to consumers. Prices are softer, and on most grades of scrap have gone off from $1 to $3 per ton, the heaviest decline having been in steel melting scrap, which is $3 to $4 per ton lower. Some dealers here believe the Government is going to take hold of the scrap situation, and regulate prices, and for this reason dealers are not anxious to sell, and consumers are pretty well covered ahead and are not buying until they know more definitely what the Government is going to do. There is an insistent heavy demand for low phosphorus melting stock, also for borings and turnings, and for sheet bar crop ends, and prices on these grades have declined less than on other kinds of scrap. The scrap list of the Pennsylvania railroad, east, closed Tuesday, July 3, while the list of the Pennsylvania lines west closes July 6, but local dealers have not bid on either lists; in fact, are not buying or selling scrap until the situation as to what the Government will do has cleared to some extent. The be-

lief is that prices may decline still further, if the present inactivity should last for any length of time. We note a sale of six hundred tons of low phosphorus plates and billet ends at $56 per gross ton delivered to consumer's mills. Prices for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, are as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$42.00 to $43.00
No. 1 foundry cast	36.00 to 38.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	46.00 to 48.00
Hydraulic compressed sheet scrap	34.00 to 35.00
Bundled sheet scrap, sides and ends, f.o.b. consumers' mill, Pittsburgh district	28.00 to 29.00
Bundled sheet stamping scrap	25.00 to 26.00
No. 1 railroad malleable stock	36.00 to 37.00
Railroad grate bars	19.00 to 20.00
Low phosphorus melting stock	58.00 to 60.00
Iron car axles	58.00 to 60.00
Steel car axles	60.00 to 65.00
Locomotive axles, steel	63.00 to 65.00
No. 1 busheling scrap	32.00 to 33.00
Machine-shop turnings	21.00 to 22.00
Old carwheels	39.00 to 40.00
Cast-iron borings	22.00 to 23.00
*Sheet bar crop ends	55.00 to 58.00
No. 1 railroad wrought scrap	45.00 to 46.00
Heavy steel axle turnings	29.00 to 30.00
Heavy breakable cast scrap	32.00 to 33.00

*Shipping point.

Coke.—The scarcity of cars and the heavy demand for blast furnace coke for prompt shipment have put up prices very rapidly, and in the last few days high grade blast furnace coke for delivery to eastern furnaces shipped over the Pennsylvania railroad has sold at $16, and for delivery to Mahoning and Shenango blast furnaces over the Pittsburgh and Lake Erie railroad has sold at $14.50 to $15 per net ton, at oven. There is an insistent demand for all the blast furnace coke that is offered. One large consumer in the Chicago district has been buying very freely for some time and offering practically any prices that producers ask to get the coke. Some very large contracts for blast furnace coke expired June 30, and these have not been renewed. Instead, shippers on these contracts have agreed to furnish regular customers with coke, prices to be fixed from month to month. This is resulting in a very large demand for prompt coke and still higher prices are predicted. The car supply is bad, having averaged less than 60 per cent last week. We now quote best grades of blast furnace coke for prompt shipment at $15 to $16 per net ton, at oven, but we omit prices on contract blast furnace coke as nothing is being done. We quote best grade of 72-hour foundry coke for prompt shipment at $13 to $14 and on contracts made some time ago, $10 per net ton, at oven. The *Connellsville Courier* gives the output of coke in the upper and lower Connellsville regions for the week ending June 23 as 361,661, an increase over the previous week of 7209 tons. The output this week in the upper and lower Connellsville regions will no doubt show a large falling off as compared with last week, owing to the holiday on the Fourth of July. Coke workers are likely to lose two or three days on account of this holiday.

Chicago

CHICAGO, July 2.

Little change is discernible in this market. The producers of steel are still awaiting information as to what portion of the Government needs will be assigned to them individually. One Western mill has been called on to supply 16,000 tons of plates, shapes and bars as a part of its quota. Even at present prices, a great deal of business could be had were the mills ready to accept it. Agricultural interests are inquiring for miscellaneous material, largely bars and small shapes for first half 1918 delivery. Later the mills will figure on these inquiries, but first they want to hear from the Government. Oriental buyers are finding this market a more precarious source of plates. Steel men here expect that export licenses ultimately will be issued by the Government. Not a single structural award was announced this week. Standard railroad spikes are up one-quarter cent to 4.25c. Southern furnaces are getting most of the business in pig iron, all grades of which are firmly held at the prices of last week. In old material, declines are general in a quiet market.

Pig Iron.—Quotations stand generally at the levels of a week ago. As compared with the activity of a few weeks ago, the market is quiet, although a few fair-sized inquiries are current. Business has been largely centered in Southern iron, although its sellers have drawn the lines tighter around last half deliveries. The plan of the leading Southern producer is to sell a standard No. 2 only in conjunction with quantities for first-half delivery, in which case it quotes $49, Chicago. Sales of last-quarter iron have been made on this price and basis. About 6000 tons of prompt low silicon Southern have been sold at $44.50 Birmingham, a local pipe company taking 3000 tons of July and a plow company 1500 tons at this price. Other makers have obtained $49.50 Birmingham for last-quarter iron running 1.75 per cent silicon and over. The leading Southern producer offers various grades as follows: Silicon, 3 per cent and over, $46.50, Birmingham; 2.75 and over, $46; 2.50 and over, $45.50; 2.25 and over, $45; 2 per cent and over, $44.50, and 1.75 and over, $44.25, all for first half of 1918. Jackson County 8 per cent silvery is nominal at $70 to $80, furnace. Tennessee 8 per cent is around $57.75, Chicago. Charcoal iron is unchanged, with a limited quantity still obtainable for last half and first half. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer, and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 1 to 4	$57.00 to $62.00
Lake Superior charcoal, Nos. 5 and 6 and Scotch	57.00 to 62.00
Northern coke foundry, No. 1	55.50
Northern coke foundry, No. 2	55.00
Northern coke foundry, No. 3	54.50
Northern high-phosphorus foundry	55.00
Southern coke No. 1 f'dry and 1 soft	49.50
Southern coke No. 2 f'dry and 2 soft	49.00
Malleable Bessemer	55.00
Basic	55.00
Low-phosphorus	85.00
Silvery, 8 per cent	70.00 to 80.00

Sheets.—The Government requirements for sheets are giving considerable concern to the mills, representatives of which leave for the East today to attend a meeting at which the situation will be discussed. The leading Western maker is not quoting. One other puts No. 28 black at 9c., Pittsburgh; No. 10 blue annealed at 8.75c., and galvanized at 11c. September delivery, and a small tonnage to sell. The jobbers have made no changes in their quotations.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 9.50c.; No. 28 black, 9.50c.; and No. 28 galvanized, 11c.

Rails and Track Supplies.—Tie plates have been advanced to $70, Chicago; standard railroad spikes to 4.25c. base; small spikes to 4.50c. base, and track bolts to 5.25c. base. There is some inquiry for fastenings, but in the aggregate it is not great. For rails inquiry is small.

Quotations are as follows: Standard railroad spikes, 4.25c. base; small spikes, 4.50c., base; track bolts with square nuts, 5.25 c., all in carloads, Chicago; tie plates, $70 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base; open hearth, $40; light rails, 25 to 45 lb., $65; 16 to 20 lb., $66; 12 lb., $67; 8 lb., $68; angle bars, 3.25c., base.

Rivets and Bolts.—As a result of the growing strength of the situation and the smaller production because of shortages of labor and materials, the leading interest has advanced its prices 10 per cent. Other makers have yet to follow and the following mill and jobbing quotations are unchanged:

Mill quotations are without change, as follows: Carriage bolts up to ⅞ x 6 in., rolled thread, 40; cut thread, 35-2½; larger sizes, 25; machine bolts up to ⅞ x 4 in., rolled thread, with hot-pressed square nuts, 10-10; cut thread, 40; large size, 30; gimlet-point coach screws, 45; hot-pressed nuts, square, $2.10 off per 100 lb.; hexagon, $1.90 off. Structural rivets, ⅜ to 1¼ in., 5.439c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

Store prices are as follows: Structural rivets, 5.50c.; boiler rivets, 5.50c.; machine bolts up to ⅞ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to ⅞ x 6 in., 40-2½; larger sizes, 30-5; hot pressed nuts, square, $3, and hexagon $3 off per 100 lb.; lag screws, 50 per cent off.

Ferroalloys.—For early delivery 80 per cent ferromanganese is quoted at $450, and for the first half at $400. Ten per cent Bessemer ferrosilicon has been bought at $100, Jackson County furnace.

Plates.—Only one producer names a quotation for plates, and that mill is taking some business at 10c., delivery in the third quarter. Common tank plates range up to 11c., Pittsburgh. Where Oriental shipbuilders will get material is a question, although it is expected that the United States Government will take cognizance of their needs and issue export licenses. Government business is not largely in evidence, although a local mill will furnish some plates on a requisition for 16,000 tons of steel, including plates, shapes and bars.

We quote for Chicago delivery of plates out of jobbers' stocks, 5c.

Structural Material.—Not a single structural job is reported for the week just ended, neither is there any new car business. Only one mill quotation is available and that is supplied by an Eastern producer which quotes 6c., Pittsburgh, for limited quantities, third quarter delivery. The quotation of jobbers is unchanged.

Jobbers quote 6c. for material out of warehouse.

Bars.—The one quotation obtainable for mild steel bars is 4.50c., Pittsburgh, taking a freight rate of 0.189c. per 100 lb. Rail carbon bars are stronger at 4.50c. to 4.75., Chicago. Iron bars are held at 4.50c. to 5c., some makers asserting they have none to sell even at the higher price. Jobbers' quotations are unchanged.

We quote prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c. to 5c.; reinforcing bars, 4.50c., base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Wire Products.—The leading interest adheres to its nominal quotation, 3.20c. for wire nails, and corresponding prices for other products. The prices of the independent makers to jobbers, per 100 lb., Pittsburgh, are as follows:

Plain fence wire, Nos. 6 to 9, base, $4.189; wire nails, $4.189; painted barb wire, $4.339; galvanized barb wire, $5.039; polished staples, $4.339; galvanized staples, $5.039; all Chicago, carload lots.

Old Material—The market has turned quiet and the result of its being left severely alone by buyers of all kinds has resulted in declines for nearly every item on the list. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$47.00 to $48.00
Relaying rails	59.50 to 60.00
Old carwheels	37.00 to 39.00
Old steel rails, rerolling	47.00 to 47.50
Old steel rails, less than 3 ft	49.50 to 50.00
Heavy melting steel scrap	36.00 to 38.00
Frogs, switches and guards, cut apart	36.00 to 38.00
Shoveling steel	34.00 to 36.00
Steel axle turnings	24.00 to 25.00

Per Net Ton

Iron angles and splice bars	$46.00 to $46.50
Iron arch bars and transoms	46.50 to 47.00
Steel angle bars	40.50 to 41.00
Iron car axles	50.50 to 51.50
Steel car axles	49.00 to 50.00
No. 1 railroad wrought	40.00 to 41.00
No. 2 railroad wrought	37.50 to 38.00
Cut forge	36.50 to 37.00
Pipes and flues	28.00 to 29.00
No. 1 busheling	30.00 to 31.00
No. 2 busheling	22.00 to 23.00
Steel knuckles and couplers	41.00 to 42.00
Steel springs	41.50 to 42.00
No. 1 boilers, cut to sheets and rings	26.50 to 27.00
Boiler punchings	36.50 to 37.00
Locomotive tires, smooth	50.00 to 50.50
Machine-shop turnings	19.00 to 19.50
Cast borings	18.00 to 19.00
No. 1 cast scrap	30.50 to 31.50
Stove plate and light cast scrap	21.50 to 22.00
Grate bars	24.50 to 25.00
Brake shoes	24.50 to 25.00
Railroad malleable	33.00 to 33.50
Agricultural malleable	28.00 to 29.00

Cast Iron Pipe.—The United States Government has placed 300 tons with the United States Cast Iron Pipe & Foundry Co. for the naval training station at Great Lake, Ill. The order was placed with no delay and in a manner that indicated knowledge of the requirements. Livingston, Mont., has placed 1500 tons with the American Cast Iron Pipe Co. Quotations are unchanged.

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., $68.50; 6 in. and larger, $65.50, with $1 extra for class A water pipe and gas pipe.

Philadelphia

PHILADELPHIA, July 2.

Brisk inquiry in many lines aside from plates, with better business in pig iron, has marked the trade here during the past week. Export inquiry for ship steel is, of course, nothing new, but a development in this line is shown by the increased demand from exporting houses on the Pacific slope for both plates and sheets, presumably for Japanese consumption. On the whole, a considerable tonnage is involved in these inquiries, subject, no doubt, to a good deal of duplication, but mills in this district have dismissed them from consideration, in view of the tremendous need for ship materials in this country on Government and private account. As a sidelight on shipyard activity, a Philadelphia office has received considerable inquiry for ship spikes, the total wants being about 3000 kegs.

Pig Iron.—Normal relations of standard grades have been altered decidedly in a week of better sales, accompanied by advancing prices. The market is active and strong, with numerous inquiries running from 300 to 1500 tons on foundry grades. Virginia iron, with important makers out of the market, is now distinctly ahead of eastern Pennsylvania No. 2 X, sales this week being reported at $52.50, furnace, equivalent to $55.25, Philadelphia, against $54.50 as an extreme top for eastern Pennsylvania No. 2 X. At this price eastern Pennsylvania iron is a little high, and the real market cannot be said to run above $54. Philadelphia, as of to-day. There is talk of anything from $54.75 to $56.75 as the delivered price of eastern Pennsylvania No. 2 X, but the substantial tonnages which have actually been moving have not reached such figures. Standard low phosphorus has established an actual price of $90 in sales upward of 10,000 tons, while copper-bearing low phosphorus is held at $80 to $85, furnace, for first half delivery. Basic iron is temporarily in the doldrums, as steel makers are apparently covered, and in the absence of transactions it is held at a nominal quotation of $50 to $52. Some fair tonnages of eastern Bessemer have been sold recently at $60, furnace, and a round tonnage of coke malleable was disposed of in this market at $58.50, delivered. Charcoal iron, whether Lake Superior or Southern, seems to be firm at $60, furnace. Some small sales of No. 2 foundry at $47, Birmingham, for last half delivery are reported. One quotation on this grade for 1918 delivery was given to-day as $42, Birmingham, while $52, furnace, was cited as the idea of one house on eastern Pennsylvania No. 2 X for 1918 delivery. As a whole, sellers are not eager to make commitments very far forward in view of the uncertainty prevailing as to fuel supply and other elements of manufacture. Quotations for standard brands, prompt shipment, and delivery in buyers' yards, range about thus:

Eastern Pa. No. 2 X foundry	$52.00 to $54.00
Eastern Pa. No. 2 plain	51.50 to 53.50
Virginia No. 2 X foundry	54.25 to 55.25
Virginia No. 2 plain	53.75 to 54.75
Basic	50.00 to 52.00
Gray forge	50.00
Standard low phosphorus	90.00

Iron and Steel Bars.—Good tonnages from widely distributed interests are reported for the week by makers of bar iron, for delivery at mill convenience. The price range is maintained, most makers quoting 4½c. base, Pittsburgh, though one maker is quoting 5c. and keeping busy. Steel bars are still held at 4½c., Pittsburgh, as a minimum, with as high as 5c. asked by one interest.

Structural Material.—Prices on structural steel remain unchanged, with one large interest quoting 4½ to 5c., another asking 6c. on contracts for third quarter specification, and a third large producer out of the

market. The Gerber Engineering Co. is to supply approximately 1000 tons for the new office building to be erected in Chestnut Street on the site of the Chestnut Street Theatre, and an inquiry is in the market for from 700 to 1000 tons for an office building in Washington, intended for the use of Government departments.

Plates.—There is no mistaking the position of plates as the headliner in the steel market. Old customs have reversed themselves, so that buyers are now trying to make prices with a view to tempting the mill to take their orders. One inquiry covering 13,000 tons for export, of which 3000 tons was for France, failed to get a quotation from the mill approached. Another maker reports export inquiries of 2000 to 5000 tons from Japan, Italy, Spain and Norway. The minimum price for ordinary tank steel is still 10c. base, Pittsburgh, but orders have been reported at 10½c. and upward, depending upon specification and delivery. Boat steel likewise holds to 12½c. as the minimum, but it is reported that some business has been placed at 15c. base. American shipyards have placed no new business with mills for some time, this being due to the fact that they are busy filling Government requirements. It is hard to get any promise of delivery earlier than a year, and plate users are evincing uneasiness lest they be seriously affected if the Government takes a large share of the mill output. Last week was marked by very heavy specifications, literally swamping the mills, since many contracts had June 30 as the limit and buyers were eager to save every pound of tonnage contracted for at prices lower than the present basis.

Sheets.—Mills in this district are really marking time and selling virtually nothing until the probable Government needs are fully known. Some Government tonnage is being specified, with prospects of more. The minimum of 8½c. Pittsburgh for No. 10 blue annealed still obtains, with 8¾c. as an outside price.

Ferroalloys.—Ferromanganese is quoted to-day at $450 for prompt, $425 for last quarter and $400 for first quarter 1918. Spiegeleisen is held at $85 furnace for prompt delivery, with the market strong. A price of $105 on 10 per cent Bessemer ferrosilicon for July shipment was reported to-day.

Track Supplies.—Standard spikes, hitherto held at 4c. base, Pittsburgh, were quoted to-day at 4¼c. by one interest on the ground that spikes should not be listed at a price below steel bars. An inquiry for 1000 kegs to cover the needs of the United Railways & Electric Co. of Baltimore has been in this market. Tie plates are being held at 4½c. Pittsburgh, with 5c. asked on small lots.

Old Materials.—Shipments of old materials to Pittsburgh, while they have by no means ceased, have diminished and the market seems more settled, though still inclined to be spasmodic at times. While there was considerable softening here and there, indications of added strength are not altogether wanting. Eastern mills as a whole are not buying freely, though sales of steel melting scrap approximating 10,000 tons, at $40 have been reported. Cast borings, on two sales close together, showed a gain of $2 during the week, the price of $27 on the first sale mounting to $29. Sales of machine shop turnings at $27.50 have been made during the week and old car wheels have shown added strength. Prices to-day, based on Eastern Pennsylvania delivery, range about thus per gross ton:

No. 1 heavy melting steel	$40.00 to $42.00
Old steel rails, rerolling	50.00 to 55.00
Low phosphorus heavy melting	56.00 to 58.00
Old iron rails	52.00 to 55.00
Old carwheels	38.00 to 40.00
No. 1 railroad wrought	57.00 to 59.00
No. 1 forge fire	26.00 to 28.00
Bundled sheets	26.00 to 28.00
No. 2 busheling	18.00 to 20.00
Machine shop turnings	26.00 to 28.00
Cast borings	27.00 to 29.00
No. 1 cast	39.00 to 41.00
Grate bars, railroad	22.00 to 25.00
Stove plate	22.00 to 25.00
Railroad malleable	32.50 to 35.00
Wrought iron and soft steel pipe (new specifications)	40.00 to 42.00

Coke.—Spot fuel is genuinely scarce, and important dealers confess inability to command supplies or to quote on inquiries. Forward contracts are reported on a basis of $12.50 to $13, oven, for foundry coke. The same grade was quoted to-day at $16 for spot, with furnace coke at $15.

Cleveland

CLEVELAND, July 2.—(*By Wire.*)

Iron Ore.—Ore men feel that in view of the present conditions of the pig iron and steel market they should get higher prices for any ore they have left for sale for this season. In one case, quotations higher than regular market prices are reported to have been made and one leading shipper is declining to make quotations, while waiting developments in respect to Government regulation of prices. A number of inquiries are pending, but only a limited additional tonnage can be sold owing to the lack of vessel capacity. The car shortage is still very bad and this is causing considerable delay of boats at Lake Erie docks. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, $5.95; Mesaba Bessemer, $5.70; old range non-Bessemer, $5.20; Mesaba non-Bessemer, $5.05.

Pig Iron.—There is a moderate volume of inquiry and apparently a shortage of both steel making and foundry iron for this year's delivery. One leading producer is making no quotations in view of possible action by the Government to regulate prices. The General Electric Co. is inquiring for foundry, malleable and basic iron, mostly for its first half requirements and is expected to purchase 15,000 to 20,000 tons. The Erie Forge Co., Erie, Pa., will install an additional open-hearth furnace and is inquiring for 10,000 tons of basic iron for the last quarter and first half. A leading sanitary interest has purchased about 15,000 tons of Northern and Southern iron for first quarter delivery. The price of foundry iron has been advanced to $56 for any delivery by two Lake furnaces. Southern iron is fairly active. Considerable tonnage was booked during the week at $45 Birmingham for No. 2 for first half delivery. Tennessee iron is being quoted as high as $50 for that delivery. A number of sales of Virginia iron were made in the Cleveland territory during the week at prices ranging from $53.20 to $55.20 for No. 2 for first half delivery. A Valley mill has taken 1000 tons of Ohio silvery, 8 per cent silicon, for July and August delivery at $85 furnace. This iron is now quoted at $80 furnace for delivery during the first half. We quote f.o.b. Cleveland as follows:

Bessemer	$57.95 to $58.95
Basic	52.30 to 54.30
Northern No. 2 foundry	54.30 to 56.30
Southern No. 2 foundry	49.00 to 54.00
Gray forge	50.95
Ohio silvery, 8 per cent silicon	81.62 to 86.62
Standard low phos., Valley furnace	83.00 to 85.00

Coke.—Foundry coke has advanced to $14 to $15 for standard Connellsville makes for prompt shipment and several sales are reported around $14.50. No prices for contracts are being made.

Finished Iron and Steel.—Interest in the steel market is centered almost wholly in Government orders and there is an increasing anxiety among consumers not doing Government work as to whether they will be able to get their steel. Inquiries have come from manufacturers as to whether they can depend on the mills for shipments on fourth quarter contracts. Few consumers allowed any steel on second quarter contracts to be canceled. Inquiries for steel for Government work have increased and include one for 5000 tons of nickel steel for gun forgings, one for steel for 58,000 4 to 6 in. and larger shells taken by an Ohio manufacturer, 1800 tons of structural material for mine storage houses and 250 tons for helmets. An interesting feature of the market is the heavy demand for electric steel. Three months ago there was a surplus of this steel and it was being shipped on open-hearth specifications. Now makers are four months behind on deliveries. The greater demand is partly attributed to Government requirements. Sales during the week in-

cluded two lots of electric steel of 500 tons each. The plate market is very firm at 12c. to 12½c., Pittsburgh. Plate mills are having much trouble in getting raw material and in shipping their products. In semi-finished steel we note a sale of 1000 tons of ingots by a Cleveland district mill at $70 and several car lots of forging billets at $130. The demand for both light rails and standard sections from industrial companies is heavy, and there is an acute shortage. Hard steel bars have been advanced to from 4c. to 4.25c. The sheet market is very firm and active, although some jobbers expecting Government regulation of prices are deferring purchases. We quote sheets at 8.50c. to 8.65c. for No. 28 black, 8.50c. to 8.75c. for No. 10 blue annealed and 10.50c. to 10.75c. for No. 28 galvanized. Warehouse stocks were greatly depleted during June and sales fell off slightly. The warehouse price on blue annealed sheets has been advanced to 9c. Other stock prices are unchanged.

Bolts, Nuts and Rivets.—The new demand for bolts and nuts is very heavy, having been stimulated by the Government requirements from makers of motor trucks, wagons and other equipment. These manufacturers so far are not being given price concessions for bolts and nuts to be used in Government work. New business is being placed at the price advance made by Cleveland manufacturers last week. Cleveland rivet manufacturers have advanced prices to conform with those recently made in the Pittsburgh territory. The demand for rivets is very heavy, a large volume of business being placed by ship-building companies which are accompanying their orders with specifications. There is an increased demand for export. On the Government inquiry for 40,000 tons of rivets for boats, rivet manufacturers have quoted a price for conversion, this being a fixed amount above the price at which they are to be furnished the steel and it is expected that the matter will be settled this week. We quote rivets at 5.25c., Pittsburgh, for structural, and 5.35c. for boiler rivets, for delivery during the last half. Bolt and nut discounts are as follows:

Common carriage bolts, ⅜ x 6 in., smaller or shorter, rolled thread, 35 off; cut thread, 30 and 5; larger or longer, 20. Machine bolts, with h. p. nuts, ⅜ x 4 in., smaller or shorter, rolled thread, 40; cut thread, 35; larger and longer, 25. Lag bolts, cone point, 40. Square h. p. nuts, blank, $1.90 off list; tapped, $1.70 off list. Hexagon, h. p. nuts, blank, $1.70 off; tapped, $1.50 off. C. p. c. and t. hexagon nuts, all sizes blank, $1.25 off; tapped, $1 off. Cold pressed semi-finished hexagon nuts, 50 and 5 off.

Old Material.—Following the advance in prices and feverish activity, the market has reacted. The weakening is attributed partly to a falling off in the demand, mills having withdrawn from the market after purchasing round tonnages, but, apparently, caused principally by the feeling among dealers that the Government may step in and regulate prices of scrap with other raw material. Last week, sales of heavy melting steel scrap were made at $45, to Cleveland mills, but the price to-day is around $43. This grade is quoted at $44 to $45 for delivery to Valley points. The softening of the market has brought out a large amount of heavy steel scrap. The Cromwell Steel Co., Lorain, is a new scrap buyer in this territory, having purchased 12,000 tons of heavy steel and being in the market for an additional tonnage. Borings and turnings are easier, but other grades are fairly firm. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton	
Steel rails	$44.00 to $45.00
Steel rails, rerolling	48.00 to 50.00
Steel rails, under 3 ft.	47.00 to 50.00
Iron rails	48.00 to 50.00
Steel car axles	55.00 to 57.50
Heavy melting steel	43.00 to 44.00
Carwheels	40.00 to 41.00
Relaying rails, 50 lb. and over	50.00 to 55.00
Agricultural malleable	29.00 to 31.00
Railroad malleable	42.00 to 44.00
Light bundled sheet scrap	24.00 to 25.00

Per Net Ton	
Iron car axles	$55.00 to $60.00
Cast borings	20.50 to 21.50
Iron and steel turnings and drillings	19.50 to 20.00
No. 1 busheling (nominal)	30.00 to 32.00
No. 1 railroad wrought	44.00 to 45.00
No. 1 cast	33.00 to 35.00
Railroad grate bars	22.50 to 23.50
Stove plate	21.00 to 22.00

The contract for about 26,000 tons of steel that will be required for 4,750,000 shell forgings that will be made for the Government by the Hydraulic Pressed Steel Co., Cleveland, has been divided between the Lackawanna Steel Co., Cambria Steel Co., the Inland Steel Co., the Minnesota Steel Co., and the Bourne-Fuller Co.

Cincinnati

CINCINNATI, July 2—(*By Wire*).

Pig Iron.—Southern foundry iron for nearby shipment has sold freely at $50 Birmingham, and confirmation has been received that the 15,000 tons of basic for first half shipment mentioned last week was sold at this same price. As far as known, no foundry iron has been bought at $50 for first half shipment, but a number of contracts have been made at $48. The minimum quotation to-day on Southern for this year is $47. Northern foundry is almost unobtainable for any shipment this year, and the furnaces are not very keen to take on much business for the first half of next year. Last week, $54, Ironton, on No. 2 foundry was done for first half shipment, but to-day's quotation is firm at $55 for shipment during the remainder of the year, and in the first half of next year. Virginia iron was offered in this territory at $50, furnace, for first-half shipment, and several contracts were made at this figure by melters in Ohio, Indiana and Michigan. The furnace making this quotation withdrew from the market early last week. A small sale of Virginia iron, running 3 per cent in silicon, was made to-day for this year's shipment at $52.50, furnace. The Ohio 8 per cent silvery irons are now quoted at $85 to $90, furnace, for first-half shipment, and 10 per cent Bessemer ferrosilicon is firm at $105, at which price some was recently sold. There is a limited demand for malleable, but it is very firm at $55, Ironton, for shipment either this year or first half of next. A number of melters are inquiring for prices on iron to be shipped in the last half of next year, but the furnaces are not willing to open their books that far ahead. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, as follows:

Southern coke, No. 1 f'dry and 1 soft.	$51.40 to $52.40
Southern coke, No. 2 f'dry and 2 soft.	$49.90 to 51.90
Southern coke, No. 3 foundry	50.40 to 51.40
Southern coke, No. 4 foundry	50.00 to 51.00
Southern gray forge	48.90 to 49.90
Ohio silvery, 8 per cent silicon	81.26
Southern Ohio coke, No. 1	56.76
Southern Ohio coke, No. 2	56.26
Southern Ohio coke, No. 3	55.76
Southern Ohio malleable Bessemer	56.26
Basic, Northern	56.26
Lake Superior charcoal	56.75
Southern carwheel foundry	48.90

Finished Material.—The local store price on blue annealed sheets has been advanced ½c., making to-day's quotation 9½c. a lb. The demand for blue annealed sheets is very good, and mill shipments are moving at a better rate. The call for galvanized sheets is becoming more limited, as sheet metal contractors find it hard to obtain fair prices on all kinds of contract work, and as a consequence their activities just now are mostly confined to repair jobs. The nearby mills are quoting No. 28 black sheets at 8.15c. Cincinnati, or Newport, Ky., and No. 28 galvanized at 10.15c. Plates, ¼ in. and heavier are unchanged at 9c. from warehouse stocks, and structural shapes at 5c. Steel bars are unchanged at 4.65c. and twisted steel bars at 4.70c. Machine bolts, ⅜ x 4 in. and smaller are quoted at 45 per cent discount; larger and longer, 30 per cent; files, 50 per cent discount; hacksaw blades 10 per cent discount and hand taps at 55 and 7½ per cent discount. Rivets have been advanced about 20 per cent in the past 30 days. The warehouse price on wire nails remains at $4 per keg base, which is 15c. per keg below the present mill price as quoted by independent manufacturers. A price advance to $4.25 is scheduled for the present week.

Coke.—Spot foundry coke is very strong, and some 72-hr. coke in the Connellsville field has brought as

high as $15 per net ton at oven. Prompt shipment foundry coke is quoted at $13.50 to $15. Contract figures are from $11.50 to $13. In the New River district, spot foundry coke ranges from $13 to $14, and in Wise County and Pocahontas fields prices are from $12.50 to $13.50. In all four fields, contract prices are from $11.50 to $13, with very little contracting being done. Furnace coke is very firm for prompt shipment, and lately contract prices also appear to be on the upward trend. We quote for prompt shipment $11 to $12 per net ton at oven and on contract $9.50 to $11. Very little furnace coke is being bought, although for domestic uses carload quantities are sold from time to time, usually bring the maximum quotation for spot shipment. The car situation is unchanged, and many shipments are delayed.

Old Material.—Prices are not very strong, and a reduction of 50c. a ton has been made on several different kinds of scrap. The rolling mill demand for wrought scrap is somewhat slack, while foundry purchases of cast scrap show a decline. Relaying rails are in excellent demand, and the matter of price does not seem to have cut off buying on the part of customers who need rails. The following are dealers' prices f.o.b. at yards, southern Ohio and Cincinnati.

Per Gross Ton

Bundled sheet scrap	$23.00 to $23.50
Old iron rails	40.00 to 40.50
Relaying rails, 50 lb. and up	45.50 to 46.00
Rerolling steel rails	42.50 to 43.00
Heavy melting steel scrap	40.00 to 40.50
Steel rails for melting	40.00 to 40.50
Old carwheels	36.00 to 36.50

Per Net Ton

No. 1 railroad wrought	$38.00 to $38.50
Cast borings	13.00 to 13.50
Steel turnings	13.00 to 13.50
Railroad cast	28.00 to 28.50
No. 1 machinery cast	29.00 to 29.50
Burnt scrap	17.00 to 17.50
Iron axles	47.50 to 48.00
Locomotive tires (smooth inside)	42.00 to 42.50
Pipes and flues	22.50 to 23.00
Malleable cast	27.50 to 28.00
Railroad tank and sheet	20.50 to 21.00

Birmingham

BIRMINGHAM, ALA., July 2. (*By Wire.*)

The market for pig iron sold by furnaces is on a basis of $45 for 1918 with the three companies which are in the market. The 1917 basis ranges from $46, the schedule of the leading foundry sells to $50. Brokers do the bulk of the spot business at $48 to $50.

(*By Mail*)

The last week in June was another kaleidoscopic one in the Birmingham iron market. On Monday the leading foundry interest, which had been quoting 1918 delivery at $42 less than a week, during which a considerable tonnage was sold, advanced to $45 for 1917 and 1918 delivery and sold a fair tonnage for 1918. On Friday the 1917 minimum was raised to $46. At the close of the week the leading interest, which had been selling for 1918 at $42.50 and found the trade eager to book at that figure, raised to $45 for 1918. Still another interest made a sale for 1918 delivery in the middle of the week at $43, then withdrew quotations and started booking only upon direct instructions of the head office. Still another company sold a lot of basic for 1917 and 1918 delivery at $50. The furnace men with one accord say they have no spot price, because they have no spot iron. All iron made is due regular customers and they will not quote for spot delivery. The nearest to a spot furnace quotation is that of $46 by the leading foundry iron seller, but that price is for regular customers only. There was a sale of a small tonnage for last quarter at $45. Boiled down, the close of the week showed a 1918 market on a $45 basis with one seller asking more. The company quoting $50 for 1918 for a week had not reported a sale at that figure, but was not soliciting business. As for the spot market the best-informed broker, one making more spot sales probably than any other one, placed it at the close of the week on a minimum of $48 to $50. A furnace operator made this statement: "It is a rather unique situation is it not—our delivering $14 to $16 iron and being forced to turn down firm offers of $50 for spot? We cannot deliver the spot because we have not caught up with our customers." Furnace operators receive daily pleas to secure carload spot lots, which, in turn, they turn over to brokers. It is very seldom that a consumer declines a car offered at $50. Charcoal iron has sold during the week at $55 and tends to advance.

We quote per gross ton f.o.b. Birmingham district furnaces for prompt iron as follows:

No. 1 foundry and soft	$48.50 to $50.50
No. 2 foundry and soft	48.00 to 50.00
No. 3 foundry	47.50 to 49.50
No. 4 foundry	47.25 to 49.25
Gray forge	47.00 to 49.00
Basic	48.00 to 50.00
Charcoal	55.00 to 57.00

Steel bars in car lots f.o.b. Birmingham, 4.50c. to 4.75c.; iron bars, 4.30c. to 4.40c.

Old Material.—The scrap market remains firm at the advances. There has been a decline of 50 cents a ton in some articles in some transactions, but there has not been sufficient uniform difference to warrant change in price schedule. Transactions have been on a large scale. We quote per gross ton f. o. b. Birmingham district yards, prices to consumers as follows:

Old steel axles	$50.00 to $55.00
Old steel rails	37.00 to 40.00
No. 1 wrought	35.00 to 40.00
No. 1 heavy melting steel	25.00 to 27.00
No. 1 machinery cast	27.00 to 28.00
Carwheels	27.00 to 29.00
Tram carwheels	25.00 to 30.00
Stove plate and light	19.00 to 20.00
Turnings	13.00 to 14.00

Cast-Iron Pipe.—The Government pipe business, both water and gas, as well as sanitary, was parcelled out in such manner that nearly all Alabama shops secured a proportion. Manufacture has been rushed and delivery made in a number of instances. The price made the Government was $5 under the regular price. The business has served to keep all plants going well. Recent advances are more firmly established. We quote per net ton f. o. b. pipe shop yards as follows: 4 in., $63; 6 in. and upwards, $60 with $1 added for gas pipe and special lengths.

Coal and Coke.—Current quotations on standard foundry coke for spot shipment are $15 with $12.50 for contracts. The movement to northern Mexican smelters has improved owing to their purchase of freight cars, which the railroads have agreed not to divert, thus establishing a shuttle-train movement between smelter and ovens.

St. Louis

ST. LOUIS, July 2.

Pig Iron.—While increased activity has developed in the pig iron market during the past week, there has been little, practically no, increase in the amount of the transactions as aggregated at the end of the week. The call is both for first half of next year and for early shipment, on the latter of which nearly all furnaces represented in this territory are out of the market. Such transactions as have been closed during the week have been for small amounts and the total probably will not exceed 2500 tons for all deliveries, for although a great number of melters have shown much anxiety to cover needs, present and prospective, they have been halted by the prices which have confronted them when they entered the market. Offers approaching $50, Birmingham, for No. 2 Southern foundry have been turned down by some furnaces during the week, this for prompt shipment, while 1918 delivery has ranged up to that figure with furnaces unwilling to make contracts, at least for any quantity or for any other than old customers. Lake Superior charcoal iron has been sold during the week as high as $60.25, furnace, early shipment, and the price being quoted to-day is $62.50, furnace. Practically all furnaces have been withdrawn from the market for this year's delivery, being sold up to their normal capacity.

Coke.—Coke is just as difficult as pig iron to obtain for early shipment, and Connellsville coke, except for shipment in open top cars, is virtually off the market in this territory. New River coke is being held at $14, ovens, for early shipment for best 72-hour selected.

The coke makers are, apparently, not interested in contracts for future delivery, being more inclined to hold their unsold product for spot shipment at premium prices. Shipments of coke and of pig iron as well are in large volume and the consumption shows no diminution. The by-product situation shows no change from that which has been reported for the last several weeks.

Finished Iron and Steel.—In finished products there have been no future contracts possible, the mill representatives being under instructions to discourage buying for any deliveries until better information can be had as to Government intentions. Stock out of warehouse is growing harder and harder to get, the deliveries to the warehouses being affected both by mill conditions and the car shortage. For stock out of warehouse, we quote as follows, the prices being very stiffly held: Soft steel bars, 4.55c.; iron bars, 4.50c.; structural material, 5.25c.; tank plates, 8.05c.; No. 10 blue annealed sheets, 8.55c.; No. 28 black sheets, cold rolled, one pass, 8.85c.; No. 28 galvanized sheets, black sheet gage, 11.25c.

Old Material.—The scrap market has been getting steadily weaker during the past week, seemingly out of sympathy with the situation due to the uncertainties as to the Government's position in the iron and steel lines and the possibilities regarding price legislation or price fixing. There is, at the present time, literally no market and quotations can only be reported from an estimated value basis rather than as an actual quotation of prices, for no one knows what to pay, neither does the seller know what to ask. The downward tendency has approximated $2 to $3 per ton so far as can be determined in the present state of the market, but the general feeling is that the situation is only temporary and that there will be decided changes as soon as the governmental attitude can be definitely determined. Altogether, dealers regard the present situation as one of indecision rather than as a real market with definite tendencies. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton

Old iron rails	$45.00 to $46.00
Old steel rails, re-rolling	45.00 to 46.50
Old steel rails, less than 3 ft	39.00 to 40.00
Relaying rails, standard section, subject to inspection	50.00 to 51.00
Old carwheels	35.00 to 36.00
No. 1 railroad heavy melting steel scrap	39.50 to 40.00
Heavy shoveling steel	36.50 to 37.50
Ordinary shoveling steel	35.50 to 36.50
Frogs, switches and guards cut apart	39.50 to 40.00
Ordinary bundled sheet scrap	19.50 to 20.00
Heavy axle and tire turnings	21.00 to 22.00

Per Net Ton

Iron angle bars	$36.00 to $37.00
Steel angle bars	33.50 to 34.00
Iron car axles	49.00 to 50.00
Steel car axles	47.50 to 48.00
Wrought arch bars and transoms	41.00 to 42.00
No. 1 railroad wrought	39.00 to 40.00
No. 2 railroad wrought	37.00 to 38.00
Railroad springs	33.00 to 34.00
Steel couplers and knuckles	33.00 to 34.00
Locomotive tires, smooth inside, 42 in. and over	45.00 to 46.00
No. 1 dealers' forge	33.00 to 34.00
Cast iron borings	16.50 to 17.00
No. 1 busheling	27.50 to 28.50
No. 1 boilers cut to sheets and rings	23.00 to 24.00
No. 1 railroad cast scrap	28.00 to 29.00
Stove plate and light cast scrap	17.00 to 18.00
Railroad malleable	27.00 to 28.00
Agricultural malleable	25.00 to 26.00
Pipes and flues	24.00 to 25.00
Heavy railroad sheet and tank scrap	22.00 to 23.00
Railroad grate bars	20.00 to 21.00
Machine shop turnings	18.50 to 19.50

Buffalo

BUFFALO, July 2.

Pig Iron.—Inquiry during the past week has reached a total of nearly 40,000 tons of various grades and for both 1917 and 1918 shipments. Only a small part of this inquiry was quoted on by Buffalo district furnaces, however, and in a large number of instances Buffalo producers did not quote on any of the tonnages asked for, on account of being heavily sold up and their feeling of disinclination to take on further commitments because of the uncertain situation as to future production costs, etc. Where furnaces are quoting for first quarter and first half, the range of prices named is from $50 to $56. Prompt shipment iron is almost a negligible element in the Buffalo market.

We quote as follows for first quarter and first half of 1918 and for such small amounts of 1917 iron as remain available:

High silicon irons	$54.00 to $56.00
No. 1 foundry	53.00 to 55.00
No. 2 X foundry	52.00 to 54.00
No. 2 plain	51.00 to 52.00
No. 3 foundry	50.00 to 51.00
Gray forge	50.00 to 51.00
Malleable	53.00 to 55.00
Basic	53.00 to 55.00
Lake Superior charcoal, f.o.b. Buffalo	55.00 to 60.00

Finished Iron and Steel.—The situation in steel products is about the same as a week ago. Almost no sales are being made, as finished product consumers seem to be satisfied to remain inactive until it is determined what the Government is to do in reference to the fixing of prices. It is believed that approximately 80 per cent of the tonnage that is under inquiry at the present time is either directly or indirectly for Government requirements. Most consumers of steel are buying only in such amounts as are necessary to sort up and equalize their stocks. In wire products and tin plate also, very little material is being quoted on and only such quantities are being purchased as are absolutely required for current use.

Old Material—There has been a break in the market for heavy melting steel, which has caused a drop in price of $4 to $5 per ton. The largest consumers have withdrawn from the market, being apparently covered. The slump in heavy melting is undoubtedly caused by the forecasts of the Government's attitude relative to the fixing of lower prices for steel products. Dealers seem to anticipate further reductions if the present trend is maintained. Although there has been no pronounced development affecting the lowering of prices in other commodities, as yet, the general market is in a rather unsettled condition and prices all along the line will undoubtedly fall off in sympathy with the recession in heavy melting steel. We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$38.00 to $39.00
Low phosphorus	55.00 to 60.00
No. 1 railroad wrought	50.00 to 55.00
No. 1 railroad and machinery cast	32.00 to 33.00
Iron axles	55.00 to 60.00
Steel axles	55.00 to 60.00
Carwheels	38.00 to 40.00
Railroad malleable	35.00 to 36.00
Machine shop turnings	21.00 to 22.00
Heavy axle turnings	26.00 to 27.00
Clean cast borings	21.00 to 22.00
Iron rails	45.00 to 46.00
Locomotive grate bars	23.00 to 24.00
Stove plate	23.00 to 24.00
Wrought pipe	35.00 to 36.00
No. 1 busheling scrap	33.00 to 34.00
No. 2 busheling scrap	21.00 to 22.00
Bundled sheet stamping scrap	22.00 to 23.00

San Francisco

SAN FRANCISCO, June 26.

News of the Government's ordering large tonnages of rolled steel products from the mills has caused no little perturbation here. Deliveries have been so uncertain for some time that anxiety is felt among the trade in the matter of filling orders and contracts. On some steel products, prices are quoted by eastern concerns only on delivery, making the future impossible to discount. These conditions are disconcerting to the San Francisco market, which already bears a load of piled up orders. The demand for railroad supplies is very brisk and wire products are called for in larger quantities than can be supplied. The demands of the new shipyards will accentuate the present situation regarding deliveries of material. In addition, the United States Army and Navy requirements for structural material of all kinds are increasing as the military plans develop. Owing to the pre-occupation of European steel manufacturers and the lack of tonnage via the Suez Canal, export inquiries are more numerous than ever known in the past. They emanate from the West Coast of South America and from Oriental points from Vladivostock to Java.

Bars.—Prices are quoted by the local mills on bases that jobbers of eastern material are unable to meet. Steel bars in carload lots are quoted at local mills on a base price of 4.75c.; out of stock at 5.25c. Jobbers quote 3 in. and under structural base at 7.50c.; over 3 in. 7.75c. Coast sizes are on a 6c. base.

Structural Materials.—Outside of shipbuilding and United States Government requirements, the amount of business offering in structural materials is not so large as anticipated. A halt has been called in private construction. Government demands are increasing and the range of requirements for construction work of all kinds and for repairs is very large. Some structural shapes are plentiful in this market, while others are difficult, and in some cases, almost impossible to secure. This has caused a lot of embarrassment and is a hindrance in securing new business. Definite prices can only be had on date of shipment.

Plates.—Plates for shipbuilding are still hard to obtain, owing to the dearth of railroad cars and the over-crowded condition of the mills. The proposed United States Government allotment of supplies to the shipyards will ease the situation somewhat. Tank steel plates are quoted by jobbers on a 10c. base with short stocks and no guaranteed delivery. On ordinary plate specifications for tank work, some mills are offering these for fairly early delivery on a base of $8 to $10 per 100 pounds at shipping point. The Government's construction and repair work is calling for large quantities of plates.

Sheets.—Owing to extraordinary war demands, some jobbers are unable to satisfy the needs of customers. New prices quoted by jobbers here are: 28 gage galvanized sheets, 12.45c.; 28 gage black sheets, 10.49c.; No. 10 blue annealed sheets, 10.50c.; with other sizes advanced in proportion, and further advances expected within the next 30 days. All reports indicate that the problem of replenishment for the market is exceedingly difficult to solve.

Wrought Pipe.—An undersupply of wrought pipe is seriously threatening oil production in this State. Stocks of oil are running short, and without the necessary pipe there can be no exploitation of fresh territory. Railroad transportation will be badly handicapped all along the Coast within the next 90 days if some relief from the oil and pipe shortage is not found. Buyers have been notified by independent manufacturers of advances in wrought pipe. Some of these advances which have not yet been followed by the big producers are: On ⅛-in., ¼-in., and ⅜-in. sizes, $24 per ton; on ½-in., $20; ⅞-in. to 3-in. inclusive, $14; 2½-in. to 6-in. lap weld, $20; 7-in. to 12-in., $26. All reports from mills.

Cast Iron Pipe.—Municipal and private requirements are not large at this time; and only small orders are coming in from these sources. Bids are about to be opened by the United States Navy Department her for 5000 ft. of 6-in. cast iron pipe to be laid under water from the mainland to the Naval Training Station on Goat Island. Bell and spigot cast iron water pipe, Class D, is selling, with delivery in 45 days, at $59 per ton f.o.b. Birmingham, Ala.; and at $63 for immediate foundry shipment.

Pig Iron.—Prices are quoted here for No. 2 foundry pig at an average of from $50 to $55 and for No. 2 foundry Alabama at from $40 to $45. The United States Navy demands for the Mare Island Navy Yard elicited bids for No. 3 foundry grade as follows: Middleboro, $45; St. Louis, $47.50 and Mesabie Valley, f.o.b. St. Louis, $53 per long ton for shipment in one day.

Coke.—So little can be had in this market that, to avoid disappointing delays, one large consumer is using briquettes made from the refuse of the gas retorts of the Pacific Gas & Electric Company, which are said to give satisfaction. Prices range about $20 with no guaranteed delivery.

Old Materials.—With a good demand and prospects of a shortage, dealers are holding for good prices, though these are more or less irregular. Rails command from $23 to $25; country scrap, $20 or a little better, while as high as $32.50 has been paid for heavy melting.

New York

NEW YORK, July 3.

Pig Iron.—The pig iron market in the metropolitan district has been only fairly active and the largest inquiries from melters in the State have been submitted in the Buffalo district, the General Electric Co. being in the market there for 10,000 to 15,000 tons for the last quarter of this year and the first half of next, and the Gould Coupler Co. for 8000 to 10,000 tons of basic for the first half of 1918. Foreign inquiry continues to come in and Japan has succeeded in buying 5000 tons of Alabama iron at about $44.50 Birmingham for No. 2. Italy is not so fortunate on account of the tremendous charges for carrying pig iron to that country, which now range from $90 to $100 per ton. A considerable tonnage of Bessemer purchased some time ago for shipment to Italy has been sold on the basis of about $59 Valley for shipment backward toward Pittsburgh. Prices on eastern Pennsylvania irons again advanced $2 to $3 per ton and for shipment $53 furnace is the usual quotation for No. 2 X and for next year's shipment the iron is quoted at $51 to $52 furnace. Virginia No. 2 X is being sold at $52 furnace for this year and at the same price for next year. We quote tidewater for early delivery as follows:

No. 1 foundry	$53.25 to $54.25
No. 2 X	52.75 to 53.75
No. 2 plain	52.25 to 53.25
Southern No. 1 foundry	51.75 to 54.75
Southern No. 2 foundry and soft	51.25 to 54.25

Structural Material.—Outside of Government orders the market is lifeless, new projects not relating to army or navy needs being insignificant, except for some work for which the Public Service Commission has recently entered the market. This involves 3800 tons for the Culver Rapid Transit Line in Brooklyn and 600 tons for a subway station at Lawrence Street, bids for both of which are to go in early in July. The plans are out for 2300 tons for the new Government projectile plant at Charleston, W. Va., bids on which are to be received July 16. On the same date bids will be taken for 300 tons for a building for the Government at Lake Denmark, Dover, N. J. Bids have been asked on the steel necessary for additions to Bancroft and Isherwood Halls at the Naval Academy at Annapolis, and inquiries have appeared for 400 tons for a building for the Staten Island Shipbuilding Co. The American Bridge Co. has bid on 500 tons for a bridge for the Chesapeake & Ohio and has also taken 800 tons for a smithery building for the League Island Navy Yard, bringing the original building, which called for a structural shop, to a total of 4500 to 5000 tons and making this company's total recent contracts for the Government not far from 30,000 tons. The company has also taken 300 tons for a training school at Newport, R. I. The Chesapeake Iron Works has taken 400 tons for a boiler house for the Consolidated Gas, Electric Light & Power Co. of Baltimore. There has been no decision yet on the 4200 tons required for the 35 or more small buildings for Government storage, bids on which went in on June 25. In railroad work the Pennsylvania Railroad is asking for 550 tons for six bridges and the Philadelphia & Reading 400 tons for one bridge at Hopewell, besides 300 tons for other small bridges. The Pennsylvania Railroad has awarded at least 2000 tons recently to various fabricators for numerous small bridges and similar work. We quote plain material from mill at 4.669c. to 5.169c., New York, the lower price in three to four months and the higher for small lots in earlier deliveries. Shipments from warehouses are 5.25c. per pound, New York.

Iron and Steel Bars.—A leading producer has advanced the price of bar iron to 4.75c., Pittsburgh, for fourth quarter delivery. Some business is still being

taken by other mills at 4.50c., Pittsburgh. Many makers of steel bars are not taking on new business, but are limiting their sales to cover requirements of regular customers. One concern has advanced large size bolts and nuts 30 per cent. We quote steel bars in mill shipments at prices ranging as high as 5.50c., Pittsburgh, or 4.669c. to 5.669c., New York, and bar iron at 4.669c. to 5.169c., New York. From New York district warehouses iron bars are sold at 4.75c. and steel bars at 4.75c. to 5.50c.

Steel Plates.—Makers of plates are still waiting for the Government to make known its requirements. Until this is done they think it a better policy to refuse to accept any more new business from private consumers, especially in view of the fact that it is impossible to promise definite deliveries because of the uncertainty as to what quantities the Government will take. There is not a little impatience because of delays at Washington. Some business in small lots of tank plates is being done, but for the most part the mills are reserving their supplies of Lloyd's specification plates entirely for the Government. Some requisitions have already been received by the mills covering plates for mine sweepers and steel merchant ships, but the total tonnage thus far placed is small in comparison with what must eventually be done if the shipbuilding program is fully carried out. Export demand continues active, but exporters are finding it exceedingly difficult to get supplies, and are often resorting to the purchase of re-sale lots. Such sales of tank plates as have been made, mostly for lots up to 1000 tons, were at 9.50c. to 10c. Universal plates are scarce in this market. Many of the mills are not quoting on boiler plates. No sizeable sales of ship plates have been reported, but 12c. has been noted in a few instances as the price at which holders of stocks were willing to sell. The Grand Trunk has ordered 1000 box cars with the American Car & Foundry Co. On mill shipments of universal and tank plates, when such are accepted, the price is 10.169c., New York, and ship plates, 12.169c., New York. Warehouse stocks are becoming seriously depleted because of the unusual demands upon them. Orders as large as 1000 tons have been picked up by buying from various warehouses. Plates out of store are 9c. to 10c., New York.

Ferroalloys.—The ferromanganese market is easier. The work of the alloy committee of the Council of National Defense has evidently had the effect of assuring consumers of fair supplies and there is less uneasiness than for some time. Inquiries are not in large volume and sales have been very few. Consumers are beginning to come into the market for 1918 and inquiries for this delivery are increasing. Domestic alloy for delivery this year is quoted at $400 to $425, delivered, with about $350 to $375 asked for the first half of 1918. Imports in May were only 2187 tons, according to data furnished THE IRON AGE, the lowest in many months, but it is believed that receipts for June will show a considerable increase. Spiegeleisen, 20 per cent, is not active. Inquiries before the market amount to about 1000 tons and the quotation is around $85, furnace, for delivery this year. Ferrosilicon, 50 per cent, is unchanged at $200 to $225 for material wanted this year, with $130 asked for contracts for 1918 delivery. Ferrotungsten is quoted at $2.20 to $2.50 per lb. of contained tungsten, New York, with the ore concentrates selling at between $20 and $22 per unit. Ferrovanadium ranges from $2.75 to $3, Pittsburgh, per lb. of contained vanadium. Ferro-carbon-titanium is selling at 8c. per lb. in carload lots, 10c. per lb. in ton lots and 12½c. per lb. in lots less than a ton. Ferrochrome, 60 to 70 per cent, is quoted at 16c. to 20c., New York, per lb., of contained chromium.

Cast Iron Pipe.—Recent advances in prices, including the $5 advance last week, have not stopped inquiry from private consumers, but there is practically no business coming from municipalities. No definite information is as yet obtainable as to Government requirements for cantonments in Eastern territory. Carload lots of 6 in. to 8 in. and heavier are now quoted $65.60 per net ton tidewater and 4 in. $68.50.

Old Material.—Owing to the withdrawal from the market of the Carnegie Steel Co. and other large buyers last week, the scrap market sagged very decidedly for two or three days and some heavy melting steel for shipment to the Pittsburgh district was purchased by brokers at as low as $36.50, but later in the week and at the beginning of this week the market was stronger and the prices on steel for shipment to Pittsburgh were on about the same basis as in the early part of last week. For shipment to eastern Pennsylvania the market was considerably stronger, owing to the buying by one or two large consumers, and the prices have been advanced. Brokers quote buying prices as follows to local dealers and producers, gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$38.00 to $39.00
Old steel rails (short lengths) or equivalent heavy steel scrap	39.00 to 40.00
Relaying rails	65.00 to 70.00
Rerolling rails	48.00 to 50.00
Iron and steel car axles	54.00 to 55.00
No. 1 railroad wrought	52.00 to 54.00
Wrought-iron track scrap	48.00 to 50.00
No. 1 yard wrought long	42.00 to 43.00
Light iron	14.00 to 15.00
Cast borings (clean)	22.00 to 23.00
Machine-shop turnings	21.50 to 22.00
Mixed borings and turnings	21.50 to 22.00
Wrought-iron pipe (1 in. min. diameter, not under 2 ft. long)	36.00 to 37.00

The foundry scrap market is strong and transactions are numerous. Dealers in New York City and Brooklyn are quoting as follows to local foundries, per gross ton, New York:

No. 1 machinery cast	$35.00 to $36.00
No. 1 heavy cast (column, building material, etc.)	34.00 to 35.00
No. 2 cast (radiators, cast boilers, etc.)	29.00 to 30.00
Stove plate	22.00 to 23.00
Locomotive grate bars	22.00 to 23.00
Old carwheels	35.00 to 36.00
Malleable cast (railroad)	36.00 to 38.00

To Keep Secret Patented War Inventions

WASHINGTON, July 2.—To prevent publicity detrimental to the public safety by conveying valuable information to the enemy, Senator Weeks of Massachusetts has introduced a bill suspending the granting of patents for inventions useful in carrying on the war. The bill provides that whenever, during the time when the United States is at war, the "publication of an invention by the granting of a patent might, in the opinion of the commissioner of patents, be detrimental to the public safety or defense, or might assist the enemy or endanger the successful prosecution of the war, he may order that the invention be kept secret and withhold the grant of a patent until the termination of the war; provided, that the invention disclosed in the application for said patent may be held abandoned upon its being established before or if said invention has been published or an application for a patent has been filed in a foreign country without the consent or approval of the Commissioner of Patents, or under a license of the Secretary of Commerce as provided by law."

The bill further provides that when an applicant whose patent is withheld shall tender his invention to the Government of the United States for its use, he shall, when he ultimately receives a patent, have the right to sue for compensation in the Court of Claims, such right to compensation to begin from the date of the use of the invention by the Government. The bill has been referred to the Senate committee on patents, which, it is said, is already prepared to report it with a favorable recommendation as the measure is strongly indorsed by Government officials.

The Republic Iron & Steel Co., which will build two more 90 ton open hearth furnaces at its open hearth steel plant, Youngstown, Ohio, will do all the engineering work for these furnaces itself, but expects to place contracts for erecting them, and also for the two 4-hole soaking pits in a short time. J. W. Deetrick, president of Republic company, says its expects to have these two furnaces ready about April 1, next. The company expects delay in the delivery of materials.

Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St Paul, 32.9c; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c. Denver pipe, 76.1c., minimum carload, 46,000 lb.; structural steel and steel bars, 76.1c., minimum carload, 40,000 lb. Pacific coast (by rail only), pipe 65c.; structural steel and steel bars, 75c., minimum carload, 60,000 lb. No freight rates are being published via the Panama Canal, as the boats are being used in transatlantic trade.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 4.50c.

Wire Products

Wire nails, $4.00 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire is $4.05 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.95; galvanized wire, $4.65; galvanized barb wire and fence staples, $4.85; painted barb wire, $4.15; polished fence staples, $4.15; cement-coated nails, $3.90 base, these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 43 per cent off list for carload lots, 42 per cent off for 1000-rod lots, and 41 per cent off for small lots, f.o.b. Pittsburgh.

Nuts and Bolts

Discounts in effect are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days:

Carriage bolts, small, rolled thread, 40 per cent, small cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent; with c. p. nuts, 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq. blank, $2.10 off list, and tapped, $1.90 off; hex., blank, $1.90 off, and tapped, $1.70 off; nuts, c. p. c. and t. sq.. blank, $1.70 off, and tapped, $1.50 off; hex blank, $1.60 off, and tapped, $1.40 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Wire Rods

Soft Bessemer and open-hearth rods to domestic consumers at $95 to $100; high-carbon rods made from ordinary open-hearth steel, $100 to $110, and special steel rods with carbons running from 0.40 to 0.60, $100 to $110 at mill; above 0.60 carbon, $115 to $120.

Railroad Spikes and Track Bolts

We quote railroad spikes 9/16 in. and larger, at $5.00 base; ⅝ in., 7/16 in. and ½ in., $7.50 to $8.00. Boat spikes are about 6.50c. to 7c., all per 100 lb. f.o.b. Pittsburgh, but some makers are quoting above these prices. We quote track bolts with square nuts at 6.50c. to 7c. to railroads, and 8c. to 8.50c. in small lots, for fairly prompt shipment.

Steel Rails

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails, and on carload and smaller lots, 4c. to 4.25c. at mill. Light rails: 25 to rails as follows: 25 to 45 lb., $75 to $80; 16 to 20 lb., $80 to $81; 12 and 14 lb., $82 to $83; 8 and 10 lb., $83 to $84; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard section rails of Bessemer stock are held at $38, and open-hearth $40, per gross ton, Pittsburgh.

Tin Plate

Long terne plate, No. 28 gage base, $7.25 to $7.50; short terne plate, $12 to $12.50, maker's mill, prices depending on quantity and delivery wanted. The present schedule of prices on terne plate is as follows: 8-lb., 200 sheets, $14 per package; 8-lb., 214 sheets, $14.30 per package; 12-lb., I. C., $15.25 per package; 15-lb., I. C., $15.75 per package; 20-lb., I. C., $16.50; 25-lb, I. C., $17.25; 30-lb., I. C., $18; 35-lb., I. C., $18.75; 40-lb., I. C., $19.50.

Iron and Steel Bars

Steel bars at 4.50c. to 5c. for delivery late this year, and 5c. and higher from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c.; railroad test bars, 5.25c. in carloads and larger lots f.o.b. mill.

Wrought Pipe

The following discounts in steel are to jobbers for carloads on the Pittsburgh basing card in effect from May 1, 1917, all full weight except for LaBelle Iron Works and Wheeling Steel & Iron Co., which quote higher prices and National Tube, which adheres to card of April 1.

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	42	15½	⅛ and ¼	23	+4
½	46	31½	⅜	24	+3
¾ to 3	49	35½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	42	29½	2	26	12
2½ to 6	45	32½	2½ to 6	28	15
7 to 12	42	28½	7 to 12	25	12
13 and 14	32½	..			
15	30	..			

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	38	20½	⅛, ¼ and ⅜	22	5
½	43	30½	½	27	14
¾ to 1½	47	34½	¾ to 1½	33	18
2 to 3	48	35½			

Lap Weld, extra strong, plain ends

2	40	28½	2	27	14
2½ to 4	43	31½	2½ to 4	29	17
4 to 6	42	30½	4½ to 6	28	16
7 to 8	38	24½	7 and 8	20	8
9 to 12	33	19½	9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized, but in some sections of the country discounts on less than carloads are three (3) points less (higher price) than the carload discount on both black and galvanized steel pipe.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are four (4) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are five (5) points lower (higher price).

Boiler Tubes

Nominal discounts on less than carloads, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes, and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in.	28	1¾ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3¼ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in.	No quotations
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths.

Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net, or 2 per cent discount in 10 days:

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer

	Cents per lb.
Nos. 3 to 8	8.00 to 8.50
Nos. 9 and 10	8.25 to 8.50
Nos. 11 and 12	8.50 to 8.75
Nos. 13 and 14	8.75 to 9.00
Nos. 15 and 16	9.00 to 9.25

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	8.30 to 8.50
Nos. 22 and 24	8.35 to 8.85
Nos. 25 and 26	8.40 to 8.90
No. 27	8.45 to 8.95
No. 28	8.50 to 9.00
No. 29	8.55 to 9.05
No. 30	8.65 to 9.15

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11	9.00 to 9.50
Nos. 12 and 14	9.10 to 9.60
Nos. 15 and 16	9.25 to 9.75
Nos. 17 to 21	9.40 to 9.90
Nos. 22 and 24	9.55 to 10.05
Nos. 25 and 26	9.70 to 10.20
No. 27	9.85 to 10.35
No. 28	10.00 to 10.50
No. 29	10.25 to 10.75
No. 30	10.50 to 11.00

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	7.80 to 8.30
Nos. 17 to 21	7.85 to 8.35
Nos. 22 to 24	7.90 to 8.40
Nos. 25 to 27	7.95 to 8.45
No. 28	8.00 to 8.50
No. 29	8.05 to 8.55
No. 30	8.05 to 8.55
Nos. 30½ and 31	8.10 to 8.60

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
		Electro-	New	New	St.	New	St.
June	Lake	lytic	York	York	Louis	York	Louis
27	32.25	32.25	62.00	11.37½	11.25	9.37½	9.12½
28	32.25	32.25	62.00	11.37½	11.25	9.37½	9.12½
29	32.00	32.00	62.00	11.37½	11.25	9.25	9.00
30	32.00	32.00	62.00	11.37½	11.25	9.25	9.00
July							
2	31.75	31.75	62.00	11.37½	11.25	9.25	9.00

NEW YORK, July 3.

Stagnation characterizes most of the metals and price tendencies are lower. Copper is in poor demand and nominal. Tin is unchanged, and shows little activity. Lead is lower and demand only fair. Spelter is decidedly weaker. Antimony continues unchanged and dull.

New York

Copper.—The tone is easier and the tendency of the copper market is downward, with the quotation yesterday for Lake and electrolytic nominally at 31.75c., New York. If possible, the market has been quieter this week than last, with business confined to small lots and the market a drifting one. Considerable secrecy surrounds negotiations at Washington regarding Government purchases. The statement, recently published, that the Government has bought 60,000,000 lb. for early delivery at 25c. per lb. is believed by some in the trade, and is not accepted by others. If the deal has really gone through, it is thought that it covers requirements for not more than two months. More attention is being paid to the reports of serious strikes among the miners in the West, but in some quarters these are believed to be exaggerated for political effect. Quotations for third quarter are generally regarded at 30c., New York, with fourth quarter at 29c., and July metal obtainable at 31.75c. to 32c. The London market for electrolytic is unchanged at £142 for spot delivery.

Copper Averages.—The average price of either Lake or electrolytic copper for the month of June, based on daily quotations in THE IRON AGE, was 32.46c.

Tin.—Cautiousness pervades the entire market and general business is slow. The repeated absence of cables from London at the usual time, and the fact that they are often delayed until the next day, holds business in check, and is felt by all buyers and sellers. As a result, sellers are in doubt as to what to quote, and buyers as to what course to pursue. Very little business was done late last week. Spot metal, about 50 tons, was sold June 27 at about 62c., New York, but on June 28 and 29 no sales were reported, although inquiries probably aggregated 100 tons. On July 2 about 100 tons of September-October shipment from the East was sold at 56.25c., New York, and there was considerable inquiry for June shipment from the East, but there was practically none to be had because of its scarcity. The spot market was practically at a standstill. Deliveries of metal for June, according to the New York Metal Exchange, were 6398 tons, of which 2798 represent arrivals at the Pacific coast. Arrivals on July 2 were 280 tons, with the quantity afloat 3081 tons. Spot Straits tin on July 2 in London was quoted at £244.

Lead.—The lead market is entirely bare of features and prices have eased off to 11.25c., St. Louis, which was forecasted last week. Some business was done last week but the volume was not large, a few sales being made as low as 11c., St. Louis. At the close inquiry was better and a fair business was reported done at 11.25c., St. Louis. More metal is being offered than there seems to be a demand for and it is not improbable that the market may go lower. Business in general is unsatisfactory and the recent purchase by the Government for no more than its July requirements has weakened rather than strengthened the market.

Spelter.—The market is decidedly weak and quotations are off about ⅛c. from those of last week. Early delivery of prime Western is obtainable at 9c., St. Louis, or 9.25c., New York, with August and September metal quoted at 9.12½c., St. Louis, or 9.37½c., New York. Transactions are extremely light. Reports that the Government has purchased 11,000 tons of high grade spelter at 13.50c. per pound, or 2c. higher than the 6700 tons purchased early in May, are not confirmed. The continued uncertainty regarding this whole important matter is a great drawback. At present prices, there are many producers unable to make a profit and if these conditions continue much longer numerous smelters will have to close down. Spelter exports in May were 18,553 tons.

Antimony.—No change is reported. Chinese and Japanese grades are quoted at 19c. to 19.50c., New York, duty paid, with demand very slack. About 25 tons of Cookson's antimony on the way here from England has been sunk. This was quoted at 22c., New York, ex-steamer, and is the first to be released to this country in some time.

Aluminum.—Prompt and early delivery of No. 1 virgin metal, 98 to 99 per cent pure, is quoted at 58c. to 60c., New York, but demand is very light.

Old Metals.—The market is quiet. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible	30.50 to 31.00
Copper, heavy and wire	29.00 to 29.50
Copper, light and bottoms	27.50 to 28.00
Brass, heavy	20.00 to 20.25
Brass, light	15.00 to 15.75
Heavy machine composition	27.00 to 27.25
No. 1 yellow rod brass turnings	19.25
No. 1 red brass or composition turnings	21.50 to 22.50
Lead, heavy	10.50 to 10.75
Lead, tea	9.75
Zinc	7.75

Chicago

JULY 2.—The entire market is quiet with the only business of a routine sort. Quotations generally are a little lower. We quote as follows: Casting copper, 30c.; Lake, 31c.; electrolytic, 32c.; tin, carloads, 62.50c.; small lots, 65c. to 66c.; lead, 11.25c. to 11.50c.; spelter, 9c.; sheet zinc, 19c.; Oriental antimony, 22c. to 24c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 26.50c.; copper clips, 26c.; copper bottoms, 24c.; red brass, 23.50c.; yellow brass, 17c.; lead pipe, 9c.; zinc, 6.50c.; pewter, No. 1, 35c.; tin foil, 40c.; block tin, 45c.

St. Louis

JULY 2.—Non-ferrous metals continue to be held firmly, though there has been little feature other than that to the market. In car load lots, the quotations to-day were: Spelter, 9.25c. to 9.50c.; lead, 11.25c. to 11.50c. In less than car load lots, the quotations have been: Lead, 13c.; spelter, 11.50c.; tin, 68.50c.; Lake copper, 33.50c.; electrolytic copper, 33c.; Asiatic antimony, 25c. In the Joplin district, the price of lead ore has held pegged at $130 per ton basis of 80 per cent metal, with the average for the district at $130 because of the premium ores which covered the off grade ores. The production of lead is increasing with the opening of new bodies, but the demand seems to keep up with the supply. It is also true that many of the producers are holding considerable quantities of ore for higher prices. In zinc blende, the price for the week, basis of 60 per cent metal, ranged from $70 to $80 per ton with the average for the week for the district at $76 per ton. Calamine ranged from $38 to $45 per ton basis of 40 per cent metal with the average at $43 for the district. On miscellaneous scrap metals, we quote as follows: Light brass, 12c.; heavy yellow brass, 15c; heavy red brass and light copper, 20c.; heavy copper and copper wire, 23.50c.; pewter, 25c.; tinfoil, 40c.; lead, 6.50c.; zinc, 6c.; tea lead, 4c.

The establishment of a central bureau for master gages and of district headquarters for copies of those gages is being investigated by a committee of the American Society of Mechanical Engineers, with President Ira N. Hollis chairman of the committee.

IRON AND INDUSTRIAL STOCKS

Easier Money Conditions—Rate Decision Causes Some Anxiety in Wall Street

Two features stood out prominently in the stock market last week. The first was the easing of somewhat strained conditions caused by the high rate of interest prevailing the previous week and the second was the anxiety caused at the close of the week by the decision of the Interstate Commerce Commission in the railroad rate case.

The establishing of easier conditions in the money market was greatly helped by the Federal Reserve banks and is regarded as a notable achievement of the new banking system. The old world has been watching developments in this country very closely and the London correspondent of the *Evening Post* cabled his paper Saturday as follows:

LONDON, June 30.—Lombard Street now believes, in the light of events on your money market, that the adaptation of your financial machinery to the transactions growing out of the war loan, and to the consequent phenomenal shifting of cash balances, will turn out to be as strikingly successful as was the loan itself. To us, the indications are plain that your Federal Reserve officials are taking the large view and obtaining a thorough grasp of the financial situation. This skillful administration of the system has manifestly been primarily responsible for the easy money conditions with which your market ends the week.

These results could not have been foreseen with absolute assurance here, and we knew that demands on the credit system, incidental to your Liberty Loan and the fiscal year-end, must be colossal during the past few days. This was what kept our own bankers from reducing deposit rates last week.

The immediate effect of the Interstate Commerce Commission's freight rate decision was a decline Saturday of from one to five points in the leading railroad shares, but before the close of the exchange some of the stocks had recovered and a better feeling prevailed. Industrial stocks displayed considerable strength Saturday, some steel stocks especially being in active demand.

Among the industrial stocks that registered gains during the week were the following:

Allis-Chalmers, 1 point; American Car & Foundry, 1¼; Baldwin Locomotive, ⅝; Crucible Steel, 5¾; International Harvester, 5; Lackawanna Steel, ¼; United States Steel, ⅛. Among the stocks that made losses during the week were the following: American Can, ½; American Locomotive, 2⅜; Bethlehem Steel, ½; Bethlehem Steel Class B, 1½; Colorado Fuel & Iron, ¼; Gulf State Steel, 1; Midvale Steel, ½; National Enameling & Stamping, ⅝; Pressed Steel Car, 2⅛; United States Steel Preferred, ¼. American Steel Foundries and Republic Iron & Steel stood at the end of the week the same as at the beginning, the former at 72½ and the latter at 92½.

The range of prices in active iron and steel stocks on Wednesday of last week and Monday of this week was as follows:

Allis-Chal., com..	29 - 30½	Lacka. Steel	94¾ - 98
Allis-Chal., pref..	82¾ - 86	Lake Sup. Corp..	19½ - 20
Am. Can, com...	47½ - 50	Midvale Steel ...	61½ - 64⅝
Am. Can, pref...	104⅞ - 105	Nat.-Acme	34¼ - 35½
Am. Car & Fdry., com.	76 - 79⅞	Nat. En. & Stm., com.	38¼ - 40
Am. Loco., com..	69½ - 76½	Nat. En. & Stm., pref.	98
Am. Rad., pref.....	275	N. Y. Air Brake.....	145
Am. Ship, com...	86 - 90	Nova Scotia Stl..	99 - 100¼
Am. Ship, pref.....	94⅝	Pitts. Steel, pref.....	100
Am. Steel Fdries.	70 - 73⅜	Pressed Stl., com.	74½ - 76½
Bald. Loco., com.....	70	Pressed Stl., pref.	100 - 101½
Beth. Steel, com.....	145½	Ry. Steel Spring, com.	52¾ - 56⅜
Beth. Steel, Class B	137½ - 143¾	Republic, com...	90½ - 93½
Carbon Stl., com.	102 - 105	Republic, pref...	102⅝ - 103½
Central Fdry., com.	36 - 38	Sloss, com.	57½ - 59
Central Fdry., pref.	54½ - 56¼	Superior Steel...	49 - 51¾
Colo. Fuel	51½ - 54½	Sup. Steel, 1st pref....	101
Cruc. Steel, com..	85¾ - 91¼	Transue-Williams	46 - 46½
Cruc. Steel, pref.	102¾ - 103	Un. Alloy Steel..	45 - 45¾
Deere & Co., pref.	99⅝ - 99½	U. S. Pipe, com..	22⅝ - 23¼
Gen. Electric	162 - 162½	U. S. Pipe, pref.....	57½
Gt. No. Ore Cert.	31⅝ - 33	U. S. Steel, com..	128 - 132⅝
Gulf States Steel.	127 - 128½	U. S. Steel, pref.	117¼ - 118
Gulf S. Steel, 1st pref.	109½	Va. I. Co. & Coke	70 - 72¼
		Westing. Elec....	49⅞ - 52¼

Pays Dividend in Liberty Bonds

The American Brake Shoe & Foundry Co., New York, has declared a dividend of 5 per cent in Liberty bonds, the first distribution so far made of the new 3½'s by an industrial corporation. Besides the bond dividend the company paid an extra cash dividend of 1 per cent and also another 1 per cent with the request that this extra payment be turned over to the Red Cross. In addition to these dividends the usual quarterly 2 per cent on preferred and 1¾ per cent on common were paid. William G. Pearce, president, said in a letter accompanying the dividends that the munitions contracts had been completed and the profits were represented by the new Erie plant, which cost $2,000,000, and a reasonable amount of cash. The employment of the profit from munitions work, he said, together with the regular earnings of the company, made it probable that the preferred stock dividend would hereafter be 3 per cent instead of 2 per cent quarterly unless heavy war taxes prevented.

Continental Can Co. Adds to Capital

The directors of the Continental Can Co. have decided at a special meeting to issue 20,000 shares of new common stock, to which stockholders will be permitted to subscribe to the extent of 25 per cent of their present holdings. The new issue is to provide additional working capital. The company now has $8,000,000 of common stock outstanding and the new issue will bring the total up to $10,000,000. There is $5,000,000 of 7 per cent cumulative preferred also outstanding.

Will Retire Bonds

On July 1, the Sharon Steel Hoop Co., Sharon, Pa., will retire $750,000 of bonds of the Youngstown Iron & Steel Co., which it took over some months ago. Reports that the Sharon Steel Hoop Co. would erect a blast furnace at Sharon are officially denied. The company has under consideration plans for material extensions and improvements to the plants of the Youngstown Iron & Steel Co. at Haselton, Ohio, but what these will be has not yet been determined, and may not be for some time.

Industrial Finances

The Erie Iron & Steel Co., Erie, Pa., has increased its capital stock from $100,000 to $500,000.

The Washburn Wire Company has called for redemption on June 30, at $130 per share, all its preferred stock, amounting to 25,000 shares.

In addition to the regular 2 per cent monthly dividend, the Kokomo Steel & Wire Co., Kokomo, Ind., has declared a 5 per cent cash dividend, payable July 1. At the annual meeting the officers and directors were all re-elected. Officers: A. A. Charles, president; A. V. Conrath, vice-president; J. E. Frederick, general manager and secretary; G. W. Charles, treasurer, and S. S. Shambaugh, assistant treasurer. The year just closed was by far the best in the company's history, business done amounting to over $6,000,000.

Directors of Trumbull Steel Co., Youngstown, recommend a capital increase from $10,000,000 to $12,000,000 with an offering of new stock. Proceeds will be used for increasing output of open-hearth and plate departments and purchase of coal lands now under option.

A new holding company is to be organized by the Breitung ore interests and will be known as the Breitung Co. It will have $15,000,000 common stock and $3,000,000 preferred. Edward N. Breitung is president of the new company, Norman Herriman is vice-president and William A. Hamilton secretary. The companies taken over are Mary Charlotte Mining Co., Breitung Hematite Mining Co., Juliet Iron Co., Lucky Star Mining Co., Washington Iron Co., and the Clifford Extension Iron Co., all of Michigan; Hopkins Mining Co. of Minnesota and the Breitung Iron Co., a Michigan corporation, owning the Loon Lake Mining Co., at Wilde, Ont.

The Detroit Iron & Steel Co., Detroit, has voted to increase its common stock from $750,000 to $1,500,000 by issuing a 100 per cent stock dividend from accumulated earnings. A 10 per cent cash dividend on common stock and a 1¾ per cent dividend on preferred were also declared. The 10 per cent cash dividend on common stock will be paid quarterly, beginning July 16. The capital stock of the company is now $2,500,000.

The Gulf States Steel Co. has called a special meeting of holders of stock trust certificates for Aug. 21 to take action on a plan to retire $2,000,000 first preferred stock outstanding at $110 a share and accrued dividends.

Brier Hill Elections

Annual meetings of subsidiary interests of the Brier Hill Steel Co. were held at Youngstown, Ohio, last week, and resulted in election of officers as follows: Brier Hill Coke Co.: Thomas McCaffrey, president, W. H. Warren, vice-president, W. B. Phelan, secretary, N. B. Folsom, treasurer, and Thomas McCaffrey, W. H. Warren, J. G. Butler, Jr., John N. Allen, G. F. Alderdice and W. B. Phelan, directors. Brier Hill Supply Co.: John N. Allen, president, Thomas McCaffrey, vice-president, W. B. Phelan, secretary, N. B. Folsom, treasurer, and Thomas McCaffrey, W. B. Phelan and John N. Allen, directors. The Brier Hill Coke Co. operates about 450 beehive coke ovens at Brier Hill, Pa., which formerly supplied coke for the Grace and Tod blast furnaces of the Brier Hill Steel Co. at Youngstown. However, the Brier Hill Steel Co. now has a plant of 84 Koppers by-product coke ovens, which furnish plenty of coke for its two furnaces, and the output of the 450 beehive ovens at Brier Hill is nearly all sold in the open market.

Dividends

The American Laundry Machinery Co., quarterly, 1¾ per cent on the preferred, payable July 16.

The American Screw Co., quarterly, 1¾ per cent and extra 3 per cent, payable June 30.

The American Shipbuilding Co., quarterly, 1½ per cent and extra 3 per cent on the common, and 1¼ per cent on the preferred, all payable July 20.

The E. W. Bliss Co., quarterly, 1¼ per cent, and extra 11¼ per cent on the common, payable July 2.

The Canadian Crocker-Wheeler Co., quarterly, 1¾ per cent on the common and preferred stocks, payable June 30.

The Canadian Westinghouse Ltd., quarterly, 1¾ per cent, payable July 2.

The Carbon Steel Co., quarterly, 1½ per cent and extra 2½ per cent on the common, payable Aug. 15, also extra 1½ and 2½ per cent on the common, payable Nov. 15, and 6 per cent annual on the second preferred, payable July 30.

The Central Foundry Co., 1¼ per cent on the preferred, payable July 16.

The Charcoal Iron Co. of America, quarterly 15c. per share on the common and 30c. per share on the preferred, payable July 5.

The Chicago Pneumatic Tool Co., quarterly, 1 per cent, payable July 25.

The Eastman Kodak Co., quarterly, 2½ per cent on the common, and 1½ per cent on the preferred, payable Oct. 1, and extra 5 per cent on the common, payable Sept. 1.

The Lukens Steel Co., quarterly, 1¾ per cent on the first and second preferred, payable July 15.

The Poole Engineering & Machine Co., quarterly, 1½ per cent, payable July 12.

The Scovill Mfg. Co., quarterly, 2 per cent and extra 10 per cent, payable July 2.

The Sharon Steel Hoop Co., quarterly, 2 per cent, payable July 10.

The Standard Coupler Co., 4 per cent on the preferred, payable June 30.

The Transue & Williams Steel Forging, quarterly, $1.25 per share, payable July 16.

The Westinghouse Air Brake Co., quarterly, $1.75 per share, payable July 21.

No building or construction work costing over $2,500, or involving the use of structural steel, can be undertaken without a license from the Ministry of Munitions of Great Britain, and such license is as necessary for work involved in the restoration of property destroyed or damaged by fire or aircraft as for work undertaken in other circumstances.

To operate the blast furnace which it recently purchased at Goshen, Va., the Miami Metals Co. has organized the Southeastern Iron Co. The subsidiary operations will be directed by H. A. Brassert.

STEEL COST INVESTIGATION

Senate Committee Waiting and Trade Commission Inquiry Will Be Protracted

WASHINGTON, July 2.—The investigations of the steel trade with a view to determining a basis for reasonable prices to the Government, which were launched last week, are making slow progress. The Senate Committee on Interstate Commerce and the Federal Trade Commission, which are preparing to conduct the inquiries, are heavily burdened with other matters and important developments are not to be looked for in the very near future. The Senate Committee on June 26 began formal hearings, pursuant to the agreement reported in this correspondence last week, but has devoted all of its public sessions to hearing representatives of the coal industry. This branch of the inquiry having been practically concluded, the committee has adjourned subject to the call of the chair to permit plans to be made for taking up other branches of the investigation, including iron and steel. Certain members of the committee are of the opinion that, in view of the investigation now on foot by the Federal Trade Commission, further steps in this direction by the Senate Committee would be a mere duplication of work and might delay rather than expedite a final determination of the issues involved. Chairman Newlands, however, is authority for the statement that the committee has not yet decided to abandon the steel inquiry.

The Federal Trade Commission held several executive sessions during the week to plan the investigation directed by the President, Mr. Wilson himself meeting with the members of the commission on one occasion and taking an active part in the discussion. The commission now has a force of approximately 200 more or less experienced investigators either in Washington or scattered over the country engaged in various lines of work, and it is proposed to select from these 40 or 50 of the most competent and to set them at work without delay. The object of the inquiry will be, first, to secure as early as possible a preliminary report on the cost of making steel and the other products covered by the investigation, and to follow later on with a more elaborate and comprehensive study of methods of manufacture, selling practices, profits, and other factors entering into the broad problem as to what constitutes a reasonable scale of prices for Government requirements. Obviously this inquiry will consume much time and it is the best opinion here that the most important purchases to be made by the Government of steel and other materials now under investigation will be made on the basis of tentative prices to be increased or reduced in accordance with a final schedule to be based in whole or in part upon the ultimate findings of the commission.

New Design of Crucible

Sometime ago, the Lava Crucible Co. was organized in Pittsburgh to develop and manufacture a new design of lava crucible for melting brass, steel and other materials. The crucible is the invention of Louis DeBats, and the company has leased a plant at Zelienople, Pa., on the main line of the Baltimore & Ohio Railroad. Kilns, dry rooms, etc., are being installed for a capacity of 100 crucibles per day and the company expects to be making crucibles not later than Aug. 15. It is stated that the crucibles are made entirely of domestic graphite, carbide of silica, clay and other binding materials. The Lava Crucible Co., has offices in the First National Bank Building, Pittsburgh. M. E. Moffett is president; M. W. Ray is vice-president and P. L. Berley is secretary and treasurer.

PERSONAL

The first unit of what may be termed the Industrial Aid has arrived at a port in Europe in the person of H. D. Tremper, of the Federal Export Corporation, 115 Broadway, New York. Mr. Tremper will act as advisor of the European branches of his company, but a more important feature of his mission is the service he will render to the industrial and commercial interests of this country's allies, in preparing for the competition with the central powers which is expected after the war. On June 21 a dinner was given Mr. Tremper at Sherry's by S. C. Munoz, president of the Federal Export Corporation. A jeweled pin of entwined French and American flags was presented to Mr. Tremper by Mr. Munoz, with the comment: "This remembrance typifies the spirit of the men gathered here in their desire to extend help to those men overseas who have dedicated their plants to the service of their country without regard of what the future may bring them after the return of peace." Mr. Munoz further remarked on the wrong conception of our commercial position in this war, and emphasized the point that the United States needs its allies in a prosperous condition, if only for a selfish reason. He added: "This mission of Mr. Tremper's should not be confused with a business trip. He goes out as our envoy to find where and how the United States can help those who have nobly given up their livelihood in defense of their principles—and ours. We are building for the future and it depends on how the business interests of this country handle our control of the world's necessities, whether the United States becomes known as the kind and friendly nation, or is despised for its power and its money grasp on the world."



H. D. TREMPER

Otto H. Kaufman has been appointed sales manager of the Challoner Co. and Giant Grip Horseshoe Co., Oshkosh, Wis.

Jay C. McLauchlan, for many years district sales manager at Detroit of the Lackawanna Steel Co., Buffalo, has resigned and is now associated with Pickands, Mather & Co., Cleveland. He has been succeeded at Detroit by H. E. Blackwell.

D. B. Mugan, formerly associated with the Illinois Central Railroad Co., in charge of the electrical department at New Orleans, has been appointed resident manager of the Edison Storage Battery Supply Co., with headquarters at 201 Baronne Street, New Orleans.

H. C. Ryding, who has been assistant to the vice-president of the Tennessee Coal, Iron & Railroad Co., has been appointed to succeed Frank H. Crockard as vice-president. The office of assistant to the vice-president has been discontinued. Mr. Ryding became connected with the Tennessee company in 1907, resigning the position of steel works and rolling mill superintendent at the Lorain, Ohio, plant of the National Tube Co. He was associated with the late Max M. Suppes in the building of the girder rail mill of the Johnson Co. at Johnstown, Pa., and later in the construction and operation of the works of its successor, the Lorain Steel Co., at Lorain. His experience has been extensive in both the metallurgical and rolling mill departments of steel manufacture. He is a native of Great Britain and his technical training included courses in that country and Germany.



H. C. RYDING

Charles J. Barr, who resigned last year as general superintendent of the Ensley Works of the Tennessee Coal, Iron & Railroad Co. to become general manager of the Algoma Steel Co., Sault Ste. Marie, Ontario, will return to the service of the Tennessee company. It is expected that Mr. Barr will have charge of the extensive construction program which was recently announced the Steel Corporation would carry out at Fairfield, Ala.

Oden H. Wharton became president of the Crucible Steel Co. of America, Pittsburgh, on July 1. Mr. Wharton was born and raised in Easton, Pa., and received his schooling at that place. His first business connection was as office boy for Park Brothers & Co., Ltd., at that time operating the Black Diamond Steel Works in Pittsburgh, soon becoming bill clerk and then traveling for some years for the company. Later he was connected with the sales departments of the Park Steel Co. in Cleveland and other cities. He went to Boston for some years as representative of the Park Steel Co., and later of the Crucible Steel Co. of America, and was finally appointed general manager of sales of that company, with headquarters at Pittsburgh. After holding this position for several years, his health failed, and he was succeeded by Reuben Michener, the present general manager of sales. Mr. Wharton traveled in Europe for a year or more, and regaining his health, was appointed assistant to President Charles C. Ramsey of the Crucible Steel Co. On the death of President Ramsey, last January, Herbert DuPuy, chairman of the board of the company, assumed temporarily the presidency of the company. The new president is a member of the Duquesne and Pittsburgh Clubs, the Allegheny Country Club and the Pittsburgh Athletic Association.



ODEN H. WHARTON

W. P. Steele has been appointed Western representative of the American Locomotive Co., with headquarters in the McCormick Building, Chicago.

George McDeems has been made superintendent and manager of the Elmwood Castings Co., Cincinnati.

Walter A. Zelnicker Supply Co., St. Louis, announces the recent appointment of Karl W. Bock as manager. Mr. Beck had been for 10 years secretary of and assistant to the vice-president of the Union Pacific Coal Co. and subsidiary coal companies, located at Omaha, Neb. The St. Louis company also announces

that it has secured the services of W. H. Dayton as city salesman. Mr. Dayton was formerly with the Railroad Supply Co., Chicago, as secretary and purchasing agent; also its Eastern representative for five years. He went to St. Louis seven years ago, representing the Railway Supply Co., the Chicago Signal & Supply Co. and the Elyria Iron & Steel Co.

W. W. Butler, vice-president of the Canadian Car & Foundry Co., Montreal, has announced the appointment of R. H. Parks as operating manager of the company. Mr. Parks will have operating charge of all the car plants of the company. He has been identified with the car building industry for many years and went to Canada from the Bettendorf Car Co. of Davenport, Iowa. Coincident with this appointment, W. S. Atwood has been appointed assistant to the vice-president and managing director. Mr. Parks, accompanied by Mr. Atwood, has left for Fort William, Ont., to make arrangements in connection with the equipment of the Fort William plant of the company, at which a large part of the new contract recently secured by the company from the Dominion Government will be carried out.

William Guy Wall, vice-president and chief engineer of the National Motor Vehicle Co., Indianapolis, has been given a commission of major by Secretary of War Baker and will have charge of the design and production of armored motor cars and tanks. He has been chief engineer of the National company for 15 years and has had a wide experience with high speed motors.

H. L. Paulus, R. G. Ferguson and F. L. Graf, for a number of years connected with the Baird Machinery Co., Pittsburgh, have severed their connection with that company and have joined the staff of the J. S. Miller Machinery Co., Pittsburgh.

J. E. Thropp, Jr., for some time superintendent of the Sheridan, Pa., blast furnace of the Berkshire Iron Works (owned by E. J. Lavino & Co., Philadelphia) and superintendent of the Marietta, Pa., blast furnace of the same interests, has resigned.

Paul D. Hanks, president Kerr Turbine Co., Wellsville, N. Y., announces the appointment of G. M. Campbell, formerly of the Lynn, Mass., plant of General Electric Co., as works manager and production expert.

Samuel L. Nicholson, who has been sales manager of the Westinghouse Electric & Mfg. Co. since 1909, has been promoted to the position of assistant to vice-president, with headquarters at East Pittsburgh. In 1898, Mr. Nicholson became sales representative of the Westinghouse Electric & Mfg. Co., in New York, subsequently having charge of the city and industrial division of the New York office. On the reorganization of the sales department in 1904, he was made manager of the industrial department, which position he filled until his selection as sales manager of the company in 1909.

Walter V. Turner, chief engineer of the Westinghouse Air Brake Co., Wilmerding, Pa., delivered an address last week on "The Making of War Munitions," before the Alexander Hamilton Institute in Pittsburgh.

Frederick Cunliffe has been appointed traffic manager of the Allegheny Forging Co., Pittsburgh, works at McDonald, Pa.

Lawrence B. Robertson, superintendent of the coke department of the Maryland Steel division of the Bethlehem Steel Co., is vice-chairman of the Baltimore section committee of the American Society of Mechanical Engineers.

Lucius M. Wainwright, president Diamond Chain & Mfg. Co., Indianapolis, is vice-chairman of the local committee of the American Society of Mechanical Engineers.

George V. Ahara, Canadian Fairbanks-Morse Co., Ltd., is chairman of the Toronto local committee of the American Society of Mechanical Engineers.

Charles T. Main, consulting engineer, Boston, has been nominated for president of the American Society of Mechanical Engineers for the year beginning next December. For vice-presidents the nominations are: Spencer Miller, Lidgerwood Mfg. Co., New York; Max Toltz, president Toltz Engineering Co., St. Paul, Minn., and John Hunter, chief engineer Union Electric Light & Power Co., St. Louis. For managers the nominations are: Fred A. Geier, president Cincinnati Milling Machine Co., Cincinnati; D. R. Yarnall, Yarnall-Waring Co. and Nelson Valve Co., Philadelphia, and Fred N. Bushnell, vice-president Stone & Webster Engineering Corporation, Boston.

H. D. Shute, whose election as vice-president of the Westinghouse Electric & Mfg. Co., as recently announced, will have executive charge of the company's commercial organization, both domestic and export, succeeding Vice-President L. A. Osborne, whose headquarters have been transferred to New York.

T. G. Whaling, who has been assistant general manager and sales manager of the Westinghouse Lamp Co., has been appointed general manager to succeed Walter Cary, recently elected a vice-president of the Westinghouse Electric & Mfg. Co. Mr. Cary, who for the past six years has been vice-president, and for 14 years general manager of the Westinghouse Lamp Co., will still devote a large part of his time to the incandescent lamp business, together with his duties in connection with the Westinghouse Electric & Mfg. Co.

Robert S. Stewart, vice-president of the United States Motor Truck Co., Cincinnati, has been appointed executive officer in charge, and Forrest J. Alvin is to be general manager and director of sales of the company. The company is at present doubling its production, which is already the largest in its history.

Harry L. Shepler has resigned as vice-president of the Willys-Overland Co., Toledo, effective July 1. William H. Birchall, superintendent, has been made general superintendent of the Toledo factory, assuming the work formerly in the charge of Mr. Shepler.

James H. Heaslet has resigned as vice-president in charge of production of the Studebaker corporation, South Bend, Ind., and has become consulting engineer of the company.

OBITUARY

JOHN BENNETT, vice-president, Coates, Bennett & Reidenbach, Inc., Rochester, N. Y., died suddenly in that city June 23. He was well known in the iron, steel and metal trades, having entered the business over 20 years ago, and passing through its various stages, beginning as an employee in the office and rising to the position of vice-president and manager of the iron and steel department. He was born in England April 2, 1869, and came to this country in 1890.

COLONEL FRANK L. BIGELOW, president and treasurer of the Bigelow Co., New Haven, Conn., boiler maker, died suddenly, June 20, while playing golf. Mr. Bigelow was born in New Haven, Sept. 21, 1862, the son of ex-Governor Hobart B. Bigelow. He was graduated from Sheffield Scientific School, Yale University, in 1881, and immediately entered the Bigelow Co., which was founded by his father. He was also president of the National Pipe Bending Co.

ABRAHAM L. KEISTER, president of the Lincoln Coal & Coke Co., died at his home in Scottdale, Pa., May 26, 1917, aged 64 years. He was president of the First National Bank of Scottdale from the time of its organization to his death, and served as a member of the House of Representatives from the 22d Pennsylvania District in the sixty-third and sixty-fourth Congresses.

GEORGE M. ROBINSON, who retired this year as president of the Charter Gas Engine Co., Sterling, Ill., after 50 years of service with that company, died June 22. He was a pioneer in the movement to place a gas engine on the market, the Charter engine being the first to use gasoline as a fuel.

Book Reviews

The Effect of Wars and Revolutions on Government Securities. By E. Kerr. Pages 131, 5¼ x 8 in.; illustrated by charts and tables. Published by William Morris Imbrie & Co., bankers, New York and Chicago.

The extent to which the United States Government can go in financing the present war, without undue risk, is interestingly discussed in this book. It is argued that on the basis of the relation between national indebtedness and wealth at the time of the Civil War, when an obligation was incurred equal approximately to one-ninth of the country's wealth, "the present Government should be able to float a loan of $25,000,000,000, with every prospect of its forming a safe, sound and thoroughly desirable investment for the individual." On the basis on which Great Britain and France are borrowing, the author holds that this country could borrow with comparative safety up to $38,500,000,000. "The United States has proved," he says, "that it can easily and rapidly pay off a considerable debt, and it is still a country with magnificent opportunities for development and the production of new wealth."

"The period following the Napoleonic War saw an enormous change in the economic, industrial and governmental conditions and methods of the world, while from about that time date most of the debts of the modern nations. The world's development has been practically steady and continuous since then." The author argues that while no one can foretell what will happen after such a great war as this, if precedent can be taken to mean anything at all the expansion and stimulation in industries and invention which will follow this war will be greater than have ever been known in the world's history.

Poor's Manual of Public Utilities. Text pages, 2400 + 31 pages of high and low prices, 5¾ x 8¾ in. Published by Poor's Railroad Manual Co., New York. Price, $10.

Complete financial statements of practically every public utility company in the United States and Canada in which there is public interest are presented in the 1917 edition of this well-known work. A new feature is the "margin of safety" over interest or dividend requirements of individual stocks and bonds. This margin is a practical rating of securities based on the facts and answers the question, "What is the risk involved?" The new manual gives general information revised to May 15, 1917; income accounts and balance sheets as of Dec. 31, 1916, and some as late as April 30, 1917.

"Structure of the Coating on Tinned Sheet Copper in Relation to a Specific Case of Corrosion" is the title of Technological Paper No. 90, issued by the U. S. Bureau of Standards by Paul D. Merica, associate physicist. The attention of the author has been directed to a curious case of local corrosion or pitting in tinned sheet copper roofing. The pits occur in general along the line of surface scratches, having appeared some eight or ten years after completion of the roof. These pits are apparently unrelated to the service conditions, and to the direction of rolling of the sheet. When the copper becomes exposed, as in the present case at the bottom of the scratches on the surface, it forms together with the alloy layer a galvanic couple, electrolytic action sets in and the copper at these points is corroded, forming the pits described. This publication gives the results of a study on the structure of tin coatings on copper and it is shown that this coating consists of at least three layers, viz.: a thin layer of Cu_3Sn immediately next to the copper, then a layer of Heycock and Neville's constituent H, containing about 60 per cent by weight of tin, and finally a layer of the eutectic of tin and copper, in which is found most probably also the lead when it is present in the tinning mixture. These alloy layers are electronegative to both the tin and the copper base.

Of more than ordinary interest in the present crisis is bulletin 219 entitled "Industrial Poisons Used or Produced in the Manufacture of Explosives," just issued by the United States Bureau of Labor Statistics. The study was made by Dr. Alice Hamilton during nine months of 1916, the 41 factories visited being located in Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia and Indiana, and employing about 90,000 workers. Of these approximately 30,000 were doing work exposing them to poisons, and practically no women, girls or boys were among this number. The report describes the physiological action of the poisons mentioned and then takes up in detail the processes involved in the manufacture of poisons, closing with suggestions for the prevention and treatment of cases of industrial poisoning in the manufacture of explosives. Safety standards and precautionary measures applicable to the manufacture of certain explosives, adopted by Massachusetts and Pennsylvania, and in Great Britain, appear as appendixes to the bulletin.

"Industrial Heating as a Central Station Load" is the latest booklet published by the Society for Electrical Development on selling the idea of doing things electrically. Before publishing this booklet the whole industrial heating field was carefully analyzed by the engineering staff of the society. Every fact, every theory, every practical application was looked into, with the view to publishing the very best analysis possible for the benefit of members of the society and the entire electrical industry. New conditions and the war make this book very timely. Part 1 deals with electric furnaces. Part 2, out May 10, gives in compact form for ready reference facts and data as to various uses and applications of commercial electric heating, which will apply more particularly to the smaller cities. The two books together provide a library on industrial heating.

"The 'Western's' Steel Book," edited by Erwin C. Arndts, M.E., and published by the Western Spring & Axle Co., Cincinnati, gives in its first chapter a résumé of the early history of iron and steel. Another chapter, "From Ore to Merchant Mill," gives an idea of the methods used in mining and transporting iron ore, the operations of the blast furnace, of crucible Bessemer, open-hearth steel and electric steel works, and of the rolling mill. Microstructure and physical properties of steel, critical points, heat treatment and the properties of alloy steel come in for discussion in succeeding sections and an appendix is devoted to nomenclature and bibliography. The body of the book consists of 93 pages and there are 17 pages in the appendix.

The Cleveland Engineering Society has issued a special publication in the form of a magazine containing a series of profusely illustrated articles by well-known engineers on what may be termed the popular side of developments in irrigation, public water supply, transportation, bridge building, measurement of the flow of rivers and naval architecture. It is a contribution of the society's committee on co-operation, which aims to familiarize the public with fundamental ideas concerning engineering works as the means for preventing unwise undertakings from being espoused by the people.

"Notes on the Geology and Iron Ores of the Cuyuna District, Minnesota," by E. C. Harden and A. W. Johnston, is Bulletin 660-A of the U. S. Geological Survey. The general features of the district as well as the geology, the iron-bearing formation and the iron ore are discussed.

A large force of men is putting the machines at the shops of the Jeansville Iron Works in shape for the manufacture of American shell orders recently received. As soon as the equipment has been changed, many men will be taken back. The Jeansville Works formerly employed 2500 men on a Russian shell contract which has now been filled.

Judicial Decisions

ABSTRACTED BY A. L. H. STREET

EFFECT OF WAR DECLARATION ON ALIEN'S CONTRACTS.—The federal government has power to provide for the confiscation of the property of alien enemies in this country, or for suspension of their right to sue in our courts, subject to such treaty provisions as that contained in the Prussian-American treaties of 1799 and 1828, to the effect that on war arising resident aliens shall be allowed nine months in which to collect their debts and depart freely. But the declaration of the existence of a state of war between the United States and Germany did not automatically terminate the right of German citizens to sue in American courts to enforce their just claims in private transactions. Until Congress legislates upon the subject, the right to sue exists. The fact that a corporation organized under the laws of one of the states is composed entirely of German stockholders does not deprive the company of its legal status as a citizen of the United States, although Congress would have power to prevent transfer of the company's assets to Germany. (New York City Court, Fritz Schulz, Jr., Co. vs. Raimes & Co., 164 New York Supplement, 454.)

DELAY BY BUYER IN ACCEPTING DELIVERY.—When a seller of goods contracts to ship them to a third party's warehouse and there deliver them on board cars or vessel to be furnished by the buyer within a certain time, the seller will have a valid claim against the buyer for storage charges accruing and actually incurred by the seller on account of delay of the purchaser in furnishing the necessary cars or vessel. Claim for such reimbursement is not waived by making delivery on board the cars or vessel when transportation facilities are tardily furnished. And, if it is agreed that the purchase price is to be paid only when the goods are loaded, the seller will have a valid claim against the buyer for interest at the legal rate on the amount due for the goods for the time that the seller may be kept from earning payment by reason of the buyer's delay in providing cars or a vessel as agreed. (Kansas City Court of Appeals, Bird vs. Fox, 193 Southwestern Reporter, 941.)

AUTHORITY OF SALESMEN.—A foundry company having sent a salesman to a customer to obtain an order for iron work, after negotiations had been initiated by correspondence, impliedly authorized the salesman to bind the company by closing a contract. (Arkansas Supreme Court, Chattanooga Roofing & Foundry Co. vs. Porter, 193 Southwestern Reporter, 797.)

INJURY TO EMPLOYEE IN INSTALLING MACHINERY.—An employee injured through fall of a heavy motor from a wall on which he was attempting to install it, with the assistance of two helpers, is entitled to recover damages from his employer on the theory of the latter's failure to furnish enough men to do the work properly, unless the risk involved in three men undertaking the work was so obvious that a workman of reasonable prudence would not have encountered it in the circumstances. (St. Louis Court of Appeals, Levecke vs. Curtis & Co. Mfg. Co., 193 Southwestern Reporter, 985.)

STATE CONTROL OVER NON-RESIDENT CORPORATIONS.—One state has power to prescribe by law the conditions under which corporations organized under the laws of another shall be permitted to do business of an intrastate character in the first. Accordingly, a state may validly impose a special excise tax on corporations, both domestic and foreign, doing business in the state, based on the volume of intrastate business done. (United States District Court, Northern District of West Virginia, Baldwin Tool Works vs. Blue, 240 Federal Reporter, 202.)

INJURY TO MOLDER.—In an action against a steel manufacturer for injury to a molder, caused by spurting of molten metal from a mold, it was open to the jury to find that the defendant was negligent in furnishing light caps for use in covering open molds after filling, and in failing to use aluminum in the molds to counteract tendency of the metal to spurt. (United States Circuit Court of Appeals, Sixth Circuit, Republic Iron & Steel Co. vs. Hines, 240 Federal Reporter, 77.)

COPYING UNPATENTED ARTICLES.—The rule of law which makes it unfair competition, against which relief will be granted by injunction and award of damages, for one manufacturer of an unpatented article to simulate the appearance of the product of a competitor for the purpose of diverting to himself patronage which the public intended to give to the competitor, is limited to non-functional features. All manufacturers of unpatented goods are entitled to utilize any feature which makes for efficiency or economy. (New York Supreme Court, Appellate Division, Diamond Expansion Bolt Co. vs. United States Expansion Bolt Co., 164 New York Supplement, 433.)

HOURS OF SERVICE LAW VALID.—The law enacted by the Oregon legislature in 1913, making it a misdemeanor to employ any person in a mill, factory or manufacturing establishment more than ten hours in any one day, except in the case of watchmen, emergencies in making necessary repairs, or in avoiding imminent danger to life or property, and except that there may be three hours' overtime employment on payment of time and one-half for such extra work, is a valid exercise of the police power in the interest of the public health, and not an unconstitutional attempt to fix wage standards. The last-mentioned proviso is properly interpreted as being intended as an additional means of deterring employers from exacting overtime work. There is no unconstitutional discrimination wrought by limiting the operation of the law to mills, factories and manufacturing establishments. (United States Supreme Court, Bunting vs. State of Oregon, 37 Supreme Court Reporter, 434.)

DUTY TO WARN EMPLOYEES AGAINST DANGERS.—The legal obligation of an employer to warn his workers against dangers to which they are exposed in their employment is limited to perils known to the employer and of such nature that he has no good reason for assuming from the particular employee's experience and apparent intelligence that the employee appreciates the risk. (Pennsylvania Supreme Court, Hanley vs. Carnegie Steel Co., 100 Atlantic Reporter, 543.)

DELIVERY OF FREIGHT WITHOUT BILL OF LADING.—A railway company is not liable to the shipper of an engine for delivering the same without production of the bill of lading, which was drawn to the shipper's order and attached to note sent to a collecting bank with instructions not to deliver the bill of lading to the concern to which the engine was destined until payment of the note, whereby the shipper was prevented from collecting the note, if the concern was actually entitled to possession of the engine. (Arkansas Supreme Court, Ben D. Schaad Machinery Co. vs. St. Louis, Iron Mountain & Southern Railway Co., 193 Southwestern Reporter, 270.)

CONTRACTS RESTRAINING COMPETITION.—An agreement by a manufacturer or dealer to pay a stated amount annually in consideration of a prospective competitor staying out of the field is void as being in unreasonable restraint of trade, although the courts do sanction the validity of agreements whereby the seller of an established business agrees, as part of the sale, not to compete with the purchaser. (Arkansas Supreme Court, Shapard vs. Lesser, 193 Southwestern Reporter, 262.)

"WILLFUL MISCONDUCT" OF EMPLOYEE.—A youthful employee who had been instructed not to oil machinery while in motion, thoughtlessly started to oil it after the power had been shut off but while the machinery was still running by momentum, and was injured in consequence. Held, that he was not guilty of such "willful misconduct" as debars him from an allowance under the California workmen's compensation act. (California District Court of Appeals, Diestelhorst vs. Industrial Accident Commission of California, 164 Pacific Reporter, 44.)

TO CONSERVE STEEL FOR WAR

Council of National Defense Urges Co-operation of Manufacturers

WASHINGTON, July 2.—An urgent plea that steel be used for general business purposes only when the requirement is unavoidable is made in a war bulletin just sent out by the Chamber of Commerce of the United States in co-operation with the Council of National Defense. While the chamber takes a rather extreme view with respect to the prospective steel shortage, the fact that the bulletin is being widely distributed among steel consumers gives it a very special interest at this time. It is in part as follows:

"It should be anticipated that the steel situation, which is developing with rapidity, will probably make it impossible for those general manufacturers, unable to find a steel substitute, to secure adequate supplies of steel and may even make it impossible to secure any.

"No substantial increase in production is anticipated. On the other hand, indications are that the war requirements will continue to increase. Steel is needed in war for ships, railroad cars and locomotives, rails, trucks and containers. It must be had for shells and other munitions work—requirements large in tonnage far beyond what is generally supposed. In addition, businesses producing government materials and supplies, the necessities of life and the materials for producing the necessities of life, require steel in great quantities for buildings, machinery, tools and containers. When all these requirements are met, it is said, little if any steel will be left for so-called general business. Materials which can be used in substitution for steel are plentiful in comparison. Lumber may be expected to meet all needs and cement may be had in quantity for concrete work.

"The course for business men to pursue is clear. Every effort should be made to use wood and concrete in place of steel whenever this can be done, and construction and development work requiring steel should be postponed wherever possible. Apparently little will be gained by contracting ahead for steel. Experience to-day indicates that it will soon be necessary for producers of steel to ship their product where required in connection with the war rather than to fill such contracts as they may have on their order books. When the production of railroad cars and locomotives is interfered with because necessary steel is going to industries producing pleasure automobiles, steel furniture, and buildings for amusement purposes, the situation cannot be expected to continue.

"Business men will probably make their plans in the expectation that soon there will be established an order for distribution of steel, and that the wild scramble to enter orders for future delivery of steel will be ineffective. In fact, it will occur to many, no doubt, that failure to recognize this situation may lead to unfortunate results. In a business requiring steel, if contracts are placed for future delivery, not only for steel but for other materials, the manufactuer may find that he cannot get the steel, but can get the other materials. In this case he might find that he had on hand large quantities of materials which he could not use because he had no steel.

"In purchasing materials and supplies, it is argued, business men will doubtless consider the wisdom of returning, so far as possible, to doing business locally. For many commodities the railroads can no longer spare the equipment to bring distant points into close contact. Purchase must be made near at home wherever this can be done. The preference which must be given to shipments of iron and steel will soon make this situation of daily importance.

"For the particular information of those in the iron and steel business it may be said that the Council of National Defense wishes to hear from producers of iron and steel, whenever output is limited through transportation difficulties or through business conditions. Furthermore, pending the establishment of some method of distributing steel output according to war needs, producers of steel may render real service by assisting those producing war work to secure their steel requirements. Not only will this help win the war, but will tend toward less disturbance in business when steel supplies are shut off from those industries engaged in unessential production."

Engineering Council Organized

The Engineering Council, the engineering body which recently came into being as a medium of co-operation between the four national engineering societies, to "speak authoritatively for all member societies on all public questions of a common interest or concern to engineers," held an organization meeting in the rooms of the American Society of Mechanical Engineers on the afternoon of June 27, when the following officers were elected: President, Prof. I. N. Hollis, Worcester Polytechnic Institute; vice-presidents, H. W. Buck and George F. Swain; secretary, Calvert Townley; executive committee, the four officers named with J. Parke Channing, consulting mining engineer, and D. S. Jacobus, Babcock & Wilcox Co.

The unanimous desire to help the Government in the prosecution of the war resulted in the appointment of a committee of three, consisting of H. W. Buck, Prof. A. M. Greene, Jr., Rensselaer Polytechnic Institute, and Edmund B. Kirby, to consider the best means of utilizing the inventive ability of members of the founders' societies. The secretary was instructed to inform all Government bureaus that might be interested in the organization of the Engineering Council. The council is composed of 24 members, five appointed by each of the four large national engineering societies and four by the United Engineering Society, which operates the Engineering Societies Building.

Texas Co. to Make Improvements

At a recent meeting of the stockholders of the Texas Co., held at Houston, Texas, an increase of the capital stock of the corporation from $55,000,000 to $69,375,000 was authorized. It is announced that the additional proceeds will be used chiefly for enlarging the refining facilities of the company. It will build a large oil refinery at Tampico, Mexico, and also plans to lay a pipe line from the oil fields near Tuxpam to Tampico and to build two or more oil pumping plants. The company will organize a subsidiary corporation under the laws of Mexico to operate this project. It will erect 116 cottages for employees, a large clubhouse and an office building. The new town will be provided with electric lights and all modern conveniences and comforts. The Texas Pipe Line Co. has been incorporated at Houston with capital stock of $14,000,000 for the purpose of taking over the oil pipe line holdings in Texas of the Texas Co. R. A. John is president; J. L. Dowling, vice-president, and A. M. Donoghue, secretary-treasurer.

Locomotive Orders

Recent orders for locomotives have been 35, not including an unconfirmed report of an order for 400 narrow gage locomotives placed by the Russian Government with the American Locomotive Co. The Baldwin Locomotive Works has taken 10 locomotives for the Chicago & Alton, while the American Locomotive Co. will build 10 for the Terminal Railroad Association of St. Louis, seven for the Kansas City Southern and two each for the Chicago, Indianapolis & Louisville and the Detroit & Toledo Shore Line. It is estimated that orders this year to July 1 have been 3528, of which 1592 are for export. This total compares with 5750 ordered in all of 1916 and 2300 in 1915.

The Central Iron & Steel Co., Harrisburg, Pa., has placed its new 200-ton open-hearth furnace, recently constructed, in operation, making the ninth furnace at the plant. The new unit is of tilting type. A series of new coke ovens are now in course of erection.

Oregon Steel Plant Sold

The plant of the Oregon Iron & Steel Works, Oswego, Ore., has been purchased by William Piggott of Seattle, head of the Pacific Coast Steel Co. in the Northwest. Mr. Piggott announces that the plant will be operated in the manufacture of pig iron, ore to be brought from the west coast of South America. The plant cost $300,000 25 years ago, has a capacity of 125 tons daily, and is equipped with 800-hp. engine and boiler capacity for another engine unit. It ceased operation 20 years ago, when the supply of cheap ore in the mines nearby was exhausted. Consideration in recent purchase was $100,000. It is understood a number of improvements will be required, including installation of new machinery and complete overhauling of the plant. Mr. Piggott, president Seattle Car & Foundry Co., with his Seattle associates, acquired control of the stock of the Pacific Coast Steel Co., operating plants at San Francisco and Youngstown, about a year ago, at a cost of $1,000,000. The company has recently purchased the Irondale plant and is establishing blast furnaces at that point.

Strikes of Copper Miners May Be Serious

Strikes among the miners of several of the large copper producers are reported as assuming serious proportions. The estimated production which may ultimately be cut off by such strikes is put by some at 50,000,000 lb. per month. The great Butte mining camp in Montana with a monthly production of about 33,000,000 lb. is practically idle. Most of the trouble is ascribed to the work of German sympathizers because the unrest came suddenly. Higher wages is the demand, despite the fact that the men are now paid more than ever. The demand is for a 6-hr. day at $1 per hour, irrespective of the market price of copper, hitherto the basis for computing wages on a sliding scale. The situation, if prolonged, according to producers, is likely to have a serious effect on metal available for consumption in the last quarter. The Government and the allies are expected to use between 300,000,000 and 500,000,000 lb. before Dec. 31, 1917, according to some estimates.

Buys Foundry Iron

CINCINNATI, July 3.—(*By Wire.*)—The Standard Sanitary Mfg. Co. has bought 2000 tons of Virginia No. 3, 1000 tons of Northern and about 1500 tons of Southern, all for first half, paying full market prices.

The shipyard of Bayles & Son at Port Jefferson, L. I., has been purchased by W. B. Ferguson and associates and incorporated as the Bayles Shipyard, Inc. Mr. Ferguson, who was formerly a naval constructor, is president and general manager. A new joiner ship, two stories, 132 x 40 ft., will be completed about July 15. There will be four ways for 5500-ton ships and room for 10 or 12 small boats. Repair work will also be done. The concern is in the market for two locomotive cranes, and will soon issue a list of other needed equipment. A New York office has been opened at 115 Broadway.

The Ashland Iron & Mining Co., Ashland, Ky., expects to have in operation three additional furnaces before August 15. It is already operating three furnaces. A 144-in. plate mill has been ordered from the United Engineering & Foundry Co., and a 24-in. structural mill from the Fort Pitt Bridge Co. Both mills will be driven by General Electric motors. W. B. Seeton is president.

Homer Strong, dealer in new and used machinery, whose jobbing machinery supply house and steel warehouse are at Rochester, N. Y., has opened branch offices at Buffalo and Syracuse. The former at 380 Ellicott Square Building is in charge of G. B. Morris, and the latter at 818 University Building, Syracuse, is in charge of H. L. Roscoe.

Government Copper Purchase

WASHINGTON, July 2.—The copper committee of the Council of National Defense has arranged for the purchase by the Government of 60,000,000 lb. of copper for the Ordnance Bureau of the War Department at the tentative price of 25 cents per pound. Definite orders for this copper have not yet been given and no limit upon the date within which the copper is to be delivered has been fixed. The price agreed upon is subject to revision after the Federal Trade Commission has made its report as to the cost of producing copper.

The committee on raw materials of the Council of National Defense some time ago, as the result of negotiations with the copper producers, purchased for the Government 45,000,000 lb. of metal at 16 2/3 cents per pound. When the War Department decided that it would require a much larger quantity of copper, the producers objected to supplying the additional amount at the original price but expressed a willingness to accept a figure to be arrived at by negotiations based upon the report of the Trade Commission as to cost of production. As the producers were able to demonstrate that there had been a material increase in the expense of both mining and refining, 25 cents was fixed upon as a tentative price for all quantities in excess of 45,000,000 lb. The published statement that the War and Navy Departments will require 300,000,000 lb. additional of copper cannot be confirmed but appears to be based upon the assumption that the war will last several years.

Daylight Saving Passes Senate

WASHINGTON, July 2.—The Senate on June 28 passed as a war measure the so-called daylight-saving bill introduced by Senator Calder of New York. It provides that all clocks shall be set ahead one hour at 2 a. m. on the last Sunday in April of each year and put back one hour at 2 a. m. on the last Sunday in September. The measure also legalizes the present standard time divisions of the country.

During the debate on the bill it was asserted by its advocates that it can be put into effect without the slightest disturbance of the business or domestic affairs of the country, and especially that there is no basis for the suggestion that it will cause confusion in railroad operations or necessitate revision or reprinting of time tables. A slight readjustment will be necessary with respect to trains actually moving at the time the clocks are turned ahead and turned backward, but it is asserted that this will not embarrass the operations of the roads in any particular. Data before the Senate indicates that where the daylight saving plan has been tried abroad, notably in Great Britain, important economies have resulted, especially in the saving of coal for the production of gas and electricity. In all manufacturing plants where the plan has been tested it is said to have operated to the very substantial advantage of both workmen and employers.

Seattle Company to Build Radio Equipment

The Kilbourne & Clark Mfg. Co., Seattle, has received a contract from the Navy Department for radio equipment for 250 ships, at a cost of $988,800, said to be the greatest single contract for this line of equipment ever awarded. Contract includes one-kilowatt sets for 200 ships and two-kilowatt sets for 50 ships. Besides this the company recently received Government contracts for radio sets for 63 ships at a cost of $123,200. As a result of the recent awards the company's plant will be doubled and the number of employees increased from 100 to 300. The recent contracts give the company a total of more than $1,500,000 in signed orders for radio apparatus, including sets for nine ships for Norway interests, two sets for English ships, and several for Russian interests.

The Red Cross committee of the Pittsburgh Crucible Steel Co., Midland, Pa., has raised nearly $15,000 for the American Red Cross $100,000,000 fund.

NEW TRADE PUBLICATIONS

Electric Arc Welding.—Lincoln Electric Co., Cleveland. Pamphlet No. 104. Lists the various processes of welding such as forge or pressure welding and autogenous welding with brief descriptions of the essential features of each and their adaptability. The greater portion of the pamphlet is given over to the applications of electric arc welding in steel and iron foundries, railroad shops, shipyards, drop forge shops and general manufacturing plants. The applications are discussed at some length and cost data and views of typical installations are included.

Expansion Joints.—Ross Heater & Mfg. Co., Inc., 753 Bird Avenue, Buffalo. Folder. Gives general descriptions and specifications for a line of expansion joints of the cross-head-guided type, which were illustrated in THE IRON AGE, May 4, 1916. The joints are designed for lines carrying oil, gas, water or superheated, saturated or exhaust steam and can be supplied in all sizes up to a maximum diameter of 24 in. and pressures up to 500 lb. A number of views of installations of the joints supplement the text description.

Spray Nozzles and Filters.—Monarch Mfg. Works, P. O. Box 2070, Philadelphia. Bulletin No. 6-C. Illustrates a line of nozzles for use in acid chambers and for recooling condensing water which operate at relatively low pressures. The various features of simple construction and low operating pressure are emphasized, the text being supplemented by a number of engravings of the several styles of nozzles. The filters illustrated use either a natural stone or gravel as the filtering medium. Brief descriptions and specification tables are presented, together with instructions for cleaning.

Electric Light and Power Distribution.—L. K. Comstock & Co., 30 Church Street, New York City. Bulletin No. 4. Devoted to the cost of an electric light and power distributing system in an industrial plant. Emphasis is laid upon the fact that it is the ultimate cost of a system that counts, and the elements of this are shown diagrammatically. It is pointed out that the total cost of a distributing system is divided into two parts—the initial cost or the expense incurred before operations are begun and the future cost which goes on continuously during the life of the plant. The various sub-divisions of this future cost are touched upon, and emphasis is laid upon the elements of service which this company can supply to owners, architects and engineers in the design and installation of systems. A number of views of plants in which this company has installed the electrical distributing systems are presented, and a partial list of users, including industrial and power plants, banks, office and public buildings, etc., is included.

Lubricating Devices.—Marvel Engineering Co., 1437 Carroll Avenue, Chicago. Booklet. Points out the advantages of using the grease cup method of lubrication, such as the reduction of shutdowns due to heated and wornout bearings, elimination of time for removing and replacing oil soaked belts and saving in the amount of lubricant required. Brief illustrated descriptions of the various styles of cups are presented, supplemented by instructions for installing them. A number of test results and a partial list of users are included.

Grinding and Buffing Machine.—U. S. Electrical Mfg. Co., 459 East Third Street, Los Angeles, Cal. Folder. Mentions a motor-driven grinding and buffing machine for machine shops and all-round general use. An illustration of the machine which can be supplied for either bench or pedestal mounting is presented and the various features of construction are briefly mentioned.

Wrought Iron Pipe.—A. M. Byers Co., Pittsburgh. Booklet, entitled, "On the Trail of Byers Pipe." Presents illustrations of a large number of buildings in which the company's pipe was installed from 25 to 45 years ago for plumbing, heating, gas and power service. In connection with each illustration a brief statement is given of the length of time the pipe was in service and the purpose for which it was used.

Wagon Loader.—George Haiss Mfg. Co., Inc., 141st Street and Rider Avenue, New York. Pamphlet. Concerned with a wagon loader for handling sand, building materials, coal, etc. A number of views of the loader at work are presented and a condensed specification table is included. Cost data and a partial list of users are also given.

Refuse Destroyer and Gas Machines.—Tirrell Gas Machine Lighting Co., 103 Park Avenue, New York. Two folders. The first describes the Incinerite, which is a combined waste receptacle and destructor. A brief description of the construction of the device which is built in portable and wall types is presented, together with a condensed specification table of the various sizes. A partial list of users is also given. The other folder relates to an equalizing gas machine for power and industrial uses and the various appliances employed in connection with it. Brief descriptions and illustrations of the machine and the different appliances are presented a short statement of the advantages of using gas for power and industrial purposes is included.

Hoists.— Wright Mfg. Co., Lisbon, Ohio. Hoist Catalog No. 8. Gives illustrations and brief specification tables of a line of geared and screw bolts, differential blocks and steel trolleys. Short descriptions of the different parts of the hoist are given and a number of views of it in use in various industrial plants are included.

Forgings.—Union Switch & Signal Co., Swissvale, Pa. Bulletin No. 87. Concerned with a line of forgings for automobile, tractor, airplane, railroad and general service. The facilities of the company are briefly mentioned, including a list of the various presses and forging machines with which the plant is equipped. Lists of typical forgings of the different classes are given and illustrations showing the variety of drop forgings produced are included. Mention is also made of the facilities which the plant has for turning out steel, brass, bronze and aluminum castings.

Oxy-Acetylene Welding and Cutting Apparatus.—Prest-O-Lite Co., Inc., Indianapolis. Form No. T-248. Describes and illustrates a line of apparatus for cutting and welding metals by the oxy-acetylene process. A brief general description of the various types of apparatus and the work for which they are adapted is presented. This is followed by detailed descriptions of the different apparatus and the accessories provided with each. Mention is made of auxiliary equipment such as couplers for tanks, trucks, adapters and preheating and reheating outfits. A list of the various extra parts that can be supplied is included.

Ball Bearings.—Hess-Bright Mfg. Co., Philadelphia. Form No. 828. Illustrates the application of ball bearings to machinery and shows what precautions should be taken to preserve their efficiency. Among the points upon which emphasis is laid are the use of clean lubricant, guarding against distortion of the outer race, etc. Numerous diagrams showing the application of the bearings and emphasizing the points brought out are included.

Screw Extractor.—Cleveland Twist Drill Co., Cleveland. Two folders. Treat of an extractor for broken screws, studs, staybolts, etc., which was illustrated in THE IRON AGE, Jan. 18, 1917. The method of extracting the broken screw from the hole is gone into at some length, the text being supplemented by engravings showing the way in which the extractor works.

Underfeed Stokers.— Combustion Engineering Corporation, 11 Broadway, New York. Bulletin No. B-2. Pertains to an underfeed type of stoker for boilers handling all grades of fuel from lignite or brown coal to semi-anthracite. A description of the stoker which is supplemented by numerous illustrations is presented, special emphasis being laid upon the distribution of the air and the automatic regulation of the fuel and air supplies by a compensating type damper regulator which is sensitive to minute variations of steam pressure. The features of adaptability, ease of installation and operation and smokeless operation are all touched upon, the text being supplemented by engravings of plants in which the stokers have been installed.

Ventilating Fans and Electric Hoists.—Sprague Electric Works of General Electric Co., 527 West Thirty-fourth Street, New York. Booklet No. B-3429 and Bulletin No. 48,700-A. The first relates to a line of motor-driven ventilating fans for supplying fresh air as well as for removing steam, moist air, gases and fumes or circulating air over heating or refrigerating pipes to maintain even temperature in rooms. A brief description of the unit which consists of a motor, the fan and a supporting tripod is presented and tables of the various sizes of fans for use with direct or alternating current motors are included. The bulletin, which supersedes No. 48,700 deals with a line of cage controlled electric monorail hoists. Brief descriptions of the various types which can be supplied for use with direct or alternating current motors are presented with rating and dimension tables. A number of views of the hoist in use in industrial plants are given.

Engine Lathes.—Oliver Machinery Co., Grand Rapids, Mich. Circular. Shows a 26-in. extra heavy duty engine lathe of the single pulley drive type, arranged for either belt or motor drive. A comprehensive description of the construction of the lathe is presented with sideheads calling attention to the various parts. A condensed table of specifications of the lathe which was illustrated in THE IRON AGE, Jan. 18, 1917, is included.

Machinery Markets and News of the Works

AIRPLANE TOOLS BOUGHT

Large Orders Placed by Willys-Overland

Shipbuilding Concerns More Active—Several Concerns Making Inquiries—Government Contracts for Mine Sweepers—Munitions Plants Are Purchasers

The Curtiss Aeroplane & Motor Corporation and Willys-Overland Co. combination, of which John M. Willys will become the head, last week placed orders for machine tools aggregating several hundred thousand dollars in value. The Curtiss Corporation has contracts on hand from the United States Government and the allied governments amounting to $20,000,000. The Curtiss Corporation increased its capital stock $2,000,000 to provide capital for extensions. The Willys-Overland Co. will build a new factory in Toledo, Ohio, for making airplane engines. The Curtiss Corporation has taken additional manufacturing space in Buffalo and will erect a construction and assembling plant, one story, 100 x 200 ft., at Atlantic City. Other automobile and airplane concerns which will participate in the Government airplane program have also been in the market. The Nordyke & Marmon Co., Indianapolis, which is erecting an airplane engine plant, is inquiring for tools in the Chicago market.

Shipbuilding concerns are showing more and more activity, though quite a number which have made inquiries during the last few weeks have not closed as yet, and their delay is said to be due to the slowness of the Emergency Fleet Corporation in giving out contracts and specifications. The Downey Shipbuilding Co., 120 Broadway, New York, will issue a list this week of its requirements. The New Jersey Shipbuilding Co., whose plant is at Gloucester, N. J., is also inquiring for equipment. The Chester Shipbuilding Co., Chester, Pa., has bought several cranes and will be in the market for other equipment. The Moore Shipbuilding Corporation, successor to the Moore & Scott Iron Works, Oakland, Cal., has been buying shipyard equipment through a New York representative. The Newport News Shipbuilding & Drydock Co. has placed orders in the past week for $75,000 worth of machine tools, and other contracts are pending. The Skinner & Eddy Corporation of Seattle has made inquiries among Eastern machine-tool builders. The Bayles Shipyard, Inc., Port Jefferson, L. I., with office at 115 Broadway, New York, will soon issue a list of equipment needed for a joiner plant, and other general shipyard machinery will also be bought, including two locomotive cranes. The Fore River Shipbuilding Corporation, Quincy, Mass., is inquiring for $300,000 worth of machine tools. Work is progressing rapidly on submarine chasers for the Navy. It is understood that additional vessels of this type will soon be bought. The Government has awarded contracts for 24 mine sweepers to several Eastern shipyards. From Seattle come reports that 100 wooden ships are now being built on the Pacific Coast, and this number may soon be increased to 150. The shipbuilding payroll in Seattle, alone, is now $1,200,000 a month, as compared with $200,000 a month a year ago.

The Government has placed contracts for mines and bombs, and a number of concerns will be employed as sub-contractors. Some of these have been inquiring for machine tools. The Savage Arms Co. will make 4000 Lewis machine guns for the Government.

More price advances have been recorded. A few manufacturers of turret lathes announced a 10 per cent increase; another manufacturer of radial drills raised his prices 15 per cent., so that now the higher prices of these tools are general; sensitive drill presses were advanced 10 per cent and grinders 5 per cent. Milling machines and punching and shearing machinery are also higher in price.

Deliveries are being extended still further. Many of the large builders are sold up for the remainder of this year, and are not anxious to take on any more business. Claims for priority of shipment are being made by so many buyers that machine-tool builders are obliged in many cases to refer the matter of delivery to the Government officials.

There is considerable crane business. Most of the orders are for one, two or three cranes.

Export business shows no cessation.

New York

NEW YORK, July 2.

The closing of contracts for several hundred thousand dollars' worth of machine tools by the Willys-Overland Co.-Curtiss Aeroplane & Motor Corporation combination was the feature of the New York market the past week, it being the first large indication of the extensive manufacture of airplanes in this country. The Curtiss Corporation, at a meeting last week, announced a $2,000,000 increase in its capital stock to provide the funds for extensions. It is adding to the equipment of plants in Buffalo and Hammondsport and will build a construction and assembling plant at Atlantic City.

Staten Island is expected to become a center for steel shipbuilding in this section, and a number of yards will probably be started there soon. Projects on Newark Bay are already under way and one concern which is erecting a wooden shipbuilding plant there will lay the keel of its first ship within a few days. The Downey Shipbuilding Co., 120 Broadway, New York, which recently received a Government contract, will issue a list of its requirements this week. The New Jersey Shipbuilding Co., whose plant is at Gloucester, N. J., is also inquiring for equipment. The Chester Shipbuilding Co., Chester, Pa., has bought several cranes and will be in the market for other equipment. The Moore Shipbuilding Corporation, successor to the Moore & Scott Iron Works, San Francisco, which has a Government contract, has made purchases of punching and shearing machinery and other equipment in this market. The Skinner & Eddy Corporation, Seattle, Wash., has made inquiries among Eastern machine-tool builders. The Bayles Shipyard, Inc., Port Jefferson, Long Island, with office at 115 Broadway, will soon issue a list of equipment needed for a joiner shop; other general shipyard machinery will also be purchased. Work is progressing rapidly at various shipyards on submarine chasers for the United States Navy. A dozen of these boats have already been completed at the New York Navy Yard. It is understood that additional vessels of this type will soon be bought. Contracts for twenty-four mine sweepers have been let by the Government to about a dozen shipyards.

The Fore River Shipbuilding Corporation, Quincy, Mass.,

has issued a list of requirements for yard extensions, which include two 26-in. engine lathes, four 36-in. engine lathes, two 28-in. turret lathes, one 24-in. engine lathe, two 18-in. engine lathes, three 7-in. vertical boring mills, 6 x 8 ft., five 42-in. Bullard vertical boring mills, two No. 2 Detrick & Harvey (or equivalent), and one Fosdick (or equivalent) horizontal boring mills, four horizontal milling machines, one planer, 9 x 16 ft., two planers, 5 x 12 ft., one planer, 24 in. x 6 ft., one 24-in. shaper, two universal milling machines, two 20-in. lathes, one 3-ft. radial drill, one surface grinder for tool work, one cutter grinder, one cylindrical grinder, one 20-in. shaper and other smaller tools, and miscellaneous equipment.

The Newport News Shipbuilding & Drydock Co., Newport News, Va., has closed for about $75,000 worth of the equipment it recently inquired for. Two turret lathes were bought from the Jones & Lamson Machine Co., a bevel gear planer from the Gleason Works, a plain radial drill and three sensitive radial drills from the American Tool Works Co. The American Tool Works Co. was also awarded a contract for twelve engine lathes and the Bullard Machine Tool Co. will furnish two vertical turret lathes. Orders for milling machinery and horizontal boring mills are pending. Cranes and shipshed tools will probably be closed for this week. The new plate and angle shop which this company is now building will require four double-end plate planers, two double-end beam punches, three horizontal punches and one double-angle shear.

Ordnance and munition plants are also active in the market, but mostly to replace worn-out tools. The Government last week placed large contracts for mines and bombs, and it is understood that a number of concerns will be employed as sub-contractors. These concerns are expected to come into the market for tools. The Savage Arms Co., Utica, N. Y., is increasing its facilities to manufacture Lewis machine guns for the Government.

Price advances continue. A few manufacturers of turret lathes announced a 10 per cent increase; another manufacturer of radial drills raised his prices 15 per cent; sensitive drill presses were advanced 10 per cent and grinders 5 per cent. Milling machines also went up. Punching and shearing machinery has also been advanced by some of the makers.

Deliveries are being extended still further. Many of the large builders are sold up for the remainder of this year and are not anxious to take on any more business. Claims for priority of delivery on the plea of urgent Government work are being made by so many buyers that machine-tool builders are obliged in many cases to refer the matter of delivery to the Government officials, letting them decide which buyer should come first.

There is considerable crane business. Most of the orders are for one, two or three cranes. The Chile Exploration Co. division of the American Smelting & Refining Co., which recently inquired for about 26 cranes, has curtailed its requirements, and will not close for a week or so. A considerable number of machine tools is also being purchased by this company. The West Virginia Pulp & Paper Co., Williamsburg, Pa., has bought a 15-ton crane.

Export business shows no cessation so far as the allied countries are concerned. While officials at Washington are considering the question of establishing an embargo on certain shipments to neutral countries contiguous to Germany, it is interesting to note that the restrictions now in effect are so far-reaching that they are having almost the same effect as the most severe embargo. One concern has recently refused business from Spain because of a belief that the machinery was to be used for a purpose that would be indirectly beneficial to Germany. South Africa is buying machine tools here which before the war were always bought in England. Representatives of the Tata Iron & Steel Co., Ltd., Sakchi, India, have closed for the tools which were required for additions to that concern's plant.

The Earp Thomas Metal Products Co., Newark, has been incorporated with a capital of $50,000 to manufacture metal goods. G. S. Earp Thomas, Oswald Earp Thomas, Glen Ridge, and W. E. Atkins, Newark, are the incorporators.

Fire recently destroyed the pattern shop of Maher & Flockhart, iron founders, Polk Street, Newark, with a loss estimated at about $10,000.

J. & W. Lyall, Passaic, N. J., operating a plant on Brighton Avenue for the manufacture of textile machinery, has been incorporated under the name of the J. & W. Lyall Loom & Machine Co., with a capital of $50,000, to provide for proposed extensions. The incorporators are William J. Lyall, H. V. R. Scheel, and Timothy Kelly.

The Bayonne Bolt & Nut Co., Second Street, Bayonne, N. J., manufacturer of bolts, spikes, nuts, etc., will build an extension to its plant at Humphrey Avenue and Second Street, to cost about $8,000.

The Charles V. Hoffman Co., Jersey City, N. J., has been incorporated with a capital of $25,000 to manufacture boiler equipment. The incorporators are Charles V. Hoffman, Louis L. Browne and Charles F. Dayton.

Edward V. Hartford, Inc., 141 Morgan Street, Jersey City, manufacturer of shock absorbers, has filed plans for a one-story addition to its plant. It is also known as the Hartford Suspension Co.

The Zealandia Co., Jersey City, has been incorporated with nominal capital of $5,000 to manufacture mill machinery. C. H. Jarvis, J. Frank Turner and Philip L. Neieser are the incorporators.

The New Jersey Shipbuilding & Dredging Co., Jersey City, has been incorporated with a capital of $500,000 to operate a shipbuilding plant. The incorporators are E. C. Moore, Tribune Building, New York; John F. Clarke, East Twenty-eighth Street, Bayonne; and A. P. Margolies, Jersey City.

The Pintsch Compressing Co., 206 Erie Avenue, Jersey City, manufacturer of gas fuel tanks, will erect a one-story addition to its works at 310 Wayne Avenue.

The Thomas & Betts Co., 215 Broad Street, Elizabeth, N. J., has been incorporated with a capital of $300,000 to manufacture surgical and scientific apparatus. The incorporators are Richard D. Betts, Lewis H. George and Robert McK. Thomas.

The Canadian Car & Foundry Co., 165 Broadway, New York, is negotiating with the Board of Commissioners, Lyndhurst, N. J., for the rebuilding of its plant, recently destroyed by an explosion.

John Vereb, Jr., 669 State Street, Perth Amboy, N. J., contractor, will erect a one-story machine shop on Cortlandt Street.

The Standard Underground Cable Co., 26 Washington Street, Perth Amboy, N. J., is building an extension to its plant.

The Downey Shipbuilding Corporation, 120 Broadway, New York, has commenced work on its proposed shipbuilding plant at Milliken, Staten Island. The company, recently organized with a capital of $10,000,000, has acquired the structural steel and iron plant of Milliken Brothers, Inc., including about 1800 ft. of water-front property, which will be used for the new works. Six ship berths will be installed, and an extensive shipbuilding plant equipped to handle an order received from the Government. Wallace Downey is head of the company.

The American Die & Tool Works, New York, has been incorporated with a capital of $25,000 to manufacture automatic machinery, dies and tools. The incorporators are G. L. Goshco, C. Wassill and J. Lucher, 2173 Pacific Street, Brooklyn.

The Super-Diesel Traction Corporation, New York, has been incorporated with a capital of $10,000 to manufacture tractors and agricultural machinery. E. A. Rumely, C. A. Lewis and R. A. Rudd, 25 City Hall Place, are the incorporators.

The E. K. Die Works, Inc., Brooklyn, N. Y., has been incorporated with a capital of $10,000 to operate a die manufacturing plant. The incorporators are C. and E. Klagges and G. J. Ellisberg, 371 West Twenty-third Street, Brooklyn.

The McCarthy Drill & Tool Corporation, New York, has been incorporated with a capital of $325,000 to manufacture drills, machinery and tools. The incorporators are C. H. McCarthy, O. S. and B. E. Mitler, 30 Church Street, New York.

The Jupiter Machine Mfg. Co., New York, has been incorporated with a capital of $50,000 to operate a plant in Richmond Borough, Staten Island, for the manufacture of punching and shearing machinery. E. A. Dippel, C. A. Stitch, and G. M. Thompson, 221 West Twenty-first Street, are the incorporators.

The Fifth Avenue Coach Co., 10 East 102nd Street, New York, has acquired property at 132nd Street and Broadway for the erection of a four-story plant for the manufacture of motor buses. The proposed plant is estimated to cost about $1,000,000. R. W. Meade is president.

The Wisconsin Brass Corporation, New York, has been incorporated with capital of $20,000, to manufacture brass and sheet tubing. The incorporators are R. Victor, A. S. Ridley and E. H. Green, 49 Wall Street.

W. M. Messersmith, Edward E. Adams and Edward W. Jansen, New York, have incorporated, in Delaware, the Superheater Co., with capital of $10,000,000, to manufacture superheaters for locomotives and marine engines. James Addison, Garden City, and J. P. Weaver, Woodhaven, L. I., are also interested.

The Tock Screw Machine Products Corporation, Flush-

ing, L. I., has been incorporated, with capital of $50,000, to manufacture automatic and screw machinery. The incorporators are C. R. and V. O. Tock and H. A. Tremaine, Flushing.

The Norwich Wire Works, Norwich, N. Y., has increased its capital from $25,000 to $100,000.

The Ross Valve Mfg. Co., Troy, N. Y., operating a plant at Sixth and Oakwood avenues, has been incorporated with capital of $40,000, to manufacture valves and other specialties. The incorporators are J. C. and A. Ross.

The Bartlett All-Steel Scythe Co., Geneva, N. Y., has increased its capital from $75,000 to $250,000.

The Curtiss Aeroplane & Motor Corporation, Buffalo, has increased its capital from $6,750,000 to $7,515,000 for extensions.

The Efficiency Gas Generator Co., Inc., Buffalo, has been incorporated, with a capital stock of $50,000, to manufacture oil gas generators. The incorporators are Garritt VanDaam, John H. Stevens and William H. Godbold, Brisbane Building, Buffalo. A manufacturing plant is to be established soon.

The Johnston Harvester Co., Batavia, N. Y. organized in 1870, has been succeeded by the Massey-Harris Harvester Co., Inc., with capitalization of $3,000,000. The greater amount of stock in the new company will go to the members of Massey-Harris Company, Ltd., Toronto, Ont., which had the controlling interest in the Johnston Harvester Co.

Gooley & Edlund, Cortland, N. Y., will build a one-story factory, 60 x 160 ft., to cost about $25,000.

The I. G. Jones Co., Inc., Syracuse, N. Y., has been incorporated, with a capital of $50,000, by I. G. Jones, H. L. Betts and F. C. Faulkner, to manufacture engines, boilers, etc.

The H. Bridgman Smith Co., Brooklyn, N. Y., does not expect to build for several years upon its recently acquired property at Kingsland, N. J.

The Corrugated Fibre Mills, Inc., New York, is the purchaser of 5 acres of land and a factory building at Mill Basin, Jamaica, L. I., and not the Paper Working Machines Co., as was recently stated. The former company has no connection with the latter.

New England

BOSTON, June 30.

Capacity production is still the order of the day in New England factories. A large volume of munitions orders is coming into New England, but, in response to the Government's request, little talk is being made about them, and no details are being published. The Fore River Shipbuilding Corporation has issued a list of machine tools of the larger sizes, amounting to about $300,000 in value, which it is reported, will be bought directly for Government account. No large lists for private account have been reported, but numerous sales of small lots are keeping the order books full.

Machine tool builders are strengthening their own equipment in all departments, and deliveries of new tools have not sufficiently improved to affect the second-hand dealers. There is a huge demand for rebuilt or good second-hand machines of the larger sizes of all types, particularly from the Middle and Far West. If the story of the travels of some of the second-hand tools that have been shipped out of Boston in the last few days could be written, it would furnish an interesting side light on the rapidly changing conditions in individual plants during wartime industry.

One of the older New England arms factories, which a few months ago was looked upon as a promising "war baby," has gone into receivers' hands, and one of the best-known lathe and planer plants has been acquired by the Robert F. Herrick interests that have taken over several other machine tool concerns since 1915.

The General Ordnance Co. of Connecticut has taken over the entire assets of the Delaware corporation of the same name. The outstanding capital is $2,100,000; the authorized capital, $3,000,000. The company, whose plant is located at Derby, Conn., manufactures the Davis non-recoil gun, for which it has large orders, and besides a general ordnance business, makes air compressors and similar machinery.

Interests representing Robert F. Herrick, Boston, have secured virtually all of the common stock of the Whitcomb-Blaisdell Machine Tool Co., Worcester, Mass., amounting to $200,000, and some of the preferred stock of which $150,000 is outstanding. Mr. Herrick is president of the Reed-Prentice Co., Worcester, and is reported to have heavy holdings of stock in many other New England industrial companies, including the Becker Milling Machine Co., Hyde Park, Mass., and the Wyman & Gordon Co., Worcester.

The Hopkins & Allen Arms Co., Norwich, Conn., has been petitioned into a receivership by the Billings & Spencer Co., Hartford, Conn. Edwin W. Higgins, vice-president of the Hopkins & Allen Arms Co.; Leon J. Garcey, comptroller of the same company; and Lewis D. Parker, Billings & Spencer Co., have been appointed receivers. John A. McGregor is president of the company, which has outstanding obligations amounting to several millions. The Hopkins & Allen Arms Co. has contracts from the Belgian Government for 140,000 Mauser rifles at $27 a rifle, and 10,000 rifles at $28 a rifle. About 11,000 rifles have been delivered. Over 1500 hands have been laid off, most of them being immediately taken over by other Connecticut munitions plants. One report states that the Belgian Government will pay a higher price for the completion of the contract if the receivers decide to continue manufacturing operations; another report is that the business will be taken over by the Colt's Patent Fire Arms Co., Hartford.

The Rockwood Sprinkler Co., Worcester, has increased its capital from $260.000 to $360,000.

The Worcester Foundry Co., Worcester, has awarded a contract for a foundry, 52 x 198 ft., at 180 Prescott Street.

The International Casket Hardware Co., Meriden, Conn., has gone into voluntary bankruptcy, with liabilities of $87,954.24, and assets of $58,275.20. The International Silver Co., Meriden, holds a chattel mortgage for $40,000.

The Koehler Mfg. Co., Marlboro, Mass., has been incorporated with authorized capital stock of $50,000, to manufacture miners' and safety lamps, igniters, etc. The directors are; H. G. Powning, president; Walter S. Field, treasurer, and H. G. Lapham.

The American Crucible Co., Boston, has been incorporated with authorized capital stock of $150,000. The directors are: Lyon Weyburn, president; William E. McKee, 504 Center Street, Newton, treasurer; and V. H. Mayr.

The Morse Twist Drill & Machine Co., New Bedford, Mass., has let a contract for an addition to its plant.

The International Engineering Works, Framingham, Mass., has been incorporated with authorized capital stock of $500,000. The directors are William B. Hamlin, president; Leland Wells Pollock, Wakefield, treasurer; and Jane A. Hay.

The Boston Starter & Specialty Co., Boston, has been incorporated with authorized capital stock of $10,000. The directors are E. P. Thompson, president; Edward C. Ramsdell, 44 Riverview Road, treasurer; and R. S. Almeder.

The Gildersleeve Ship Construction Co., Portland, Conn., has been incorporated with authorized capital stock of $100,000, by Alfred Gildersleeve and Oliver Gildersleeve, Jr., town of Gildersleeve, and B. C. Stone, Middletown.

The Aerocruiser Corporation of America, Augusta, Me., authorized capital $1,000,000, has been incorporated. E. M. Leavitt, Augusta, is president and treasurer.

The Wright Wire Co., Worcester, has awarded a contract for new buildings which will practically double the capacity of its Palmer, Mass., plant. Besides an annealing shop, an addition to the wire rope mill, and a lime storage building, 30 workmen's homes will be erected.

Philadelphia

PHILADELPHIA, July 2.

The American Metal Co., Stenton Avenue and Rockland Street, Philadelphia, has awarded a contract for the construction of a two-story brick addition to its plant, about 65 x 325 ft., to cost $90,000.

The De Long Hook & Eye Co., Broad and Wallace streets, Philadelphia, manufacturer of metal specialties, is having plans prepared for a four-story, reinforced-concrete plant, 80 x 240 ft., at Twenty-first and Clearfield Streets. A one-story power plant will also be constructed.

The Electric Storage Battery Co., Nineteenth Street and Allegheny Avenue, Philadelphia, manufacturer of storage batteries and electrical supplies, will erect two one-story additions to its plant.

The Philadelphia Drying Machine Co., Westmoreland Avenue and Stokley Street, Philadelphia, has awarded a contract for the construction of a one-story shop and power plant addition, about 220 x 220 ft., to cost $40,000.

The Midvale Steel Co., Widener Building, Philadelphia, will build a two-story pattern and wood-working shop, 46 x 130 ft., at its Nicetown works.

The H. C. Gray Co., Philadelphia, has acquired property at 1322-26 Mount Vernon Avenue, as a site for a

machine plant, to specialize in automobile work, and to cost about $15,000.

William Sellers & Co., 1600 Hamilton St., Philadelphia, manufacturers of machinery, will erect a one-story extension, 14 x 20 ft., at Sixteenth and Hamilton streets.

The Biddle Motor Car Co., Philadelphia, has increased its capital from $100,000 to $250,000 for proposed expansion.

The Bureau of Yards and Docks, Navy Department, Washington, is taking bids up to July 27, for three one and two-story, brick and reinforced concrete shop additions at the Frankford Arsenal, Philadelphia.

Henry Potts & Co., Real Estate Trust Building, Philadelphia, will purchase a number of 200-hp. horizontal return tubular boilers, and 100-hp. locomotive boilers.

The Montgomery Iron & Steel Co., 1832 North Ninth Street, Philadelphia, manufacturer of structural shapes and other iron and steel products, will construct a new shop to cost about $5,000.

The William Cramp & Sons Ship & Engine Building Co., Beach and Ball streets, Philadelphia, has filed plans for the erection of a one-story addition to its works, at Almond Street and Boston Avenue.

The Ridge Avenue Iron & Metal Co., 1016 Ridge Avenue, Philadelphia, will make extensions in its plant at 328-30 Noble Street, to cost about $3,000.

The Pennsylvania Forge Co., Wakeling and Bermuda streets, Philadelphia, manufacturer of iron and steel forgings, has secured about 25 acres at Jenks and Bath streets, for future extension. Charles C. Davis is president.

The Electric Cushion Armor Co., Camden, N. J., has been incorporated with a capital of $125,000 to manufacture machinery and a special protective device for ships. George Brooks, Samuel Hough, and William H. Dilmore, Camden, are the incorporators.

The Curtiss Aeroplane & Motor Corporation, Buffalo, N. Y., has acquired property at Caspian and Maine avenues, Atlantic City, N. J., for a plant. The initial structure, to consists of work shops and assembling department, will be one story, 100 x 200 ft., and cost about $20,000.

The Edgemont Iron Works, Edgemont, Pa., is taking bids for the erection of a two-story reinforced concrete addition, 32 x 80 ft.

The Reading Iron Co., Baer Building, Reading, Pa., manufacturer of pipes, tubing, iron and steel forgings, etc., is building an addition to its forge shop at the North Reading works.

The Valley Iron Works, 233 West Street, Williamsport, Pa., specializing in the manufacture of stationary engines, has awarded a contract for the erection of a two-story addition, about 30 x 60 ft.

The Home Torpedo Co., Bradford, Pa., has been incorporated in Delaware with a capital of $25,000, to operate a plant for the manufacture of torpedoes and auxiliary specialties. R. S. Pringle, Carl K. Dresser and H. M. Wick, Bradford, are the incorporators.

The International Money Machine Co., Terre Haute, Ind., is arranging for the immediate occupancy and operation of its new plant at Reading, Pa. It is said that the company will move considerable machinery from its Terre Haute works for installation at the new factory and purchase other equipment.

The Autocar Co., Lancaster Avenue, Ardmore, Pa., manufacturer of automobiles and parts, is having plans prepared for a five-story reinforced-concrete addition.

Clarence Coughlin, Wilkes-Barre, Pa., and associates, have incorporated in Delaware the Mann Metals & Iron Co., with capital of $20,000, to operate a plant in the vicinity of Nanticoke. Other incorporators are Morris Mann, Nanticoke, and Frederick Streng, Laurel Run.

The Jeanesville Iron Works, Hazleton, Pa., is making extensive improvements in its plant and machinery to provide for the manufacture of shells. The equipment will be remodeled and rebuilt to handle the special work.

The Maccar Truck Co., Cliff Street, Scranton, Pa., manufacturer of automobile trucks and parts, is having plans prepared for a one-story addition, about 40 x 65 ft.

The C. Hammond & Son Co., Ogontz, Pa., has been incorporated with a capital stock of $10,000 to manufacture edge tools and hammers. The incorporators are Charles H. Culin, Ogontz; Bertha Marx, Philadelphia, and James C. Jones, 1531 North Fifteenth Street, Philadelphia.

The Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa., manufacturer of pipe, boilers, tanks, etc., has acquired a tract of about five acres, adjoining its plant near Maclay Street and the Paxton Canal, to be used for future extensions.

Baltimore

BALTIMORE, MD., July 2.

The McNamara Brothers Co., Inc., Ranstead's Wharf, Baltimore, manufacturer of tanks and boilers, has commissioned Herman F. Doehiman, 1101 American Building, to prepare plans for a steel plate tank factory, a boiler plant, and an office building to be erected at Bush Street and the Baltimore & Ohio Railroad.

The Crown Cork & Seal Co., 1511 Guilford Avenue, Baltimore, John M. Hood, president, has awarded a contract for the construction of an additional factory at Canton, Md.

The Baltimore Copper Smelting & Rolling Co., Baltimore, recently incorporated with a capital of $100,000 to manufacture copper and metal products, has filed articles in New York to operate in that district. W. C. Dickey, 519 West Twenty-third Street, New York, is local representative.

The Chesapeake Iron Works, Baltimore, has commenced the erection of an addition, 45 x 90 ft., for the manufacture of electric traveling cranes. R. C. Sandlass is general manager.

The Charlotte Truck & Tractor Co., Charlotte, N. C., has been incorporated with a capital of $50,000. John B. Ross, B. A. Hawkins, and G. E. Dennis are the incorporators.

The Chrisman Foundry Co., Westover, W. Va., has been incorporated with a capital of $100,000. The incorporators are A. H. McBee, Frank Fox, and E. F. Beall, all of Morgantown.

The Chesapeake Iron Works, Baltimore, Md., is now engaged in the manufacture of electric traveling cranes of three-motor, direct-current type of from 5 to 30-tons capacity and up to 60-tons, five-motor double trolley, any span. Fairly early deliveries are being promised.

Chicago

CHICAGO, July 2.

No developments of a stirring nature are to be found in this market. Action on the Chicago & Northwestern list was expected this week, but it is generally reported that nothing has been done. Inquiries for heavy machines have been received from Pacific coast shipyards, and a few machines have been shipped to Atlantic coast yards. Business on wareroom floors has been a little more brisk, and June closed better than was expected.

Except for the large orders placed a few weeks ago for munitions-making equipment, there has been little activity of that character in this territory. An Indianapolis company which successfully handled a foreign contract for shell parts is holding its equipment in the hope of getting a similar order from the United States Government. A large Milwaukee company that made a great many shells is also awaiting a Government order. It is expected that the Nordyke & Marmon Co., Inc., Indianapolis, will buy some equipment in this city for the manufacture of airplane engines, but so far they have made only tentative inquiry.

The price advances on radial drills and planing machines, referred to a week ago, apply to practically all machines of their kind.

Armour & Co., Chicago, have prepared plans for a two-story reinforced concrete mechanical shop, 110 x 304 ft., on West Thirty-ninth Street and Packers' Avenue, Chicago. The estimated cost is $70,000.

Contracts have been awarded for the construction of a three-story, heavy mill construction factory, 100 x 175 ft., at 3548 to 3558 Shields Avenue, Chicago, for the Peacock Estate, at an estimated cost of $100,000. The building has been leased, but the name of the lessee has not been announced.

The City Council, Chicago, has passed several ordinances which will give the city riparian rights of the shore owners on Lake Calumet, in exchange for submerged lands which will lead to the development of the lake as an inland harbor.

The Illinois Engineering Co., Chicago, has purchased a building at the northeast corner of Racine Avenue and Twenty-first Street, which will be used for the manufacture of vapor and vacuum heating equipment.

The Krom Nik Gear Co. has been incorporated, with a capital stock of $50,000, to manufacture gears of alloy steel. Among the incorporators are Carl T. Murray and Edward McK. O'Bryan, 39 South LaSalle Street, Chicago. One of those actively interested is J. W. Fulton, 901 South Michigan Avenue, Chicago.

Julian Grear, Metropolis, Ill., is completing the erecting of a one-story brick machine shop, 50 x 100 ft., to replace a building destroyed by a storm last spring.

Work will soon be started on the construction of a plant for the Harrison Steel Castings Co., Murphysboro, Ill. The contract calls for the delivery of the fabricated steel by July 1. J. W. Harrison is president.

Col. G. W. Burr, commandant of the Rock Island Arsenal, Rock Island, Ill., recently returned from Washington, D. C., where he discussed details of contracts for the construction of a caisson factory to cost $2,250,000. He was in conference with General Crozier, Chief of Ordnance.

Extensive improvements are being made to the plant of the Mayer Brothers Co., Mankato, Minn. An extension, 36 x 116 ft., is being added to the foundry, and to the machine shop an addition 40 x 80 ft., both of brick and concrete, to cost about $3,000 respectively. The company manufactures motor-driven power hammers, and has just completed an order for the Government.

The East Chicago Foundry Co., East Chicago, Ind., has been incorporated with a capital stock of $30,000. The incorporators are H. C. Stuart, H. S. Evans, P. S. Graver and W. F. Graver.

The Racine Metal Cutting Machine Co., Racine, Wis., has been incorporated with a capital stock of $5,000 by J. E. Pritchard, H. K. Pritchard and L. W. Klinkert.

The Farm Power Equipment Co., Chicago, has been incorporated in Delaware with capital of $2,500,000, to manufacture gas engines, farm tractors, etc. The incorporators are W. R. Donaldson and J. E. Harper, Chicago; and James H. Aye, Oak Park, Ill.

The 3P Auto Tractor Co., Davenport, Iowa, recently organized with a capital stock of $50,000 to manufacture a tractor attachment for Ford cars, is installing the necessary equipment and within a few weeks expects to be turning out the finished attachments.

The Landover Autotruck Co., Chicago, a Delaware incorporation, has increased its capital stock from $300,000 to $1,500,000.

Milwaukee

MILWAUKEE, July 2.

A feature of the Milwaukee local machine-tool industry the past week has been the general receipt of inquiries for milling machines from Government arsenals and private ordnance makers closely affiliated with Federal interests. This is the first instance of prospective Government business to be noted here. Bookings from the usual domestic sources the past week have been maintained at the average of the last two years or more, but are still confined to single machines or small lots. Orders are of a scattering nature and come from the Pacific coast and widely distributed points. One large interest looks upon the proposed prohibition of exports with much favor, inasmuch as such action would relieve to some extent the sold-up condition on numerous types of tools which are badly needed by domestic buyers.

The demand for steam generating equipment continues good, and one important hydroelectric project is in prospect in Wisconsin this year.

The foundry trade shows great activity, and further announcements of extensions of plants have recently been made in this district.

The Globe Seamless Tubes Co., Milwaukee, is contemplating extensions and improvements involving, it is said, approximately $100,000. A number of additions, including one to the tube mill, are contemplated, and the entire plant will be overhauled and new equipment installed. The project has not fully matured, and an engineer has not yet been selected. F. J. O'Brien is general manager.

The Lasure Clutch Co., Madison, Wis., maker of transmission devices for gas engines, has decided to move its plant and headquarters to Watertown, Wis., where manufacturing quarters have been provided. The company is being reincorporated under the style of the Lasure Friction Clutch Co. of Watertown, with a capital stock of $60,000, of which $20,000 will be preferred and $40,000 common stock. The equipment is being moved from Madison, and the company will resume operations at Watertown about July 10 or 15.

The Harley-Davidson Motor Co., Milwaukee, has awarded contracts for the erection of a one-story fireproof addition, 35 x 75 ft., to its main testing shop at Thirty-eighth and Cold Spring Avenues.

The Western Fixture Co., Milwaukee, which recently completed the erection of a new machine shop, welding and cutting plant, and factory at 1402-1406 Weil Street, has changed its name to Milwaukee Cylinder Grinding Co. It will specialize in gas engine repairs, but will continue to manufacture metal display fixtures. Felix Biegelaar is general manager.

The Belle City Mfg. Co., Racine, Wis., maker of agricultural implements and farm machinery, has awarded contracts for the erection of a brick and steel foundry and machine-shop addition, 50 x 100 ft.

The Ransom Mfg. Co., Oshkosh, Wis., maker of grinding machines and other tools, has awarded contracts for the erection of a shop addition.

The Peninsular Power Co., Chicago, and Iron Mountain, Mich., has been granted permission to issue $500,000 of new 7 per cent preferred stock, the proceeds to be used for the construction of a hydro-electric plant on the Brule River, in Florence County, Wis., near Florence.

The National Pie Crust Machinery Co., Milwaukee, has been incorporated with a capital stock of $100,000, to manufacture electrical baking machinery. For the present the machines will be manufactured under contract by the Andrew Motor Mfg. Co., 834 Muskego Avenue, Milwaukee. The officers are: President, A. L. Fierlein, Chicago; vice-president, Leland Wilcox; secretary-treasurer, A. C. White, both of Des Moines, Iowa.

The Geuder, Paeschke & Frey Co., Milwaukee, is to erect a two-story brick and mill addition, 56 x 125 ft., to its sheet metal and enameled ware plant at Fifteenth Street and St. Paul Avenue.

The Stalwart Mfg. Co., Milwaukee, has been incorporated with a capital stock of $2,000 to manufacture patented devices. The corporators are Harry S., Theodore, and Herbert Schroeder; Frank A. Gauger, Julius F. Rutz and Max Fiedler.

The Geuder, Paeschke & Frey Co., Milwaukee, manufacturer of tin and sheet metal ware and stampings, has awarded contracts for the erection of a two-story factory addition, 55 x 137 ft., to cost $30,000 with equipment. The work is in charge of Klug & Smith, consulting engineers, Mack Block, Milwaukee.

The Line Material Co., South Milwaukee, Wis., maker of supplies and materials for electric power, telephone and transmission lines, will manufacture a special automatic fuse plug. J. P. Arndt, formerly of Neenah, Wis., has joined the company.

Cleveland

CLEVELAND, July 2.

The demand for machine tools for Government requirements is increasing, and a number of inquiries for fair-size lots of machines are pending from northern Ohio manufacturers, who either have taken or are figuring on Government orders. The McMyler-Interstate Co., Cleveland, has taken a large order for forgings for 3-in. guns, and is in the market for equipment for rough machine work on the casings and tubes. The Imperial Munition Board of Canada has come to the aid of some Central Western and Canadian manufacturers who have orders for engine parts of the English type of airplane motor, and has succeeded in getting about a dozen machines. A number of American engineers are understood to be working on the development of new types of airplane motors that will withstand the service required at the front.

Motor truck makers and shipyards are calling for additional property for a factory at Detroit Avenue and West active. There is a steady call for small lots of automatic screw machinery, but no large inquiries are pending. The demand for cranes continues heavy. A Government order for four large cranes for the Pacific coast has been placed with a Cleveland manufacturer.

The Ohio Blower Co., Cleveland, has acquired additional property for a factory at Detroit Avenue and West Ninety-third Street, adjoining the first unit of its new four-story building, 60 x 200 ft., it has erected for the manufacture of automobile bodies.

The Warner & Swasey Co., Cleveland, has placed a contract for a one-story machine shop, 200 x 200 ft., on the site which it recently purchased.

The Kremer-Cummins Machine Co., Cleveland, has been incorporated with capital stock of $15,000 by Robert W. Kremer, Robert R. Cummins and others.

The American Steel & Wire Co., Cleveland, has taken out a permit for a coal storage and coal handling plant and a one-story mill building.

The Trelectric Machinery Co., Cleveland, has been organized with capital stock of $25,000 by William C. Tregonning, J. A. Boyden, H. N. Pettibone and others, to manufacture electrical appliances.

The Fulton-Pit Car & Mfg. Co., Canal Fulton, Ohio, has purchased the plant of the Kenova Mine Car Co., Kenova, W. Va., now under construction.

The Taylor Coupler & Castings Co., Toledo, is completing a factory building, 60 x 125 ft., and plans to erect another soon.

The plant of the Rex File & Saw Co., Newcomerstown, Ohio, recently burned, will be rebuilt by Heller Brothers, Newark, N. J., who recently purchased the business.

The plant of the Seneca Chain Co., Kent, Ohio, has been purchased by the Stewart Electric Co., Cincinnati, from Fishel & Marks, Cleveland. No announcement has been made as to the disposition of the plant.

The Greene Aeronautical Co., Elyria, Ohio, has been organized to develop a mechanical device for controlling the movement of airplanes, and is purchasing some machinery for an experimental plant which it has opened in charge of Otto M. Greene, the company's engineer.

The Zahner Metal Sash & Door Co., Canton, Ohio, has increased its capital stock from $600,000 to $2,000,000. This, it is stated, has been necessitated by the growth of business and additions required.

The Selas Co., Canton, Ohio, is planning to move its branch plant in Canton to New York, where it will be combined with its main plant.

The Clauss Shear Co., Fremont, Ohio, has commenced the erection of a one-story concrete addition, 40 x 160 ft.

The J. H. R. Products Co., Willoughby, Ohio, will erect a new plant, 75 x 200 ft., for the manufacture of chemicals.

The Keough Automobile Direction Indicator Co., Mansfield, Ohio, has been incorporated with a capital stock of $15,000 by Z. Keough and others, and plans to establish a plant for the manufacture of an electrical operated device.

Cincinnati

CINCINNATI, July 2.

Prompt deliveries can now be made on some sizes of lathes, as well as screw machines. The demand for shaping machines is very good, as these are needed by makers of war munitions for making dies. There is also a heavy call for boring and turning mills, principally from rubber tire manufacturers.

Quite a number of local sub-contracts for munitions have been let, in which may be included small parts for submarines. A southern Ohio rolling mill has a large contract for rolling and forging shell rounds for the Government, and at Dayton, Ohio, several firms have large contracts for shell work, some of which is now under way. Very little new equipment is being bought by the Dayton companies, as their plants were previously equipped to manufacture munitions for the Allies.

Labor troubles in this vicinity are mostly confined to Hamilton, Ohio, where three paper manufacturing plants are closed. A large foundry in that city, whose molders struck three weeks ago for recognition of the union, is still idle.

The Ideal Concrete Machinery Co., Cincinnati, has been incorporated with $140,000 capital stock by N. H. Beckman and others. It will add equipment to its plant on Colerain Avenue.

The Hamilton Machine Tool Co., Hamilton, Ohio, will build an addition to its plant, 40 x 200 ft., of brick and steel, which it expects to have in operation before Sept. 1. Most of the equipment will be of the company's own manufacture.

The Columbia Machine Tool Co., Hamilton, Ohio, which recently acquired the business of the Ceramic Machinery Co., will manufacture machine tools, making a specialty of shaping machines. A plant, 66 x 190 ft., of brick and steel, is being erected, and will be in operation at an early date. E. S. Rich, formerly with the Hamilton Machine Tool Co., is secretary.

The Dayton-Wright Aeroplane Co., Dayton, Ohio, has acquired the new plant of the Domestic Engineering Co., at Moraine City, and will equip it for the manufacture of aeroplanes. The building is 270 x 1000 ft., of concrete and steel.

The Kidder-Oswald Co. and the Dayton Adding Machine & Time Lock Co., Dayton, whose merger was effected several weeks ago, contemplate enlarging their plants.

Lee A. Jones, Dayton, has purchased the plant of the Vulcan Tool Co., Dayton, and will enlarge it at an early date. It makes a specialty of tools and screw machine products.

The Buckeye Tool & Machine Co., New Philadelphia, Ohio, has been incorporated with $70,000 capital stock to manufacture milling machines and operate a jobbing machine shop. The company is in the market for machine shop equipment, including lathes, planers, shapers, screw machines, etc. The officers are: President, T. B. Stroup; vice-president and general manager, H. B. Horrold; treasurer, E. R. Mowery, and secretary, R. O. Finger.

The Ironton Fire Brick Co., Ironton, Ohio, has been incorporated with $20,000 capital stock, and is establishing a plant for the manufacture of fire brick. The officers are: President, Col. H. A. Marting of the Marting Iron & Steel Co.; vice-president, Albert C. Steece, president, Ironton Portland Cement Co., and secretary, treasurer and general manager, Claude C. Hayward, an expert fire brick manufacturer. Practically all of the equipment has been purchased, and the company expects to have its kilns in operation before Aug. 1.

The Dayton Malleable Iron Company, Dayton, is making a brick and steel addition, 110 x 160 ft., to its plant at Ironton. All equipment is bought through the Dayton office.

The Pattin Brothers Co., Marietta, Ohio, will rebuild its machine shop recently damaged by fire.

The Ashland Steel Co., Ashland, Ky., shut down July 1 for two weeks in order to make general repairs and install new equipment.

The Patent Vulcanite Roofing Co., Anderson, Ind., will operate a machine shop in connection with its new plant.

The Star Foundry Co., Covington, Ky., has increased its capital stock from $20,000 to $40,000. No additions to its plant are contemplated at present.

The Crown Hardware Mfg. Co., Dayton, Ohio, has increased its capital stock from $60,000 to $150,000.

The Kramer Brothers Foundry Co., Dayton, will erect an addition to its plant for office and warehouse purposes.

The Jaeger Machine Co., Columbus, Ohio, is moving into its new plant on Dublin Avenue.

The Pennsylvania Railroad Co. announces it will make extensive additions to its shops at Columbus. It is reported that the improvements will cost $1,000,000.

The Central South

LOUISVILLE, July 2.

Availability of materials is measuring the business in iron and steel lines at this time. High prices are tending also to hold purchases down although inquiries are numerous. The demand for casing and wire rope from the oil fields is very large and insistent. Electric motors continue in good demand. The labor situation is improving.

The Star Foundry Co., Covington, Ky., has increased its capital from $20,000 to $40,000.

The Diamond Block Coal Co., Drakesboro, Ky., is in the market for a second hand air compressor, direct connected, with capacity of 200 to 250 cu. ft. per min.

The Louisville, Indianapolis & Chicago Railroad Co. will improve its yards and shops at Lafayette, Ind., at a cost of $150,000.

The Madisonville Gin Co., Madisonville, Tenn., has been incorporated with capital of $10,000 by A. S. Jenkins, H. E. Magill, W. H. McCroskey and others to build cotton gins

John N. Adams, Charleston, Tenn., will purchase machinery equipment for a hydro-electric plant of 1800 hp.

The Angel Mfg. Co., Kingston, Tenn., has been incorporated with a capital stock of $4,000 by E. C. Angel, G. T. Cunningham, W. P. McDonald and others to manufacture automobile vaporizers and other automobile accessories.

The Pulaski Electric & Water Co., Chattanooga, Tenn., has been incorporated with capital stock of $50,000, proposing to develop water power sites and build hydro-electric plants. George B. Adams, C. O. Lindsey, G. W. Erwin and others are the incorporators.

The Clinchfield Hydro-Electric Power Co., Pressmen's Home, Tenn., has been incorporated with capital stock of $50,000 by John A. Thompson, E. K. Baldwin, M. P. Beasley, L. D. Carmack and others to develop water-power and construct hydroelectric plants.

The Trans-Mo Truck Co., Nashville, Tenn., has been incorporated with a capital stock of $20,000, to build automobile trucks. The incorporators are S. O. Edwards, Charles H. Simpson, Anthony Sudekum and others.

The Special Ford Starter Co., 433 Jefferson Street, Paducah, Ky., is planning for the immediate establishment of a plant for the manufacture of automobile starters. It is now purchasing equipment.

The Union Motor Co., Memphis, Tenn., has increased its capital stock from $40,000 to $80,000.

The Dyersburg Cotton Compress Co., Dyersburg, Tenn., has increased its capital stock from $50,000 to $75,000.

St. Louis

ST. LOUIS, July 2.

The Met-Sto-Bat Metallic Storage Battery Co., St. Louis, has been incorporated with capital stock of $50,000 by Henry Handschlegel, A. I. Jacob, John K. Sterling and others, to manufacture storage batteries.

The Primo Light & Mfg. Co., St. Louis, has been incorporated with capital stock of $50,000 by Henry C. Finck, Leo J. Bayer and Henry H. Oberschelp, to manufacture heating, lighting and power devices.

The Big Lake Drainage District, Charleston, Mo., will proceed with about $140,000 of drainage work for which considerable dredging equipment will be required. The Berthe Engineering Co., Charleston, is in charge.

The Hercules Bed Spring Co., Kansas City, Mo., a subsidiary of the Cleveland Wire Springs Co., Cleveland, Ohio, has acquired a building at 1323 West Ninth Street for manufacturing purposes. C. H. Minturn is manager.

The Spring Wheel Company, 730 Trendley Avenue, St. Louis, is in the market for lathes, bolt cutters, pressers, boilers, electric motors, etc.

The Oklahoma Gas & Electric Co., Oklahoma City, Okla., has increased its capitalization from $5,000,0000 to $50,000,000 and will increase its power production at Muskogee and elsewhere, also build and acquire plants to supply power and light. The Byllesby interests control the company.

The Ardmore Wrench Co., Ardmore, Okla., incorporated with capital stock of $40,000 by James B. Coffey, J. M. Patrick and others, will manufacture wrenches.

The Monroe Power Screw Driver Co., Shawnee, Okla., incorporated with a capital stock of $25,000 by George B. Dowdy, D. C. Monroe and H. B. House, will manufacture mechanical devices.

The Holtby Automatic Oiler Co., Mangum, Okla., has been incorporated with capital stock of $25,000 by W. H. Holtby, Coke Witt and B. V. Stover.

The Planters Gin Co., Drew, Miss., has been incorporated with capital stock of $27,500 by J. C. Newton, S. P. Rich and A. R. Stokely and will equip a cotton ginnery.

The Black Bayou Drainage District, O. C. Kulicka secretary, Greenville, Miss., is in the market for three drag line machines, seven floating dipper dredges and other equipment. The Morgan Engineering Co., Goodwyn Institute Building, Memphis, Tenn., is in charge.

S. J. Stewart, 312 Carondelet Street, New Orleans, La., is reported in the market for lathes, punch press, rotary shears, shapers and other equipment.

The Machinery Exchange Co., New Orleans, is in the market for log loaders, locomotives for logging roads and other machinery.

The Ged Iron Works, Ged, La., has been incorporated with capital stock of $27,500 by C. K. Gribble, S. J. McGee and T. T. Damon to equip an iron works and machine shop.

Texas

AUSTIN, TEX., June 30.

An unusual amount of activity is reported in enlarging industrial plants and constructing new ones, with the demand for machinery and equipment exceptionally good. The call for small tools is also satisfactory.

The San Antonio Traction Co. and the San Antonio Gas & Electric Co. are to be merged into a new corporation, to be known as the San Antonio Electric Co. It will have a capital stock of $4,700,000, and plans to construct an interurban electric line between San Antonio and Austin, a distance of 82 miles.

The Farmers Gin Co. will build a cotton gin at Cleburne to cost $15,000. J. M. Helsley is a stockholder.

McBride & Law, Beaumont, shipbuilders, have secured a contract from the Government to construct four wooden ship hulls, to cost approximately $200,000 each.

The Universal Shipbuilding Co., which is building a shipyard at Houston, has secured a contract from the Government for the construction of 12 wooden ships. B. L. Waggoman, Fort Worth, is head of the company.

The National Shipbuilding Co., Orange, has been incorporated and will construct a shipbuilding plant at a cost of about $100,000. J. M. Dullahan is a stockholder.

The Hughes Tool Co. has purchased an 8-acre site near Houston, upon which it will construct a plant for the manufacture of tools.

The Pacific Gas & Electric Co., Phoenix, Ariz., will issue $555,000 of bonds, the proceeds of which will be used in enlarging its electric power plant and making other improvements.

California

LOS ANGELES, June 26.

The Crellin Machine Co., 121 West Railroad Street, Los Angeles, has awarded a contract for the erection of a one-story machine shop addition, 30 x 100 ft., on Railroad Street. The company specializes in the manufacture of tools and dies.

The California Aircraft Corporation, 2108 West Seventh Street, Los Angeles, has been incorporated with a capital of $250,000 to operate a plant for the manufacture of aeroplanes and other aircraft. George E. Moore, 738 South Coronado Street; Robert L. Bailey, 832 South Hope Street; and Bert Gilhousen, 1207 Ardmore Avenue, are the incorporators.

The Little Giant Heating & Lighting Co., Los Angeles, has been incorporated with a capital of $100,000, to manufacture heating and lighting systems. A. L. Davison, 712 H. W. Hellman Building; D. S. Collins, 4942 Lynn Street; and S. V. Halstead, 629 South Flower Street, are the incorporators.

The Haft Fuel Machine Corporation, O. T. Johnson Building, Los Angeles, manufacturer of fuel burning machinery, will build a one-story shop extension on West Pico Street, about 30 x 50 ft.

Throop College, Pasadena, Cal., will build a shop extension to its mechanical engineering laboratory, to be used for oil and gas engine work, with installation of equipment for practical instruction, including air compressors.

The City Council, Coalinga, Cal., is planning for the construction of a municipal ice-manufacturing and cold storage plant on property recently acquired.

The Southern Sierras Power Co., Riverside, Cal., has been granted permission to build an electric generating plant at Blythe. The company plans for the installation of a steam operated plant for initial service.

The Pacific Northwest

SEATTLE, WASH., June 26.

The lumber industry in the Pacific Northwest seems to be assured for the next 18 months. At least 100 ships, and possibly 150, will be built on this coast the remainder of this year and in 1918. Each ship will require close to 1,700,000 ft. of lumber. To meet the Government's specifications it will be necessary to cut 840,000,000 ft. and mills will be rushed to capacity. Statistics show orders far under normal and below production, while shipments exceed production, indicating that the immense stocks piled up in the early months of the year are being moved and that the car shortage is at an end for the time being.

Recent figures show that the shipbuilding payroll in Seattle is more than $1,200,000 monthly, compared with $200,000 a month of a year ago. The most significant development has been the organization of the large number of plants, subsidiary to shipbuilding, and which are now getting the business formerly given to Eastern companies. There are now 10,500 workers employed in Seattle shipbuilding plants and this force will be materially added to in the near future.

Figures recently compiled show that a total area of 336 acres of the waterfront of Seattle, valued at $4,635,000, has recently been acquired by manufacturing companies, and in practically every instance the purchase presages the establishment of another industrial plant in that section.

F. Rogers and others have leased waterfront at Astoria, Ore., and will install a wooden shipbuilding plant with four ways.

The port of Astoria commission, Astoria, Ore., will install a coal and general freight handling crane at a cost of $18,000.

The Seattle Construction & Dry Dock Co., Seattle, has contracted to build for the United States Shipping Board 10 one-type 7500-ton steel ships, each to be 396 ft. long, 56 ft. beam and 29 ft. 3 in. depth of hold.

The Union Iron Works has leased 600 ft. of water front at Juneau, Alaska, on which ways will be built for marine repairing.

The Department of Public Works, Seattle, Wash., will install four 10-ton hammerhead shipbuilding cranes at the new graving dock.

The Reedsport-Oregon Shipbuilding Co., Portland, has been incorporated with a capital stock of $25,000 by W. H. Curtis, Fred Spoerl and C. V. Cooper.

The Holstrom Shipbuilding Co., Seattle, has been incorporated with a capital stock of $250,000 by P. C. Shanstrom, G. C. Wheeler and Charles S. Gleason.

The Portland Galvanizing Works, Portland, has been incorporated with a capital stock of $25,000 by Martin Leiser, J. Supple and Fred A. Ballin.

Sanderson & Porter, New York, who hold contracts for 10 Government vessels, have leased a site of 20 acres at Raymond, Wash., and 10 ways will be constructed immediately. The first vessel will be launched April, 1918, and one every fifteen days thereafter.

The Stolt Nielson Steamship Co., Seattle, has been incorporated by representatives of the B. Stolt Neilson Co. of Norway, with a capital stock of $3,000,000.

The National Shipbuilding Co., Seattle, has been reorganized with O. D. Trieber president. The company has contracts for the construction of eight wooden ships and is now constructing two five-mast auxiliary schooners of 3500 tons.

The Phoenix Gas Engine Mfg. Co., Seattle, has been incorporated for $800,000 by C. B. Williams, A. E. Forsyth, G. W. Kemp and others.

The Puget Sound Corporation, Olympia, Wash., has been incorporated with a capital of $5,000,000, to build steel ships and machinery, own and operate power plants and engage in general manufacturing business. The incorporators are A. P. Gilles, Olympia, and A. C. Lindsay, P. H. Hoag and A. C. Phillips, all of Chicago.

The Marine Pipe & Machinery Co., Seattle, has awarded a contract for the construction of a two-story foundry and machine shop to cost $15,000.

The Hoods Mfg. Co., Seattle, has let contract for a foundry, 70 x 100 ft.

The Portland Galvanizing Works, Portland, Martin Leiser, owner, plans to immediately double the capacity of its plant. New machinery will be installed and the improvements will cost $25,000.

The Dominion Products Co., New Westminster, B. C., has completed plans for construction of an addition, 115 x 150 ft., to its plant at New Westminster. The equipment to be installed includes fans and motors, four mechanical stokers and equipment and three high pressure boilers, 18 ft. x 72 in.

The Idaho Power Co., Nampa, Idaho, plans the installation of six new units to furnish 8000 hp. at the Swan Falls plant on Snake River at an expenditure of more than $500,000.

The Kruse & Banks Shipyard, North Bend, Ore., plan to construct five vessels for the jitney fleet. Several ways will be added to the yards.

The Deninie Aircraft Co., Spokane, Wash., has leased three brick buildings and five acres of ground and will immediately begin the manufacture of 10 standard tractor airplanes for the Government. O. H. Carver is general manager. The plant will have capacity of 30 machines a year, each costing, fully equipped, $15,000.

The Oregon Navigation Co., Portland, Ore., has been organized by George E. Hardy & Co. with a capital stock of $250,000. It will construct sailing vessels costing approximately $120,000 each.

Canada

TORONTO, July 2.

The Acadia Gas Engines, Ltd., Bridgewater, N. S., organized to take over the Acadia Gas Engines Co., is issuing bonds, amounting to $75,000, the proceeds to be used for making additions to the plant and to purchase equipment. It also proposes to manufacture new lines.

The Canadian Copper Co., Copper Cliff, Ont., will be in the market for two or three centrifugal pumps for its sewage pumping station being erected at a cost of $20,000.

John Watson, Fergus, Ont., will erect a sawmill to cost $10,000 to relace the one recently destroyed by fire. New machinery and equipment will be required.

The Canada Screw Co., 334 Wellington Street, West, Hamilton, Ont., purposes to build an addition to its factory at a cost of $100,000.

The Atlas Films of Canada, Ltd., Toronto, has been incorporated with a capital stock of $75,000 by Frank Regan, Daniel P. Kelly, 145 Brunswick Avenue; John Callahan and others, to manufacture motion picture machines, etc.

The Sterling Iron & Metals, Ltd., Toronto, has been incorporated with a capital stock of $40,000 by Lionel Davis, 82 Kendal Avenue; Myrtle Young, Ethel Frise and others, to manufacture iron, steel, tools, machinery, etc.

The Mono Linó Typesetting Co., Ltd., Toronto, has been incorporated with a capital stock of $40,000 by William F. Addison, 152 Pearl Street; Henry C. Mainprice, William R. Adamson and others, to manufacture type, typesetting machines, tools, etc.

The Reeder-Weeks Mfg. Co., Ltd., Hamilton, has been incorporated with a capital stock of $40,000 by Robert Weeks, Lewis P. Reeder, William Lees and others, to manufacture automobile tire chains, machinery, tools, and implements.

Beatty Brothers, York Street, London, Ont., proposes to build a factory and boiler house at a cost of $50,000.

The Booth-Coulter Copper & Brass Co., 115 Sumach Street, Toronto, is building an addition to its plant to cost $7,000.

The John Morrow Screw & Nut Co., Hamilton, is building an addition to its plant to cost $30,000.

The testing department of the Canadian General Electric Co., Peterboro, Ont., was damaged by fire, with a loss of $10,000.

The Pennsylvania Coal & Transportation Co., Ltd., Montreal, has been incorporated with a capital stock of $2,000,000, by Gerald A. Coughlin, Francis K. Bush, George R. Drennan and others, to build ships, engines, boilers, machinery, etc.

The Electric Steel & Engineering, Ltd., Welland, Ont., has been incorporated with a capital stock of $2,000,000 by James S. Lovell, 119 Madison Avenue; Charles D. Magee, 300 St. George Street; William Bain, 189 College Street, and others, all of Toronto, to manufacture iron, steel, machinery, tools, etc.

Slater & Barnard, Ltd., Hamilton, have been incorporated with a capital stock of $1,000,000 by Norman Slater, Thomas H. Barnard, James W. King and others, to manufacture hardware, tools, machines, etc. It is stated that the incorporation provides for the amalgamation of the Allith Mfg. Co., and of the Acme Stamp & Tool Co., but the management of the companies will be unchanged.

The nosing room of the shell department of the Goold, Shapley & Muir plant, Brantford, Ont., was damaged by fire June 24, amounting to about $25,000. Considerable machinery was destroyed.

Government Purchases

WASHINGTON, June 30.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until July 10, schedule 1289, for two universal back geared milling machines and one 60-in. portable slotting machine for Philadelphia.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until July 9, 1917, for furnishing electric traveling cranes in the structural shop at the navy yard, New York.

Proposals will be received at the Bureau of Yards and Docks, Navy Department, Washington, July 9, 1917, for eight 600-horsepower boilers with superheaters and stokers for the navy yard, Norfolk, Va.; six 600-horsepower boilers with superheaters and stokers for the navy yard, Philadelphia, Pa.; two 600-horsepower boilers with superheaters and oil-burning equipment for the navy yard, Puget Sound, Wash.; one 400-horsepower boiler with stoker and stokers for seven existing boilers for the Naval Academy, Annapolis, Md., stokers for ten existing boilers for the navy yard, Washington; two 350-horsepower boilers with superheaters and stokers for the navy yard, Charleston, S. C., and two 600-horsepower boilers with superheaters and oil-burning equipment for the naval station, Pearl Harbor, Hawaii.

Bids were received at the Bureau of Supplies and Accounts, Navy Department, Washington, on June 26 for furnishing material and supplies for the naval service as follows:

Schedule 1242. Ordnance. Class 162. Washington—1 motor driven milling machine—Bid 63, $3,155 and $3,095; 88, $3,499.

Schedule 1243. Ordnance. Class 163. South Charleston, W. Va.—Ingot manipulators—Bid 62, $32,150; 118, $21,600.

Schedule 1244. Steam Engineering. Class 171. Brooklyn—1 motor-driven lathe—Bid 45, $1,520; 52, $1,218; 63, $1,540 and $1,489; 67, $1,860; 68, $1,622; 101, $1,160. Class 172. Brooklyn—1 motor-driven milling machine—No bids. Class 173. Brooklyn—1 motor-driven drill—Bid 36, $195; 68, $605 and $735. Class 174. Brooklyn—1 motor-driven grinder—Bid 17, $214.30; 18, $265.45; 38. $195; 46, $245; 52, $236; 68, $265.45. Class 175. Brooklyn—1 motor-driven grindstone—Bid 63, $241.50; 68, $237.

The following bids were received by the Board of Awards, Department of Agriculture, Washington, June 22, for furnishing motor-driven drill press: Fairbanks Co., Baltimore, Md., 23 in. press, $404; December 30. Kemp Machinery Co., Baltimore, Md., 21 in. press, $660; 130 days.

The names of the bidders and the numbers under which they are designated in the above list, are as follows: Bid 17, The Cincinnati Electrical Tool Co., 650 Evans Street, Cincinnati, O.; 18, Jas. Clarke, Jr., Electric Co., 520 N. Main Street, Louisville, Ky.; 36, The Greendale Distilling Co., Lawrenceburg, Ind.; 38, The Guerber Engineering Co., Bethlehem, Pa.; 45, Inter-Continental Machinery Corporation, 165 Broadway, New York; 46, W. Irwin Cheyney, Heed Bldg., Philadelphia, 52, Kemp Machinery Co., 223 North Calvert Street, Baltimore, Md.; 62, The Morgan Engineering Co., Alliance, Ohio; 63, Manning, Maxwell & Moore, Inc., 119 W. 40th Street, New York; 67, Niles-Bement-Pond Co., 111 Broadway, New York; 68, D. Nast Machinery Co., Bourse Bldg., Philadelphia; 88, Sherritt & Stoer Co. (Inc.), 603 Finance Building, Philadelphia; 101, Swind Machinery Co., Widener Building, Philadelphia.

THE IRON AGE

New York, July 12, 1917

ESTABLISHED 1855 VOL. 100: No. 2

Properties and Structure of Nickel Steel

Effect of Annealing at Various Temperatures—Proper Practice to Obtain Best Results on Large and Small Forgings

BY S. W. PARKER*

THE following experiments were made in order to determine the best annealing temperatures for two grades of 3.50 per cent nickel steel, commonly used for forgings.

In practice forgings are annealed in order to accomplish any or all of the following:

Relieve forging strains.
Produce good machining qualities.
To so refine the grain or structure of the steel as to produce the best physical properties possible without heat treatment.

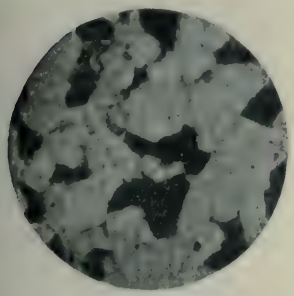
The experiments here reported were made on small forged bars, but practical experience has proved that the conclusions arrived at may be applied to large forgings, the increase in mass being balanced by an increase in the time of heating to and soaking at the annealing temperature. The actual physical properties obtained will of course depend largely on the amount of reduction from the ingot to the forging; the greater the reduction in forging the more likely will the physical properties of a longitudinal test be within limits.

The test bars used were forged down to 1 in. square by 6 in. long from two 4 x 4-in. billets of different grades which had the following composition:

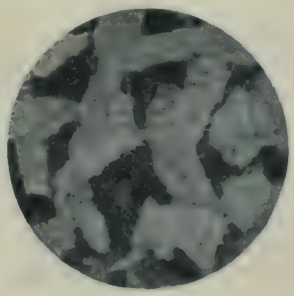
Carbon, Per Cent	Phosphorus, Per Cent	Manganese, Per Cent	Sulphur, Per Cent	Silicon, Per Cent	Nickel, Per Cent
0.22	0.011	0.38	0.028	0.12	3.16
0.41	0.033	0.55	0.049	0.14	3.40

After becoming cold these bars were heated to 1850 deg. Fahr. and kept at that temperature or higher for two hours. At the end of that time they were removed in a mass and buried in a box containing a mixture of powdered magnesia and asbestos, where they cooled very slowly. This first heat-

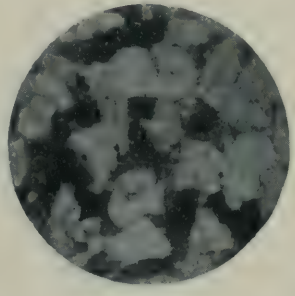
*Testing department, Bethlehem Steel Co., Steelton, Pa.



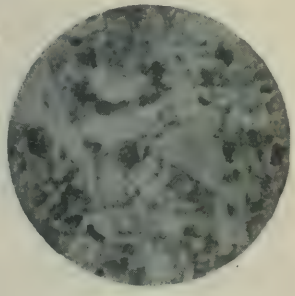
Not Reheated
Tensile Str...41,000
Elastic L....73,000
Elong. 2 in.. 29.0
Red. of Area. 49.7



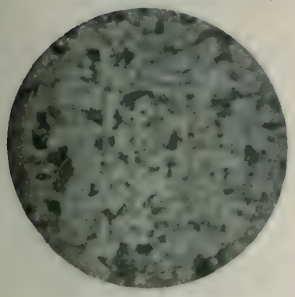
Reheated at 1250 Deg. F.
37,000
70,500
32.5
53.9



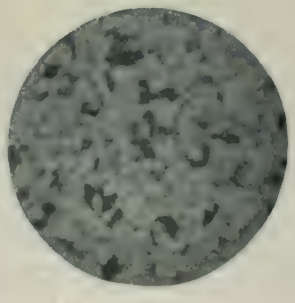
Reheated at 1300 Deg. F.
37,000
70,000
32.5
57.3



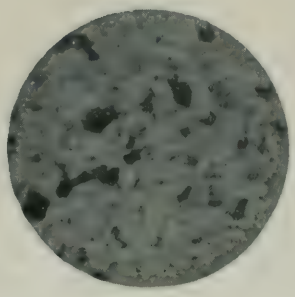
Reheated at 1350 Deg. F.
39,000
71,000
32.5
58.6



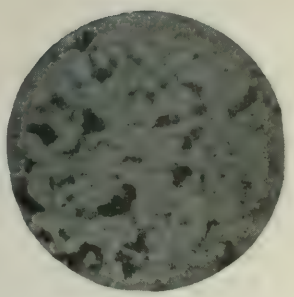
Reheated at 1400 Deg. F.
Tensile Str...50,000
Elastic L....74,000
Elong. 2 in... 32.0
Red. of Area. 58.9



Reheated at 1450 Deg. F.
49,000
74,500
31.5
56.8

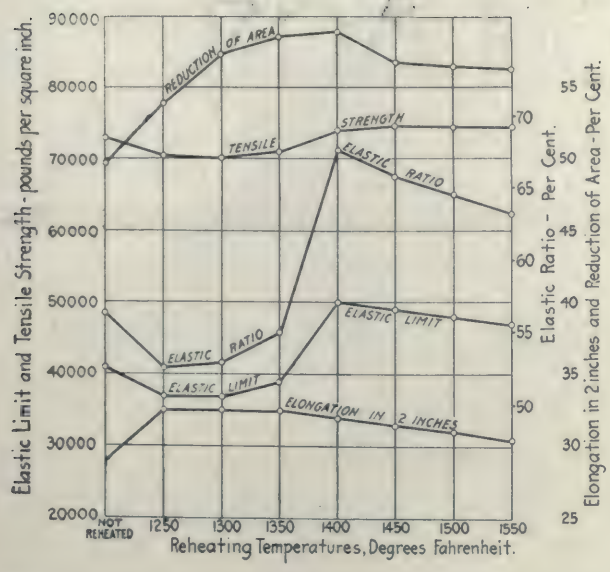


Reheated at 1500 Deg. F
48,000
74,500
31.0
56.5

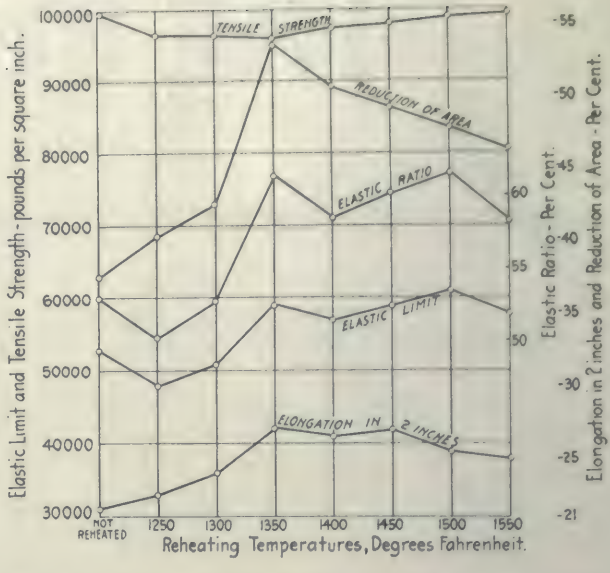


Reheated at 1550 Deg. F.
47,000
74,500
30.5
56.3

Photomicrographs, 100 Diameters, of Nickel Steel Containing 0.22 Per Cent Carbon and the Physical Results at Different Temperatures



Effect of Various Annealing Temperatures on 0.22 Carbon Nickel Steel, Heated to 1850 Deg. Fahr. and Cooled Slowly, Reheated to Temperatures Varying from 1250 to 1550 Deg. Fahr.



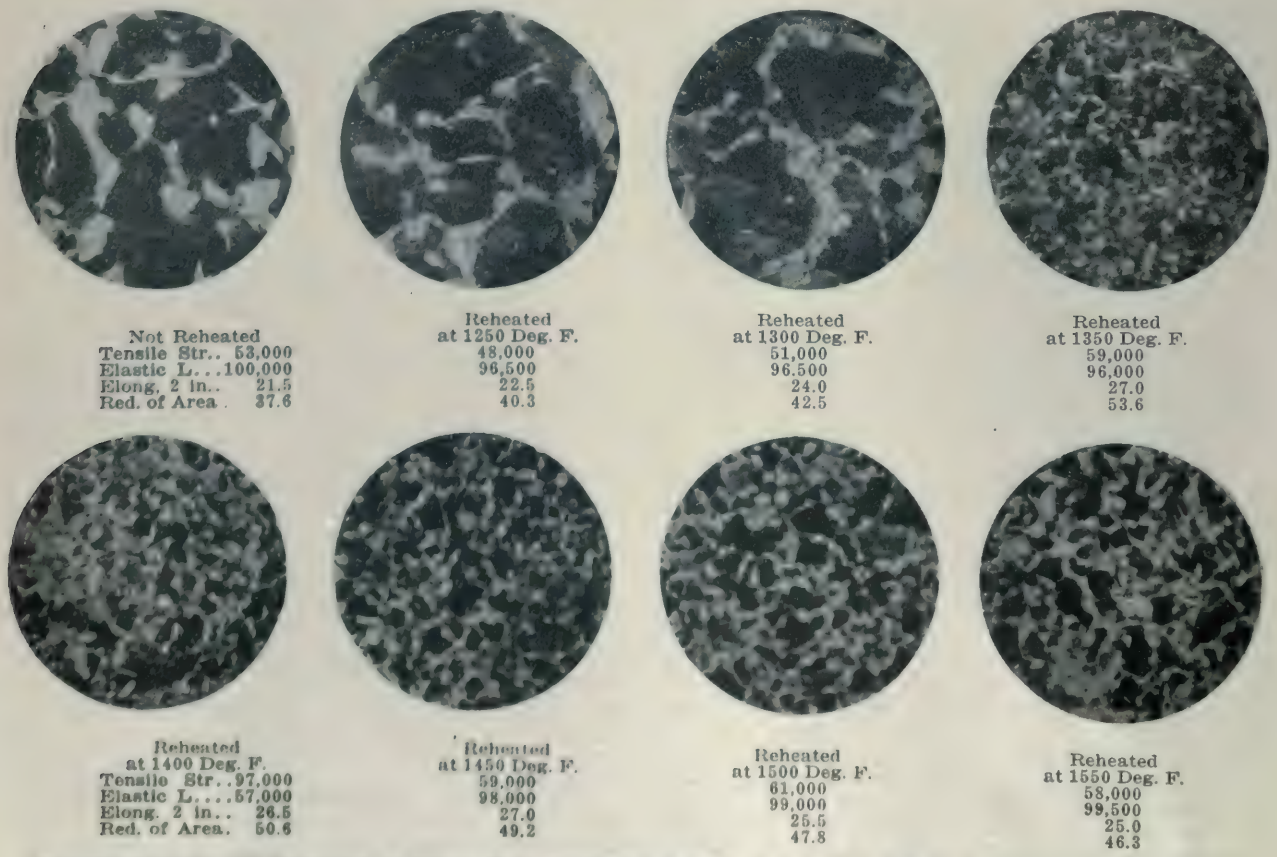
Effect of Various Annealing Temperatures on 0.41 Carbon Nickel Steel, Heated to 1850 Deg. Fahr., and Cooled Slowly, Reheated to Temperatures Varying from 1250 to 1550 Deg. Fahr.

ing was done to enlarge the grain of the bars until it was about as coarse as that which is found in fairly large forgings before annealing. The experiments, therefore, were started with about the same conditions of coarse structure in the bars that exist in unannealed forgings.

One bar of each grade was set aside to be tested without reheating; the other bars were reheated in an electric tubular-muffle furnace to various temperatures between 1250 and 1550 deg. Fahr. This was done by placing a bar of each grade in the cold furnace with the end of a Le Chatelier pyrometer between them and heating to the required temperatures in from two to three hours, holding at this temperature for one hour, and then allowing the bars to cool down to room temperature in the furnace.

These two sets of bars were turned down to threaded tensile tests 0.505 in. in diameter and tested. The elastic limits were determined with a Berry strain gage, using increments of load of 1000 lb. per sq. in., and were in all cases very sharply defined. Pieces were cut from the ends of the tests for the examination of the structure and photomicrographs.

The physical properties of these tests were plotted against the annealing temperatures, as shown in the illustrations. The structure of each bar, together with its physical properties, is also shown.



Not Reheated	Reheated at 1250 Deg. F.	Reheated at 1300 Deg. F.	Reheated at 1350 Deg. F.
Tensile Str.. 53,000	48,000	51,000	59,000
Elastic L...100,000	96,500	96,500	96,000
Elong. 2 in.. 21.5	22.5	24.0	27.0
Red. of Area . 37.6	40.3	42.5	53.6

Reheated at 1400 Deg. F.	Reheated at 1450 Deg. F.	Reheated at 1500 Deg. F.	Reheated at 1550 Deg. F.
Tensile Str..97,000	59,000	61,000	58,000
Elastic L....57,000	98,000	99,000	99,500
Elong. 2 in.. 26.5	27.0	25.5	25.0
Red. of Area. 50.6	49.2	47.8	46.3

Photomicrographs, 100 Diameters, of Nickel Steel, Containing 0.41 Per Cent Carbon and the Physical Results at Different Temperatures

Nickel Steel of 0.22 Per Cent Carbon

The minimum hardness and tensile strength were obtained by annealing at between 1250 and 1350 deg. Fahr., at which temperatures the structure had only started to break up and refine.

The percentage of elongation of this steel is naturally high on account of the predominance of ferrite, and the maximum elongation was reached before the structure had been refined. The reduction of area, however, was considerably affected by the grain size and reached a maximum in the test annealed at 1400 deg. Fahr., in which the structure had been completely refined.

The property most affected by annealing is the elastic limit. This was increased from 41,000 lb. per sq. in. in the unannealed bar to 50,000 lb. per sq. in. in the bar annealed at 1400 deg. Fahr., in which the grain was the finest in the series. This increase in elastic limit by refinement of grain plays an important part in annealing forgings, especially in cases where the specifications require high elastic limits together with good ductility.

The best combination of physical properties is obtained in this steel by annealing at a temperature ranging between 1400 and 1450 deg. Fahr.

Nickel Steel of 0.41 Per Cent Carbon

The hardness and tensile strength of this steel were also reduced to a minimum by annealing at between 1250 and 1350 deg. Fahr., and were not dependent on the grain size.

The elongation, in the case of this harder steel, was considerably affected by the size of the grain; it was lowest in the coarse-grained bar which had not been reheated, and reached a maximum in the bars annealed at between 1350 and 1450 deg. Fahr., in which the grain was finest. It will be seen that, as the annealing temperature was increased beyond 1450 deg. Fahr., the elongation decreased and the grain size grew correspondingly coarser. The reduction of area was similarly affected by the size of the grain.

As in the case of the 0.22 per cent carbon nickel steel, the elastic limit increased greatly when the structure was completely refined, the increase being, in this case, 6000 lb. per sq. in. It started to decrease in the bar annealed at 1550 deg. Fahr., the change being due to the coarsening of the grain.

For this steel the best combination of physical properties is obtained by annealing at between 1350 and 1450 deg. Fahr., the minimum temperature being lower than in the case of the 0.22 per cent carbon steel.

These results have been repeatedly checked in practice and the general conclusions are being applied in the annealing of forgings of all sizes.

The Youngstown Sheet & Tube Co., Youngstown, Ohio, has placed a contract with Stone & Webster Co. for the foundation of its new 84-in. plate mill, and the Dravo Construction Co., Pittsburgh, will build the foundation for the two 80-ton open-hearth furnaces. Work on these contracts will start at once. An appropriation of $1,000,000 has been made by the Youngstown Sheet & Tube Co., for the account of its subsidiary, the Buckeye Land Co., to finance house building at East Youngstown this year. The appropriation covers the cost of purchase of a 300-acre tract.

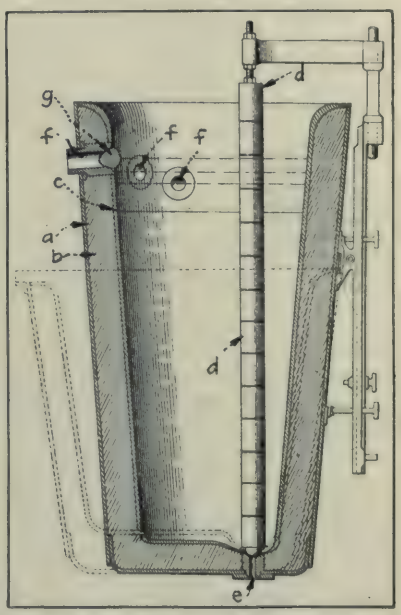
S. Birkenstein & Sons, metal dealers, Chicago, have purchased between 50,000 and 60,000 sq. ft. of land at the northwest corner of Hawthorne Street and North Avenue, Chicago, on which it is planned to build a warehouse for their business.

A Self-Skimming Ladle for Steel Foundries

A NEW type of ladle, known as a self-skimming one, has been invented by J. C. Davis, fourth vice-president of the American Steel Foundries, Chicago. It is especially adapted for pouring steel castings and is claimed as making it possible to expose 45 per cent less area of steel to the detrimental action of the slag than in the case of the old style ladle where basic slags are obliged to remain for a long time in contact with the metal. This is particularly the case in pouring castings, for the chemical reaction between the slag and the steel tends to lower the silicon content of the steel and to add oxygen and phosphorus to it.

The new type of ladle has the further advantage, it is claimed, of imparting a greater hydrostatic head to the metal, which the inventor claims has the effect of causing the lighter slag to rise to the top of the steel and remain there while the ladle is being emptied.

In making open-hearth steel it is almost impossible to produce an exact quantity of steel of the desired composition at one time because owing to various delays more metal than was contemplated in the original charge has to be added. It is therefore necessary that the ladle, which is to hold the steel and its slag, be of such ample proportions as to properly receive and contain the original charge and any such additional amounts which have to be added. Normally, therefore, when a heat of steel is discharged into its ladle there is so much space between the top of the steel and the top of the ladle that the ladle receives an excessive amount of slag, which remains usually in contact with the steel until the ladle is emptied entirely. The greater the volume of slag in the ladle, the greater is the hydrostatic head or pressure exerted by the slag, thereby causing the latter to settle more deeply into the steel, increasing the slag's contaminating effect. These conditions are especially true in steel foundries.



The New Type Ladle Which Skims Itself of Excess Slag. The Old Type Is Shown Relatively by the Dotted Line

As shown by the illustration the new ladle is of smaller diameter and is much deeper than the type of ladle usually used. It is pierced near the top with several circular openings which are staggered at different levels, the purpose being to provide outlets for the removal of slag.

Before the ladle is filled with steel, the slag openings are closed with a plug, composed mainly of silica sand with a binder of fire clay, and these plugs can be removed as required in order to regulate the height of the slag in the ladle to a proportion just sufficient to serve as a blanket to prevent chilling the steel. The ladle consists of an exterior shell, *a*, a brick lining, *b*, and a thinner lining, *c*, of material containing magnesite and dolomite. The stopper is shown at *d*, the pouring opening at *e*, and the slag holes at *f*. How the slag holes are plugged is illustrated at *g*.

The Standard Equipment Co., 47 Orange Street, New Haven, Conn., has recently taken over the entire plant and equipment of the D. & H. Mfg. Co., also of that city.

Exports Pass the Billion Dollar Mark

Movement of Iron and Steel Products to Foreign Lands Extremely Heavy During the Eleven Months Ending May—Submarine Not Curtailing Shipments

WASHINGTON, July 10.—Exports of iro nand steel for the 11 months ended May passed the billion dollar mark, their value being nearly double that of the shipments for the corresponding months of 1916. Exports by values in May, while reflecting higher prices, were slightly below the record made in March of this year, but, with the exception of the total of January, 1917, were far in advance of any other month in the history of the country. A gain of nearly 5 per cent over April is further evidence that the submarine campaign is in no way affecting this movement.

Exports of iron and steel by values during May gained 47 per cent over those of the corresponding month of 1916, but lost 3.5 per cent compared with the record total of March of this year. Shipments of tonnage commodities rose 8.8 per cent over May, 1916, but declined 8.7 per cent compared with the record total of last September. Exports of machinery, though gaining 4.4 per cent over May, 1916, declined 7 per cent as compared with the high water-mark reached last August. Shipments of machine tools, which have been steadily diminishing for several months, fell 34.5 per cent short of those of May, 1916, which was the banner month for exports of metal-working machinery, marking the peak of the demand incident to the fitting up of British and French munitions plants. For the eleven months ended May, the total exports of iron and steel surpassed by 85 per cent those of 1916, which exceeded all previous records by more than 130 per cent. Shipments of tonnage commodities gained 45 per cent, machinery 45 per cent and machine tools 50 per cent over the record totals of 1916.

The value of all shipments of iron and steel products in May, 1917, was $107,362,635, as compared with $72,918,913 for the same month of 1916 and $111,164,876 for March of this year, when high water-mark was reached. For the eleven months ended May, 1917, the total was $1,010,496,046, as compared with $545,018,533 for the same period of 1916, which was an advance of

Exports of Iron and Steel

	May		Eleven Months	
	1916, Gross Tons	1917, Gross Tons	1916, Gross Tons	1917, Gross Tons
Pig iron	22,293	61,112	237,629	751,524
Scrap	24,889	11,382	138,842	227,909
Bar iron	7,364	7,886	64,463	58,730
Wire rods	15,684	15,666	153,483	130,130
Steel bars	77,669	62,541	564,121	697,740
Billets, ingots and blooms, n.e.s.	142,782	168,158	845,803	1,745,363
Bolts and nuts	2,494	2,204	28,688	26,748
Hoops and bands	3,280	6,405	37,249	42,213
Horseshoes	1,051	319	11,757	4,022
Cut nails	614	368	4,084	4,251
Railroad spikes	1,959	1,332	24,306	16,828
Wire nails	12,205	10,133	111,575	114,857
All other nails, including tacks	745	1,297	8,567	16,513
Cast-iron pipes and fittings	4,609	6,364	46,738	68,470
Wrought pipes and fittings	12,400	12,563	113,446	153,400
Radiators and cast-iron house heating boilers	198	562	2,070	3,887
Steel rails	48,841	49,260	492,038	562,336
Galvanized iron sheets and plates	7,536	8,141	69,496	82,296
All other iron sheets and plates	5,239	5,244	38,583	44,851
Steel plates	22,679	54,849	252,618	361,199
Steel sheets	9,675	15,789	88,487	107,048
Structural iron and steel	22,938	34,764	251,832	319,971
Tin and terne plates	25,585	23,283	200,722	207,489
Barb wire	39,197	8,543	326,745	285,834
All other wire	22,665	19,735	221,185	220,310
Total	540,591	587,900	4,334,511	6,253,831

Special Alloys and Ores

	May		Eleven Months Ending May	
Imports	1916, Gross Tons	1917, Gross Tons	1916, Gross Tons	1917, Gross Tons
Ferromanganese	*a*	2,019	*a*	69,924
Ferrosilicon	417	1,114	4,933	7,846
Manganese oxide and ore of	74,825	81,269	430,620	593,310
Nickel ore and matte	7,865	7,024	79,848	83,310
Tungsten bearing ore	*a*	404	*a*	3,480
Exports				
Ferrotungsten and tungsten metal	*a*	207	*a*	719
Ferrovanadium	92	139	436	1,076
Nickel, nickel oxide and matte	1,622	806	10,428	13,039

a Not separately reported.

Exports of Machinery

	May		Eleven Months	
	1916	1917	1916	1917
Adding machines	$138,116	$205,907	$956,327	$1,636,460
Air-compressing machinery	52,159	81,247	490,042	1,026,265
Brewers' machinery	7,674	3,853	28,620	57,779
Cash registers	155,861	70,449	1,314,674	1,284,618
Parts of	6,167	2,676	108,768	111,053
Cotton gins	2,059	6,298	61,845	102,209
Cream separators	49,126	68,219	456,348	438,567
Elevators and elevator machinery	121,358	189,592	1,367,357	1,960,457
Electric locomotives	14,523	25,755	436,863	508,807
Gas engines, stationary	40,798	71,548	331,085	637,192
Gasoline engines	1,466,457	2,416,745	9,731,480	16,303,160
Steam engines	500,322	1,410,860	13,265,351	17,222,062
All other engines	590,114	347,683	2,788,230	4,489,453
Parts of	877,648	2,945,271	6,407,301	17,110,182
Laundry machinery, power	29,028	45,435	259,948	313,975
All other	14,901	17,667	239,263	282,444
Lawn mowers	21,678	22,325	174,917	163,993
Metal-working machinery (including metal-working tools)	9,935,806	6,515,007	52,849,047	76,348,162
Meters, gas and water	38,636	30,997	258,454	361,334
Milling machinery (flour and grist)	377,523	59,576	2,425,815	1,042,066
Mining machinery, oil well	275,561	189,876	1,183,790	1,742,026
All other	475,373	787,753	5,722,740	9,008,906
Paper-mill machinery	57,632	190,302	821,633	1,715,021
Printing presses	200,024	149,698	1,441,043	1,690,497
Pumps and pumping machinery	611,438	569,224	4,224,081	5,597,292
Refrigerating and ice-making machinery	97,796	72,152	655,237	790,204
Sewing machines	534,430	682,948	4,995,701	5,730,301
Shoe machinery	66,648	111,472	1,182,508	1,226,203
Sugar-mill machinery	137,902	366,204	5,589,716	10,316,369
Textile machinery	234,759	290,266	2,336,151	3,194,803
Typesetting machines	218,668	95,345	806,307	1,012,280
Typewriting machines	968,417	818,728	7,990,138	10,100,421
Windmills	86,967	131,341	982,076	844,123
Wood-working machinery, saw mill	34,340	32,640	328,553	424,518
All other	73,723	111,895	1,020,196	913,294
All other machinery and parts of	3,471,329	3,823,524	28,903,231	38,696,782
Total	$21,984,961	$22,960,478	$162,135,926	$234,403,278

Imports of Iron and Steel

	May		Eleven Months	
	1916, Gross Tons	1917, Gross Tons	1916, Gross Tons	1917, Gross Tons
Ferromanganese	....	2,019	.....	69,924
Ferrosilicon	417	1,114	4,933	7,846
All other pig iron	9,650	1,189	99,358	33,997
Scrap	6,407	16,372	92,115	208,236
Bar iron	909	33	86,646	4,241
Structural iron and steel	67	133	1,305	926
Hoop or band iron	....	24	470	24
Steel billets without alloys	2,624	2,899	11,071	12,575
All other steel billets	2,219	717	10,678	10,473
Steel rails	9,196	1,491	49,233	13,097
Sheets and plates	151	44	1,618	1,727
Tin and terne plates	39	2	712	610
Wire rods	434	1	4,126	2,064
Total	32,113	26,038	362,265	366,740

more than 130 per cent over any previous corresponding eleven months. Exports of machinery in May were valued at $22,960,478, as compared with $21,984,961 for the same month of 1916. Shipments of metal-working machinery aggregated $6,515,007, as against $9,938,806 for the same month of 1916, when maximum exports were recorded. Exports of machinery of all kinds for the eleven months ended May, 1917, were valued at $234,403,278, as compared with $162,135,926 for the corresponding period of 1916, which was an advance of nearly 60 per cent over any preceding 11 months. Details of the exports of machinery for May, 1916 and 1917, and for the two 11 months' periods are given in the accompanying table.

Exports of iron and steel for which quantities are given aggregated 587,900 gross tons in May, 1917, as compared with 540,591 tons in the same month of 1916. The record for exports of these commodities is still held by September, 1916, with a total of 643,763 gross tons, although the shipments of March of this year aggregated 606,560 tons. For the eleven months ended May, 1917, the shipments were 6,253,831 gross tons as compared with 4,334,511 tons for the same period of 1916. An accompanying table shows the exports for May and for the eleven months ended May, 1917, as compared with 1916.

Imports of tonnage iron and steel showed a decline in May, the upward tendency noted in recent months having been sharply checked, due to a falling off in the imports of both ferromanganese and scrap. The total receipts of tonnage iron and steel in May were 26,038 gross tons, as compared with 32,113 tons for the same month of 1916. The imports for the eleven months ended May, 1917, were 366,740 gross tons, as compared with 362,265 in 1916. The accompanying table shows the imports of tonnage commodities for May and for the eleven months ended May, 1917, as compared with 1916.

M. C.

New Company to Make Ferrosilicon

The Southern Ferroalloys Co., Chattanooga, Tenn., has been organized as a Tennessee corporation with a capital stock of $210,000. Chattanooga and Chicago interests are represented in the company, which has leased, with an option to buy, the plant of the Southern Steel Co., Chattanooga. It is expected that in November the company will begin the manufacture of ferrosilicon for the production of which three electric furnaces are being installed. Power will be obtained from the Tennessee Power Co., which has a hydroelectric plant, and the expectation is that 3000 tons of high-grade ferrosilicon will be produced annually. While present plans call for the making of ferrosilicon only, the manufacture of other ferroalloys later on is contemplated. The officers of the company are: President, Hall J. Kruesi, Chattanooga; chairman of the board, Eugene B. Clark, president Buchanan Electric Steel Co., Chicago; vice-president, N. Thayer Montague, Chattanooga; secretary and treasurer, Theodore L. Montague, Chattanooga, and general manager, George L. Davison. The last-named is now of Chicago, but will make his home in Chattanooga.

The United Furnace Co., Canton, Ohio, will build a ladle house, 55 x 125 ft. George M. Demarest, Pittsburgh, is engineer.

PIG IRON WARRANTS

George H. Hull Favors Important Extension of Governmental Control

Present conditions in the pig iron market are discussed in a statement which has been issued by George H. Hull, president of the American Pig Iron Storage Warrant Co., New York, who presents what he believes is a satisfactory method of preventing prices from ascending to still higher levels. Mr. Hull says that for the ninth time within the past 80 years business in the United States has been hampered and delayed in consequence of a famine in pig iron. "In times of peace," he says, "these delays have resulted in the loss of millions of dollars to the business of the country; in time of war, they must necessarily prolong its duration and thus add enormously to the loss of human lives. The violence of these pig iron famines can be appreciated by the pronounced effect they have had upon its price during their existence: During the mildest ones, price has advanced more than 100 per cent. During the most violent ones it has gone up from 300 to 400 per cent. Pig iron, which sold at $9 per ton in Pennsylvania in 1897, is now selling for $50 per ton. During the Civil War, iron advanced to $80 per ton. No one can estimate how much more severe the present famine may become, or how much it may weaken our effectiveness in the war, if our Government does not take prompt steps to remedy the evil.

Contrasting conditions of this country with those in Great Britain, Mr. Hull says: "There has existed for more than 70 years a simple and practical system for accumulating reserve stocks of pig iron; and it has for 70 years resulted in that country carrying an average stock equal to *six months' production.* The average stock carried by the United States in that period has been *less than three weeks' production.* The measure of benefit enjoyed by the business enterprises of Great Britain, through her intelligent laws and customs in this respect, can be estimated from the fact that during the nine pig iron famines which have occurred within the last 70 years, the average advance in its price has been but 50 per cent, as against an advance of more than 200 per cent in the United States."

Mr. Hull says that efforts have been made to introduce the British system into the United States, but with only partial success for the reason that customs which have grown up in the United States have become too fixed to be changed or overcome by private enterprise. "It is believed now," says Mr. Hull, "that nothing but a great calamity, such as the present war, and Government action can do away with these customs and inaugurate the British system in this country."

Mr. Hull then proceeds to argue that there is no constitutional reason why the United States Government cannot do what is necessary to inaugurate the British system and he believes the war has furnished strong reasons why it should do so. He adds: "For 50 years or more, our Government has acted as warehousemen for the *whiskey producers* of the country. All that is needed now to make it possible to accumulate an ample supply of pig iron as soon as possible is that the Government should offer to act as warehousemen for the *pig iron producers.* The service sought from the Government, to accumulate reserve stock of pig iron now, will not be one-tenth as arduous or complicated as the service it has rendered to whiskey producers for the carriage of their product. Whiskey requires for its care, expensive warehouses, fire insurance, constant attention, etc. Pig iron can be stored in open yards in full view of the public. It requires no warehouse, no care, no fire insurance, and no attention."

In conclusion Mr. Hull says: "In Great Britain the pig iron warrant system was established and has been maintained by private enterprise. If such a system is now inaugurated and maintained in this country by the Government, its national credit would make it vastly more effective and useful than the British system has been, and in normal times the system would pay the Government a revenue. But that would be the least of its benefits; it will make this country the future store-

house of the world for pig iron. M. Lebon says, 'It is on the coal and iron of the world that the world's peace depends.' *The United States could be trusted with this power.* . . . To-day we are suffering for everything we need made of iron; comparatively no stock on hand and prices up 300 to 500 per cent. Is it not time for the Government to act, and do for its people what they need, and cannot do for themselves?"

Traveling Crane for Steel Mills

A new line of electric traveling cranes designed for high efficiency to meet the severe requirements of steel mill crane specifications has been brought out by the Champion Crane Co., Cleveland, of which the Biggs-Watterson Co., Guardian Building, Cleveland, is general sales agent. Various refinements have been provided in this crane, rather than any radical changes in the mechanical design. The predominating features claimed for it are its simplicity, safety, accessibility and interchangeability of parts.

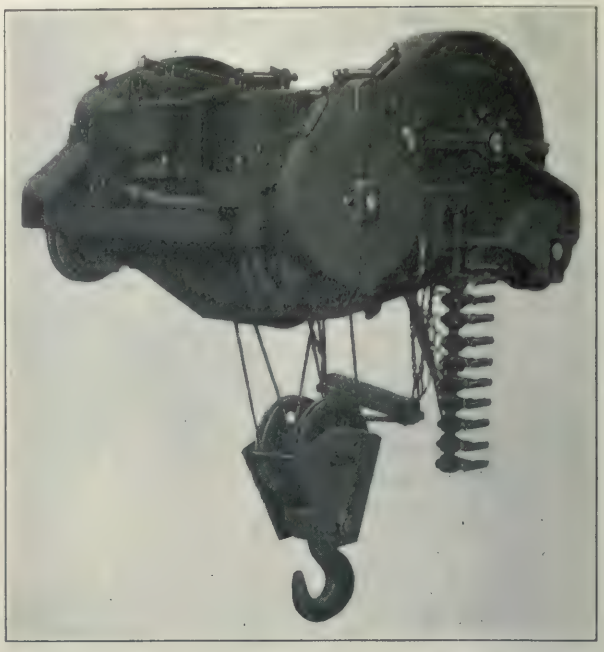
The structure is designed to secure the rigidity required to withstand heavy shocks and severe strains. The side frames consist of two heavy steel castings connected by a wide and heavy steel girt or separator. The separator, which carries only the hoisting motor and its electric brake, is fastened to the side frames by large bolts and rests on ledges machined on the side frames so as to relieve the bolts of all shearing strains.

All fastenings are effected by through bolts with U. S. standard nuts, and all bearings are provided with caps and fitted with split phosphor bronze bushings. The bushings are provided with end flanges. The upper half has a lug protruding through a center hole in the cap to prevent rotation. The lug is drilled and tapped to receive compression type grease cups. Shafts in the hoisting mechanism are located in a horizontal plane, permitting any shaft with its pinions and gears or hoisting drum to be lifted out without disturbing any other part. The shafts are of forged steel.

Shaft bearings on the hoist train are interchangeable so that only one size of bushings need be carried for replacement. A new feature in the design of the trolley side frames is that they are arranged to receive not only split bronze bushings for grease lubrication, but also solid bushings with rings for oil lubrication.

Either cast-iron trolley track wheels with chilled ground treads are furnished as the standard or cast-steel wheels can be supplied. The wheels are keyed to axles revolving in MCB type bearings provided with phosphor bronze hexagon bushings and oil cellars of ample capacity.

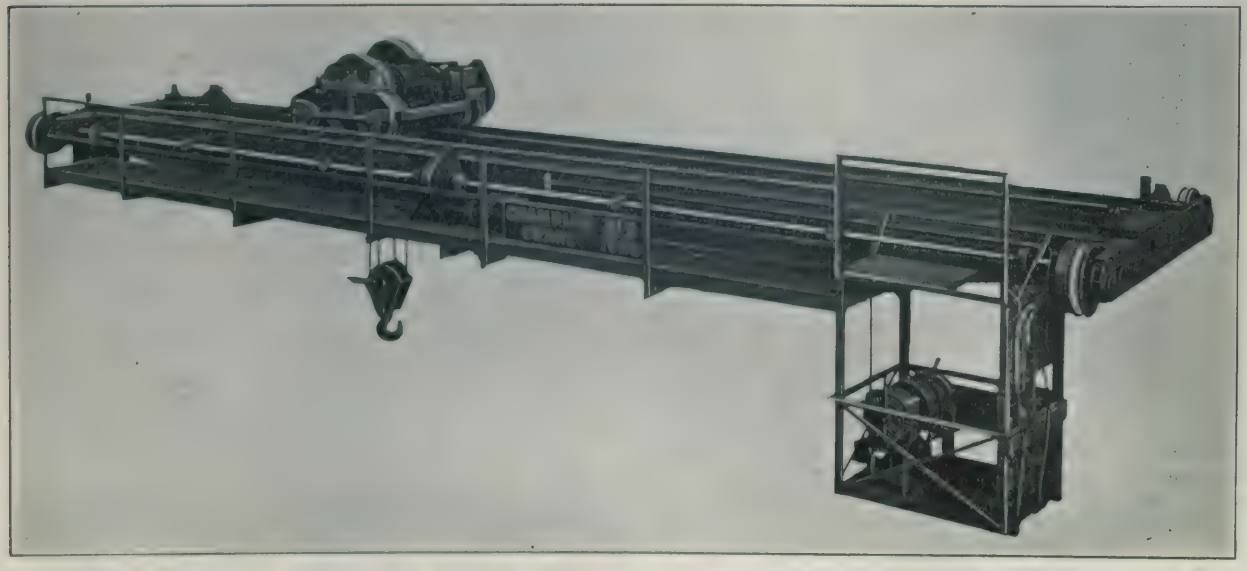
The lower block is of the side plate design. The hook is of forged steel and swivels on chrome-nickel steel balls. The hook is inserted through a forged steel cross-head. The sheaves on the lower block have phosphor bronze bushings and any sheave is interchangeable with any other of equal diameter, whether located on the upper or lower blocks.



The Movement of the Hook Block Is Relied Upon to Prevent Overwinding by Breaking the Circuit through the Limit Switch

The upper rope sheaves are carried on an independent structural girt which is attached to the trolley in such a way that it is not rigidly secured to the trolley frame, and it is stated that because of this design excessive deflection, due to an overload or accidental injury, cannot be communicated to the trolley frames or throw the hoist bearing out of line, thus precluding the possibility of binding the machinery. The ends of the structural steel load girt are connected to the trolley frame by pins, about which the ends of the girt are free to rotate under the influence of the deflection. This structural steel girt has no connection with the separator supporting the hoist motor.

All gears are steel with cut teeth and all pinions are cut steel forgings. The gears have wide faces and substantial arms to stand overloads due to the sudden starting, stopping and reversing of the motor. The gears are inclosed in cast oil-tight gear cases with large swinging covers. There are no overhanging gears, all gears being keyed to their shafts and located between two bearings. The gears in the trolley propelling



Refinement of Mechanical Design Rather than Any Radical Changes Characterizes a New Line of Electric Traveling Cranes for Steel Mill Service

mechanism are accessible by removing one-half section of the inclosure.

The mechanical load retaining brake used when dynamic breaking is not employed is a modification of the Weston multiple disk type. The working parts are inclosed in a casing and a differential flexible band is provided to grip the brake wheel or case when lowering. The advantage claimed for this type is that it applies itself without undue shock and the operation is positive, smooth and noiseless. The load brake is located between large bearings adjacent to the drum pinion, the outer bearings and retaining device being fastened to a bracket cast integral with the trolley frame.

The trolley is designed for any standard crane hoist motor and motor brake, either alternating current or direct current. The hoist mechanism is provided with an automatic switch, limiting the upper travel of the hook. The limit contact is actuated by the hook block itself. The magnetic switch is normally held in a closed position and is opened whenever the circuit is interrupted. In other words the safety hoist limit operates by "breaking" and not by "making" a circuit. The trolley is designed so that attachments can be made of all standard safety devices and for the attachment of platforms to the sides or ends of the trolley.

Cradle Dump Body Storage Battery Truck

An electric storage battery truck equipped with a cradle dump body has been brought out by the Orenstein-Arthur Koppel Co., Koppel, Pa. It is intended for carrying a load of 3000 lb. in the dump body or can be employed as a tractor for pulling 10,000 lb.

The truck proper is of the builders' standard construction with a frame of steel channel section and a hinged oak platform. Four spiral steel springs support the frame and are relied upon to protect both the load and the truck from shock. Cast steel wheels, 20 in. in diameter, with 3-in. solid rubber tires and two Timken roller bearings to each wheel, are used. The wheel base is 52 in. and the gage is 34 in. An Ironclad Exide battery supplies power to the motor, which propels the truck at a speed of 7 miles per hr.

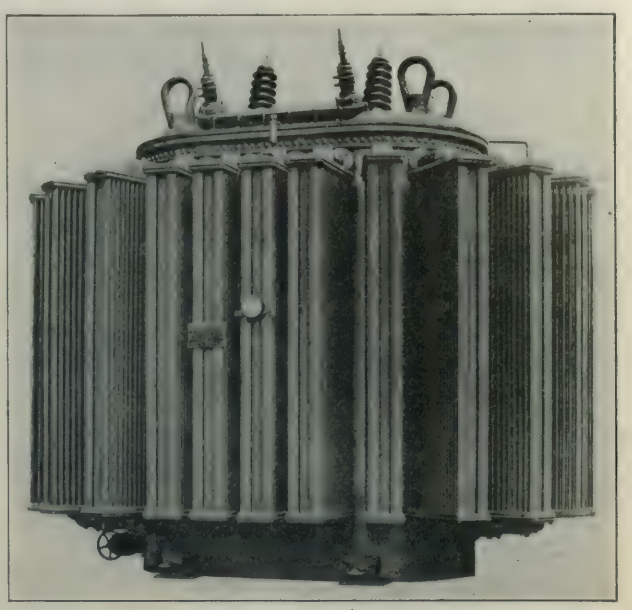


A Load of 3000 Lb. Can Be Carried in the Cradle Dump Body or the Truck Can Be Employed as a Tractor to Haul 10,000 Lb.

The body is of the self-clearing type with a dumping angle of 40 deg. A simple mechanism operated from the platform regulates the dumping of the body. Lifting hooks are provided at each end of the body to enable it to be removed and give access to the batteries through a door in the platform. The loosening of the bolts holding the dump body frame in place enable it to be removed and access to the motor jackshaft and brake to be obtained after a section of the hinged platform is thrown back.

A Large Self-Cooled Transformer

Transformers having radiators located around the containing tank have been built for the Carnegie Steel Co. by the General Electric Co., Schenectady, N. Y.



Oil Circulating Automatically through a Set of 24 External Radiators Is Employed to Cool This 8000-Kva. Transformer, Which Is One of Six Furnished to a Large Steel Company

In addition to the use of the radiators, the transformers are interesting as they are said to be the largest ones of the self-cooled type ever constructed. Each transformer is rated at 8000 kva. and is employed for stepping a voltage of 44,000 down to 6600. The order called for six of these transformers and they have been installed on a single-phase, 25-cycle circuit.

The 24 radiators consist of vertical flattened tubes rigidly welded into headers which are flanged for bolting to the tanks. The total surface provided approximates 1,000,000 sq. in. and the cooling is obtained by circulating oil automatically through the radiators which are self-draining and have no pockets. This feature of construction is relied upon to prevent the accumulation of air at the top and moisture and sediment at the bottom. All of the seams and the joints in the tank and radiators are welded with a view to preventing oil leakage, and with the same object in view screwed pipe fittings have been done away with between the containing tank and the radiators. The connections between the radiators and the tank are made by cast-iron elbows with machined surfaces and flanges on the tank and the radiator are provided for securing the elbow in place with bolts.

Electrical Engineers' Meeting

The eleventh annual convention of the Association of Iron and Steel Electrical Engineers will be held in the Bellevue-Stratford Hotel, Philadelphia, Pa., Sept. 10 to 14, 1917. Wednesday, Sept. 12, is to be devoted entirely to a patriotic program, with addresses by army and navy engineers on vital subjects concerning industries. A. H. Swartz of the Westinghouse Electric & Mfg. Co., Cleveland, is chairman of the entertainment and convention committee. It was first decided not to hold a convention of the electrical engineers this year on account of the war, but Secretary of War Baker recommended that the convention should be held, as no doubt it would aid in bringing to electrical engineers the great necessity of close co-operation with the Government during the war.

The Kokomo Steel & Wire Co., Kokomo, Ind., has filed its answer in the Federal Court at Indianapolis in the suit against it by the Republic of France. It makes a general denial of the charges of breach of contract and alleges payments were not made as promptly as provided in the contract.

Magnetic Analysis of Steel Products*

Advantages as Applied to Rails—Detection of Defects Not Revealed by Mechanical Tests — Value of the Individual Test

BY DR. CHARLES W. BURROWS

THE fundamental principle that there is an exact correspondence between magnetic and mechanical properties has been established beyond doubt. Considerable headway has been made in the practical application of this principle.

The present paper may be considered as a further, though partial, report on the same problem. In it are given very briefly some of the actual accomplishments toward the solution of the problem. At the present time laboratory tests are being made upon tools, cutlery, springs, ball bearings, cables, rails and a few other articles. Not only are the laboratory methods capable of being expanded into practical shop or commercial tests, but the actual development along certain lines is in progress.

The science of magnetic analysis consists in the systematic correlation of the magnetic and other properties of materials and of the application of the laws and principles which underlie the interrelations of such properties, particularly the interrelations of the magnetic and mechanical properties of steel. The art of magnetic analysis consists in the determination of the magnetic characteristics, or better, a small number of the magnetic characteristics, and from these observations making estimations of the mechanical properties.

Criteria of Mechanical Properties

The nature of a piece of steel may be studied by observing its behavior under the action of certain mechanical forces. The usual mechanical tests result in the destruction of the specimen so that it is not feasible to give such a test to the identical material to be used in a given structure. Even such superficial and intensely localized tests as the Brinell ball hardness test and the scleroscope test require the finishing of the surface tested, and after their application leave the surface in a modified condition.

The chemical analysis is extremely valuable and is usually considered as being the most valuable criterion of the mechanical possibilities of the steel. This test also must be made on a part of the material which does not enter into the final structure. It is, however, entirely inadequate to tell what condition the steel may have been left in as a result of its previous thermal and mechanical treatment. Two pieces of steel of the same chemical composition may be given different heat treatments and finally have widely different mechanical properties. Microscopic analysis becomes difficult in the fine-grained steels. Here the structures of slightly different heat treatment are so nearly alike that it is possible to make only a rough estimation of the heat treatment from the microscopic observations.

The mechanical, chemical and microscopic analyses of steel form the basis for the customary specifications and testing. They are, however, open to one or more of the following objections:

They are vicarious, destructive, local or qualitative.

Factors Affecting Mechanical Properties

It is well supported by experimental evidence, but not so generally known, that two pieces of steel which differ in certain particulars, likewise show corresponding magnetic differences.

Magnetically an increase in carbon content is accompanied by an increase in coercive force and hysteresis, and a decrease in permeability. The cold drawing of a carbon steel increases its tensile strength and simultaneously increases its coercive force and hysteresis. Cold drawing also decreases the magnetic permeability.

Magnetically, changes of equal magnitude also occur on quenching. The quenched steel has a greater coercive force, a greater hysteresis, and a lower permeability. In a specific case a one-per-cent carbon steel in the quenched and the annealed conditions had Brinell hardness numerals, in terms of kilograms per 0.1 mm. indention of 4390 and 800 respectively. The corresponding values of the coercive forces for a magnetizing force of 150 gausses were 33 and 12. Steel changes with lapse of time. Both mechanical and magnetic changes occur. Glass-hard steel softens with age. The same steel shows a decrease in coercive force.

The mechanical properties of a bar of steel may differ from point to point if the bar has not received the same treatment throughout. For instance, if a uniform bar is given a slight bend and again straightened it will show a slight change in its mechanical properties. There will be an increase in both hardness and tensile strength. The same bar will show a corresponding decrease in permeability in the same region.

Even during the operation of stressing a bar we feel sure that changes in the mechanical nature are occurring. Less is known about this phase of the problem than the preceding. However, we do know that small alternating stresses, even though well within the elastic limit, leave the material mechanically fatigued and if the stresses are repeated often enough rupture occurs. While it is difficult to study the changes in mechanical properties after repeated or alternating stresses, the magnetic problem is quite simple and has been investigated to some extent.

Defects in Raw Material

Raw material must be uniform in quality. The proper mechanical and thermal treatment must be determined for each steel that is used. It very frequently happens that two steels of quite different composition may give equally good performance for a particular service provided each steel is given the appropriate heat treatment. In general the heat treatments required for the two steels will be different. Consequently if the heat treatment appropriate to the second steel is given to the first, disastrous results may be expected.

The requirement that all bars shall be alike in properties implies that each bar shall have the proper composition, shall be properly forged, rolled or drawn, as the case may be, and shall be free from local imperfections such as blowholes, segregation, etc.

Occasionally a lot of steel of the wrong composition is supplied through error; or, by some chance, a single bar of different composition may get mixed up with the general stock. If not detected such a bar may cause much loss or annoyance. Very frequently a steel, especially among the alloy steels, may have the proper chemical composition but with the elements not in the proper state of solution. It is not uncommon to find that a tool made from a large bar will prove defective while the same bar when forged down to a smaller size will yield perfect tools. Since the cost of labor frequently amounts to more than the cost of material, it is very desirable to separate the good from the defective material before costly labor has been put upon it. Another defect that sometimes is found in cold-drawn material is the tearing apart of some of the crystals beneath the outer surface.

*From a paper presented at the annual meeting of the American Society for Testing Materials, Atlantic City, N. J., June 27, 1917. The author is with the Bureau of Standards, Washington. At the Budapest Congress of the International Association for Testing Materials in 1901 there was proposed Problem 28, "The consideration of the magnetic and electric properties of materials in connection with their mechanical testing." At the 1912 congress of the same society the author of the present paper presented a report on this problem. This paper pointed the way to a number of possibilities but was little more than a glance into the future.

Many of these defects would pass unnoticed in the usual examinations by the chemist, microscopist, or mechanical tester. In such cases as the above a magnetic examination may be expected to be of service.

Value of Individual Tests

The ideal test of a finished product is one which permits the examination of each individually and does not assume that the characteristics of 99 pieces are identical with those of the hundredth one which happened to be picked out for test. Magnetic analysis is adapted to such individual testing. The individual test not only permits the elimination of defective pieces but also permits the grading of a product which, while satisfactory in general, is not all of the same degree of perfection. It is a matter of common experience that an occasional tool is found which is quite superior to the average fairly good tool. Any method which will enable one to select such exceptionally good tools cannot fail to be helpful. This process of grading will enable the manufacturer to offer a uniformity of product hitherto unknown and permit him to guarantee such uniformity with surety. It is true that certain tools will have to be sold as seconds at a reduced price. On the other hand there will be a new class of exceptional quality which will bring a correspondingly higher price.

The individual test will permit improvement in design. At present we insist upon factors of safety so large that there would be a reasonable factor of safety even though there were a considerable amount of defective material. If a material is used whose individual properties are not known and which may vary between wide limits a greater factor of safety is used than if known material were used. For example, a cast-iron structure might have a factor of safety of ten while a similar structure of steel would be safe with a factor of four or five.

Frequently it is desirable to make exhaustive tests upon a few pieces. Such cases arise where one or more samples are submitted in competition with other material. I recently witnessed a test on the results of which an order of $200,000 was to be based. Five pieces worth about $2 each were submitted by each competitor. The properties of each sample depended upon proper composition and proper heat treatment. Even though the composition were correct a slight error in the heat treatment would place the material at a disadvantage. By a suitable magnetic test the manufacturer could have assured himself that his samples were representative of his best product.

I have made laboratory tests on a number of commercial articles with considerable success. Experimental evidence already at hand shows that it is feasible to apply individual magnetic tests to many forms of tools, cutlery and springs. These tests are of such a nature that they may be carried out on a commercial scale. Rings and balls for ball bearings are now being tried out by this method with every promise of success. Steel rails, in spite of their size, lend themselves very readily to this method of examination.

Magnetic Detection of Service Effects

Since the magnetic and mechanical properties of steel suffer changes with the lapse of time and under ordinary service conditions, the magnetic method offers a very promising means of examining, without destruction, the changes that develop during the life history of a structure. Some of the things to be looked for are the ordinary results of wear and tear. A good example of this is the mine or elevator cable.

A structure may fail by the development of flaws. For instance, a steel rail may render apparently satisfactory service for several years and finally develop a transverse fissure which results in a dangerous accident. Periodic examinations of rails which are under suspicion because of excessive duty or other causes may be made and we may thus detect the presence of such a flaw in an early stage of its development.

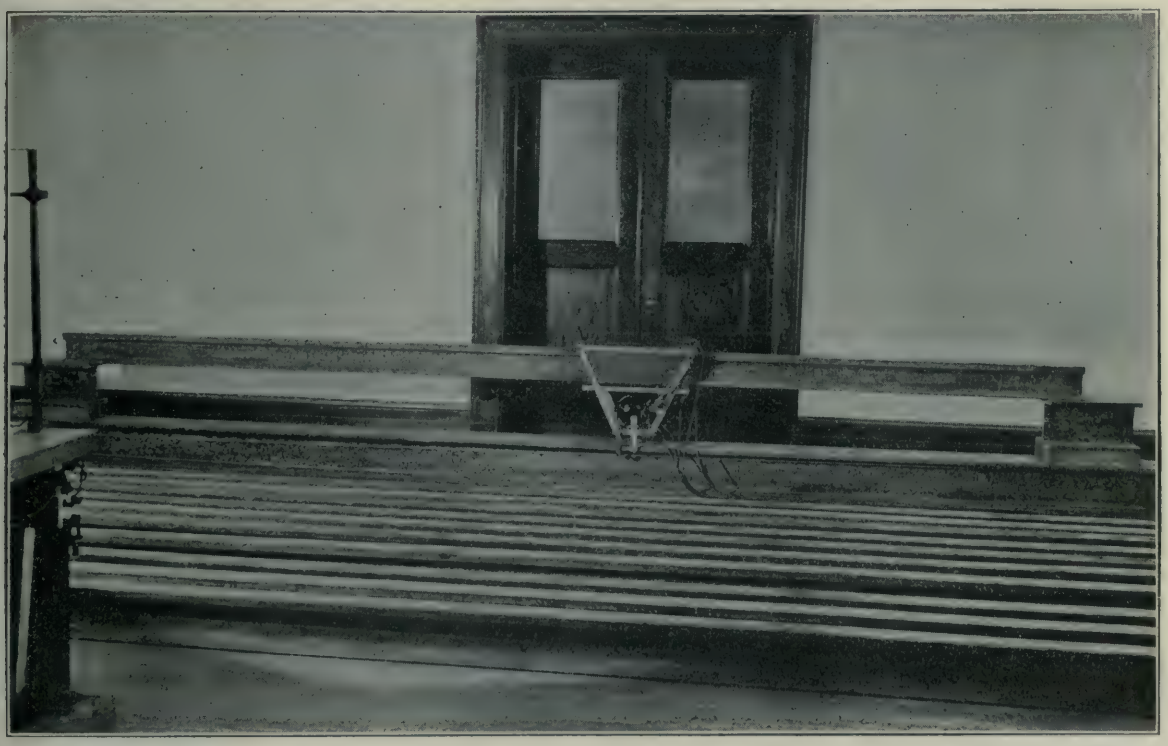


Fig. 1—The Magnetic Circuit of the Rail Under Examination by the Leakage Test

Magnetic analysis may be of use in the development of a new design. It is customary when a new design or a new model is developed to run a service test and at intervals to dismantle the apparatus and go over in detail the various members of the structure. This procedure is common in high-grade mechanisms such as automobiles, adding machines, etc. Such an examination will detect errors in design or faulty material which result in fracture or excessive wear.

Another field which has not as yet been tried, but for which the possibility has already been established, is in the study of the state of stress of a given structural member. The fact that steel suffers certain changes in its magnetic properties when put under tension and certain other changes when put under compression renders such a determination possible.

The apparatus required and the procedure of testing depends to a great extent upon the nature and size

of the material tested as well as upon the characteristic flaws to be expected. Apparatus for examining safety-razor blades is necessarily quite different, notably in size, from apparatus for the testing of steel rails. In the case of a lathe tool in which only the nose is hardened the examination differs from that of a locomotive driving rod which is more nearly uniform throughout.

Magnetic Testing of Rails

If the testing of rails is to give a certainty of the quality of the material, it is necessary to test not only each rail, but every element of the length of each rail. This may be accomplished by a double magnetic test. One part of the magnetic test will determine whether there are non-uniformities along the length of the rail. Since this test is based upon a determination of magnetic leakage it is referred to as the "leakage" test. The leakage test determines the homogeneity of the rail.

Inhomogeneities, while they may not be due to dangerous imperfections, always cast suspicion upon the rail. Inhomogeneous rails should not be used in places where the highest degree of perfection is required. For instance, inhomogeneous rails should not be used on bridges, in tunnels, or where the traffic is heavy. Homogeneity in itself is not evidence of perfection. A rail may be quite uniform along its length and yet be an unsafe rail. Its dangerous nature may be due to improper chemical composition or to errors in the process of manufacture such as improper finishing temperatures or excessive cooling rates. To determine whether or not such defects exist requires a determination of one or more magnetic constants. The measurements may be made in some form of permeameter and in conformity with the nomenclature for similar tests on small specimens, we call this part of the magnetic examination the "induction" test.

Figs. 1 and 2 show the general appearance of the leakage apparatus for rails. A magnetizing solenoid is moved along the length of the rail. Any non-uniformity along the rail will cause a variation in magnetic leakage. This variation in leakage develops a small electromotive force which is approximately proportional to the degree and sharpness of the non-uniformity. A special recording voltmeter, not shown on the photograph, makes a photographic record of the magnetic inhomogeneities. This examination of a rail can be made in about one minute and excessive demands for skill and training are not made upon the operator.

Fig. 3 shows a set of magnetic-leakage records of a 105-lb. rail before and after gagging. This rail has the following chemical composition:

	Per Cent
Carbon	0.68
Manganese	0.98
Phosphorus	0.025
Sulfur	0.031
Silicon	0.144



Fig. 2—The Traveling Solenoid Used in the Leakage Test of Rails

It is one of a set of rails which was expressly prepared for this investigation. The rails as they left the hot bed were practically straight and therefore did not need to go through the gag press.

The middle record shows the normal record of a rail free from inhomogeneity. The irregularity in the curve at the right-hand end is due to the starting of

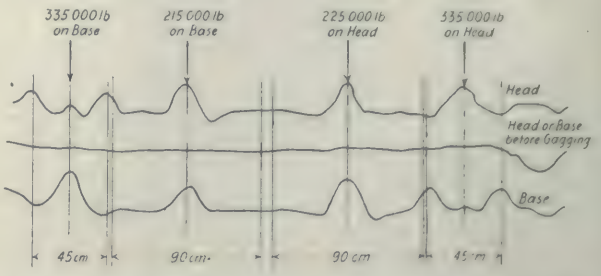


Fig. 3—Leakage Curves of a Rail Before and After Gagging. Vertical Arrows Indicate Position of Application of the Gag. Horizontal Arrows Indicate the Distance Between the Supports

the apparatus and therefore has no significance. From these curves several observations may be made.

The rail before gagging shows a magnetic-leakage curve which is substantially a straight line.

Pressure applied locally so as to deform the metal produces a magnetic inhomogeneity at the point where the pressure is applied. This is true whether the pressure is applied on the head or on the base.

The extent of this local inhomogeneity depends upon the distance between supports. If the supports are far apart the strain seems to extend over the entire cross-section and seems to be greater on the side of the rail opposite the point of application. If the supports are close together the strains are localized on the side on which the pressure is applied.

The strains set up by the supports depend upon the distance apart of the supports. If the supports are 90 cm. apart the magnetic effect of the supports is insignificant. If they are only 45 cm. apart this effect is considerable. In fact, the side of the rail on which the supports lie shows a magnetic inhomogeneity at each support which is greater than the corresponding inhomogeneity opposite the gag.

Other observations on other rails show that the degree of magnetic inhomogeneity increases with the load applied by the gag.

Furthermore it is worthy of note that another rail from the same ingot which had been annealed showed a much less effect for the same gagging stress.

This ability of the magnetic leakage test to indicate the effect of gagging is of importance in view of the fact that many people consider that excessive gagging produces minute failures in the rail which are in effect potential transverse fissures.

The induction test is fairly simple. Fig. 4 shows the test rail and magnetizing solenoids in position. The accessory apparatus, similar to that required in induction measurements of small rods, is not shown. The most useful magnetic quantity is probably the coercive force. For the purpose of illustration we may give the coercive forces of two lots of rails of substantially the same chemical composition, made at the same mill, and differing only in their method of cooling. Four rails rolled in winter were from the first ingot which passed through the mill in starting the round for that particular date. Consequently these rails were the first upon the hot bed which was initially cold. Two other rails of substantially the same chemical composition were selected from a full hot bed and from the middle of a round rolled when the atmospheric temperature was 70 deg. Fahr. The averages of the coercive forces for a magnetizing force of 145 gausses were 10.30 gausses for the winter rails and 8.91 gausses for the summer rails. This difference of 1.39 is probably due in great part to

the difference in the rate of cooling of the two sets of rails.

Commercial Magnetic Analysis

The fundamental fact that there is a definite relation between the magnetic and mechanical properties of steel is so well established that the successful application of magnetic analysis to commercial testing is assured. In any particular case the apparatus must be developed and operators trained. However, the difficulties presented are not excessive. Before shop methods of examination of any given product can be installed, a preliminary investigation must be carried out which involves five steps.

Magnetic data of representative material must be determined. Good, bad and indifferent materials must be examined and the data thus obtained correlated so that one may know what magnetic characteristics go with each grade of material.

From the mass of data thus obtained the most suitable magnetic criteria must be determined. In some cases any one of several magnetic constants may be equally satisfactory. In other cases only one specific constant may be used. Still others may require the combination of two or more magnetic constants.

Suitable apparatus must be designed. After the proper criteria have been determined the next step is to determine what type of apparatus is best suited for the particular material to be tested.

Limits of quality must be determined. Since the proper combination of speed, cost and accuracy may call for some slight deviation from the ideal theoretical considerations, the material to be tested must be examined by the final form of apparatus. From these data the final criteria of quality must be determined.

The final step of this preliminary investigation is the reduction of all the operations to mere routine, so that shop determinations may be made by an observer who is not necessarily an investigator.

It is not feasible to make an estimate of the cost of the testing equiment. However, it would not be excessive. The rail-testing apparatus shown could be duplicated for about $1,500. While this apparatus would undoubtedly require modification for shop practice, this amount may be considered as a rough estimate of the cost.

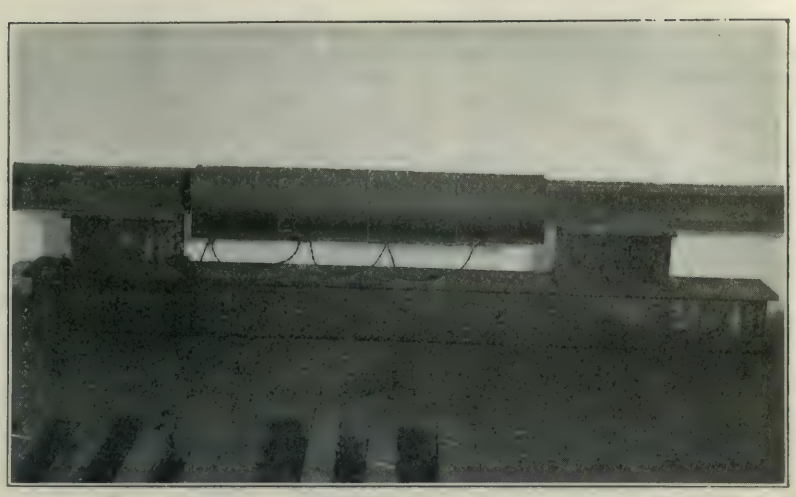


Fig. 4—A Simple Type of Rail Permeater

Discussion

Dr. J. S. Unger, manager central research bureau, Carnegie Steel Co., in discussing the paper, said:

Magnetic testing to a certain extent permits of testing every piece if of some length, such as a rail or drill, but short, heavy objects, such as castings, are difficult if not impossible to test. The apparent advantage of testing every rail is not new, as every rail is, and always has been tested automatically during the process of straightening. It has been shown that magnetic and mechanical properties bear a relation to one another. This same statement may be made of the chemical composition or heat treatment when compared with the mechanical properties.

Magnetic testing will show a pipe if of considerable extent. As there are almost diametrically opposite opinions among railroad authorities as to whether a pipe is injurious in a rail, must this not be settled first?

The effects of cold rolling or drawing, torn surfaces or interior defects produced by cold work may be shown. A rail in service is cold rolled on the head, which is an essential part of the service it performs. A locomotive standing on a track will stress the rail under each wheel. Such stresses can be magnetically shown. If the locomotive be moved or the tie supports changed, the stresses change to new points. Magnetic disturbances are shown at each tie in Scientific Paper 272 of the U. S. Bureau of Standards.

It is claimed a rail may be magnetically homogeneous, but unfit for service, due to improper chemical composition, finishing temperature or excessive cooling rates. Rails are not made of either very soft or very hard steels, but within reasonably close chemical requirements, yet some rails do fail. If rail finishing temperatures considerably above and below the limits prevailing at different mills affect the quality, why does the actual experimental evidence from the track not prove it? Winter and summer rails are shown with different magnetic properties attributed to different rates of cooling. The inference is, that the more rapidly cooled rails are inferior. If this be true, why are some railroads considering plant installations to heat and artificially cool rails more rapidly, and how can we explain a difference of 50 per cent less wear in oil-quenched rails after five years' service when compared with a similar number of untreated rails under exactly the same conditions of service, no failures occurring in either?

If a gagged rail shows a magnetic disturbance where gagged and an annealed rail a lesser effect, should rails not be ordered annealed or, what accomplishes the same purpose, of a softer variety chemically? If such be done will the rails not require more frequent renewals on account of wear? Referring again to the gagging, no truly comparative track evidence has been presented, so far as I know, to prove that it is injurious. I have not been able to prove it from gagged and ungagged rail experiments made in the track.

It is recommended that magnetically inhomogeneous rails should not be used on bridges. The data on rail failures do not indicate that rails fail at this point, probably due to their better support. If rails are inhomogeneous, would it not be better to discard all such rails, or if they must be used to install them at such points where failures rarely occur?

Reference is made to the detection of flaws such as transverse fissures and to the periodic examination of rails in service. I am interested in knowing if a fissure has been detected in an apparently sound rail, and if such can be detected after such a rail is laid, or does it only appear after being in service for some time.

Within three years at least five methods have been suggested for testing rails. The question arises, have these tests where used positively shown the fitness or unfitness of a rail for actual service? Is there not a greater need for the correlation of the present tests with the data from actual service than for any new method of testing? I believe a study of the conditions existing in the track is of equal importance with a study of the rail.

Comments by Professor Howe and Dr. Burrows

Dr. Henry M. Howe termed the paper a step forward in a very important direction. Described in a word it measures, he said, the reaction of a form of energy which has no permanent effect on the material. He suggested that we must not expect immediately great practical use of the method, but he does believe that there will be radically new methods of testing, though present methods may not give way in the present generation.

Dr. Burrows, in his elaboration of the paper, emphasized the coercive force as probably the most important feature of the magnetic method, particularly in analyzing heat-treated specimens. A given steel annealed may have a coercive force (the force necessary to neutralize residual magnetism) of 10, but this may be about 30 or 40 after the specimen is quenched. He finds the coercive force will indicate differences in quenching temperatures as close as are measurable by means of the pyrometer. With rails it has not been found feasible as yet to apply coercive force, but instead to depend on variations in permeability. He has found it possible to investigate articles in length shorter than the diameter, and has secured results in investigating balls for bearings.

He explained that magnetic tests have not yet been made of rails in place, though he did not regard such an investigation as impossible, particularly as there is no necessity that in the investigation the rail should be encircled. Investigations were in progress to test elevator cables by carrying the apparatus near by. He explained an interesting case of how he applied the magnetic test to a large number of bars to locate one which he knew some years before had been cut in the middle but joined together with ground surfaces so that the joint could not be detected visually.

Rapid Growth of Shipbuilding Plants

Large Additions to Works of Standard Corporation—Improvements on Staten Island—Large New Plant of Baltimore Company—Plans for Wooden Ships

Nineteen shipbuilding concerns, with a total authorized capital stock of about $75,000,000, received charters during June, marking the climax of shipbuilding expansion which, since Jan. 1, has resulted in the formation of companies having an aggregate capitalization of more than $150,000,000. Three of the largest companies incorporated during the past month have a combined capital of $60,000,000. They are the Great Eastern Shipbuilding & Drydock Co., $30,000,000; the Merchant Shipbuilding Corporation, $20,000,000, and the Seabury Engine & Shipbuilding Co., $10,000,000. During the first six months of 1917, ten companies have been chartered with capitalization of more than $5,000,000 each.

This striking shipbuilding expansion is as yet largely on paper, however. Many of the concerns decline to divulge their plans, but are said to have been organized with the expectation of receiving Government contracts, which have not as yet materialized. Actual shipbuilding activity is so far largely confined to those plants which were in operation before the United States inaugurated its shipbuilding program, although other yards are being equipped as rapidly as present conditions will permit.

The shipyards in the vicinity of New York, which have been affected by strikes of workmen during the past week are largely engaged in repair work for the Government, principally on the German liners, which were seized upon the outbreak of hostilities. It is reported that the Government may take over some of these yards, if the strike situation is not speedily settled.

Important Shipyard Extensions

The Standard Shipbuilding Corporation, with office at 44 Whitehall Street, New York, is completing large additions to its plant on Shooter's Island, in lower New York Bay. This property, comprising 53 acres, was acquired last September. A new boiler shop and plate shed, 240 x 400 ft., has been completed; an extension of the machine shop, 84 ft. 6 in. x 282 ft., and an extension of the blacksmith shop, 66 x 120 ft. have likewise been finished. These buildings are of steel construction. A large quantity of equipment is now being installed. Six new shipways of steel, each 450 ft. long, and 14 derrick towers of steel have also been built, each tower having four 5-ton electrically operated derricks. Forty-eight derricks were furnished by the American Hoist & Derrick Co. A new pier has also been built and considerable money has been expended in dredging and filling in low land. A total of $3,000,000 has been expended for shops, equipment and incidental work. Six ships are now under construction, one having been launched on May 29, and another will leave the ways soon. These ships are of standard design, being of steel, 392 ft. over all, and of 7300 gross tons dead weight. They are being built on private contracts, but presumably will be taken over eventually by the Government.

The Staten Island Shipbuilding Co. is making important improvements at its Staten Island yards. A plate shed, one story, 100 x 150 ft., has been completed and the following buildings are under construction: A mold loft, joiner shop and saw mill, two stories 83 x 225 ft.; a bending shed, one story, 75 x 200 ft.; a power house, one story, 45 x 80 ft., and an extension, to the foundry, 100 x 100 ft. These buildings are of steel. They will be completed about Sept. 1. Two shipways to accommodate 450-ft. ships will be erected soon and two more berths for 200-ft. ships. The company is receiving bids on material for the construction of a boiler shop, 60 x 250 ft., and a machine shop, 110 x 250 ft., with three galleries, and a blacksmith shop. Several traveling cranes will be required for the proposed boiler shop. The Staten Island Shipbuilding Co. is doing considerable private work and also has received a Government contract for four ships.

The Downey Shipbuilding Corporation, 120 Broadway, New York, is going ahead with plans for building steel ships on Staten Island. This concern recently acquired the plant of Milliken Bros., Inc., at Milliken, S. I., which includes a fabricating shop. Definite plans of this company will be announced soon by Wallace Downey, the president.

The Submarine Boat Corporation, 11 Pine Street, is maintaining silence regarding its reported plans for the building of a steel shipyard on Newark Bay. This project has been talked about for some weeks. In co-operation with the Lackawanna Bridge Co., the Submarine Boat Corporation is said to be making plans to launch a steel ship every day after the first one leaves the ways.

The Samuel L. Moore & Sons Corporation, whose plant is at Elizabeth, N. J., is building three steel ships and is doing considerable fitting-up work for the Bethlehem Steel Corporation.

Equipment has been bought for the new shipyard of the New Jersey Shipbuilding Co. at Gloucester, N. J., and the work of construction is being rushed with all possible speed. The company expects to have its first shipways completed by Nov. 1. The New Jersey Shipbuilding Co. is closely connected with the Pennsylvania Shipbuilding Co. of Philadelphia, as both the president and secretary-treasurer of the New Jersey Shipbuilding Co. are officers of the Pennsylvania company and the business is conducted under virtually the same management.

The Newburgh Shipyards, Inc., which has taken over a yacht-building plant at Newburgh, N. Y., has purchased adjoining property and is considerably expanding the yards in anticipation of building steel ships for the Emergency Fleet Corporation. Thomas F. Desmond, a consulting engineer, is president of the corporation, E. C. Bennett is vice-president and general man-

ager and T. W. D. Massiah is purchasing agent. A plate shop, 100 x 200 ft., a mold shop, 60 x 200 ft. and four shipways, each to accommodate a 400-ft. ship, are being built. A joiner shop, pattern shop, power house and other shipyard shops will also be constructed. The concern will purchase a considerable number of machine tools, three locomotive cranes and overhead cranes. It is hoped to lay the first keel by Sept. 1.

Big Expansion of Baltimore Shipyard

Work on the construction of the very large new plant of the Baltimore Dry Docks & Ship Building Co., which will be located on the old McLean property at Fort McHenry, Md., and will cost in the neighborhood of $3,000,000, exclusive of the land, is now under way. Contracts for the addition have practically all been closed. The largest, for the erection of steel buildings, was awarded to the Belmont Iron Works, Philadelphia, and amounts to approximately $500,000. The shipyard tools were contracted for with the Hilles & Jones Co., Wilmington, Del.; the Cleveland Punch and Shear Works Co., Cleveland; Manning, Maxwell & Moore, Philadelphia, and the Niles-Bement-Pond Co., New York. Other contracts were awarded as follows: transformers, rotary converters and switchboard, Westinghouse Electric & Mfg. Co., Pittsburgh; motors, General Electric Co., Schenectady, N. Y.; air compressors, Ingersoll-Rand Co., Philadelphia; two locomotive cranes, Industrial Works, Bay City, Mich.; two locomotive cranes, Ohio Locomotive Crane Co.; accumulator and hydraulic pump, R. D. Wood & Co., Philadelphia; wood working and boiler shop tools, R. D. Wood & Co.; machine shop tools, Manning, Maxwell & Moore, and Niles-Bement-Pond Co.; bridge cranes, Manning, Maxwell & Moore; shipyard cranes and 70-ton fitting-out crane, Edward F. Terry Mfg. Co., New York. Day & Zimmerman, Philadelphia, are the engineers.

Otto G. Simonson of Baltimore, is architect for the office buildings, plans for which will be completed within a day or two, and bids for the work will be asked within the next few days.

The improvement plans of the company provide for the erection of the following large buildings: Boiler shop, 110 x 340 ft.; outfitting shop, 70 x 400 ft.; ship shop, 260 x 340 ft.; layout shop, 80 x 360 ft.; mold loft over layout shop, 80 x 360 ft.; fabricating shop, 100 x 400 ft.; assembly shop, 80 x 400 ft.; store building, 50 x 200 ft. The office buildings, which will be three story, will be 50 x 150 ft. There will be four shipbuilding berths.

These improvements were necessitated by millions of dollars' worth of new business, including much work for the Government, which the company has received. At its upper plant, the company will construct for the Navy Department three mine planters. These will be approximately 180 ft. long, with 35 ft. beam, and will have a speed of 14 knots. Only the hulls of the planters will, however, be constructed by the company, as the Government will install the boilers and other equipment after the hulls are completed. In addition to this, the United States Shipping Board Emergency Fleet Corporation has just closed a contract with the company for the construction of eight 8800-ton cargo ships, at approximately $11,000,000. These vessels will be constructed at the lower plant. They will be of the following dimensions: Length over all, 423 ft. 9 in.; length below poop, 410 ft.; beam, molded, 54 ft.; depth, molded, 29 ft. 9 in.; draft designed load, 24 ft. 2 in.; speed, loaded, 10½ knots. Ten ships to be constructed at these yards will be commandeered by the Government. The new plant is expected to be in full operation by Dec. 1. Output of both plants will be 18 large and three small ships annually.

Plans Now for 375 Wooden Ships

The wooden ship program is making progress. It is now understood that the Shipping Board has modified its original plans for 1000 wooden ships and instead will build 375. Specifications have been issued and bids asked for material for this number of ships.

The Foundation Co., Woolworth Building, New York, has completed 10 ways for wooden ships at its yard on the Passaic River, and expects to lay the first keel about Aug. 1. Several small buildings have been erected on the property. A considerable part of the yard equipment has been bought. The Shipping Board has authorized the company to ask for bids on bolts, tie rods, clinch rings, strapping rivets, stem bar, turn buckles, spikes, etc., of which about 150 tons will be required for each ship. These will be bought in the open market, and it is understood there will be no attempt at price-fixing. The company will also buy its forgings in the open market. Ten wooden hulls are to be built, the first to be delivered to the Emergency Fleet Corporation by March, 1918.

Sanderson & Porter, 52 William Street, New York, are equipping their shipyard and also expect to lay the first keel about Aug. 1. They will build 10 wooden hulls, the first to be delivered by April, 1918.

The Traylor Shipbuilding Corporation, whose plant is a Cornwells, six miles south of Bristol, Pa., is building 10 shipways, a few of which have been completed, and the first keel will be laid within 30 days. Ten wooden ships will be built. The machinery for these ships will be built by the Traylor Engineering & Mfg. Co., Allentown, Pa.

The Tebo Yacht Basin Co., Brooklyn, is preparing its yard for the building of submarine chasers for the United States Navy.

Changes in Boiler Plate Specifications

WASHINGTON, July 10—As the result of an investigation by the Bureau of Standards of the requirements of the Steamboat Inspection Service for steel boiler plate, the interesting fact has been developed that the specifications heretofore in force have been unnecessarily severe and may be safely relaxed so as to increase the output without in any way lessening the safety of this material. Following the bureau's report the executive committee of the Board of Supervising Inspectors of the Steamboat Inspection Service, at a meeting recently held here, has adopted a series of amendments in the general rules and regulations.

One of the most important changes recommended by the Bureau of Standards is the raising of the sulphur limit in open-hearth steel from 0.04 to 0.05 per cent. No change is made in the phosphorus, the amended rule reading as follows:

> Open-hearth steel shall contain not more than 0.04 per cent of phosphorus nor more than 0.05 per cent of sulphur.

The bureau also recommended the adoption of a new rule relating to tensile-test specimens and quench-bend specimens which has been adopted, as follows:

> Two tension tests and one quench-bend test shall be made from each plate as first rolled from the billet, slab, or ingot, the tensile-test specimens to be taken from the diagonal corners of the plate, and the quench-bend specimen to be taken from that part of the plate which represents the top of the billet, slab, or ingot.
>
> The quench-bend specimen shall withstand, without fracture, being bent over until the ends are parallel and the inner radius equal to one and one-half times the thickness of the test specimen.

Section 18, Rule II, all classes, of the general rules and regulations, has been stricken out and a modified rule for determining the working pressure on flat surfaces of boilers has been adopted.

All of the amendments agreed upon by the Board of Supervising Inspectors will be embodied in detail in a circular letter entitled "Sixth Supplement to General Rules and Regulations" which will be issued within a few days by the Steamboat Inspection Service to boiler manufacturers, manufacturers of boiler plate, steamboat companies and others. The circular may be obtained on application to United States local inspectors of the Steamboat Inspection Service.

The New Departure Mfg. Co., Bristol, Conn., has given a bonus of an extra week's wage to all employees who have been in the service of the company over three months and a halfweek's wage to all employees who have been in the service for more than one month and less than three.

Roll Scale in the Bessemer Process*

Better Steel, Increased Output and Lower Cost Some of the Benefits from Its Use—Advantages and Disadvantages Compared

BY A. PATTON AND F. N. SPELLER

THE use of roll scale in the Bessemer process dates back, to the best of our knowledge, at least twenty years. It was first used by the Ohio Steel Co., Youngstown, Ohio (now the Ohio Works of the Carnegie Steel Co.), under the direction of Sam McDonald, superintendent of the Bessemer department at these works. Two 10-ton vessels and one blowing engine capable of blowing one heat at a time were employed. The object of using the scale was to shorten the length of the blow, or in other words, to increase the production with the same equipment.

Various means were tried out for introducing the roll scale into the bath of molten iron: It was shoveled into the vessel before the heat was charged, so that the metal would flow over the scale; it was shoveled into the bath after the vessel was turned up; it was dumped into the empty iron ladle by the wheelbarrow load, and at times was dumped on top of the molten metal in the iron ladle. But the practice of introducing the scale into the iron ladle had to be abandoned on account of danger from explosions and of skulling the ladles.

It was soon learned that the proper place to charge the scale was in the empty vessel, so that when the molten iron was poured into the vessel it flowed over the scale, causing a considerable reaction to take place before the heat was turned up. Eventually, cylindrical chutes similar to those now in use were installed. Into these chutes the scale is dumped and carried into the empty vessel. Before this convenient means of introducing the scale was adopted, the Ohio Works had satisfactorily demonstrated that roll scale would increase production, by blowing 107 heats in one 12-hr. turn (1087 tons) with one blowing engine, blowing one heat at a time; whereas, prior to the use of scale, the best practice at these works was about eighty heats under the same conditions.

In using roll scale and other oxides of iron to facilitate and control the refining of pig iron in the converter, the Bessemer plant has borrowed one of the most active agencies used in the open-hearth process with, as would be expected, much the same results. The effect of such additions to the Bessemer charge may be discussed as to the influence of this practice on quality, production and cost.

Experience has shown that the judicious use of roll scale in the Bessemer operation will not only increase production and reduce cost, but that at the same time it will improve the general quality of the steel. Most of the data on which these conclusions are based were obtained at the Bessemer plant of The National Works, National Tube Co., McKeesport, Pa., with the assistance of George Hitchins, superintendent of steel works, and others of this company.

Influence on Quality

With special reference to the manufacture of soft, weldable steel for pipe, it can be assumed to start with that the most important element in this problem is uniformity of operation. A higher standard of uniformity, especially in those points which affect the welding quality of the steel, is demanded in the manufacture of steel skelp than for other products, and it is probably true that this is generally obtained under modern conditions. Prominent among the factors contributing to this success is the use of roll scale in the converter.

The influence of this practice on quality is primarily due to the wider latitude in silicon which is thereby given to the blast-furnace operations, resulting in higher average silicon and lower sulphur. To obtain uniformly low-sulphur metal from the blast furnace, the Bessemer department must be designed and operated so as to be able to use without complaint iron that will run from 1 to 3 per cent in silicon. This gives the blast-furnace management a larger margin of safety, thus making unnecessary sudden changes to prevent making iron too hot or too cold for the Bessemer plant. At the steel plant of the National Works, the average sulphur in the steel for 1915 was 0.038 per cent with 95 per cent under 0.050 per cent, the blast-furnace iron averaged for that year 1.77 per cent silicon.

The proper use of roll scale, pig and steel scrap enables the blower to turn down his heats nearer to the same point in carbon by giving a sharper contrast on the final changes in the flame. This makes the loss in manganese and the residual manganese in the steel more constant. It also enables all heats to be blown more nearly in the same time and to the same temperature, which, of course, is favorable to uniformity in heating and rolling and makes all dependent operations more systematic.

The introduction of roll scale provides oxide of iron which would otherwise have to be formed by burning about 1¼ per cent of the metallic charge. A larger amount of oxide added is reduced by silicon in the bath. Somewhat higher silicon must therefore be present when roll scale is used to make up the thermal deficiency.

Production and Cost

In the design of a Bessemer plant, about all the engineer can do with regard to production is to make the vessels sufficiently large to blow the size of heat desired, with a bottom having sufficient blast area to blow the heat in a given time. He would probably use in his calculations a pig iron with 1 to 1.25 per cent silicon. If the blast area was figured sufficiently large to blow iron containing 2 to 2.50 per cent silicon in the same length of time, the operator would be in trouble when required to blow iron carrying in the neighborhood of 1 per cent silicon. The vessels would slop badly, increasing the loss, and the quality of the steel would deteriorate. A vessel properly designed, with a bottom having sufficient blast area, using 20 to 25 lb. per sq. in. (1.4 to 1.7 atmospheres) blast pressure and designed to blow a heat of 1 per cent silicon iron with pig scrap in 10 min., will blow a heat of 1.25 per cent silicon iron in the same time if steel scrap is used. When the silicon rises above 1.25 per cent, roll scale and pig scrap can be used, increasing the scale as the silicon rises and so continuing to blow heats in approximately 10 min. When the iron runs above 2 per cent silicon, it may be advisable to use steel scrap and roll scale, although the proportions required cannot be laid down according to rule, but must be varied by the operator, depending on mill conditions.

By this procedure heats can be blown in 10 min. which would otherwise require 18 min.; thus the full capacity of the plant can be maintained regardless of variations in the pig iron.

The Bessemer department of the National Works has three vessels 8 ft. (2.4 m.) in diameter of 9 tons capacity; the bottoms have 18 tuyères, each having seven holes ½ in. (1.3 cm.) in diameter, giving a blast

*From a paper presented at the annual 1917 meeting of the American Iron and Steel Institute in New York. Mr. Patton is superintendent steel works, Jones & Laughlin Steel Co. (superintendent of National Tube Co. steel works for 10 years prior to Nov. 1, 1916), and Mr. Speller is metallurgical engineer, National Tube Co.

area of 24.7 sq. in. (159 sq. cm.). Using 20 to 25 lb. (1.4 to 1.7 atmospheres) blast pressure, heats of metal with silicon in the charge ranging from 1 to 2.50 per cent can be blown in 10 to 12 min. As most of these heats carry over 1.40 per cent silicon, roll scale and pig metal are nearly always used for "scrapping," the roll scale occasionally running as high as 6 per cent.

Steel scrap is not used with roll scale as a rule unless it is desirable to blow the heats more quickly, and this usually becomes necessary only when the silicon in iron rises above 2.50 per cent. The production of this plant has been increased at least 20 per cent by the use of roll scale in this way.

To analyze the comparative cost of the practice we have been discussing is naturally a very complicated matter. Some Bessemer superintendents claim that it takes 2 tons of roll scale to make a ton of steel. This estimate seems to us excessively high, but even if such were the case we have in this practice a direct method of producing steel far below the cost of any known process.

In order to determine the influence of roll scale by itself, we made several experiments in November, 1916, by running five heats with and without scale at the same time in this plant, all other conditions being maintained constant as nearly as possible. The results of these tests are given in Table 1. The difference in time of blow is the most striking feature. This is entirely accounted for in the shortening of the silicon blow. For example, we give the following records from heats which were carefully watched in this respect, from the last series in Table 1:

Without Roll Scale			With Roll Scale		
Heat No.	To First Carbon Flame, Minutes	Finish of Blow, Minutes	Heat No.	To First Carbon Flame, Minutes	Finish of Blow, Minutes
3	7	14¼	3	2½	10
4	7¾	15	4	3¼	11
5	7¾	15	5	3	10½

The quicker removal of silicon is apparently due to the large excess of oxygen supplied by the roll scale, and to the oxide of iron which remains in the bath available for combination with the silica. Silica is thus removed from the bath as fast as it forms and we have a good slag from the time the vessel is turned up. The rapid reduction of the magnetic oxide is clearly indicated by the chilling effect on the heat, which is equal to about one and one-half times that produced by the same weight of pig iron.

To determine whether a larger percentage of iron was carried away in the slags under certain conditions, samples of mixer metal and slag were taken for analysis throughout the month of November, 1916. These slags were fairly uniform. At least, the combined iron in the slags did not vary with the silicon in the charge, as would be expected if the variable amount of roll scale added had any material influence on the slag. As the converter slags were as a rule observed to have the same physical consistency as well as practically the same analyses under this practice, it may be assumed that the free iron or shot carried away in the converter slag is also proportional to the weight of slag produced, which varies with the silicon in the charge.

During the month of November, 1916, when the experiments referred to in Table 3 were made, we weighed all the converter slag that was shipped from the mill, and weighed or estimated the loss in the lining and bottoms of the converters. With these data and the analyses of the slags and the charge throughout the month, we have computed the loss in metal in the slag as follows:

Converter Slags

Weight of slag calculated from silica contents per charge of 22,400 lbs.:

	SiO_2, Lb.
100 lb. from bottom × 80 per cent	= 80.0
50 lb. from sides* × 97 per cent	= 48.5
	128.5
1.74 per cent Si in charge = 0.0174 × 22,400 × 69/28	= 835.2
Total SiO_2 in charge	= 963.7

*Estimated by measuring vessel before and after 500 heats.

Slags carry 60 per cent SiO_2 (averaged from analyses of samples after removing shot).

$$\text{Silicates in slag} = \frac{963.7}{0.60} = 1{,}606 \text{ lb.}$$

Slag per heat, as weighed for month = 2,016 lb. (= 9 per cent of charge).

Theoretical weight of slag from SiO_2 in silicates = 1,606 lb.

Shot and scrap = 410 lb. or 20.3 per cent. of slag

Combined iron in silicates = 16 per cent × 1,606 = 256 lb. = 12.7 per cent of slag.

Total iron in slag = 33.0 per cent.

The silicon in the charge for the group of heats included in the test heats referred to in Table 3 was practically the same as the average for the entire month. The actual converter and cupola loss for this month amounts to 9.05 per cent, which is somewhat above the average, due to an unusually high percentage of shot in the slag and to the fact that the average silicon for this month was comparatively high. The converter and cupola losses for this month and for the same month in 1915 have been analyzed and are given in the original paper. The actual loss in November, 1915, was 8.45 per cent.

The use of roll scale was started at the National Works in December, 1906. For that year the silicon in the charge averaged 1.29 per cent. Assuming all other conditions to be unchanged, the increase in converter loss due to raising the silicon in the charge to 1.61 per cent, as was the case in 1915, would be about 0.3 per cent, based on the slag carrying 24 per cent iron in each case.

There is probably a little more loss due to the greater activity of the reactions in the converter when using dirty or moist roll scale, but this is recovered for the most part and is credited to the steel works. The free iron now lost in the converter slag might also be recovered to advantage so that the necessary excess loss by this practice would consist of only a little more

Table 1.—Results of Experimental Heats With and Without Roll Scale

Exper. Run No.		Analysis of Mixer Iron			Weight of Charge in Pounds					Per Cent Si in Charge	Blast Press. Pounds per Sq. In.	Time of Blow, Min.	Analyses of Slags					
													Converter Slag			Ladle Slag		
		Total C	Si	Mn	Mixer Iron	Pig Iron	Steel	Roll Scale	Total Weight				SiO_2	Iron	Mn	SiO_2	Iron	Mn
No. 1.	Without scale	4.34	1.96	0.84	18,640	.....	3,160	.....	21,800	1.80	23	19.0	65.27	15.30	8.11	53.12	15.70	14.00
	With scale	4.21	2.20	0.81	19,180	.....	2,130	1,210	22,520	1.90	23	12.5	61.80	17.50	7.84	50.10	16.20	13.44
No. 2.	Without scale	3.98	1.60	0.76	19,000	3,000	.....	.....	22,000	1.63	25	18.6	63.60	16.20	8.11	48.06	15.60	12.84
	With scale	4.06	1.63	0.77	19,000	2,000	.....	1,000	22,000	1.56	25	10.0	62.26	17.70	8.64	48.64	16.50	12.97
No. 3.	Without scale	3.92	1.62	0.70	19,100	3,500	.....	.....	22,600	1.62	25	18.9	65.34	16.50	8.24	50.48	13.00	11.59
	With scale	4.00	1.96	0.75	19,200	2,500	.....	1,400	23,100	1.87	25	11.3	63.40	16.50	8.15	52.04	15.90	12.94
No. 4.	Without scale	4.24	1.79	0.64	19,020	2,540	.....	.....	21,560	1.80	25	15.0	63.50	14.50	6.82	47.40	18.20	18.21
	With scale	4.00	1.77	0.68	19,080	1,550	.....	1,000	21,630	1.69	25	10.2	60.50	18.70	8.01	47.00	16.10	16.95
Averages		4.08	1.82	0.74						1.73								

NOTE.—The average weight of all converter slags produced for this month was 2,010 lb. per heat. The ladle slag averaged 417 lb. per heat and was quite constant.

than the combined iron in the larger volume of slag due to a higher content of silicon. As the per cent of combined iron in the slag has been found to be practically constant, this would be lost in any case in proportion as the silicon in the charge is raised, which we maintain is warranted to a certain extent on the basis of better quality alone.

Against this loss, most of which is in consequence of the larger volume of slag produced, we must credit a 20 per cent reduction on steam cost and a similar reduction in most of the other items of cost, together with a 10 per cent increase in scrap-melting capacity due to the use of higher silicon iron. It is hardly necessary to produce further figures, even if we had them, to indicate that there is a substantial saving in cost of production by this practice. It may be said that it costs a little more to make the higher silicon iron, but this is obviously more than offset by the advantages obtained, some of which, such as increased yield of finished product, are difficult to compute.

We have attempted to give briefly the results of ten years' experience in the use of roll scale under the conditions that prevail at this particular plant. However, in summing up the benefits derived, as "better steel," "increased production" and "lower cost," we would not have the reader conclude that this is a "cure-all," as the practical Bessemer operator will readily appreciate that there are many other details such as temperature, ladle reactions, etc., which will require just as much attention as ever. Aside from all other factors, however, the judicious use of roll scale is a study within itself.

Fused Bauxite as a Refractory

Refractory materials suitable for furnace linings and for crucibles are claimed possible as a result of new methods of preparing bauxite made public by M. N. Lecesne in a recent issue of *La Ceramique*. The material is a result of the following procedure:

A mixture is prepared of one part of anthracite and three parts of bauxite of average composition (about 60 per cent of alumina, 10 per cent of iron sequioxide and 10 per cent of silica), and in the state of moisture in which it comes from the quarry. The mass is charged into a furnace lined with refractory material (preferably fused bauxite), and previously heated up with anthracite, air being blown through the charge at an initial pressure of about 40 in. water gauge, rising afterwards to as much as tenfold that pressure, according to the depth of the charge, though 160 in. of pressure is the usual maximum. The temperature rises quickly and the sudden vaporizing of the water in the bauxite causes the latter to break up and granulate, while the aluminum carbide which is produced burns and raises the charge to over 3000 deg. C. of incandescence. In consequence, the silica is volatilized and the iron, reduced by the action, is expelled by the air blast as a shower of sparks which in contact with the outer air are transformed into magnetic oxide. The air blast is continued, to burn off the surplus anthracite and cool down the fused mass, which can then be discharged from the furnace and ground, mixed with crude or calcined bauxite as a binder, molded, dried and fired in the same way as calcined bauxite.

If the fusing process is performed quickly, or in about three hours, the resulting mass will be highly porous, besides containing a sufficiency of unconsumed anthracite to facilitate grinding and briquetting. The fused bauxite constitutes an artificial corundum which will give a refractory material capable of withstanding a temperature of over 2000 deg. C. if mixed with some of the same material, freed from iron by magnetic separation, and with water and quicklime, the latter forming a binder of silicate of lime. In association with bauxite (1 part to 9 of the corundum) the product is hard, but porous, and forms a suitable lining for reverberatory furnaces and those heated with liquid or gaseous fuel.

The total number of establishments now under control of the Ministry of Munitions of Great Britain is 4942. Incidentally it is proposed to extend as necessary the principle of dilution to particular classes of work not now undertaken by women and also the transference of operatives from one district to another.

MANGANESE ORE OUTPUT

Large Increase in Domestic Mining for This Year Is Predicted

WASHINGTON, July 10.—The demand for manganese has greatly stimulated development and prospecting in the United States and miners everywhere are responding to such purpose that the Department of the Interior estimates that the domestic output in the calendar year 1917 will be trebled. In a formal statement concerning the increased production of manganese, Secretary of the Interior Lane says:

"Modern steel making demands manganese, and the shortage of a domestic supply of this ore has been a matter of concern to those of us who wish America to be industrially independent. But now the war requirements for steel have been realized by the manganese operators, for reports already received in the Department of the Interior show that shipments of high grade manganese during the past six months aggregate 28,345 tons, or nearly 10 per cent more than the tonnage for the whole 12 months of 1916, which amount in turn was three times the 1915 shipments. Shipments are reported from 10 States, but in Montana alone the shipments since last January largely exceed the shipments for the whole United States in 1915.

"The manganese situation, therefore, is most encouraging and the United States Geological Survey estimate for the whole year is 80,000 tons of the high grade ore. This, however is less than 20 per cent of the present large demand of the steel industry. Yet it is significant that the shipments of lower grade manganese ore likewise are record breaking, the six months of 1917 considerably exceeding the 12 months of 1916, and the present rate of production promises an even larger tonnage for the remaining six months. This gratifying activity in the mining of so essential an ore seems to be largely the result of better financing and better engineering of the industry, which in turn is simply another expression of how America is meeting the present crisis in American fashion."

Standardizing Motorcycles

At the suggestion of the War Department a number of motor cycle engineers representing the entire American motor cycle industry held a meeting in Washington during the past week to consider the extent to which the parts of motor cycles can be made interchangeable. These experts who met under the auspices of the Society of Automotive Engineers in co-operation with the automotive transport committee of the Council of National Defense agreed upon numerous immediate steps looking to the ultimate interchangeability of parts in motor cycles intended for use abroad. These parts will all be brought to stated dimensions, but no effort will be made to enforce these standards upon motor cycle manufacturers. There is little doubt, however, that this movement will result in great progress toward the general standardization of the entire industry.

Return to Work

An agreement has been reached between the Orbon Stove & Range Co., Belleville, Ill., and the molders' union whereby the men returned to work June 28 after a strike of several weeks. The original cause of the trouble was a strike of stove mounters and steel range workers who called out the foundry laborers and made it impossible for the molders to work. Subsequently an injunction was issued restraining the unions from interfering with operations at the plant, and the molders, when they learned they were included in the injunction, refused to work until the order was removed. The injunction which affected the molders was dismissed July 3.

McCrossin & Darrah, American Trust Building, Birmingham, now represent the Link-Belt Co., Chicago, in Alabama. E. Francis McCrossin and John F. Darrah are experienced in Link-Belt engineering work.

Post-War Business Relations with Germany

A metal merchant, in a communication to the London *Ironmonger*, has the following to say regarding business relations with Germany after the war:

The home trade problem is easier to solve than the question of raw materials, and the general question of raw materials is easier to deal with than the question of trade with neutral countries and with the Empire.

Take as an example bar iron for export. After the war our price may be for some time about £10 per ton, and the German price, to "get in" again, may be equal to £6 10s. per ton. If we arrange as an Empire matter that no German bars are to be admitted into our colonies or dependencies, which, I take it, is on the lines of Mr. Rawlins' desires, the result will be that the Indian and Egyptian peoples will be forced to pay 50 per cent more for their iron than their neighbors in the Dutch East Indies or in Turkey.

Two undesirable results would follow: First, it would force certain trades into German hands; and, second, it would give cause for grave discontent in India and in Egypt from buying in the cheaper Dutch East Indies or in Turkey.

A minor matter would be the difficulty of preventing Egypt from buying in the cheaper Turkish market and the Indian people from the cheaper Dutch market. More than this, there is the problem of our Allies. Is it not likely, for instance, to injure our position with the Russian democracy if the attempt is made to force them to buy dearer bar iron from the Allies than they can get from Germany, and would it not help the strong movement in Russia for immediate restoration of friendly relations with Germany, if Germany, the cheap and anxious seller, is barred from commercial relations in the interests of British trade?

I am not arguing the position, but only suggesting points that have to be considered in relation to the whole, and I mention bar iron because it is best to have something definite in mind and not because it is the best or the only illustration.

Two things should be kept well in mind. First, the desirability of making, as a condition of peace terms, the complete restoration of machinery and plant to the destroyed works in France and Belgium before German export trade is allowed; and, second, to make our own fiscal arrangements regarding raw materials with the view of our being able to compete favorably in the world's markets in price as well as in quality.

The Joseph F. Wangler Boiler & Sheet Iron Works Co., St. Louis, has removed its general offices from its long established location at 1547 North Ninth Street to 911 Federal Reserve Bank Building, 415 Pine Street, in that city. The company manufactures steam boilers and tanks and constructs boiler plate and sheet iron work. Joseph A. Wangler, who has been connected with the company for more than 25 years, is president.

The R. B. Phillips Mfg. Co., Worcester, Mass., has been sued for $45,000 by the George Q. Hill Co., Boston, for alleged breach of contract. The Hill company claims that the Phillips company delivered only about one-fifth on a contract for 1,000,000 adapters and 1,000,000 caps for the British fuse No. 101, and that the alleged failure to deliver made it impossible for the George Q. Hill Co. to fulfill its contract.

The Portage Refrigerator & Heater Co., Portage, Pa., recently incorporated in Delaware with a capital of $100,000, is making rapid progress in the erection of a new plant and plans for early occupancy. The new works will be used for the manufacture of refrigerators and steam and electric heaters.

New Navy Specifications for Steel Castings

New specifications governing the manufacture of steel castings, have recently been issued by the United States Navy Department. They are dated May 1, 1917, and are designated as 49 S1d superseding those issued June 1, 1916. The chemical and physical properties demanded by those specifications are as follows:

	Chemical Composition, Not Over		Physical Requirements				
Grade	P.	S.	Minimum Tensile Strength, Lb. per Sq. In.	Minimum Yield Point, Lb. per Sq. In.	Minimum Elongation Per Cent in 2 In.	Minimum Reduction of Area, Per Cent	Bending Test; Cold Bend (Not Less Than)
F	0.05	0.05	85,000	53,000	22	35	120 deg. about an inner dia. of 1 in.
A	0.05	0.05	80,000	45 per cent of tensile strength obtained.	17	20	90 deg. about an inner dia. of 1 in.
D	0.05	0.05	70,000		22	30	120 deg. about an inner dia. of 1 in.
B	0.06	0.05	60,000		22	30	120 deg. about an inner dia. of 1 in.
C	0.06	0.07	.....	.....	..	..	.....

NOTE.—Class F castings may contain nickel or other alloying metals.

It will be seen that the sulphur requirements are not over 0.05 per cent in all grades of castings except Class C which is not tested in any way and is regarded as the least important. The purpose for which each grade is used is revealed by the following paragraph from the specifications:

Grade A is intended for all important parts subject to crushing stresses or surface wear only, such as hawse pipes, chain pipes, turret roller paths, engine guides, slippers, etc.

Grade B is intended for parts subject to tensile or vibratory stresses, such as stems, sternposts, stern tubes, rudder frames, struts, engine bedplates, cylinders, gun-mount stands, carriages, slides, and other parts subject to the shock of recoil.

Grade C is intended for gun mounts, such as brackets, levers, wheels, etc., not subject to shock of recoil, and for commercial fittings where structural strength and separation of water-tight compartments are not involved, such as pipe flanges (other than bulkhead and deck), cagemast fittings, stowage lugs and clips, hinges for doors and hatches where water-tightness is not involved, etc.

Grade D is intended for the same general purpose as grade B, but where greater strength is required with equal ductility.

Grade F is intended for castings for gun yokes, gun mount stands, carriage slides, deck lugs, etc., of large size.

The latest specifications of the Navy for structural steel work, dated Feb. 1, 1917, and designated as 48 S1c, demand not over 0.05 per cent sulphur and phosphorus in all steel castings used in yards and docks and similar work and limit the sulphur to 0.045 per cent for rivet steel for bridges and buildings.

It is known that in many cases it is difficult to meet a sulphur specification of not over 0.05 per cent in recent months, even in acid open-hearth work. The intensive stress for output under which blast furnaces and coke plants have had to operate has tended to increase rather than diminish the quantity of sulphur in these raw materials, thereby making it still more difficult for steel makers to meet specifications.

Aeronautical Research Laboratory

The National Advisory Committee for Aeronautics has just closed a contract with the J. G. White Engineering Corporation for the erection of a research laboratory on Langley Field, near Hampton, Va. At this laboratory, in addition to the usual structural tests on airplanes and airplane parts, scientific research peculiar to aeronautics will be conducted under the immediate supervision of the committee. The laboratory will comprise complete machine, instrument, and pattern shops, as well as a drafting room with the most modern equipment.

The coal handling machinery and accessories at the Naval Station, New London, Conn., are for sale. The equipment consists of Brown patent bridge tramways, hoisting engines, boilers, self-dumping coal tubs, etc., and a coal shed containing approximately 430 tons of structural material. The sealed proposals for this material will be opened at 1 p. m., July 16.

Tremendous Demand for Machine Guns

Great Task of Meeting Government Requirements to Be Submitted to Manufacturers—What the Building of Thousands of Airplanes Means

WASHINGTON, July 10.—The greatly increased importance of the machine gun for use on land, water and in the air promises to tax the productive capacity of all private plants equipped to manufacture these weapons and the Government has now put squarely up to the producers the serious problem as to whether the demands of the nation can be adequately met. The machine gun is a distinctly modern factor in offensive and defensive warfare on land, but the most recent development in its use is due to the progress made within the past year or two in the utilization of the submarine and the aeroplane. It is now the firm conviction of the ablest military and naval experts that, notwithstanding the great increase in the use of the machine gun by the infantry, an even larger number will be employed on the water and in the aerial service.

When the European war began the actual equipment of the United States Army was from one to three machine guns per regiment. Early observations of infantry tactics on the western war frontier demonstrated to our experts with the French and British armies the wisdom of the use of a much larger number of machine guns than was ever before regarded as practicable, and, based on the work of the infantry of the Allies, it was decided to increase our machine gun equipment to 12 guns to the regiment. This decision involved supplying the army with six or seven times as many machine guns as had previously been thought necessary and, with the decision to put an army of 2,000,000 ultimately in the field, it meant the manufacture of approximately 20,000 of these weapons.

The arming of merchant ships and the equipment of swift naval vessels and small auxiliaries to fight the submarines gave the next impetus to the machine gun, and a short time ago the navy ordered no less than 1600 improved Marlin rapid firing machine guns designed especially to shoot at submarine periscopes. The ultimate needs of the navy for all purposes will probably amount to several times this number and will include one or more additional types of gun.

Building a Great Air Fleet

The latest and by far the most important development in the machine gun requirements grows out of the decision of the war administration to attempt the construction of an immense fleet of airplanes, each carrying one or more guns. The immediate object of the authorities will be to authorize the building of at least 20,000 planes, and this number may be doubled or quadrupled should the war last beyond the calendar year 1918. It is becoming more and more apparent that, in view of the unlimited capacity of the allied nations to build airplanes and the military superiority over the German forces which a great fleet of airships would give the allied armies, the most promising method of shortening the war is to adopt the urgent recommendations of our military observers in Europe and to take up the manufacture of aircraft and all the adjuncts thereof upon a stupendous scale.

Summarizing the latest estimates for machine gun requirements for all purposes, it is seen that the regular infantry forces of the United States, the new national army and the militia, will require at least 25,000 guns, the navy 4000 or 5000, and the great projected air fleet anywhere from 20,000 to 50,000, depending upon the number of airplanes actually authorized by Congress.

That the War Department is keenly alive to the magnitude of the task before it in providing machine guns there is ample evidence. While the present policy of the department in the matter of disclosing its plans is decidedly conservative, the following authorized statement will indicate what is being done to meet the great emergency now confronting the country:

The subject of machine guns, their design and supply, has necessarily required a great deal of attention on the part of the War Department. On Oct. 2 last, a board of officers was convened, upon which both the army and navy were represented, with instructions to make tests of machine rifles and recommend as to the type which should be employed in the United States Army. The board has had a number of meetings, and has carried out a program of tests which occupied practically all of the month of May. It tested 18 different types of machine guns, of which eight went clear through the test, surviving to the end, while the others fell out at various stages.

Machine guns can be divided into classes along several different lines. They may be classified as air-cooled guns and water-cooled guns, depending upon the nature of the reliance for keeping the barrel as cool as possible under the heating action of rapid fire. Some systems surround the barrel with a water jacket, while others depend upon circulation of air about the barrel, either natural or forced. They may also be classified as recoil-operated guns or gas-operated guns. In the recoil-operated guns a certain movement is permitted to the barrel and this movement sets in motion the mechanism for withdrawing the empty cartridge case, ejecting it, cocking the piece, reloading a new cartridge, and firing; in gas-operated guns this mechanism is actuated by the pressure of the gas which is obtained from the barrel by tapping it at a point some distance down toward the muzzle.

The most recent classification of machine guns is into heavy type and light type. The heavy guns are those of greatest reliability and greatest capacity for continuous action, and they are used in positions where these qualities are considered so necessary as to more than overcome the disadvantage of increased weight of the guns, or where, on account of lack of necessity for the easy movement of the guns, weight is not material. The light type comprises those which are light enough to be easily carried by a man in a forward movement, and in which, for the sake of lightness, the capacity for continuous fire is to a certain extent sacrificed. These light-type guns have been refined down by recent invention until some of them now weigh not more than 14 pounds, and can be easily carried and fired by one man, who can shoot from the hip while advancing. These light-type guns are sometimes called automatic rifles, but this is through paucity of vocabulary, since all modern machine guns are automatic rifles.

Machine guns form the essential armament of fighting aeroplanes. The aeroplane service gives a particularly good opportunity for the air-cooled type, since long-continued firing is not necessary, and since the rapid motion through the air assists in cooling the barrel.

The machine gun board, as a result of its labors, found itself able to recommend satisfactory types of guns of both kinds, and it is now up to the manufacturing talent of the country to produce them in the large numbers in which they will be required. It is not deemed wise to disclose the program of manufacture nor to render prominent by publication the places where manufacture is likely to be carried on, but it will be gratifying to the country to know that in the tests and conclusions of the machine gun board it was abundantly shown that American invention has not been asleep.

Congress Favors Airplanes

It can be stated very positively that the War Department will have the active co-operation of the leaders of both Houses of Congress in its plans for a great air fleet. The House Committee on Military Affairs last Friday began consideration of a series of bills to authorize the aircraft program as submitted by Secretary Baker. The chief measure on the committee's docket calls for an initial appropriation of $630,000,000, of which $363,000,000 would be expended in the purchase of 22,625 airplanes and 45,250 engines, while the remainder would be used in the construction of training camps and the training of a large number of aviators. Another bill relates to the organization and personnel of the aerial corps, and clothes the President with

authority to obtain the necessary men by draft, if voluntary enlistment fails to meet the requirements of 75,000 men, which is the War Department's latest estimate.

In the construction of the required number of airplanes and engines, the War Department is proposing to utilize the facilities of several of the largest automobile plants in the country. Already representatives of the department have visited these plants and have begun negotiations to ascertain the terms upon which the airplanes and engines can be turned out with the greatest possible rapidity. As the period of serviceability without overhauling of an airship engine is only some 300 hours, it is absolutely essential that each airplane should be supplied with two engines, and in view of the large number to be utilized in France, it is regarded as highly important that they should be thoroughly standardized with interchangeable parts. The airplanes will probably be of at least three types—for instruction, scouting, and actual fighting, the last mentioned type being the heaviest and capable of carrying, in addition to crew and armament, considerable quantities of bombs and explosives.

Airship Engine Problems

No decision has yet been reached on the important question as to whether the actual construction of airship engines will be deferred until a standardized type has been worked out by the advisory committee for aeronautics, but it is probable that at least one type of engine now in use will be employed for the equipment of such aeroplanes as are delivered within the next six months, while the "All America" engine will be utilized for subsequent deliveries.

The Navy Department has taken steps to greatly increase the output of submarine chasers to be armed with machine guns and weapons of larger caliber, and it is stated that in the near future a considerable number of the small light vessels of the chaser type may be added to the American fleet in European waters. The first of the standardized chasers has successfully undergone her trial runs with results that convince the officials that a type of great value in the fight against submarines has been produced. Several hundred additional vessels are now under construction in navy yards and private plants and within the past week orders have been issued almost doubling the number which will be turned out within the next six months. The task of securing engines for these vessels has proven a difficult one, as the Navy Department, for obvious reasons, does not wish to employ too many different types. It has been necessary to purchase engines built by several manufacturers, but upon similar designs, and a fairly satisfactory number have been procured. With a view to efficient operation and quick repair, all submarine chasers sent into European waters will probably be equipped with the same type of engine.

W. L. C.

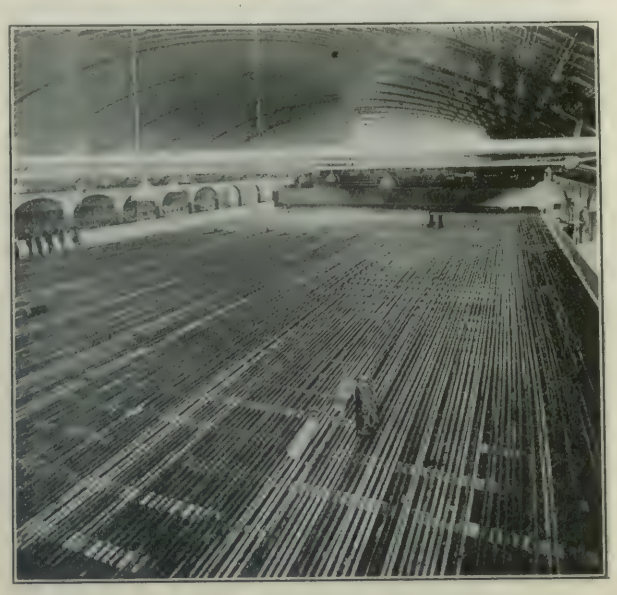
New Company Takes Over Snyder Furnace Patents

The Industrial Electric Furnace Co., an Indiana corporation, has acquired the business of the Snyder Electric Furnace Co. and the Snyder patents and designs of electric furnaces and processes. The directors of the new company are Charles B. Sommers, Stoughton A. Fletcher and Charles B. Fletcher, of Indianapolis, and F. Von Schlegell and F. T. Snyder, of Chicago.

The company will start with an engineering force and will take up the manufacture of electric furnaces for steel work, will enlarge the plant at Clearing both for electrometallurgical developments and for the commercial production of electric furnace products. Mr. Snyder, who will be interested in and associated with the new company as engineer and metallurgist, has had many years of experience in the electric furnace field and was the inventor of the Snyder furnace. The executive officers of the company will be F. Von Schlegell and Charles B. Fletcher. The offices will be at 53 West Jackson Boulevard, Chicago.

Ten Miles of Welded Pipe

To make 10 miles of pipe as one continuous pipe, with every joint leak-proof and trouble-proof after being buried in ice, was the problem that confronted



Ten Miles of Pipe in the Ice Skating Ring at San Francisco, Welded from Pieces of Used Galvanized Pipe

the builders of the Winter Garden ice rink at San Francisco. Investigation had shown that in many ice rinks where ammonia systems were built with screwed fittings, leaks frequently developed in the joints, necessitating shutdowns for repairs. Oxy-acetylene welding by the Prest-O-Lite process was used, and instead of using new pipe, 55,000 ft. of 2-in. used boiler tubing was purchased at a saving of 20 per cent over the cost of new galvanized pipe. The floor is 210 ft. long and 90 ft. wide, and there are some 2000 welded joints.

The contractors claim the work was done by average welders and that the cost per joint was approximately the cost of an ordinary screw connection. The rink has been in operation for about six months, and the management reports that not a leak has developed.

Analyses of Ores

WASHINGTON, July 10.—With a view to correcting various misapprehensions which appear to exist in the minds of the mining public, especially in the West, as to the policy of the Bureau of Mines of the Department of the Interior in making analyses or assays of ores, Director Van H. Manning of the bureau has made the following statement:

"The Bureau of Mines is not authorized to make analyses or assays for the sole benefit of private parties, its function being rather to investigate problems of general interest and importance to the mining industry, and to publish the results of these investigations for the benefit of the industry and the general public.

"The bureau, however, desires to assist miners and prospectors in every way possible, and, if desired, will be glad to furnish a list of private chemists and assayers doing this kind of work. In supplying such a list, the bureau cannot, of course, undertake to recommend or favor any particular laboratory or individual, or tests made by these laboratories.

William B. Pollock Co., Youngstown, Ohio, has nearly completed the erection of a 500-ton blast furnace for the Whitaker-Glessner Co. at Portsmouth, Ohio. This new stack will make pig iron for the open-hearth steel plant of the company at Portsmouth. The Pollock company also has a contract for the building of a large blast furnace for the Tata Iron & Steel Co., Sakchi, India. The company built the new 550-ton blast furnace for the Republic Iron & Steel Co. at Haselton, Ohio, which was blown in recently.

IS HOPING FOR HARMONY

President Wilson's Attitude on Ship Controversy—More Money Will Be Asked

WASHINGTON, July 10.—Congress will be asked for an additional $500,000,000 to carry out the program of the United States Shipping Board, which has been expanded to include at least 5,000,000 tons dead weight of shipping in addition to vessels already under construction for private account which will be taken over by the Government. The original allotment carried by the war budget bill, including the amount actually appropriated and that authorized merely, to be appropriated hereafter, was $755,000,000, so that the amended project involves expenditures aggregating more than one and a quarter billion dollars. Chairman Denman of the Shipping Board is authority for the statement that a supplemental estimate will be prepared, but as this must receive the President's approval, it is not likely to be forwarded to Congress immediately, although it is the best opinion here that the Chief Executive will ultimately indorse the proposed increase in the cost of the emergency fleet of cargo vessels. The question as to whether steel or wood will be used in the construction of the additional 2,000,000 tons of emergency shipping, is not at issue in this connection. Chairman Denman, in an informal statement with regard to the board's action, says that more steel contracts can be placed and that "the vast resources of quick wood construction are far from exhausted." Many wooden ships, he says, can be built having greater speed than the majority of the vessels now crossing the war zone.

General Goethals, the manager of the Emergency Fleet Corporation, declines to comment upon the supplemental estimate for funds for the Shipping Board. His friends, however, express the opinion that the expansion in plans of the board emphasizes the importance of the early determination of the interesting question as to who is to exercise supreme authority in the construction of the emergency fleet, and it is predicted that, unless the President clothes him with full authority, General Goethals will tender his resignation. The President is extremely reluctant to take any action that will force an issue between Chairman Denman and General Goethals and will exhaust every resource to keep both men at their posts. He is said to be of the opinion that if a direct issue can be held in abeyance until the bulk of the contracts for vessels have been let and the Federal Trade Commission has fixed a basis for the settlement of the vexed question as to the price of steel plates and shapes, the strained situation in the Shipping Board will relax and it will be practicable for both Chairman Denman and General Goethals to continue in office. Both officials now agree that wooden vessels as well as steel should be built to the capacity of the American shipyards, and as the question of the price to be paid for steel will probably be determined by the President, it would seem possible that all controversial issues in the board may be settled without forcing the resignation of either the chairman of the board or the general manager of the corporation.

Large Manganese Ore Imports in May

Manganese ore imports into the United States in May were the largest for any month this year or in many months previous. The total was 81,269 gross tons, bringing the total to June 1, 1917, to 254,012 tons. This is at the rate of 50,802 tons per month for this year, as compared with 48,026 tons as the 1916 monthly average, then the record. The largest previous imports this year were 56,394 tons in March. For the 11 months ended May 31, 1917, the total imports have been 593,310 tons or the largest for any similar period, even exceeding the record total of 576,321 tons in all of 1916.

The name of Kugel-Miner-Morse, Inc., Erie, Pa., dealer in iron and steel products, has been changed to Miner-Morse Corporation.

British Steel Exports and Imports Growing Despite Submarines

British steel exports in May were 199,418 gross tons, excluding iron ore and including scrap, which compares with 180,869 tons in April. The extent to which they have been restricted is illustrated by the fact that in May, 1916, they were 395,750 tons and in May, 1915, they were 267,524 tons. The May exports rank third in magnitude for the first five months of this year, with the average to June 1 at 203,377 tons per month as compared with 279,819 tons per month in 1916.

Pig-iron exports in May were 60,644 tons against 51,041 tons last April and 83,839 in May, 1916. Ferro-alloy exports, largely ferromanganese, in May were nearly 50 per cent less than they were in May, 1916, or 7557 tons against 14,137 tons. The monthly average to June 1, this year, has been 9016 tons as compared with 11,260 tons per month in the same period in 1916.

May exports of rails were only 1689 tons and were 10,500 tons less to June 1, 1917, than to June 1, 1916. Steel-bar exports are steadily falling off. In May they were only 19,537 tons as compared with 27,840 tons in April this year and 80,205 tons in May, 1916. The total to June 1, 1917, or 150,969 tons, is only 50 per cent of the exports to June 1, 1916.

Imports of steel in May, excluding iron ore and including scrap, were 39,181 tons, the largest since unrestricted submarine warfare started. Since February imports have increased from 27,428 tons in that month to 39,181 tons in May. The average to June 1 was 33,737 tons and the May imports were next to the largest this year. Imports this year, however, are nearly 50 per cent less than in the same period in 1916 when the average to June 1 was 64,649 tons per month.

Both manganese ore and iron-ore import statistics for May are not given this time for the first time since the war.

The Tin-Plate Situation

The Department of Commerce announces that the committee on the conservation of tin plate "recommends to the Secretary of Agriculture and the Secretary of Commerce that inasmuch as the patriotic and hearty response to the previous recommendations of the committee regarding the use of tin plate has resulted in material relief in providing cans for the early crop of perishables, tin-plate manufacturers no longer refrain from shipments of plate to those packers making their own cans, when such cans are likely to be used for the packing of nonperishable food products." The committee also recommends that can makers no longer be required to withhold shipments of cans to be used for the conserving of food products.

Great pressure is being brought to bear upon the Government by manufacturers of other than food products to secure permission to use tin plate for the making of containers. In many cases it appears that none of the substitutes suggested by the Government, such as glass, wood, fiber, paraffined paper, etc., will serve the purpose of these manufacturers who are threatened with the complete loss of their business as the result of the tin-plate situation. While the officials regret the conditions that have developed as the result of the tin-plate control, there is nothing that can now be done to remedy the matter.

The American Locomotive Co. formally took possession on July 2 of the Seaboard Steel Casting Co., Chester, Pa., which it recently purchased from the Penn-Seaboard Steel Corporation. The name Seaboard will be retained and the plant will be known henceforth as the Seaboard Works of the American Locomotive Co. There are to be no changes in the works or office management. Everett Sproul will continue as works manager, and David G. Stokes in charge of the office.

Hilb & Bauer, Cincinnati, scrap merchants, have removed their offices from the fifteenth floor of the Union Trust Building to larger quarters on the fourth floor of that building.

NAVAL PROJECTILE PLANT

Plans Have Been Prepared—Bids on Machinery Are Received

WASHINGTON, July 10.—Plans and specifications for the naval projectile plant to be erected at Charleston, W. Va., have been completed and bids for the erection of the buildings will be opened by the Bureau of Yards and Docks of the Navy Department July 16. The plant was appropriated for in the last annual appropriation act and will be located on the tract of land acquired by the Government for the projected armor plant factory. The original intention to push the construction of the armor factory ahead of the projectile plant has been abandoned and there is now little prospect that the building of the armor factory will be undertaken in the near future. The projectile plant, however, will be proceeded with as rapidly as possible, and the Navy Department announces that no bid will be considered that is based upon a time of completion of more than 365 calendar days.

With a view to equipping the projectile factory as soon as the buildings are ready, the Navy Department has solicited and received bids on the principal items of machinery to be used. The schedule includes the following items, and while the awards have not yet been made, the name of the lowest bidder in each case is here presented:

One 3000-ton straight hydraulic (no steam) piercing press, including hydraulic intensifier. Lowest bidder, United Engineering & Foundry Co., Pittsburgh, $99,400.

Two 500-ton hydraulic piercing presses. United Engineering & Foundry Co., $23,750.

Four motor driven hydraulic pumps. Edward J. Smith, agent, Washington, $41,825.

Three 6-ton electric furnaces. American Bridge Co., Washington, $45,500.

Two 6000-lb. ingot manipulators. Wellman-Seaver-Morgan Co., Cleveland, $21,600.

Two 40-in. heavy-type, rapid-production, shell stock, cold-saw cutting-off machine, with direct-connected motor drive, holding jigs, and stock-feed devices. Newton Machine Tool Works, Philadelphia, $3,290.

Four 36-in. by 14-ft. double back-geared engine lathes. Brown & Zortman Machinery Co., Pittsburgh, $2,037.

Seventeen 30-in. by 16-ft. heavy projectile turning lathes. Himoff Machine Co., Astoria, Long Island, N. Y., $4,540.

Twelve 30-in. by 18-ft. heavy projectile boring lathes. Himoff Machine Co., $5,150.

Four 36-in. by 14-ft. triple-geared lathes. Niles-Bement-Pond Co., New York, $6,550.

Eleven 36-in. by 20-ft. triple-geared lathes. Houston, Stanwood & Gamble Co., Cincinnati, $6,425.

Three 24-in. heavy duty turret machines, motor driven. Steinle Turret Machine Co., Madison, Wis., $5,198.

Four 24-in. heavy duty turret machines, motor driven. Swind Machinery Co., Philadelphia, $5,717.

Four heavy duty combination thread-milling and turret machines. Swind Machinery Co., $5,099.

Four heavy duty combination thread-milling and turret machines. Swind Machinery Co., $5,430.

Three heavy duty combination thread-milling and turret machines. Swind Machinery Co., $4,677.

Two forging hammers, one of 1100 lb. and one of 2500 lb. Manning, Maxwell & Moore, New York, $6,173.

While the bids received for this machinery compare very favorably with current prices for similar equipment for private establishments and for export, they will materially exceed the allotment of the appropriation for these fixtures, and the Department is in a serious quandary as to the best method of meeting the situation. It is not regarded as advisable at this time to seek a larger appropriation at the hands of Congress, which might open up the long-standing controversy concerning the wisdom of the Navy Department's policy of manufacturing projectiles on a large scale. It is probable that the Department will seek, through negotiation, to secure lower prices for this equipment and it is more than likely the purchase of the least essential items will be postponed until other funds are available.

The principal buildings of the plant are four in number, including a machine shop, a foundry and forge shop, a heat treatment shop, and a lavatory and locker building. The Department hopes to include the four buildings in a single contract. The machine shop will be 111 by 402 ft. and will consist of a main span with a side span on each side and a lean-to extending along a portion of one of the side spans. With the exception of the tool room at one end there will be no dividing partitions. Girders will be required for overhead traveling bridge cranes in each span. The building, supported on concrete foundations, will have structural steel frame, concrete foundation and base course, hollow tile block belt courses and pilasters, steel sash for window areas, built-up roof covering over gypsum composition or concrete slab roofs. The floor will be all concrete.

The foundry and forge shop building, the largest of the group, will be 560 feet long by 135 feet wide and will consist of a main span flanked by side spans. The general construction, window areas, roof, etc., will be similar to the machine shop building. The sides and ends of the building will be left open for a height of several feet above the base course and no floor will be required.

The heat treatment building will be 92 by 153 ft. and will consist of two spans with a line of interior columns. The construction will be similar to that of the machine shop and foundry and forge shop.

The lavatory and locker building will be 75 by 12 ft. and will be a one-story, hollow tile block structure on concrete footings and foundation wall. Window sills and lintels will be reinforced concrete. The floors will be concrete and the interior walls will be plastered.

The bill of materials for the four buildings will include considerable quantities of iron and steel, including the following items:

Reinforcing steel, 38 tons; cast iron drainage pipe with fittings, 6 in. to 12 in., 4044 lin. ft.; steel pipe for downspouts, with all fittings, 4 in. to 6 in., 3318 ft.; structural steel, 2330 tons; steel sash, walls (pivoted and fixed), 5620 sq. ft.; steel sash, monitor (top hung), 11,350 ft.; steel doors, 2129 sq. ft.; steel stairs, 12,200 lb.; pipe railing, 30 lin. ft.; wire partitons, doors and frames, 3190 sq. ft.; steel rails for railroad tracks, new 80-lb., A. S. C. E., 158 tons; steel ties, splice bars, bolts, nuts, frogs, switches, etc., 35 tons.

W. L. C.

Brass Manufacturers Meet

The summer meeting, June 25 to 28, at Hotel Hollenden, Cleveland, of the National Association of Brass Manufacturers was largely attended and several matters of importance to the members were acted upon. The association discussed freight equalization and a zone chart showing the correct freight equalization of every shipping point and destination in the United States was presented. The matter was referred to a committee comprising Messrs. Johnson of Illinois, Gillette of Pennsylvania and Harper of Wisconsin. The possibility of removing the technical specifications now applying on Government purchases of brass goods was discussed at some length and the matter referred to the committee on standardization.

The members expressed by a rising vote of thanks their appreciation of the labors of the cost committee which submitted a final preliminary report that was notable in its completeness and thoroughness. The committee included Messrs. Burleigh, H. Mueller Mfg. Co., Decatur, Ill.; Whitaker, L. Wolff Mfg. Co., Chicago; and Sanders, Standard Sanitary Mfg. Co., Pittsburgh. The next meeting will be held in Milwaukee, Sept. 27 and 28, 1917.

The Halcomb Steel Co., Syracuse, N. Y., recently absorbed the new works of the Syracuse Crucible Steel Co. and the latter ceases to exist as a separate unit. It is a large and finely equipped crucible steel and rolling mill plant, adjoining the Halcomb unit, and the merger makes the operation the largest of its kind in the country.

The Bridgeport Brass Co. of Bridgeport, Conn., announces the removal of its New York office to Suite 2236, Woolworth Building, 233 Broadway.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the DAVID WILLIAMS CO., 239 West Thirty-ninth Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: Equitable Building. Philadelphia: Real Estate Trust Building. Cleveland: Guardian Building. Cincinnati: Mercantile Library Building.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year. Entered at the New York Post Office as Second-class Mail Matter.

The Embargo on Exports

If the embargo on exports proclaimed by the President were strictly enforced as to iron and steel exports to neutral countries it would not materially affect the trade. Exports to belligerents, it is to be presumed, are to be encouraged. The iron and steel items involved are scrap, pig iron, billets, structural shapes, ship plates and ferromanganese. The neutrals are not iron and steel producing countries, to any extent, hence do not need scrap, pig iron, billets or ferromanganese, as they would have no means of utilizing them. Information has been collated at Washington showing that Sweden has exported large quantities of iron ore and pig iron to Germany, and has imported some pig iron from the United States. While it is important that our contribution to Sweden's ability to supply Germany with ore and pig iron be discontinued, the quantity to be released is an insignificant portion of our production, as our pig iron exports to Sweden in the first quarter of this year were only 16,000 tons.

It is only in the highly finished manufactures of iron and steel that our exports to neutral countries have lately been of moment, typewriters and sewing machines being conspicuous examples, but even in these our exports to the European Allies have greatly preponderated.

Our iron and steel exports to the European Allies, it must be remembered, are by no means all our exports to the allied belligerents. We have had large exports to Canada and Japan. There have been considerable exports of such items as locomotives, cast-iron pipe, structural shapes, etc., to Cuba, but Cuba is one of our Allies.

As scrap, pig iron and billets do not go to neutrals because they cannot utilize them, so also the two finished steel products included in the embargo have not been passing to neutrals to any great extent, the exports being chiefly to the European Allies, particularly England, and to Canada and Japan.

An important result expected from the embargo is the diversion of some ocean shipping to trade with the Allies instead of neutrals. Observing the statistics of vessels cleared from the United States in the ten months ended April, 1916, and the similar period ended last April, it is rather significant that the tonnage of vessels embarked for Denmark and the Netherlands has materially increased. Spain is another European neutral, and the tonnage for Spain decreased 28 per cent. The only certain difference is that Spain is not contiguous to Germany.

Apart from the questionable vessel movement between the United States and neutrals contiguous to Germany, the shipping statistics show clearly the large vessel tonnage that in the exigencies of war can be diverted to carrying our goods to our European Allies. The following figures represent the net vessel tonnage cleared from the United States in ten months' periods:

	Ten Months Ended April, 1916	1917
American	14,053,673	15,127,132
Foreign	27,756,750	27,414,270
Total	41,810,423	42,541,402

Thus the foreign vessel tonnage slightly decreased, but the total increased, by reason of the large increase in vessels of American registry. A comparison of figures for April alone, 1916 and 1917, shows the same trend. The distribution of the tonnage was approximately as follows: Europe, 37 per cent.; North America, 51 per cent.; South America, 5 per cent.; other continents, 6 per cent. The clearings for North American ports, of course, represent a large percentage on account of the shortness of the trip. It is evident, however, that there remains quite a good supply of vessel tonnage for carrying supplies to our Allies in Europe.

Price Fixing and Maximum Output

In every boom in the American iron trade, as successive high prices were reached additional capacity has been brought into operation which could only become active under high-pressure prosperity. That is just what has been happening under the soaring war prices for steel and pig iron in the past year. But the basic facts in such a wheeling into line of the least fit of the country's iron and steel producers is apt to be overlooked in such an attempt as is now being made at Washington to regulate war-time prices on the basis of the costs of large producers. It has been the history of every iron trade boom that just as each new height in the ascent of prices automatically brought in more high-cost capacity, the reverse operation set in when the break came, the less fit furnaces and rolling mills dropping out as prices fell.

The fixing of prices materially lower than the level to which war demand has pushed iron and

steel products would tend to produce, in the midst of war prosperity, the very effect which has been so familiar in the natural reaction from every trade boom. Production at low cost works would continue in full volume, but works with the highest cost would be forced out, at least until readjustment had worked down the line of labor and raw material costs.

Whether Congress gets under the load or whether it is put upon the President, added to the heavy burdens he now carries, or delegated to those he might appoint, price fixing in the present crisis is the greatest economic problem with which any government has been called on to deal. Unreasonable prices must not be paid for what is required to carry on the war, but at the same time there must be no impairment of the country's financial or industrial power, and every resource of production must be kept at the highest pitch. Eagerness to make a record for "saving" so many million dollars —saving it by taking from one class of producers profits which would come to them in an unregulated and hence competitive market—can bring prices down effectively, but the advantage would be dearly bought if output were lessened and further increase in steel-making capacity at the high prices that must now be paid for such increases were prevented.

Great Britain got behind her steel industry in many cases to the extent of making enormous advances for the building of new capacity at high level war prices. To-day contracts for new open-hearth steel works in this country represent in some cases three times the amounts paid for like capacity early last year. Yet all such building carries the risk of having a surplus of high cost blast furnaces and steel works after the war. The British Government has taken that risk in large measure in building up steel capacity there from 7,500,000 tons a year to over 10,000,000 tons a year, with 12,000,000 tons to be reached by another year, so that "control prices" for British steel do not represent anything like the "saving" that appears on their face.

It is vastly more important that the steel industry be stimulated to the largest possible output than that a certain number of dollars be taken by the Government from the prices which manufacturing consumers are paying in the open market. There is no question that $4 is an exorbitant price for sufficient ferromanganese for the manufacture of a ton of steel; but it took an exorbitant price for ferromanganese to stimulate manganese mining in the United States to the point of making possible an 80,000-ton output for 1917, whereas before dependence on outside supplies was complete. The manganese situation is not paralleled in the market for finished steel, it is true, but it forcibly illustrates the point that the fixing of prices in war time, using prices before the war as a basis, is highly charged with possibilities of industrial derangement.

There is little need to argue for some form of regulation of iron and steel markets in view of the runaway condition apparent in the past three months. Producers are fully alive to the dangers of excessive prices. But as between direct action of Government authorities and action by the producers under Government sanction, the former has decidedly more possibilities of harm. It is to be expected that mistakes will be made in the conduct of the war, but a dictatorship in so important a matter as iron and steel values is a monumental mistake that would do far-reaching and incalculable harm.

New Leadership Needed

When a man becomes obsessed by the belief that a large percentage of the people of this country is being willfully and maliciously oppressed in a manner akin to the oppression which has disgraced some of the autocracies of the old world, he is in danger of getting a distorted view of events at home and of seeming to align himself in sympathy with the worst forms of law-breakers. This was illustrated last week at Carnegie Hall, New York, when at the reception to the Russian mission Theodore Roosevelt and Samuel Gompers engaged in a controversy in regard to the recent race riots in East St. Louis.

While the reception was not the place for discussing the sins of omission or commission of any Americans, Col. Roosevelt expressed the opinion of a vast majority of his countrymen when he declared that, whether there was provocation or not, the race riots were waged with such appalling brutality as to leave a stain on the American name. On the other hand, Mr. Gompers, in this case as sometimes in the past, came very near to apologizing for crime. While he expressed detestation of all brutal conduct, Mr. Gompers asserted that "the luring of these colored men to East St. Louis is on a par with the behavior of the brutal reactionary and tyrannous forces that existed in Russia." No wonder this assertion was vigorously denounced by Col. Roosevelt, who said that "the riots took place in a northern State where the whites outrank the negroes twenty to one" and that "if in that State the white men can't protect their rights by their votes against an insignificant minority, and have to protect them by the murder of women and children, then the people of the State which sent Abraham Lincoln to the Presidency must bow their heads."

The facts are that the negroes were not "lured" to East St. Louis or induced to go there by any promise that was not fulfilled. There was a demand for labor which, five or six years ago—long before the strikes of the past few months—caused negroes to move from the South to East St. Louis, where they earned much higher wages than they had ever been paid in their old homes. They sent word to their friends in the South that they had found a place where they earned wages higher than they had ever dreamed of. Naturally the migration increased rapidly, and in the course of time trouble arose between whites and blacks for various reasons; but there was absolutely no justification for the riots nor had Mr. Gompers any for the attitude he took in his controversy with Col. Roosevelt.

Since the United States entered the great war Mr. Gompers has occupied a high position in the councils of the nation and frequently his influence has been for the best interests of the country. Much that he has done in opposition to the plans of labor agitators has been admirable,

but now and then the old Gompers—the Gompers who defended the dynamiters and accused their prosecutors a few years ago, the Gompers who a few months ago declared that he would defy law and courts if his ideas of the rights of railroad employees were not upheld—appears and exercises a malign influence, showing the imperative need of wiser leadership of workingmen, leadership which will uphold law always and never apologize for crime.

The Stimulus to Manganese Mining

A predicted output of nearly 80,000 tons of high grade manganese ore in the United States this year, or nearly nine times the 1915 production, moves Secretary Lane of the Department of the Interior to say that "the manganese situation in this country is most encouraging and that this output, which is less than 20 per cent of the present large demand of the steel industry, is simply another expression of how America is meeting the present crisis in American fashion."

But the steel industry's actual needs in manganese ore for 1917, if all the ferromanganese were made in this country, would be not less than 775,000 to 800,000 tons. Thus the expected domestic output this year is only about 10 per cent of the amount necessary, instead of approximately 20 per cent, or not much more than enough to run the country's steel industry for one month. Our present consumption is about 28,000 tons of ferromanganese per month, requiring 70,000 tons of ore to make it.

While insignificant as compared with the total requirements, this unusual domestic production is a welcome acquisition to the country's imports of manganese ores and metals. We are not so sure that Secretary Lane has rightly judged in saying that this result is largely due to "better financing and better engineering of the industry." It is rather due to the fact that ferromanganese brings in the market to-day a price about ten times that which prevailed before the war. The pockety deposits in various parts of the country would have lacked neither financing nor engineering years ago, with a submarine war to make the price.

Sulphur in Steel Castings

Apparently taking the view that sulphur, even in a small percentage, is detrimental to steel castings, the Navy Department has decided to manufacture such castings for itself by the only process on a small scale which will regularly insure low sulphur content. It will also use this process for making some of its own projectiles at its new plant at Charleston, W. Va. As announced last week, the Department is about to install six 6-ton electric furnaces at various plants, of which some are now using the converter process for small castings. The Canadian Government some months ago gave orders for electric furnaces but on a larger scale.

The most recent specifications of the Navy for steel castings, as given on another page, call for a sulphur content of not over 0.05 per cent in all grades but one. In some former specifications this limit was 0.07 per cent. It is known that a 0.05 per cent limit is impossible to meet in many cases, and it is also acknowledged that not infrequently the rule has been waived so that producers could furnish the Government with the castings desired. This has been true particularly in recent months when producing conditions have been such as to increase rather than lower the sulphur content of steel. The Navy itself, in all probability, has been unable to meet its own specifications on small castings.

Evidently as a result of the Navy's move to make its own castings by the low sulphur process, there has been a sudden demand by other producers for electric furnaces for the same purpose—a demand so great that it has been impossible by one large electric furnace interest to meet it. Whether sulphur is actually detrimental to steel is a disputed question. In steel castings there is always the chance that it may be, because of cracks due to red shortness—defects which can only be partly removed by welding. In any case, the development referred to is another evidence of the growing commercial importance of electric steel which is advancing by remarkable strides in the United States and England.

Decrease in Steel Corporation's Orders

The United States Steel Corporation's monthly statement shows unfilled orders on its books as of June 30 of 11,383,287 tons, which is a decrease of 503,304 tons from those reported May 31. The June report is the smallest since last November, when the total on Nov. 30, 1916, was 11,058,542 tons. It is, however, over twice the unfilled orders for the corresponding month in 1915, when they were 4,678,196 tons. The following table gives the unfilled tonnage at the end of each month from January, 1914:

	1917	1916	1915	1914
January	11,474,054	7,922,767	4,248,571	4,613,680
February	11,576,697	8,568,966	4,345,371	5,026,440
March	11,711,644	9,331,001	4,255,749	4,653,825
April	12,183,083	9,829,551	4,162,244	4,277,068
May	11,886,591	9,937,798	4,264,598	3,998,160
June	11,383,287	9,640,458	4,678,196	4,032,857
July		9,593,592	4,928,540	4,158,589
August		9,660,357	4,908,445	4,213,331
September		9,522,584	5,317,618	2,787,667
October		10,015,260	6,165,452	3,461,097
November		11,058,542	7,189,489	3,324,592
December		11,547,286	7,806,220	3,836,643

Iron and Steel Dictatorship Not Likely

WASHINGTON, July 11 (*By Wire*).—So much opposition has developed in the Senate to the provisions of the food control bill giving the President power to regulate the manufacture and distribution of iron and steel, copper, lead and other commodities that the Committee on Agriculture has decided to recast the bill and is now at work upon a substitute draft. This will be reported to the Senate as soon as completed and taken up in place of the measure now under consideration, which was fully described in THE IRON AGE last week. There is a fair prospect that iron and steel and other metals will be excluded from the new draft.

Large Decrease in British Exports of Sheets and Tin Plates

The extent to which the export business of Great Britain in galvanized sheets and tin plates has declined since the war is shown by the following table, all in gross tons:

	Galvanized Sheets	Tin Plates	Black Sheets
To May 1, 1917	9,250	60,328	4,614
To May 1, 1916	57,447	116,379	69,570
To May 1, 1915	110,797	130,622	12,554

The average value of galvanized sheets per ton in 1915 was $64.10; for 1916, $118.63, and for 1917, $121.91.

EXCESSIVE NEGRO MIGRATION

Illinois State Council of Defense Warns Against Artificial Movement of Population

Samuel Insull, Chicago, chairman Illinois State Council of Defense, following the recurrence of the race riots in East St. Louis, Ill., which resulted in the loss of many lives and the destruction of much property, ordered the printing and distribution in pamphlet form of a report based on an investigation which the council had made of conditions in East St. Louis. One of the conclusions reached by the investigators was that the migration of any class from one part of the country to another should follow natural lines. In part the report says:

"The information obtained establishes that the riots were due to the excessive and abnormal number of negroes then, and for some months past, in East St. Louis. The feeling against the colored people originated in two sources—social and labor. There was resentment that the colored people, having overcrowded their quarters, were spreading out into sections of the city regarded as exclusively the precincts of the white people. The colored men, large numbers of whom had been induced there and who could find no jobs in their desperate need were preventing desired improvements being made by labor and threatening the existing standards of labor, and the white men were resenting it. * * *

"It was alleged that employers had had meetings to arrange a program of importation of the Southern negroes, and that the larger employers of the city had collectively been responsible. The managers of all the larger industries of the city were examined, and all denied any collusion, or knowledge of the campaign conducted in the South to bring negroes to East St. Louis. The fact remains, however, that these managers were the chief beneficiaries of the surplus of labor, and the force of motive points in their direction."

Publicity the Cure

The council's committee on labor made these recommendations:

"1. That the widest publicity be given to the situation at East St. Louis through the Council of National Defense, and through the respective State councils of defense, that the danger in the situations of this kind may be made apparent to the South and the industrial centers of the North, to the end that migration of the Southern negroes may be discouraged before other outbreaks of a similar nature occur.

"2. That migration of any class from one part of the country to another be allowed to flow along natural lines that the equilibrium of population may not be disturbed; that the severest condemnation should be visited upon those who undertake to promote any artificial movement of population, because such artificial movement is sure to result in friction, and now more than ever should friction be avoided.

"3. That the problems of shifting labor where labor is needed during the war be handled by the various State councils of defense, in conjunction with the Council of National Defense, in connection with those responsible officers of the labor movement who are daily showing their patriotism in endeavoring to restrain industrial strife, and in connection with the Department of Labor of the United States and similar departments of the States. It is anticipated that if this is done that labor can be shifted to where it is needed with sole reference to the benefit of industry as well as the workers themselves, and consequently to the welfare of the nation."

The Nagle Steel Co., Pottsville, Pa., has commenced operation of the new plate mill formerly used by the Potts Brothers Iron Co. The plant has been remodeled and rebuilt for the company's requirements. This is the fourth plant now operated by the Nagle company, the others being located at Glasgow, near Pottstown, Seyfert, Pa., and Rahway, N. J.

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Will Build Large Plant

PITTSBURGH, July 11 (*By Wire*).—The National Tube Co. of Pittsburgh has started work on the erection of a large plant at its by-product coke ovens at Lorain, Ohio, for the production of benzol and toluol.

Steel Exports to Be Controlled July 15

How Licenses Are to Be Obtained—The Question of Plates for Japan—Allies Purchasing Commission to Be Organized

WASHINGTON, July 10.—The exportation of the most important products of the United States, including leading items of iron and steel, will pass under Government control on July 15, pursuant to a proclamation just issued by the President in accordance with the terms of the recently enacted espionage law. Every shipper of the commodities listed by the President will be required to obtain a license and his application therefor will be passed upon by the Exports Council or its representatives. No more sweeping innovation in the exercise of governmental authority has occurred since the declaration of a state of war with Germany, and as the objects sought to be attained are manifold and of a far-reaching consequence to the trade of the world, the development of the Council's policy will be awaited with the liveliest interest by producers and consumers alike in all the affected trades.

Iron and Steel Products Listed

By the terms of the President's proclamation licenses will be required for the exportation of coal, coke, fuel oils, kerosene and gasoline, including bunkers; food grains, flour and meal therefrom; fodder and feeds; meat and fats; pig iron, steel billets, ship plates and structural shapes, scrap iron and scrap steel; ferromanganese; fertilizers; arms, ammunition and explosives.

The objects of the control of these producers are three-fold: first, to conserve the supplies of these commodities for the consumers and the industries of the United States; second, to prevent these articles from finding their way to the common enemy; and third, to secure the equitable distribution among the Allies of the United States in the war with Germany of any surplus not needed in this country. Up to the present time the Government has developed no altruistic plans with reference to supplying neutral nations with these commodities and the flow thereof to such nations will depend almost wholly upon the war necessities of the United States and the Allies, and, to a very slight extent only, upon the commercial demand.

Plates to Japan May Be Checked

The correspondent of THE IRON AGE is in a position to state briefly the purposes of the Exports Council with relation to shipments of steel products in so far as they have been formulated. Exporters will probably be able to secure licenses for the shipment of the specified iron and steel commodities to the Allies with very little difficulty, except that the Exports Council may seek to check somewhat the heavy shipments of plates and shapes to Japan for shipbuilding purposes. In passing on applications for licenses for plates and shapes the council will keep constantly in mind the requirements of American shipyards for the construction, not only of those vessels of the Emergency Fleet Corporation already projected, but also those contemplated in the expanded policy of the United States Shipping Board described in another column and involving at least two million tons additional of steel and wooden ships.

Germany Getting Iron From Neutrals

Applications for licenses to ship the specified steel commodities to neutral countries contiguous to Germany will be rigorously inspected with the chances always against favorable action by the council. Official reports received within the past few days from special agents abroad indicate that the Central Powers are receiving from neutral countries, and especially from Sweden, very large quantities of materials that go directly into the manufacture of munitions. Iron ore shipments from Sweden to Germany are said to have reached a total of 9,000,000 tons in the last two years, all of it of a grade required in the production of fine steel. This quantity is equal to Sweden's entire export of iron ore under normal conditions. During the three months ended March 31 of the present year Sweden imported from the United States 16,000 tons of pig iron and at the same time sold a large quantity of her own product to Germany. The official reports state that during the past two years Germany's imports of pig iron from Sweden have aggregated 250,000 tons, in addition to which Sweden has supplied the Teutonic Allies with 15,000 tons of ferrosilicon and ferromanganese, together with large quantities of manganese, copper, zinc and other metals and ores.

Whether exports of the specified iron and steel products to neutral countries contiguous to Germany will be absolutely interdicted has not been determined, but the Exports Council is greatly interested in the information it has received that in Sweden, for example, more than 600,000 tons of merchant shipping are held in port and are thus withdrawn from the merchant tonnage available for the transportation of supplies to the Allies. It is conceivable that the liberation of this interned tonnage may be the price which the Exports Council will put upon the further shipment of iron and steel to Sweden, although under no circumstances would it be the policy of the council to permit to be shipped to Sweden or any other neutral contiguous to Germany any considerable quantities of iron and steel that might find their way to the Central Powers.

Exports Under Existing Contracts

The probability of favorable action upon an application for a license to ship the specified iron and steel products to neutral nations not contiguous to Germany, as, for example, to South America, will depend upon special conditions peculiar to each case. It will be the policy of the Exports Council at the outset to permit shippers to fulfill outstanding contracts, provided they have not been entered into since the Government first gave notice of its intention to take over the control of the export trade. The size of shipments constitute an important factor, as the Council will not consider it advisable to interfere with small transactions, having in mind the larger question of supplying the needs of the United States and the Allies which would not be affected to any material extent by the diversion of small amounts of any of the controlled commodities.

Allies' Purchasing Commission

It is believed that one of the first effects of the President's proclamation will be the organization in London of the projected International Purchasing Commission representing all the Allies. This commission will have for its chief concern the buying and distribution of wheat and other food products, but presumably it will ultimately take over the purchasing of all articles for national use or for distribution by governmental agencies. It is expected that the commission will speedily designate a representative in the United States to act in conjunction with the Joint

Purchasing Commission which the President for some weeks has contemplated appointing to take over the work of buying for the Government, now in the hands of the Council of National Defense. The rapid development of the war situation, with its thousand and one ramifications calling for immediate cosideration, has made such drafts upon the President's time that his selection of the Purchasing Commission and the reorganization of the Council of National Defense have been deferred from week to week, but will probably be effected in the near future.

How to Get Licenses

Secretary of Commerce Redfield has made the following announcement with reference to the procedure to be adopted by exporters in the United States in applying for export licenses:

1. Applications for licenses may be made by the Bureau of Foreign and Domestic Commerce, Division of Export Licenses, 1435 K Street, Washington, D. C., or to any of the branches of the Bureau of Foreign and Domestic Commerce—New York, Boston, Chicago, St. Louis, New Orleans, San Francisco, and Seattle.
2. In applying for a license to export any of the commodities covered by the President's proclamation, applicants should give the following information in triplicate form:
   a. Quantity.
   b. Description of goods.
   c. Name and address of consignee.
   d. Name and address of consignor.
3. The license will be good for only 60 days and at the expiration of that time must be renewed, and if not shipped within that time a new application must be made.
4. The various branch offices of the Bureau of Foreign and Domestic Commerce have been given full instructions as to the disposition of all applications for licenses.

It is the desire of the Bureau of Foreign and Domestic Commerce to minimize the exporter's difficulties as much as possible, and therefore wherever practicable the district offices will be authorized to issue the licenses. It is thought, however, that many of the applications may have to be forwarded to Washington for decision. In case exporters desire, they may telegraph their applications direct to the Bureau of Foreign and Domestic Commerce, Division of Export Licenses, 1435 K Street, Washington, D. C.

The Exports Council has prepared the following blank form of application for export license:

Application Form A

APPLICATION FOR ORDINARY EXPORT LICENSE

This form should be made out in triplicate, and the answers to the following questions must be written legibly, or typewritten if possible. When filled out and signed, send the three copies to the Bureau of Foreign and Domestic Commerce, Division of Export Licenses, 1435 K Street NW., Washington, D. C., or to the nearest branch office of the Bureau (New York, Boston, Chicago, St. Louis, New Orleans, San Francisco, Seattle).

Applicant's reference No..... Dated.....

Bureau of Foreign and Domestic Commerce,
Division of Export Licenses,

I hereby apply for a license to export.....

We (quantity)

of .....
(goods)

to .....
(consignee) (address)

.....
(Signature of applicant)

License to be sent to.....
(name)

.....
(address)

THIS LICENSE IS VOID AFTER SIXTY DAYS FROM DATE.

An Advisory Board will have general supervision of the scrutiny and issuing of export licenses. This board, which will relieve members of the Exports Council of details, has just been appointed and is as follows: Edward N. Hurley, former chairman of the Federal Trade Commission, representing the Department of Commerce; Vance C. McCormick, representing the State Department; Dr. Alonzo E. Taylor of the University of Pennsylvania, representing the Department of Agriculture; B. D. White, representing the food administration, and Dr. E. E. Pratt, chief of the Bureau of Foreign and Domestic Commerce, as secretary. It is probable that a representative will be named later from the Shipping Board.

Whatever policy the Exports Council may adopt with respect to the distribution of the iron and steel products covered by the President's proclamation, there is no present basis for the statements published in the daily press to the effect that an attempt will be made, through the control exercised by the council, to dictate the prices at which exported commodities shall be sold. The question as to whether the Allies shall be enabled to buy American products at the same price at which they are sold to the Government of the United States is an important one which will have to be met in the very near future; but the council does not regard it as germane to its two chief functions, viz., the conservation of the American supply for America and the prevention of indirect shipments to the enemy.

Investigation of Coal Prices

The Federal Trade Commission announces that its report upon the cost of producing bituminous coal, which is to serve as a basis for Government purchases, will be completed in about ten days. The inquiry having been undertaken at the instance of President Wilson, the report will be made direct to him and will not be forwarded to Congress unless the President decides that such a course is advisable. The commission calls attention to the fact that it has no power to fix prices and that it will confine itself to a statement of facts regarding costs, leaving it to the purchasing departments to negotiate such contracts as are now in prospect. Pending the commission's report, the coal producers will continue to supply the general public with run-of-mine coal at the basic price of $3 f. o. b. the mine.

The investigation of coal prices by the Senate Committee on Interstate Commerce may result in action by the Department of Justice, according to Senator Pomerene of Ohio, a prominent member of the committee. As the result of developments in and out of the committee, Senator Pomerene declares that criminal methods have been employed by large coal operators which have resulted in running coal prices up from $1.10 per ton f.o.b. the mines to as much as $9.25 to consumers. Thousands of cars loaded with coal have been held in freight yards, he asserts, while prices were raised, and in some cases the operators were perfectly willing to pay demurrage charges because these charges were offset by greater profits resulting from the detention of the cars. One coal company is said to have paid $400 a week in demurrage bills, but to have secured an extra profit of $1,600 by holding up shipments.

The Railroads' War Board, which has been working in conjunction with the coal producers and Council of National Defense not only to expedite coal shipments, but to relieve the general transportation situation, has issued a bulletin announcing that the car shortage has been substantially reduced by increasing the loading of freight cars and by following closely other requirements of the recently promulgated regulations.

W. L. C.

In line with the President's proclamation relative to the duty of all power plant operators to conserve fuel, the Combustion Engineering Corporation, New York has assigned one of its efficiency engineers to the work of traveling through the country to interview chief engineers and owners of such plants, with a view to reducing the fuel costs by increasing efficiency in every way possible not only in so far as the above company's stoker is concerned, but in suggestions for minor improvements and changes which can be made at small expense.

Iron and Steel Markets

THE EMBARGO ON EXPORTS

No Important Effect Upon the Market

Steel Manufacturers in Conference at Washington —The Government's Requirements

The effect on the domestic market of the Government embargo on certain iron and steel exports, effective July 15, will not be important, since exports of pig iron, steel billets, structural shapes, plates, ferromanganese and scrap to neutrals have been small. It seems likely that some restriction will be put upon exports of ship plates to Japan, as this movement has been considerable and plates are greatly needed for the ships building here.

There may be some reselling of export products now on the books, as in the case of pig iron for Sweden and Holland, but the volume will be even less than that represented in the resales of recent months, where vessel room could not be had for pig iron or steel that had been shipped to various seaports. There is no present basis for the published report that the Exports Council will use its control to dictate prices at which exported commodities shall be sold.

The latest development in Government price fixing on plates, shapes and other steel products is the calling of the American Iron and Steel Institute Committee to Washington to confer to-day (Wednesday) with the secretaries of War and the Navy and the chairman of the Shipping Board. The final word in the important negotiations affecting prices eventually on several million tons of steel products for the Government and its Allies may yet come from the President.

While a dictatorship of steel manufacture and distribution is less a possibility to-day than it appeared last week, the expectation of some form of price regulation, whether by the Government or by producers under Government sanction has grown to be the chief market influence. New business is less than in two years, both domestic and export transactions being held up by Washington negotiations.

Steel manufacturers' estimates of Government and Allies' total buying of steel products, expressed in terms of ingots, approximate 12,000,000 tons for the coming year, at the higher rate of shipbuilding now thought possible, or nearly 30 per cent of the country's present steel output. In plates and shapes the percentage taken for Government use is expected to go to 40 or 50.

A considerable addition to the 81,000 tons of shell steel recently placed by the Government is under negotiation. There are evidences also of the release of a large amount of business that has been awaiting Washington action. This applies to machine tools as well, shipyard purchases running into large figures.

Government demand for sheets has been an important factor in that market. Prices for No. 28 black and No. 10 blue annealed sheets are near to a parity around 8.75c.

Tin plate inquiries from abroad are accumulating. The Italian Commission, which recently placed 122,000 boxes, seeks 100,000 boxes more, and other export inquiries are for 84,000 and 100,000 boxes. Action on these as well as the general inquiry said to have come from Great Britain will depend on what Washington wants done.

Under present conditions manufacturers are making headway on their contract obligations, as illustrated by the reduction of 503,000 tons in the Steel Corporation's unfilled orders. Yet congestion at mills is still hampering operations, car supply showing no such improvement as might be inferred from the extensive co-operation of railroads and shippers.

In the pig iron market the feature has been the beginning of contracting covering the second half of 1918. The amount of such business is small, however, one Southern seller of foundry iron being a leader in the movement. Prices are irregular, the decision of some sellers to go $2 farther into the fifties being apparently inconsistent with concessions on offerings of resale iron elsewhere.

Prices on steel-making iron vary. While sales of Bessemer iron are reported at $57 and of basic iron at $54, there have been offers of Bessemer at $55 at Valley furnace. An inquiry in the Pittsburgh district is for 15,000 tons of basic iron for the first half of next year.

Prices on prompt blast furnace coke are steadily declining and $13 is more common this week. A contract for 8000 tons a month for the last half of the year has been put through at $10 at oven. Indications are that coke output and consequently pig iron output will show some increase in the second half of the year.

The scrap market is generally upset as the result of the past month's performances, and declines in heavy melting steel have been marked. The export embargo, the possibility of price regulation and other unsettling factors have brought dealings to a standstill in some markets.

Pittsburgh

PITTSBURGH, July 10.

The belief is general here that the embargo just declared by the Government against export shipments of pig iron, steel, scrap and some forms of finished steel is probably the best thing the Government has done since the war broke out. It is understood here that this embargo does not affect contracts already made for export shipments of iron and steel products, and it is said there are a fair number of these. The embargo means that thousands of tons of pig iron, plates, shapes, tin plates and other materials that were formerly being shipped to neutral countries will now be kept at home, and be available for our domestic manufacturers. There is a strong feeling that large quantities of food stuffs, also finished steel products, that the United States was shipping to neutral countries eventually found their way into Germany and this will now be absolutely cut off. Conditions in the local pig-iron and steel market

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	July 11, 1917.	July 3, 1917.	May 9, 1917.	July 12, 1916.
No. 2 X, Philadelphia...	**$53.00**	$52.00	$42.50	$19.75
No. 2, Valley furnace...	55.00	55.00	42.00	18.25
No. 2 Southern, Cin'ti...	49.90	49.90	40.90	16.90
No. 2, Birmingham, Ala.	47.00	47.00	38.00	14.00
No. 2, furnace, Chicago*.	55.00	55.00	42.00	19.00
Basic, del'd, eastern Pa..	50.00	50.00	38.00	19.00
Basic, Valley furnace....	**53.00**	52.00	42.00	18.00
Bessemer, Pittsburgh ...	57.95	57.95	44.95	21.95
Malleable Bess., Ch'go*..	55.00	55.00	42.00	19.50
Gray forge, Pittsburgh..	47.95	47.95	40.95	18.70
L. S. charcoal, Chicago...	**58.00**	57.00	46.75	19.75

Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	38.00	38.00	38.00	33.00
O.-h. rails, heavy, at mill	40.00	40.00	40.00	35.00
Bess. billets, Pittsburgh..	100.00	100.00	80.00	40.00
O.-h. billets, Pittsburgh..	100.00	100.00	80.00	42.00
O.-h. sheet bars, P'gh....	105.00	105.00	80.00	42.00
Forging billets, base, P'gh	125.00	125.00	105.00	69.00
O.-h. billets, Phila.....	110.00	110.00	75.00	45.00
Wire rods, Pittsburgh....	95.00	95.00	85.00	55.00

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia.	4.659	4.659	4.159	2.659
Iron bars, Pittsburgh....	4.75	4.75	3.75	2.50
Iron bars, Chicago.....	4.50	4.50	3.25	2.35
Steel bars, Pittsburgh..	4.50	4.50	4.00	2.75
Steel bars, New York...	4.669	4.669	4.169	2.669
Tank plates, Pittsburgh..	9.00	9.00	6.50	3.50
Tank plates, New York..	9.169	9.169	6.669	3.669
Beams, etc., Pittsburgh..	4.50	4.50	4.00	2.50
Beams, etc., New York..	4.669	4.669	4.419	2.669
Skelp, grooved steel, P'gh	4.00	4.00	3.50	2.35
Skelp, sheared steel, P'gh	6.00	6.00	5.50	2.45
Steel hoops, Pittsburgh..	5.25	5.25	4.25	2.75

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	July 11, 1917. Cents.	July 3, 1917. Cents.	May 9, 1917. Cents.	July 12, 1916. Cents.
Sheets, black, No. 28, P'gh	8.50	8.50	6.50	2.90
Sheets, galv., No. 28, P'gh	10.00	10.00	8.00	4.50
Wire nails, Pittsburgh..	4.00	4.00	3.50	2.50
Cut nails, Pittsburgh....	4.65	4.65	3.75	2.60
Fence wire, base, P'gh..	3.95	3.95	3.45	2.45
Barb wire, galv., P'gh..	4.85	4.85	4.35	3.35

Old Material, Per Gross Ton:				
Iron rails, Chicago.....	*$45.00*	$47.00	$32.50	$18.50
Iron rails, Philadelphia..	52.00	52.00	34.00	20.00
Carwheels, Chicago.....	37.00	37.00	24.25	12.00
Carwheels, Philadelphia.	38.00	38.00	27.00	16.00
Heavy steel scrap, P'gh.	*40.00*	42.00	28.00	16.50
Heavy steel scrap, Phila	40.00	40.00	25.00	15.00
Heavy steel scrap, Ch'go.	*34.00*	36.00	27.00	14.00
No. 1 cast, Pittsburgh...	*34.00*	36.00	24.00	15.75
No. 1 cast, Philadelphia.	*37.50*	39.00	28.00	16.00
No. 1 cast, Ch'go (net ton)	*29.50*	30.50	21.50	11.50
No. 1 RR. wrot, Phila....	*55.00*	57.00	41.00	19.50
No. 1 RR. wrot, Ch'go (net)	*39.00*	40.00	31.00	14.25

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	*$13.00*	$15.00	$7.50	$2.75
Furnace coke, future....	**10.00**	9.50	7.50	2.50
Foundry coke, prompt...	**14.00**	13.00	8.50	3.25
Foundry coke, future....	10.00	10.00	9.00	3.50

Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York..	*30.75*	31.75	31.00	26.00
Electrolytic copper, N. Y.	*30.75*	31.75	31.00	25.75
Spelter, St. Louis.....	*8.87½*	9.00	9.12½	8.75
Spelter, New York.....	*9.12½*	9.25	9.37½	9.00
Lead, St. Louis	*11.00*	11.25	10.25	6.25
Lead, New York.....	*11.12½*	11.37½	10.45	6.45
Tin, New York.....	**63.00**	62.00	59.37½	38.50
Antimony (Asiatic), N. Y.	*17.00*	19.00	25.00	15.50
Tin plate, 100-lb. box, P'gh.	$12.00	$12.00	$8.50	$6.00

in the past week were very quiet, and very little material is being sold. Furnaces and steel works, also finishing mills, are afraid to make contracts for forward delivery, until it is known definitely just what the Government will do and on the other hand consumers are not anxious to contract under existing conditions, with the result that new business being booked by the mills at present is slighter than at any time in two years. Shipments are showing a heavy increase over new orders being booked, but how long this condition will last is a question. Once the Government gets active in placing contracts for war materials, they will take preference over domestic orders and the mills will bend their entire energies to get out the Government orders at the very earliest moment possible. Price changes in the past week have been light, basic iron being up $1 to $2 per ton and some sellers are asking $60, Valley, for Bessemer, but we do not hear of any sales yet at that extraordinary price. There is a scarcity in the supply of both Bessemer and basic and higher prices are not unlikely. There has been a decline in prices of prompt furnace coke, fairly large sales to-day (Tuesday) having been made at $13 to $13.25 at the ovens. Scrap is in a decided slump, and prices have again gone off $2 to $5 per ton.

Pig Iron.—The pig-iron committee, of which C. D. Dyer, vice-president of the Shenango Furnace Co., is chairman, will take charge of buying of pig iron for the Government and distributing its orders among the furnaces. As yet, nothing definite has been done with the inquiry of Italy for 60,000 tons of Bessemer iron or with the Government inquiry for 10,000 tons of foundry iron. A local committee, of which T. W. Friend is chairman, has been appointed to handle the inquiry from the Italian Government for 60,000 tons of Bessemer iron, but this committee has done nothing definite. The two largest inquiries in the market for basic iron are from the Whitaker-Glessner Co., Wheeling, W. Va., and from the Erie Forge Co., Erie, Pa., each concern wanting 10,000 tons for first half of next year, but nothing definite has been done with either inquiry. In fact, actual sales of Bessemer and basic iron are for small lots only, it being very difficult to find any large lots for the open market. We note a sale of 2000 tons of basic iron at $54, 1500 tons of Bessemer at $57, both at Valley furnace. It is said small lots of Bessemer have sold at $58 at Valley furnace. We quote Bessemer iron at $57 to $58; basic, $53 to $54; malleable Bessemer, $53 to $54; No. 2 foundry, $55 to $58, and gray forge, $47 to $48, all f.o.b. at Valley furnace for delivery this year. The freight rate from Valley furnaces on pig iron to the Cleveland and Pittsburgh districts is 95c. per ton.

Billets and Sheet Bars.—The local markets on semi-finished steel is very quiet, consumers being well covered on contracts and very little steel is available for the open market. For the present quarter, some large users of billets and sheet bars that have contracts with regular sources of supply are said to be paying from $80 to $85 per ton, for both billets and bars, but this is not official. It is probable that soft Bessemer or open-hearth billets and sheet bars would bring $100 to $105 in the open market for fairly prompt shipment. Forging billets are very firm at $125 to $130 at mill.

We now quote soft Bessemer and open-hearth billets at $95 to $100 and soft Bessemer and open-hearth sheet bars at $105 to $110, maker's mill, Pittsburgh or Youngstown. We quote forging billets at $125 to $135 per ton for ordinary sizes and carbons, f.o.b. maker's mill.

Ferromanganese.—The new inquiry for ferromanganese is quiet, consumers apparently being covered on their entire needs for the present quarter and some over the remainder of this year. For delivery over last half of this year we quote 80 per cent domestic ferromanganese, $400 to $425, and for first half of next year about $350 per gross ton at maker's furnace. There seems to be an ample supply of ferromanganese to fully meet the needs of this country in making steel. Small lots of 50 per cent ferrosilicon for spot shipment are still

being sold at prices ranging from $225 to $300 delivered. We quote 18 to 20 per cent spiegeleisen at $80 to $85 per gross ton, at furnace. Consumers of Bessemer ferrosilicon and silvery iron are covered over this year, and the new demand is light.

We quote 9 per cent Bessemer ferrosilicon at $89, 10 per cent $90, 11 per cent $95, 12 per cent $100, 13 per cent $105, 14 per cent $115, 15 per cent $125, and 16 per cent $135. We now quote 7 per cent silvery iron at $51 to $52, 8 per cent $52 to $53, 9 per cent, $54 to $55, 10 per cent $55 to $56, 11 and 12 per cent $57 to $58. All f.o.b maker's furnace. Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having a uniform freight rate of $2 per gross ton for delivery in the Pittsburgh district.

Steel Rails.—No new orders are being placed for standard sections, but the new demand for light rails is very active and they are hard to obtain. The two makers in this district are sold up on light rails for a year or more, but the Cambria Steel Co. occasionally takes some new orders to be filled at convenience of the mill. Sales of rerolled light rails have lately been made at prices higher than are being quoted on new light rails. Prices on new light rails and on standard section are given on page 107.

Structural Material.—Most of the new business being placed in structural shapes is coming from the Government, and information on these contracts is not available. The new inquiry from the domestic trade is light, due to the very large falling off in new building operations on account of the high prices ruling for steel and labor and also on account of the uncertainty of the future. The American Bridge Co. is turning out very large quantities of structural material for the Government, and the McClintic-Marshall Co. has also taken on some large Government work.

Plates.—The local mill that has been furnishing some considerable plates to the Government for some time expects in the near future to roll about 50,000 tons of plates per month for the Government and the quantity may be larger. It is said that before long the Government will be taking about 50 per cent of the entire output of the plate mills, and this means there will be fewer plates for large consumers, such as the steel car builders, boiler shops and for other work. The Standard Steel Car Co. has taken 250 steel gondolas for the Phelps Dodge Co. and 250 tank cars for Swift & Co. Some small inquiries for steel cars are in the market, these including 100 flat cars for the Florida East Coast Line and 40 steel hoppers and 15 steel gondolas for the Benwood & Wheeling Connecting Railroad. We quote ¼ in. and heavier sheared plates at 9c. to 10c. at mill for delivery late this year, while small lots from warehouse for fairly prompt delivery bring 11c. to 12c. and higher. Mills are quoting 10c. to 12c. on ship plates to domestic shipyards. The above prices apply only on domestic orders.

Sheets.—The Government demands for all grades of sheets are getting heavier right along, there having been a large increase in direct orders for sheets being placed by the Government and also in indirect business from concerns that are making products for Government use. On Tuesday each week the sub-committee on sheets meets in this city and makes up a schedule distributing Government orders to the different mills. It is estimated that the Government requirements of sheets for the remainder of this year may run close to 150,000 tons. The distribution of sheets from the mills to domestic consumers is getting steadily less as the Government demands increase. Three or four of the largest mills have been practically out of the market as sellers for several months, trying to take care of Government business and regular customers as best they can. A sale of 500 tons of No. 28 gage Bessemer black sheets has been made by a Mahoning Valley mill at 8.75c., f.o.b. mill. Mill prices for carloads and larger lots over which premiums are being paid for fairly prompt shipment are given on page 107.

Tin Plate.—The embargo on bright plate instituted some time ago against packers of non-perishable goods has been partially removed and bright plate is now going forward in larger quantities to packers of non-perishable foods than at any time for several months. None of the tin plate mills actually have shut off shipment of tin plate to packers of non-perishable foods, but the quantities shipped were cut down very materially, and these customers will now get more plate. Because of the close co-operation of the tin plate mills with the Government, a full supply of bright plate for packing perishable foods this summer seems absolutely assured. The foreign demand for tin plate is still very heavy. The Italian Commission recently placed 122,000 boxes with American mills, of which one mill took 32,000 boxes, and several others 10,000 boxes each. The Italian Commission is also in the market for 100,000 boxes more, and there is another export order in the market for 84,000 boxes. J. P. Morgan & Co. has an inquiry out for 100,000 boxes, and it is reported, but not officially confirmed, that England will need an immense quantity of tin plate, and hopes to get it in this country. However, on these foreign inquiries, America will refuse to quote unless directed to do so by our own Government. On current orders for tin plate, which are quite heavy, local mills are quoting $11 to $12 per base box. Nominal prices on terne plates the demand being dull, are given on page 107.

Iron and Steel Bars.—One local mill expects to be furnishing very shortly at least 5000 tons of steel bars per month to the Government, and the amount may be larger. The iron and steel bar mills are steadily restricting the percentage of output intended for domestic consumers, conserving more and more of their output for Government uses. The output of iron and steel bars for this year is practically sold up, and all the mills are very much back in deliveries. Prices on iron and steel bars being quoted by the mills in carloads and larger lots to regular domestic customers are given on page 107.

Hoops and Bands.—Mills are largely sold up this year on both hoops and bands, and most orders now being placed are for small lots, for which very high prices are being paid. Steel hoops range from 5c. to 5.50c., and steel bands from 5c. to 6c. at mill, to regular customers only. It is said that in special cases, steel hoops have sold at 6c. and steel bands as high as 7c. at mill for fairly prompt delivery.

Muck Bar.—Best grades of muck bar made from all pig iron are quoted at $95 to $100 per gross ton, maker's mill.

Wire Rods.—Mills are drawing the lines together in regard to taking on new obligations for wire rods, and have practically stopped quoting on export inquiries. Small lots of soft Bessemer and open hearth rods have sold recently at $95 to $100 at maker's mill. There is a heavy demand for special quality rods made from special steel. Prices on these range from $100 up to $120, maker's mill. Prices on rods are given in detail on page 107.

Wire Products.—No further large orders for wire and wire nails have been placed by the Government, but more are expected to be given out soon. Three or four of the largest makers of wire and wire nails are not actively trying to secure new business, desiring to conserve more and more of their output for Government uses, and to take care of obligations already on their books for domestic customers. The fact that prices of the independent mills on wire and wire nails are $16 above that of the leading interest is still causing some complication among the jobbing trade, mention of which has been made before in our reports. The export demand for wire and wire nails is still very heavy, coming largely from Japan, South America and other countries, but it is doubtful whether mills will quote in the future on very much of this export inquiry. A sale of a fairly large quantity of special analysis bright basic wire was recently made at close to $200 per ton at maker's mill. Mills are back in deliveries on both nails and wire, and with the increasing demand being made on them for their product, still slower deliveries to the domestic trade seem likely. The American Steel & Wire Co. is still taking care of its domestic customers to the best advantage it can on wire nails on the basis of $3.20 base, per keg, and on bright basic wire $3.25 per 100 lb. Detailed prices on wire and wire nails, in effect by the independent mills are given on page 107.

Shafting.—The demand for shafting is only fairly heavy, and most large consumers are covered over the remainder of this year. Specifications from the screw stock machine trade and from implement makers are

heavy, but from the automobile builders are light. It is expected, however, that the contracts, soon to be placed by the Government for army trucks and other vehicles will be reflected in a very much heavier demand from motor truck builders. Discounts on shafting are firm, ranging from list to 10 and 5 per cent off, depending on the quantity and the delivery wanted.

Railroad Spikes and Track Bolts.—There is a decided scarcity in the supply of spikes due to the fact that one or two makers are out of the market as sellers, while other makers who buy their steel outside are not getting more than 25 to 40 per cent of the quantity of steel they need. Prices of base sizes of spikes are firm at $5, and on smaller sizes $7.50 to $8. There is a very heavy demand for boat spikes from the shipyards, and this will get much heavier as the boat building program of the Government gets into full swing. Prices on track bolts are also very firm, due to scarcity of supply and the heavy demand. Prices in demand on railroad spikes and track bolts are given on page 107.

Cold Rolled Strip Steel.—The direct demand from the Government for cold rolled strip steel and also the indirect demand from customers of the mills are getting steadily heavier. Owing to the uncertainty as the attitude of the Government makers of cold rolled strip steel are selling for delivery only 60 days ahead and still demand that 50 per cent of the specifications must accompany each order. On these contracts, the mills are still quoting 9c. at mill, but on small current orders for fairly prompt shipment prices range from 10c. up to 12c. at mill. Terms are 30 days, less two per cent off for cash in 10 days, when sold in quantities of 300 pounds or more.

Nuts and Bolts.—All makers report the new demand for nuts and bolts is very heavy, and much beyond their ability to supply promptly owing to the scarcity of steel, also of labor. The car supply is better and the heavy stocks of nuts and bolts held in warehouses awaiting cars for shipment are now moving out more freely. There is still a heavy export demand for nuts and bolts, but makers are turning these down as they desire to conserve their entire output for the Government and regular domestic customers. In addition, it is almost impossible to get cars and bottoms for export shipment. The discounts adopted on April 12 last are still in effect, and are given in detail on page 107.

Rivets.—Makers report the new demand fairly heavy, and most large consumers are covered over the remainder of this year. The supply of steel and labor is short, and this is cutting down output of rivets to a considerable extent.

Wrought Pipe.—There are now three distinct lists of discounts on the market, one of these being the card of the National Tube Co., adopted on April 2 with the basing discount 55 per cent, another being the discounts of May 1 adopted by the independent mills, which is 49 per cent and the third the lists of the Labelle Iron Works and the Wheeling Steel & Iron Co., on which the basing discount is 42 per cent. The mills that are quoting the lower discounts on steel pipe have been practically out of the market as active sellers, these concerns filling large orders for the Government, and also trying to take care of domestic customers as best they can. It is probable that within a very short time all the independent steel pipe mills will adopt the discounts now in effect by the Wheeling Steel & Iron Co., and the Labelle Iron Works, one or two mills having done so in the past week. On lap weld steel pipe, mills have nothing to sell for this year and several have practically their entire output sold up for first half of next year. The demand for oil country goods is extremely heavy, and heavy premiums over regular prices are being paid for fairly prompt delivery. Discounts on steel pipe as adopted on May 1, and on iron pipe as adopted July 1 by leading iron pipe mills are given on page 107.

Boiler Tubes.—Conditions in the boiler tube market are the same as have been noted in this report for some months past. The output of iron and steel tubes is sold up for a year or more ahead and on seamless steel tubing for a longer period. Discounts are purely nominal, and show prices much below what are actually being paid by consumers who can find any mills that have either iron or steel tubes to sell. Nominal discounts on iron and steel tubes as adopted Nov. 1, 1916, but which have been obsolete for some months, are given on page 107.

Old Material.—It is believed that the embargo declared by the Government against any further export shipments of scrap except by special permit will have a beneficial effect, as it will probably assure to domestic consumers all the scrap they need for their use. Not much scrap has been exported from the Pittsburgh district, but it is known that exports have been heavy from Eastern points at which large amounts of scrap originate. The prospect that the Government may soon take charge of scrap and regulate prices has practically stopped all new business. Dealers are afraid to sell, and consumers will not buy until it is known definitely just what the Government is going to do. Under this waiting attitude, prices naturally have gone lower to the extent of $1 to $3 per ton, depending on the grade. Selected heavy steel melting scrap has sold in small lots as low as $40 per gross ton, delivered, and the market is none too strong at that figure. Low phosphorus is also lower in price, and borings and turnings have declined about $1 per ton. Sheet bar crop ends have gone off more than any other grade of scrap, and are freely offered at $47, or less, at shipping point. It is not likely there will be very much new business in scrap until the Government attitude is definitely known, and in the meantime, prices are likely to go off still more. New sales in the past week have been very light. We note a sale of about 200 tons of heavy melting steel scrap at $40, and 600 tons of low phosphorus billet and plate ends at $56 per gross ton, both delivered to consumers' mills. Dealers quote for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$40.00 to $42.00
No. 1 foundry cast	35.00 to 36.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland Md., and Franklin, Pa.	43.00 to 45.00
Hydraulic compressed sheet scrap	33.00 to 34.00
Bundled sheet scrap, sides and ends, f.o.b. consumer's mill, Pittsburgh district	26.00 to 27.00
Bundled sheet stamping scrap	23.00 to 24.00
No. 1 railroad malleable stock	33.00 to 34.00
Railroad grate bars	17.00 to 18.00
Low phosphorus melting stock	56.00 to 57.00
Iron car axles	55.00 to 56.00
Steel car axles	57.00 to 58.00
Locomotive axles, steel	60.00 to 61.00
No. 1 busheling scrap	28.00 to 30.00
Machine-shop turnings	20.00 to 21.00
Old carwheels	37.00 to 38.00
Cast-iron borings	21.00 to 22.00
*Sheet bar crop ends	48.00 to 50.00
No. 1 railroad wrought scrap	42.00 to 43.00
Heavy steel axle turnings	27.00 to 28.00
Heavy breakable cast scrap	31.00 to 32.00

*Shipping point.

Coke.—The total output of coke in the Upper and Lower Connellsville regions for the first six months of 1917 is given as 9,247,113 tons, a decrease over the first half of 1916 of 2,362,113 net tons. The main reason for this falling off in output was scarcity of labor and also cars, many plants having to shut down at different periods during 1917 for lack of cars, and also on account of shortage of labor. There was a heavy demand in the past week for blast furnace coke for prompt shipment, and sales were made at as high as $16 per net ton at oven for best grades. However, the car supply in the last few days has been better, and prices of spot furnace and foundry coke are lower. Prices on prompt blast furnace coke are steadily declining, and on Tuesday fairly large sales of high grade blast furnace coke for spot shipment were made at $13 to $13.25 per net ton at oven. One Valley blast furnace interest recently made a contract for about 8000 tons of blast furnace coke per month, delivery over last half of this year, at $10 per net ton at oven. As long as the high prices of prompt coke were in force, there was no chance of any contracts being made, as producers preferred to sell their coke at the market, and name prices each day as they have been doing so far this month.

We now quote best grades of blast furnace coke for prompt shipment at $13 to $13.25, and foundry coke at $14 per net ton at oven. Some time ago some large contracts for 72-hour high grade foundry coke were made at $10 per net ton at oven, but none has been made lately. The Connellsville *Courier* gives the output of coke in the Upper and Lower Connellsville regions for the week ending June 30 as 371,168 net tons, an increase over the previous week of 9,507 tons.

Chicago

CHICAGO, July 9.

To uncertainty over the extent to which the Government will demand their products, and that created by the proposal to fix prices by Governmental means for the private consumer, is now added doubt as to how far the mills will be affected by Government control of exports. The question arises as to how far the foreign orders already booked will be allowed to take their normal course. Japan has done some tremendous buying of plates, pig iron and rivets and bolts, to say nothing of other products. One interest expects that foreign orders may be filled if they do not interfere with Government needs. Others believe that the effect of the license system will be minimized by the lack of ships, this already having been a doleful feature of the export trade. It is generally believed that, if exports were curtailed or deferred, as they likely would be under the proposed regulation, the result would be of a stabilizing character, and this would be welcomed, even by those who are supposed to be profiting most by existing conditions. It is predicted that an export embargo would operate to bring plates and sheets down to more reasonable levels. Pig iron is without change, except that the largest Southern merchant interest has practically withdrawn from the market for the first half of 1918, and opened its books for the last half of 1918. Structural material makes a better showing with six awards, though most of them are small. The Grand Trunk system has placed 1000 cars for use in the United States. Manufacturers of tie-plates have made sales of carload lots at $90 to $100 for prompt delivery. Not much business is in sight, but in the last six weeks one manufacturer has booked about 50 per cent of capacity. The Government demand for sheets continues heavy. The old material market shows a downward trend, but is being supported to some extent by conditions in the East.

Pig Iron.—In all quarters, new business is quiet, with efforts concentrated on making deliveries of iron under contract, especially where the prices involved were much lower than those which prevail to-day. Naturally, the buyers in these cases are anxious to get the iron in their yards, and their insistence that iron be shipped without further delay is based fully as much on fear that some untoward circumstance may intervene as on actual need. Their attitude may be understood from the fact that some Southern iron purchased at $16.50 has lately been shipped. The market continues to change with great rapidity. On July 6 the leading Southern interest offered limited quantities for both last-half and first-half delivery, whereas to-day (July 9) it announces its withdrawal from the first half, and its willingness to consider orders for the last half of 1918 at $48, Birmingham. In the last half of this year, some odd lots may be available, but for these offers must be submitted to the furnace. Last-half Southern No. 2 foundry would be difficult to find under $50, Birmingham, or $54, Chicago; while first-half basic is around $50, Birmingham, and foundry may be said to range from $46 to $50, Birmingham, for the same position. The Southern car situation is somewhat improved. High silicon Tennesse iron (containing phosphorus) delivery during the first half of 1918, ranges from $48, furnace, for 4 to 5 per cent, to $55, furnace, for 8 to 9 per cent, taking a freight rate of $2.75 to Chicago. For delivery in the last half, 8 per cent Tennessee silvery has been quoted at $80, furnace. Northern iron is unchanged at $55, furnace, for malleable Bessemer, basic and No. 2 foundry, with inquiry much lighter, a condition not displeasing to the sellers. A report that $52 was paid for 5000 tons of iron, presumably Northern, for the last half of 1918 is accepted inasmuch as the definite offer was made to one seller, and the proffer declined. A Virginia maker of foundry iron offers a small tonnage of No. 2 for the first half at $50, but to selected buyers only, and then subject to confirmation. Makers of charcoal iron are confining their sales to regular customers only, declining in many cases to quote on attractive new business. The quotations of the leading makers continue to show some variance. The minimum quotations are $56 to $58.50, f.o.b. furnace, another interest quoting $57.50 to $60, furnace. Standard low phosphorus is scarce and in good demand, quotations ranging from $85 to $90 and upward, delivered. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 1 to 4	$58.00 to $62.00
Lake Superior charcoal, Nos. 5 and 6 and Scotch	58.00 to 62.00
Northern coke foundry, No. 1	55.50
Northern coke foundry, No. 2	55.00
Northern coke foundry, No. 3	54.50
Northern high-phosphorus foundry	55.00
Southern coke No. 1 f'dry and 1 soft	54.50
Southern coke No. 2 f'dry and 2 soft	54.00
Malleable Bessemer	55.00
Basic	55.00
Low-phosphorus	85.00 to 90.00
Silvery, 8 per cent	70.00 to 80.00

Ferroalloys.—No change is reported in 80 per cent ferromanganese, quotations ranging from $400 to $450, according to delivery, the higher price applying to prompt and the lower to first half delivery.

Plates.—Except for one Eastern mill, which quotes 10c., Pittsburgh, or 10.189c., Chicago, for such limited quantities as it can supply, makers are unwilling to name a price. Many instances are related where mills have refused to accept 9c. to 10c. It is the opinion of some of the mill representatives that prices will decline if an embargo is placed on exports, and at least some of these representatives say they would welcome a change in this direction.

We quote for Chicago delivery of plates out of jobbers' stocks, 8c.

Structural Material.—In shapes, also, the only available quotation is that of an Eastern mill which quotes 6c., Pittsburgh, or 6.189c., Chicago, for such lots as it can roll. Small structural jobs are said to be numerous, despite conditions, and the awards, especially for railroad bridge work, show a betterment. The Grand Trunk System has placed 1000 box cars, for use in the United States, with the American Car & Foundry Co. The Florida & East Coast Railway is inquiring for 100 box cars, the United Verde for 30 ore cars and the Baltimore & Ohio for 14 hoppers. These latter inquiries would hardly be noticed in other times. The structural awards of the week follow:

Northern Central Railroad Co., tanks for elevator, Baltimore, Md., 173 tons, to American Bridge Co.

Ohio & Colorado Smelting & Refining Co., addition to Wedge Roaster Building, Salida, Col., 120 tons, to American Bridge Co.

Commonwealth-Edison Co., Lowe Avenue Substation at Chicago, 143 tons, to Gage Structural Steel Works.

Kelley Convertible Auto Truck Co., 1200 truck frames, Chicago, 132 tons, to not reported.

Northern Central Railroad Co., elevator at Baltimore, Md., 1167 tons, to Christopher Simpson, St. Louis.

Great Northern Railway Co., one beam and six plate girder spans, 270 tons, to Wisconsin Bridge Co.

Jobbers quote 5c. for material out of warehouse.

Bars.—No great change in the bar situation is noted. Mild steel is quoted at 4.50c., Pittsburgh, or 4.689c., Chicago, by an Eastern mill; from others no quotation is obtainable. Rail carbon bars are a little easier at 4.25c. to 4.50c., Chicago, it being intimated that sales have been made at concessions. Iron bars are unchanged at 4.50c. to 5c., Chicago.

We quote prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c. to 5c.; reinforcing bars, 4.50c., base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Wire Products.—The leading interest adheres to its

nominal base of 3.20c. for wire nails, although other producers quote 4c. and upward. The policy of not taking new business is gradually reducing unfilled orders to give the Government demand the right of way. The demand for woven wire fencing is not as good as it usually is at this season, farmers using more barbed wire than ordinarily. Some independent manufacturers who make cement-coated nails are making no prices to their trade, leaving that to be determined at the time of delivery. Quotations to jobbers, per 100 lb., Pittsburgh, are as follows:

Plain fence wire, Nos. 6 to 9, base, $4.189; wire nails, $4.189; painted barb wire, $4.339; galvanized barb wire, $5.039; polished staples, $4.339; galvanized staples, $5.039; all Chicago, carload lots.

Rails and Track Supplies.—Though the leading interest quotes $70 for tie-plates, others ask and have obtained $90 to $100, Chicago.

Quotations are as follows: Standard railroad spikes, 4.25c. base; small spikes, 4.50c., base; track bolts with square nuts, 5.25c., all in carloads, Chicago; tie plates, $70 to $90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base; open hearth, $40; light rails, 25 to 45 lb., $65; 16 to 20 lb., $66; 12 lb., $67; 8 lb., $68; angle bars, 3.25c., base.

Bolts and Nuts.—But little new business is being considered by the makers. They are speculating as to what effect any Government attempt to control exports will have upon their trade with the Far Eeast. Japan in particular has been a large buyer of bolts and rivets. For prices and freight rates, see Finished Iron and Steel, f.o.b. Pittsburgh, on page 107.

Store prices are as follows: Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to ⅞ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to ⅞ x 6 in., 40-2½; larger sizes, 30-5; hot pressed nuts, square, $3, and hexagon $3 off per 100 lb.; lag screws, 50 per cent off.

Old Material.—While further reductions in prices are to be noted, the market is nevertheless holding up fairly well, and it is declared that none of the dealers are inclined to sell short. While the recent tendency has been downward, prices are to some extent supported by the situation in the East. Even at present levels, Eastern buyers have found they can afford to pay the freight rate on material from the West and have done so. It is admitted that the local market is not so strong. Several railroads have issued lists of moderate size, among them the following: Union Pacific, C., C., C. & St. L., Pere Marquette, C. & I., Soo Line and C., St. P., M. & O. The Great Northern, under date of June 30, offered 3500 tons of low grade 56 and 60-lb. rails with angle bars which have been in use on a logging road. It also offered 1000 tons of No. 1 steel rail scrap. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$45.00 to $46.00
Relaying rails	59.50 to 60.00
Old carwheels	37.00 to 38.00
Old steel rails, rerolling	46.50 to 47.50
Old steel rails, less than 3 ft.	47.50 to 48.00
Heavy melting steel scrap	34.00 to 36.00
Frogs, switches and guards, cut apart	34.00 to 36.00
Shoveling steel	33.00 to 35.00
Steel axle turnings	23.50 to 24.50

Per Net Ton

Iron angles and splice bars	$45.00 to $45.50
Iron arch bars and transoms	45.00 to 45.50
Steel angle bars	39.00 to 39.50
Iron car axles	50.50 to 51.50
Steel car axles	49.00 to 50.00
No. 1 railroad wrought	39.00 to 40.00
No. 2 railroad wrought	37.00 to 37.50
Cut forge	36.00 to 36.50
Pipes and flues	26.50 to 27.50
No. 1 busheling	28.50 to 29.00
No. 2 busheling	20.50 to 21.50
Steel knuckles and couplers	41.00 to 42.00
Steel springs	41.50 to 42.00
No. 1 boilers, cut to sheets and rings	26.50 to 27.00
Boiler punchings	36.50 to 37.00
Locomotive tires, smooth	50.00 to 50.50
Machine-shop turnings	20.00 to 20.50
Cast borings	18.50 to 19.00
No. 1 cast scrap	29.50 to 30.50
Stove plate and light cast scrap	20.50 to 21.00
Grate bars	24.50 to 25.00
Brake shoes	24.50 to 25.00
Railroad malleable	33.00 to 33.50
Agricultural malleable	27.50 to 28.50
Country mixed scrap	17.00 to 17.50

Sheets.—The demand for sheets in connection with Government work is heavy and it is being cared for. Leading makers are not quoting on private needs as a rule, although they are serving their contract customers, and occasionally taking a new order. About the best quotations to be obtained are 9.189c., Chicago, for No. 10 blue annealed; 10.189c. for No. 28 black, and 11.189c. for No. 29 galvanized. Jobbers' quotations are unchanged.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 9.50c.; No. 28 black, 9.50c.; and No. 28 galvanized, 11c.

Cast-Iron Pipe.—Government needs for the cantonments continues to engage the attention of the makers. Several hundred tons of 16-in. pipe will be used at Fort Benjamin Harrison, Ind. On July 13, Duluth, Minn., is expected to place 900 tons. Quotations are unchanged.

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., $68.50; 6 in. and larger, $65.50, with $1 extra for class A water pipe and gas pipe.

Philadelphia

PHILADELPHIA, July 9.

Additional Government work has been given out to fabricating shops in this territory during the past week, and it is understood that substantial tonnages have been allotted. In addition, different shops have been notified to expect orders at any time under the Government price plan and specifications are now being looked for. In fact, Government influence and Government policy seem to be the main factors in this market at present, for in addition to the concrete effect which army and navy orders are having on the steel supply available for civilian purposes, uncertainty over Federal price fixing and the application of the embargo on overseas shipments have given emphasis to a policy of watchful waiting on the part of manufacturer and consumer alike. Nobody seems anxious for commitments very far forward until some of the haze clears away. Meanwhile, the first week in July has lived up to its reputation as a period of comparatively little business, but there has been a stiffening of prices for prompt or nearby delivery in most lines.

Pig Iron.—Actual transactions have been comparatively few and small, with inquiry rather less. The chief business offered during the week is the inquiry of the Lenoir Car Works for 6400 tons of six specified analyses, delivery running into the first half. Eastern Pennsylvania No. 2 X foundry shows an advance to $54.50 delivered on actual sales, with some firms asking anywhere from $54.75 to $55.75 and some sales at $53.75 for 1917 and 1918 delivery reported. Virginia No. 2 X holds to the top of $55.25 as previously reported, with $52.75, Philadelphia, for first half 1918 quoted as the price of a leading interest which is back in the market with a restricted tonnage to offer. Steel-making irons are dragging again, with basic nominal at $50 to $52 and standard low phosphorus nominal at $90. Copper-bearing low phosphorus is held at $85 to $90 furnace, and one maker reports the bulk of his capacity taken for the first half. Some tonnages of off-grade irons, running as high as 0.06 sulphur, have moved at $53. Gray forge has been quiet, with $50 as a nominal price. Some sales of No. 2 foundry at $48.50 Birmingham for first half delivery are reported by a local house. Quotations for standard brands, prompt shipment, and delivery in buyers' yards, range about thus:

Eastern Pa. No. 2 X foundry	$53.00 to $54.50
Eastern Pa. No. 2 plain	52.50 to 54.00
Virginia No. 2 X foundry	54.25 to 55.25
Virginia No. 2 plain	53.75 to 54.75
Basic	50.00 to 52.00
Gray forge	50.00
Standard low phosphorus	90.00

Structural Material.—Government activities are naturally affecting the structural output so far as general consumers are concerned, and though repeated refusals by the mills have had their effect in discouraging prospective buyers, prices have stiffened this week, and one large interest which had been giving 4½c. to 5c.,

Pittsburgh, as its range, is now on a flat basis of 5c. for anything like prompt delivery, with 4¾c. at mill convenience. A second considerable interest is taking some business for third quarter specification on a basis of 6c. Pittsburgh, while a third producer, when able to supply shapes from a limited stock, is asking 5¼c., Pittsburgh. Only two inquiries of moment are in this market this week—one of about 400 tons for a new building for the Consolidated Gas & Electric Co., Baltimore, and the other 2600 tons for the new public library of Philadelphia, on which bids will be taken this week.

Coke.—Fuel conditions are a trifle better than they were last week, both furnace and foundry grades being offered at $1 less than a week ago for spot. To-day's prices are fairly represented by $15 for foundry and $14 for furnace for prompt delivery.

Ferroalloys.—Business has been dull in ferroalloys, with no changes in price noted. Ferromanganese holds at $450 for prompt and $425 for last quarter. Spiegeleisen is quoted at $85 furnace for prompt.

Old Materials.—In general the market may be said to be quieter and a little softer on scrap for immediate shipment. There is still considerable shipment to the Pittsburgh district, but mills in Eastern territory are going slowly. Despite the lull, the fundamental conditions are not changed; that is to say, there is no great abundance of material and in the view of some houses in this market there is really a scarcity. Hence, the embargo on the exporting of iron and steel scrap, as proclaimed by the President, has become a matter of interest here, for there is a great volume of scrap, now owned by foreigners and awaiting export, in cities on the Atlantic seaboard. It is estimated that the quantity may reach 100,000 tons, and a good proportion is in storage in this city, held on Italian account chiefly. Italy, as an ally of America, might be willing to forego shipment and release this material to American buyers in return for shipments of semi-finished or finished steel to Italian ports. This is one of the possibilities which was pointed out to-day in the trade. Aside from such speculations, there has been little to record. A few leading numbers in the list of old materials have softened and have diminished the spread between their high and low, but, on the whole, prices have been well maintained. Though the actual market for old carwheels remains where it was last week, some small lots have been sold on a basis of $45 a ton delivered. Prices per gross ton delivered in Eastern Pennsylvania territory range about thus:

No. 1 heavy melting steel	$40.00 to $41.00
Old steel rails, rerolling	50.00 to 55.00
Low phosphorus heavy melting	55.00 to 58.00
Old iron rails	52.00 to 55.00
Old carwheels	38.00 to 40.00
No. 1 railroad wrought	55.00 to 57.00
No. 1 forge fire	26.00 to 28.00
Bundled sheets	26.00 to 28.00
No. 2 bushelings	18.00 to 20.00
Machine shop turnings	26.00 to 28.00
Cast borings	27.00 to 29.00
No. 1 cast	37.50 to 40.00
Grate bars, railroad	22.00 to 25.00
Stove plate	22.00 to 25.00
Railroad malleable	32.50 to 35.00
Wrought iron and soft steel pipe (new specifications)	38.00 to 40.00

Iron and Steel Bars.—Strong inquiry in both iron and steel bars is reported, and there is more than enough business to go around. Prices are maintained at 4½c., Pittsburgh, for steel bars, whether soft bars or reinforcing, with 4½c. to 5c., Pittsburgh, being asked by various makers of bar iron, with deliveries at mill convenience. On the basis of steel bars being worth 4½c., a local office has quoted standard spikes, in small lots, at 5½c., Pittsburgh, and taken orders for September delivery.

Sheets.—With nothing to sell, producers in this district are quoting a genuinely nominal price of 8½c. base Pittsburgh for No. 10 blue annealed. Government requirements have taken a considerable proportion of this district's output and will take more.

Plates.—As in the case of structural materials, Government specifications are becoming more numerous and are absorbing a larger proportion of mill output. This situation is beginning to interfere with deliveries of plates to private customers. Almost simultaneously with the announcement of the embargo on the shipment of steel plates, export inquiries were received here to the extent of 33,000 tons, the largest block being 25,000 tons and the smallest 3,000. Minimum prices remain unchanged—10c. base Pittsburgh for tank and 12½c. for boat steel, with shipment at mill convenience. This means a minimum of 10 or even 12 months after orders are placed. Mills are running close to 100 per cent output and are making every effort to maintain maximum production, but they are finding rapid increases in cost, owing to the higher price of labor and raw materials.

Cleveland

CLEVELAND, July 10.

Iron Ore.—The movement of ore boats is being very seriously hampered by the congestion at the lower Lake docks, and the situation is made worse by the car shortage that adds to the delay in unloading. Some ore boats have been kept in Lake Erie ports five or six days awaiting their turn to unload and some now at the Cleveland docks will be tied up as long unless the car supply improves. During June 7,512,087 gross tons of ore was received at Lake Erie ports as compared with 4,095,973 tons for the previous month and 7,758,276 tons for June, 1916. Shipments to furnaces for June were 5,580,964 tons, an increase of 1,589,041 tons over the amount forwarded during May. The balance on docks July 1 was 4,828,523 tons, an increase of 707,218 tons over the amount of ore on docks June 1. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, $5.95; Mesaba Bessemer, $5.70; old range non-Bessemer, $5.20; Mesaba non-Bessemer, $5.05.

Pig Iron.—The market in this territory has quieted down materially. Some consumers are deferring purchases because of possible action by the Government in regulating prices. However, there is still a fair volume of inquiry, much of this being from brokers and from Eastern consumers. One important Lake furnace interest has advanced its price on foundry iron $2 a ton to $58 for No. 2, at which it has made several small lot sales and has quoted as high as $60. A sale of foundry iron is reported at $54 by a Valley furnace for the fourth quarter delivery, but Valley quotations generally range from $55 to $58. The only inquiry pending for steel making iron is one for 15,000 tons from the Pittsburgh district for the first half of next year. Southern iron prices are unchanged and the market is not active. We note the sale of several small lots for the first half delivery at $45 Birmingham for No. 2 and some producers are asking $50. Ohio silvery iron has sold at $87 for early shipment or an advance of $2. This price is being quoted for delivery this year and during the first half. We quote f.o.b. Cleveland, as follows:

Bessemer	$57.95 to $58.95
Basic	52.30 to 55.30
Northern No. 2 foundry	55.30 to 58.30
Southern No. 2 foundry	49.00 to 54.00
Gray forge	50.95 to 52.95
Ohio silvery, 8 per cent silicon	88.62
Standard low phos., Valley furnace	83.00 to 85.00

Coke.—Several prompt shipment sales of foundry coke are reported at $14 per net ton at oven for standard Connellsville makes and we note the sale of 800 tons at that price for delivery over a period of four months. Generally no prices are being named except for prompt shipment.

Finished Iron and Steel.—New inquiry in finished lines is not active and is confined largely to miscellaneous small lots of steel, much of which is required for Government work. Fairly heavy orders are being placed for motor truck requirements. The demand for plates continues heavy. Sales of tank plates have been made by Cleveland mills at 11c. Pittsburgh, for delivery in about ninety days, and quotations range from 10c. to 12c. The sheet market is very firm and the demand for black and blue annealed sheets is heavy, although some manufacturers and jobbers are holding off because of the possibility of price regulation. Considerable inquiry is coming out for sheets for Government requirements. Among these is one for 1000 tons of black sheets for early shipment for camp ranges. Black and blue annealed sheets are now on about the same basis,

the general quotation being 8.75c. to 9c. Pittsburgh for No. 28 black and No. 10 blue annealed. We quote galvanized sheets at 10.50c. to 11c. for No. 28. Cleveland mills have advanced the price of bar iron to 5c. Hard steel bars are quoted at 4c. to 4.50c. Small spikes for which there is an active demand from coal mining companies are scarce and are quoted as high as 6c. to 7c. per lb. Warehouse business is fairly heavy, but stocks are badly depleted. Warehouse prices are unchanged at 5c. for steel bars, 5.25c. for structural material, 9c. for plates and 9c. for blue annealed sheets.

Bolts, Nuts and Rivets.—The price the Government will pay for bolts, nuts and rivets required for boats and other work is still unsettled. A committee of the Bolt, Nut and Rivet Institute has been appointed to confer with the Government authorities and it is expected that this committee will be called to Washington this week for conference in regard both to prices and the distribution of orders among various manufacturers with the view of securing for the Government the best deliveries. The demand for bolts and nuts continues heavy, considerable business coming from wagon builders and other manufacturers having Government orders. We quote rivets at 5.25c., Pittsburgh, for structural and 5.35c. for boiler rivets. Present bolt and nut quotations do not represent minimum prices but those for the general run of orders. Buyers of round lots are allowed 5 to 10 per cent discount from the regular discounts which are as follows:

Common carriage bolts, ⅝ x 6 in., smaller or shorter, rolled thread, 35 off; cut thread, 30 and 5; larger or longer, 20. Machine bolts, with h. p. nuts, ⅝ x 4 in., smaller or shorter, rolled thread, 40; cut thread, 35; larger and longer, 25. Lag bolts, cone point, 40. Square h. p. nuts, blank, $1.90 off list; tapped, $1.70 off list. Hexagon, h. p. nuts, blank, $1.70 off; tapped, $1.50 off. C. p. c. and t. hexagon nuts, all sizes blank, $1.25 off; tapped, $1 off. Cold pressed semi-finished hexagon nuts, 50 and 5 off.

Old Material.—The market is weak and prices on several grades have declined during the week. The sharpest slump is in heavy melting steel which is $3 to $4 per ton lower than a week ago. Boring and turnings are $1 per ton lower. Fear that the Government will interfere and regulate scrap prices is still having its effect upon the market and some dealers look for still lower prices. There is a moderate amount of trading, largely in material on cars. With the uncertainty of the price situation some dealers are unwilling to buy or sell at present unless they can close both ends of the transaction and thus avoid the danger of a loss by price fluctuations. Cast scrap is firm and in good demand. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton

Steel rails	$38.00 to $39.00
Steel rails, rerolling	48.00 to 50.00
Steel rails, under 3 ft.	46.00 to 47.00
Iron rails	48.00 to 50.00
Steel car axles	55.00 to 57.50
Heavy melting steel	39.00 to 40.00
Carwheels	38.00 to 39.00
Relaying rails, 50 lb. and over	50.00 to 55.00
Agricultural malleable	29.00 to 31.00
Railroad malleable	42.00 to 44.00
Light bundled sheet scrap	24.00 to 25.00

Per Net Ton

Iron car axles	$55.00 to $60.00
Cast borings	19.50 to 20.50
Iron and steel turnings and drillings	18.50 to 19.50
No. 1 busheling (nominal)	30.00 to 32.00
No. 1 railroad wrought	44.00 to 45.00
No. 1 cast	33.00 to 35.00
Railroad grate bars	22.50 to 23.50
Stove plate	21.00 to 22.00

Cincinnati

CINCINNATI, July 10—(*By Wire*).

Pig Iron.—There is a reluctance on the part of melters to take hold at the present time, and as a consequence new business is very light. Most consumers of foundry iron have this year's requirements provided for and a comparatively large number have bought at least part of their wants for the first half of next year. The furnaces and their selling agents are not making any effort to force the issue and are content to let the market slip along quietly, with only small orders being placed. The largest sale reported is for 1500 tons of Southern foundry iron for a Michigan melter. Another firm in the State bought 500 tons of Virginia iron, both for first half shipment. A Virginia producer offered yesterday to take on a limited tonnage of foundry iron for first half shipment at $50 furnace, and today advanced its price to $52.50. A wide range of prices exists in the South, but for spot shipment $47, Birmingham basis, is considered minimum. For last quarter and first half shipment, from $46 to $50 is quoted. It is reported from a reliable source that one Southern maker offered and sold some iron in this and the Chicago districts at $45, Birmingham, for first half shipment. The high silicon irons continue to command fancy prices. Last week one car of 15 per cent Bessemer ferrosilicon brought $125 at furnace for nearby shipment. The Ohio silvery irons range from $85 to $90 furnace based on an 8 per cent analysis. Northern iron is fast becoming an unknown quantity for prompt shipment, and for this year. Furnace iron has disappeared with only a little resale iron obtainable around $55 to $56, Ironton, which are the figures quoted for first-half movement. A number of inquiries have come to light for the last half of next year, but are understood merely to be feelers for expressions as to the future. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, as follows:

Southern coke, No. 1 f'dry and 1 soft.	$51.40 to $52.40
Southern coke, No. 2 f'dry and 2 soft.	49.90 to 51.90
Southern coke, No. 3 foundry	50.40 to 51.40
Southern coke, No. 4 foundry	50.00 to 51.00
Southern gray forge	48.90 to 49.90
Ohio silvery, 8 per cent silicon	86.26 to 91.26
Southern Ohio coke, No. 1	56.26 to 57.26
Southern Ohio coke, No. 2	56.26 to 57.26
Southern Ohio coke, No. 3	55.26 to 56.26
Southern Ohio malleable Bessemer	56.26 to 57.26
Basic, Northern	56.26 to 57.26
Lake Superior charcoal	56.75 to 57.75
Southern carwheel foundry	48.90 to 49.90

Finished Material.—Both steel and iron bars have advanced to 5c. base, and twisted steel bars are quoted by jobbers at 5.05c. Structural shapes are now quoted at 5.25c., and ¼-in. plates and heavier, 9½c. Cold rolled shafting, list price plus 15 per cent; rivets, ½ in. and larger, with round heads, 5.50c. base; with cone heads, 5.60c. The smaller sized rivets are quoted in keg lots at 15 per cent off list. Machine bolts, ⅜ x 4 in. and smaller, are unchanged at 45 per cent discount; larger and longer, 30 per cent discount; files, 50 per cent discount; hack saw blades, 10 per cent discount, and hand taps at 50 and 7½ per cent discount. We quote No. 28 galvanized sheets at 10.15c. Cincinnati or Newport, Ky., and No. 28 black sheets at 8.15c., but these figures are only nominal.

Old Material.—The market has developed a surprising weakness, and nearly every grade of iron has been reduced all the way from 50c. to $2 a ton. The rolling mills have curtailed their purchases, and the foundries are also indifferent about buying at present values, and the majority of them are simply taking scrap as needed. The incoming supply has increased so that yard stocks are now piling up at a slow but steady rate. The following are dealers' prices, f.o.b., at yards, southern Ohio and Cincinnati.

Per Gross Ton

Bundled sheet scrap	$22.50 to $23.00
Old iron rails	39.00 to 39.50
Relaying rails, 50 lb. and up	45.50 to 46.00
Rerolling steel rails	40.50 to 41.00
Heavy melting steel scrap	38.00 to 38.50
Steel rails for melting	38.00 to 38.50
Old carwheels	35.00 to 35.50

Per Net Ton

No. 1 railroad wrought	$38.00 to $38.50
Cast borings	13.00 to 13.50
Steel turnings	13.00 to 13.50
Railroad cast	27.00 to 27.50
No. 1 machinery cast	27.50 to 28.00
Burnt scrap	17.00 to 17.50
Iron axles	47.50 to 48.00
Locomotive tires (smooth inside)	40.50 to 41.00
Pipes and flues	21.50 to 22.00
Malleable cast	26.50 to 27.00
Railroad tank and sheet	19.00 to 19.50

(*By Mail*)

Coke.—Unheard of prices have been obtained for spot foundry coke in the Connellsville field. Right now this appears to be the only producing district that can take on any spot business. Last week some 72-hr. coke brought $16.50 per net ton at oven, although this by no means represents contract prices. Contract figures are unchanged around $11 to $13, representing the very wide difference of opinion on the part of producers. Pocahontas and Wise County contract fig-

ures are about on the same level, although some Wise County 72-hr. coke might be bought for future delivery around $10 to $10.50. Furnace coke is at a standstill, although getting forward shipments as fast as needed has proved an exasperating experience in more than one instance. From $9 to $11 is quoted on contract business.

Birmingham

BIRMINGHAM, ALA., July 10—(*By Wire*).—Apparently the lowest price obtainable on 1918 pig iron is $45, furnace, with sales made at $46 and a disposition to go higher. Fifty dollars is common on spot iron and $51 and $52 have been paid. Some sales of last half of 1918 iron have been made at $48 by one concern. Furnace interests are well sold into first quarter of 1918 and several are out of that market as well as 1917.

(*By Mail*)

The first week in July closed with 1918 iron firmer at the minimum of $45 and some sales made at prices above that. The leading interest was quoting a minimum of $45, and it is known that sales were made during the week at $45 and $46. A last quarter lot of iron brought $50. The leading seller of foundry iron, which had been selling at $45 for some time, withdrew from the market for first half of 1918 on July 6 and announced a quotation of $48 for the last half of 1918. The retiring of such a large interest for such a period featured the week. Other foundry iron makers were quoting a minimum of $45 for 1918, and one maker sold a lot of 500 to 700 tons for first quarter of 1918 at $48. This iron in analysis approached No. 1 soft. One company of considerable importance reports having booked about all it cares to for the first quarter of 1918. Furnaces are no longer interested in 1917 business, and have nearly all marked up to $50 for the rest of this year. So far as can be ascertained, not a sale of spot was made during the week under $50. Reliable brokers who handle this business say prices obtained were $50, $51 and $52. Furnace operators are not forcing the rises; indeed, some are looking ahead to a possibility of inability on the part of the consumer to take the iron if it goes much higher. The total volume of business done for 1918 very well covers first quarter output. Sloss-Sheffield has two stacks on basic for the allies, and will finish that contract in the early fall, it is understood. Talladega furnace is understood to be nearing the operating point. Trussville may not come in until September. Repairs on Vanderbilt furnace are being rushed by the Woodward Iron Co. The output continues to break records month by month. We quote per gross ton f.o.b Birmingham district furnaces for prompt delivery as follows:

No. 1 foundry and soft	$50.50 to $51.50
No. 2 foundry and soft	50.00 to 51.00
No. 3 foundry	49.50 to 50.50
No. 4 foundry	49.25 to 50.25
Gray forge	49.00 to 50.00
Basic	50.00 to 51.00
Charcoal	55.00 to 56.00

Steel Bars.—Steel bars in car lots, f.o.b. Birmingham, 4.50c. to 4.75c.; iron bars, 4.30c. to 4.40c.

Cast-Iron Pipe.—Pipe for cantonments at Columbia, S. C., Louisville, Fort Sam Houston, Tex., and other points, leaves Birmingham from different shops almost daily. Orders from the trade at large are scattering. Those that come are placed at the quoted prices. We quote, per net ton, f.o.b. Birmingham pipe shop yards, as follows: 4 in., $63; 6 in. and upwards, $60, with $1 added for gas pipe and extra lengths.

Coal and Coke.—Coal and coke operators are concerned with delivery only, maximum prices maintaining as a rule. Both industries are busy and highly prosperous. Standard beehive foundry coke sells at $14 to $15. Blacksmithing coal brings $6.

Old Material.—The scrap market has rallied from the wild spurt which was caused by a tremendous demand from the East, and has settled down to a much quieter market, although the general tone is strong enough to maintain the present price schedule. Some transactions are made below the following quotations by 50c. to $1, but, as a rule, they hold. We quote per gross ton f.o.b. Birmingham dealers' yards as follows:

Old steel axles	$50.00 to $55.00
Old steel rails	37.00 to 40.00
No. 1 wrought	35.00 to 40.00
No. 1 heavy melting steel	25.00 to 27.00
No. 1 machinery cast	27.00 to 28.00
Carwheels	27.00 to 29.00
Tram carwheels	25.00 to 30.00
Stove plate and light	19.00 to 20.00
Turnings	13.00 to 14.00

Buffalo

BUFFALO, July 10.

Pig Iron.—Most of the furnaces of the district are out of the market for 1917 business, and will not take even carload lot orders for this year's delivery. Inquiry for 1918 is not active at present, and some furnaces are not quoting on their next year's production, but are planning to await developments for the next two or three months. Prices are very firm, and have an advancing tendency. Such tonnages as are quoted on for next year are $53.00 to $55.00, for No. 2 X foundry, with other grades in proportion, according to silicon content, and for this year's delivery, wherever any quotations can be brought to light, the price range is $55.00 to $58.00, according to grade, and the views of the seller. As intimated above, very little tonnage of any grade is procurable from the furnaces of the district for 1917 delivery, even at this high range in price. For 1918 iron, first half delivery, we quote as follows, f.o.b. furnace, Buffalo:

High silicon irons	$54.00 to $56.00
No. 1 foundry	53.00 to 55.00
No. 2 X foundry	52.00 to 54.00
No. 2 plain	51.00 to 52.00
No. 3 foundry	50.00 to 51.00
Gray forge	50.00 to 51.00
Malleable	53.00 to 55.00
Basic	53.00 to 55.00
Lake Superior charcoal, f.o.b. Buffalo	55.00 to 60.00

Finished Iron and Steel.—The market is practically at a standstill as regards closing of transactions, because of the mills declining to entertain further sales until they know more clearly just what the Government demands are going to be, and buyers are not inclined to submit new orders. Pressure for steel already ordered is, however, becoming more urgent. The mills are converting more and more of their tonnage to Government work. Everything in the way of tin plate is in active demand. Standard railroad spikes are in strong demand, and prices have advanced, with prospect of still further advance in the immediate future. The Ferguson Steel & Iron Co., Buffalo, has the contract for 125 tons of structural steel for the construction of an engine house and signal tower for the New York Central Railroad Co., at its Gardenville yards.

Old Material.—The market has been quiet during the past week, with a let-up in buying in almost all lines, particularly in heavy melting steel on the part of the larger consumers. For heavy axle turnings, however, increased demand is shown, and the price for this commodity has advanced, now being held at $28.00 to $29.00 per ton. Trading in the other commodities on the list has been very light, compared with business done during the past two or three weeks. The placing of the embargo by the United States against the exportation of scrap has had a restraining effect on dealings, and the definite results of this action by the Government are being waited for by dealers. We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$38.00 to $39.00
Low phosphorus	55.00 to 60.00
No. 1 railroad wrought	50.00 to 55.00
No. 1 railroad and machinery cast	32.00 to 33.00
Iron axles	55.00 to 60.00
Steel axles	55.00 to 60.00
Carwheels	38.00 to 40.00
Railroad malleable	35.00 to 36.00
Machine shop turnings	21.00 to 22.00
Heavy axle turnings	28.00 to 29.00
Clean cast borings	21.00 to 22.00
Iron rails	45.00 to 46.00
Locomotive grate bars	23.00 to 24.00
Stove plate	23.00 to 24.00
Wrought pipe	35.00 to 36.00
No. 1 busheling scrap	33.00 to 34.00
No. 2 busheling scrap	21.00 to 22.00
Bundled sheet stamping scrap	22.00 to 23.00

British Steel Market

Ferromanganese Strong—Tin Plates Higher—Pig-Iron Supplies Increase

LONDON, ENGLAND, July 11.—(*By Cable.*)

Supplies of Cleveland pig iron are increasing, but the market is quiet. Hematite iron is strong. Semi-finished steel is idle and nominal. Wire rods are quoted nominally at £30 c.i.f. Tin plates are firm at 35s. 6d., basis. Ferromanganese is strong, with $400 paid for delivery in the United States c.i.f. fourth quarter. We quote as follows:

Tin plates, coke 14 x 20; 112 sheets, 108 lb., f.o.b. Wales, 35s. 6d. against 35s. last week.
Black sheets, £21 5s.
Ferromanganese, £45 nominal.
Ferrosilicon, 50 per cent, c.i.f., £35 upward.

Benzol is quoted at 14d. as against 13d. per gallon a month ago. Toluol is unchanged at 2s. 3d. and ammonium sulphate is still nominal.

Scarcity of Ferromanganese and Tin Plates—Pig Iron Firmer and Higher

LONDON, ENGLAND, June 19.—(*By Mail*).

Intense pressure to fill national requirements is the dominant factor. Demand for steel is an ever increasing one, and as this is expected to continue indefinitely it threatens to become more acute. A close control is kept over the allocation of material. The heavy demands incidental to the speeding up of the shipbuilding program constitute an additional factor of importance. Little or nothing is heard of general merchant business, which has been wiped out of existence. The steel market is faced with many difficulties, including troublesome labor, with far more orders to execute than can be filled.

The tendency in pig iron has been firmer, as indicated by the recent sanction of an advance of 5s. a ton in the price of common South Staffordshire material. Adjustments may possibly ensue in other maximum prices on the applications made because of increased costs. Due to the increased output of Cleveland foundry material there has been a further extension of the allocations this month to home consumers who are now comfortably situated, but the pressure of demand for East Coast hematite cannot be met fully, although there has been some improvement in the output of steel-making irons in other districts. Export business in hematite is restrained. There is a full supply of forge iron available and export business in this could easily be larger, given tonnage facilities.

Semi-finished steel is unchanged. But little surplus is to be had after the heavy Government requirements are filled. American billets are not being offered, and the market for semi-finished material is nominal. Wire rods are wanted at about £28, c.i.f. Liverpool, but very little is obtainable and pounds over that figure are asked, terms being subject to freight, which is very scarce.

In the finished steel accumulation of orders is as great as ever, and makers have but little room for new business, while heavy deliveries are being made against current Government contracts. Scotch works are busier in view of the large requirements of shipbuilders.

Tin Plates and Ferromanganese Scarce

Black sheets are quiet, works being well booked. The galvanized sheet trade remains absolutely paralyzed, due to the prohibition. Demand for tin plates is incessant, but business has become more and more circumscribed through the growing scarcity of offers of all kinds of plates. As already cabled, a census of all stocks has been ordered, suggesting a more rigid control enforced over the supplies, available and suitable for war work. A lot of Government business is waiting to be placed, and prices are tending upward strongly to about 35s. per basis box f. o. b. for war work. There is still inquiry for oil plates, but makers are fully booked and there is little stock to be had. The Welsh output is now about 15 to 20 per cent of the normal, and there is no sign of relief in raw material.

It is utterly impossible to obtain reliable f. o. b. quotations for ferromanganese, the market being quite at sea and nominal. Demand continues unabated, but sellers are rare and asking much stiffer terms. Some business has been done for the first quarter of 1918 at $325 to $350 c. i. f. for American port, and at about £65 f. o. b. for a Mediterranean port. Indian manganese ores are wanted at full prices, but the fixing up of freight is more difficult.

St. Louis

ST. LOUIS, July 9.

Pig Iron.—Although there has been no cessation of the upward tendency in pig iron, particularly Southern brands, in this market there has been a very definite disposition on the part of melters to make purchases. However, they have been largely prevented by the fact that very few furnaces represented in this territory are willing to take on any business, partly on account of various uncertainties, but chiefly because of their sold-up condition well into next year and an indisposition to tie themselves up to contracts beyond the first half of 1918 and not all of their capacity for that period. While No. 2 Southern foundry iron is valued at $48, no quotation at that figure can be made and some furnaces represented here have informed their agents that they want at least $55, Birmingham, for the remainder of their output for the first half of 1917. Most of the furnaces are entirely out of the market. The sales during the week were chiefly in small lots ranging from 300 tons down with the exception of one sale of 1000 tons of malleable and one reported sale of 15,000 tons of basic for December and first half delivery at $50, Birmingham, confirmation of which was not acknowledged, though no positive denial was forthcoming. Outside of the special transactions noted, the sales for the week may have aggregated 2000 tons, all as the result of negotiations, no widespread inquiries being put on the market these days.

Coke.—No contract coke, either 48-hr. or 72-hr., is available in this market and the ovens are holding to the high spot prices of $16 to $18, Connellsville, and some small sales have been made at those figures. No by-product coke is to be had and the situation is becoming crucial for some melters who cannot get what their needs require, even though they are willing to take their coke in open cars.

Finished Iron and Steel.—There is literally no market in finished products at this point, as mill representatives are refusing to take business and are, in addition, deferring deliveries because of the Government needs, which are given precedence, of course. Two railroads are feeling out the steel rail situation, one for a small lot for early delivery and another lot for 1919 of about 30,000 tons, while the second is for 1919 delivery of about 20,000. So far as can be learned here, they are receiving very little encouragement. Movement out of warehouse continues up to the ability of the warehouses to meet the demand, which is as a matter of fact excess of stocks on hand or available from shipments. We quote for stock out of warehouse as follows: Soft steel bars, 4.55c.; iron bars, 4.50c.; structural material, 5.05c.; tank plates, 8.05c.; Nos. 8 and 10 blue annealed sheets, 9.55c., these gages having been coupled in the quotations; No. 28 black sheets, cold rolled, one pass, 9.85c.; No. 28 galvanized sheets, black sheet gage, 11.25c.

Old Material.—In the scrap market, it continues to be anybody's guess both as to present prices and as to what the market is going to do next. Dealers are afraid to play the market either way and are doing only such business as is required by the status of their contracts on hand. While it is recognized that supplies are short and that there is little hope of any increase from railroad loading or other sources, at the same time there is a weakening tendency apparent due of course to the actual inactivity and the normal tendency to reduce prices when there are no transactions being made. No lists have been put out during the past week and altogether the market is a most treacherous one with no

definite justification for a prediction of a movement in either direction. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows, with the reservation that transactions are strictly upon the buyers' and sellers' needs at the moment rather than upon any market figures that might be given:

Per Gross Ton

Old iron rails	$44.00 to $45.00
Old steel rails, re-rolling	45.00 to 45.50
Old steel rails, less than 3 ft.	39.00 to 40.00
Relaying rails, standard section, subject to inspection	50.00 to 51.00
Old carwheels	34.00 to 34.50
No. 1 railroad heavy melting steel scrap	38.00 to 38.50
Heavy shoveling steel	34.00 to 34.50
Ordinary shoveling steel	32.50 to 33.00
Frogs, switches and guards cut apart	39.00 to 39.50
Ordinary bundled sheet scrap	19.50 to 20.00
Heavy axle and tire turnings	21.00 to 22.00

Per Net Ton

Iron angle bars	$36.00 to $37.00
Steel angle bars	35.50 to 36.00
Iron car axles	50.00 to 51.00
Steel car axles	48.00 to 48.50
Wrought arch bars and transoms	41.00 to 41.50
No. 1 railroad wrought	39.00 to 40.00
No. 2 railroad wrought	37.00 to 38.00
Railroad springs	33.00 to 34.00
Steel couplers and knuckles	35.00 to 36.00
Locomotive tires, smooth inside, 42 in. and over	45.00 to 46.00
No. 1 dealers' forge	33.00 to 34.00
Cast iron borings	17.50 to 18.00
No. 1 busheling	27.00 to 27.50
No. 1 boilers cut to sheets and rings	23.00 to 23.50
No. 1 railroad cast scrap	28.00 to 29.00
Stove plate and light cast scrap	18.00 to 18.50
Railroad malleable	31.00 to 31.50
Agricultural malleable	25.00 to 26.00
Pipes and flues	25.00 to 25.50
Heavy railroad sheet and tank scrap	24.00 to 24.50
Railroad grate bars	20.00 to 20.50
Machine shop turnings	19.50 to 20.00
Country mixed scrap	16.50 to 17.00

New York

NEW YORK, July 10.

Pig Iron.—A lull has come in the pig iron market, at least so far as any large tonnages for domestic melting are concerned, but prices are firm and in some cases advances have been announced. The Virginia Iron, Coal & Coke Co., whose price Monday was $50, furnace, for No. 2 foundry for the first half of next year, advanced Tuesday to $52.50. Another illustration of advancing prices was furnished by one of the Buffalo companies, whose price to July 7 was $53, furnace, on No. 2X for next year's delivery, but the company has now advanced to $55 for the first quarter of next year, although continuing to sell at $53 for the second quarter. For eastern Pennsylvania iron, at least one company has advanced to $54, furnace, for this year and to $53 for next year. The largest new domestic inquiry is for 2000 to 2500 tons of low phosphorus for the American Locomotive Co. for the last half of this year. A number of inquiries for from 200 to 500 tons of foundry iron have appeared. The largest inquiry for export is for 500 tons per month for the last quarter of this year and the first half of next year. This is for high silicon iron ranging from 14 to 17 per cent, and there is also an inquiry for 300 to 500 tons of 50 per cent ferrosilicon. It is doubtful whether this iron can be obtained for export. Keen interest is being manifested by exporters in the order of the President prohibiting the exporting of pig iron except by special permission. These permits must be obtained not by the sellers, but by those who are actually doing the exporting. We quote tidewater for delivery as follows:

No. 1 foundry	$54.25 to $55.25
No. 2 X	53.75 to 54.75
No. 2 plain	53.25 to 54.25
Southern No. 1 foundry	54.75
Southern No. 2 foundry and soft	54.25

Structural Material.—Government business continues to monopolize the attention of fabricators almost to the exclusion of all other projects. An illustration is the building of the new public library at Philadelphia. Owing to some hitch in the original bids for the steel for this building, involving a considerable tonnage, it has been necessary to readvertise and it is stated that it will be almost impossible to obtain this steel because fabricators are inclined to give consideration at present to Government work only. Bids have been asked on 2400 tons for the new Government projectile plant at Charleston, W. Va., and inquiries are out for 1200 tons for the new Park Avenue viaduct, which is to run from Fortieth Street northward around the Grand Central Station, New York. Apparently it will be difficult to obtain the steel for this viaduct. Bids have been opened on the 600 or 700 tons required for extension to the Bancroft and Isherwood halls at the Naval Academy at Annapolis, J. Henry Miller at Baltimore being the low bidder for the former and another Baltimore contractor the low bidder for the latter, but no awards have yet been made. It is stated that dormitories at West Point will also have their capacity doubled in a similar manner. The Pennsylvania Railroad is inquiring again for 500 tons for various bridge work and the Southern Railway has placed a small bridge with the Bethlehem Bridge Co., calling for 100 tons. The American Bridge Co. has taken 500 tons for a station for the Brooklyn subway, while the Brier Hill Steel Co. has taken 100 tons for the Boyertown Casket Co., Boyertown, Pa. The National Sugar Refining Co. is reported as asking for 800 tons for plant extension at Yonkers and the American Smelting & Refining Co. is stated to be placing several orders of 100 to 200 tons each for different plant extensions. No decision is yet reported on the 3800 tons for Culver Rapid Transit Line in Brooklyn, on which the Public Service Commission expects to make a decision very soon. We quote plain material from mill at 4.669c. to 5.169c., New York, the lower price in three to four months and the higher for small lots in earlier deliveries. Shipments from warehouses are 5.25c. per pound, New York.

Ferroalloys.—Inquiry for ferromanganese for delivery next year is reported to be in fairly large volume and it is expected to be still larger in the near future. For delivery this year inquiry is very meager and sales for any position have been few in the last week. Consumers seem to be pretty well cared for by contracts and disinclined to make purchases under present conditions unless absolutely necessary. The spot market for domestic alloy is generally quoted as $400 to $425, delivered, with the last quarter at about $375. For the first half of next year $350 is being quoted. The fact that manganese ore imports in May are officially reported as 81,269 tons, next to the largest importation in the last 18 months, and also the fact that the production of ferromanganese in the United States in June will approximate 21,000 tons, according to the blast furnace reports of THE IRON AGE, are decidedly encouraging signs as to the future supply of this important product. Two new domestic producers of ferromanganese have appeared as active makers in the last month, one in the Buffalo district and another in New Jersey, and it is stated that a furnace in Virginia will be producing ferromanganese Aug. 1. The spiegeleisen market is very quiet with $85, furnace, quoted for any delivery this year. Excellent inquiry for 50 per cent ferrosilicon has appeared, and some good sales are reported for next year's delivery at $130. Material desired for this year's delivery is quoted at about $200 to $225, delivered.

Iron and Steel Bars.—Most of the larger mills still decline to quote on hard and soft steel bars. Bar iron is now being temporarily substituted for some of the purposes for which the steel bars are ordinarily used. Bar iron is being quoted by a leading producer at 4.75c., Pittsburgh, but small lots can be had from other sellers for 4.40c. to 4.50c. Several leading small arms and ammunition manufacturers have opened a joint purchasing office at 50 East Forty-second Street, New York, where, it is understood, all the steel for these plants will be purchased under Government supervision. Another allotment of shell steel for Government purposes is expected to be announced soon by the special committee of the American Iron and Steel Institute. We quote steel bars in mill shipments at 4.50c. to 5.50c. Pittsburgh, or 4.669c. to 5.669c. New York, and bar iron at 4.669c. to 5.169c., New York. From New York district warehouses bar iron is sold at 4.75c. and steel bars at 4.75c. to 5.50c.

Plates.—Business in plates is virtually at a stand-

still. Some small tonnages have been placed during the past week, but there are no large inquiries in the market aside from the Japanese shipbuilding concerns, which are still making offers higher than domestic consumers seem willing to pay. It is estimated that from 75 to 90 per cent of the business in plates during the past few weeks has been for export to Japan. Mills are receiving requisitions from the Government for ship plates to be sent to navy and merchant marine shipbuilding yards. There are inquiries in the market for shipment of tank plates to Russia, but difficulties are being encountered in obtaining the tonnage required. On mill shipments of universal and tank plates the price is 10.169c., New York, and ship plates, 12.169c., New York. Plates out of store are 9c. to 10c., New York.

Cast Iron Pipe.—The placing of orders by private buyers continues at a very satisfactory rate, but municipalities are not coming into the market and orders for the Government cantonments are not developing rapidly. Some pipe has been shipped to the cantonment at Ayer, Mass., but none has yet been furnished for the Long Island cantonment. Carload lots of 6-in. to 8-in. and heavier are now quoted at $65.50 per net ton, tidewater, and 4-in., $68.50.

Old Material.—The sagging in the scrap market, noted last week, has become much more pronounced so far as heavy melting steel is concerned and cast borings and turnings are also weak. The mills in the Pittsburgh district, Ohio and eastern Pennsylvania are all out of the market and things are at a standstill. Quotations have been marked down at least $3 to $4 per ton on most grades. Embargoes have been declared against Monessen and Lebanon and very little scrap is being shipped. The present condition is generally attributed to the attitude of the Government. It will not be surprising if an upward turn should come at a not far distant day. Brokers quote buying prices as follows to local dealers and producers, per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$35.00 to $36.00
Old steel rails (short lengths) or equivalent heavy steel scrap	36.00 to 37.00
Relaying rails	65.00 to 70.00
Rerolling rails	45.00 to 46.00
Iron and steel car axles	52.00 to 53.00
No. 1 railroad wrought	49.00 to 50.00
Wrought-iron track scrap	45.00 to 46.00
No. 1 yard wrought long	42.00 to 43.00
Light iron	14.00 to 15.00
Cast borings (clean)	21.00 to 22.00
Machine-shop turnings	21.00 to 22.00
Mixed borings and turnings	20.00 to 21.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long)	34.00 to 35.00

In spite of the weakness in steel scrap, the foundry market is being well maintained and machinery cast is strong. There has been a little better activity in stove plate, but prices have receded about $1 per ton. Locomotive grate bars are not so strong. Dealers in New York City and Brooklyn are quoting as follows to local foundries per gross ton:

No. 1 machinery cast	$36.00 to 37.00
No. 1 heavy cast (column, building material, etc.)	34.00 to 35.00
No. 2 cast (radiators, cast boilers, etc.)	29.00 to 30.00
Stove plate	20.00 to 21.00
Locomotive grate bars	20.00 to 21.00
Old carwheels	35.00 to 36.00
Malleable cast (railroad)	36.00 to 38.00

Ten in Operation

CHICAGO (*By Wire*).—The second furnace of the four new stacks which the Illinois Steel Co. is adding to its Gary works was blown in last week, making 10 furnaces now in operation at Gary. Two more are to be completed.

The La Crosse Tractor Co., La Crosse, Wis., has announced a bonus of 10 per cent of wages earned to all employees who continue steadily in the company's employ until Nov. 1. Provision is made for pro rata payments to employees who may be conscripted. The company is adding to its working force and has recently sent a demonstrator as instructor in France and England to train men to operate tractors which have been sold in those countries.

Navy Can Build 32 Ships at a Time

The United States Navy shipyards have recently been buying large quantities of equipment, which Secretary of the Navy Daniels now announces will provide facilities for the construction of 32 warships at a time. Secretary Daniels said:

"With the shipways now being built or projected, the United States Navy yards will be able to have in course of construction on the ways at one time 16 war vessels, in addition to submarines and submarine chasers. Seven of the vessels could be battleships, two auxiliaries, such as transport, fuel ships, hospital ships, etc., and seven destroyers. Should the needs of the nation require battle cruisers, instead of battleships, it would be possible to substitute them on the longer slips for an equal number of battleships. As much work must be done on the vessels before the keels are laid and after launching, there could be under construction at one time in the yards at least double the number of vessels for which slips are available. This construction work is in addition to the repair work and rebuilding of the fleet which must be carried on."

Secretary Daniels announces that there are now under construction in Government yards three battleships, four destroyers and a number of submarines and submarine chasers. All work at navy yards is being rushed, the men working overtime and in shifts and bonuses are being offered for the completion of work ahead of schedule.

New Plant for Pittsburgh Steel Products Co.

The Pittsburgh Steel Products Co., Frick Building, Pittsburgh, which has a large plant at Monessen for the manufacture of seamless steel tubes, plans to build new works at Allenport, on the opposite side of the Monongahela River from Monessen, where it owns a site of about 300 acres. The extent of the new plant has not been determined, but it will probably be larger than that at Monessen. The Pittsburgh Steel Products Co. was formerly known as the Seamless Steel Tube Co. of America. The plant at Monessen turns out all sizes of seamless steel tubes from 1 in. to about 6 in. in diameter, the capacity being about 60,000 tons per year. The Pittsburgh Steel Company, which has blast furnaces, open hearth steel works and rod and wire mills at Monessen, and the Pittsburgh Steel Products Co. are largely identical.

Germany's Supply of Brass and Copper

The extent to which Germany is increasing its supply of brass, copper and other metals is illustrated by the testimony of a wounded British soldier on furlough at home. Referring to the large amount of old metal waiting to be gathered up after the war, he said it would be chiefly steel, for the Germans appear to be collecting the brass in thorough fashion for remelting. In several captured German trenches and dug-outs he had seen little canvas bags partly filled with broken fuses, nose-caps and other brass scrap, indicating that this method of collecting is being systematically carried out by the enemy.

New British Order on Machine Tools

A cablegram from the American Consul General, London, dated June 29, says that the Minister of Munitions gives notice of the withdrawal of the general permit to purchase or negotiate for the purchase of machine tools and machinery driven by power for metal working. It is now required that all applications for permits to purchase or enter into negotiations for such machinery be made to executive officers of area clearing house boards, whose addresses may be obtained from Director Central Clearing House, Ministry of Munitions, Charing Cross Buildings, London.

The Toledo Furnace Company, Toledo, Ohio, has increased its capital stock $2,000,000. This amount of stock will be distributed among the present stockholders. The company plans to build during the coming fall a large concrete dock along the river front adjoining its plant.

IRON AND INDUSTRIAL STOCKS

Motor Stocks Weak—Effect of Taxation Being Carefully Considered

The fact that there has been a decided decline in the demand for pleasure automobiles, was reflected in the stock market last week and stocks of a number of the motor companies developed marked weakness. In the general market there was less activity and the transactions amounted to only about 70 per cent of the volume of the previous week. The prices, as a rule, were lower at the end of the week. Call money during the week was easier, the highest rate having been 4½ per cent compared with 6 per cent in the preceding week, while at the close of last week the rate was only 3¼ per cent.

In connection with the consideration of values of stocks, close study is being given to the provisions of the Senate revenue bill in regard to excess profits. While, of course, the Steel Corporation and other large companies will pay tremendous amounts into the national treasury, some of the smaller companies which had very low earnings in the years 1911, 1912 and 1913, on which the Senate bill bases calculations of average earnings, will find the provisions very severe. The same is true of new companies which were only getting under way in the years mentioned and of course had small earnings but have been prosperous during the past two years.

Among the industrial stocks that registered gains during the past week were the following: National Enameling & Stamping, 1⅝; United States Steel Preferred, ⅛. Among the stocks that made losses during the week were the following: Allis-Chalmers, 1¼; American Car & Foundry, 1¾; American Locomotive, 1⅝; American Steel Foundries, 2; Baldwin Locomotive, 1⅞; Bethlehem Steel Class B, 6¼; Colorado Fuel & Iron, 2¼; Crucible Steel, 3½; Gulf States Steel, 4; International Harvester, 2; Lackawanna Steel, 3; Midvale Steel, 1½; Pressed Steel Car, 1; Republic Iron & Steel, 1½; United States Steel, 3. American Can stood at the end of the week the same as at the beginning at 49½.

The range of prices in active iron and steel stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com.	26½-29¾	Int. Har. of N. J., pref.	116
Allis-Chal., pref.	82¾	Int. Har. Corp., pref.	101
Am. Can, com.	48¼-51	Lackawanna Steel	90½-96
Am. Can, pref.	105 -106	Lake Sup. Corp.	18½-19½
Am. Car & Fdy., com.	75 - 77	Lukens, com.	45
Am. Car & Fdy., pref.	116	Lukens, 1st pref.	102½-103½
Am. Loco., com.	69¾-71	Midvale Steel	60 - 63
Am. Loco., pref.	103 -103½	Nat-Acme	33⅞-35
Am. Rad., com.	278 -280	Nat. En. & Stm., com.	38⅜-42½
Am. Ship, pref.	92½	Nat. En. & Stm., pref.	96¼-97½
Am. Steel Fdries.	69⅞-72	N. Y. Air Brake	137½-140½
Bald. Loco., com.	67⅞-75½	Nova Scotia Stl.	95 - 97¾
Bald. Loco., pref.	99	Pitts. Steel, pref.	100
Beth. Steel, com.	132¾-138	Pressed Stl., com	73 - 75¾
Beth. Steel, class B	129½-141	Pressed Stl., pref.	101½
Carbon Stl., com.	103	Ry. Steel Spring, com.	53 - 53¾
Central Fdry., com.	35 - 35½	Ry. Steel Spring, pref	98⅞-99
Central Fdry., pref.	52 - 53	Republic, com.	89½-93⅜
Charcoal Iron, pref.	61⅛-64¼	Republic, pref.	102½-103¾
Chic. Pneu. Tool.	72 - 73½	Sloss, com.	56½-57
Colo. Fuel	50 - 52½	Superior Steel	47⅞-50
Cruc. Steel, com.	83½-90⅝	Superior Steel, 1st pref	101⅛-102½
Cruc. Steel, pref.	102⅜-103	Transue-Williams	42¼-43⅝
Gen. Electric	157½-160	Un. Alloy Steel	44¾-45½
Gt. No. Ore. Cert.	30⅝-32⅝	U. S. Pipe, com.	21½
Gulf States Steel	123 -125¼	U. S. Steel, com.	124⅝-129⅛
Gulf States Steel, 1st pref	110	U. S. Steel, pref	117½-118
Int. Har. of N. J., com.	110 -111¾	Va. I. C. & Coke	68 - 69½
		Warwick	9
		Westing. Elec.	49⅝-50⅛

Pacific Coast Merger

The Seattle Car & Foundry Co., Seattle, Wash., owned largely by William Piggott, has been merged with the Twohy Brothers Co., operating railway car building plants in Portland and Spokane. The new concern will be known as the Pacific Car & Foundry Co. The deal involves capital of more than $1,000,000. Headquarters of the new concern will be in Seattle, but the company will extend its activities and widen its markets to cover the entire Pacific Coast, as well as a large foreign trade. The plant of the Seattle Car & Foundry Co. has been engaged for years in the manufacture of railroad equipment for western lines, for logging railroads and for Japanese interests and other countries of the Far East, where a big trade has been built up. Backing up the merger, and forming an alliance with it, will be the entire resources of the Pacific Coast Steel Co., of which William Piggott is president. The plant of Twohy Bros. in Portland has an appraisal value of $350,000, and does a big business in car building and repair work. This is the third purchase made by the Pacific Coast Steel Co. and the Seattle Car & Foundry Co. in less than a year. The first was the acquirement of the Irondale plant of the defunct Western Steel Corporation, which is being remodeled and equipped. The second purchase, made recently, gave the parent company the control of the Oregon Iron & Steel Co. at Oswego. The last merger is expected to be followed by the extensive improvement of the plants, in order to enter upon an extensive scheme of car building.

Industrial Finances

The Universal Motor Co., Oshkosh, Wis., has authorized a 10 per cent cash semi-annual dividend and will shortly make a 100 per cent stock dividend with the doubling of the capital.

The Liberty Steel Co., Warren, Ohio, has been authorized by the Secretary of State of Ohio to increase its capital stock from $600,000 to $750,000. The company was also authorized to issue $150,000 of 10-year 6 per cent bonds.

The Russell Machine Co., Twenty-eighth Street, Pittsburgh, manufacturer of machinery and parts, has acquired the plant of the Thomas Carlins Sons Co., 1600 River Avenue, Pittsburgh, at a receivers' sale for a consideration of $106,275. The Carlins property has heretofore been devoted to the manufacture of boilers, engines, stacks and kindred products, and will be used by the Russell company as an extension to its present works.

The property of the defunct M. H. Foundry & Mfg. Co., Belleville, Ill., was purchased at public auction July 3, by Henry Lengfelder, president Orbon Stove & Range Co., for $8,700. The sale was conducted by E. E. Wangelin, trustee. The company, which was devoted principally to the manufacture of sanitary drinking fountains, became bankrupt. It is understood that Mr. Lengfelder purchased the plant with a view to organizing a new company and resuming operations.

Dividends

The Colorado Fuel & Iron Co., quarterly, ¾ per cent on the common, payable July 25.

The Curtiss Aeroplane & Motor Co., 3½ per cent on the preferred, payable July 16.

The Standard Underground Cable Co., quarterly, 3 per cent and extra 3 per cent, payable July 20.

The United Alloy Steel Corporation, quarterly, $1 per share, payable July 30.

The Willys-Overland Co., quarterly, 75c. per share on the common, payable Aug. 1.

Chain Works Purchase

The Rowe Calk Co., Hartford, Conn., has purchased the Diamond Chain Co., York, Pa., in order to have a source of supply for the anti-skid chain used in the manufacture of its grip device. The new officers of the Diamond Chain Co. are the following: President and factory manager, Samuel M. Horn, York, Pa.; vice-president, William H. McLaughlin, Hartford, Conn.; secretary, treasurer and general manager, Warren D. Chase, Hartford, Conn.; assistant secretary, S. Ralph Horn, York, Pa.; assistant treasurer, E. S. Bestor, Hartford, Conn. All the above except Mr. Horn, who developed the business of the Diamond Chain Co., are connected with the Rowe Calk Co. Work was begun this week on considerable extensions to the plant at York. The chain company will continue to sell its product in the general market.

Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c. Denver pipe, 76.1c., minimum carload, 46,000 lb.; structural steel and steel bars, 76.1c., minimum carload, 40,000 lb. Pacific coast (by rail only), pipe 65c.; structural steel and steel bars, 75c., minimum carload, 60,000 lb. No freight rates are being published via the Panama Canal, as the boats are being used in transatlantic trade.

Structural Material

1-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 4.50c.

Wire Products

Wire nails, $4 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire is $4.05 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.95; galvanized wire, $4.65; galvanized barb wire and fence staples, $4.85; painted barb wire, $4.15; polished fence staples, $4.15; cement-coated nails, $3.90 base, these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 43 per cent off list for carload lots, 42 per cent off for 1000-rod lots, and 41 per cent off for small lots, f.o.b. Pittsburgh.

Nuts and Bolts

Discounts in effect are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days:

Carriage bolts, small, rolled thread, 40 per cent, small cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent; with c. p. nuts, 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq. blank, $2.10 off list, and tapped, $1.90 off; hex., blank, $1.90 off, and tapped, $1.70 off; nuts, c. p. c. and t. sq., blank, $1.70 off, and tapped, $1.50 off; hex. blank, $1.60 off, and tapped, $1.40 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Wire Rods

Soft Bessemer and open-hearth rods to domestic consumers at $95 to $100; high-carbon rods made from ordinary open-hearth steel, $100 to $110, and special steel rods with carbons running from 0.40 to 0.60, $100 to $110 at mill; above 0.60 carbon, $115 to $120.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $5.00 base; ⅜ in., 7/16 in. and ½ in., $7.50 to $8. Boat spikes are about 6.50c. to 7c., all per 100 lb. f.o.b. Pittsburgh, but some makers are quoting above these prices. Track bolts with square nuts 6.50c. to 7c. to railroads, and 8c. to 8.50c. in small lots, for fairly prompt shipment.

Steel Rails

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails, and on carload and smaller lots, 4c. to 4.25c. at mill. Light rails; 25 to 45 lb., $75 to $80; 16 to 20 lb., $80 to $81; 12 and 14 lb., $82 to $83; 8 and 10 lb., $83 to $84; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard section rails of Bessemer stock are held at $38, and open-hearth $40, per gross ton, Pittsburgh.

Tin Plate

Long terne plate, No. 28 gage base, $7.25 to $7.50; short terne plate, $12 to $12.50, maker's mill, prices depending on quantity and delivery wanted. The present schedule of prices on terne plate is as follows: 8-lb., 200 sheets, $14 per package; 8-lb., 214 sheets, $14.30 per package; 12-lb., I. C., $15.25 per package; 15-lb., I. C., $15.75 per package; 20-lb., I. C., $16.50; 25-lb., I. C., $17.25; 30-lb., I. C., $18; 35-lb., I. C., $18.75; 40-lb., I. C., $19.50.

Iron and Steel Bars

Steel bars at 4.50c. to 5c. for delivery late this year, and 5c. and higher from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c.; railroad test bars, 5.25c. in carload lots and larger lots f.o.b. mill.

Wrought Pipe

The following discounts in steel are to jobbers for carloads on the Pittsburgh basing card in effect from May 1, 1917, all full weight except for LaBelle Iron Works and Wheeling Steel & Iron Co., which quote higher prices and National Tube, which adheres to card of April 1.

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	42	15½	⅛ and ¼	23	+4
½	46	31½	⅜	24	+3
¾ to 3	49	35½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	42	29½	2	26	12
2½ to 6	45	32½	2½ to 6	28	15
7 to 12	42	28½	7 to 12	25	12
13 and 14	32½	..			
15	30	..			

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	38	20½	⅛, ¼ and ⅜	22	5
½	43	30½	½	27	14
¾ to 1½	47	34½	¾ to 1½	33	18
2 to 3	48	35½			

Lap Weld, extra strong, plain ends

2	40	28½	2	27	14
2½ to 4	43	31½	2½ to 4	29	17
4 to 6	42	30½	4½ to 6	28	16
7 to 8	38	24½	7 and 8	20	8
9 to 12	33	19½	9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized, but in some sections of the country discounts on less than carloads are three (3) points less (higher price) than the carload discount on both black and galvanized steel pipe.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are four (4) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are five (5) points lower (higher price).

Boiler Tubes

Nominal discounts on less than carloads, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes, and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in.	28	1¾ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3¼ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in.	No quotations
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths.

Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net, or 2 per cent discount in 10 days:

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer

	Cents per lb.
Nos. 3 to 8	8.00 to 8.50
Nos. 9 and 10	8.25 to 8.50
Nos. 11 and 12	8.50 to 8.75
Nos. 13 and 14	8.75 to 9.00
Nos. 15 and 16	9.00 to 9.25

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	8.30 to 8.50
Nos. 22 and 24	8.35 to 8.85
Nos. 25 and 26	8.40 to 8.90
No. 27	8.45 to 8.95
No. 28	8.50 to 9.00
No. 29	8.55 to 9.05
No. 30	8.65 to 9.15

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11	9.00 to 9.50
Nos. 12 and 14	9.10 to 9.60
Nos. 15 and 16	9.25 to 9.75
Nos. 17 to 21	9.40 to 9.90
Nos. 22 and 24	9.55 to 10.05
Nos. 25 and 26	9.70 to 10.20
No. 27	9.85 to 10.35
No. 28	10.00 to 10.50
No. 29	10.25 to 10.75
No. 30	10.50 to 11.00

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	7.80 to 8.30
Nos. 17 to 21	7.85 to 8.35
Nos. 22 to 24	7.90 to 8.40
Nos. 25 to 27	7.95 to 8.45
No. 28	8.00 to 8.50
No. 29	8.05 to 8.55
No. 30	8.05 to 8.55
Nos. 30½ and 31	8.10 to 8.60

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
July	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
3	31.50	31.50	61.87½	11.37½	11.12½	9.25	9.00
5	31.25	31.25	62.25	11.25	11.00	9.25	9.00
6	31.25	31.25	62.00	11.25	11.00	9.25	9.00
7	31.00	31.00	....	11.25	11.00	9.25	9.00
9	31.00	31.00	62.75	11.12½	11.00	9.12½	8.87½
10	30.75	30.75	63.00	11.12½	11.00	9.12½	8.87½

NEW YORK, July 10.

All the metals are lower except tin and the entire market is extremely dull. There is little demand for copper and it has declined considerably. Tin has advanced because stocks are light. Lead is again lower with demand very small. Spelter continues stagnant and weaker. Antimony has again declined on little demand.

New York

Copper.—The tendency of the copper market has been easy for some little time, but yesterday a decided weakness developed. The real cause of the decline in the past two weeks and especially in recent days is difficult to locate. There has been almost an entire absence of business and it is not certain whether the lower prices come from first or from second hands. The quotation yesterday for both Lake and electrolytic was 30.75c., New York, a decline of 1c. per lb. since last week, but this is largely nominal. Quotations for later positions have also declined about ½c. per lb. to 29.50c. for the third quarter and 28.50c. for the fourth quarter, New York. It is surmised in some quarters that one important reason for the present weakness is due to the fact that producers may not be so sure that Government and other purchases will be made on a 25c. per lb. basis. It is felt that they may be realizing that the basis for purchases will be cost plus a reasonable profit, which would bring the price in many cases below that paid in May when 16.67c. was realized. The continued discussion of the subject at Washington with no agreement is considered ominous and the fact that the proposition that the aluminum producers made was thrown out is not regarded as favorable. The London market is unchanged at £142 for spot electrolytic.

Tin.—For another week cablegrams from London have been late practically every day and business has consequently been considerably hampered. This, together with the continued uncertainty as to the Government's attitude on taxes and other matters, has brought business almost to a halt. The fact that spot Straits tin has advanced in the last week to 63c., New York, or 1c. per lb., is attributed to the decrease in stocks which are now lighter than for some time and it is stated that it is easier to purchase 5 tons than 25 tons for this position. The market the entire week has been peculiar in that inquiries for futures have been strong one day with spot in poor demand while the next day the reverse has been the case. On July 5 there was a good demand for futures, amounting to 200 to 250 tons, which ended in some business, but the spot market was dull, while on July 10 futures were neglected and fairly large inquiries for nearby deliveries were hard to satisfy. Arrivals to July 10, inclusive, have been 700 tons, with the quantity afloat 4354 tons. Spot Straits tin in London yesterday was quoted at £247, an advance of £3 over that quoted a week ago.

Lead.—Demand for lead has slowed down decidedly and lower prices have naturally resulted. The quotation yesterday was 11c., St. Louis, or 11.12½c., New York, and it is understood that even lower than this has been quoted to some large buyers. Some of the larger producers state that they are unable to sell for July delivery while others say they can. The Government attitude is a disturbing factor and while the present position is relatively strong on the prospect of more orders from the Government, a further decline is expected by some before any change for the better.

Spelter.—The market continues to sag in the absence of any active demand. The quotation for early delivery by certain producers continues at 9c., St. Louis, or 9.25c., New York, but it is reported that some interests are shading this to 9.12½c., New York, on small transactions, the negotiations being conducted very quietly. Futures continue to be quoted slightly higher than nearby deliveries, or 9.12½c., St. Louis, and 9.37½c., New York, but buying is inactive. At present prices some producers are undoubtedly losing money, and it is stated that here and there some furnaces have been shut down ostensibly for repairs. Labor troubles are looming large, those in the Butte and Superior district being reported as serious. Nothing more is heard in detail as to the published report of the Government purchasing 11,000 tons of high grade spelter at 13.50c. per lb.

Antimony.—In the absence of demand the market has declined and is now quoted at 17c. to 17.50c., New York, duty paid, for Chinese and Japanese grades.

Aluminum.—No. 1 virgin metal, 98 to 99 per cent pure, is in poor demand for early delivery and is quoted at 57c. to 59c., New York. It is understood that the Government rejected the producers' proposal to furnish aluminum at 27½c. per lb., or an advance of 10c. over the 10-yr. average price.

Old Metals.—The market is declining. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible	29.50 to 30.00
Copper, heavy and wire	28.00 to 29.00
Copper, light and bottoms	26.00 to 26.50
Brass, heavy	19.50 to 19.75
Brass, light	15.00 to 15.25
Heavy machine composition	26.50 to 26.75
No. 1 yellow rod brass turnings	19.00
No. 1 red brass or composition turnings	21.50 to 22.50
Lead, heavy	10.00 to 10.25
Lead, tea	9.00
Zinc	7.25

Chicago

JULY 9.—Consumers show a disposition to refrain from buying copper, evidently because of a belief that the market will drop lower. It is asserted, however, that the metal is stronger than most people realize. Futures continue strong, but prompt electrolytic is a little easier. Lead is dormant. Spelter pursues an unsatisfactory course, though prices are fairly firm. Antimony is inactive and weak. All the metals show a quiet trend. We quote as follows: Casting copper, 30c.; Lake, 31c.; electrolytic, 31c.; tin, carloads, 63c.; small lots, 65c. to 66c.; lead, 11c.; spelter, 9c.; sheet zinc, 19c.; Oriental antimony, 20c. to 21c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 25.50c.; copper clips, 25c.; copper bottoms, 23c.; red brass, 23c.; yellow brass, 16c.; lead pipe, 9c.; zinc, 6.50c.; pewter, No. 1, 35c.; tinfoil, 40c.; block tin, 45c.

St. Louis

JULY 9.—Rather quiet conditions prevail in the nonferrous metal markets, with the tone easier, if anything, than during last week. Today's quotations, in less than carload lots, are: Lead, 12c.; spelter, 11c.; tin, 67c.; Lake copper, 33c.; electrolytic copper, 32.50c.; Asiatic antimony, 22c. In carload lots, lead was quoted today at 11c. to 11⅛c. and spelter at 8⅞c. to 9c. In the Joplin district the demand for zinc blende was light and the price range, basis of 60 per cent metal, was $65 to $75 per ton, with the average for the district at $70 per ton. In the second grades, there was some slight improvement in tone. Lead was steady for the week at a somewhat lower range than the previous week, the price for 80 per cent ore being $120 per ton and the average for the week for the district $119 per ton. For calamine the price range remained steady at a slightly lower range, $35 to $42 per ton, basis of 40 per cent metal, with the average for the district at $38 per ton. Sheet ground properties have begun to shut down because of the price of ore, and this is beginning to reduce the production. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 12c.; heavy yellow brass, 15c.; heavy red brass and light copper, 19c. to 20c.; heavy copper and copper wire, 22.50c. to 23.50c.; zinc, 6c.; lead, 7c.; tea lead, 4c.

Pittsburgh and Nearby Districts

At Pittsburgh last week, final steps were taken for the consolidation of the Knox Pressed & Welded Steel Co., of Pittsburgh, and the Blaw Steel Construction Co., Hoboken, Pa., which became effective on July 1, the new company being known as the Blaw-Knox Co. Officials were elected as follows: Albert P. Lehman, president; I. F. Lehman, vice-president; F. M. Bowman, vice-president; L. L. Knox, vice-president; W. C. Coffin, vice-president; B. L. Hirshfield, treasurer, and C. H. Lehman, secretary. The board of directors consists of the above, and also Andrew M. Moreland, Charles Dreifus, Herbert L. May, Wayne Rawley, Hugo Sidenberg, George H. Martin and Joseph Prostaur. The general offices of the new company are at Hoboken, Pa., and the city sales offices are in the Farmers' Bank Building, Pittsburgh. The company maintains branch offices at 165 Broadway, New York; People's Gas Building, Chicago; Rialto Building, San Francisco, and No. 6 Beacon Street, Boston. The management of both the old companies remains the same in the new company. The Blaw-Knox Co. is now executing large orders for the Government.

The office of the American Ore Reclamation Co. has been moved from the Oliver Building to the Renshaw Building.

The Wire Drawing Machine Co., New Brighton, Pa., with a capital of $100,000, has been incorporated by Albert H. Miller, Samuel A. McCullough and M. B. Houck.

Following the decision in the 15 per cent rate cases the Inter State Commerce Commission has rejected complaints of the Youngstown Sheet & Tube Co., and the Pittsburgh Steel Co. against the Lake Shore & Michigan Southern, and the Wheeling Steel & Iron Co. against the Pennsylvania Railroad Co.

Industrial Troubles

About 2000 employees of the International Nickel Co., Bayonne, N. J., have declared a strike for a 15 per cent advance in wages. The men also ask the reinstatement of eight discharged members of a mediation committee.

About 100 employees of the Torsion Balance Co., Eighth Street, Jersey City, N. J., manufacturer of scales, etc., declared a strike on June 29 for an eight instead of nine-hour day. The company has notified the men of their formal discharge.

About 1500 employees connected with shipbuilding plants at Hoboken, N. J., declared a strike on July 2 for an advance in wages from $3.95 to $4.50 a day. The men are from the works of: Tietjen & Lang Dry Dock Co., Seventeenth Street; W. & A. Fletcher Co., Hudson Street, and the Consolidated Iron Works, River Street.

About 800 employees of the Hazard Rope Works, Wilkes-Barre, Pa., declared a strike on July 2, due to the discharge of a woman employee who had been active in union affairs. The men returned to work on July 5 upon the reinstatement of the woman.

In order to economize in coal and copper, and to provide capacity for a rapidly increasing demand, the Sioux City Service Co., Sioux City, Iowa, has made a careful study of its power plant conditions and electrical distribution system. Fred A. Krehbiel and E. N. Lake, of the Krehbiel Co., Chicago, have co-operated with the company's engineers in making detailed tests and reports. Following the recommendations of the engineers, extensive improvements will be made at once in the power plant and in the distributing system.

In order to release freight cars the New York Central Railroad (Lake Shore) is dumping hundreds of carloads of fabricated steel and ingots at Dune Park, in the Calumet region of South Chicago. The steel is destined for export to the French Government, but is presumably held up because of lack of ocean freight space. Meanwhile the cars are urgently needed for other service.

Some Sales Law Points

BY A. L. H. STREET

Liability of Guarantor of Payment of Note.—The seller of machinery took notes to cover the purchase price, with chattel mortgage security against the machinery. Payment of one of the notes was guaranteed by defendant. On default by the buyer, he gave the seller a bill of sale for the machinery, empowering the seller to resell. Under these circumstances, it is decided that the seller was not bound to proceed to a resale of the property in the manner required by the Wisconsin statutes relating to the sale of mortgaged property, in order to preserve the right to hold defendant on his guarantee on the property failing to yield enough to discharge all the notes. But the seller was not entitled to apply all the proceeds of the resale to three of the notes, payment of which defendant had not guaranteed, to the exclusion of the fourth note on which defendant was guarantor. (Wisconsin Supreme Court, International Harvester Co. vs. Holmes, 162 Northwestern Reporter, 925.)

Authority of Selling Agents.—Plaintiff, owning a lot of old machinery, rails, etc., caused them to be shipped to the yard of a second-hand machinery dealer for resale on such terms as might prove satisfactory to plaintiff. Some of the rails were sold to defendant by the dealer, and plaintiff, claiming that the sale was unauthorized, brought suit to recover the value of the rails from defendant. In ordering a new trial on plaintiff's appeal from a judgment in defendant's favor, it is held that where the owner of goods confers upon another an apparent right to sell them, a third person purchasing on the faith of such apparent authority will take good title to the property, notwithstanding any actual limitations on the second party's authority; but that the trial judge committed error in instructing the jury to the effect that if plaintiff had intrusted other similar property to the dealer for resale, that would be conclusive as to his authority to resell the particular property. This was error, because the proof as to such other property would merely be some evidence tending to show the extent of authority possessed by the dealer as to the particular property. (Arkansas Supreme Court, Rogers vs. Scott, 194 Southwestern Reporter, 689.)

Buyer's Rights as Against Delayed Delivery.—That a buyer of machinery under a contract which requires the seller to make delivery by a specified time agrees to an extension of time for delivery to another specified date will not preclude him from rejecting delivery tendered by the seller after the later date. When the buyer notifies the seller that a thing ordered is needed at once, the seller's agreement to deliver by a specified time becomes one of the vital elements of the contract. And the fact that the buyer may give notice that the seller will be held liable for damages resulting from failure to make timely delivery under the contract cannot be interpreted as a waiver of right to reject delivery in that event. When the seller's failure to make delivery within a stipulated time has given the buyer ground for rejecting the subject of sale when tendered to him, his right to so reject delivery is not affected by the fact that there may be some other motive which is the real reason for the rejection, as shutting down of the plant in which the goods ordered were to be used. (United States Circuit Court of Appeals, Sixth Circuit; General Electric Co. vs. Chattanooga Coal & Iron Corporation; 241 Federal Reporter, 38.)

Waiver of Buyer's Right to Rescind Purchase.—Applying the well established rule of law that right to rescind a contract is generally lost unless promptly exercised on occurrence of the ground for rescission, the Texas Court of Civil Appeals holds that where the purchaser of machinery retained it nearly three years after he became dissatisfied with it, and after being advised that the seller would make no further repairs, he deprived himself of any right to return the machinery and recover the purchase price. (Bancroft vs. Emerson-Brantingham Implement Co., 194 Southwestern Reporter, 991.)

PERSONAL

Charles M. Schwab and other officials of the Bethlehem Steel Co. were in Baltimore July 9 and witnessed the launching of the steamer Cubore, which was built at the Sparrows Point, Md., plant of the company for the Ore Steamship Co. Before the launching, Mr. Schwab said that although he had hinted that he would have an important announcement to make upon his next visit, the people of Baltimore would have to be disappointed on this occasion.

John L. Roche, formerly in charge of the bolt works of the Remington Arms Co., Chester, Pa., has resigned.

W. H. Portner, Maytown, Pa., has become superintendent of the works of the Gadsden Car Co., Gadsden, Ala.

At a meeting of the board of directors of the American Locomotive Co., held June 21, L. A. Larsen was appointed assistant comptroller, effective July 1.

S. Montaner, commission agent, Barcelona, Spain, whose business includes hoops and bands, black and galvanized sheets and steam motor trucks, is now in the United States. On July 12 he leaves for Havana, and on July 25 sails for Spain.

J. Curthew Sanders of Stewart, Sanders & Co., bolt and nut manufacturers, Johannesburg, South Africa, is now in the United States. His New York address is care Herzfelder & Son, 6 Cliff Street.

Robert Wuest, for so many years prominent in the metal-working field as secretary and later as commissioner of the National Metal Trades Association, has recovered his health and has returned to active business. He has established insurance offices in the Union Trust Building, Cincinnati, and will engage actively in the field of group insurance.

R. A. Bull, who has been connected for the past year with the Chicago Steel Foundry Co., Chicago, has been elected vice-president and general manager of the Duquesne Steel Foundry Co., Coraopolis, Pa., and has entered upon his new duties. Mr. Bull was formerly president of the American Foundrymen's Association.

P. D. Murphy, for 13 years in the sales department of the Aluminum Co. of America, Oliver Building, Pittsburgh, has resigned. Effective Monday, July 16, Mr. Murphy will become general manager of sales of the Ridgely Trimmer Company, Springfield, Ohio, manufacturer of steel wool, largely used by painters, paper hangers and other craftsmen as a substitute for sand paper.

Joseph G. Butler, Jr., of Youngstown, Ohio, has written a 300-page book entitled, "A Trip Through France in Wartime." The book deals with the industrial, social and military conditions in Europe, and also refers to the great expansion that will come to the iron and steel industry in France when the war is over. The edition is limited to 200 volumes, which will be distributed to friends of Mr. Butler in this country and Europe.

Charles S. Clark, formerly sales agent of the Pennsylvania Steel Co., Boston, has been elected first vice-president and general manager of the Laconia Car Co., and will make his headquarters at Laconia, N. H., where the business of the company will be transacted hereafter. Mr. Clark has been well known to the New England railroad, electric railway and steel business men for many years.

George W. Armstrong is president of George W. Armstrong & Co., Inc., Fort Worth, Texas, the firm recently organized to take over the Texas Rolling Mill Co., Fort Worth, Texas, and the Osage Iron & Steel Co., Sand Springs, Okla. The other officers are: Barney Smith, vice-president and general manager; Rufus A. Colgin, second vice-president, and John F. Foster, secretary and treasurer.

E. T. Edwards, Columbia, Pa., is treasurer of the Eastern Bar Iron Institute, the organization of manufacturers of bar iron which operates under the Eddy system of open price competition, and which has an office at 103 Park Avenue, New York.

Standish Meacham, advertising manager of Rogers, Brown & Co., Cincinnati, has sailed from an Atlantic port for France, where he will serve as a secretary of the Army Young Men's Christian Association.

R. H. Parks of the Bettendorf Car Co., Davenport, Iowa, has been appointed operating manager of the Canadian Car & Foundry Co., Montreal, in charge of all its car plants. W. S. Atwood has been appointed assistant to the vice-president and manager.

C. Edwin Clarke formerly master mechanic of the Cambria Steel Co., Johnstown, Pa., is now chief engineer of the Wilmington Steel Co., Wilmington, Del.

Clifford B. Langstroth, supervisor of the heat-treating and drop-forge departments of the Ross Rifle Company, Quebec, has been appointed metallurgist with the Link-Belt Co., Indianapolis.

Gordon M. Campbell, manufacturing engineer, General Electric Co., West Lynn, Mass., has joined the Kerr Turbine Co., Wellsville, N. Y., as works manager.

Sir Robert Hadfield has had a baronetcy conferred on him by King George of England.

E. J. Parker, manager of the Morgan Engineering Co., has joined the staff of the Vulcan Steel Products Co., 120 Broadway, New York, as sales manager of the machinery and tool department. The company contemplates opening a chain of offices in Europe, China and Japan, and Mr. Parker will leave shortly for abroad to personally conduct this work.

Murray Shipley has sold his entire interest in the Lodge & Shipley Machine Tool Co., Cincinnati, and has severed his connection with the company. Announcement has not been made as yet of the new officers. The death of William Lodge, who had been associated with Mr. Shipley in the enterprise for 25 years, occurred in April.

Harry Latshaw announces that he is no longer associated with Julius Blum & Co. and has become connected with the iron, steel, brass and copper firm of H. L. Latshaw & Co., 220 Broadway, New York.

M. Cochrane Armour, for many years a member of the firm of Rogers, Brown & Co., withdrew from the firm June 30, and its business will be continued under the same name by the following partners: William A. Rogers, A. A. Fowler, W. T. Shepard, D. B. Meacham, J. K. Pollock and E. L. Billingslea.

B. M. W. Hanson has been elected a vice-president and general works manager of the Colt's Patent Firearms Mfg. Co., Hartford, Conn., and has assumed his new position. Mr. Hanson retired as works manager of the Pratt & Whitney Co., Hartford, June 30.

Edwin P. Brown has been elected president of the United Shoe Machinery Corporation, Boston, Mass., to succeed the late Sidney W. Winslow. Mr. Brown became associated with the United Shoe Machinery Co. in 1900, and has been general manager of the company for some years. He was western sales agent of the Colorado Fuel & Iron Co. at El Paso, Texas, from 1893 to 1899, and was with the American Zinc, Lead & Smelting Co. in 1899. He is now a director in the American Zinc, Lead & Smelting Co.

John R. Foster, formerly with Allan S. Davison Co., Pittsburgh, has resigned, effective July 1, and has been elected vice-president of the recently organized Iron & Fuel Trading Co., First National Bank Building, Pittsburgh, which will deal in pig iron, coal and coke, alloys and refractories.

The Traylor Engineering & Mfg. Co., Allentown, Pa., which has made extensive purchases, is in the market for a 48 x 48 x 16 ft. planer with four heads, an 8-ft. boring mill and a 24-in. slotter.

The Republic Iron & Steel Co. is blowing in this week the new No. 5 blast furnace at its Haselton group in the Youngstown district, which has been under construction for some months.

Quenching Experiments and Physical Properties

A study of the rate of cooling in various quenching media and an attempt to connect the rate of cooling with the physical properties obtainable in quenched and tempered forgings was the object of some experiments described by Lawford H. Fry of Burnham, Pa., in a paper before the Iron and Steel Institute, London, May 3, 1917. The paper was entitled "Notes on Some Quenching Experiments" and its substance was as follows:

The main series of experiments was carried out with two locomotive driving axles, which were drilled so that a pyrometer could be inserted and the temperature of the axle measured continuously during the process of quenching. One axle was 11 in. in diameter, was forged solid, and weighed 1830 lb. The other axle was 12 in. in diameter, bored longitudinally with a 3-in. hole, and weighed 2000 lb. To measure the temperature, a hole for a pyrometer was bored in one end of each axle to a depth of about 15 in., parallel to the longitudinal axis. In the solid axle the hole was half way between the center and the outside of the axle, while in the bored axle it was half way between the surface of the bore and the surface of the axle. The pyrometer used was a base metal thermocouple fitted with a plug which was driven into the outer end of the hole so that the quenching medium could not enter and the actual temperature of the interior of the axle could be measured.

In carrying out the experiments the axle was heated uniformly as though for quenching in the usual course of manufacture, then withdrawn from the furnace and the pyrometer inserted. About two minutes was allowed for the thermocouple to take the temperature of the axle, and the axle was then quenched. The quenching media experimented with were air, water, a heavy oil of 26 deg., a light oil of 29 deg. Beaume gravity and three strengths of a cutting compound dissolved in water.

The rates of cooling in the various media are plotted in a series of curves, from which it is clear that the bored axle cooled more rapidly than the solid axle in the same medium, owing to the greater surface exposed to cooling for each pound of weight. Experiments were also made with test pieces and it was found that in a given medium the heat was given up by the axle and by the test piece at practically the same rate in British thermal units per square inch of surface.

The author points out that the physical properties of steel are determined, not by the rate at which the heat is lost per unit of surface, but by the rate at which heat is lost per unit of weight, that is, by the rate at which temperature is lost. It is therefore necessary to define not only the cooling medium, but the size of the piece cooled, and not to speak of "water quenching" or "air cooling," but to give the rate of temperature loss over a given range. The author concludes that for rapidity of cooling it is necessary to have: Intimate contact between fluid and object to permit transfer of heat from object to fluid, and free flow of fluid to remove heated or vaporized fluid from the surface of the object.

Electrolytic Aluminum and Carbon Consumption

Discussing the reaction involved in the production of aluminum by electrolysis, Dr. Richard Seligman described before the May meeting of the Institute of Metals some work which convinced him nearly 10 years ago of the fallacy of the conventional view that carbon monoxide is the sole gaseous product of the electrolytic reduction of alumina. He pointed out that a correct appreciation of the mechanism of the reaction is not only interesting from a scientific point of view, but is also of very great practical importance because anode carbon consumption is one of the main items in the cost of producing aluminum, and it is clear that on the assumption that for every three units of aluminum produced two units of carbon must necessarily be consumed a downward limit is put to the possible reduction of this source of expenditure.

Sheffield Coal & Iron Co. Plants to Start

Arrangements have been completed for the refinancing of the Sheffield Coal & Iron Company, which has blast furnaces at Sheffield, Ala., and iron mines, coke ovens and other property, and the plants will be put in operation at the earliest date possible. The plan of financing provides funds to build at Sheffield a by-product coke oven plant, and the furnace and mines will be equipped with modern facilities for economical operation so as to insure continuous operation. On account of the high cost of construction and the difficulties in securing delivery of building material, the construction of the by-product ovens will be deferred for the present, but the money for construction has been provided for. Meanwhile coke will be made at the company's bee-hive ovens at Jasper, Ala. The general manager of the company will be W. L. Kluttz, who has been vice-president and a director of the Central Iron & Coal Company, at Holt, Ala. He will reside in Sheffield.

Wages of Puddlers and Mill Workers Are Advanced

YOUNGSTOWN, OHIO, July 11 (*By Wire*).—The examination of sales sheets by representatives of the manufacturers and of the Amalgamated Association in the sheet mill division, completed Tuesday night, shows a new card rate of 4.45c., which is an increase from the former rate of 3.90c. existing in May and June. In the tin plate division, the new card is $6.85 per box, an advance from $5.75. The increase in the wages of sheet workers is 16½ per cent and for tin mill workers, 22 per cent.

An examination of bar iron sales shows an average price of 2.65c. and establishes wages of puddlers at $12.80 per ton, an advance of $1.

Blast Furnace Completed in 57 Days

The Cambria Steel Co. on July 3 blew in blast furnace No. 11 at Johnstown, Pa., just 57 days after work on the stack began. The foundation was already in place at that time. This makes a new record for blast furnace construction, the former record having been attained on June 5, 1916, when the same company completed a blast furnace at Johnstown in 85 days. The ceremony at the new furnace was in charge of Vice-President Edwin E. Slick of the Midvale Steel & Ordnance Co. and the torch was applied by Edwin Slick, Jr., son of Mr. Slick.

All in Blast

LEBANON, PA., July 10.—With the resumption of the No. 3 stack of the Bethlehem Steel Co.'s Bird Coleman plant at Cornwall and of the Lebanon Blast Furnace Co.'s stack in this city, all the furnace stacks in the Lebanon Valley are again in operation. Both of the stacks mentioned were re-lined during their idleness of six weeks.

While minor improvements will be made at the Duluth plant of the Minnesota Steel Co., no appropriations have been made for any of the extensive new construction outlined in recent newspaper publications at Duluth. This as published included two additional blast furnaces and four open-hearth furnaces.

The Remington-U. M. C. Co., Bridgeport, Conn.; the Remington Co. of Delaware (Eddystone plant), the Peters Cartridge Co., Cincinnati, and the Winchester Repeating Arms Co., New Haven, Conn., have opened a joint purchasing office at 50 East Forty-second Street, New York.

The stockholders of the Washburn Wire Co., Providence, R. I., will vote on the plan of reorganization whereby the plant and assets of the company will be taken over by the Washburn Wire Co. of Delaware, which has just been organized.

OBITUARY

Frank Firmstone

The death of Frank Firmstone at Glendon near Easton, Pa., June 27, 1917, removes one who for a good many years was an important figure in the pig iron industry of eastern Pennsylvania. Glendon had been the family home for more than two generations. Frank Firmstone was born there Aug. 29, 1846, the son of William Firmstone, who was one of the first blast furnace operators to use anthracite in smelting iron ore. The Crane Iron Co. started the first furnace on the Lehigh River that made the manufacture of anthracite pig iron a commercial success. One year later the Glendon Iron Co. began using anthracite under the management of William Firmstone. Frank Firmstone, after his school training at Easton, went to Saunders Military Academy, Philadelphia, and in 1865 graduated from the Polytechnic College of Pennsylvania as a



FRANK FIRMSTONE

mining engineer. For 21 years he was connected with the Glendon Iron Co., at the death of his father in 1875 becoming general manager. He gave up the business in 1887 and later became associated with the Cranberry Iron & Coal Co., Cranberry, N. C., being president of that company for a number of years and a director in its subsidiary companies until his death. He was a director of the Longdale Iron Co., Longdale, Va., from its organization in 1870 until its dissolution in 1911 and in that period had intimate contact with blast furnace operations in Virginia.

Mr. Firmstone's contributions to the literature of blast furnace practice were mainly through the proceedings of the American Institute of Mining Engineers. Particularly in the eighties and nineties he was an active participant in its meetings and discussions. He was a member, also, among other organizations, of the American Society for Testing Materials, the American Society of Civil Engineers, the American Society of Mechanical Engineers and the Engineers' Club of New York. At the request of THE IRON AGE, J. E. Johnson, Jr., has written the following estimate of Mr. Firmstone's work:

"Frank Firmstone's most active work as a furnace operator terminated 30 years ago when he resigned the management of the Glendon Iron Co., founded by his father. At one time Glendon was one of the great works of the Lehigh Valley and in fact of the country. He succeeded to the management when only 32 years old, and after his resignation in 1887 the works declined in importance, scarcely a trace being now visible where they once stood.

"Mr. Firmstone learned the blast furnace under the hard conditions prevailing when anthracite fuel with its slow rate of combustion was used to smelt the refractory magnetite ores of New Jersey, an operation which could only be carried on at a very slow speed. He was out of sympathy with the modern practice in hard-driving which has developed from the use of coke fuel, high blast pressures and soft ores, so he retired from active service rather than adapt himself to conditions which seemed wrong to him.

"Mr. Firmstone was a profound student with a brilliant mind and a retentive memory. His mind was a treasure house of information and one associated with him for many years has said that he had never known any other man to possess a mass of information so vast and at the same time so accurate, and that if Frank Firmstone made a statement it need not be checked up but could be accepted as a fact. This might well serve as the epitaph of this iron master, whose personality was so little known during his later life to the modern school of furnacemen."

WILLIAM C. SCOFIELD, Cleveland, for many years identified with the iron and steel industry in that city, died July 6, age 95 years. He was born in England and came to this country when 21 years of age. His first connection with the iron and steel industry was in 1872 when he purchased a controlling interest in the Otis Iron Co. that at the time was operating a bar iron mill on Whiskey Island, Cleveland, and changed the name to Lake Erie Iron Co. This plant was later sold to the Republic Iron & Steel Co. and finally dismantled. The present plant of the Lake Erie Iron Co. was built in 1878 and Mr. Scofield was president of the company at his death. Three sons were associated with him in the business, Frank R. Scofield, vice-president; Charles W. Scofield, secretary and treasurer, and G. F. Scofield. one of the directors.

CASIMIR VON PHILP, who had been connected with the Bethlehem Steel Co. at South Bethlehem, Pa., since 1890, died at Ocean City, N. J., July 5, following an attack of apoplexy. He was an engineer of unusual ability and originality. For a considerable period he was chief engineer of the Bethlehem company and in recent years was in charge of the machinery department. His inventions included improvements in rolling mills and special features of heavy forging equipment produced at the Bethlehem works. Sweden was his native country, but his ancestry was Scottish. He was 64 years of age. His society memberships included the American Society of Mechanical Engineers and the Engineers' Club, New York.

JAMES WHITEFIELD WOOD, a member of the firm of Tippet & Wood, Phillipsburg, N. J., manufacturers of boilers, tanks, etc., died June 25 at Easton, Pa., aged 72 years. He was a graduate of Lafayette College, a Civil War veteran, and director of the Eastern Trust Co.

GEORGE MATHIOT ROBINSON, who had been connected with the Charter Gas Engine Co., Sterling, Ill., since 1871, died June 22, age 63 years. Mr. Robinson was secretary of the company from 1877 to 1890 and president from 1890 to 1917.

JOSEPH V. KUNZE, vice-president of the Pelton Water Wheel Co., New York, and manager of its Atlantic department during the past 24 years, died at his home in Brooklyn June 27, after a brief illness.

HENRY C. RIKER, for over twenty-five years a highly esteemed representative of the Walter W. Woodruff & Sons Co., Mount Carmel, Conn., died at his home, Shelton, Conn., June 22.

Large Lake Ore Shipments in June

June shipments of iron ore from the Lake Superior region were 9,639,991 gross tons, exceeding the record amount for June, 1916, by 132,415 tons or 1.39 per cent. The comparative shipments by ports for June and for the season were as follows:

	June, 1916	June, 1917	To July 1, 1916	To July 1, 1917
Escanaba	1,159,424	909,804	2,602,824	2,205,297
Marquette	539,327	527,701	1,154,140	625,749
Ashland	1,101,370	1,176,517	2,204,263	1,909,268
Superior	1,945,234	2,121,663	3,878,915	3,526,082
Duluth	3,116,665	3,363,211	6,325,990	5,128,894
Two Harbors	1,645,556	1,541,095	3,449,435	2,739,645
Totals	9,507,576	9,639,991	19,615,567	16,135,135
Increase, 1917		132,415		
Decrease, 1917				3,480,432

While June shows an increase over June, 1916, the total to July 1, 1917, is much below that for the same period last year because of the backward season early this year. The Duluth and Superior percentage this year was 53.64 against 52.01 last year. The Escanaba movement this year is 13.67 per cent, compared with 13.27 per cent last year. The percentages for Marquette and Two Harbors both fell off.

Left Large Bequest to Employees

John Bartlett Pierce, Peabody, Mass., vice-president American Radiator Co., who died June 23, expressed in his will, which was filed July 9 at Salem, his appreciation of the faithful services of about 400 of his older employees by distributing among them $1,000,000 directly with the further provision that they shall receive 60 per cent of the income of a $2,500,000 trust fund, this principal also ultimately to be distributed among them.

The employees who will enjoy these benefits are those who had been in the service of the company for 10 years or more before December, 1913, when the will was drawn. Limitations are placed on the amount, both as to income and principal, of the residuary estate each individual employee shall receive. The will provides that the surplus caused by this limitation is to be used to maintain the John B. Pierce Foundation for technical research in heating, ventilating and sanitation "to the end that the general hygiene and comforts of human beings and their habitations may be advanced."

Organizes New Company

Lewis H. Scurlock, vice-president, director and organizer of the M. & S. Corporation, Detroit, who has been actively identified in the development of the M. & S. differential, has retired from active participation in the affairs of the M. & S. Corporation, still retaining his interests and remaining vice-president of the corporation. He has organized The Krom-niK Gear Co., with a paid-up capital of $50,000 and general offices at 1100 Karpen Building, Chicago, and taken over the exclusive distribution of the M. & S. differential, which will be manufactured by the M. & S. Corporation, as well as the exclusive distribution of Anderson rolled gears made by the Anderson patent machine process at Cleveland. The Krom-niK Gear Co. will act as the sales organization for both of these concerns. J. W. Fulton, vice-president of The Krom-niK Gear Co., has been long known to the automobile trade. J. S. Houston, secretary and treasurer of the company, has until recently been identified with large lumber interests.

The New York Air Brake Co., Watertown, N. Y., which has received a Government contract for the manufacture of 3-in. gun carriages, will erect a new manufacturing plant to provide for a large expansion in facilities. The new building will be of steel with concrete floors, 800 x 100 ft., and will be built by the Austin Co., Cleveland. The plant is to be completed within 60 days.

The Metal Block Corporation, 208 South La Salle Street, Chicago, has discontinued its plant at 2215 Ellston Avenue in that city and is operating its new plant at 1230 North Kostner Avenue.

Purchase of Kewanee Pipe Fitting Works

Financial journals have stated in the past week that arrangements have been completed through Hayden, Stone & Co. for the purchase by the Walworth Mfg. Co., Boston, of the Kewanee, Ill., plant of the National Tube Co. On behalf of the Steel Corporation it has been stated that negotiations looking to the acquisition of the Kewanee works by the Boston interests named have been in progress. The product of the Kewanee plant, which is chiefly pipe fittings and valves, the output being 28,000 tons of gray iron and malleable castings per year and 2600 tons of brass castings, complements to a considerable extent that of the Walworth Mfg. Co. The site at Kewanee contains 38 acres of land. The buildings are modern and well equipped with labor-saving devices. About 2500 men are employed. The rolling mills formerly operated at the Kewanee plant by the Western Tube Co., which was the original company, were dismantled in 1908 and the tube mills in 1915 and 1916. The Walworth company was started in 1842 and was the first in the country to manufacture cast iron fittings. It was a pioneer in the installation of steam-heating plants and has been an important factor in the development of steam, water and gas material and fittings. The Stillson wrench is one of its products.

American Electro-Chemical Society Meeting

The thirty-second general meeting of the American Electro-Chemical Society will be held in Pittsburgh, Oct. 3-6. A special feature of the meeting will be a series of papers and discussions on electro-chemical war supplies, and the part the electro-chemical industry will play in the war. The committee in charge is outlining a plan of technical sessions, visits to industrial plants and entertainment features. It invites the delegates to arrive in Pittsburgh on Wednesday, Oct. 3, so as to get together informally and enjoy some recreations which have been planned for them. Thursday, Oct. 4, will be held a regular meeting of the society in the morning, with optional excursions to industrial plants in the afternoon. In the evening an illustrated lecture on a semi-technical subject will be given. Friday, Oct. 4, a symposium on electro-chemical war supplies will be held in the morning, followed by excursions to industrial plants in the afternoon. A subscription dinner will be held at the William Penn Hotel in the evening, with special entertainment features. Saturday, Oct. 5, will be devoted to an all-day excursion, on a special train with complimentary luncheon, to several industrial plants in the Pittsburgh district.

Whitman-Bull Tractor Co. Formed

The Whitman-Bull Tractor Co., St. Louis, capitalized at $1,250,000, has been formed to take over the Whitman Agricultural Co., St. Louis, and the Bull Tractor Co. and the Toro Motor Co., both of Minneapolis, Minn. The equipment of the two Minneapolis plants will be moved to St. Louis and housed in the Whitman plant. The new company will build tractors complete and will continue to make the Whitman line of farming implements. The capital stock of $1,250,000 will be issued in the form of 8 per cent cumulative preferred stock and 12,000 shares of common stock of no par value will also be issued. P. J. Lyons, president Bull Tractor Co., will be president of the new company. The other officers will be: H. L. Whitman, St. Louis; James W. Lyons, Chicago, and P. H. Knoll, Minneapolis, vice-presidents; Lawrence B. Pierce, treasurer and chairman of the board of directors; H. L. Whitman, Jr., secretary and foreign sales manager. These men, with W. A. Bush, Isaac N. Orr and J. D. McCarthy, constitute the board.

The New Britain Machine Co., New Britain, Conn., will devote a large part of its equipment to the manufacture of anti-aircraft gun mounts for the Government. It has put its working force on an 8-hour basis and will take on several hundred new hands to fill the night shifts. It is also planning to make extensive additions to its plant.

Machinery Markets and News of the Works

MUNITIONS CONCERNS BUY

Need Tools on Big Government Orders

General Business Is Active—Shipyards Are Still Making Purchases—Japanese Government Buys Tools in This Country

Munitions contracts recently closed by the United States Government are having their effect on the machine-tool trade. Those concerns receiving contracts which were previously engaged on similar work for the Entente Allies require only a few tools for balancing up their equipment, but some of the orders received have been of good size. The Savage Arms Co., Utica, N. Y., has closed for a number of tools. This concern is making Lewis machine guns for the United States Government and the Allies and is said to have on hand orders aggregating $30,000,000. Some of the other concerns which have received large munitions contracts recently are the Crucible Steel Co., the American Can Co., the Bartlett, Hayward & Co., the Consolidated Car Heating Co., the Westinghouse Electric & Mfg. Co., the East Jersey Pipe Co., the New York Air Brake Co., the American Car & Foundry Co., the Pressed Steel Car Co., the Worthington Pump & Machinery Corporation, the E. W. Bliss Co. and the Washington Steel & Ordnance Co. Considerable business is expected to follow the opening of a joint purchasing office at 50 East Forty-second Street, New York, by the Winchester Repeating Arms Co., the Remington-U. M. C. Co., Bridgeport, Conn., the Remington Arms Co. of Delaware, and the Peters Cartridge Co.

The Aircraft Production Board is going ahead with its plans for a big airplane fleet in anticipation of the passage by Congress of the bill appropriating $639,000,000 for the purpose of training and equipping an army of 75,000 aviators. The Willys-Overland Co. is already at work to attain a production of 15,000 motors a year for training machines, and the Wright-Martin Co. is understood to be expecting a Government contract very soon. The development of a standard motor adapted for fighting airplanes is now being made the subject of special investigation. A heavy volume of inquiry for equipment for building airplane motors and other parts is coming from Detroit. The Nordyke & Marmon Co., Indianapolis, will build 1000 airplane motors within 90 days.

Shipyards strikes have had little appreciable effect on sales of equipment. The Newburgh Shipyards, Inc., with offices at 31 Nassau Street, New York, is equipping a yard at Newburgh, N. Y., to make standardized steel ships and is in the market for considerable equipment, including three locomotive cranes and an overhead crane equipment. The Staten Island Shipbuilding Co., 1 Broadway, New York, will soon close for one 75-ton crane, two 50-ton cranes and a 15-ton crane for its boiler shop. The Baltimore Dry Docks & Shipbuilding Co. has finished its extensive purchases, closing last week for boiler shop equipment. The Tebo Yacht Basin Co., Brooklyn, is equipping its yard for the building of submarine chasers. The Government let many new contracts for chasers, about doubling the number which will be turned out within the next few months. The Fore River Shipbuilding Corporation, Quincy, Mass., has closed for the machine tools it recently inquired for. No time was lost, as the equipment was needed for urgent Government work. The Union Iron Works has closed recently for machine tools aggregating about $400,000 in value. The orders were placed in the East, but the tools will be shipped to the Pacific Coast. The Newport News Shipbuilding & Dry Dock Co. will close for the remainder of its requirements this week.

The Japanese Government, through Commander Godo, 25 Madison Avenue, New York, has been making extensive purchases of machine tools for use in the Government munitions works in Japan. The Pennsylvania Railroad is expected to place an order this week for boiler shop equipment. The Midvale Steel & Ordnance Co. and the Cambria Steel Co. have been making purchases for several weeks past. The Chicago & Northwestern Railroad has placed orders for many of the tools it recently inquired for.

The Government last week closed contracts for 15 mine-storage buildings, and the contractors announced their need of 15 two-ton cranes. The Maryland Shipbuilding Co., Baltimore, is said to have abandoned its plan to buy six five-ton overhead traveling cranes owing to its inability to obtain early deliveries. Several other shipyards are understood to be planning the substitution of other methods of hoisting because of the sold-up condition of the crane-building plants. Eastern shipyards have placed many orders for locomotive cranes.

There has been a good demand the past week for twist drills and small lathes for export. A large number of machine tools purchased months ago for shipment to Russia have been turned back on the market.

On all purchases for the United States Navy, including those for the shipbuilding companies engaged on Government work, the Compensation Board of the Navy now requires of builders of machinery and machine tools a detailed statement showing why present prices of such equipment have advanced in price. The builders are required to justify their prices on the basis of increased costs of material and labor, giving facts and figures that bear out their explanations of the advances. It is understood that the Government is paying half the cost of new equipment required for Government work.

New York

NEW YORK, July 9.

Fire, June 27, at 401-407 Mulberry Street, Newark, N. J., partially destroyed the works of W. J. Bailey & Co., manufacturers of tools, William Link & Co., manufacturers of jewelry, and the H. J. Ruesch Machine Co., operating a machine shop for the manufacture of metal specialties.

The Lidgerwood Mfg. Co., Frelinghuysen Avenue and Peddie Street, Newark, N. J., manufacturer of heisting machinery, will build a new one-story machine shop, about 30 x 125 ft., to cost $7,000.

Edmund Jost's Sons, 48 Dickerson Street, Newark, machinists, specializing in the manufacture of metal goods, will erect a new one-story machine shop, 40 x 100 ft., at 58-60 First Street, to cost $9,000.

The American Handikit Co., Inc., Newark, has leased property at 112-116 Arlington Street and will establish a plant for the manufacture of small tools.

The Hanson & Van Winkle Co., 269 Oliver Street, Newark, manufacturer of dynamos and kindred specialties, has filed plans for a new two and one-half story factory, 46 x 50 ft., at Adams and Chestnut streets, to cost about $15,000.

Benjamin E. Jarvis, Newark, operating a pattern making plant at 113 Mechanic Street, has been incorporated under the name of Benjamin E. Jarvis, Inc., with capital of $50,000 for business expansion. Other incorporators are J. T. Clark and L. C. Lotz.

A power house to cost about $14,000 will be constructed by the Alcohol Products Co. at its new refining plant to be erected at Blanchard Street and the Passaic River, at a cost of about $70,000.

The International Arms & Fuse Co., Grove Street and Bloomfield Avenue, Bloomfield, N. J., is planning for the installation of new automatic screw machinery.

In connection with the proposed rebuilding of the plant in the Kingsland section, Lyndhurst, N. J., of the Canadian Car & Foundry Co., 165 Broadway, New York, Joseph A. Evans, lessee of the plant, will equip the works for shell loading operations to handle Government work. The Ordnance Department, Washington, urged the immediate reconstruction of the plant.

The Babcock & Wilcox Co., East Third Street, Bayonne, N. J., has commenced excavations for the proposed new machine works, 150 x 400 ft., for the construction of marine boilers.

The New Jersey Acetylene Cutting & Wrecking Co., Bayonne, has been organized to operate a plant at 15-19 John Street for cutting and working steel and iron. Samuel and Max Levine head the company.

The Lehigh Valley Railroad, Washington Street, Jersey City, N. J., is said to be having plans prepared for the erection of a new car shop at its works at Perth Amboy. It will be equipped to specialize in locomotive repairs as well as general car work and will include an electric crane for locomotive handling.

The General Bakelite Co., Perth Amboy, N. J., and 2 Rector Street, New York, manufacturer of insulation specialties, will build a three-story addition, 50 x 75 ft., to cost about $20,000.

Van Allen's Convertible Automobile Body Co., 133 Broadway, Paterson, N. J., has been incorporated with a capital of $50,000 to manufacture automobile bodies. Charles H. Van Allen, Alfred H. Post and Alfred H. Post, Jr., are the incorporators.

The Industrial Service Co., Lincoln, N. J., is reported to be planning for the purchase of new locomotive cranes, 15 to 25 tons capacity.

Albert Palmer, Madison, N. J., and associates, have incorporated in Delaware the Washburn Wire Co., with capital of $1,000,000 to manufacture iron, steel, copper and other kinds of wire. Frank R. Series, East Orange, and George F. Handell, Montclair, are other incorporators.

The Aeromarine Plane & Motor Co., East Keyport, N. J., has commenced operations at its new plant for the production and assembling of aeroplanes. It is planning for the immediate erection of an addition.

The Aborn Steel Co., 105 Leroy Street, New York, has acquired about 25 x 90 ft., at 22 Clarke Street, for the erection of a one and two-story building to cost $10,000.

The Bacon Engineering Co., New York, has been incorporated with a capital of $10,000 to manufacture automatic machines and engage in allied engineering work. S. H. and M. Wishnew, 406 Pulaski Street, Brooklyn, are the incorporators.

The Sperry Gyroscope Co., 40 Flatbush Avenue Extension, Brooklyn, N. Y., manufacturer of gyroscopes, etc., has awarded a contract for the construction of an 11-story and basement, reinforced-concrete addition to its plant, 100 x 110 ft., at the Manhattan Bridge Plaza.

The Ridgway Steel Products Corporation, New York, has been incorporated with a capital of $10,000 to manufacture iron and steel specialties. E. G. Wood, A. B. Romen and C. Stahl, 11 East Forty-fifth Street, are the incorporators.

The Lowry-Knise Tool Co., Syracuse, N. Y., has been incorporated with a capital of $10,000, to manufacture tools, dies and machinery. The incorporators, all of Syracuse, are E. N. Lowry and E. E. and A. E. Knise.

The W. A. Mills Brass Co., Port Chester, N. Y., has been incorporated with a capital of $25,000 to manufacture brass, copper and other metal goods. W. A. and W. A. Mills, Jr., and C. W. Stevens are the incorporators.

The George Schautz Engineering Co., Buffalo, has been incorporated with capital of $30,000 to manufacture cranes and parts. George and J. A. Schautz and F. J. Leuthner, Buffalo, are the incorporators.

The Buffalo Pressed Steel Co., Inc., Buffalo, has increased its capital from $30,000 to $75,000.

Cousins & Son, 73 Washington Street, Buffalo, manufacturers of boilers, tanks, stacks, etc., have incorporated under the name of the J. D. Cousins & Sons Boiler Works, with capital of $50,000. J. D., L. A. and J. Cousins are the incorporators.

The Bayonne Nut & Bolt Co., Bayonne, has purchased additional machinery for an extension to its plant, to be completed and in operation in the fall.

The B. Meyerovich Engineering Co., Moscow, Russia, has opened a branch office at 1675 Broadway, New York, and is in the market, according to its representative, for large quantities of machinery, tools and metals. The aim of the New York branch is to further the distribution of American machinery and tools in Russia. Mr. Meyerovich, chief engineer, intends coming to this country soon to extend the company's business.

The Caledonia Bean Harvester Works, Caledonia, N. Y., has had plans prepared for a foundry, 70 x 100 ft., one story. W. H. Brownell is manager.

A boiler house to cost $15,000 is to be erected by the Fabrikoid Co., Newburgh, N. Y.

Burdick & Son, Inc., 72 Hamilton Street, Albany, will erect two additions to its factory, 66 x 120 ft. and 66 x 70 ft., four stories and basement, to cost $40,000.

New England

BOSTON, July 7.

It is becoming more evident day by day that New England is destined to play an important part in the munitions business of the United States. There is little being said about munition contracts, but one by one various plants are being expanded to take care of the business placed by the Government. Machine tool builders and their agents have a large number of proposals all figured for various plants in New England, but the Government's delay in placing orders has in some cases held up these proposals so long that the agents have been compelled to withdraw them. The total business, present and prospective, is enormous, and it is a big question if even extreme measures to overcome the labor shortage will enable the manufacturers to produce machine tools as fast as needed. Government work, direct and indirect, is getting the preference everywhere, and private customers are accepting the situation with little complaint. The Fore River Shipbuilding Corporation is reported to have closed for the entire list issued a short time ago.

The New Britain Machine Co., New Britain, Conn., has accepted a direct contract from the War Department to manufacture anti-aircraft gun mounts. It is reported that this contract totals nearly $2,000,000 and the company is starting to expand its plant greatly in order to fill the contract.

The General Electric Co. will move its fan motor department from Pittsfield, Mass., to Watsessing, N. J., in the fall. It is understood that the scarcity of labor has been one factor in bringing this change about.

The New England Power Co., which now has several electric plants in operation in the Connecticut and Deerfield valleys, is planning an expenditure of $7,000,000 for a 112,000,000-kw.-hr. electric power plant on the Deerfield River at Readsboro, Vt.

The Carver Cotton Gin Co., East Bridgewater, Mass., has been incorporated with authorized capital stock of $600,000. The directors are Henry F. Knight, president; Arthur F. Johnson, 50 State Street, Boston, secretary; and H. W. King.

The Bristol Brass Co., Bristol, Conn., is building a one-story addition, 50 x 120 ft. This addition will be used temporarily for storage purposes, but later will form a part of the casting shop.

The Auto Parts Mfg. Co., Waltham, Mass., has been incorporated with authorized capital stock of $50,000. The directors are Charles J. Batcheller, president; John Wylie, Lynnfield Centre, treasurer, and H. W. Batcheller.

The Rimmon Eyelet Co., Seymour, Conn., has awarded a contract for a two-story factory, 50 x 125 ft.

The Dighton Furnace Co., Chelsea, Mass., has been incorporated with authorized capital stock of $25,000. The directors are John H. McNary, 17 John Street, president and treasurer; G. M. Hallahan and A. M. Peirce.

The North & Judd Mfg. Co., New Britain, Conn., is having plans figured for an addition, 70 x 150 ft., one story.

The Hope Foundry Co., Cranston, R. I., has been incorporated with authorized capital stock of $30,000. The incorporators are John E. Costello, 1045 Elmwood Avenue,

Providence; Edward J. Magee, Providence, and Richard S. Smith, Warren.

The Fafnir Bearing Co., New Britain, Conn., has awarded a contract for an addition 50 x 80 ft., one story.

The Cumberland Shipbuilding Co. has been organized at Portland, Me., with the following officers: James C. Hamlen, president; James C. Hamlen, Jr., vice-president; Seth A. Moulton, general manager. The company proposes to build 2000-ton ships at South Portland.

The New Britain Machine Co., New Britain, Conn., which has accepted a large contract to make anti-aircraft gun mounts, is adding two stories to a five-story building, 38 x 260 ft., and is to add three stories to a four-story building, 55 x 380 ft., which is now under construction.

The Turner & Seymour Mfg. Co., Torrington, Conn., has awarded a contract for an addition to its foundry, 50 x 150 ft.

The Smith & Wesson Co., Springfield, Mass., has begun the erection of a five-story addition, 60 x 200 ft.

The S. A. Woods Machine Co., South Boston, Mass., is having plans drawn for a one-story addition, 90 x 100 ft.

The General Electric Co. has awarded a contract for the erection of a four-story foundry, 80 x 340 ft., on Porter Street, East Boston.

The Acme Stamping Co., Torrington, Conn., has been incorporated with authorized capital stock of $20,000 by Morris Weiss, James D. Hutton and Michael S. Cimmino.

The Miamus Motor Works, Stamford, Conn., has awarded a contract for a one-story addition, 42 x 66 ft.

The Anderson Die Machine Co., Bridgeport, Conn., has increased its capital stock from $25,000 to $50,000.

Sargent & Co., New Haven, Conn., have awarded a contract for an addition, 228 x 314 ft., one-story.

The Warren Steam Pump Co., Warren, Mass., has awarded a contract for a one-story addition, 64 x 105 ft.

The Scovill Mfg. Co., Waterbury, Conn., has awarded a contract for a pattern building, 62 x 216 ft., four stories.

Philadelphia

PHILADELPHIA, July 9.

The Scott Paper Co., Seventh and Glenwood avenues, Philadelphia, has commenced the erection of a new three-story building at Chester, Pa., 70 x 156 ft. to comprise the final unit of recent extensions to its factory. E. I. Scott is president.

The Demas Armor-Cased Tire Saving Co., Philadelphia, has been incorporated with a capital of $200,000 to manufacture tires and special tire casings. George H. B. Martin, Philadelphia, and S. C. Seymour, Camden, N. J., are the incorporators.

The H. Belfield Co., 435 North Broad Street, Philadelphia, manufacturer of steam fittings, plumbers' supplies, etc., has acquired property at Cambria and Twentieth streets, about 275 x 300 ft., and is said to be planning to use the site for extensions.

George W. McKonn and J. F. Cushman, Philadelphia, have organized a company to construct and operate a shipbuilding plant near Wilmington, N. C. Property has been acquired on the Cape Fear River for the proposed works.

The Plexus Tire & Rubber Co., Philadelphia, has awarded a contract for the erection of a new one-story plant, about 50 x 130 ft., at State Road and Levick Street to cost $20,000.

The Bound Brook Engine & Mfg. Co., Philadelphia, has been incorporated with a capital of $300,000 to manufacture engines and kindred equipment. Root C. Finder, H. Wolfenden and Wray C. Arnold, Philadelphia, are the incorporators.

The Pennsylvania Equipment Co., 1438 South Penn Square, Philadelphia, is said to be in the market for a number of marine engines of different types and sizes for vessels now being constructed for the Emergency Fleet Corporation.

The Bernstein Mfg. Co., Ford St., Philadelphia, manufacturer of iron and steel products, is taking bids for the erection of an addition to its plant at Third Street and Allegheny Avenue.

S. W. Evans & Son, 4623 Paul Street, Philadelphia, manufacturers of wire goods, will erect an addition to their plant.

The American Bridge Co., Trenton, N. J., is said to be planning for additions to its plant to cost about $1,000,000, to be used in shipbuilding operations, a new department which has been inaugurated by the company. The proposed buildings will be located at South Trenton, and will be equipped to specialize in barges and boats of kindred type.

The Camden Forge Co., Elm Street, Camden, N. J., specializing in the production of iron and steel forgings, has increased its capital from $100,000 to $500,000.

The Atlantic City Steamship & Terminal Co., Atlantic City, N. J., has been incorporated with a capital of $300,000 to construct a shipyard. C. H. Jeffries, L. D. Alger and G. S. Brooks are the incorporators.

The Chester Shipbuilding Co., Chester, Pa., is reported to be planning for the construction of a new shipbuilding plant near Savannah, Ga. C. M. P. Jack is general manager.

The United States Gauge Co., Sellersville, Pa., manufacturer of gages, etc., is having plans prepared for a three-story addition, about 50 x 50 ft.

The Miller Auto Co., Harrisburg, Pa., has been organized by W. H. Miller, B. F. Barker and A. H. Snyder to manufacture automobiles, motor trucks and parts.

The Traylor Engineering & Mfg. Co., Allentown, Pa., is arranging for the immediate construction of marine engines, boilers and kindred equipment of 1400 hp. capacity for the ships to be built at the works of the Traylor Shipbuilding Co., Cornwells, a subsidiary organization. The company will build ten vessels, to be completed early in 1918.

The Crown Smelting Co., Concord Avenue and Patterson Street, Chester, Pa., specializing in the production of babbitt metal and brass specialties, is building a two-story addition to its main plant.

The Lancaster General Hospital, Lancaster, Pa., is planning for the erection of a new electric power house, at a cost of about $18,000.

The Greenough Coal Co., recently organized by Thomas J. Mitchell, Uniontown, Pa., and associates, is said to be planning for the installation of an electric power plant on its properties at Hellier, Ky.

The Leetsdale Foundry & Mfg. Co., Leetsdale, Pa., a Delaware corporation, has increased its capital from $30,000 to $80,000.

The Donaldson Iron Co., Broad Street, Emaus, Pa., manufacturer of iron pipe and tubing, has increased its capital from $200,000 to $400,000. It is reported that the company plans for expansion. John D. Ormrod is president.

The Brinton Motor Truck Co., recently incorporated for $20,000, has opened an office at 5740 Cherry Street, Philadelphia.

Baltimore

BALTIMORE, MD., July 9.

The Maryland Brass & Metal Works, Guilford Avenue and Federal Street, Baltimore, will build a two-story, 46 x 88-ft. addition. William Gisriel, Jr., is president and general manager.

C. H. Crook, 28 Light Street, Baltimore, is interested in a shipbuilding plant to be established in Baltimore. It is understood that a large tract of land on deep water adjoining part of the property of the Baltimore Dry Docks & Shipbuilding Co. has been taken over. The McLean Contracting Co., foot of East Fort Avenue, O. B. Coblentz, president, also is understood to be interested.

The Baltimore Gas Appliance Co., Bayard and Hamburg streets, Baltimore, Md., has awarded a contract for the erection of a new one-story plant on South Carey Street as an extension to its works.

The Black & Decker Mfg. Co., 105 South Calvert Street, Baltimore, Md., manufacturer of electric drills, air compressors, etc., is taking bids for the erection of the first unit of a new machine works and plant to be erected at property recently acquired at Towson, Md. The structure will be one story, 60 x 200 ft. Herman F. Doeleman, American Building, is engineer.

The McNamara Brothers Co., Ransteads Wharf, Baltimore, Md., manufacturer of boilers, tanks, etc., is taking bids for the erection of a new two-story plant, 80 x 160 ft., on South Bush Street.

The Southern Railway Co. is building extensions to its car repair works at Spencer, N. C., to provide for a total capacity of 225 cars. The additions consist of a one-story shop building, 50 x 100 ft., and shed 600 x 900 ft. It is said that the new machinery to be installed will be operated with individual motor drive.

The Terminal Shipbuilding & Engineering Corporation, Norfolk, Va., has been incorporated with a capital of $100,000 to construct and operate a local shipbuilding plant. G. Vernon Meakin is president.

The Union Truck Co., Morgantown, W. Va., has been incorporated with a capital of $25,000 to manufacture motor trucks. C. C. Brown, M. L. Clovis and E. M. Everly, Morgantown, are the incorporators.

The Richmond Foundry Mfg. Co., Richmond, Va., has increased its capital from $100,000 to $400,000.

Chicago

CHICAGO, July 9.

Orders placed by the Chicago & Northwestern Railroad against its list of approximately 100 tools made the week a good one with several of the dealers, especially those who did not withdraw their quotations following the recent advance in prices. Others foresaw the advance and made their quotations sufficiently high to cover themselves.

Much comment is heard concerning the greatly lessened operations of the makers of pleasure automobiles, which, in turn, affect the manufacturers of parts. Foundries which specialized in automobile castings are slowing up to an extent which forces them to let men go, and in one instance a capable foundry foreman is looking for another position. While the truck business can replace the pleasure car activity to a considerable extent, it is realized that there are a great many parts and attachments used in pleasure cars that are not needed on automobile trucks, also that firms which have not specialized on the latter cannot always easily switch over to their manufacture.

Munitions manufacture appears to be making small headway in this section, but it is expected to quicken before long. A local valve manufacturing company has a contract for turning out 330,000 small shells, and will strive to complete the order in five months, with the assistance of sub-contractors. The company has been productive of fairly good orders for machine tools.

As a result of large orders placed in the East, deliveries on both large and small turret lathes of some makes have been pushed ahead. Inquiries continue to be received from both the Atlantic and Pacific coasts for machines needed by shipbuilders, the greater demand coming from the Pacific.

Extensions to industrial plants are more numerous than in previous months. Reinforced concrete is used almost invariably because of the scarcity of structural steel.

The International Airship Corporation, 36 South State Street, Chicago, is soon to begin work on a one and two-story reinforced concrete and steel factory, 100 x 600 ft., to cost about $100,000. Three hangars, each 80 x 100 ft., mostly of wood, are also to be constructed. W. H. Pruyn, architect, 122 South Michigan Avenue, will award the contracts.

The Felt & Tarrant Mfg. Co., Chicago, manufacturer of comptometers and calculating machines, will erect a five-story reinforced concrete addition, 45 x 75 ft., to its plant in North Paulina Street. Bids will be taken by L. G. Hallberg & Co., 116 South Michigan Avenue.

The Patent Vulcanite Roofing Co. will erect a one-story mill construction addition, 140 x 170 ft., to its plant at 2529-2543 West Forty-eighth Street, Chicago, at an estimated cost of $70,000.

The general contract has been awarded for another story to a three-story machine shop, 50 x 125 ft., for the Elmes Engineering Co., 216 North Morgan Street, Chicago.

Plans have been prepared for an additional story, 45 x 95 ft., to a pump building at 136th Street and Brandon Avenue, Hegewisch, for the Western Steel Car & Foundry Co., to cost over $8,000.

The general contract has been let for a three-story manufacturing building, 55 x 120 and 69 x 82, for G. M. Marks, 1239 to 1243 West Madison Street, Chicago.

Plans for a machine shop, 75 x 130 ft., have been prepared by L. H. Bronson, 842 Kinzie Street, Chicago.

The C. H. Hansen Co., 178 North Clark Street, Chicago, is planning to build a three-story addition, 50 x 100 ft., to its factory, at an estimated cost of $25,000.

The Pan-American Motor Co., Decatur, Ill., is planning the erecting of a factory to cost $30,000.

An addition, 100 x 750 ft., will be built by the Universal Tractor Co., Waukegan, Ill.

It has been reported that the L. Wolff Mfg. Co., Chicago, manufacturer of plumbing supplies, would remove its plant to Michigan City, Mich. The company states that while it has purchased land in Michigan City, and may eventually build, there is no justification at this time for saying that the entire plant will be removed from Chicago.

The Standard Spiral Pipe Works, Chicago, which recently suffered a heavy loss due to a fire which destroyed its entire plant, has rebuilt, new machinery is being installed, and work will be resumed soon. The company is also erecting a building more than twice as large as the original, in which will be installed, besides an additional pipe shop, a forge department, 75 by 150 ft., which will have an equipment of 20 hammers, both board and steam drop; also bull dozers and Bradley hammers.

Milwaukee

MILWAUKEE, WIS., July 9.

In the absence of expected developments relative to Government buying of machine tools, local tool builders continue in a state of suspense, but at the same time are using every effort to produce and deliver existing bookings which, added to new orders, will keep local shops fully occupied long past the end of the year. While immediate business is good, it is without feature, and shows little change from the conditions in recent weeks. Orders come from all parts of the country, and from practically every division of the metal-working industry. The Pacific coast, which has become an important buying factor, continues to place a fair amount of business in small lots. The volume and nature of inquiries received indicate a large amount of business in sight.

The Milwaukee Electric Crane & Mfg. Co., Milwaukee, Sixtieth and Greenfield Avenues, West Allis, formerly owned by the Fred M. Prescott Steam Pump Co., has reached full capacity production, and is making regular deliveries. A large volume of orders is being booked from all parts of the United States and Canada, for overhead electric traveling cranes of from 2 to 100 tons' capacity, single line grab buckets, and electric hoists.

The Killen-Strait Tractor Co., Appleton, Wis., manufacturer of gas engines, tractors, etc., expects to complete work this week on its new foundry, 48 x 70 ft., which will provide facilities enabling the company to manufacture all of its own castings. Heretofore the heavier castings were purchased from outside foundries.

The Lipman Refrigerator & Car Mfg. Co., Beloit, Wis., will award contracts within the next 10 days for the erection of the first units of its proposed plant for the manufacture of refrigerator cars and the installation of refrigerating systems in old cars. The initial expenditure will be about $50,000. Plans have been prepared for a machine shop, foundry, sheet metal shop and office building and track storage sheds.

W. S. Blachley, Kilbourn, Wis., operating a machine and automobile repair shop, has erected a 40 x 100-ft. addition, and will install additional equipment.

The Appleton Auto Body Co., Appleton, Wis., which established a plant at Fremont and Jefferson Streets in leased quarters in February, is having tentative plans prepared for a manufacturing plant, with wood and metal-working shops, to be erected during the fall and winter C. C. Seeger is vice-president and general manager.

Detroit

DETROIT, July 2.

It is stated that Detroit will receive about 60 per cent of the $600,000,000 the Government will spend for airplanes, and the large automobile factories are preparing for big orders. Jobbers report many inquiries of unprecedented size on special machines and manufacturers are planning to change their equipment to make munitions and war material.

Deliveries are slowing up and quotations being made on next year's delivery of lathes and milling machines, which are hardest to get. Drill presses are also quoted for long-time delivery. Grinders are more easily obtainable.

Automobile companies report a good business, with nearly a normal demand in pleasure cars. Labor is well employed at high wages, with a shortage in skilled lines.

The U. S. Pressed Steel Co., Ypsilanti, Mich., is laying the foundation for another extension to its plant.

The Samson Trailer Co., Grand Rapids, Mich., organized some time ago to manufacture auto and tractor trailers, has been incorporated with a capital stock of $150,000. Frank T. Hulswit and David A. Warner are stockholders.

Dodge Brothers, Detroit, manufacturers of automobiles, are taking bids for the erection of a seven-story brick and concrete addition to their plant, about 165 x 275 ft. Smith, Hinschman & Grylls, Detroit, are the architects.

The Hayes Motor Truck Wheel Co., St. Johns, Mich., is planning to increase its equipment to manufacture 500 wheels a day instead of 200.

The Hamilton Motors Co., Grand Haven, Mich., has about completed its factory buildings and will shortly turn out trucks in large numbers. It is capitalized at $500,000.

The Napoleon Motor Co., Napoleon, Ohio, is removing its plant to Traverse City, Mich., where it will manufacture pleasure cars and motor trucks.

The Leonard Tractor Co., Jackson, Mich., has begun business with a capital of $1,000,000 common and $500,000 preferred stock of which $1,000,000 has been subscribed.

It is announced that the Metzger Register Co. will remove from Elkhart, Ind., to Grand Rapids, Mich. Leroy Metzger is head of the company, which is capitalized at $50,000.

The General Machine & Tool Co., Jackson, Mich., has been incorporated with a capital stock of $24,000 to manufacture machinery and tools. Among the incorporators are Louis Paul, P. W. Rogers and J. W. Myers.

Cleveland

CLEVELAND, July 9.

There is a heavy volume of inquiry for equipment for building airplane motors and other parts, much of this coming from Detroit. One inquiry from this source is for forty-three turret lathes for work on airplane engines. It is understood that two types of engines for airplanes will be built in Detroit, one by a leading automobile company and another by a new company that is being formed, and in which Henry M. Leland and his son, Wilfred C. Leland, formerly of the Cadillac Motor Car Co., are interested. There is a good demand for both turret lathes and automatic screw machines, about one-half of the inquiries being for machines for Government work.

While machine tool builders generally report a good volume of business, the market has quieted down among dealers the past few days, both in volume of orders and inquiries. Sales have been confined largely to single machines and small lots. Inquiries have fallen off, and practically no inquiry of any size has come out. Considerable business, however, is pending in inquiries that developed during the previous week or two.

There is a heavy demand for locomotive cranes from Eastern shipyards, one of which has placed orders with a Cleveland manufacturer for 16 cranes.

Bardons & Oliver, Cleveland, have withdrawn all prices on their line of turret lathes. This firm has not definitely decided what its advance will be, but in the meantime is making quotations at about 11 per cent above its recent prices.

The Cleveland Pneumatic Tool Co., which is building a new plant, is in the market for equipment, including lathes, shapers, and milling and drilling machines. No formal list has been prepared, but a number of machines will be required.

The Cowles Tool Co., Cleveland, recently organized, will manufacture milling cutters, and later will add reamers to its ine of products. The company is building a plant at 2086 West 110th Street. E. A. Cowles is president.

The Simplex Cable Hoist Co., Cleveland, has been incorporated with a capital stock of $10,000 by H. C. Quigley and others, to make hoisting machinery.

The Wellman-Seaver-Morgan Co., Cleveland, has recently taken orders for two car dumpers, one for the Brier Hill Steel Co., and the other for the Utah Copper Co.

Plan have been prepared by the Forest City Engineering Co. for a new plant, one story, 60 x 200 ft., to be erected at East 152d Street and St. Clair Avenue, Cleveland, by the Blomquist-Eck Machinery & Mfg. Co. It will install about $20,000 worth of new machinery, orders for most of which were placed some time ago.

The Anderson Mfg. Co., Elyria, Ohio, has been incorporated with a capital stock of $25,000 by A. G. Anderson and others, to manufacture tools and dies, succeeding the Cleveland Die Tool & Engineering Co. The new company was made to effect a change in the name which was given to the former company before its removal from Cleveland to Elyria.

Cincinnati

CINCINNATI, July 9.

A number of Government contracts that have been let to Dayton, Ohio, firms for die work have caused a good demand for shaping machines. The foreign call for machine tools continues good, but shipments are being made only to France and England. There is also quite a demand from these countries for portable electric tools. The Government has also placed a number of orders for portable electric drilling machines, the latest one reported having been received by the Standard Electric Tool Co., Cincinnati, covering 35 of its standard ½-in. machines.

Sawmill equipment is in good demand, especially in the South. Internal combustion engine makers are busy. The high cost of boilers has caused the substitution of gas engines instead of steam engines in a large number of instances. The report that a Hamilton, Ohio, firm had received an order for a large number of marine engines is denied.

The Cincinnati Bickford Tool Co., Oakley, Cincinnati, has added an extension to its plant, 30 x 125 ft., which will be used principally as an assembling department. Later the company plans to make an addition to its main shop. A. H. Tuechter is president.

The Cisco Machine Tool Co., Cincinnati, will build an addition, 59 x 200 ft., two stories. G. Mil Horton is general manager.

The Fosdick Machine Tool Co., Cincinnati, is making an addition to its plant at Northside that will largely increase its capacity. N. B. Chace is general manager.

The Dayton Stamping & Tool Co., Dayton, has been incorporated with $250,000 capital stock by James G. Mitchell, Frank Moeschl, and others. The company, heretofore operating under a partnership agreement, will remove its plant to 348-352 Xenia Avenue. It has lately received a Government contract.

The Ohmer Fare Register Co., Dayton, expects to extend its plant in Edgemont.

The Pasteur-Chamberland Filter Co., Dayton, has recently received a Government contract for electric searchlights, and is adding to its plant in North Dayton.

The Hampton-Scott Co., Columbus, Ohio, is building an addition to its plant in Grove City suburb, 50 x 150 ft., two stories. It manufactures metal specialties.

The Banner Pattern Works, Columbus, Ohio, whose plant was recently destroyed by fire, has secured quarters in the former Born bottling plant. The Franklin Die & Tool Co. will also remove to the same building.

The Hill Pump Co., Anderson, Ind., will erect an addition to its plant, 44 x 97 ft., one story.

The American Safe & Lock Co., Anderson, Ind., has plans under way for a foundry addition.

On July 1 fire damaged the plant of the Union Light, Heat & Power Co., Newport, Ky., causing an estimated loss of $25,000, mainly to the supply house. The machinery was only slightly damaged.

The Ironton Punch & Shear Co., Ironton, Ohio, is in the market for a 60-in. or 72-in. boring mill, similar to the Fosdick type.

Indianapolis

INDIANAPOLIS, July 9.

The East Chicago Foundry Co., East Chicago, Ind., has been incorporated with $30,000 capital stock to manufacture iron and steel products. The directors are Harry C. Stuart, Henry S. Evans and William F. Graver.

The Grapho-Metal Packing Co., Indianapolis, has been incorporated with $15,000 capital stock to manufacture machinery. The directors are Egbert M. Hamlet, James Ostrander and Albert M. Bristor.

The Highway Iron Products Co., Indianapolis, has been incorporated to manufacture road machinery. The directors are Hubert Loeser, M. L. Joseph and C. V. Joseph.

The Beatty Machine & Mfg. Co., Hammond, Ind., has been incorporated with $250,000 capital stock to manufacture machinery. The directors are William R. Beatty, P. H. Joyce, H. J. Cassady, John E. Fitzgerald and H. J. Aaron.

The James H. Johnson Co., Indianapolis, has been incorporated with $20,000 capital stock to manufacture gasoline saving devices. The directors are James H. and George W. Johnson, Bullochville, Ga., and Thomas H. Johnson, Shiloh, Ga.

The Central South

LOUISVILLE, KY., July 9.

General business is good, with oil well and coal mining interests active buyers of supplies and equipment. Several railroad construction projects are to open. Local building operations have fallen off temporarily, although construction work on additions to factories is going forward.

The Dow Wire & Iron Works, Louisville, is going rather extensively into the manufacture of automobile accessories.

The Roy C. Whayne Supply Co., Louisville, is in the market for an Austin or Parsons trench machine to cut 6 ft. deep, 36 in. wide; also a machine to cut 13 ft. deep and 40 in. wide.

The Riddle Coal Co., Chattanooga, Tenn., is in the market for used electric trolley or storage motors, 36 and 42-in. gage, in good condition.

The John G. Duncan Co., Knoxville, Tenn., is in the market for a second-hand, left-hand Corliss engine, 22 x 42,

heavy duty preferred, in good condition, for immediate delivery; second-hand hoisting engine, steel derrick, with bull wheel; iron planer, 4 or 5 ft. between housings, 10 or 12 ft. long and 4 or 5 ft. high; second-hand gasoline engine, 30 or 40 hp.; hoisting engine, with two cylinders and drum, to carry 600 ft. of ¾-in rope; 10-hp. John F. Byers single cylinder, double drum hoisting engine and boiler; and dealers' prices on second-hand rail straightener, immediate delivery.

Birmingham

BIRMINGHAM, ALA., July 9.

An active demand exists in practically all lines of iron and steel and woodworking machinery and for equipment for coal mines, lumber mills and graphite plants. Dealers are more concerned with delivery than anything else.

Announcement of the specific placement of $11,000,000 to be devoted to plant extension at Birmingham by the United States Steel Corporation is expected in part or whole at an early date.

W. F. Owen, president Gulf, Mobile & Northern Railroad, announces that the board of directors have voted $1,000,000 for dock improvements at Choctaw Point, Mobile, similar to the Bush terminals in Brooklyn.

The Jeffris Lumber Co., Jeffris, La., will build a mill with dry kilns and manufacture wirebound boxes and veneer. The plant will cost $300,000. The company has connection with Armour & Co., Chicago.

The United States Maritime Corporation, Brunswick, Ga., has been organized with capital stock of $2,500,000 to build ships for the Government. Stockholders of the Freighters' Ship Construction Co., Stonington, Conn., are interested.

R. J. Edenfield, Augusta, Ga., and W. E. Moore & Co., Pittsburgh, engineers, have obtained a franchise and propose to build a hydroelectric plant near Augusta, Ga.

St. Louis

ST. LOUIS, July 7.

There are indications of improvement in the demand for machinery, though dealers would scarcely become enthusiastic over any increase, as they are hard put to it now to satisfy customers on deliveries, which are becoming more extended. This section is only feeling the pressure for shipbuilding tools in an indirect manner, and local industries continue to wait for more definite tendencies before contracting for replacements on extensions. Operations, however, continue at a high level.

The Mid-West Mfg. Co., St. Louis, has been incorporated with a capital stock of $20,000 by C. A. Rising, Charles J. Benson and Edward D'Arcy, to manufacture machinery.

The Wielandy-Reller Auto Equipment Co., St. Louis, has been incorporated with a capital stock of $20,000 by Frank H. Wielandy, Paul J. Wielandy and Oliver A. Reller to manufacture automobile equipment.

The Planters' Gin Co., Crawfordsville, Ark., has been incorporated with a capital stock of $25,000 by Guy A. Blann, J. C. Huffman, B. E. Bean, and others, and will equip a cotton ginnery.

The Farmers' Gin Co., Dermott, Ark., has been incorporated with a capital stock of $30,000 by G. W. Lambert, E. P. Remley and W. E. Lephieu, and will equip a cotton ginning plant.

The Middle West Gas & Electric Co., Springdale, Ark., has bought the Springdale Light & Power Co.'s plant and will add to the equipment to furnish power and light for several towns. The expenditure of about $75,000 for machinery is contemplated.

The Wilson Coal & Ice Co., Wilson, Ark., has been incorporated with a capital stock of $25,000 by A. B. Hill, R. E. Lee Wilson and T. A. Gillette and will install equipment for the manufacture of ice.

The Monroe Power Screw Driver Co., Shawnee, Okla., has organized and will receive bids in 60 to 90 days for air or electrically driven equipment for its manufacturing plant. L. C. Webster, box 12, may be addressed.

The O. K. Storage Battery Co., Oklahoma City, Okla., has been incorporated to manufacture storage batteries, with a capital stock of $100,000, by A. F. Fricks, Earl Rueb and C. F. Wilson.

The Reedy Auto Truck & Trailer Co., Tulsa, Okla., has been incorporated with a capital stock of $50,000 by James J. H. Reedy, G. C. Bizzell, and others.

The Richardson Aeroplane Co., New Orleans, La., will build an addition and install new equipment for the manufacture of aeroplanes.

Texas

AUSTIN, TEX., July 7.

The machinery and tool trades showed unexpected dullness the past week. It is reported, however, that many orders of considerable magnitude are pending, particularly for heavy machinery. Crop conditions show a material improvement.

The Texas & Pacific Coal Co., which has 25 producing natural gas wells near Thurber, with a total daily capacity of about 50,000,000 cu. ft., has finished the survey for a pipe line to run from Thurber to Fort Worth and Dallas.

Swift & Co., Chicago, have awarded a contract for the construction of a cotton seed oil refinery at Houston, to cost $250,000. The plant will include a four-story refinery, two-story packing house, boiler and engine building, office building, black grease plant and storage tanks.

The De Leon Compress & Warehouse Co., De Leon, incorporated with a capital stock of $40,000, will install additional machinery in its cotton compresses at De Leon and Cisco.

The Hardwick-Roberts Heater Co., Fort Worth, will build a factory to cost about $50,000, to make a device for heating automobiles.

The Atlas Wind Mill Co., incorporated at Wichita Falls, will build a plant to cost about $150,000, to manufacture wind mills. J. E. Robertson, Mineral Wells., Tex., is president.

California

SAN FRANCISCO, July 3.

Aside from Government work and work more or less directly dependent on Government demands, the inquiry for machinery and tools has eased off. A good demand is noted for second-hand machinery. A lot of old machinery abandoned for years and no longer usable is being sold for scrap. In one case machinery from a lumber mill burned twenty years ago has been unearthed and shipped to San Francisco for scrap.

The round house, machine shop and blacksmith shop of the Verdi Lumber Co., Verdi, Nev., was burned last week with a loss of between $50,000 and $60,000. The shops and round house will be replaced as soon as the equipment can be secured.

The Bean Spray Pump Co., San Jose, Cal., is increasing its capital stock from $500,000 to $1,000,000, a part of the additional capital to be used in building and equipping an additional foundry, blacksmith shop, warehouse, and in the purchase of new machine tools, and the remainder for working capital. A frontage of 540 ft. has been secured.

The Craig Shipbuilding Co., Long Beach, Cal., has increased its capital stock $500,000.

The Benicia Shipbuilding Co., has increased its capital stock by $200,000, to be used in equipping a shipbuilding plant on San Francisco Bay.

The Edwin Forrest Forge Co., Oakland, Cal., has bought 40,000 sq. ft. on which it will erect shops for making cams, cranks, steamboat shafting, ship smithing and other machine forgings.

The Stuart Machine Co., San Francisco, has been incorporated with a capital stock of $12,000 by W. A. Plummer, E. A. Bruer, John L. Stuart, Edwin B. Thoming and W. R. Morris to manufacture a machine for inserting grommets and eyelets in canvas.

The Hollywood Shipbuilding Co., Oakland, Cal., has been organized and will be incorporated with a capital stock of $1,500,000 by David Hollywood, Frank J. Woodward, J. F. Carlson, Arthur Arlett, E. C. Proctor, Hiram Johnson, Jr., F. W. Hollman and Clarence J. Berry. The company has secured a site of 26 acres with 1000 ft. of water frontage on San Francisco Bay. It has received Government contracts for six steel steamers of 8800 tons each.

The Bern Shock Absorbing Wheel Co., San Francisco, has been incorporated with a capital stock of $50,000 by J. P. Bern, E. B. Cushman, C. Vargas, L. L. Levinson and O. L. Berry.

J. A. Johnson, San Francisco, and E. B. Noble, Berkeley, Cal., have bought property on the water front at Benicia, Cal., to be used as a site for a shipbuilding plant.

The C. L. Best Gas Traction Co., San Leandro, Cal., will double the capacity of its traction engine manufacturing plant.

The Globe Foundry & Mfg. Co., Berkeley, Cal., has been incorporated with a capital stock of $50,000 by A. J. Tucker, R. S. Elliott and H. R. Elliott.

The Engineering Products Co., San Francisco, has been

incorporated with a capital stock of $10,000 by Louis P. Howe, M. Syme and A. H. Picketts.

The Los Angeles Shipbuilding & Dry Dock Co., Los Angeles, will erect a two-story plate shop, about 66 x 320 ft., at its shipbuilding plant now in course of erection on Smith Island, to cost $10,000. The company has also filed plans for a one-story shop building, 20 x 100 ft. S. L. Napthaly is vice-president and general manager.

The Hobbs Storage Battery Co., Los Angeles, has been incorporated with a capital of $100,000 to manufacture storage batteries and other electrical equipment. A. A. Hobbs, A. W. Bumiller, S. M. Haskins and H. V. Andrews are the incorporators.

The Pacific Glass Casket Co., 416 Merritt Building, Los Angeles, has filed plans for the construction of a one-story machine shop on Twenty-second Street, Santa Monica.

C. E. Fulton, Los Angeles Harbor, San Pedro, operating a shipbuilding plant on Morman Island, is planning to increase the capacity of the present works to provide for the construction of several vessels simultaneously.

The Interlocking Marine Device Co., Los Angeles, has been incorporated with a capital of $10,000 to manufacture a device for marine service. The incorporators, all of Los Angeles, are E. Avery Newton, A. H. Koebig, and Henry W. Schlueter.

The American Carbon Co., Los Angeles, has been incorporated with a capital of $350,000 to operate a local works for the production of carbon and allied specialties. Henry N. and John B. Livezey, and Walter W. Evans, Jr., Los Angeles, are the incorporators.

The Banning Ship Yard, Los Angeles Harbor, San Pedro, operating a shipbuilding plant at the south end of Morman Island, will install new machinery and equipment to increase the capacity of its works. The company has received a contract from the Government for two standard-type vessels, each 280 ft. in length, and plans to inaugurate immediate construction. William Muller heads the company.

The Tracy Engineering & Shipbuilding Co., San Diego, Cal., recently incorporated to acquire the works of the Tracy Brick & Art Stone Co., near San Diego, is reported to have awarded contracts for the remodeling of the plant for shipbuilding work, including the erection of new structures. New machinery will be installed. Theron H. Tracy, 1621 Grand Avenue, Los Angeles, is president.

The Pacific Northwest

SEATTLE, WASH., July 3.

The Anaconda Copper Mining Co., Great Falls, Mont., announces that work will begin immediatetly on the construction of a rod and wire mill to cost $500,000.

Fire originating in the engine room destroyed the plant of the Panama-Eastern Lumber Co., Hoaquiam, Wash., with a loss of about $200,000.

The Eagle Brass Foundry, Seattle, will construct a two-story foundry building, 90 x 105 ft., to cost $6,000. A pattern shop, 25 x 29 ft., will also be built.

The City Council, Tacoma, Wash., has approved the proposed purchase of the electric power site, owned by P. H. Hebb, for $1,000,000, and its subsequent develoment to 125,000 hp., at an additional expenditure of $2,225,000.

The plant of Wynkoop Brothers, boat manufacturers, 209 Bancroft Street, Portland, has been destroyed by fire. It will be rebuilt immediately.

The Clark Creek Lumber Co.'s mill at Kelson, Wash., which has been idle for several years, will be reopened by William Robb and William Clark, owners. Extensive repairs will be made and new machinery installed. The mill has a daily capacity of 35,000 ft.

The Stewart Brothers Co., Portland, Ore., has leased property on which will be erected a plant to manufacture logging supplies, including wire rope and blocks. It will be associated with the Hoflus Equiment Co., with R. A. Stewart, chief executive. The Hoflus Equipment Co. manufactures locomotives, rails, switch materials and other railroad supplies.

The Western Reduction Co., Portland, manufacturer of novelties, will construct a factory, 100 x 150 ft., and a power house, 14 x 32 ft., at Twenty-fourth and Nicolai streets.

The Snohomish Iron Works, Everett, Wash., is equipping its plant with new machinery, which will considerably enlarge its capacity.

The Olympic Steel Works, 5200 Ninth Avenue, Seattle, has completed plans for the erection of foundry, 73 x 102 ft., to cost $6,000.

Canada

TORONTO, July 9.

The plant which is being erected at New Toronto, Ont., for the Goodyear Tire & Rubber Co., at a cost of $1,500,000, is practically completed, and will be ready for the manufacture of automobile, motor cycle, bicycle and airplane tires about Aug. 1. It will employ 1500 men and women, and will have a daily output of 3000 automobile tires alone. This factory is one of six which the company proposes to erect on its 27-acre site at New Toronto, as soon as expansion is necessary.

The Corrugated Paper Box Co., Ltd., 187 Geary Avenue, Toronto, is in the market for a 6-ft. center, 18-in. swing lathe.

Kruk Brothers, Ltd., Chesley, Ont., is in the market for a dynamo, 110 volt, direct current, with about 500 lights.

The F. E. Combe Furniture Co., Kincardine, Ont., is in the market for a 100-hp., horizontal boiler; must pass Government inspection.

The Canadian Sprinkler Equipment Co., Ltd., Toronto, has been incorporated with a capital stock of $50,000 by John G. Leckie, George G. Beckett, John A. Kent and others, to manufacture automatic sprinklers, fire extinguishers, etc.

The Power Development Co., Ltd., Montreal, has been incorporated with a capital stock of $500,000 by Gerald A. Coughlin, Francis G. Bush, George R. Drennan and others, to carry on the business of furnishing electric light, heat and power.

The Clemens Electrical Corporation of Canada, Ltd., Hamilton, Ont., has been incorporated with a capital stock of $50,000 by Henry N. Kittson, Alexander Methereli, William D. Dailey and others, to manufacture electrical appliances, machinery, etc.

The Lynn Rubber Mfg. Co. of Canada, Ltd., Montreal, has been incorporated with a capital stock of $10,000 by Charles G. Derome, Jules Bruneau, Jean Ducharme and others, to manufacture rubber goods, etc.

The Farmers Supply Co., Ltd., Winnipeg, has been incorporated with a capital stock of $250,000 by Frederick M. Burbridge, David L. Bastedo, Robert C. McPherson, to manufacture tractors, engines, implements, etc.

The Globe Engineering Co., Ltd., Hamilton, manufacturer of implements, machinery, etc., has been incorporated with a capital stock of $100,000 by Ivor D. Lewis, William F. Coote, Russell W. Treleaven and others, to take over the plant and business of the Globe Electric Machine Co., Ltd.

The Maritime Electric Co., Ltd., Fredericton, N. B., has been incorporated with a capital stock of $1,000,000 by John J. F. Winslow, John J. McCaffrey, Ernest A. McKay and others, to build and operate plants for generating electric light, heat and power, etc.

The Frasers Companies, Ltd., Plaster Rock, N. B., has been incorporated with a capital stock of $10,000,000 by Donald Fraser, Plaster Rock; Archibald Fraser, Fredericton; William Matheson, Andover, N. B., and others to take over the business now being carried on by Donald Fraser & Sons, Ltd., and several other lumber companies operating in New Brunswick and Quebec provinces.

Structomode, Ltd., Hamilton, has been incorporated with a capital stock of $5,000 by George W. Ballard, Minnie E. Stowe and others, to manufacture models from iron, wood, steel, etc.

The Fox Chain Co. of Canada, Ltd., Hamilton, has been incorporated with a capital stock of $200,000 by Cecil V. Lang, Ewartt G. Binkley, Nellie Moore and others, to manufacture anti-skid chains, automobile parts, tools, etc.

The Arrow Optical Co., Ltd., Toronto, has been incorporated with a capital stock of $40,000 by John Brisacher, Emil Deuber, Thomas E. Willan and others, to manufacture optical goods, jewelry, watches, etc.

The Canadian Consolidated Rubber Co., Kitchener, Ont., will build a brick addition to its machine shop to cost $15,000. F. C. Harding is manager.

The Brunner Mond Co., Amherstburg Ont., is in the market for two electric hoists, 35 hp., two drum.

The Hamilton Steel Wheel Co., Hamilton, will erect an addition to its factory to cost $25,000.

The New Westminster Construction & Engineering Co. is clearing a site on Poplar Island, B. C., for the erection of a shipbuilding plant, and will construct a bridge from the foot of Third Avenue, New Westminster, to connect the island. The company has secured contracts from the Imperial Munitions Board, Ottawa, for building four wooden steamers 250 ft. long by 44 ft. beam.

THE IRON AGE

New York, July 19, 1917

ESTABLISHED 1855 VOL. 100: No. 3



Stove Plate Foundry of a Modern Design

Cleveland Co-operative Stove Co.'s Interesting Type of Building Designed to Provide Excellent Working Conditions

A MOLDER'S efficiency is increased by good working conditions, and in times when labor is scarce a plant that is thoroughly modern and pays particular attention to its working conditions will fare better in securing a labor supply than one where little is done to make the plant a pleasant place in which to work. This was the predominating idea in laying out the new foundry of the Cleveland Co-Operative Stove Co., Cleveland, the designing engineers carrying out the general plans of John H. O'Brien, president and general manager of the company, whose long practical experience in the foundry industry started with his entering the plant as a boy in the shipping department and climbing by successive steps until he became head of the company.

The new Co-Operative Stove foundry is a light gray iron shop that is an unusually fine example of the modern type of foundry construction. It is designed especially for stove plate work and the making of various other stove parts, and is arranged for the convenient handling of material and economic production. As a part of the plan to provide good working conditions for the men the plant was laid out to assure an abundance of light and ventilation. Practically the entire outer wall surface is glass in hinged sash that swing outward in long sections for ventilation.



The Interior of the Foundry with the East Bay and the Battery of Air Squeezers in the Foreground and the Cleaning Department at the Right

Interesting features of the plant include the design of the building, wide molding bays and a wide gangway or aisle that extends through the center of the building for its entire length. The plant was laid out with a view of providing an abundance of floor space and preventing crowded floors that are found in many foundries, and that this has been accomplished is indicated by the views of the foundry floor as shown in the illustrations.

Another departure from the usual type of foundry is the use of a concrete floor. Shoveling molding sand from a dirt floor results in an unevenness, and many of the molds do not stand on a level. It was mainly to assure an always level floor that concrete was used, although the fact that a concrete floor would be better for the operation of electric tractors for handling material and castings was also given consideration. While an electric tractor is not yet being used in the plant it is the intention to equip it with one for handling purposes.

The foundry, which was placed in operation early in July, is located on Harvard Avenue on the Newburgh & South Shore Railroad. It has a daily melting capacity of about 40 tons of pig iron. The building is 450 ft. long and 135 ft. wide, of brick, steel, concrete and glass construction. Practically the entire floor is one large room, the only sections that are partitioned off being a small blower and compressor room at the side near the cupola and a small store and office room at one corner. From the foundry office on the second floor of the latter room a view may be had of the entire foundry floor. The company plans eventually to extend the building 550 ft., making a foundry floor 1000 ft. long. This extension will be made to permit the abandonment of its old plant in another section of the city, but until this is built the old plant will be operated.

The foundry building has a monitor roof of the Pond truss type, giving it the general appearance of two saw-toothed structures joined back to back. The design is clearly illustrated in the view of the exterior. An important feature of the roof design is that pockets in which smoke may gather without means of removal are, it is claimed, entirely eliminated. The building is divided into two bays 60 ft. wide by two rows of 8-in. building columns of the H-type spaced on 20-ft. centers and providing a 15-ft. center aisle or gangway extending the length of the building. The foundry is 16 ft. in height to the steel trusses, and 43 ft. in height to the peaks of the monitor. The width of the monitor is 66 ft. The monitor roof is in the form of a V, the two sides meeting in a valley above the center of the building.

Practically one-half the floor space is used for bench and machine work. These two departments occupy the entire east bay, with the exception of the core-making department, which is located at the lower end of this bay. Cores are baked in a battery of four six-drawer Sly core ovens. A large part of the west bay is used for floor work, the remainder being taken up with the cupola, cleaning department and blower house.

The molding machine equipment consists of 40 Nos. 74 and 75 Osborn plain air squeezers of the sand straddle type, being mounted on wheels and pushed back and forth across the foundry floor by the molder. Each machine molder has a floor space 60 ft. long, or the width of the bay, and 6 ft. wide. The molds are made between 7:15 a. m. and 2:15 p. m., each during that time using the sand the length of his bay. The rest of the day is spent in pouring and shaking out the castings and placing them in the adjoining gangway for removal to the cleaning department. If it is found that their daily production can be increased the individual bays will be made wider and the supply of sand for each machine and each man's molding floor space will be increased. Hand ladles of 30-lb. capacity are used for pouring.

The air-supply line extends along the bay in the roof trusses and air is carried down to each machine by a hose of sufficient length to permit the travel of the machine from one side of the bay to the other, or the length of the molders' floor. The machines are equipped with closing benches and riddle racks, making them practically travelling benches. The two sizes of machines will take flasks



A View of the Charging Platform from the Front Looking Toward the Coke Storage Bin in the Rear



The Cupola Is Located Well Out in the Foundry, with Its Spout Reaching into the Gangway, and the Large Charging Platform Extends Beyond the Cupola Across the Gangway, Thus Providing Large Storage Space for Coke

30 and 32 in. long and of any width required. They are used for all small work that can be put on a power squeezer. Match plates are used in making a portion of the machine molds. Sand is cut on a cutting machine supplied by the Sand Mixing Machine Co.

The plant is equipped with an 84-in. Sly cupola, located an equal distance from either end. This cupola is placed nearer the center of the floor than in most foundries, being set so far out from the side that the pouring spout reaches out into the gangway, making it more convenient to handle the metal than if the cupola is located back near the outer wall. The cupola has a special tuyere of the Zippler type. The charging platform is unusually large, being 60 ft. long and 30 ft. wide. It extends several feet beyond the cupola and clear across the gangway. Coke is stored on the section of the charging platform beyond the cupola, the extension to this platform providing a storage space for about 2 carloads. With a large storage section in front of the cupola the charging platform has room for holding enough pig iron, coke and limestone to charge the cupola for about a week. The cupola is provided with two charging doors on opposite sides, the one at the rear facing the coke bin being used exclusively for charging coke. Coke is shoveled into steel charging boxes of 50-lb. capacity from which it is dumped into the cupola.

The charging platform is built of concrete, 4½ in. in thickness covered with ½-in. steel plate, and steel plates are used for the sides. The floor plate is set in with flat-head countersunk screws, affording a smooth surface for shoveling. Pig iron and other charging materials are taken to the charging floor on an Otis elevator with an 8 x 8-ft. cage and the cupola is charged by hand. The cupola is lighted by a Mahr Mfg. Co. oil lighter using fuel oil. A Sly cinder mill is located adjacent to the cupola. The cupola drop, instead of being taken to the mill in wheelbarrows, is dragged from beneath the cupola to the front of the mill by two hooks attached to a windlass, and from there is shoveled into the mill. Blast for the cupola is supplied by a No. 6½ Root's positive pressure blower, and air for the molding machines is furnished by an Ingersoll-Rand 10 x 12-in. compressor which maintains a 100-lb. pressure on a storage tank above the blower house. The blower and compressor are each driven by a 50-hp. Lincoln electric motor.

The cleaning department is equipped with 24 Sly tumbling mills arranged in groups of six driven from motors on the floor, chain drive being provided from the main shaft to the individual machines. The mills are both circular and round and in various sizes for different classes of work. Grinding is done on four double-wheel machines supplied by the Bridgeport Safety Emery Wheel Co. The current for driving the cleaning equipment is carried down in metal conduits from the roof trusses. The tumbling mills and grinding machines are to be connected to an exhaust system that is being installed by the Ohio Blower Co., Cleveland. Dust will be drawn from the machines by a 70-in. fan and discharged above the roof.

The building has brick sidewalls 4 ft. high, and above that is continuous window space in steel sash of the Pond type. There are three swinging sash sections hinged at the top in the side walls, and three similar sections in the monitor. As the sashes swing out at the bottom they form an awning and can be opened for ventilation in any weather and the draft of air is well above the workmen's heads. As many or as few window sections can be opened in any part of the building as desired, depending on the direction and force of the wind. The sash are 70½ in. wide and are glazed with ¼-in. factory ribbed wire glass. They are counterbalanced for ease in opening and closing by the operating mechanism. Some sash sections are 200 ft. in length and others are divided into 50-ft. operating groups.

The concrete foundry floor is 6 in. in thickness, a special type of hardened floor being provided in the gangway and around the cupola where hard service is required. The roof is covered with 2 x 6-in. tongue and groove boards over which is laid slate surface roll roofing.



The Molding Machine Bay of the Foundry and the Molds Made in One Morning

While artificial lighting will not be needed much of the time, an abundance of interior light will be provided when required. In each 20-ft. bay space as marked by the building columns, two electric lamps of ample capacity will be suspended and a row of lamps will be provided in the gangway to supplement those in the bays.

Coke, sand and limestone are stored in two long brick and steel sheds located along the cupola side of the foundry, being separated from the main building by a 20-ft. paved runway. These are duplicate buildings 104 ft. long and 28 ft. wide, the sections occupied by the coke bins not being covered. Five doors open from the side of each storage building, and three doors are provided along the side of the foundry for wheeling in sand. Sufficient storage space has been provided so that enough sand can be placed in the bins in the late summer to last all winter. Between the sand houses space is provided for the storage of pig iron. A railroad siding runs the length of the yard along the outer side of the sand and coke bins, making it convenient for unloading material.

A very complete service building is located at the side of the foundry in a line with the storage buildings. This is 91 ft. long and 28 ft. wide, of brick and steel construction, with a concrete floor. It includes lavatories with modern equipment, toilet rooms, six shower baths and a dryer room. The latter will be provided with steam pipes, along the side of which the men will hang their damp working clothes at night. Steel hooks will be furnished in this room for street clothes, lockers being eliminated as not being as easy to keep free from vermin. The dryer room is given a thorough cleaning every day. Inclosed toilet facilities are provided in the foundry at convenient points along the gangway, and drinking fountains are located at various places throughout the foundry.

The plant was designed by George S. Rider & Co., consulting and designing engineers, Cleveland. The steel sash equipment was furnished by the David Lupton's Sons Co., which also controls the Pond type of monitor roof used.

Will Systematize Shipments

WASHINGTON, July 17.—The General Munitions Board has decided to establish special terminal facilities at several of the largest Atlantic ports for the orderly, rapid and careful loading of vessels with munitions and supplies required by our armies in Europe and those of the allies. For this purpose, a special advisory committee on terminal facilities has been named, as follows:

Francis L. Stuart, consulting engineer (formerly chief engineer of the Baltimore & Ohio Railroad), chairman, who represents the port of Baltimore.

B. F. Cresson, consulting engineer, 50 Church Street, New York City, designated by the State of New Jersey to represent the New Jersey sections of the ports of New York and Philadelphia.

R. A. C. Smith, dock commissioner of the city of New York, and Charles W. Staniford, chief engineer of the department of docks and ferries of New York City, designated by the mayor of New York to represent that city's water front and the port of New York.

J. B. Locke, secretary of the Newport News Chamber of Commerce, designated by C. B. Garnett, chairman Virginia State Corporation Commission, and Mayor Moss of the city of Newport News.

W. A. Cox, secretary and traffic manager of the Norfolk Chamber of Commerce, designated by C. B. Garnett, chairman Virginia State Corporation Commission, and Wyndham R. Mayo, mayor of Norfolk, Va.

The representatives of the ports of New Orleans and Boston will be announced hereafter. The committee will at once begin consideration of its problems.

M. L. Cooke, chairman of the subcommittee on storage facilities of the General Munitions Board, at whose instance the special advisory committee has been named, states that the solution of the problem of special terminals will eliminate unnecessary freight hauls, releasing more cars and locomotives to transport the commerce of the country and greatly increasing our ability to keep our troops in France fully supplied with every form of war material.

The Fertel-Dangler-Wilson Co., Cleveland, dealer in iron, steel and metals, at its annual meeting July 10 elected the following officers for the ensuing year: C. S. Dangler, president; F. B. Dangler, M. H. Wilson, Jr., and A. A. Murfey, vice-presidents; S. Fertel, treasurer and general manager; W. E. Fertel, assistant treasurer; I. F. Freiberger, secretary.

ALTERNATING TORSION TESTS*

Improved Machine for Testing the Toughness of Steel and Non-Ferrous Metals

BY D. J. MCADAM, JR.

IN the proceedings of the Society for last year a description was given of an alternating torsion testing machine developed at the U. S. Naval Engineering Experiment Station, Annapolis, Md. In this article there were also given some endurance tests on various kinds of steel. It was stated that experiments were baing made in testing non-ferrous metals and alloys by the same method. In the testing of very ductile material, however, difficulties were encountered, necessitating important additions to the machine. The present article describes the modified machine.

The illustration shows a sketch of the machine showing end and side views. In this figure, *K* and *J* represent the worm gear and driving wheel of the machine. The arm *B*, which is caused to oscillate by means of its eccentric attachment to the rotating wheel *A*, gives alternating rotation to a shaft passing through the bearing *C*. This shaft is attached to one end of the helical spring *D*. To the other end of the spring *D* is joined a shaft that passes through the radial and thrust ball bearing *E* and is fastened to one end of the test specimen *F*. From the other end of the specimen *F*, a shaft passes through the radial ball bearing *G*, and is fastened to the arm *H* which extends between the springs *I*.

When, therefore, the arm *B* is caused to oscillate, alternating rotation is transmitted through the spring *D* to one end of the specimen F. Since this rotation is resisted by the action of the springs *I* on the arm *H*, an alternating torsion is applied to the specimen. The torsional stresses can be varied by varying the eccentric attachment on the wheel *A*.

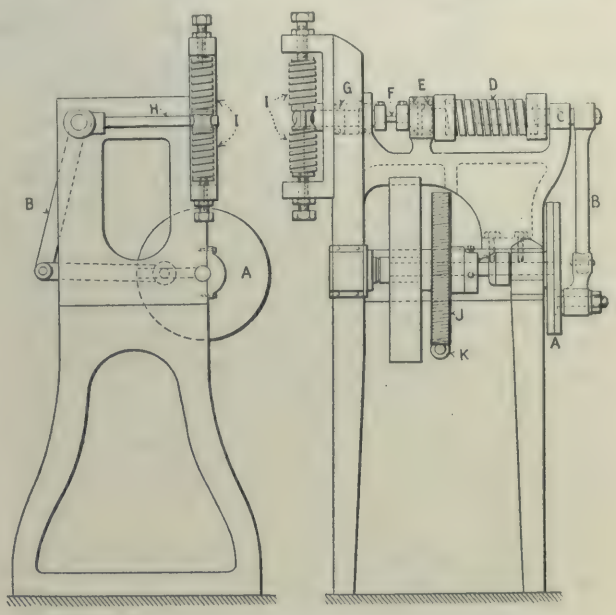
As described in the previous paper, the torsional stresses are proportional to the displacement of the springs *I*. The amount of displacement is indicated by a magnifying pointer, not shown, adjusted to the end of the arm *H*. The arrangement of the pointer and recording drum is shown in the illustration in the previous paper. A counter records the number of cycles of stress applied. A comparison of the illustration in this paper with that of the previous paper will show that the chief modification of the original machine consists in the addition of the spring *D*, the purpose of which is as follows:

If this spring is omitted and the arm *B* connected by a shaft with the specimen *F*, the machine could be used satisfactorily in the testing of steel. For very ductile material, however, such as non-ferrous metals, the machine would not be satisfactory. As the ductile specimen yielded, the applied stress would soon drop almost to zero, and the specimen would last indefinitely unless the angle of rotation were increased. Any arbitrary increase, moreover, in the angle of rotation would, of course, make the test indefinite and worthless. The object of the spring, then, is to take up the torsional strain of the specimens as the yield takes place.

Suppose, for example, the eccentric attachment of arm *B* is adjusted so that the angle of rotation of the shaft in the bearing *C* is 5 deg. on each side of the neutral position. At the beginning of the test, the angle is usually distributed through the system so that most of it occurs in the spring *D*, while the torsional strain of the specimen *F* might be only a fraction of a degree. As the specimen yields, however, the torsional strain of spring *D* decreases while that of specimen *F* increases to the maximum angle (in the supposed case, 5 deg.). By use of a long helical spring, therefore, the torsional angle of the test specimen may be automatically increased as the test proceeds, while the torsional moment is held nearly constant until a very short time before fracture occurs.

*From a paper presented by permission of the Secretary of the Navy, at the twentieth annual meeting of the American Society for Testing Materials at Atlantic City, N. J., June 27, 1917.

As a further improvement in the use of this machine, a system of magnifying pointers is to be attached at each end of the speciment *F* and at each end of the spring *D*. By the relative motion of these pointers and by the motion of the pointer attached to the



Two Views of the Alternating Torsion Testing Machine

arm *H*, a complete record of the angle of torsion of the specimen, and of the torsional moments applied by springs *D* and *I*, may be obtained.

Since the above described improvements have been but recently added to the machine, very few tests on non-ferrous metals have been completed. Preliminary experiments, however, have shown that the machine in its improved form will be useful in testing the toughness of non-ferrous metals as well as of steel.

Separating Fine Gun and White Metal Borings

A new method for separating fine gun metal and white metal borings has been perfected by the chief chemist of New South Wales Railway Department. The old method was by liquation on an iron plate or in a furnace, which was satisfactory for coarse borings but quite useless for fine grades. The problem of the removal of the white metal in the fine borings has been solved. The small borings are passed to a magnetic separator, picked up by a revolving belt fitted with pockets, and conveyed to an overhead bin, whence they gravitate to classifiers and are separated into three grades. From bins 1 and 2, containing the coarser material, the borings gravitate to a short revolving belt, fitted with pockets, and are delivered into a bin above the furnaces. These furnaces are made of iron tubes, one fitting inside the other. The outer one, being several inches larger in diameter than the inner, is supported by means of brackets to the floor and carries in the intervening space between the two tubes a coil of iron pipe, with suitable sized perforations for heating the walls of the inner tube with gas. The inner tube revolves and the hot borings and liquid white metals pass into revolving screens, smaller in mesh than the last classifier, and the liquid white metal escapes through the screen into an outer surrounding vessel, heated by a gas coil. In this way the white metal does not cool, but collects at the bottom, and can be run into molds. The clean borings pass along the screen on to a hand truck on wheels and are taken to the foundry, melted, and used for ordinary gun metal castings. Each grade is treated separately.

The Pennsylvania Railroad Co. is arranging for the construction of 2000 all-steel box cars and 200 all-steel cabin and flat cars at its Altoona (Pa.) shops for delivery after Jan. 1. It is said that the work will keep the shops operating at full capacity well into 1918.

Goethals' Great Shipbuilding Program

Starting Is Delayed by Letter from Chairman Denman—Order of the President—Ships Building and Proposed

WASHINGTON, July 17.—In an executive order issued July 11, President Wilson, it was thought, brought to an end the controversy between Chairman Denman of the United States Shipping Board and General Goethals, general manager of the Emergency Fleet Corporation, as the former was given authority to operate vessels required by the board, while to the latter apparently was given the broadest powers in regard to the construction of vessels, the purchase or requisitioning of those in process of construction for private account and the purchase or requisitioning of all materials for ship construction. Later developments indicated, however, that the controversy between Denman and Goethals had not been settled. The President's order was as follows:

EXECUTIVE ORDER

By virtue of authority vested in me in the section entitled "Emergency Shipping Fund" of an act of Congress entitled "An Act Making Appropriations to Supply Urgent Deficiencies in Appropriations for the Military and Naval Establishments on Account of War Expenses for the Fiscal Year Ending June 30, 1917, and for Other Purposes," approved June 15, 1917, I hereby direct that the United States Shipping Board Emergency Fleet Corporation shall have and exercise all power and authority vested in me in said section of said Act, in so far as applicable to and in furtherance of the construction of vessels, the purchase or requisitioning of vessels in process of construction, whether on the ways or already launched or of contracts for the construction of such vessels and the completion thereof, and all power and authority applicable to and in furtherance of the production, purchase and requisitioning of materials for ship construction.

And I do further direct that the United States Shipping Board shall have and exercise all power and authority vested in me and in said section of said act, in so far as applicable to and in furtherance of the taking over of title or possession, by purchase or requisition, of constructed vessels, or parts thereof, or charters therein; and the operation, management and disposition of such vessels, and of all other vessels heretofore or hereafter acquired by the United States. The powers herein delegated to the United States Shipping Board may, in the discretion of said board be exercised directly by the said board or by it through the United States Shipping Board Emergency Fleet Corporation, or through any other corporation organized by it for such purpose.

(Signed) WOODROW WILSON,
President.

The White House,
July 11, 1917.

Believing that he had been given full authority to proceed, General Goethals lost no time in doing so and on July 13 sent the following letter to Chairman Denman:

General Goethals' Letter

Now that the President has authorized the Emergency Fleet Corporation to exercise the powers granted by Congress to build and commandeer ships, I intend, on Monday, to start ship construction which will complete my shipbuilding program. My full program is as follows:

1. *Ships now building:*

Contracts for 348 wood ships have been let, or agreed upon, with a tonnage capacity of 1,218,000 tons, at a cost, completed, or approximately $174,000,000.

In addition, I have under negotiation contracts for about 100 wood ships.

Contracts for 77 steel ships have been let, or agreed upon, with a tonnage of 642,800 tons, at a cost of approximately $101,660,356.

There are thus provided 425 ships of all sorts, with an aggregate tonnage of 1,860,000, at a cost of approximately $275,000,000, besides 100 more wood ships under negotiation. I shall continue to let all contracts for wood ships of design approved by the naval architect of the corporation which I can secure from responsible bidders.

NEW GOVERNMENT SHIP PLANTS

2. *Construction of standardized ships:*

My main reliance for getting the greatest amount of the most serviceable tonnage in the shortest time will be on the construction of fabricated steel ships of standard pattern. For that purpose I shall use, to some extent, the existing yards.

On Monday I shall offer contracts for the building of two plants (to be owned by the Government) for the construction of fabricated steel ships, to produce 400 ships of an aggregate tonnage capacity of 2,500,000 tons within the next eighteen to twenty-four months. For the building of these two yards and the construction of ships in them I shall offer as compensation to the agents who undertake the work a fee of approximately 6 per cent of the total cost of the work, with rewards for savings in cost and for speed in delivery. Provision will be made for decreasing the fee to prevent unnecessary cost. The contracts will give the Government the benefit of Government fixed commodity prices, and will provide for cessation of work at any time, so that the appropriation may not be exceeded. Options will be given to the contractors to purchase the plants at arbitrated values on the completion of the work.

The design of the ship is ready, the plans of the yards are ready, the distribution of the work of furnishing the material and of fabrication is arranged.

This part of the program will take all the $550,000,000 available not absorbed by contracts made or making, as stated at the beginning of this letter. The program will more than redeem my estimates to the Congressional committee at the time this appropriation was asked for, of 3,000,000 tons of new construction within eighteen months.

The additional contracts for wood ships which I expect to place, together with the full number of fabricated steel ships which it is planned to build, will require more money than Congress has authorized. When I know how much will be needed it will be necessary to ask Congress for further sums.

WILL HASTEN COMMANDEERING

3. *Commandeering of ships in yards:*

On Monday I shall deliver to ship builders a general statement of the program which I have long been maturing for commandeering ships now under construction for private account. (Such ships have an aggregate tonnage considerably in excess of 1,500,000 tons).

The essence of this program is to commandeer all such ships and expedite their construction by adding labor and cutting out refinements. By thus Federalizing each yard, giving it Government help and putting it on a speed basis, we shall produce its greatest efficiency. As fast as the berths are cleared, each yard will be devoted to the production of a single type of tonnage, for which it is best suited. I count upon the complete cooperation of the yards.

This program is made comprehensive because expedition cannot be obtained in a yard engaged partly on rush work and partly on pre-wartime schedules. My investigation has satisfied me that citizens of the United States and of our allies will pay the cost of expediting ships now building for them and take them off our hands. If this policy is adopted, it will conserve our fund.

I agree that it is essential for the Shipping Board to requisition at once the neutral ships which are constructed and ready to sail. I have no data to make an estimate as to how many of these ships there are or how much money will be required for this purchase. I shall, therefore, cut my program to the extent of $50,000,000. Please notify me at once whether this is enough.

Each day's delay in summer—in commandeering or contracting—means two days' loss of time in throwing the work into the winter months. It is for that reason I am urgent that the program start on Monday.

Will Federalize Shipbuilding

On Saturday, July 14, General Goethals made public the following statement:

It has been decided, after consultation with representatives of the shipyards, that the construction of steel merchant ships in all the shipyards of the United States must be hastened—

(1) By the addition of overtime where necessary.

(2)By proceeding to additional labor shifts as soon as may be, and

(3) By the elimination of nonessential refinements of construction and equipment.

It is necessary, also, that each yard increase its production to the maximum, and after the building berths are cleared of ships now under construction be devoted to producing the particular type of ship to which it is best suited.

Because of their varied contracts for shipbuilding, the yards can not carry out this program without the help of the Government; it has, therefore, been decided that the shipbuilding industry of the nation shall be federalized. All steel merchant ships now on the building berths will be forthwith requisitioned by the United States, and each yard will proceed to complete such ships under the direction of the general manager of the United States Shipping Board Emergency Fleet Corporation and will take on new work (other than repair work) only with his consent.

No ships under construction for the Navy Department or for any other Government department, or for the United States Shipping Board Emergency Fleet Corporation, and no ship repair work, will be requisitioned at this time.

It is the policy of the Government to make fair payments for the work done under this program, so that investment of private funds in the shipbuilding industry may be secured, and to encourage the training of men to work in that industry.

It is essential to the success of this program that the shipyards and the men employed in them co-operate with the Government.

The program contemplates that the yards under their present management will hire and pay labor and continue in charge of ship construction as heretofore.

For work done in carrying out this program the yards will be compensated on the following general basis:

(A) For work on ships now under construction the yard will continue to furnish, as its own expense, the labor and all materials (so far as not now on hand) necessary to complete the ships, and will be entitled to hold for its own account all payments heretofore made under the construction contracts, and to receive from the Government the balance of the contract prices on the dates and conditions provided in the contracts (with the following modifications):

1. The prices paid will be minus amount saved by elimination of nonessential refinements and plus additional expense of changes in specifications determined upon by the general manager.

2. In the event of any increase in the scale of wages at the yard after the date of federalization, such increase will be paid by the Government if it is found to be justifiable and is approved by the general manager.

3. The Government will pay the overtime allowance (over yard basis) on the cost of direct labor on any ship (or will adopt some other equitable basis as to the overtime expense).

4. In case the yard adds an extra shift it will receive a suitable allowance to cover the extra cost due to lower efficiency of night work under these conditions.

(B) For construction of new ships the Government will pay—

1. Approved material costs (the Government reserving the right to furnish materials).

2. Direct labor cost.

3. An additional sum to include other costs and a fair profit.

All moneys due the yards, except as herein otherwise provided, will be paid in installments hereafter fixed.

Direct labor cost will be exactly defined.

Arrangements for adjusting the payments already made to the yards by ship purchasers will be made by the Government.

Federalization of yards will end within six months after peace (subject to completion of ships under way).

If necessity arises, the Government, from time to time, may furnish sums, to be hereafter fixed, for plant and equipment, including the erection of laborers' houses and accommodations (to remain the property of and the income thereof to be received by the Government) on such terms and at such times as may be arranged.

Orders will be issued as soon as may be to each yard separately defining the application of this program to the particular yard. This statement is intended to show the general basis of federalization of the yards.

This statement of program is made under authority delegated by Executive order of the President, dated July 11, 1917, to the United States Shipping Board Emergency Fleet Corporation.

GEORGE W. GOETHALS,
General Manager United States Shipping Board Emergency Fleet Corporation.

The carrying out of General Goethals' plan was delayed at least temporarily Monday by the receipt by him of a letter from Mr. Denman, chairman of the Shipping Board, which owns all the stock of the Emergency Fleet Corporation of which General Goethals is general manager. Mr. Denman is understood to favor the Hough design for wooden ships. It is also a serious question over the price to be paid for the steel. Another point of difference relates to the method of commandeering ships.

Explaining the delay in General Goethals' announced commandeering of shipyards Monday, Chairman Denman said:

"We requested of General Goethals certain information concerning the program for expending the $750,000,000 of public money for which the President's order has made the Emergency Fleet Corporation and the Shipping Board responsible. If General Goethals' plans had reached the condition of preparedness it has been asserted they had reached, the information could have been furnished within two hours, or we could have been told that the information was not at hand. When we do receive the information in writing we will take up with General Goethals the discussion of all the matters involved in the project of building ships.

"What we want is a speedy construction of ships, a reasonable price for steel and ship fabrication, the retention of all alien tonnage on our stocks which may be necessary to carry troops to Europe if the rate of submarine sinkings continues even two-thirds as great as they have been during the five months ended July 1."

Germany's Industrial Outlook After the War

The German industrial outlook after the war was discussed at a recent general meeting of the Ilsede and Peine Steel Works by the president, Wilhelm Meyer, in the course of which he said, as reported by the London *Ironmonger*, that the future development of the German steel industry depended primarily upon the peace conditions. The payment of interest of the gigantic war loans and the provision of a sinking fund for their redemption would be a terrible burden, while enormous sums must be paid annually to the dependents of fallen soldiers and to unfit men. The question would be a good deal simplified if Germany should be able to insist upon the payment by her enemies of adequate war indemnities, but even in that event taxation was sure to increase. Germany's enemies were resolved to keep her out of the world's market after the war. But Germany was mainly dependent upon the exportation of her industrial products and in particular upon her large export trade with her present enemies. Nevertheless, Mr. Meyer declined to be despondent, and he expressly declared that he and his associates would not consent to a peace without annexations or indemnities. "In the land of militarism," he said, "everyone was taught from youth upwards to work and to do his duty in his appointed place. This would not only remain so but the call might be intensified, and while Germans worked and did their duty their enemies would not be able to conquer them in trade and industry. It was true that they had lost many markets through the war, but they would recover these, and recover them all the sooner if they were set free from the innumerable regulations and other fetters that had been imposed upon them during the war."

June Production of Dominion Steel

The output of the Dominion Steel Corporation, Sydney, N. S., for the month of June was as follows: Pig iron, 29,375 tons; ingots, 30,647 tons; blooms, 15,980 tons; shell blooms, 11,485 tons; shell bars, 4868 tons; rods, 10,000 tons; nails, 3534 tons.

As this is the first time output figures have been given out for a number of years it is not possible to make any comparisons, but they show a small advance over the same month last year. Pig iron output was slightly better than a year ago, while ingots fell off slightly.

Tongue and Ear versus Eye and Hand

A Fable for Official Washington but with a Moral for Business Conduct in General

BY DR. WILLIAM KENT

"DOCTOR, you've got to do something more for me," said the Boss of a great department in Washington to his physician. "I'm following your rules as to diet, exercise, sleep, rest periods, automobiles, golf and the like, and you say I'm in perfect mental and physical condition. I work steadily eight or ten hours a day vigorously, and I have a strong appetite for work, but I am worrying because the work is moving so slowly; things don't seem to get done, and the newspapers are pounding me about it."

"You ought to join the Don't Worry Club," said the doctor. "I'm already in it," replied the Boss, "and I know all their rules and mottoes by heart. 'Worry kills, work never does'; 'Worry never accomplishes anything'; 'Get busy and you will forget all your worries'; 'Rome was not built in a day'; 'Have patience, all these things will straighten themselves out if you only wait'; 'Haste makes waste'; 'We're farther ahead in two months than England was in a year'; 'We can't invent ourselves out of this war; all we've got to do is to keep on digging'; 'Keep business as usual, keep calm, don't rock the boat,' and so on.

"Well, I never knew worry to be cured by maxims and mottoes," said the doctor. "There are only two cures: 1. Remove the cause. 2. Substitute a stronger sensation, a counter-irritant, one that will be more real cause for worry, but which is so strong that worry is forgotten and action takes its place. Seasickness, for example, is a worry sickness, and a shipload of seasick people can be cured instantly by a rumor that the ship is on fire. In your case removal of the cause of your worry seems to be the proper remedy. As you say 'things don't seem to get done.' That's the cause; your worry is the effect. The remedy is get things done. But how? That requires first a diagnosis of your environment and your working conditions. I will have to ask you some questions. Have you any financial troubles?"

"No, thank heaven, Congress has granted everything I asked."

"Are your assistants, heads of bureaus, advisers, loyal, capable and efficient?"

"They are the best in the world; I could not ask for any better. Many of them are experts of world-wide distinction. They are all working hard, are overworked, in fact, and some of them are so patriotic that they are serving without pay."

"A great secretary of state once said that the greater part of his work was signing letters that he never wrote in answer to letters that he never saw. Is your work like that?"

"No, I keep in touch with all the work of my department. It is my duty to know what is going on. I am constantly in conference with my organization."

"You speak of your organization. Briefly what is it; how does it work; what is its efficiency?"

"First, there is my private staff, which I call my cabinet. The chief, a most able man, is my understudy, who could take my place if I were to drop out. The next is his understudy, who could take his place. Then we have bureaus, each with an expert superintendent, which are in charge of executive duties. We have also functional foremen for each branch of the service. These bureaus prepare contracts, specifications, methods of inspection and tests, advertising, look after raw material, machinery, labor, transportation, delivery, storage, forwarding and the like. Besides these we have a legal bureau, whose duty is to assist in preparing contracts and to see that we do not violate any law, and an accounting bureau which sees that all the money spent is accounted for, keeps cost accounts, and makes out vouchers and reports for the Treasury Department. Then we have a consulting board, an advisory board, an emergency board, a research board, and a planning board, and for each of these we have all the necessary outfit of stenographers, typewriters, filing and correspondence clerks. We have an excellent organization, thoroughly systematized, and every man in it seems to be doing his work faithfully, and with patriotic enthusiasm. As to its efficiency, the work is so vast and the responsibility so tremendous, that we have as yet no standards for measuring efficiency, and therefore cannot state it in percentages, as some of the efficiency engineers do."

"What work do these several boards do?"

"They have meetings, they consult, confer, advise, plan things to be done in the future, near and distant, correspond, receive suggestions, turn them over to committees of study and report, and they frequently have conferences with my cabinet and myself and make verbal and written reports of their opinions and conclusions. They are composed of most excellent men, professional men and inventors of the highest standing, and of course they cannot be hurried."

"Of course not; boards never can. As General Goethals says: a board is long, narrow and wooden. Now I want to ask you about your own work; what do you do all day?"

"I get to the office at 8.30, and my secretaries who have been there since 7.30 hand me those letters from the early mail that they think I should see, having themselves dictated answers to all those of a routine or unimportant nature, or else marked on them the symbol of the form letter with which the typewriters answer them. From 8.30 to 9.30 I put my answers on the dictaphone. Then I get rid as quickly as I can of the callers for whom appointments had been made by my secretaries and of the morning's callers whose cards have been allowed to get as far as my room. From 11 to 1 and from 2 to 4 I am in conference with heads of bureaus and chairmen of boards. From 4 to 4.30 I glance over my afternoon letters, dictate replies to a few of them, receive a few more callers to 5 o'clock, when my automobile takes me to the golf ground. I try to leave all my business in the office, but often some one catches me at the golf club and I have to drive him home with me talking business on the way; sometimes a conference is held in the evening, and then I am apt to lie awake in bed an hour or so planning out things to be taken up in conferences the next day."

"Thank you. I think I have diagnosed your case. No wonder that you are worried because things don't get done, and no wonder that things don't get done the way you and your boards are trying to do them. I am now going to give you a scientific lecture and a prescription, which I don't suppose you will take; therefore I am going to ask you to put a dictaphone on this table and to give me a few typewritten copies of what I say, so that I may use them on some other Government officials who are in the same condition as yourself, and possibly use one of the copies as the basis of a paper to be presented to the medical society, entitled "The Tongue and the Ear versus the Eye and the Hand."

The dictaphone being placed, the doctor proceeded as follows:

"What you and the Government are trying to do is to get things done, in other words to do useful work. In the engineer's language work is the expenditure of energy, the overcoming of resistance through space. The work to be done in this war is chiefly mechanical engineering, and the work of the mechanical engineer consists largely in changing the location and changing the shape of material things. He takes iron ore and coal from the ground, uses them to make steel, which he forges into guns and shells. He moves them to the battlefield in France, where the shells are moved from the guns into the enemy's trenches, causing a rearward movement of the enemy's forces. He takes cast iron, wrought iron, steel, copper, mica and shellac, puts them into certain shapes and makes them a wonderful structure, co-ordinated and harmonious, called a dynamo or electric generator, into which he puts horsepower obtained from a steam-engine, and from which he obtains kilowatts of electric current, to be utilized in driving all kinds of machinery. The work or energy put into the shaft of the dynamo in a given time by the steam engine is called the input; the work it gives out, that is, the useful work, is called the output, and the ratio of the latter to the former, it may be from 50 to 90 per cent, is called the efficiency. But the dynamo does other work besides making electric current. It makes useless friction, hysteresis, eddy currents and hot air; these constitute the wasted work or losses, and they may amount to 10 to 50 per cent of the input, according to the construction or organization of the dynamo and according to the relation that exists between the capacity of the dynamo and the work that it is given to do.

"The increase in the number and in the variety of things that an engineer has to do has in recent years led to the subdivision of the profession into many branches. The latest development in this line has produced what are known as industrial or organizing engineers. Their work has largely to do with the human element, and they have made a new definition of engineering,

the science and art of overcoming the resistances of nature, including human nature.

"They do, or try to do, the planning, while the other engineers, civil, mechanical, mining, electrical and chemical do the performance. They try to organize, co-ordinate and harmonize business and engineering, and to get things done promptly and at minimum cost. Their branch of the profession is a new one; they have not yet developed the standards and the precision of methods that the other branches have. Efficiency is their watchword, and they have done great things in measuring the efficiency of machines and of labor, and in increasing production, but their own methods are in many respects very inefficient.

"But industrial or organizing engineers are not to be condemned as a class because some of them, or even a majority of them, are sufficient. They are as necessary in the present age as lawyers and surgeons are, and there are but few great lawyers and few great surgeons. There are a few great industrial engineers in this country and the thing to be done is to discover them and put them into positions of authority. They may not be known in the engineering profession; they may be business men, surgeons or lawyers, but they must be geniuses of organization, and know how to select their co-workers and subordinates. Rockefeller and Carnegie were not engineers, Elbert H. Gary and Lloyd George were lawyers.

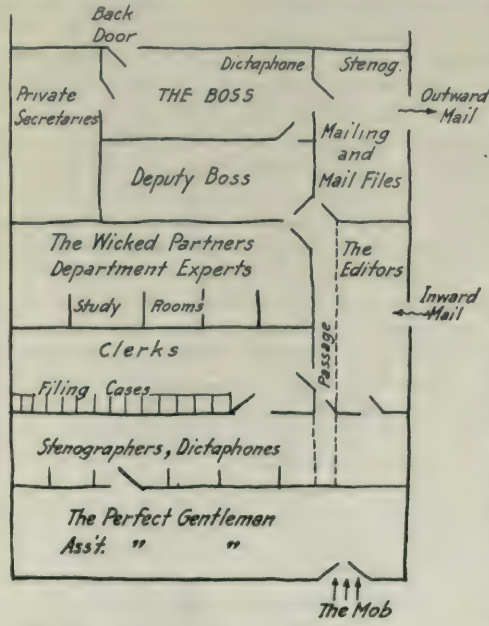
"The great organizer is not necessarily a great man or a superman. He needs a normal brain, good common sense, no great conceit of his own ability, no special expertness in details, no great hunger for work twenty-four hours a day, but he must have a knowledge of human nature, a judgment of character, a willingness to entrust details to other men, more capable than himself in handling them, and a determination to conserve his own powers and not overwork himself, so that he may have time to do calm thinking. He must not allow his time to be taken up in useless talking or conferences or arguments. Physically he is an ordinary man, receiving his brain impression through his eyes and ears, and conveying his impressions to others by his tongue and his pen. He realizes the fact that his ears and those of other people are less efficient means of obtaining knowledge than his eyes; that his and other peoples' memories of information received through the ear are faulty, that he remembers better what he sees than what he hears. He realizes also that when he uses his tongue, what he says may go in one ear of the hearer and out of the other, and that if he wishes his words to be most effective he writes them out with a pen in his own hand, rather than confiding them to a stenographer or a dictaphone. Paraphrasing Richelieu he says, 'In the hands of men entirely great the pen is mightier than the tongue.'

"His subordinate verbally makes a suggestion. He says, 'That sounds all right. Just write it down on a piece of paper, and boil it down to ten words. Put it in the basket on my desk and I will consider it.' He wishes to consult a lawyer. Instead of requesting a conference, he writes out the question in the fewest possible words and sends it to him, asking for a written answer.

"He wishes to hold a council of war, in which free use of the tongue will be permitted, but he writes out the question at issue, sends a copy to each of his staff, and asks them each to bring an answer in writing to the meeting, and be prepared to defend the answer orally.

"Knowing that spoken language is an imperfect means of conveying thought and that hearing spoken language is an imperfect means of receiving thought, he has the words spoken at the council taken by a dictaphone, and typewritten copies of them and the written answers given to each one present, so that each one may use his eyes and his pen in correcting and editing his spoken words, striking out all unnecessary verbiage, and in studying and making notes on the answers and the discussion of the other members. He appoints a committee of two to study all the corrected and annotated manuscripts and to draft a report for final action by the council, which report is submitted at a second meeting of the council held a few hours after the first meeting if quick action is needed, at which it may be discussed, amended, voted on, and, if passed, approved and acted upon.

"Note that in this council of war the organizer, the chief or boss, does not need to use his tongue or even his brain. He



The Doctor's Prescription to Relieve the Executive

has propounded the question, and he gets each of the staff to exercise his own brain upon it, and makes a committee of only two men do the real hard work of digesting, co-ordinating and harmonizing the several opinions and preparing the final report. He is an 'easy boss,' but he is easiest on himself; he conserves his brain energy by not allowing his ears to be bombarded nor his tongue to bombard the ears of others. He has a well-oiled machine, his organization is an efficient dynamo that turns out a maximum of useful current and a minimum of friction and hot air. He makes the other men do the work, so that when the time comes for him to pass judgment upon it and accept the great responsibility of signing his name to it, he can do it calmly with a clear brain.

"Now, Boss, I've diagnosed the disease of yourself and of your whole organization. Can't get things done. Brain fag, due to excessive vibration of the gray matter, caused by vibration of the ear drum and by pulsations of the tongue. Over-production of hot air. Now for the prescription. Put cotton in your ears and in those of your staff and boards for five or six of the working hours of each day. Become for these hours deaf and dumb. Stop using your ears and your tongue, and use your eyes and your pen instead. You may, however, talk to your dictaphone, for it can't talk back to you and vibrate your ear drums. But remember that over-use of the dictaphone tends to verbosity; therefore, use your eyes and your pen to boil down the typed copy of your dictation. If you will take this prescription and use it faithfully, things will get done and you will get rid of your worry."

The Boss agreed with the doctor in his diagnosis. "I am going to try your prescription," said he, "but I am afraid it will go hard with my staff and boards. It would disrupt their whole system. Just look at this diagram of the system. Here are a lot of circles representing the several branches of the service, and the links connecting them show how information proceeds from one to another passing through my office on the way. The diagram looks rather complex, but it is simpler than it looks. There are some short cuts, for getting rid of some of the red tape, that we use in the acutal working of the system, which are not on the formal diagram."

"I have seen a good many diagrams of business organizations, but this is the worst I ever saw," observed the doctor. "Here I will sketch a diagram for your organization. At the top I put you in a room by yourself, where you are protected by numerous barriers against intrusion. There is a back door through which you may escape, and through which you may admit some personal friend who has your private countersign. Next is the room of your deputy who does all your routine work and who has your rubber stamp. In front of his room is a large room and a series of small rooms for the men who do the real work of the department. They are the same men who are now your staff and your advisory boards. Each man is an expert in some one or more specialties. They do not work as a board, long, narrow and wooden, but as individuals or partners, each high-brow expert having a wicked partner and an understudy. Every report, conclusion or opinion coming out of this room must be signed by at least two men, as a precaution against the bulls or blunders that are apt to be made by a man temporarily afflicted with brain fag.

"At the bottom of the diagram, the front of the building, is a large room devoted to the Perfect Gentleman and his assistants, and connected with it are several small rooms for stenographers and dictaphones. The mob, men with inventions, suggestions, complaints, etc., are welcomed in this room with the utmost courtesy, affability and diplomacy. They all want to see the old man, or the Boss, and take up his time talking to him, but they don't see him, at least not that day, unless they bear introductions from the President or from some foreign ambassador or can give the Boss's countersign. 'Ah! I'm very sorry, but the Boss's calendar is filled up for every minute of this day, and he cannot see any one. Perhaps, if the matter is of special importance I can arrange an appointment for to-morrow.' 'Well, if I can't see him, perhaps I can see Mr. Blank,' naming one of the chief experts. 'Ah! I'm sorry, but he is exceedingly busy and has left word that he cannot be interviewed to-day. The only way to get at him is by correspondence. If you will kindly step into one of these small rooms you will find a dictaphone, or a stenographer, if you prefer, and you can have a letter to him typewritten at once, and he will get it just as soon as he is disengaged.' So the letter is written and signed, and the applicant departs after receiving assurance that a reply to the letter will be mailed to him the next day. The letter does not go to the expert, but to the editor's room, where one of the editors who is familiar with the subject dictates an abstract of it, boiling it down as much as possible, adds to the abstract a note to the effect that the invention, or suggestion, or complaint, is practically the same that was made by A. B. on April 30 and by C. D. on May 2, file Nos. 7468 and 8214. The expert gets the abstract, shows it to his partner and his understudy, they agree as to its contents, and as to the reply to be made to it, and it is sent back to the editor with the note, 'Answer same as 8214,' initialed by the chief expert.

"The editors edit the incoming mail in the same way, relieving the experts of the labor of reading a lot of useless verbiage, and of dictating letters which are only duplicates of those that have been written many times before.

"Contracts and other important matters requiring executive action are completed by the experts and editors and made ready for signature before they reach the rooms of the deputy boss. He examines them, and lays them before the Boss with the words 'Please sign here.' How do you like my diagram?"

"I like some parts of it," said the Boss, "especially the wicked partners, the editors and the perfect gentleman, but I don't like what you've done with me. You've taken away all my work, you've reduced me to a nonentity, a rubber stamp. You've relieved me of all responsibility and all authority."

"Not at all. You have all the responsibility and authority you ever had. You have the responsibility of selecting your co-workers and subordinates, of assigning them to their several duties and of holding them responsible for results, for getting things done, leaving them unhampered by your interference with details. Why do you want to do any work that you can hire other men to do better than you can do it? Now, I don't want you to introduce this scheme to your organization. Just write the heads of your several boards, enclosing a copy of your present diagram and asking them if it cannot be improved in some way that will lessen your work and their own in attending conferences, in listening to arguments, in using their tongues and their ears. Suggest a competition among them in inventing some workable scheme, and I would not be surprised if they finally arrived at some such diagram as I have sketched out."

"Thank you, Doctor. I am going to take your whole prescription."

The Cleveland Cliffs Iron Co., Ishpeming, Mich., is having plans prepared by M. J. Strum, architect, 116 South Michigan Street, Chicago, for an $85,000 hospital and infirmary building at its mining headquarters in Ishpeming. The building will be 50 x 150 ft., three story and basement, fireproof, and contain a complete new equipment.

TWENTY THOUSAND AIRPLANES

House Committee Reports in Favor of Appropriating a Very Large Amount

WASHINGTON, July 17.—The project to provide the American forces in France with an immense fleet of airships was fairly launched when the House June 13 unanimously passed a bill appropriating $640,000,000 for this purpose. It is the expectation of the Administration that this entire sum will be expended during the coming 12 months, and that if the war continues beyond 1918, a large additional fund will be provided. Not less than 20,000 airplanes will be constructed as speedily as possible, each equipped with two complete engines and armed with from one to three machine guns. The bill authorizes an aviation service of approximately 75,000, including officers, trainers, student fliers and enlisted men.

Notwithstanding the fact that the bill has been exhaustively discussed in committee, the House was asked to pass it without any detailed explanations concerning the character of the airplanes that are to be built and the Military Committee will vouchsafe no detailed reasons for seeking the very large appropriation carried by the measure. The hearings before the committee were stenographically reported but have been printed in confidence for the use of Chairman Dent and his colleagues, and will not even be distributed to other members of the House. It is understood that the policy of secrecy to be pursued is due to the fact that much expert testimony was adduced at the hearings, covering not only types of planes, methods of construction, capacity of factories in this and foreign countries for the building of planes, but also certain important innovations in the arming and equipping of fighting airships.

It is asserted that, notwithstanding the greater experience of French and English aviators as compared with the members of the Flying Corps of the American Army, the airships to be built under the appropriation just reported will constitute an important advance over any heretofore constructed and will prove of great value in winning the war. Several types of airplanes will be built for the American Army in addition to the designs heretofore adopted of American origin. It is understood that the French, English and Italian Governments have placed at the disposal of the United States the best designs they are now employing in active service and that foreign factories will take several contracts to build airships for the American forces. It is also said that a part of the appropriation to be granted by Congress will be used in constructing hydro-airplanes that will be utilized in checking submarine warfare. This phase of aviation has been closely studied by both military and naval experts, and some extraordinary developments in this direction are promised in the near future.

The bill as it was passed by the House provides that the President may raise and maintain by voluntary enlistment or by draft "such number of enlisted men for the aviation service as are authorized by the measure." A very considerable part of the large appropriation will be used in the establishment of aviation schools and camps and a very large number of air pilots will be developed into experts in the shortest possible time.

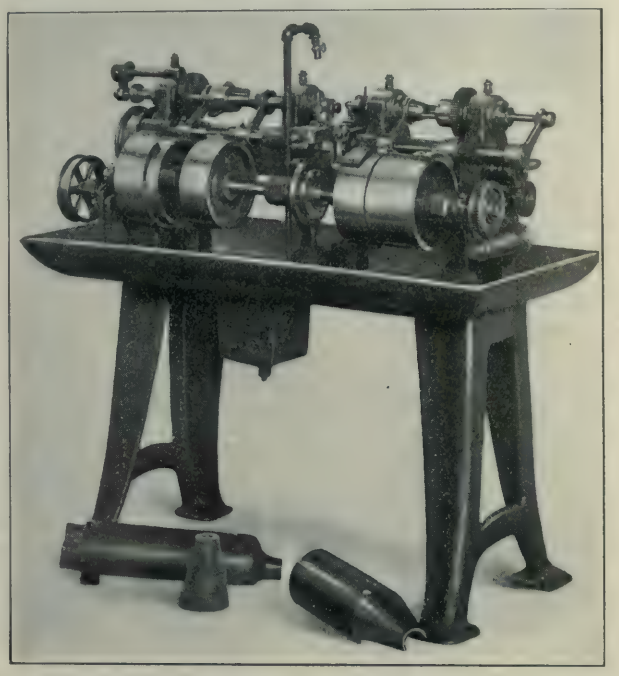
British Forgings, Ltd., Begins Operations

Rapid progress has been made in the construction of the steel plant being erected for the British Forgings, Ltd., on a site of 130 acres on Ashbridges Bay, Toronto. Construction work is being carried on under the supervision of the Toronto Harbor Commission's staff. Work was started the first week in February, and has been so energetically pushed that one of the furnaces has been completed and was put in operation June 18. There will be 10 electric furnaces in all and the total capacity of the plant will be from 300 to 400 tons of steel per day.

Automatic Machine for ⅜-In. Pins

A fully automatic machine of somewhat unusual design has been brought out by the Detroit Tool Co., Detroit. It is intended for producing small pieces that do not have to be drilled or threaded and do not exceed 3 in. in length from steel or brass stock up to ⅜ in. in diameter. The machine is intended for cutting off and turning only and the parts made by it are finished on both ends, thus eliminating the auxiliary operation of burring. If desired, the machine can be fitted up to take care of pieces on which a rolled thread can be used.

The machine has two spindles and the stock is fed in through the headstock spindle in the customary way to a feed stop. The tailstock spindle, which is geared to the same driving shaft as the headstock spindle



Pins 3 In. Long Are Automatically Turned and Cut Off from ⅜-In. Stock and Finished on Both Ends, Thus Eliminating the Auxiliary Burring Operation

and consequently revolves at the same speed, grips the stock. It is emphasized that the work is held rigidly during the entire cutting-off operation and no burr is left on either end of the product. This gripping of the work by both spindles also eliminates chatter in the cutting-off and forming operations, with a resultant increased production, due to the fact that more pieces can be cut off for each grinding of the tools and the feed of the tools can also be increased. The spindle bearings are of phosphor bronze and made to fit a steel sleeve having a taper hole to compensate for wear. This construction, it is emphasized, enables each bearing to be taken out and refitted and replaced without disturbing the alignment of the spindles.

The cross slides work independently of each other, thus enabling both front and back tools to be used simultaneously. The cams controlling the operation of the various tools are mounted on a shaft at the rear of the machine. A clutch located at the front of the machine enables the camshaft to be put in motion at any time. Placing the camshaft at the rear, it is pointed out, enables the cams to be changed easily. Change gears to the number of 14 are supplied with each machine, thus enabling the timing of the cams to be arranged so as to reduce the lost motion as much as possible.

The American Sheet & Tin Plate Co., New Castle, Pa., has commenced the operation of the first of its new double hot mills for the production of tin, effective July 3. The company is making rapid progress in the construction of additional mills to comprise a total of 10 new units for the manufacture of tin and terne plate.

Will Probably Not Build Armor Plate Plant

Many Difficulties in the Way of Government Construction—Cost Would Greatly Exceed the Appropriation—Time Is Also an Important Factor

WASHINGTON, July 17.—Every indication now points to the covering into the Treasury of the $11,000,000 appropriated by Congress last winter for the construction of the Government armor factory. The magnitude of the job, the great technical difficulties of such an undertaking, the impracticability of successfully operating an armor factory independently of a well co-ordinated steel works, the great increase in the cost of every factor entering into the enterprise, from the foundations of the building to the last item of equipment, and the impossibility of assembling within a reasonable length of time an adequately skilled personnel are some of the considerations that have finally brought the authorities to recognize the reasonableness of the proposition which the armor plate manufacturers made many months ago, viz., to permit the privately owned plants to continue to make high-grade armor for the Government at prices to be fixed by the Federal Trade Commission.

Many unforeseen things have happened since this proposition was rejected, but it is more than an impressive coincidence that the Government and the entire country are to-day waiting on the Federal Trade Commission to determine the cost of making steel as a basis for the prices which the President intends to fix, not only for the United States and its allies in the European war, but also for the private consumer. How far the plans of the Chief Executive with reference to price fixing may be carried through cannot be foreshadowed, but it is a moral certainty that, with the cooperation of the steel trade, they will be executed to a point that will eliminate all necessity for a Government armor factory.

Results of Investigation

The proposition to construct a Government plant for the manufacture of armor has not been abandoned without a careful investigation of its practicability and probable cost. The work of inquiry has been in able hands, and this fact renders the outcome the more significant. No difficulty was experienced in securing a desirable site; indeed, in this regard, an embarrassment of riches confronted the Secretary of the Navy, who was invited to take, on his own terms, any one of at least a score of more or less eligible locations. When, however, the work of estimating closely the cost of constructing and equipping a plant began, it immediately became evident that the appropriation at hand was wholly inadequate. The buildings alone would probably have cost much more than the entire amount allotted by Congress, while the cost of every item of equipment would have exceeded by from 50 to 200 per cent the estimates upon which the congressional committees based their calculations.

The time factor in this big equation had an important effect in discouraging the idea of a Government factory. While it was obvious at the outset that the projected plant could not be completed in time to supply any armor for the ships included in the Navy Department's three-year program of expansion, nevertheless Admiral Strauss, Chief of the Bureau of Ordnance at the time the Government armor factory measure was under consideration in Congress, expressed the opinion that the plant could be constructed and equipped and made ready for turning out armor in about half the time predicted by the most experienced steel men connected with private armor making establishments. Developments since these estimates were made have merely served to demonstrate the conservatism of the private manufacturers. Time is now the essence of every contract and builders and manufacturers alike, realizing the difficulty of obtaining materials and labor, are protecting themselves at all points and are unwilling to risk penalties for delays. While some extraordinary accomplishments in the way of quick building are currently reported, they do not include such complicated propositions as completely equipped Government armor factories.

Much More Money Required

Bids recently received by the Navy Department for the equipment of the projectile factory, which is to be built on the site acquired for the Government armor plant, indicate that the appropriation for fitting up the armor factory would have paid but for a small part of the necessary tools and fixtures. The allotment for tools for the projectile factory was proportionately larger than for the armor plant; nevertheless, the aggregation of the lowest bids on the equipment already advertised demonstrates that there will be a big deficit even assuming that the Government is able to secure reductions on some of the most important items, and it is now practically certain that the Ordnance Bureau will have to choose between deferring the installation of an important part of the equipment and asking Congress for more money.

A serious difficulty in the way of obtaining tools and equipment for the armor plant is the fact that much of the machinery is so heavy than only two or three manufacturers in the country are in position to build it, and the books of these concerns are so filled with rush orders, in many of which the Government itself is interested, that it would be impracticable, if not impossible, to meet the requirements of the armor factory within two or three years. The forging and bending shop, for example, will have three 14,000-ton presses capable of forging and bending the thickest and heaviest armor. The original estimate of their cost was $400,000 each, but a fair price to-day would probably be double this amount. A complication here is the fact that in the three private armor factories the forging and bending presses are of the hydraulic type, the use of which necessitates a very high power pumping engine. Certain experts have urged the installation of the steam intensifier type of forging press, which has been used abroad with considerable success and which is much cheaper than the hydraulic press. The efficiency of the steam intensifier has not been fully demonstrated in this country, however, and the designers of the Government plant must thus choose between a more or less experimental type of forging press and a more costly hydraulic type with its high-duty pumping engine.

No Request for Appropriation

No immediate announcement is likely to be made regarding the armor factory, although conclusions probably will be drawn from the significant fact that the Appropriations Committee of Congress has called upon the Departments for their final estimates for the special session and no request for an additional appropriation for the armor factory has been made. In the mean-

time, the Federal Trade Commission is prosecuting its investigation into the cost of making steel and promises a report to the President by Aug. 1 or very soon thereafter.

The commissioner's report will not attempt to fix prices and will doubtless serve merely as a starting point in negotiations between the President and the steel makers. It is quite possible that the steel producers will take exceptions to the findings of the commission, which will doubtless be amended, if errors can be pointed out. At the outset, the prices to be agreed upon will cover only those forms of iron and steel in greatest demand, especially plates and shapes for the construction of the emergency fleet under the supervision of the United States Shipping Board. Ultimately, however, it will be practicable, on base prices to be jointly determined by the Government and the trade, to fix the cost of any special product of steel and no trouble is anticipated in figuring a fair price for armor plate. The private armor manufacturers have already assured the Government in writing that their profits on armor have been less than a reasonable rate of interest on the money invested in special plant and equipment; hence, there is little prospect of any difficulty in arriving at a satisfactory cost basis for future contracts.

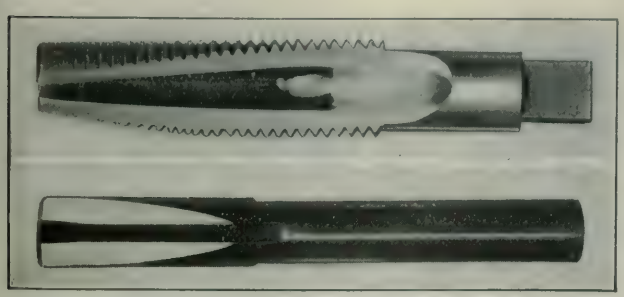
W. L. C.

Taps and Reamers of Special Design

A new design of taps and reamers has been developed by Carl Schoenert & Sons, Inc., 631 South Twentieth Street, Newark, N. J. The special feature about these tools is a hole drilled through the center, and among the advantages claimed for this arrangement are a better chance for lubrication and the elimination of the crowding of the chips into the holes. In the case of a reamed hole, it is stated that not only is the hole a true cylinder, but the surface is smooth and has the appearance of being polished. The grinding of the cutting edges, it is emphasized, can also be accomplished easily without any special adjustments.

The reamers, which are made in various sizes with both straight and taper shanks, are said to be strengthened by the hole that also gives a chance for lubrication and for the chips to work out of the hole and not block up the flutes. The chips produced are said to be of the same shape and appearance as those made by a lathe tool and the hole is made to the size of the reamer. The reamer can be used either right or left, as the cutting edges are on both sides. In this way, if the right hand side is worn off the reamer can be used left-handed if necessary, although the cutting edge can be easily sharpened by holding the reamer against the wheel of a grinding machine and conforming the edge to the shape of the wheel.

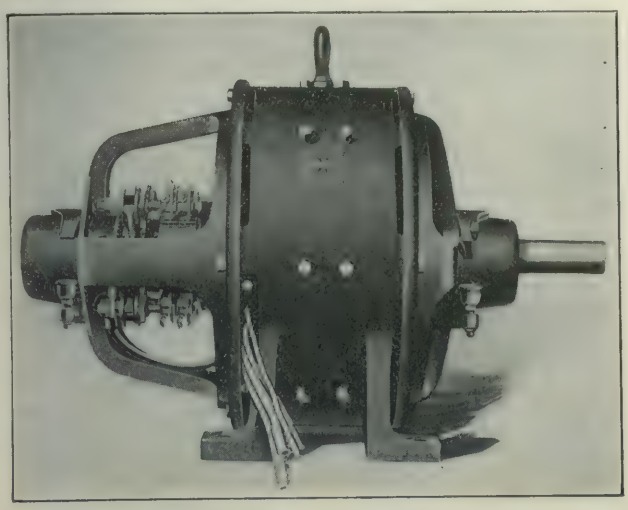
The taps are made on the same principle as the reamers, and it is emphasized that they have a greater clearance than the standard tap and cut the chips practically the same as a reamer would do. The hole drilled through the center of the tap gives the lubricant a chance to flow into the work.



Slotting the Blades of Taps and Reamers Is Claimed to Provide a Convenient Path of Exit for the Chips and Give an Opportunity for Lubricating the Cutting Edges

Direct Current Motor for Mill Service

A heavy duty, general service, direct current motor, designed to meet the requirements of iron and steel mills and metal working plants, has been brought out by the Reliance Electric & Engineering Co., Cleveland. This type T Reliance motor, as it is designated, is built for constant and adjustable speed duty. All frames have four laminated main poles, which are fastened in place by large cap screws. The field and commutating coils are assembled on pressboard and fiber spools. Metal supports between the coil and the frame clamp the fields in place.



Rigid Construction Characterizes a Direct Current Motor That Has Been Developed for Severe Service in Iron and Steel Mills and Metal Working Plants

The bearing housing has a deep oil well with a pocket in which sediment may settle without interfering with the operation of the oil ring. The bearings are cast-iron shells with a depression in which the babbitting is held in place. Pressure relief grooves, drained by a large hole, are provided at the end of the bearings to prevent oil being squirted along the shaft. The oil is distributed through spiral grooves. The bearing is shouldered in the end bracket against end thrust and held against rotation by dowel screws under the oil hole cover.

It is stated that a standard panel type, no-voltage release, starting rheostat is all that is required for non-reversing service not calling for frequent starting, but a drum type or automatic starter should be used if the motor is to be started or reversed frequently or under a load.

Prosperity at Youngstown

The payrolls of the leading independent plants in the Youngstown, Ohio, district for June amounted to $5,795,064, a new high record. The May payrolls were estimated at $5,402,315. The city of Youngstown has been enjoying for months the greatest prosperity in its history. Every manufacturing plant in the Youngstown district is running to full capacity, most of them night and day, when men can be obtained, and labor is being paid the highest wage ever known. The early completion of several of the new steel bar and small shape mills at the McDonald works of the Carnegie Steel Co., at McDonald, a few miles from Youngstown, will add still more to the general prosperity of Youngstown. Building operations in that city are extremely active, and there would be still more activity, were it not for the scarcity in the supply of skilled mechanics. Bank clearings in Youngstown are said to be nearly double what they were five years ago.

The Homestead Valve Mfg. Co., Pittsburgh, has appointed the National Mill Supply Co., Fort Wayne, Ind., its exclusive representative in the Fort Wayne vicinity.

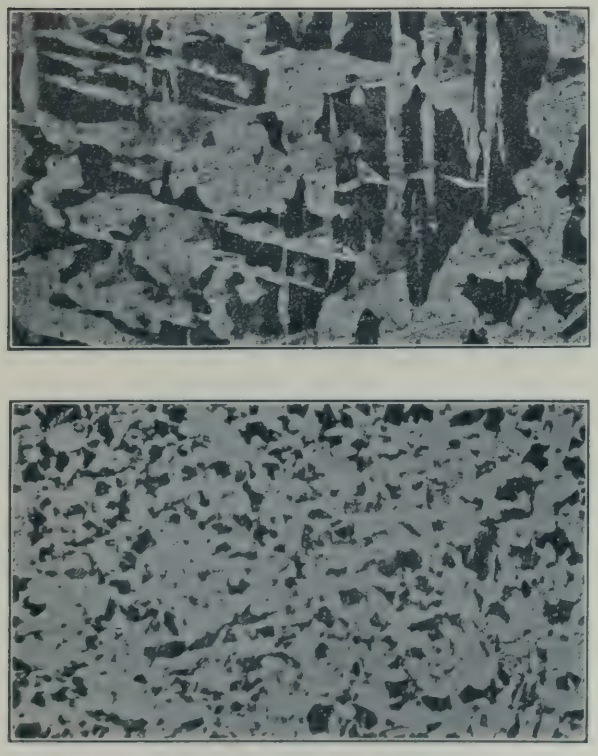
The Role of Vanadium in Steel Making*

Its Value as an Alloy in Plain Carbon Forgings and Castings—Its Efficiency in Tool Steel—Effect on the Structure

BY G. L. NORRIS

THIS discussion is confined almost entirely to the consideration of pearlitic-vanadium-ternary steel, or simple carbon-vanadium steel, and will not more than briefly touch on the quaternary-vanadium steels.

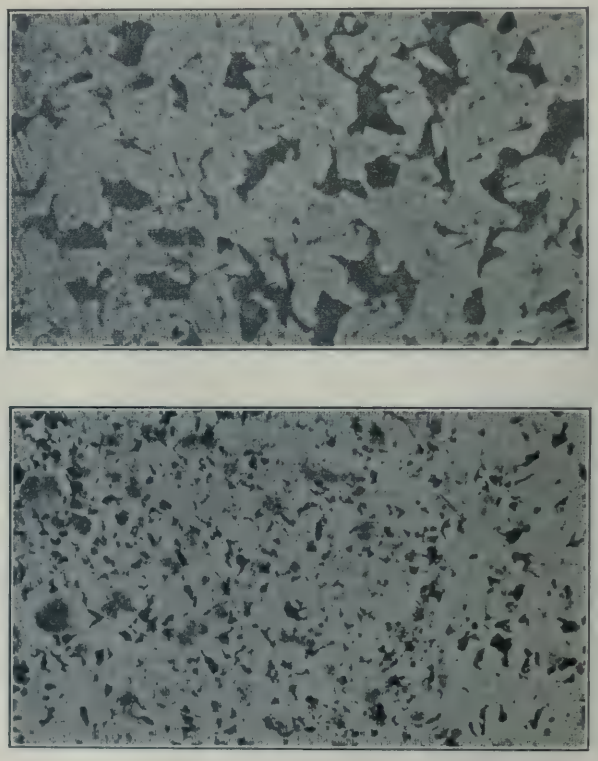
First, however, the writer wishes to touch briefly upon a still somewhat prevalent popular idea that vanadium is a powerful scavenger, and that the beneficial effects of its use in steel are principally due to its removal of minute, residual amounts of oxygen and nitrogen from the steel. It has even been advanced by some individuals that when all the vanadium added has been completely used up in scavenging, and none remains in the steel, all the improvement or beneficial effects possible have been accomplished; despite the fact that there is an increase in the mechanical properties of the steel with increasing amounts of vanadium present, and that vanadium has equally as great beneficial effects in steels made under reducing conditions such as crucible and electric furnace steels, as in the case of steels made under oxidizing conditions like open-hearth and Bessemer steels. While it is true that vanadium oxidizes readily and will combine with nitrogen, its value as a scavenger is negligible, as there are much cheaper metals that are as effective, or perhaps more so.



Photomicrographs, 60 Diameters, of Open-Hearth Carbon Steel for Castings, Containing 0.27 Per Cent Carbon, 0.54 Per Cent Manganese and 0.29 Per Cent Silicon. The upper one represents the metal as cast and the lower as annealed at 860 deg. C.

The remarkable effects of vanadium on steel are due entirely to its presence in the steel as an alloying element, and its influence on the other constituents with which it is in combination. When added to steel it is found in both the main constituents, ferrite and pearlite, but principally in the latter. Only a few hundredths of one per cent of the vanadium combines with the ferrite. This minute amount, however, appears to increase the strength, toughness, hardness and resistance to abrasion of the ferrite. Nearly all the vanadium, however, is found in the pearlite, in chemical combination with the cementite, as a compound carbide of vanadium and iron in the case of ternary steel, and as more complex carbides in the case of quaternary steels.

Vanadium replaces the iron in the cementite or the carbide by increasing amounts until finally, when the percentage of vanadium is about 5 per cent, all the iron has been replaced by the vanadium. The vanadium-containing cementite is not as mobile as ordinary cementite and consequently does not segregate into as large masses, but occurs in relatively minute particles and, therefore, is more uniformly distributed. It does not, consequently, readily occur as lamellar or thin plates in the pearlite, but in a granular or sorbitic condition. This strong tendency of vanadium to form sorbitic and even troostitic pearlite, is doubtless one of the reasons for the mechanical superiority of steels containing vanadium, not only statically but dynamically.



Photomicrographs, 60 Diameters, of Open-Hearth Vanadium Steel for Castings, Containing 0.28 Per Cent Carbon, 0.58 Per Cent Manganese, 0.26 Per Cent Silicon and 0.16 Per Cent Vanadium. The upper one is the metal as cast and the lower as annealed at 860 deg. C.

Vanadium carbide is not as readily soluble on heating as iron carbide, and consequently vanadium steel requires a higher temperature to dissolve the cementite and put the steel in the austenitic condition for quenching. The presence of vanadium does not raise the Ac_1 and Ar_1 points more than about 10 deg. C., and repeated heatings do not seem to lower the Ar_1 point. The Ac_{2-3} and Ar_{2-3} points are raised somewhat more and continue to rise with increase in percentage of vanadium.

*From a topical discussion on the role of various alloying elements in alloy steels, presented at the twentieth annual meeting of the American Society for Testing Materials at Atlantic City, N. J., June 27, 1917. The author is metallurgist, American Vanadium Co., Pittsburgh.

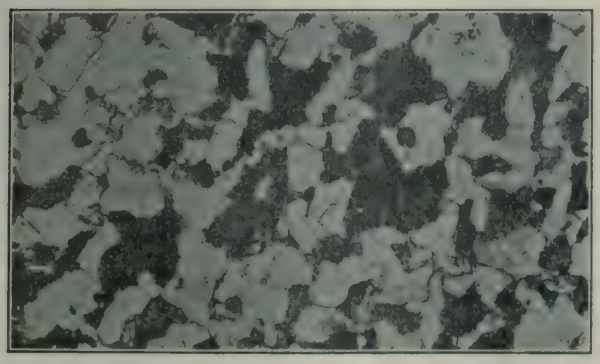
The effect of vanadium on the physical or mechanical properties of steel increases with the percentage of vanadium until about 1 per cent is present, after which there is a decrease, even in the case of quenched steels, and with 3 per cent or more of vanadium the steel is actually softened on quenching until unusually high temperatures are reached, say about 1300 to 1400 deg. C.

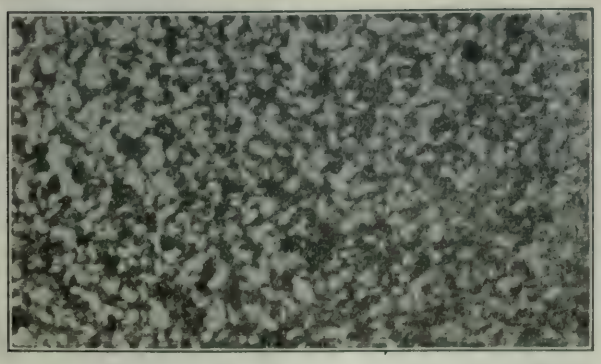
Vanadium in Tool Steels

Vanadium steel hardenite has a greater thermal stability, or power to withstand elevated temperatures without softening or breaking down or separation of cementite. This property is responsible for the great improvement in high-speed steels, through the addition of vanadium to stand up longer under the high temperatures developed at the point of the tool in taking heavy cuts at high speed. Percentages of vanadium as high as 3.50 have been successfully used in high-speed steel, and 1.50 to 2.50 per cent are not uncommon, although only a few years ago the percentage ranged from 0.30 to 0.75, and it was thought that the addition of over 1 per cent gave very little additional advantage. The improvement in high-speed steel through the use of vanadium has borne an almost direct relation to the percentage of vanadium present, and is considered to be from 60 to 100 per cent.

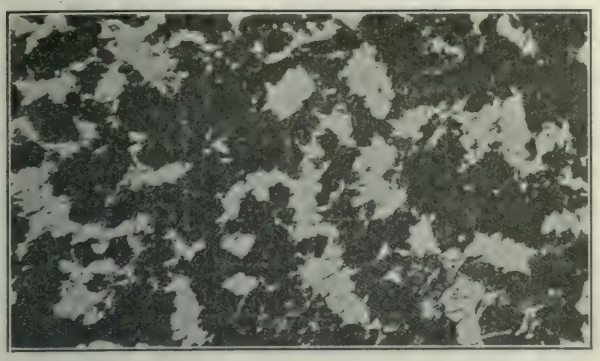
In the case of carbon-vanadium tool steel the use of vanadium has proved almost equally beneficial, although at present only about 0.2 per cent of vanadium is used in such steel. It has a wider quenching range—that is, can be heated higher without injury—hardens deeper, retains cutting edge longer, and is very much tougher and stronger. A bar of 1 per cent carbon tool steel containing 0.25 per cent vanadium, quenched and drawn back at 400 deg. C., will bend 90. deg. without failure, whereas a similar steel without vanadium will bend only about 20 or possibly 30 deg.

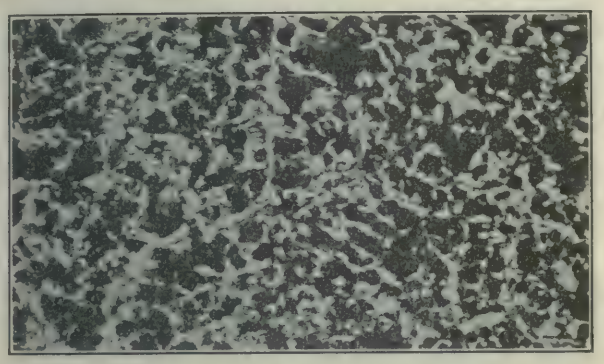
Comparative compression tests of such tool steels with like tempering or drawback gave on 1¼-in. cubes, 490,000 lb. for the vanadium steel and 278,000 lb. for the steel without vanadium. For battering tools, such as pneumatic chisels, setts, calking tools, rock drills, etc., vanadium tool steel possesses marked superiority on account of its combination of hardness, strength and toughness.





Photomicrographs, 250 and 270 Diameters Respectively, of Open-Hearth Bar Steel, the Upper Containing 0.45 Per Cent Carbon and 0.48 Per Cent Manganese and Annealed at 800 Deg. C., While the Lower Has 0.34 Per Cent Carbon, 0.87 Per Cent Manganese and 0.13 Per Cent Vanadium, and Annealed at 790 Deg. C.





Photomicrographs, 250 Diameters, of Open-Hearth Bar Steel, Annealed at 800 Deg. C. The upper represents steel containing 0.43 per cent carbon and 1.30 per cent manganese; the lower, steel containing 0.47 per cent carbon, 0.90 per cent manganese and 0.15 per cent vanadium

One of the principal applications of vanadium steel has been for steel castings, particularly for locomotive frames. The composition of the steel is the same as usual for such castings, excepting for 0.15 per cent or more vanadium. The addition of this small amount of vanadium increases the elastic limit of the annealed castings 25 to 30 per cent without lowering the ductility. The tensile strength is not increased proportionately in the case of thoroughly annealed castings, but is usually 10 to 15 per cent greater. The following averages of tests within the same ranges of composition, having about 0.25 per cent carbon, 0.62 per cent manganese, 0.27 per cent silicon, with about 0.18 per cent vanadium in the vanadium steel, are typical:

	Carbon Steel	Vanadium Steel
Elastic limit, lb. per sq. in.....	36,495	48,210
Tensile strength, lb. per sq. in...	73,820	79,930
Elongation in 2 in., per cent.....	27.3	26.6
Reduction of area, per cent.....	46.0	48.1

For reasons apparent from what has been previously stated, vanadium-steel castings require a somewhat higher annealing temperature than ordinary steel castings. They are also more susceptible to hardening, and therefore should be cooled slowly in the annealing furnace until they have cooled below the Ar_1 point. The annealing temperature should be about 875 deg. C.

Special Treatment of Steel Castings

There is a growing tendency to heat treat, and quench and temper steel castings for many purposes. Vanadium steel is much more suitable for heat-treatment than ordinary steel, as it hardens more on quenching and consequently much higher physical properties can be obtained. Even air cooling from the annealing temperature, followed by an annealing at a low temperature, greatly increases the elastic limit without affecting the ductility. One company by this treatment meets the following minimum physical requirements with vanadium steel of the average chemical composition previously given:

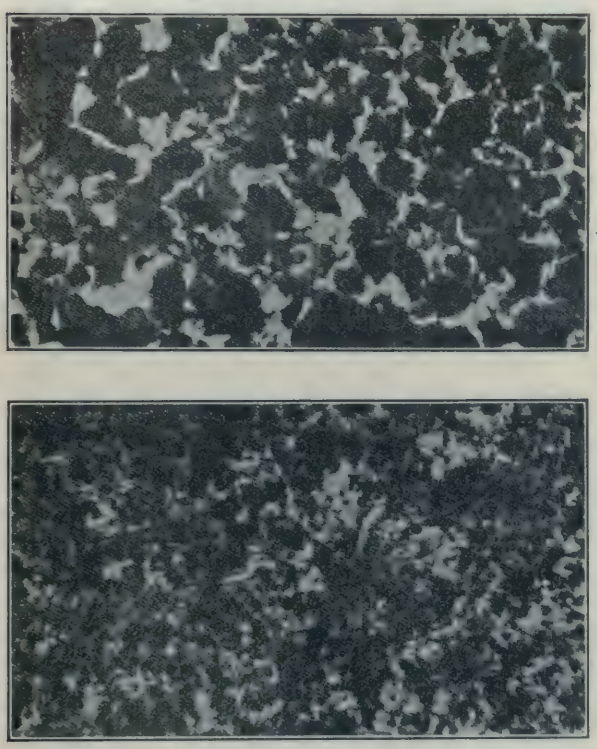
Elastic limit, lb. per sq. in.....	65,000
Tensile strength, lb. per sq. in.....	80,000
Elongation in 2 in., per cent.....	20
Reduction of area, per cent.....	40

Tests of quenched-and-tempered castings of the same composition show as follows, the quenching and draw-back temperatures being the same for both steels:

	Carbon Steel	Vanadium Steel
Elastic limit, lb. per sq. in.....	58,630	72,860
Tensile strength, lb. per sq. in....	90,630	95,630
Elongation in 2 in., per cent.....	25	26
Reduction of area, per cent.....	52	56

For higher carbons, the advantage in favor of vanadium steel is even greater. Water was the quenching medium.

There is also doubtless a great future for vanadium-quaternary-steel castings, both annealed and heat-treated—particularly the latter—for, as in the



Photomicrographs, 600 Diameters, of Crucible Bar Steel, Annealed at 800 Deg. C. The upper one represents steel containing 0.65 per cent carbon and the lower the same steel with 0.22 per cent vanadium

case of forged or rolled quaternary steels, the improvement in the mechanical properties from the presence of vanadium would be much greater even than in the case of simple carbon-vanadium steel.

Plain Carbon-Vanadium Forgings

The value of vanadium in simple carbon forging steels has been over-shadowed by the greater mechanical properties of the vanadium-quaternary steels, such as chrome-vanadium, yet they have mechanical properties equal to those of ordinary 3 per cent nickel steel under like conditions. Excepting where the very high physical properties obtainable from quaternary steels are desired, carbon-vanadium steel can be used to advantage, especially for large forgings.

This steel presents fewer manufacturing difficulties than quaternary steels. It is less liable to losses from shrinkage cracks and checks in the ingot, and to heating and cooling strains in the forging and heat-treatment operations. It requires no more special care in handling than ordinary carbon steel, and is worked with equal facility.

Carbon-vanadium forging steel in the normalized condition, which may be described as annealed for grain refinement, has physical properties superior to those specified for heat-treated carbon-steel forgings. This simple treatment alone, therefore, gives physical properties sufficiently high for a great number of forgings that would otherwise have to be quenched and tempered.

A large field for annealed or normalized carbon-vanadium steel is its use for locomotive forgings. It is generally conceded that there is need of a steel of greater strength, not only to meet present conditions, but also to permit of reducing sections of reciprocating parts to obtain better counterbalancing. To meet this requirement, the railroads several years ago turned to heat-treated carbon and heat-treated alloy steels, notably chrome-vanadium.

The use of heat-treated locomotive forgings has not proved altogether satisfactory for a number of reasons. One objection to the use of these forgings is the lack of heat-treating equipment in most railroad shops. This operates particularly in repair work where for any reason the forging has to be locally heated to straighten, stretch or shorten, destroying thereby the effect of the original heat treatment and producing

Table of Physical Properties of Carbon-Vanadium Forging Steel

Chemical Composition, per Cent	Kind of Specimen	Treatment	Elastic Limit, Lb. per Sq. In.	Tensile Strength, Lb. per Sq. In.	Elongation in 2 In., per Cent	Reduction of Area, per Cent
C. 0.34 Mn. 0.87 V. 0.13	1½-in. round bar	As rolled	78,000	102,000	23	51
		Annealed 800° C	65,000	86,000	28	63
		Oil Q. and T., 900/600° C.	90,000	118,000	25	61
		Oil Q. and T., 875/600° C.	85,000	102,500	22	57
		Water Q. and T., 875/600° C.	93,000	110,000	24	57
		Water Q. and T., 845/565° C.	109,000	125,000	19	60
		Water Q. and T., 845/540° C.	112,500	130,000	19	58
		Water Q. and T., 845/510° C.	115,000	133,350	19	58
		Water Q. and T., 845/455° C.	118,500	145,000	15	51
		Water Q. and T., 845/400° C.	132,500	160,000	12	40
C. 0.37 Mn. 0.96 V. 0.13	1-in. round bar	As rolled	75,000	102,000	23	57
		Annealed 800° C. in air	70,000	90,000	28	63
		Oil Q. and T., 900/650° C.	90,000	114,000	22	64
		Oil and Q. T., 900/600° C.	92,000	118,500	21	63
		Oil Q. and T., 900/540° C.	95,000	120,500	22	62
		Water Q. and T., 830/650° C.	85,000	102,000	26	68
		Water Q. and T., 830/600° C.	97,000	115,000	23	65
		Water Q. and T., 830/540° C.	100,000	120,000	23	67
C. 0.37 Mn. 0.96 V. 0.13	3½-in. hub, outside[1] 3½-in. hub, center[1] 2½-in. pin, center[1]	Oil Q. and T., 900/595° C.	92,000	119,000	20	55
		Oil Q. and T., 900/595° C.	87,000	116,000	20	52
		Oil Q. and T., 900/595° C.	95,000	121,000	18	52
C. 0.47 Mn. 0.90 V. 0.15	1½-in. round bar	As rolled	98,000	135,000	16	39
		Annealed 790° C.	70,000	108,000	21	51
		Annealed 790° C.	70,000	107,000	22	53
		Annealed 830° C.	75,000	107,500	21	48
		Oil Q. and T., 900/700° C.	95,000	120,000	22	61
		Oil Q. and T., 900/650° C.	97,000	125,000	21	60
		Oil Q. and T., 900/600° C.	100,000	128,000	21	58
		Oil Q. and T., 875/430° C.	117,000	137,000	19	52
		Oil Q. and T., 875/315° C.	112,000	139,000	18	51
		Oil Q. and T., 875/200° C.	115,000	142,500	17	45
		Water Q. and T., 830/595° C.	122,000	136,000	20	57
		Water Q. and T., 830/540° C.	130,000	144,000	19	55
		Water Q. and T., 830/430° C.	150,000	172,000	15	44
		Water Q. and T., 830/315° C.	140,000	171,000	11	30
C. 0.47 Mn. 0.90 V. 0.15	7-in. axle	As forged	68,000	123,000	16	30
		Annealed 790° C.	52,000	90,000	24	50
		Oil Q. and T., 870/625° C.	82,000	112,500	22	55
C. 0.47 Mn. 0.90 V. 0.15	11-in. axle	As forged	70,000	117,000	16	28
		Annealed 790° C.	54,000	94,000	22	47
		Oil Q. and T., 870/625° C.	80,000	115,000	20	52
C. 0.47 Mn. 0.90 V. 0.15	Connecting rod	As forged	85,000	131,000	17	44
		Annealed 790° C.	67,000	105,000	23	52
		Oil Q. and T., 870/625° C.	86,000	123,000	20	50
C. 0.47 Mn. 0.90 V. 0.15	11-in. axle, bored with 5-in. hole	Annealed 880° C. in air	63,000	97,000	24	52
		Annealed 880° C. in air	64,000	99,500	23	51
		Annealed 880° C. in air	65,000	100,000	23	52

[1]Specimen from aeroplane engine crank shaft forged from 4 by 4-in. billet cut from 4 by 16-in. slab.

inequalities which may result in failure. Probably no other class of forgings is subject to as abusive use as locomotive forgings, and under such conditions ordinary heat-treated forgings have not been found reliable. For these and other reasons annealed forgings are preferred. Consequently, a steel that could give in an annealed condition physical properties equal to or even better than those specified for heat-treated carbon-steel forgings, would prove very desirable.

Carbon-vanadium forging steel responds to heat treatment in a very superior manner, and in this condition will meet the requirements specified by the society for quenched-and-tempered nickel-steel forgings.

The table shows the physical properties of carbon-vanadium forging steel under various conditions of section and treatment. The photomicrographs illustrate the marked influence of vanadium on the micro-

structure of simple carbon steel. [It will be noticed that it tends to close the structure as compared with the same steel without the vanadium. This is noticeable in each case.—ED.]

As previously stated, the influence of vanadium on the mechanical properties of quaternary steels is even greater than on simple or carbon steel. The best known and most extensively used of these is chrome-vanadium steel. Nickel-vanadium steel, while having possibly even higher tensile properties than chrome-vanadium steel, is considerably more expensive and has not been found to meet all conditions as satisfactorily as chrome-vanadium steel. It does not appear to have as high a resistance to shocks and repeated stresses.

Nickel-chrome-vanadium steel has found extensive application in light armor such as deck plate, gun shields and armor-piercing projectiles, where its use has greatly improved the efficiency of these materials.

Discussion

E. O'C. Acker, metallurgist, Bethlehem Steel Co., South Bethlehem, Pa., took issue with a statement of Mr. Norris, that nickel-chrome-vanadium steel has found extensive application in light armor, such as deck plate, gun shields and armor-piercing projectiles. He said that the best armor piercing projectiles are chrome-nickel and contained no vanadium. Similarly he said that the so-called special treatment steel was made without vanadium.

Mr. Norris replied that Mr. Acker's remarks involved certain commercial considerations which he did not wish to go into at the time. He maintained that vanadium was used by England, Italy and France in special treatment steel, and he knew of English helmets of nickel-chrome-vanadium steel.

Sulphate of Ammonia Output in 1916

Sulphate of ammonia production in the United States in 1916 is estimated to have been 325,000 tons, an increase of 75,000 tons or 30 per cent over that of 1915, according to pamphlet No. 83, published by The Barrett Co., 17 Battery Place, New York. Of the 1916 total, 272,000 tons are credited to the coke ovens and 53,000 tons to the gas works and bone carbonizing plants. The corresponding figures for 1915 were 197,128 tons for the former and 51,921 tons for the latter, according to the U. S. Geological Survey. To this 1915 total of 249,049 net tons should be added 1000 tons estimated for the recovery of sulphate of ammonia from bone carbonization. The 1916 increase of 75,000 tons is termed notable, but it is scarcely larger than that of Germany in 1912, when that country's coke-making industry was being transformed from a non-recovery to a recovery basis.

The 1916 coke output was a record for both beehive and by-product ovens, amounting to over 54,000,000 tons. This corresponds to about 82,300,000 tons of coal which taken with the gas works carbonization of some 4,700,000 tons brings the total coal carbonized to 87,000,000 tons for the year. This should have yielded 870,000 tons of sulphate of ammonia if treated in by-product ovens instead of 325,000 tons, the estimated recovery. Only 37 per cent of the possible recovery is being achieved.

Leases Ore Land

The Matthews Iron & Mining Co., Rome, Ga., has leased a 640-acre tract of brown ore land at Cartersville, Ga., in order to assure a full supply of brown ore to be used as a mixture with its Taylor Ridge red ore in the furnace of the company at Rome, Ga. The two leases covering red and brown ores assure the company a permanent supply and it will have a surplus for sale. The company, which some time ago purchased the 100-ton stack at Rome formerly operated by the R. G. Peters Mining Co. and the Silver Creek Furnace Co., has sold the entire output for the last half of 1917 and has also sold a considerable tonnage for the first quarter of 1918. The furnace was blown in a few days ago.

WISCONSIN ORDNANCE PLANT

Company Is Organized by Leading Manufacturers at Milwaukee

The Wisconsin Gun Co., Milwaukee, has been incorporated with a capital stock of $100,000 to erect and equip a plant for the manufacture of 3-in. field pieces of the 1916 model for the United States Government. The company is organized at the request of the Government by five important metalworking industries of Milwaukee, namely, Kearney & Trecker Co., milling machines; Cutler-Hammer Mfg. Co., electric controlling devices; Northwestern Malleable Iron Co., founder; Bucyrus Co., South Milwaukee, steam shovels, and Power & Mining Machinery Co., Cudahy, unit of the Worthington Pump & Machinery Corporation. The officers will be: President, W. W. Coleman, Bucyrus Co.; vice-presidents, E. J. Kearney, Kearney & Trecker Co.; John D. Bird, Power & Mining Machinery Co.; secretary, Frederick L. Sivyer, Northwestern Malleable Iron Co.; treasurer, Frank R. Bacon, Cutler-Hammer Mfg. Co. The directors include the officers and E. D. Swigart, Bucyrus Co.; Theodore Trecker, Kearney & Trecker Co.; A. W. Berresford, Cutler-Hammer Mfg. Co.; W. C. McMahon, Northwestern Malleable Iron Co.; C. P. Coleman, Power & Mining Machinery Co.

The company will immediately erect and equip a shop with 40,000 sq. ft. of floor space and employing 400 skilled workmen. The Cutler-Hammer Mfg. Co. has given the service of its superintendent, Henry J. Wiegand, to supervise the erection, equipment and management of the plant. It is calculated to produce 1000 guns at the rate of three each working day. The main forgings will be supplied in rough finish by the Government and the carriages and other parts will be made elsewhere, so that the Milwaukee shop will do the machining and assembling of the ordnance and make it ready for mounting upon slides fitted on carriages. The completed gun will be about 7½ ft. long and weigh 1100 lb.

The Government has made an informal statement that the capacity of the plant will be required and that when it is possible to do so, it will enter into a contract for the entire output. In the meantime, the Government hopes that the five manufacturers of Milwaukee will proceed with the erection and equipment of the shop. No mention of profit has been made in any detail of the project and the enterprise has been undertaken from a sense of duty and a desire for service to the nation, it is stated.

Only five guns of the model to be made in Milwaukee have thus far been manufactured, this work having been done at the Watervliet Arsenal. The gun is absolutely standardized in every particular for interchangeability of every part in assembling, reassembling or in case of replacements.

Rapidly Building Cantonments

WASHINGTON, July 17.—Recent reports received from the constructing quartermasters in charge of the 16 cantonments are to the effect that rapid progress is being made and, while it is improbable that all of the camps will be completed by September 1, as is desired, it is likely that all will be in readiness by the time the drafts are completed and the men chosen thereunder are assembled. War Department officials deny with emphasis the numerous charges which recently have appeared in the daily press that contractors for the cantonments now being erected for the housing of the new National army are either perpetrating frauds upon the Government or are demoralizing industrial conditions by paying exorbitant prices for material and wages far in excess of those current in the vicinity of the projected camps.

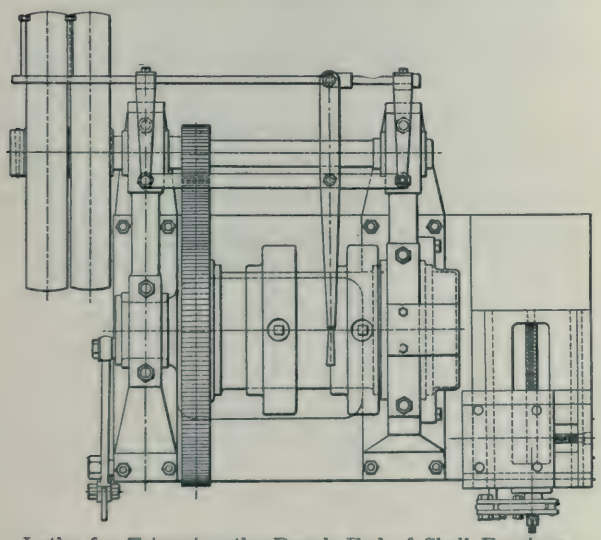
The Madison, Ill., plant of the Helmbacher Forge & Rolling Mill Co., which has been closed down some time for repairs, reopened July 16 with a force of 600 men. The company has completely overhauled the plant during the shutdown.

MUNITION-MAKING MACHINES

Special Vickers Lathes and the Appliances Used in Connection with Them

GREAT ingenuity has been exercised in the development of special munition machines and crane equipment by different British builders of machine tools. The objects kept in mind were the utilization of the same type of machine for a variety of operations and rendering women and other partially skilled and unskilled workers available and efficient. A number of these machines, which were built by Vickers, Ltd., were recently illustrated in *Engineering*. A line of machines has been developed for trimming off the rough end, boring and facing the nose and threading the base of the interior for the adaptor of large shells. While the operations performed are widely different, the main constructional features of the machines are identical. Among the advantages of such an arrangement are a lessened cost and a saving in the amount of floor space occupied due to the compact design. While a standard engine lathe with special chucking equipment could handle all three operations, it is a much more complicated machine and occupies considerably more floor space, while the cost is from two to five times as great.

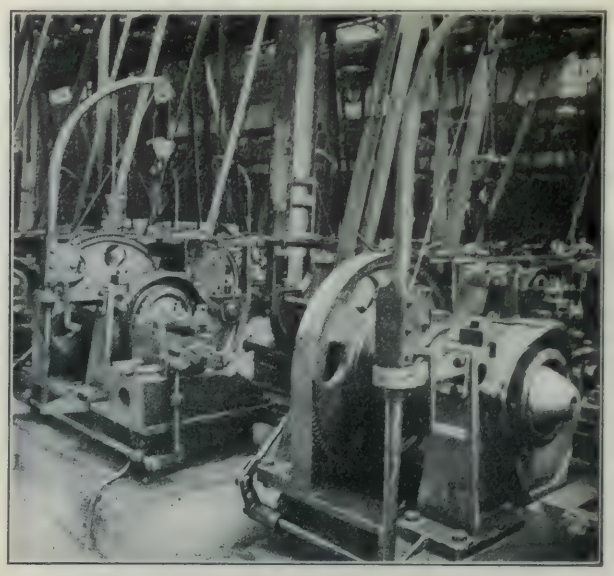
The lathe in its simplest form consists of a box bed and two cast-iron side frames which carry the bearings



Lathe for Trimming the Rough End of Shell Forgings

for the main and pulley spindles. The former is hollow and of large diameter and is driven by a single reduction gear from the pulley spindle, which is fitted with both tight and loose pulleys, thus eliminating the countershaft. The hollow spindle has a sufficient internal diameter to take the forging, and is of such a length that when the shell is nested in it the projecting end is in a convenient position for machining. The belt shifter is operated by a hand lever mounted on the machine frame.

The first operation, that of trimming off the rough end of the shell forging preparatory to turning the outside and boring the interior, is accomplished by a parting tool carried in the tool rest. The rest is carried on a block which is bolted directly to the bed and has both cross and longitudinal feeds. The former, of course, is the one employed in the trimming operation and is of the ratchet type, the pawl being driven from a reciprocating shaft carried on the front of the bed and operated from a crankpin on the outer end of the main spindle. In general, however, the girls operating the lathes prefer to use hand feed, this method entailing no change in the machine. This lathe without any modifications is also employed for facing the base of the shell, the only difference being that greater accuracy in setting up is required, since the shell is turned and bored prior to this operation. To facilitate setting up, a ring, the inner surface of which is shaped to conform to the shell nose, is fixed at the rear end

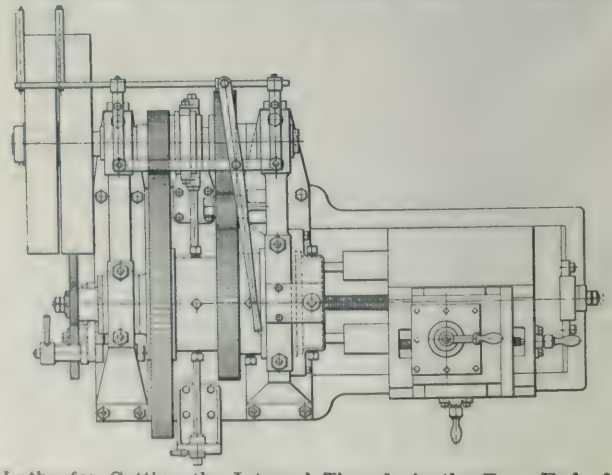


The Nose End of Large Shells Is Faced and Bored in This Special Lathe

of the hollow spindle. The nose of the shell fits into this ring and thus automatically centers the base. In the case of a machine used for trimming the smaller shells, the ratchet feed gear is omitted.

The principal modification to adapt the lathe for facing and boring the nose is the use of power to operate the longitudinal feed instead of the cross feed. This change is due to the fact that the boring is the major portion of this operation, the facing being a comparatively small job which can be easily performed with hand feed.

The general construction of the machine employed for internally threading the base end of base adaptor shells is the same as the other two lathes, although the construction is slightly more complicated. Instead of bolting the tool rest to the base, it is arranged to travel and is operated by a lead screw driven by a train of gears in the customary way. Two pinions of different sizes are mounted on the pulley spindle. One of these drives the main spindle through an idler gear while the other drives it direct, the engagement of these pinions being controlled by a dog clutch. In this way the direction of rotation of the main spindle is reversed. A solid nut which is always in engagement with the lead screw is employed to traverse the slide rest. This arrangement eliminates all likelihood of the rest getting out of pitch with the thread that is being cut, a thing that might be possible were a split nut used, as the lathes are operated entirely by unskilled labor. To stop the travel of the tool rest, a lever at the front of the machine at the left end is provided to throw the gears driving the lead screw out of mesh. A square turret and four tools are provided to recess the rear end of the thread, counterbore, cut and chase the thread. The different sized pinions on the pulley shaft provide for different rates of speed in

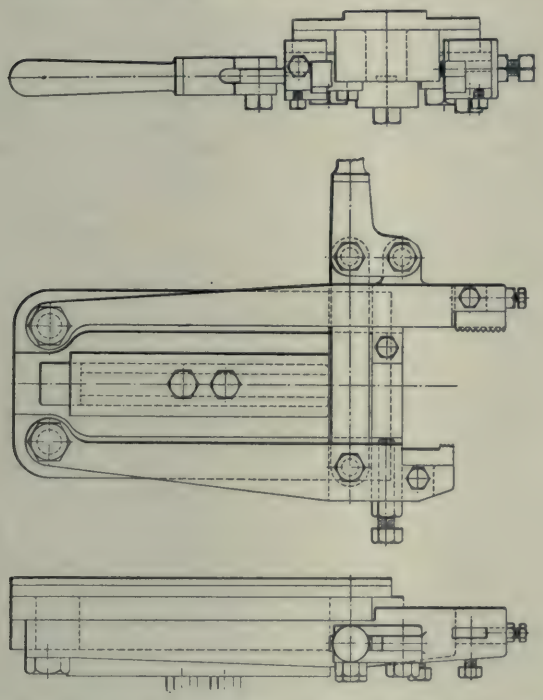


Lathe for Cutting the Internal Threads in the Base End of Base Adaptor Shells

opposite directions, the rapid one being used for bringing the tools into place, while all the cutting is done at the slower speed.

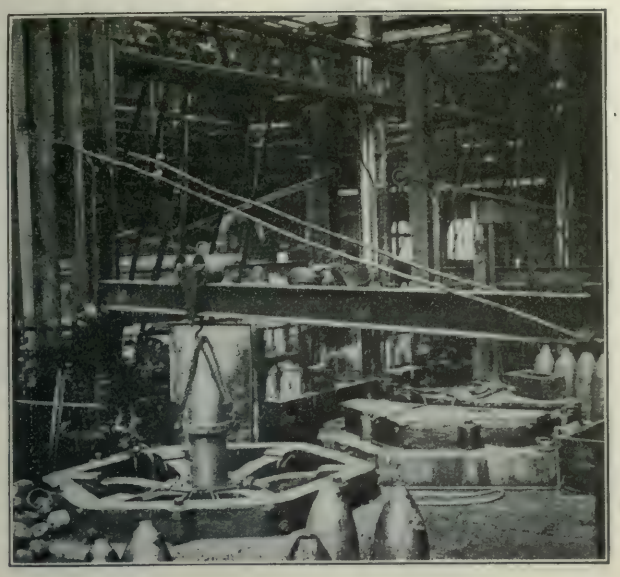
An ingenious self-contained attachment is employed for cutting the thread in the base of shells having threaded base plates. It is held in the tool rest and consists of a pair of levers which can be moved toward or away from each other by a toggle and a handle. One lever carries a half nut which engages with a thread cut on the outside of the nose of the main lathe spindle, while the other carries a chaser that cuts the thread in the shell base, the whole attachment being arranged to slide on a block attached to the tool rest. In operation the device is placed in position with the levers embracing the shell end. The toggle is then closed so that the half nut engages with the thread on the spindle, and at the same time the chaser makes contact with the interior of the base plate recess. The thread is cut as the attachment travels along due to the rotation of the lathe spindle and the engagement between the half nut and the thread on the spindle nose, the depth of thread being regulated by an adjusting screw. In this way it is possible to thread the base end of shells on a lathe that is not ordinarily equipped for screw cutting.

For handling heavier classes of shells to and from



The Self-Contained Attachment Which Is Used for Cutting Internal Threads and Is Held in the Ordinary Tool Rest

a copper banding press, a crane consisting of a simple radial jib made from a joist has been developed. The inner end of the jib is carried by the ram of a vertical hydraulic cylinder and guides and tension rods serve to guide and support the jib. A single valve, which controls the admission of pressure to the cylinder, regulates the movement of the jib, a diaphragm fitted in the exhaust being relied upon to prevent a too rapid descent. The trolley on the jib is not geared and is simply pulled along by hand, the slewing also being accomplished in this way by pulling on the hanging shell or the fall. Another lifting arrangement is of the davit type, which is attached to one of the side frames of the lathe. It has been developed to reduce the work required from overhead cranes and to render the lathe largely independent of them. A lifting drum with a ratchet and pawl arrangement is provided and the use of this crane enables a girl to lift a rough 9.2-in. forging into place for trimming. One of these cranes is shown in connection with the illustration of the lathe for facing and boring the nose ends. Another crane has a swinging jib and ratchet lifting drum and is set to serve two lathes as a general thing, swinging over one to feed the other. There is no trolley on the jib, the crane being set so that the shell swings exactly into the lathe centers or chuck as required, the



At the Copper Banding Press a Simple Form of Radial Jib Crane Is Employed to Lift the Heavier Shells

lathes, of course, being placed so that the load comes where required for each of them. The post is usually set a little out of the vertical so that the jib will swing inward when not in use and not be left projecting out into the bay where it might catch passing loads carried by the overhead traveling cranes.

New Car Service Division

WASHINGTON, July 17.—A Division of Car Service has been created by the Interstate Commerce Commission under the authority conferred by the car service act approved May 29, 1917, amending Section 1 of the act to regulate commerce, to deal with the movement, distribution, exchange, interchange, and return of freight cars. E. H. DeGroot, Jr., until recently superintendent of transportation of the Chicago & Eastern Illinois Railroad Co., now in the exclusive employ of the Interstate Commerce Commission, has been appointed chief of the division, and with A. G. Gutheim, attorney-examiner of the Interstate Commerce Commission, will take immediate charge of its organization and operation. The commission has also secured temporarily for this work the services of H. C. Barlow, chairman of the Executive Committee of the National Industrial Traffic League. During its formative period, the division will have the collaboration and advice of Mr. Barlow.

The Interstate Commerce Commission through this division will regulate car service throughout the United States, and, where occasion requires, orders or directions of the Interstate Commerce Commission will issue under the car service act direct to the carrier or carriers concerned. Subject to this fundamental principle, the Division of Car Service will, as far as practicable, avail itself of co-operative effort on the part of the carriers' Commission on Car Service, now located in Washington. This latter body consists of seven members, all superintendents of transportation of different railroads which territorially cover practically the entire United States. The Commission on Car Service has a large force of assistants under its control in Washington and in the field.

Complaints and communications regarding car service received by the Interstate Commerce Commission will be handled through the new division.

About 100 manufacturers and dealers in motor trucks in the Cincinnati district recently attended a lecture on truck springs and axles given at the United States Motor Truck Co.'s plant in that city by J. R. Phillips, service manager of the Sheldon Spring & Axle Co., Wilkes-Barre, Pa. The design and construction of worm drive truck axles and of methods of taking care of them after they have been put into service, were explained. Luncheon was served by the company to its guests. Similar lectures will be given in future.

Mechanics of the Chilled Iron Wheel*

Determining Factors Limiting Wheel Loads — Margin for Future Increases—Number Now in Service

THE mechanics of the chilled wheel have never been investigated except in a superficial way. The fundamental properties of chilled iron such as specific gravity, modulus of elasticity for varying tensile strengths, action under repeated stresses, relation of operating conditions to temperature stresses, etc., are not established. Dollars are spent in the investigation of steel where cents are devoted to chilled iron. In the face of this neglect the chilled iron wheel by sheer merit survives the struggle for existence. If the properties of chilled iron were fully understood and properly used in the wheel, a large return on the meager expenditure for investigation would flow in upon the manufacturers in the way of increased profits and to the railroads in the way of reduced costs.

Chilled Wheels Now in Service

Its economic importance can be realized when it is borne in mind that there are 25,000.000 such wheels in service, representing 8,000,000 tons of metal, requiring an annual production of 3,000,000 wheels or approximately 1,000,000 tons of chilled iron to replace those worn out in service.

The economic phase of the subject is fully established. A few suggestions are here offered that will ultimately lead to a more intelligent design and classification of wheels for the service they are to perform. Since 1875 wheel loads have increased 500 per cent, axle weights 230 per cent and wheel weights 75 per cent.

The 11,000-lb. wheel load under the 30-ton car was supposed, at the time of its introduction, to be the maximum that could be carried without breaking down the surface metal of the wheel tread and the top rail. This opinion, however, did not long impede the growth in wheel loads, for soon the 50-ton car was introduced with 20,000 lb. concentrated on one wheel. It was considered that this was the limit in car capacity and that the chilled iron wheel might not be fully satisfactory under this burden. Again this opinion is exploded, not only by the successful performance under a half million 50-ton cars, but by the fact that the chilled iron wheel has passed the experimental stage under the 70-ton car with a wheel load of 25,000 lb.

The latest increase is the experimental 35-ton car and 12,000-gallon capacity engine tender requiring an axle having a 6½ x 12-in. journal and 8⅛-in. wheel fit—designed to carry 60,000 or 30,000 lb. per wheel. It is a matter of interest to note that in the year of 1890, 30 tons was considered the maximum car capacity. We now have a single axle of 30 tons capacity or 30,000 lb. per wheel, which shows the marvelous increase in wheel burden.

Chilled iron wheels have been in service for the past five years without structural failure on axles having an 8-in. wheel fit under ore cars and in constant service on 2 per cent grades.

The question now arises—are we bearing the limit for wheel loads? If so, what is the determining factor? What margin still remains for further increases in bearing power of the metal on wheel and rail, in flange strength and in web and hub. These are the questions we propose to answer by considering each part of the wheel separately.

Bearing Power

The bearing power of iron or steel is largely controlled by the carbon content, and naturally since the tread of the cast-iron wheel contains 3.50 per cent of carbon it has a much greater bearing power than the rail which contains less than 1 per cent of carbon. A 33-in. chilled iron wheel will not perceptibly flatten under a load of 250,000 lb., which is 8 to 10 times the present maximum wheel load. Chilled iron wheels are in common use carrying 100,000 lb. or more under large crane unloading bridges, transfer tables, hydraulic locks, etc. To carry these loads, wide special flat-top rails are necessary.

The ordinary railroad rail with a 12-in. top radius will develop a permanent set when the indentation of the wheel into the rail amounts to 0.007 in. If we assume that the maximum load carried in rapidly moving service should not cause, when at rest, an indentation greater than one-half this amount, the limiting loads from the rail standpoint are readily calculated by the formula

$$L = 1{,}500\,000 d\sqrt{D}$$

in which L equals load, d equals indentation into rail and D equals diameter of the wheels. In this formula the pressure per square inch over the area of contact between wheel and rail is taken at 100,000 lb. per square inch. The limiting loads for various diameters of wheels are:

42-in. wheels	34,000 lb.
36-in. wheels	31,500 lb.
33-in. wheels	30,200 lb.
30-in. wheels	28,800 lb.

As far as the bearing power of chilled iron is concerned there is no indication of nearing the wheel load limit.

The Flange

The pressure which the flange must resist in guiding the truck around curves is equal to three-fourths the wheel load provided the truck is perfect and cars in good condition. The pressure is not influenced by degree of curve, velocity, centrifugal force or obliquity of traction, but an allowance must be made for impacts originating from irregularities in track and locked side bearings and center places which, added to the curve pressure, will make the total maximum lateral pressure against the flange one and one-half times the wheel load, or 18,000 lb. for the 30-ton car and 46,500 lb. for the 85-ton car.

It is unreasonable to suppose that a flange designed for an 18,000-lb. pressure will have the same factor of safety for 46,500 lb. pressure; in fact, the thickness of flange was developed when flange pressure did not exceed 8000 lb. It is just as necessary to increase the flange section as to increase all other sections of the wheel, when increased duty is imposed, and notwithstanding the fact that the Master Car Builders in their latest report stated that no increased flange width was necessary, this matter is by no means settled, as far as other associations are concerned, and a movement has again been started to determine whether the hundreds of thousands of flanges that are now in use (which are wider than the present M. C. B. standard flange), are not entirely in harmony with present track standards.

When this question is answered—the question of track clearance ought to have been answered long ago—we will then have an opportunity to present to the Master Car Builders' Association a flange with a factor of safety proportional to the load carried, which is not a difficult proposition and which from an engineering standpoint is demanded.

Stresses Within the Plate or Web

The University of Illinois has undertaken a thorough analysis of the properties of chilled iron and of the stresses within the wheel originating from all conditions that can arise in service as far as they can be duplicated in the laboratory. These items include

* From a joint address before the Railway Club, Pittsburgh, May 28, 1917, by George W. Lyndon, president, and F. K. Vial, consulting engineer, representing the Association of Manufacturers of Chilled Iron Wheels.

specific gravity, coefficient of expansion by heat, modulus of elasticity, tensile and compressive strengths, stresses in the wheel originating from pressing on the axle, from vertical load, from side pressure on the flange, from difference in temperature between tread and plate—also to discover the probable difference in temperature between tread and plate for continuous application of various shoe pressures at various velocities. An indication of the magnitude of these stresses already has been determined, as follows:

From pressing on an axle, having a 7-in. wheel fit at 60 tons pressure, 18,000 lb. compression per square inch is developed in the single plate; the greatest tensile stress is in the hub. If the machine work is fairly well done, these stresses are symmetrical, but if irregularly machined the stresses will be bunched and necessarily greater than normal, at times sufficient to burst the hub. Under a vertical load of 300,000 lb. the maximum compressive stress occurs on the radial line between rail and hub amounting to about 16,000 lb. in the 725-lb. M. C. B. wheel. The tensile stresses in the tangential direction are about 13,000 lb. These stresses alternate at each revolution of the wheel. The maximum stresses are in the front plate. In the back plate the load stresses are practically nil. The stresses from vertical load within the limits of railway practice are practically negligible.

Temperature Stresses the Greatest

The greatest stresses and therefore the most important are the temperature stresses; for example, a 625-lb. wheel was placed in a brake shoe testing machine and operated at various velocities under a continuous shoe pressure of 1500 lb. This corresponds to the retardation required for a 50-ton car on a 3 per cent grade when operated at 5 miles per hour and on a 2 per cent grade when operated at 30 miles per hour. Thermocouples were placed ½ in. under the surface of the tread, under the rim, at the plate intersection and in the hub. These couples were connected by brushes to a collector ring insulated from the axle so that temperatures could be taken from any part of the wheel at any time without stopping the machine. After running the equivalent of 35 miles the maximum stresses developed near the intersection of plates were found to be:

	Lb. per sq. in.
At 5 miles per hr	10,000
10 miles per hr	12,000
20 miles per hr	15,000
30 miles per hr	18,000
40 miles per hr	21,000
50 miles per hr	24,000

Since the above is a greater retardation than is required for controlling 30-ton cars, it is evident that if the shoe pressure could be made uniform on all wheels of the train there would be no overheating of wheels; but there are so many opportunities for irregularities in service that at least 200 per cent above the theoretical retardation required must be taken into consideration when designing wheels. The test also indicates the great benefit of thermal or cooling stations.

When complete data is worked out for each weight of wheel and the information published in the University bulletins, this study will constitute one of the greatest engineering achievements of modern times.

Making standards for the car wheel which ought to be recognized as the most important part of the car structure without reference to fundamental principles is absolutely unjustifiable.

We may say frankly that the work which has been done in the past eight years by our association, in conjunction with committees and other associations with which we have had to deal, has not yielded us material results. Nevertheless we have gone along in our work with committees, with associations, with Government bureaus, with state universities and with railway clubs, all for educational purposes, firmly believing that we were on the right track and that sooner or later our recommendations would be endorsed.

In these troublous times when the Nation's energy is at the highest state of tension it may be well for all of us to pause for a moment and ask ourselves—what could the railroads do to-day without the chilled iron wheel?

Labor Output and Fatigue

Industrial fatigue and output are discussed by H. J. Spooner in a 50-page pamphlet which has just been published in England, and which is commented on as follows by the London *Ironmonger*.

Mr. Spooner's name is familiar to every draftsman and to many engineers engaged in machine and motor practice. There is one foreword to the pamphlet by Sir Robert Hadfield and another by J. R. Clynes. They agree with the author that, while it is inevitable that the output of Britain must be enormously increased after the war, something must also be done to improve the conditions under which men work and live. In the space of 50 pages, Mr. Spooner passes under review much that has been accomplished since the beginning of the war. Employers interested in the matter, and there should be many such, will find the official investigations relating to fatigue carefully epitomized and much besides on the physiological and psychological aspects of the problem.

The author recommends the reconsideration of shop hours, the reclassification of trades, attention to motion study and the extension of welfare work, and directs attention to a new industrial phase which he calls labor turnover. This last is concerned with the problem of inefficient labor which is continually on the move, and expensive alike to employers and the community. The book, in short, is one of the best things of its kind that has yet appeared, probably because it has been written by a man who is closely in touch with the heart of things and knows the difficulties of the employer, and yet can understand the suspicions of the workers. As he has nothing to gain from either party, Mr. Spooner can hold the balance evenly between them. He certainly is able to show that increased output would not eventually diminish employment, but the reverse. This is a matter which requires constantly to be kept before the workers; but, on the other hand, it is equally necessary to remind employers that under the new conditions likely to prevail profits may be smaller per piece, although there is no reason why the aggregate should not be maintained, and, indeed, increased.

Will Pool Coal Shipments

WASHINGTON, July 17.—To prevent detention of cars at tidewater ports, bituminous coal amounting to about 36,000,000 tons a year will, it is announced by the coal production committee of the Council of National Defense, soon be pooled pending boat shipment at four Atlantic Coast ports—New York, Philadelphia, Hampton Roads and Baltimore.

The plan for pooling coal, it is explained, entails sacrifice by many operators. Coal shipments, it is stated, will be standardized, so that instead of there being 1165 different classifications, each of which requires considerable switching when a boat for any particular kind arrives, coal will now be classified into only 45 kinds. Coal of like kinds, after careful inspection, will be pooled—that is, run on one track—so that when a boat arrives to take a cargo of 100 cars, for instance, of a particular classification from Baltimore to Boston, the first 100 cars of that classification will be run on board and dumped.

Automatic Screw Plant on Pacific Coast

A new plant which is the first built for the manufacture of automatic screw machine parts on the Pacific Coast has been completed by the Western Screw & Lock Nut Co., at the corner of Tenth and Folsom streets in the center of the manufacturing district of San Francisco. It was built primarily to provide adequate facilities for manufacturing the Drake lock nut which was illustrated in THE IRON AGE, Oct. 26, 1916, but the production of screw machine parts as well is contemplated.

The Western Electric Co. has opened three new electrical supply warehouses as follows: New Haven, Conn., 135 Wood Street, Tyler L. Holmes in charge; Baltimore, 425 East Oliver Street, S. Greenfield in charge; Charlotte, N. C., 238 West First Street, R. H. Bouligny in charge. W. H. Quirk has been appointed manager of the company's branch at Cincinnati. W. L. Sioussat will succeed Mr. Quirk as stores manager in the company's Cleveland house.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the DAVID WILLIAMS CO., 239 West Thirty-ninth Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: Equitable Building. Philadelphia: Real Estate Trust Building. Cleveland: Guardian Building. Cincinnati: Mercantile Library Building.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year. Entered at the New York Post Office as Second-class Mail Matter.

Price Regulation at Hand

What Secretary Baker gave out in a formal way after the conference between steel manufacturers and Government heads at Washington last week had a fair sound. Prices that will "insure reasonable profits" are to be fixed, he said, and they will be decided upon "with reference to the needs of this vital and fundamental industry." Secretary Baker is understood also to have used the word "liberal" in referring to the margin that will be allowed over the cost of production as determined by the Federal Trade Commission. On its face such an announcement of policy might be called reassuring, but it does not answer the questions the manufacturers and industrial consumers of steel are asking as to the effect Government price-fixing will have on their business in the immediate future. In the first place the extent of the reduction is not yet known; in the second place it is not certain how far it will apply beyond Government needs.

The definite statement that "it is the intention of the Government to distribute the war requirements over the entire iron and steel-producing capacity of the country" might be taken to indicate that the prices fixed will be such as will permit a reasonable profit to the smaller producers in the various lines whose costs are considerably higher than those of the large integrated companies. But that is not certain; for the intimation has been given, apparently on authority, that the Government will see that such producers get their raw materials at less than current prices. That might indicate that the plan at present does not contemplate the fixing of a maximum price on pig iron which shall apply throughout that market. There has even been the suggestion from a Government source that different prices might be paid for finished steel, so as to equalize inequalities in cost. Such a proposal can hardly be meant to be taken seriously. It would involve endless complications and is squarely in the face of the President's call for one price for all.

What is certain is that the fixing of new prices by the Government is at hand—prices it will pay on the steel it buys or that is bought for use on Government contracts. Within two or three weeks, the Federal Trade Commission announces, it will be able to tell what costs are for different forms of finished steel and then the Purchasing Commission will let it be known what prices will be paid.

The Government is not alone in wanting regulation of steel prices. Many producers and buyers of steel have feared the consequences of the ungoverned upward movement of the past six months. Manufacturing consumers in various lines have been coming to the end of low-priced materials and have had to consider whether to enter the gamble and cover their needs at $40 to $50 per ton above the old contract basis. The public has little direct contact with the steel market, but it knew that nails and sheets were enormously high, and the farmer knew that implements were going up beyond any reckoning of recent years. There was growing uneasiness in a number of lines lest the disastrous effects of excessive prices would come even before the beginning of peace parleys in Europe.

The President has called on producers to revise their prices. He has said in effect that when the Government names the prices it will pay for their products they should furnish these products to private buyers at the same figures. He has bounded in a single sentence over every obstacle to such a course by declaring that the public is now as much a partner of the Government as are the Army and Navy.

Yet there are some practical considerations that must enter into such a decision. One concerns the readjustment of contracts already on the books at higher than the fixed price. It is plain that the Government's act in fixing the prices it will pay cannot abrogate such contracts. At the same time what is the position of the buyer who has such a contract as compared with that of his competitor who had not bought ahead, and who, as the President thinks, should be given the same price as the Government? It may be that the number of existing contracts at prices in excess of those that will be fixed by the Government would prove not to be large. All depends on the Government's view of "reasonable profits."

That the Allies shall have the advantage of the Government's prices is also the evident intention of the Administration, but that is a ques-

tion which only time will determine. Obviously "one price for all"—Government, public and Allies—has more chance of becoming the rule if the Government meets half way the steel manufacturers' view of what are reasonable prices for their products. The Allies paid the price for their American loan of 1915, and Great Britain has had and expects a fair return from her allies for her money and her steel. The precedents thus favor a practical view of this question.

The fixing of prices for steel, in view of the wide range of costs, as has been repeatedly pointed out, and the great web of contractual obligations existing, is a serious problem, more serious than some of those who are handling it at Washington seem to realize. What the Federal Trade Commission needs more than cost sheets is information as to the average prices at which steel products have gone from the mill in the past twelve months. From that basis the readjustment, while considerable on some products, plates in particular, would be less violent than from figures representing an investigator's theory of what the market should have been in all the months of war stimulation.

The new prices should not be fixed, moreover, without full consultation with both steel manufacturers and representatives of consuming interests. Manufacturers of agricultural implements, the building trades, the railroads, the railroad equipment companies, the builders of machinery, all should be heard from before the market is put by Government decree on a basis of regulation. The Government needs and should have, on a matter of such far-reaching consequences, the co-operation of manufacturers—not only the manufacturers of steel but all the army of manufacturing consumers whose raw materials come from blast furnaces, steel works and rolling mills. Such a handling of the question of prices in this critical time would mark the beginning of real co-operation between the Government and the makers and users of steel—a co-operation that should continue in a practical way throughout the war and through the period that is to follow, when economic problems of unparalleled difficulty must be met.

War-Time Labor and the Unions

The disgraceful riots in East St. Louis, commented upon last week, have focused attention upon negro labor to an extent that justifies reiteration of the fact that certain industries would be much embarrassed, were it not for the assistance afforded by the colored man. Since the beginning of the war, the supply of labor suitable for common yard work has been very much curtailed, many sturdy men of various nationalities, particularly those from southern and southeastern Europe, having departed to take up arms for their respective countries. There are foundry plants in East St. Louis and in and near Chicago which could not operate were it not for the fact that their coal, coke, and miscellaneous materials are handled by negroes, and it is well they are available, not only for the employer, but also for the skilled mechanic. The latter is quick to protest if there are not sufficient helpers around a plant. He should realize that there must be hewers of wood and drawers of water.

Common labor has been so scarce around Chicago that some foundry managers have been eager to pay 30 cents an hour to those, white or colored, competent to do heavy rough work, and to give them all the overtime they want in the bargain. Not only are they needed for the handling jobs but in cleaning and chipping castings. We have already reported an investigation conducted at St. Louis by the Illinois State Council of Defense, Samuel Insull, Chicago, chairman, which condemns the stimulated migration of negroes from the South to the North and by implication places blame on St. Louis employers by naming them as the "chief beneficiaries" and stating that "the force of motive points in their direction."

It is unfair to implicate industrial managers on such thin circumstantial evidence. Further north than St. Louis, as has been heretofore pointed out, the colored man has come to work on the railroads, but has deserted this work because of the more attractive wages offered in manufacturing plants. Needless to say, he was brought North because the railroads were destitute of common labor for track work, and the higher wages were offered by plant managers because of the scarcity of laborers in their respective lines. The facts present ample justification for the migration of the negroes and for their employment. That the presence of the negroes, even under the circumstances referred to, is not agreeable to the labor unionists is admitted by the Illinois State Council of Defense report when it says: "The colored men * * * were preventing desired improvements being made by labor and threatening the existing standards of labor." When the selective draft becomes operative, and additional thousands of young men, both skilled and unskilled, are taken away from their employment, the labor situation will grow worse. What will be the attitude of organized labor then? Will it insist that only a part of the wheels of industry be kept moving rather than utilize all labor that can be found? Women and girls and boys, with those regular workers who are left, cannot do it all.

Union labor, as shown by the report above referred to, had its share in the East St. Louis riots, and following the trouble there Illinois State troops were called out to control strikers at Bloomington, Ill. In the latter place, the negro question was not involved, but at a time when the nation at large has trouble enough, why should it be necessary to call out troops to control strikers? The striking street car men of Bloomington sought pure and simple recognition of their union. This is not the time for such an agitation, and a conclusion bound to be reached is that some union men and their leaders are not doing their part in the present emergency. As citizens they are at least misguided.

Price Fixing in England

Various opinions are expressed as to the efficacy of the fixing of iron and steel prices in Great Britain. It is pointed out, for instance, that the system of establishing maximum prices did not provide for works expansion and this had to be gotten around by the Government providing funds for new construction. It is suggested also that British buy-

ers had the American market to fall back upon, when they could not secure supplies at home, and that any success achieved would not furnish a criterion as to what would occur in the United States, with no opportunity on the part of American buyers to seek material elsewhere. Then there is another feature, that under certain circumstances at least higher prices prevailed for exports than the domestic limits.

Following are representative British market prices (at £1 = $4.75), changes in the past twelve-month having been very slight:

No. 3 foundry pig, Middlesbrough	$24.39
Bessemer, West Coast	30.28
Standard rails (2.31c.)	51.66
Ship angles, Middlesbrough	2.36 cents
Ship plates, Middlesbrough	2.44 cents
Galvanized sheets (24 gage)	6.10 cents

The control of prices does not seem to have caused any great amount of dissatisfaction in the British iron and steel trade, but there were two circumstances that differentiated British conditions altogether from those obtaining in the United States. In the first place, almost the entire output is being used, in one way or another, for the prosecution of the war, whereas we on this side would have to make a great deal of progress before getting into position to utilize some 35,000,000 gross tons a year of rolled iron, rolled steel and steel castings, for prosecuting war. In the second place, the British producers are allowed to retain only 20 per cent of their excess profits, the balance being collected as taxes, so that the question of profits is only one-fifth as important as it would be if there were no excess profits.

The view of the well-informed London correspondent of the New York *Evening Post* appears to be that price control in England should have proceeded much farther, for he cabled last Saturday:

> Your Government's measures to restrain profiteering command general approval, and are favorably contrasted with ours. Lack of control here is largely responsible for the increased cost of the war, and palpably increases the difficulty of financing. However, we are less favorably placed than you, who actually produce most commodities whose prices you seek to control. That fact alone suggests greater success for your measures. The attempt to assure the same prices to the public as to the Government is regarded as wise, for the rise in the cost of living here always militates against subscriptions to the war loans, by reducing the margin of income available for investment.

Early last month an advance of 5 shillings was allowed by the Ministry of Munitions in prices of certain descriptions of Staffordshire pig iron, but not, according to the *Iron and Coal Trades Review*, London, until the books of the furnaces had been showing a loss. The price of most grades of furnace coke was fixed last year at the equivalent of $5.45 per net ton at ovens.

Very little information has been available as to difficulties experienced by the British authorities in distributing or "allocating" the supplies of material, after the price had been fixed. That, perhaps, has been the most difficult part of the job, and certainly the difficulty would be greater in the United States. As has been pointed out in these columns, the regulation of deliveries—determining who is to have such steel as is available after direct Government needs have been supplied—is as important as the regulation of prices.

Progress in Electric Steel

Great strides have been made in the last few years, and particularly in 1916, in the world's production of steel in electric furnaces. Great Britain last year more than doubled her 1915 output while Germany increased nearly two-fold her 1913 record production. Canada stepped into prominence by making more electric steel last year than France, the home of the electric furnace, and Austria-Hungary doubled under war conditions her production of 1915. The output of the leading countries, at roundly 490,000 tons in 1916, was over twice that of 1915 and nearly three times that of 1913 when other steel production records were broken in most countries.

The United States has made the most rapid advance, and to-day leads by far any other country both in output and number of furnaces. While the 1916 output did not equal that of Germany, as expected, the rate of expansion in capacity was greater than in all other countries, having been last year two and one-half times that of 1915 and between five and six times that of 1913.

On July 1 it is estimated that the electric steel output of the United States was easily at the rate of 200,000 tons per year and by Jan. 1, 1918, if the furnaces now under contract are producing, it will reach 300,000 tons and outstrip any other country. On Jan. 1, 1917, the annual statistics of THE IRON AGE showed the United States to have 136 electric steel furnaces operating or contracted for, with 19 in Canada. Six months later, or early this month, conservative estimates place the United States total at not less than 165, with the total for this country and Canada not less than 210. This is a growth of over 30 per cent in six months.

It is hard to assign bounds to the further use of the electric current in steel making. The development has already exceeded the most optimistic predictions of only three years ago. Added to all is the growing use of electricity in the treatment and heating of steel, which is rapidly achieving results not thought possible only a few years ago.

CORRESPONDENCE

Industrial Workers and Medical Inspection

To the Editor: I read with considerable interest Magnus W. Alexander's recent article in THE IRON AGE, which appeared almost at the same time as a small contribution of my own to the *Railroad Herald*, on the subject of "Medical Inspection and Industrial Man Power."

Your issue of June 14 contains an article on "Industrial Medical Service of the Future," taken from an address made by a member of the American Medical Association, which well expresses the aims and views of that body, and I hope to see further comment in your columns on the subject. Under the admirable teachings of the American Medical Association the average man is beginning to wonder as he reads his

paper if America has not become a plague spot, and whether it is safe to appear on the streets without dropping in on some "regular" physician for advice.

Under the cry of "Health! Health! Health!" the matter of Sickness! Sickness! Sickness! is being constantly dinned into all ears.

If the recommendations in the article in question were carried out it would mean that from the cradle to the grave no man would enjoy industrial or private independence from the domination and direction of a medical autocracy. I grant that there are some, possibly many, who are deficient in household sanitation. But what of the man and woman who are not deficient, and yet at any time would have to admit the medical intruder into their home, show him the contents of the ice box, tell him how often the kitchen sink is disinfected, explain how the bed linen is aired, and expose all the privacy of home life to his critical gaze, and then stand aside like children to receive his commendation, or his reproof and instructions.

It is proposed that when a worker absents himself from his duties the medical inspector will immediately seek him out in his home, and report to his employer as to whether he is necessarily absent from ill health, or is out from some other cause.

Do you have any idea that labor, once it wakes up to the completeness of the domination that these modern (but dollar-wise) Don Quixotes propose to extend over industrialism, and over the private lives of workers and their children, will in any sense submit? Can anyone imagine Americans tamely submitting to so odious a condition? I think that rather the pendulum will swing to the other extreme, and that much of the real good that has been accomplished by the American Medical Association in the way of standardization will be undone, and the usefulness of medical science set back a decade.

The railroads of the country in days by-gone rode blithely rough-shod over the wishes of the people, merrily sowing the wind—and what a whirlwind the poor railroads have reaped, and are still reaping. Let the American Medical Association take warning, and if they have anything good to offer, offer it freely—but beware of trying to cram it down unwilling throats.

R. C. BROWN.

Mechanical Department, Georgia Railroad,
Augusta, Ga., June 25, 1917.

Increasing Naval Employees

WASHINGTON, July 17.—The civilian mechanical force at navy yards and other naval establishments has been increased since April 1 from 25,000 to about 35,000, according to a statement issued by the Civil Service Commission, through whose agency this increase has been effected. Concerning the work of the commission in co-operating with the Government in securing employees, and especially with reference to the safeguards adopted to prevent the disorganization of private manufacturing enterprises, an official statement in part as follows has been promulgated:

Of approximately 10,000 men appointed, 8500 have registered for employment with the commission's local boards of examiners at the yards and stations, and the remaining 1500 have been certified through the direct efforts of the commission at Washington and its agents in the field.

Of course, not only the Government is to be considered at this time. Private enterprise engaged in furnishing material to the Government must have the labor necessary to fulfill its contracts, and in order not to interfere with the work of these establishments the commission's agents are instructed not to make an offer of employment in a Government plant to a man engaged upon a Government contract without the consent of his employer.

In addition to meeting immediate calls, the commission has enrolled about 35,000 mechanics whose services are not needed in Government plants at this time but who have expressed their willingness to accept Government employment.

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Price Regulation in the Wire Nail Trade

An interesting development which throws a strong light on some phases of price advances in iron and steel is seen in the wire nail trade. For some time, as market reports have indicated, the American Steel & Wire Co., which produces approximately one-half of the wire products of the country, has continued to sell wire nails at $3.20 per keg, while sales have been made by various independent producers at $4. The situation in wire has been like that in many other products, the bulk of the current shipments being at prices considerably below the $4 level, even in the case of independent producers. At the same time, as the prompt or premium market went to $4, the jobbing trade began basing its sales to retailers on the $4 price at mill. Thus in some cases $4.50 and as high as $4.75 were charged on sales to retailers, some business in the Philadelphia district being done at $5.

The American Steel & Wire Co. having made an effort to hold prices in check to guard against the inevitable reckoning which follows an ascent of the market to unusual levels, considered that the advances asked by the jobbers were unreasonable and so informed many of its customers. The result was a readjustment of prices by jobbers, so that a spread of from 40c. to 60c. a ton was made between the $3.20 mill price plus freight and the selling price to retailers. For the most part the readjustment gave the jobbers a 50-cent profit. As was to be expected, irregularities have developed, due to the competition of nails sold to retailers by some jobbers at $3.75 to $3.95, with nails for which other jobbers paid $4 on prompt orders from mill. The movement for reasonable prices thus started by the leading producer is apparently aided by the position the Government is taking respecting the whole range of prices for steel products. The $4 mill price for nails is still maintained by some sellers and the supply is not fully equal to the demand, partly in view of the fact that billets and rods are fully as remunerative to the mills as product in the more advanced form.

The method, as outlined above, of checking advances to the ultimate consumer, has had the approval and cooperation of many members of the jobbing trade, and the resulting situation has made the move the most widely discussed development in the wire nail trade in years.

Record Exports of Copper

Exports of copper from the United States in the first five months of this year exceed any previous record and nearly equal the total of 1915, due largely to the large Allied contracts taken last year. To June 1, 1917, they have been 225,582 gross tons against 108,348 and 119,551 tons for the corresponding months in 1916 and 1915 respectively. The 1917 and 1916 exports have been as follows in gross tons:

	1917	1916
January	51,322	23,663
February	32,265	20,648
March	51,218	26,321
April	49,536	21,654
May	45,241	16,062
Totals	229,582	108,348

The total exports in 1916 were 327,310 tons, but only 276,344 tons in 1915, showing the relatively large exports so far this year. Before the war exports ran to 382,810 tons in 1913.

Imports of copper to June 1, 1917, have been 96,500 tons against 84,000 tons to June 1, 1916.

The Winchester Repeating Arms Co., New Haven, Conn., which has Government contracts reported to aggregate $100,000,000, has announced a wage increase of 10 per cent. In some cases employees' workday was reduced an hour or an hour and a half in addition. About 16,000 men are employed, and a night shift of 10,000 more will be added soon.

Many Permits Issued

WASHINGTON, July 17.—The Exports Council announce that up to Saturday night, July 14, 5210 applications for export licenses were considered and all of them acted upon before the close of business on Monday, the 16th inst. Two copies of every export license are given to every applicant who is granted the license. He, in turn, delivers these licenses to the steamship company handling the shipment, and the steamship company, in turn, deposits them both in the custom house with the manifest. This enables the custom house to keep one copy for its records. Another copy goes forward with the ocean documents to destination, and the stub of the original is returned by the custom house, properly filled in, so that the Division of Export Licenses can check back what shipments have been made against the license issued.

The Exports Council has issued a ruling in which it holds that the following articles are included within the scope of the President's recent proclamation requiring licenses for exports of certain merchandise including specified iron and steel products: Structural steel, shapes and milled steel, including angles, tees, beams and channels; plates of ordinary tank quality and rolled steel floor plates.

New Steel Plant in Portugal

The Portuguese Government intends to sell by tender a concession for 15 years for the exclusive right of establishing in Portugal a modern iron and steel works. The concessionnaire must install at his own cost a modern iron and steel plant comprising blast furnaces, steel furnaces, rolling mills, presses, shearing machines, wire-drawing plant and any other necessary accessories for an initial annual production of at least 100,000 tons of iron and for the manufacture of iron and steel bars, plates, sheets and rails. The establishment must be in working order within a period of five years from the date of the granting of the concession. The government will grant land for the erection of the works and exemption from industrial and other taxes. The concessionnaire will be able to import free of customs duty all plant and materials which cannot be satisfactorily acquired in Portugal during the first five years of the concession. The government will also authorize the construction of railroads, up to 15 kilometers, to connect the new works with the state railroad lines in the vicinity.

Large Orders for Locomotives

Orders for locomotives in the past two weeks call for a total of 708 and for an estimated expenditure of over $20,000,000. The Russian Government has ordered 500 decapod locomotives, divided equally between the American Locomotive Co. and the Baldwin Locomotive Works. The British Government has ordered 100 consolidated locomotives from the Baldwin Locomotive Works and the same company will furnish 100 locomotives for the Atchison, Topeka & Santa Fe, most of them for delivery in 1918. The Boston & Maine Railroad is reported to be inquiring for a large number. These new orders bring the total for the present year to 4271, probably over one-third of these for export. The number of locomotives needed by roads in this country is variously estimated at from 5000 to 8000 annually, but on the basis of purchases made in the first half of this year buying is proceeding at the rate of less than 3500 locomotives a year.

Work Stopped on New Cambria Plate Mill

Because of the scarcity of labor for mill operations and the increasingly high cost of materials, the Midvale Steel & Ordnance Co. has issued an order in the past week discontinuing construction work on the new 132-in. plate mill at its Cambria plant at Johnstown, Pa.

About 250 boiler makers at the plant of the Lake Erie Boiler Works, 230 Chicago Street, Buffalo, and five other shops, declared a strike July 10 for an advance in wages.

Dr. Pratt Resigns from Commerce Bureau

Dr. E. E. Pratt, chief of the Bureau of Foreign and Domestic Commerce of the Department of Commerce, has sent his resignation to Secretary of Commerce Redfield. Dr. Pratt says in his letter to the Secretary that: "I would have regretted leaving the Bureau of Foreign and Domestic Commerce at any time, but I particularly regret it at this time because of the war activities that have been placed in its care." There is said to have been a difference of opinion between the Secretary of Commerce and Dr. Pratt on the question of exports control. Dr. Pratt was recently appointed a member of the Exports Council, and is reported to have favored a more liberal interpretation of the new law than Mr. Redfield. The latter is understood to want drastic restriction on exports to Scandinavian countries and Holland. Dr. Pratt has borne the reputation of one of the leading experts on foreign trade in the Department of Commerce.

Employing More Women

The employment of women in Youngstown plants in the Youngstown, Ohio, district is steadily increasing. The General Fireproofing Co. has already in its employ a large number of women engaged in running punch presses and doing bench work. The shortage of men, due to the war and other causes, and the abnormal demand for the products of this company, are given as the reasons for its employing women to do work formerly done by men, the women doing the lighter work in this plant. The General Fireproofing Co. manufactures metal furniture, metal lath and fireproofing materials. A factory extension with two acres of floor space to be devoted to metal furniture production will be completed within two weeks. On that account, a largely increased number of women will be required.

The German Steel Output

Germany's pig iron and steel output in May of this year was very large, according to statements in the *Kolnische Zeitung* and printed in the London *Ironmonger*. In some plants it even reached the peace level, while deliveries were also larger. No official figures are given, however.

The Humphryes Mfg. Co., Mansfield, Ohio, has been sold to a new company bearing the same name, whose officers are W. G. Moore, president; O. M. Gates, treasurer; R. G. Femsch, assistant treasurer and purchasing agent; George K. Byrd, secretary and sales manager, and J. G. Groscost, assistant secretary and assistant sales manager. The board of directors consists of A. E. Duncan, chairman; W. G. Moore, O. M. Gates, George K. Byrd and Reid Carpenter. Mr. Duncan is a member of the firm of Robert Garrett & Sons, Baltimore, and Mr. Moore is associated with the same concern as consulting engineer. It is the intention of the new company to continue the manufacture of hand and power pumps, sanitary and special enameled ware and plumbers' brass goods. Steps will be taken to increase the output and effect more efficient operation. The company employs about 300 men. Accompanying announcements of the change which have been sent out to the trade is an interesting booklet entitled "Battle Fields of To-day," which comprises a set of war maps in colors, showing gains and losses in territory and other interesting statistics.

The Seattle, Wash., Port Commission has leased for 20 years several tracts of land, which will be utilized by concerns in the metal-working industries. Gray & Barasch are to put up a machine shop on a site embracing 29,000 sq. ft. A brass foundry is to be erected on another plot. The Hendricks Mfg. Co. is erecting a machine shop on a plot of 29,600 sq. ft. The Aurora Foundry Co. is erecting a foundry building on a plot of 24,400 sq. ft. The Olympic Steel Co. and the Star Machinery Co. have leased two other plots.

Cementation by Gas Under Pressure

Research work of a practical nature was discussed by F. C. Langenberg of Harvard University, Cambridge, Mass., in a paper, "Cementation by Gas Under Pressure," presented before the annual spring meeting of the Iron and Steel Institute in London, England, May 3, 1917. A brief abstract follows:

A special form of furnace was used, combining all the requirements of a vacuum and pressure furnace in a single unit. The detailed description of this furnace should be of value to other investigators, for the general arrangements make it applicable to a much wider range of work than the particular investigations of the author.

In the experiments the material subjected to carburization was ingot iron of the following percentage composition: Carbon, 0.01; silicon, 0.002; sulphur, 0.002; phosphorus, 0.003 per cent, with a trace of manganese. The gases used were illuminating gas and acetylene. The samples of iron to be cemented were turned down in a precision lathe to a uniform diameter (within 0.001 in.) and were approximately 0.45 in. in diameter and 0.85 in. in length. Every sample was accurately weighed and measured before and after treatment. Where no oxidation occurred the change in weight was a sufficiently accurate measure of the carburization ensuing. For purposes of comparison this change of weight was divided by the area of the specimen, introducing a column in the data tables, "change of weight per square centimeter of surface."

Twelve series of experiments were carried out, of which particulars are given in the paper, and the author concludes by pointing out that the gamma-beta points seem to mark a sharp break in the carburization curves for both town gas and acetylene; no carburization ensued below 720 deg. C.; and the effect of pressure on the degree of carburization with the gaseous systems found in illuminating gas was different at different temperatures, the various curves indicating that after a certain pressure is reached further increase of pressure will not cause additional absorption of carbon by the iron.

Bethlehem Steel Corporation in Court

The Bethlehem Steel Corporation appeared in the United States District Court at Trenton, N. J., on Monday of this week in two litigations. Judge Rellstab heard argument in the case of Clarence H. Venner of New York to set aside the transfer of the property of the Pennsylvania Steel Co. to the Bethlehem corporation. The corporation filed an answer to the suit of the General Investment Co. to restrain it from guaranteeing the assets of the Pennsylvania Steel Co. and its subsidiaries. In its answer the Bethlehem corporation said that the plan of guaranteeing the bonds of the Pennsylvania Steel Co. was approved after the consent of more than two-thirds of the stockholders had been obtained, as is provided in the charter of the Bethlehem corporation.

The Superior Steel Corporation, Union Arcade Building, Pittsburgh, is in the market for spot shipment, for a 1500-kw. mixed flow pressure turbine of from 230 to 250 volts. The company would buy a second-hand turbine, if it is in good condition. Communication should be addressed to Superior Steel Corporation, H. F. Devens, vice-president, Union Arcade Building, Pittsburgh.

The E. C. Humphreys Co., dealer in pig iron, ferroalloys, non-ferrous metals, clay products and molding and sand blast sand, will remove on Aug. 1 from 445 Howard Street, Detroit, to 1201 Book Building, Washington Boulevard. Offices will be opened at 556 Leader-News Building, Cleveland, and 1501 Arrott Building, Pittsburgh, at that time.

The Ashland Iron & Mining Co., Ashland, Ky., has announced an increase of 2½ per cent in the wages of employees in its open-hearth steel plant. This advance brings the rates of common labor to $2.50 a day.

Iron and Steel Markets

NEW BUSINESS HALTED

Extent of Federal Price Fixing in Doubt

Regulation of Wire Nail Profit to Jobbers—Government Buying Increases

Announcement of the result of the conference at Washington last week between Government heads and the committee of steel manufacturers gave an abrupt check to business in iron and steel on any large scale. The vague ideas the trade has entertained for some weeks of possible readjustments that would have far-reaching effects were sharpened into real prospects by the President's message to business calling for the same prices to the public as those fixed by the Government.

Steel producers have expected to accept special prices from the Government and to have its requirements take up an increasing share of their output, but Chairman Gary in his address to the Iron and Steel Institute late in May said that they also expected that as costs of production were advancing the Government would be willing to increase its purchasing prices accordingly. The conference at Washington not only pointed in the other direction, but also foreshadowed an effort by the Government to get like low prices for its allies, whereas the latter would pay more, being chiefly concerned to get the steel.

The effect on buyers was just what was to be expected. Throughout consuming industries the one policy is the postponement of buying until the Federal Trade Commission's cost-finding inquiry is finished.

That a real readjustment of prices will begin in the interval of two or three weeks required by the commission is not likely, since it is well known that first concessions do not produce business; but there has been a tendency to weakening in the past week in pig iron, scrap and coke, and the trade has not found it difficult to believe that the crest has been reached and passed.

There is much speculation as to the effect of Government price fixing on the market for finished products in which its purchases are a negligible fraction of the output, as rails, pipe and tin plate. For plates and shapes, in which Government requirements will be large, it is recognized that the private buyer would pay dearly if there were no regulation of the price for what remained for general use.

It does not appear to what extent ore, coke and pig-iron prices are to be subjects of the Government's regulation, since it will not be a buyer of these, having already covered its pig-iron wants for the present at a low price. Coke readjustment presumably will come with lower coal, and such readjustment will be welcome, as coke has gone to five or six times the basis of ordinary times.

The embargo on exports of certain steel products has already held up some shipments, but the problem of vessel space is far more the controlling factor in exports. The uncertainties as to export license affect millions of dollars' worth of product against which irrevocable credit has been arranged. Mills will have to decide whether rollings shall proceed, leaving the buyer to dispose of the product where shipment abroad cannot be made.

Mill output has been at a less rate in July than in June, and June product fell off considerably from that of May. Heat and reduced effort of workmen have told on production and there is looming up the effect of the draft. Due to scarcity of labor for works operation and to high prices for material, work has been stopped on a new plate mill at Johnstown, Pa. At Birmingham, it is just announced, a plate mill will be a feature of the new construction.

A Russian order for 500 decapod locomotives has been divided between the two makers and the Santa Fe has bought 100; thus locomotive works are faring rather better than car companies. The latter have suffered from inability to get material, and therefore would welcome Government handling of the proposed building of 100,000 cars for domestic railroads. For the present that project has been laid aside. Current car orders include 1500 for the H. C. Frick Coke Company and 1000 for the Canadian Government.

A practical effort by the leading producer to hold prices in check has developed in the wire trade. The American Steel & Wire Co., which has continued to sell wire nails at $3.20 while the market has gone to $4, has indicated to jobbers that a reasonable profit to the latter is 50 cents, rather than $1 and as high as $1.50, as charged in some cases. The result has been a readjustment to a $3.75 to $4 basis in jobbers' sales to the retail trade.

Structural contracts fell off in June to 47.5 per cent of the capacity of the fabricating shops, the smallest month's business since July, 1916.

Government work is reaching a widening circle of manufacturers. One notable operation, of which no mention can be made in detail, calls for 73,000 tons of sheets.

The decline in prompt furnace coke amounts to at least $2 and heavy melting scrap at Pittsburgh is $3 a ton lower, these representing the week's definite price changes.

Car shortage at lower Lake ports has held up ore boats and at the mines ore has had to go on stockpile instead of going forward. On the Mesaba range some steam shovels have stopped.

Pittsburgh

PITTSBURGH, July 17 (*By Wire*).

The past week in the local steel market was the dullest we have had at any time in two years and prices on pig iron and some lines of finished steel, also on scrap and coke, are showing a decidedly weakened tendency. This all comes from the uncertainty as to the final action to be taken by the Government in fixing prices on pig iron, semi-finished steel, scrap, coke and on many lines of finished steel. The statement of President Wilson last week that the Government might regulate prices, not only on its own purchases but on sales made to domestic consumers, has put the whole market at sea, and no one knows what is going to happen. The belief is strong here that the Government will not attempt to dictate prices at which iron and steel products shall be sold to domestic consumers, but will name prices that it will pay for pig iron and other materials, and that the blast furnaces and the steel

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	July 18, 1917.	July 11, 1917.	June 20, 1917.	July 19, 1916.
No. 2 X, Philadelphia...	**$54.50**	$53.00	$49.75	$19.75
No. 2, Valley furnace...	55.00	55.00	53 00	18.25
No. 2 Southern, Cin'ti...	49.90	49.90	46.90	16.90
No. 2, Birmingham, Ala.	47.00	47.00	44 00	14.00
No. 2, furnace, Chicago*.	55.00	55.00	52.00	19.00
Basic, del'd, eastern Pa.	50.00	50.00	48.00	19 00
Basic, Valley furnace....	53.00	53.00	50.00	18.00
Bessemer, Pittsburgh ...	57.95	57.95	55.95	21.95
Malleable Bess, Ch'go*..	55.00	55.00	52.00	19.50
Gray forge, Pittsburgh..	47.95	47.95	47.95	18.70
L. S. charcoal, Chicago..	58.00	58.00	52.00	19.75

Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	38.00	38.00	38.00	33.00
O.-h. rails, heavy, at mill	40.00	40.00	40.00	35.00
Bess. billets, Pittsburgh.	100.00	100.00	100.00	40.00
O.-h. billets, Pittsburgh.	100.00	100.00	100.00	42.00
O.-h. sheet bars, P'gh....	105.00	105.00	105.00	42.00
Forging billets, base, P'gh	125.00	125.00	125.00	69.00
O.-h. billets, Phila.....	110.00	110.00	110.00	45.00
Wire rods, Pittsburgh....	95.00	95.00	95.00	55.00

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	4.659	4.659	4.659	2.659
Iron bars, Pittsburgh...	4.75	4.75	4.75	2.50
Iron bars, Chicago.....	4.50	4.50	4.00	2.35
Steel bars, Pittsburgh....	4 50	4.50	4.50	2.50
Steel bars, New York....	4.669	4.669	4.669	2.669
Tank plates, Pittsburgh..	9.00	9 00	8.00	3.50
Tank plates, New York .	**10.169**	9 169	8.669	3.669
Beams, etc., Pittsburgh..	4.50	4.50	4.50	2.50
Beams, etc., New York..	4.669	4.669	4.669	2.669
Skelp, grooved steel, P'gh	4.00	4.00	4.00	2.35
Skelp, sheared steel, P'gh	6.00	6 00	6.00	2.45
Steel hoops, Pittsburgh..	5.25	5.25	5.25	2.75

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	July 18, 1917. Cents.	July 11, 1917. Cents.	June 20, 1917. Cents.	July 19, 1916. Cents.
Sheets, black, No. 28, P'gh	8.50	8.50	8.00	2.90
Sheets, galv., No. 28, P'gh	10.00	10.00	9.75	4.25
Wire nails, Pittsburgh..	4.00	4.00	4.00	2.50
Cut nails, Pittsburgh....	4.65	4.65	4.65	2.60
Fence wire, base, P'gh..	3.95	3.95	3.95	2.45
Barb wire, galv., P'gh...	4.85	4.85	4.85	3.35

Old Material, Per Gross Ton:				
Iron rails, Chicago.....	*$44.00*	$45.00	$47.00	$18.50
Iron rails, Philadelphia..	*45.00*	52.00	50.00	20.00
Carwheels, Chicago	*35.00*	37.00	43.00	12.00
Carwheels, Philadelphia..	*35.00*	38.00	35.00	15.00
Heavy steel scrap, P'gh.	*38.00*	40.00	42.00	16.50
Heavy steel scrap, Phila.	*32.00*	40.00	37.00	15.00
Heavy steel scrap, Ch'go.	*32.00*	34.00	39.00	14.00
No. 1 cast, Pittsburgh....	*32.00*	34.00	37.00	15.75
No. 1 cast, Philadelphia.	*35.00*	37.50	32.00	16.00
No. 1 cast, Ch'go (net ton)	*28.50*	29.50	32.00	11.50
No. 1 RR. wrot, Phila....	*48.00*	55.00	55.00	19.50
No. 1 RR. wrot, Ch'go (net)	*37.00*	39.00	44.00	15.00

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	*$11.00*	$13.00	$11.50	$2.75
Furnace coke, future....	10.00	10.00	9.50	2.50
Foundry coke, prompt...	*12.00*	14.00	12.00	3.25
Foundry coke, future....	10.00	10 00	10.00	3.50

Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York..	*26.50*	30.75	32.50	25.25
Electrolytic copper, N. Y.	*26.50*	30.75	32.50	25.00
Spelter, St. Louis.....	*8.62½*	8.87½	9.50	9.00
Spelter, New York.....	*8.87½*	9.12½	9.75	9.25
Lead, St. Louis.....	*10.37½*	11.00	11.50	6.10
Lead, New York.....	*10.50*	11.12½	11.75	6.25
Tin, New York.....	*62.50*	63.00	63.50	37.25
Antimony (Asiatic), N. Y.	*16.00*	17.00	19.00	14.00
Tin plate, 100-lb. box, P'gh.	$12.00	$12.00	$11.00	$6.00

mills will accept the decisions, feeling it is their patriotic duty to do so. Until more definite word comes from Washington, the market is likely to remain dormant and very little material will be sold. Furnaces are afraid to sell pig iron, consumers will not buy, and the pig iron market is at a standstill. Early last week, there were sales of Bessemer at as high as $57 and $58 and of basic at $53 to $54, but it is certain these prices would not be paid to-day. The fact that for some time the Government has been furnished sheets from $25 to $40 per ton under the regular market perhaps indicates that the Government expects to buy pig iron at proportionately low prices and other materials as well. It is reported that recently a considerable lot of foundry iron was bought by the Government at as low as $35 per ton at furnace. There have been no decided changes in prices on finished steel, but coke is at least $2 per ton lower, while scrap is off $2 to $3 per ton and is very weak. Should present conditions continue for two or three weeks, a serious decline in price in pig iron, semi-finished steel and on some lines of finished steel would, no doubt, result. As it is now, there is a deadlock, and there is practically no buying or selling, so that values are largely nominal. Should the Government decide it has not the power to fix prices on iron and steel materials to be sold direct to consumers, it would probably result in a decided upward movement in prices on materials that now are very much depressed, especially pig iron, scrap and coke. On finished steel, the mills are sold up so far ahead that it is not believed any decline in prices will come nearly as soon as in pig iron and other raw materials. The whole market will simply mark time until the Government attitude on prices is definitely known.

Pig Iron.—The local pig-iron market is a good deal disturbed, and prices have been made weaker to some extent by offerings of resale iron at prices $2 to $3 per ton lower than those that are being named by the furnaces, and at which sales of both Bessemer and basic were made just before the announcement of President Wilson regarding fixing prices. Some New York brokers had about 7000 tons of Bessemer iron in New York for export shipment, but when the railroads declared the embargo on foreign shipments of pig iron, and in fact nearly all steel materials, the 7000 tons of Bessemer was very quickly offered in this market for resale and 3000 tons have been sold to a leading steel casting interest at the reported price of $55, delivered. There have been other smaller sales of Bessemer iron held by dealers at $55 and perhaps less. It is claimed that Bessemer iron has been offered at as low as $53.50, Pittsburgh, but this is evidently resale iron that parties holding desire to dispose of as quickly as possible. Careful inquiry among producers of pig iron indicates that none of them is offering Bessemer or basic iron at lower prices than have ruled for several weeks past. They feel it is not an opportune time to endeavor to force sales of iron and will not do so until the Government attitude as to prices is definitely known. About a week ago, an open-hearth steel plant in the Wheeling, W. Va., district bought 5000 tons of basic iron for fourth quarter delivery at $53, Valley furnace, and another interest has bought 5000 tons for first half of next year at the same price. We also note a sale of 500 tons of malleable Bessemer iron for this year's delivery at $55, Valley furnace, and several small lots of foundry iron at $55, at furnace. The pig-iron market from the furnace point of view is strong, but as stated above, Bessemer and basic that are being offered for resale are disturbing the market and may result in lower prices all around.

We quote Bessemer iron at $57 to $58; basic, $53 to $54; malleable Bessemer, $53 to $54; No. 2 foundry, $55 to $58, and gray forge, $47 to $48, all f.o.b. at Valley furnace for delivery this year. The freight rate from Valley furnaces on pig iron to the Cleveland and Pittsburgh districts is 95c. per ton.

Billets and Sheet Bars.—Both Youngstown and Pittsburgh steel mills took a large part of the 85,000 tons of shell steel recently placed by the Government for quick delivery, reported in THE IRON AGE of June 21, and are turning it out as fast as possible, and shipments on part of it have already gone forward. The general steel market, like pig iron, has come to a halt, and it is not likely much will be done until the Government states definitely what it is going to do in the matter of prices. Deliveries of billets and sheet bars by the mills are reported better, due to a larger car supply. We note a sale of 200 tons of ordinary carbon forging billets at about $128, delivered to consumer's mill.

We now quote soft Bessemer and open-hearth billets at $95 to $100 and soft Bessemer and open-hearth sheet bars at $165 to $110, maker's mill, Pittsburgh or Youngstown. We quote forging billets at $125 to $135 per ton for ordinary sizes and carbons, f.o.b. maker's mill.

Ferromanganese.—Consumers are evidently well covered over the remainder of this year as new inquiry is dull, and prices are weaker. For delivery over last half of this year, we now quote 80 per cent ferromanganese at $375 to $400, and for first half of next year $325 to $350 at maker's furnace. Small lots of 50 per cent ferrosilicon are reported as bringing $200 to $225, delivered, for spot shipment. We continue to quote 18 to 20 per cent spiegeleisen at $80 to $85 per gross ton at furnace. The new demand for Bessemer ferrosilicon and silvery iron is only fair, consumers being well covered over remainder of this year.

We quote 9 per cent Bessemer ferrosilicon at $89, 10 per cent $90, 11 per cent, $95, 12 per cent $100, 13 per cent $105, 14 per cent $115, 15 per cent $125, and 16 per cent $135. We now quote 7 per cent silvery iron at $84 to $89, 8 per cent $85 to $90, 9 per cent $86 to $91, 10 per cent $87 to $92, 11 and 12 per cent $88 to $93. All f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having a uniform freight rate of $2 per gross ton for delivery in the Pittsburgh district.

Steel Rails.—No new business is being placed in standard section rails, but the new demand for light rails is very active and they continue to bring very high prices. It is said that several lots of 25 to 45-pound rails have been sold at about $90 per ton at maker's mill, for prompt delivery. Prices on new light rails and on standard sections are given on page 166.

Structural Material.—Local fabricators state they are not bidding on much new work, desiring to conserve as much of their output as possible for Government needs. The 2400 tons wanted for the armor plate and projectile Government plant at Charleston, W. Va., have been held up, as it is understood the Government will not go ahead actively with the erection of this plant during the war. The McClintic-Marshall Co. has taken 850 tons for Government work at Saint Julians Creek, Va., and Pensacola, Fla. This concern, the American Bridge Co. and other local fabricators are doing a large amount of Government work about which details have not been given out. Prices on structural shapes are given on page 166.

Plates.—The Government is taking more and more of the output of local plate mills, making it harder than ever for domestic consumers to get plates. One leading interest is said to be giving the Government from 50 to 60 per cent of its total output of plates, and another large maker 25 per cent or more. No large orders for steel cars are being placed. It is said that two leading steel car companies are not getting deliveries on more than 25 per cent of the plates they need, and this may grow less as the Government demand gets larger. There would be no trouble in selling ¼-in. heavier sheared plates for delivery over this year at 10c. at mill or higher, and the mills are turning down business of this kind offered to them nearly every day.

Sheets.—Direct and indirect Government orders for sheets of all grades in June amounted to a little over 15,000 tons, and for July promise to be larger. By reason of the close co-operation of the sheet mills with the Government, through the subcommittee on sheets, the Government has been getting promptly all the sheets it has required, and at prices from $25 to $40 per ton under regular market prices. In the month of June, it paid 6.25c. for blue annealed sheets, 8.50c. for galvanized and 6.50c. for Bessemer black, all of No. 28 gage, and these prices will also apply on July shipments. The Government has never fixed prices it will pay for sheets, the mills entering Government orders at the above prices, which were evidently satisfactory. On the average, the above prices are close to $40 per ton less than ruling market prices being charged to domestic consumers. The current demand for sheets is heavy, and with the sold up condition of the mills, deliveries to domestic consumers are very slow. Several of the larger sheet mills have been practically out of the market for several months as active sellers, obligations already on their books taking practically all the sheets they could make over the next three or four months. Mill prices for carloads and larger lots over which premiums are sometimes paid for fairly prompt shipment are given on page 166.

Tin Plate.—Much larger quantities of bright plate are now going forward to packers of non-perishable foods than for several months. The embargo against shipments of bright plate, except to packers of perishable foods, has been practically removed, and the supply of bright plate for packers of perishable foods this summer and fall will be ample to meet the demand. Tin plate mills for months have been making the largest output in their history, and while packers of vegetables and fruits this summer will be extremely busy, the tin plate mills will be able to supply the plate to take care of the demand. Not much talk has been heard recently of any attempt to work one or two turns in tin plate mills on Sundays, and in view of recent developments it is not believed this would be attempted. The American Sheet & Tin Plate Co. has started three or four new double hot tin mills at its Farrell and Shenango works, and this will very materially increase the output of plate of this company. The inquiry of the Italian commission for 100,000 boxes of tin plate and the other inquiry from J. P. Morgan & Co. for 84,000 boxes have not been placed. It is probable our Government will ask that tin plate needed by our allies will be furnished by American mills, if it is possible to do so. It is likely England will be a very heavy buyer of tin plate in this country, as it is said tin plate mills in Wales are not turning out more than 40 per cent of the regular output. Current demand for tin plate is fairly active, and mills are charging $11 to $12 per base box for primes for shipment from stock. The new demand for terne plate is dull, nominal prices being given on page 166.

Iron and Steel Bars.—Mills report the demand for reinforcing and steel bars as very heavy. The Government has been an active buyer for some time of all sizes, ranging from ⅜ to ⅞ in. The larger sizes probably are to be used for fortifications. It is said that reinforcing bars are selling at 4c. and higher at mill. The current demand for both iron and steel bars is showing a large falling off, due to the uncertainty as to whether the Government is going to fix prices on both Government and domestic purchases. Larger consumers are supplied freely against contracts, and the output of steel and iron bar mills is well under contract for the remainder of this year. Prices on iron and steel bars being quoted by the mills in carloads and larger lots to regular domestic customers are given on page 166.

Hoops and Bands.—There are no fixed prices on either hoops or bands. The large consumers are covered and most of the new business is in small lots for fairly prompt delivery. Steel hoops still range from 5½c. to 6c. and steel bands from 5c. to 6c. at mill to regular customers only. Small lots of steel hoops for prompt shipment have sold at 7c. and higher and steel bands, rolled from special steel, have sold at 7.50c. at mill.

Muck Bar.—There is no new demand, but $100 per ton could probably be obtained for high grade muckbar made from all pig iron.

Wire Rods.—Several of the larger makers are practically out of the market as sellers. They need their entire output of rods for regular trade and probably part of it for Government's needs. Shipment of rods to Canada on contracts made some time ago are still going forward. Lately several small lots of soft Bessemer and open-hearth rods have been sold at $95 to $100 at maker's mill. Rods, rolled from special quality

of steel are sold all the way from $110 to $120, maker's mill. Prices on rods are given in detail on page 166.

Wire Products.—It is said the complications in the jobbing trade over the wide range in price on wire and wire nails for several months are increasing. Jobbers who are paying on the basis of $4 for wire nails and $4.05 for bright basic wire are complaining that they are losing part of their trade to competitors who have been getting nails at $3.20 and bright basic wire at $3.25 f.o.b. at mill, Pittsburgh. How this confusion in the trade will be adjusted is a question, but it is said a movement has started to try to induce independent makers of wire and wire nails to reduce their prices, in order to put their distributors on an even basis with competitors. It is said the recent orders of the Government for 41,320 kegs of wire nails, distributed among the mills, has been practically all filled and shipped. The new demand for wire and wire nails is only fairly active, the trade not showing a keen disposition to buy, in view of the possible fixing of prices on wire and wire nails by the Government on its own purchases and to domestic consumers as well. The American Steel & Wire Co. here is still quoting wire nails to regular customers at $3.20 per keg, and $3.25 on bright basic wire per 100 lb., but has not been actively seeking new business for several months. Details of prices on wire and wire nails being quoted by the independent mills are given on page 166.

Shafting.—Makers report the new demand only fair, most consumers being covered for the remainder of this year, and specifications against contracts are fairly active. The price for shafting is firm, ranging from list to 10 and 5 per cent off, depending on the quantity and delivery wanted.

Railroad Spikes and Track Bolts.—The Pennsylvania railroad company is reported to be in the market for 12,000 kegs of spikes for delivery over the remainder of this year. The new demand has been quiet for some time, most roads being covered over this year, and specifications against contracts are only fairly active. The new demand for track bolts is reported to be heavy. Prices in effect on railroad spikes and track bolts are given on page 166.

Cold Rolled Strip Steel.—Makers report the new demand as heavier at present than ever before in the history of the cold rolled strip steel trade. The Government is reported to have been placing some fairly large orders. The new demand from domestic users is heavy. There is some disposition on the part of the buyers to hold off placing orders until they know definitely whether the Government will fix prices on its own purchases and also those by domestic consumers. On contracts, mills are quoting 9c. at mill, but on small current orders, prices range from 10c. up to 12c. at mill. Terms are 30 days, less 2 per cent off for cash in 10 days when sold in quantities of 300 lb. or more.

Nuts and Bolts.—The new demand is reported heavy, but output of nuts and bolts is being materially cut down by the shortage in the supply of steel and labor. The embargo on foreign shipments will release some products that were going abroad. All makers of nuts and bolts are back in deliveries at least 8 to 10 weeks. Discounts as adopted on April 12 last, which give prices to the larger trade in carloads and larger lots, and over which advances are charged for small lots, are given on page 166.

Rivets.—The new demand is only fairly heavy, most large consumers being covered over the remainder of this year, and some of the domestic trade is reported holding back placing orders until the Government's attitude on prices is more definitely known.

Prices on structural rivets for delivery up to Oct 1 only are $5.25 per 100 lb., base, and on cone head boiler rivets $5.35 base, per 100 lb., f.o.b. Pittsburgh. Terms are 30 days net, or one-half of 1 per cent off for cash in 10 days.

Wrought Pipe.—Some heavy Government orders for iron and steel pipe are being placed, and others are likely to come out in a short time. The sub-committee on tubular products recently placed an order for 400,000 ft. of 6-in. steel pipe to be used in laying water lines for cantonments for National Guard encampments. It is understood this heavy order was distributed among seven or eight of the leading steel pipe mills, and that it was all furnished to the Government within about 10 days from the time the order was distributed. This committee will also shortly place about 260,000 ft. of 4-in. steel or cast-iron pipe, also to be used in laying water mains for Government cantonments. The committee would prefer to have cast-iron pipe, but may be compelled to buy steel pipe owing to scarcity of supply of the former. Other very large Government contracts for iron and steel pipe are expected to be placed with the mills in a short time, and these orders will be rolled and shipped just as soon as the mills can turn them out. The current demand for iron and steel pipe continues heavy, but mills are sold up so far ahead on lap weld pipe that very little new business can be taken, and shipped out even late this year. The mills are conserving as much of their output as they possibly can to meet Government demands. None of the mills has any lapweld pipe to spare for this year, and several of the larger mills have heavy orders on their books for 1918 delivery. The demand for butt weld pipe is fairly heavy, and some mills can promise shipment in 12 to 15 weeks from date of order. Discounts on steel pipe as adopted May 1, and on iron pipe as adopted by leading makers on July 1 are given on page 166.

Boiler Tubes.—The sub-committee on tubular products expects to place, in a very short time, contracts for many thousands of tons of steel tubes for boilers to be installed in Government boats, these orders to be distributed among the different mills. All the local makers of iron and steel tubes are furnishing thousands of feet of tubes to the Government right along, probably 25 per cent or more of the output of one leading maker going to the Government. The domestic demand for both iron and steel tubes is still abnormally heavy, but mills are sold up for months ahead, and any consumers that must have tubes fairly promptly are paying premiums of $20 to $40 per ton or more over regular prices to get them. It is said that several of the larger makers of iron and steel tubes have their output sold up for more than a year ahead, and at the same time will cheerfully furnish as much of their output to the Government promptly as it may need, shoving all other orders on their books aside. Nominal discounts on iron and steel tubes, as adopted Nov. 1, 1916, but which represent prices very much below what are actually ruling, are given on page 166.

Coke.—Last week the supply of cars in the coke regions was estimated at about 95 per cent, fully 30 per cent more than in any previous week for many months. In spite of this, prices on prompt furnace coke in the last three or four days of last week, and the first couple of days of this week did not decline more than $1 per ton. It is hinted, but so far not definitely shown, that prices on prompt furnace coke are being held up by artificial means. Coke producers say this is absolutely untrue, and claim that it is the abnormal demand for prompt blast furnace coke that is holding prices. On Monday, July 16, there were fairly heavy sales of prompt blast furnace coke of best grades at $12 per net ton, at oven. The new demand is heavy, and the higher grades of blast furnace coke are being shipped out as fast as the coke is turned out on regular orders. Several large consumers of blast furnace coke in the two valleys are paying prices ruling from day to day, and to several large pig-iron producers, this has run up costs of making Bessemer and basic iron from $9 to $12 per ton higher than in June. It is said several leading coke producers have been offered contracts by furnace interests for delivery over last half of this year at as high as $10 per net ton at oven, and have promptly turned them down, preferring to ship their coke to these consumers and take chances by fixing prices from day to day. It is the belief here among some leading coke producers that the Government may step in and fix prices on coke, and for this reason they say they do not care to make contracts. We now quote best grades of blast furnace coke for prompt shipment at $12, and 72-hour foundry at $13 per net ton at oven. Some large consumers of foundry coke are covered on contracts for last half of this year, made some time ago at $10 per net ton at oven. The Connellsville *Courier* gives the output of coke in the Upper and Lower Connellsville region for the week ending July 7, as 349,218 net tons,

a decrease over the previous week of 21,950 tons; this decrease was caused by the Fourth of July holiday, the men not working on that day, and most of them were off for several days.

Old Material.—The market is weak, due to almost entire absence of sales owing to uncertainty as to the Government's attitude as regards prices that may be fixed on scrap. We note a sale of 2000 tons of heavy steel melting scrap at $38, delivered, and 800 tons of low phosphorus billets and bloom ends at $55, delivered, made last week. We quote for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$38.00
No. 1 foundry cast	$34.00 to 35.00
Rerolling rails, Newark and Cambridge, Ohio Cumberland, Md., and Franklin, Pa.	42.00 to 44.00
Hydraulic compressed sheet scrap	32.00 to 33.00
Bundled sheet scrap, sides and ends, f.o.b. consumer's mill, Pittsburgh district	25.00 to 26.00
Bundled sheet stamping scrap	22 00 to 23.00
No. 1 railroad malleable stock	32.00 to 33.00
Railroad grate bars	16.00 to 17.00
Low phosphorus melting stock	52.00
Iron car axles	54.00 to 55.00
Steel car axles	56.00 to 57.00
Locomotive axles, steel	59.00 to 60.00
No. 1 busheling scrap	27.00 to 29.00
Machine-shop turnings	19.00 to 20.00
Old carwheels	36.00 to 37.00
Cast-iron borings	20.00 to 21.00
*Sheet bar crop ends	47.00 to 49.00
No. 1 railroad wrought scrap	41.00 to 42.00
Heavy steel axle turnings	26.00 to 27.00
Heavy breakable cast scrap	30.00 to 31.00

*Shipping point.

Chicago

CHICAGO, July 16.

In every direction new business is lighter, though never before have operating departments struggled so intensely to maintain an increased production. Large interests reiterate they have no steel to sell, as they have for weeks, while now both the pig iron and old material trades are dull, and the prices of the latter have slumped. The explanation of the more general quiet is that more consumers are actuated by a desire to wait and see what the Government is going to do in the matter of prices. Makers of plates and shapes are expecting at almost any moment to be called on for large tonnages to be delivered at shipyards or fabricating shops. A great question is, how rapidly will the Government want deliveries to be made? Upon this largely depends the extent to which shipments to private consumers will be deferred. As to large quantities being wanted hurriedly, there can be no question. Major General Goethals is quoted as saying that the loss of one day in the summer means a loss of two days later on. With trading so nearly stationary, prices have shown a tendency to halt in their upward progress, and many believe that the high point has been reached. In old materials only are declines shown. The leading wire interest, which has adhered to 3.20c. Pittsburgh as its base for nails and wire products, has intimated to jobbers that it considers 3.95c. a fair quotation for them to submit to their customers. Many jobbers in Chicago and other cities are accepting the advice; but some are not, and a few say that they cannot replenish their stocks at 3.20c., and that they are therefore justified in asking more than the price mentioned. The independent producers of wire products are quoting on the basis of 4c. for nails.

Pig Iron.—The market is quiet and practically featureless so far as new business is concerned. Furnaces are being urged to rush shipments, although many of the requests are based solely on the desire of consumers to get comparatively low-priced iron in their possession. With iron, as with so many other products, activity is restrained by uncertainty as to how far the Government will take a hand in fixing prices. Again, consumers are well covered for the next few months, and many buyers are taking needed vacations. Northern iron is unchanged at $55, furnace, for No. 2 foundry, basic, malleable Bessemer, etc. In Southern iron, the situation is not much changed from that of last week, except that the leading interest which temporarily withdrew deliveries in the first half of 1918 is again willing to sell that position. For delivery in the last half of this year (all offers being submitted to furnace) it probably would not consider less than $50, Birmingham, or $54, Chicago, this also being the quotation of other makers. For first half delivery of No. 2 X, it would want close to $50, Birmingham, also, while for the last half of 1918 it quotes $48. It prefers to have its 1918 contracts cover both first and last halves. Prompt No. 2 foundry has been taken at $50, Birmingham. For several hundred tons of high grade 8 per cent Southern silvery $82.75, Chicago, was paid, but silveries running high in phosphorus can be had for much less. Inquiries for charcoal iron are fewer, but prices are unchanged. Transactions in low phosphorus have been more limited. A Western producer has declined to quote on large quantities because of uncertainties attending manufacture and delivery, but he has made some sales at the equivalent of $93, f.o.b. cars, furnace. Eastern makers of copper bearing low phosphorus quote $90, furnace, or about $95, Chicago. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 1 to 4	$58.00 to $62.00
Lake Superior charcoal, Nos. 5 and 6 and Scotch	58.00 to 62.00
Northern coke foundry, No. 1	55.50
Northern coke foundry, No. 2	55.00
Northern coke foundry, No. 3	54.50
Northern high-phosphorus foundry	55.00
Southern coke No. 1 f'dry and 1 soft	55.00
Southern coke No. 2 f'dry and 2 soft	54.00
Malleable Bessemer	55.00
Basic	55.00
Low-phosphorus	93.00 to 95.00
Silvery, 8 per cent	82.75

Ferroalloys.—The situation is unchanged with 80 per cent ferromanganese at $400 to $450, according to delivery. A round tonnage of 10 per cent Bessemer ferrosilicon was purchased at $100, Jackson county (Ohio) furnace.

Plates.—An Ohio maker quotes 10c., Pittsburgh, on tank plates, narrow widths only, delivery this year. On wide plates—72 in. and over—it is out of the market. An Eastern mill adheres to its quotation of 10c., Pittsburgh, or 10.189c., Chicago. The large local makers are not quoting at all, but are awaiting the details of the Government shipbuilding program. They are expecting daily to hear that they will be required to furnish large quantities without delay to one or more points where the material will be fabricated, preparatory to finishing touches and assembly at some of the various shipyards which the Government will virtually commandeer. It is understood that Major General Goethals has announced that all plans are completed, including the plan of distributing work to bridge and structural shops. When the orders appear, they must be given right of way, and the needs of private consumers sidetracked, though to what degree the latter will be necessary is not yet clear. Should Lloyds specifications be insisted on, it may cause some delay, as the physical tests are severe and the limits narrow, the inspection being tedious and exacting.

We quote for Chicago delivery of plates out of jobbers' stocks, 8c.

Structural Material.—So far as prices go, no change can be reported. Quotations are obtainable from only one source—an Eastern mill which quotes 6.189c., Chicago, on limited lots and sizes for delivery in the next four or five months. The car business amounts to but little, the only new inquiry being for 100 composite cars wanted by the Sante Fé. Only three structural propositions were placed in the week, as follows:

Oliver Iron Mining Co., shaft sets, shuttles and bearers for "H" Pabst mine of Norrie-Aurora group of mines at Ironwood, Mich., 223 tons, to American Bridge Co.

Illinois Steel Co., structural and machine shop extensions at South Chicago, Ill., 500 tons, to American Bridge Co.

Bank of Italy, steel frame for bank building at Fresno, Cal., 300 tons, to Central Iron Works.

Jobbers quote 5c. for material out of warehouse.

Bars.—Mild steel bars continue to be quoted by an Eastern mill at 4.689c., Chicago. Rail carbon bars are

unchanged at 4.25c. to 4.50c., Chicago, and are not so active, although their use is somewhat wider. Iron bars range from 4.50c. to 5c., Chicago. None of the makers of steel bars is pressing for business. Jobbers' quotations are unchanged.

We quote prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c. to 5c.; reinforcing bars, 4.50c., base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Wire Products.—The leading interest continues to quote the 3.20c., Pittsburgh, base, for wire nails, and jobbers, as a rule, quote 3.95c. Some of the latter, however, ask 4.45c. and over. It is an open secret that the principal producer is requesting its jobbing customers to adhere to 3.95c. on the ground that it is unfair for them to ask more of their customers in view of its adherence to the 3.20c. base. Some of the jobbers, however, assert that they have been unable to place new business at 3.20c. and are asking where they will land when their stocks bought at low prices are exhausted. They say that where they have specified justifiable quantities, they have had the amounts cut down. On the other hand, manufacturers who use wire products pronounce the course of the leading producer to be eminently fair. The independent makers quote on the basis of 4c., Pittsburgh, for nails. Their quotations to jobbers, per 100 lb., are as follows:

Plain fence wire, Nos. 6 to 9, base, $4.189; wire nails, $4.189; painted barb wire, $4.339; galvanized barb wire, $5.039; polished staples, $4.339; galvanized staples, $5.039; all Chicago, carload lots.

Rails and Track Supplies.—Little or no business is reported. An occasional carload of rails is sold at premium prices, and as stated last week $90 to $100 has been paid for tie plates. Prices are largely nominal.

Quotations are as follows: Standard railroad spikes, 4.25c. base; small spikes, 4.50c., base; track bolts with square nuts, 5.25c., all in carloads, Chicago; tie plates, $70 to $90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base; open hearth, $40; light rails, 25 to 45 lb., $65; 16 to 20 lb., $66; 12 lb., $67; 8 lb., $68; angle bars, 3.25c., base.

Bolts and Nuts.—Except that makers are bending every effort to fill orders in the face of insufficient factory labor and delays in getting material, there is nothing to say. For prices and freight rates see finished iron and steel, f.o.b. Pittsburgh, on page 166.

Store prices are as follows: Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to ⅝ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to ⅝ x 6 in., 40-2½; larger sizes, 30-5; hot pressed nuts, square, $3, and hexagon $3 off per 100 lb.; lag screws, 50 per cent off.

Sheets.—No. 10 blue annealed can be had in limited quantities at 8.50c. to 9c., Pittsburgh, or 8.689c. to 9.189c., Chicago, and No. 28 black at 8.75c. to 9c., Pittsburgh, or 8.939c. to 9.189c., Chicago. Offerings of galvanized sheets are practically nil, but they probably could be had at 10.189c. to 11.189c., Chicago. Jobbers have made no change.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 9.50c.; No. 28 black, 9.50c.; and No. 28 galvanized, 11c.

Cast-Iron Pipe.—Duluth, Minn., is about to place 900 tons. The United States Government has placed 100 tons with the United States Cast Iron Pipe & Foundry Co. for delivery at Rockford, Ill., and more business of this character is expected, although considerable wooden pipe is being used. Municipal lettings are almost entirely absent. Quotations are unchanged.

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., $68.50; 6 in. and larger, $65.50, with $1 extra for class A water pipe and gas pipe.

Old Material.—Consumers are showing almost no disposition to buy, and dealers, recognizing the unquestioned softness of the market, are not willing to force sales inasmuch as they can do so only by making concessions. Large consumers say they are well supplied and in a position to stay out of the market for a time. At the pace they are going, however, it will not be long before they will be seeking some grades. It is noticeable that in some of their recent purchases they wanted fairly prompt deliveries. The railroads are offering but little, evidently realizing that the market has taken a turn which makes the time an unpropitious one to sell. The Illinois Central disposed of some material, and moderate-sized lots are offered by the Santa Fé and C. & A. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$44.00 to $45.00
Relaying rails	59.50 to 60.00
Old carwheels	35.00 to 36.00
Old steel rails, rerolling	45.25 to 46.25
Old steel rails, less than 3 ft	42.00 to 44.00
Heavy melting steel scrap	32.00 to 34.00
Frogs, switches and guards, cut apart	32.00 to 34.00
Shoveling steel	30.00 to 32.00
Steel axle turnings	23.50 to 24.50

Per Net Ton

Iron angles and splice bars	$44.00 to $44.50
Iron arch bars and transoms	45.00 to 45.50
Steel angle bars	38.00 to 38.50
Iron car axles	46.00 to 47.00
Steel car axles	46.00 to 47.00
No. 1 railroad wrought	37.00 to 38.00
No. 2 railroad wrought	34.00 to 35.00
Cut forge	34.00 to 35.00
Pipes and flues	25.00 to 26.00
No. 1 busheling	27.00 to 28.00
No. 2 busheling	19.50 to 20.50
Steel knuckles and couplers	41.00 to 42.00
Steel springs	41.50 to 42.00
No. 1 boilers, cut to sheets and rings	24.50 to 25.00
Boiler punchings	34.50 to 35.00
Locomotive tires, smooth	50.00 to 50.50
Machine-shop turnings	19.00 to 19.50
Cast borings	17.50 to 18.00
No. 1 cast scrap	28.50 to 29.50
Stove plate and light cast scrap	18.50 to 19.50
Grate bars	22.00 to 23.00
Brake shoes	22.00 to 23.00
Railroad malleable	31.00 to 32.00
Agricultural malleable	26.75 to 27.75
Country mixed scrap	16.50 to 17.00

Philadelphia

PHILADELPHIA, July 16.

Uncertainty as to just what the Government intends to do with regard to price fixing has been a disturbing factor in the iron and steel trade in the past week. Both buyers and sellers are holding off and this is particularly true in virtually all of the finished lines with the exception of plates. There is not a single inquiry of any size in shapes reported here for the week, and as much as 6½c. is being asked by brokers for such shapes as they may have in stock. Announcement by General Goethals that one of the new Government shipyards would be located in Philadelphia is taken to mean that National City Bank interests, probably as represented by the New York Shipbuilding Co. of Camden, will undertake to operate the yard here. It has been the intention of the present owners of the New York Shipbuilding Co. to increase its capacity materially.

Pig Iron.—There has been little trading in pig iron during the week, the steel-making irons in particular being stagnant. Despite this lack of activity, the market in the foundry grades has been strong and prices show an advance over last week. The top in eastern Pennsylvania No. 2 X is now distinctly $55.75. Virginia No. 2 X remains unchanged at $52.50, furnace, and an offer is made here of Virginia high manganese irons in lots of 350 to 450 tons at prices ranging from $59.50 to $63.00, furnace. Basic and low phosphorus maintain their nominal quotations of last week. Quotations for standard brands, prompt shipment, and delivery in buyers' yards, range about thus:

Eastern Penna. No. 2 X foundry	$54.50 to $55.75
Eastern Penna. No. 2 plain	54.00 to 55.25
Virginia No. 2 X foundry	54.25 to 55.25
Virginia No. 2 plain	53.75 to 54.75
Basic	52.00 to 54.00
Gray forge	51.00
Standard low phosphorus	90.00

Coke.—Conditions are considerably easier in the fuel market, and although there is talk of $15 foundry coke, that figure seems to be a little high and spot furnace coke has been down as low as $12.50 to $13 a ton.

Ferroalloys.—Ferromanganese shows no change either in demand or in price, which holds at $450 for prompt and $425 for last quarter. The feature of the week has been a considerable increase in inquiry for 50 per cent ferrosilicon.

Iron and Steel Bars.—Makers of bar iron and soft

steel bars are showing an increasing disposition to take on no additional business except for old customers. The minimum on soft steel bars is now 4½c., Pittsburgh, and a large manufacturer of bar iron is making 5c. his lowest price for contracts, with 5½c. asked on new inquiries, no matter how attractive the specifications. It is said that the new shipbuilding program is creating a heavy demand for galvanized bars as well as ship spikes.

Ore Imports.—Custom-house reports show the following receipts during June at this port: Iron ore, from Cuba, 4500 tons, valued at $22,950; iron ore, from Sweden, 17,009 tons, valued at $88,634; ferromanganese, from England, 500 tons, valued at $51,098.

Plates.—Export inquiries presented within the last few days have aggregated between 45,000 and 50,000 tons, but it is understood that no prices were quoted. Locomotive builders have been furnishing heavy specifications to the plate mills for new railroad equipment, and Government requisitions are calling for increasingly heavy tonnage. As these receive precedence, a hardship is being worked on the regular trade, for civilian orders are taken with the understanding that they must yield in all cases to Government needs. Under the circumstances, it is difficult to have an order accepted for shipment under 11 or 12 months. Quotations remain unchanged at 10c., Pittsburgh, for tank, and 12½c. for boat steel.

Sheets.—There is practically no sheet capacity available among mills of this district unless for filling Government requirements. One very small transaction which was squeezed in last week by a local maker was taken on the basis of 8¾c., Pittsburgh, for No. 10 blue annealed.

Old Materials.—The scrap market is considerably softer this week, but the unsettled feeling seems to have a background of confidence that there will be a turn for the better perhaps before the week ends. Hesitation on the part of the mills to purchase until the price-fixing situation clears is no doubt a factor. After all, the supply of old materials seems to be limited, and any fresh demand will probably mean a hardening of prices. Prices per gross ton delivered in eastern Pennsylvania territory range about thus:

No. 1 heavy melting steel	$32.00 to $33.00
Old steel rails, rerolling	45.00 to 47.00
Low phosphorus, heavy melting	45.00 to 50.00
Old iron rails	45.00 to 47.50
Old car wheels	35.00 to 38.00
No. 1 railroad wrought	48.00 to 50.00
No. 1 forge fire	25.00 to 26.00
Bundled sheets	25.00 to 26.00
No. 2 busheling	16.00 to 18.00
Machine shop turnings*	20.00 to 21.00
Cast borings*	20.00 to 21.00
No. 1 cast	35.00 to 38.00
Grate bars	22.00 to 23.00
Stove plate	22.00 to 23.00
Railroad malleable	32.50 to 35.00
Wrought iron and soft steel pipe (new specifications)	35.00 to 36.00

*For blast furnace use.

Cleveland

CLEVELAND, July 17.

Iron Ore.—Curtailment of operations at Lake Superior mines has been necessitated by the car shortage at lower Lake ports. Boats are being delayed so long for unloading that a large amount of ore has accumulated at upper Lake ports, and in some cases the railroads have shut off on empty cars for the mines. As a result some of the steam shovels have been compelled to stop and some of the ore from underground mines is being placed on stock piles. Monday fourteen large ore boats were awaiting their turn for unloading at the Pennsylvania dock in Cleveland. The last of these will be delayed nearly five days in unloading its cargo. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, $5.95; Mesaba Bessemer, $5.70; old range non-Bessemer, $5.20; Mesaba non-Bessemer, $5.05.

Pig Iron.—The market has become very quiet. There is some demand for spot foundry iron, but in view of possible price regulation by the Government consumers are withholding inquiry for iron for future delivery. Prices generally are unchanged. Foundry iron has sold at a new high price of $60 for No. 2 for a small lot for the first half delivery, although the usual Valley and Lake furnace quotations range from $55 to $58. The sale of one lot of basic iron is reported at $55. Among new inquiries is one for 2000 tons of malleable iron for the last quarter and one from the Lenoir Car Works, Washington, for 2400 tons of low phosph. iron, mostly for the first half. We note the sale of several small lots of Virginia iron at $52, furnace, for No. 2, making the delivered price in this territory lower than that quoted by most of the Northern Ohio furnaces. Southern iron is inactive. An Alabama producer has opened its books for the last half of next year and is quoting Southern iron at $48, Birmingham, for No. 2 for all of next year. The usual quotation for this year is $50. First half prices range from $45 to $50. We quote f.o.b. Cleveland, as follows:

Bessemer	$57.95 to $58.95
Basic	53.30 to 55.30
Northern No. 2 foundry	55.30 to 58.30
Southern No. 2 foundry	49.00 to 54.00
Gray forge	50.95 to 52.95
Ohio silvery, 8 per cent silicon	88.62 to 91.62
Standard low phos., Valley furnace	88.00

Coke.—The market is weaker. There is some demand for foundry coke for prompt shipment, which is quoted at $13.50 to $14 per net ton at oven for standard Connellsville makes. Shipments are fairly good and foundries are trying to accumulate stocks. Some have been able to accumulate fair stocks recently. Furnace coke is quiet and is quoted around $12.50 for prompt shipment.

Finished Iron and Steel.—With the exception of considerable demand for plates the market in finished lines is not active, new inquiry being confined largely to small lots, some of this being from plants having Government orders. The expected regulation of prices by the Government is having an effect on the market, and buyers are withholding inquiries for steel for extended delivery. Plate mills are apparently showing no disposition to force prices higher, and the usual local quotation for tank plates is 10c., Pittsburgh, which has been the recent minimum price. Some previous quotations have been made as high as 12c. One Cleveland mill is reported to be taking plate contracts for the first half of next year at 9.50c. An inquiry from France for additional rails for portable track has been revived. If the rails could be had it is stated that 50,000 tons would be purchased, but it is expected that only about one-fourth of this tonnage will be available. A peculiar feature of the nail situation is that a leading local jobbing house securing its supply from the leading interest which is maintaining the $3.20 price is offering its stock to retailers at $3.75 per keg, while the independent mills are quoting wire nails at $4 to jobbers. As a result some jobbers are either losing business or are forced to make sales below cost. The demand for sheets continues fairly heavy. One Valley mill is offering sheets at 8.50c., Pittsburgh, for black, and 10.50c. for galvanized in narrow sizes. Other mills are asking as high as 9.25c. for black. Blue annealed sheets are quoted at 8.50c. to 9c. for No. 10. Hard steel bars are firmer, being quoted at 4.25c. to 4.50c. at mill. Warehouse prices are 5c. for steel bars, 5.25c. for structural material, 9c. for plates, and 9c. for blue annealed sheets.

Bolts, Nuts and Rivets.—The demand for bolts and nuts is heavy, both in specifications on contracts and current orders. The demand for rivets is very active. Ship builders are anxious to get under contract for rivets for the remainder of the year, and are placing orders at the regular price at 5.25c., Pittsburgh, for structural rivets. Boiler rivets are maintained at 5.35c., Pittsburgh. Bolt and nut prices are unchanged, round lot buyers being allowed from 5 to 10 per cent discount from regular discounts, which are as follows:

Common carriage bolts, ⅝ x 6 in., smaller or shorter, rolled thread, 35 off; cut thread, 30 and 5, larger or longer, 20. Machine bolts, with h. p. nuts, ⅝ x 4 in., smaller or shorter, rolled thread, 40; cut thread, 35; larger and longer, 25. Lag bolts, cone point, 40. Square h. p. nuts, blank, $1.90 off list; tapped, $1.70 off list. Hexagon, h. p. nuts, blank, $1.70 off; tapped, $1.50 off. C. p. c. and t. hexagon nuts, all sizes blank, $1.25 off; tapped, $1 off. Cold pressed semi-finished hexagon nuts, 50 and 5 off.

Old Material.—The market is dull and weak with prices on heavy melting steel and some other grades fully $1 a ton lower than a week ago. Mills generally are refusing to buy, awaiting developments in Washington relating to price regulation. There is some activity between dealers who are covering on recent short sales and they are having no trouble in buying all the material they need. A sale of 500 tons of heavy melting steel scrap is reported to a Cleveland mill at $38, but some material offered at the same price did not find a purchaser. The sale of 400 tons of cast scrap is reported at $32, a small lot of busheling at $30 and 800 tons of borings at $20. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton	
Steel rails	$38.00 to $39.00
Steel rails, rerolling	48.00 to 50.00
Steel rails, under 3 ft	46.00 to 47.00
Iron rails	48.00 to 50.00
Steel car axles	55.00 to 57.50
Heavy melting steel	38.00 to 39.00
Carwheels	37.00 to 38.00
Relaying rails, 50 lb. and over	50.00 to 55.00
Agricultural malleable	29.00 to 31.00
Railroad malleable	41.00 to 42.00
Light bundled sheet scrap	24.00 to 25.00
Per Net Ton	
Iron car axles	$55.00 to $60.00
Cast borings	19.50 to 20.50
Iron and steel turnings and drillings	18.50 to 19.50
No. 1 busheling	28.00 to 29.00
No. 1 railroad wrought	44.00 to 45.00
No. 1 cast	32.00 to 33.00
Railroad grate bars	22.50 to 23.50
Stove plate	21.00 to 22.00

Cincinnati

CINCINNATI, July 17—(*By Wire*).

Pig Iron.—The midsummer dullness has broken the record and the tonnage booked last week was probably below that of the extreme correspondingly dull periods of the past few years. The inquiry is also very much curtailed. Furnace operators in the South state that they have no iron to offer for prompt shipment and the majority of them are slow in accepting business for next year's delivery. The tendency of the melters of foundry iron is to hold off for the time being in placing orders for future delivery and just at the present moment there is hardly a ripple upon the surface. The break in scrap prices has not affected the pig-iron market and the present indifference of consumers of both pig iron and scrap does not indicate that there is any affinity between the two differently classed metals as far as prices are concerned. Spot sales have been limited to special analysis iron and contracting is at a standstill, although a few melters have lately taken the precaution to cover for a supply during the remainder of the present year. As usual in a period of this kind, odd lots of analysis iron are offered, but the total tonnage is very small and it is not having any influence on prices. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, as follows:

Southern coke, No. 1 f'dry and 1 soft	$51.40 to $52.40
Southern coke, No. 2 f'dry and 2 soft	49.90 to 51.90
Southern coke, No. 3 foundry	50.40 to 51.40
Southern coke, No. 4 foundry	50.00 to 51.00
Southern gray forge	48.90 to 49.90
Ohio silvery, 8 per cent silicon	86.26 to 91.26
Southern Ohio coke, No. 1	56.26 to 57.26
Southern Ohio coke, No. 2	56.26 to 57.26
Southern Ohio coke, No. 3	55.26 to 56.26
Southern Ohio malleable Bessemer	56.26 to 57.26
Basic, Northern	56.26 to 57.26
Lake Superior charcoal	56.75 to 57.75
Southern carwheel foundry	48.90 to 49.90

(*By Mail*)

Finished Material.—Warehouse prices are unchanged and firm and business generally is said to be fairly good. Mill shipments on structural material shows some improvement. There is a growing scarcity of both black and galvanized sheets and new business is not sought by the mills, while the jobbers are taking care of what sheets they have on hand, exerting care in filling the wants of their old customers. We quote No. 28 black sheets at 8.65c., Cincinnati or Newport, Ky., and No. 28 galvanized at 10.65c., although these are merely nominal prices. The wholesale quotation on steel and iron bars is 5c. base, and twisted steel bars, 5.05c. Structural shapes are unchanged at 5.25c. and ¼-in. plates and heavier, 9½c. Cold-rolled shafting takes the list price plus 15 per cent. Rivets ½ in. and larger with round heads are quoted at 5.50c., base, and with cone heads, 5.60c. The small sized rivets in keg lots are sold at 15 per cent off list. Machine bolts ⅜ x 4 in. and smaller are unchanged at 45 per cent discount; larger and longer, 30 per cent discount. Files 50 per cent discount, and hack saw blades 10 per cent discount.

Coke.—The situation has eased up only in a slight degree as far as the supply of spot coke is concerned. However, one user of foundry coke was compelled to purchase a small tonnage last week and paid $17 per net ton at oven for it. This coke was bought from a Connellsville producer. Other sales in the same district for prompt shipment range from $14 to $16.50. Contract figures on foundry coke are around $11 to $13, but very few contracts are being made. Furnace coke is at a standstill, although a little is bought from time to time for domestic uses, and for quick shipment it brings prices very close to those asked for foundry coke. In the Wise County and Pocahontas fields, a little 72-hr. coke might be obtained for prompt shipment around $14 to $15 at oven, but New River prices are about on the same parity with those in the Connellsville district.

Old Material.—The market is in a very much disturbed condition and prices have declined in some instances as much as $5 per ton. Dealers are at a loss to account for the unsettled conditions, although some of them claim it may be due to the fear of Government regulation of prices. At any rate, there is a wide range in values as reported by different dealers and there seems to be no chance for the market to reach a sound level any time soon. Wrought scrap generally has declined more heavily than cast iron or steel. The following are dealers' prices, f.o.b. at yards, southern Ohio and Cincinnati:

Per Gross Ton	
Bundled sheet scrap	$20.50 to $21.00
Old iron rails	35.50 to 36.00
Relaying rails, 50 lb. and up	45.50 to 46.00
Rerolling steel rails	39.50 to 40.00
Heavy melting steel scrap	35.00 to 35.50
Steel rails for melting	35.00 to 35.50
Old carwheels	32.00 to 32.50
Per Net Ton	
No. 1 railroad wrought	$35.00 to $35.50
Cast borings	13.00 to 13.50
Steel turnings	13.00 to 13.50
Railroad cast	25.00 to 25.50
No. 1 machinery cast	25.50 to 26.00
Burnt scrap	15.00 to 15.50
Iron axles	45.00 to 45.50
Locomotive tires (smooth inside)	37.50 to 38.00
Pipes and flues	18.00 to 18.50
Malleable cast	25.00 to 25.50
Railroad tank and sheet	16.50 to 17.00

Birmingham

BIRMINGHAM, ALA., July 17—(*By Wire*).—While inclined to be conservative, Birmingham iron makers have not lowered prices for any delivery and $45 for 1918 is the lowest price obtainable. Spot remains at $50 and over. Iron for last half of 1917 is also held at $50. The leading seller of foundry iron has sold some 1918 iron at $48 and $50.

(*By Mail*)

The second week in July was a listless one, the inquiry and sales of pig iron being both at a low ebb. Optimistic consumers seem to have protected themselves, while others, hoping for price recessions due to Government process, appear content to wait. Small consumers who buy prompt iron are as hard hit as ever, there being nothing for them under $50. Car shortage causes shut-downs with some frequency, one maker last week reporting a half dozen foundries shut down for lack of metal. The week-end round-up of the makers showed the leading interest selling at $45 and $46 for first half of 1918 with $50 asked for 1917, another interest selling at $45 for 1918 and out of the 1917 market, a third, which made no sales, still on the level of $45 minimum for 1918 and $50 for 1917, the leading foundry interest quoting $52 for 1917, $50 for the first half of 1918 and $48 for the second half of 1918 with some sales made at both the 1918 figures. Charcoal remains at a minimum of $55 with very little offered.

Spot furnace sales in small lots are not selling below $50 unless for resale iron or to a preferred regular customer. Sales by brokers of prompt iron are at $50. We quote per gross ton, f.o.b. Birmingham district furnaces, for prompt delivery:

No. 1 foundry and soft	$50.50 to $51 50
No. 2 foundry and soft	50.00 to 51.00
No. 3 foundry	49.50 to 50.50
No. 4 foundry	49.25 to 50.25
Gray forge	49.00 to 50.00
Basic	50.00 to 51.00
Charcoal	55.00 to 56.00

Steel Bars.—Steel bars in carload lots, f.o.b. Birmingham, 4.50c. to 4.75c.; iron bars, 4.20c. to 4.40c.

Cast-Iron Pipe.—The Government requirement for water pipe for army cantonments placed in Alabama plants is estimated at 25,000 tons and the sanitary pipe similarly placed at 2500 tons. Outside of this business, all of which is prompt shipment, orders have been in small lots and scattered. We quote per net ton, f.o.b. Birmingham district furnaces, as follows: 4 in., $63; 6 in. and upwards, $60, with $1 added for gas pipe and special lengths.

Coal and Coke.—Coal operators come near realizing on the maximum prices tentatively agreed upon with the Government, $3 to $4 per ton, f.o.b. mines with high grades of blacksmithing coal coming higher. The output is limited only by car shortage and indisposition of miners to work full time owing to high wages, etc. The demand for standard beehive foundry coke from the Pacific coast is stronger than ever known, some dealers report, and large contracts for as much as a year have been made on the basis of $11.50 to $12.50. Spot foundry averages around $15 with some as high as $17.

Old Material.—Scrap is depressed. A large tonnage is offering, but there is slow taking. The tremendous business done three weeks ago when the Southern scrap market went on a veritable boom is part cause of the present slump. We quote per gross ton, f.o.b. Birmingham dealers' yards, as follows:

Old steel axles	$50.00 to $51.00
Old steel rails	30.00 to 31.50
No. 1 wrought	35.00 to 36.00
No. 1 heavy melting steel	24.00 to 25.00
No. 1 machinery cast	26.00 to 27.00
Carwheels	27.00 to 29.00
Tram carwheels	25.00 to 26.00
Stove plate and light	19.00 to 20.00
Turnings	13.00 to 14.00

St. Louis

ST. LOUIS, July 16.

Pig Iron.—Uncertainty caused by the doubt as to the Government's action in relation to prices is having its effect on the market at this point, both as to buying and selling. With a prospect of regulation of prices there is less disposition to make contracts for the distant future and as furnaces have nothing for prompt or early delivery, there is no opportunity to do business at present on any large scale at least. The melters in this territory are covered for possibly 50 per cent of their requirements for the first half of 1918, which means that there is more buying to be done whenever it becomes possible to do so with any safety as to prices. While representatives are uncertain, the furnaces seem in much the same condition, as advices from the South making $48 the price for first half have been changed to $50 and then everything withdrawn almost on the same day. On some Southern pig iron brands as high as $55, furnace, is being asked, but $48, Birmingham, is about the price for No. 2 Southern foundry for first half at present. No. 2 X, Chicago, is held at $55 and No. 2 Northern at $55 to $56 Ironton. Sales during the week totaled possibly 2000 tons, mostly for first half delivery, and a considerable number of inquiries would undoubtedly appear, if there were any prospect of doing business. One inquiry for 5000 tons of basic for export is in the market, but has not been closed, though the local furnace is figuring on it.

Coke.—Coke is a little easier in this market for the moment with spot beehive foundry grades at $14 to $16 per ton at oven for small lots. No contract coke is obtainable and furnace coke is held higher than foundry. The local by-product plant contracted during the week to deliver 10,000 tons during the coming year, beginning in August, 1917, but the price was withheld. It is understood, however, to be not far from $12 at the oven. It goes to the Aluminum company for its East St. Louis plant.

Finished Iron and Steel.—Finished products show the same state of affairs which has existed for the past several weeks, with no contracts possible and deliveries worse than ever with no prospect of improvement. The only new sale during the week was of 600 tons of 70-lb. steel rails, standard section, to a Southwestern road out of stock. The price was not given. For material out of warehouse stock, delivery being fairly good, we quote as follows: Soft steel bars, 4.55c.; iron bars, 4.50c.; structural material, 5.05c.; tank plates, 8.05c.; No. 10 blue annealed sheets, 9.55c.; No. 28 black sheets, cold rolled, one pass, 9.85c.; No. 28 galvanized sheets, black sheet gage, 11.25c.

Old Material.—In the scrap market there has been a continuance of the uncertain conditions which have made it anybody's guess as to prices or as to what the market would do next. In consequence, there has been very little disposition to buy and none to sell while the status of old material was so indefinite. As a result of the lack of transactions, it is impossible to make quotations which can really be regarded as "the market." Rather they are estimates of values and one man's estimates are as good as another's. The railroads are not offering much of anything and they are not in possession of cars to load with scrap if they did. With the market in the noted state of dilapidation we quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	$40.00 to $41.00
Old steel rails, re-rolling	42.00 to 43.00
Old steel rails, less than 3 ft	39.00 to 40.00
Relaying rails, standard section, subject to inspection	50.00 to 51.00
Old carwheels	34.00 to 34.50
No. 1 railroad heavy melting steel scrap	38.00 to 38.50
Heavy shoveling steel	34.00 to 34.50
Ordinary shoveling steel	32.50 to 33.00
Frogs, switches and guards cut apart	38.00 to 38.50
Ordinary bundled sheet scrap	18.50 to 19.00
Heavy axle and tire turnings	23.00 to 23.50
Per Net Ton	
Iron angle bars	$37.00 to $38.00
Steel angle bars	37.50 to 38.50
Iron car axles	51.00 to 52.00
Steel car axles	49.00 to 49.50
Wrought arch bars and transoms	41.50 to 42.00
No. 1 railroad wrought	36.50 to 37.00
No. 2 railroad wrought	34.00 to 34.50
Railroad springs	32.50 to 33.00
Steel couplers and knuckles	41.00 to 41.50
Locomotive tires, smooth inside, 42 in. and over	46.00 to 46.50
No. 1 dealers forge	32.00 to 33.00
Cast iron borings	18.50 to 19.00
No. 1 busheling	28.00 to 28.50
No. 1 boilers cut to sheets and rings	20.50 to 21.00
No. 1 railroad cast scrap	25.50 to 26.00
Stove plate and light cast scrap	19.00 to 19.50
Railroad malleable	29.00 to 29.50
Agricultural malleable	24.00 to 24.50
Pipes and flues	23.00 to 23.50
Heavy railroad sheet and tank scrap	20.00 to 20.50
Railroad grate bars	18.50 to 19.00
Machine shop turnings	19.00 to 19.50
Country mixed scrap	17.00 to 18.00

San Francisco

SAN FRANCISCO, July 10.

The extraordinary situation existing in this market has been further accentuated by the Presidential embargo, made public July 9. Representatives of Eastern mills and exporters are awaiting eagerly the interpretation of the license clause, and that relating to structural steel. It would be impossible to make deliveries from Eastern mills to the Orient on orders via San Francisco within 60 days. The specific intentions of the President will, no doubt, be fully expressed shortly, and the exporters' doubts dissipated. Opinion is sharply divided here as to the influence exercised on the prices of steel products by the embargo on exports, but representatives of the large Eastern corporations are of the opinion that the tremendous domestic demand will not admit of any slump in prices, nor, indeed, of any very material reduction. However, the uncertainty over the outcome bears heavily on this market, and some of the Eastern mills' representatives decline to make quotations for the present. The railroads have been forced by circumstances to come into the market for new equipment, and their demands are heavy and insistent. A

light railroad of 12 miles is planned for the great army cantonment to be constructed at Palo Alto, some 25 miles south of San Francisco. Both Army and Navy departments are hampered in their building and repair work by the lack of material, in some instances having to accept quotations previously refused. Export orders from the West coast of South America and Japan have been arriving very freely of late, but in the present unsettled condition of affairs relating to the steel market generally they cannot be filled satisfactorily.

Bars.—Due either to the deficiency in supplies of bars or the abnormal prices, builders of concrete structures are using, in many buildings, reinforced concrete lintels and beams, which they find a fair substitute. Local mills are quoting merchant bars on a basis of 4.25c. for carload lots. Jobbers' quotations are, for steel rounds and squares, a base price of 6c.; for flats, ¼ to 1 in. thick and 1 to 6 in. wide, 6c.; under 1 in. wide, 7c.; over 1 in. thick, 7c. Refined iron bars are quoted at 5.90c. There is more than a normal inquiry for twisted steel bars, which jobbers are ready to furnish in stock lengths at a base price of 6c.

Structural Material.—The demand for structural material, other than that used in shipbuilding, is brisk from the interior of California, where a good deal of public improvement and private construction is in progress. Many who have been holding back on account of war conditions are again in the market and eager for supplies. The War and Navy departments of the United States Government will use considerable material in the erection of cantonments and other buildings. Structural shapes are being quoted at a base price of 6c. f.o.b. mill, but very little is available for immediate use.

Plates.—The demand for ship plates is immense and increasing. Three new shipbuilding yards are in the process of equipment on the Oakland and Alameda shores of San Francisco Bay. Orders from Japan are arriving by every mail, but exporters hesitate to fill these until the intent of the 60 days' export license of the President's embargo proclamation has been interpreted. Independent mills quote as follows: Lloyds hull plates, on a base of 12c. f.o.b. mill; tank plates, 11c. f.o.b. mill, though one mill quotes tank plates on a base of 10.75c. f.o.b. cars, Pacific Coast points, for export, for October, November and December delivery.

Sheets.—The same cry for sheets is heard to-day as in the closing days of last month, and it is becoming increasingly difficult to satisfy customers. In many instances the mills have to refuse new business and content themselves with doling out sufficient stock to carry their old customers. Jobbers quote an advanced base price of 12.74c. on 26-gage flat, but in view of the strong market are not inclined to render firm quotations on other lines.

Wrought Pipe.—Government needs for pipe are extremely hard to satisfy, and this leaves private concerns and municipalities with scarcely enough wrought pipe to complete work already begun. Jobbers will give no guarantee as to delivery except for stock sizes. Anticipating some relaxation of the rigid attitude of the Federal authorities toward further oil development, oil producers are planning boring more wells to supply the market, which is in a perilous situation owing to the depletion of reserve stocks required to satisfy the actual necessities of power plants and transportation companies. Inquiries for oil pipe are, therefore, on the increase.

Cast Iron Pipe.—The only buyers in this market at the present time are water companies and a few private concerns. The City of Sacramento has awarded a contract for 690 tons of water mains in 6 and 8-in. sizes at a price of $70 delivered. The present base price of 6-in. pipe or larger as quoted by Eastern representatives here is $60; for 4-in. pipe, $63.

Pig Iron.—Some concerns here which had made contracts up to the end of the present fiscal year considered themselves fortunate in having their needs taken care of, but since the embargo has been promulgated they are feeling anxious lest a decline in the price of pig iron should follow. Quotations are not readily established. Some orders have been taken at $49 to $50 per ton, f.o.b. Birmingham.

Coke.—Foundries are being supplied on orders given six months or more ago; and so barren is the coke market here that concerns which contracted for coke to June, 1918, are considered fortunate. Most holders have sold up to their capacity, and refuse to book further orders. Latest prices paid by foundries range from $28 to $30 per ton for Missouri coke. Some coke of lower grade is arriving from Puget Sound.

Old Material.—The market is almost bare of heavy melting scrap, and future conditions look serious. All scrap available for export has been sent to Japan. Good heavy scrap is selling for $25 to $28 per ton, while light scrap readily sells at $18 to $22, these prices having been paid by foundries within the last few days. One reason for the dearth of scrap in this market may be found in the fact that, during the last six months of 1916, 5680 tons were exported to the Orient, and in the first four months of 1917, 2228 tons were shipped in the same direction.

Buffalo

BUFFALO, July 16.

Pig Iron.—The market is not as active, from the buyer's standpoint, as for a week or so past. Inquiry keeps up, but orders are very light—not exceeding 3000 tons for the week—because furnaces have very little iron to dispose of. Only about 25 per cent of the inquiry received is being quoted on owing to lack of sufficient untaken output. Furnaces, as a rule, are not desirous of quoting on extended future commitments. Practically all of 1917 and a considerable proportion of first half 1918 product is already taken up. The inquiry for 15,000 tons of pig iron from a large electric interest which has been before the market recently has not yet been placed, in whole or in part, in this market, so far as can be learned. Charcoal iron for this year's delivery is also very scarce. Prices have varied but slightly from last week's quotations, but such changes as are noted show an upward trend notwithstanding the drop in the price of coke. As reported last week, there is only a narrow margin of unsold 1917 iron remaining in the market, and such small tonnages as are obtainable have a price range of $55 to $58 per ton at furnace, according to grade. For first quarter and first half of 1918, we quote as follows, f.o.b. furnace, Buffalo:

High silicon irons	$55.00 to $56.00
No. 1 foundry	54.00 to 55.00
No. 2 X foundry	53.00 to 55.00
No. 2 plain	52.00 to 54.00
No. 3 foundry	51.00 to 53.00
Gray forge	51.00 to 53.00
Malleable	53.00 to 55.00
Basic	53.00 to 55.00
Lake Superior charcoal, f.o.b. Buffalo	55.00 to 60.00

Finished Iron and Steel.—The waiting policy which has been one of the features of the market for the past couple of weeks as regards bars, shapes and plates, is still in evidence, with occasional inquiries for structural material and plates from ship-building companies. Large inquiry for sheets is noted and prices are firmly held at 8½c. for blue annealed, 9c. for black and 10½c. for galvanized. Wrought pipe is also in strong demand, but scarce. Standard railroad spikes advanced further during the week, and on small tonnage orders for immediate shipment 5¼c. to 5½c. is easily obtained, as mills are well sold up. The Hennessey-Mann Co., Buffalo, has the contract for fabricating and erecting steel for the North Division Street transformer station for the International Railway Co., Buffalo, about 100 tons, and bids are soon to be taken for steel for the transformer station for the International Railway Co. at Hertel Avenue and Military Road, Buffalo, requiring a similar amount. The Lackawanna Bridge Co., Buffalo, has received the contract for additional work on plant extension for the Union Carbide Co., Niagara Falls, requiring about 200 tons of structural steel.

Old Material.—The market is quiet, with very little buying movement under way at the present time, and no short sales are being made. Embargoes at one of

the large consuming points in the Pittsburgh district have been a means of diverting scrap shipments to other points, with a tendency toward a weakening in prices. This fact, coupled with the general lull in buying usual to the mid-summer weeks, has caused prices to sag somewhat for many commodities on the list, but there is no surplus of scrap material available, and on this account prices are not likely to go much lower during this period of rest in the market. A new buying movement, due when final action by the Government results in placing orders for war requirements, may, it is thought, again send prices to a higher level. We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$36.00 to $38.00
Low phosphorus	50.00 to 55.00
No. 1 railroad wrought	48.00 to 50.00
No. 1 railroad and machinery cast	32.00 to 33.00
Iron axles	55.00 to 60.00
Steel axles	55.00 to 60.00
Car wheels	37.00 to 38.00
Railroad malleable	33.00 to 35.00
Machine shop turnings	20.00 to 21.00
Heavy axle turnings	28.00 to 29.00
Clean cut borings	21.00 to 22.00
Iron rails	45.00 to 46.00
Locomotive grate bars	22.00 to 23.00
Stove plate	22.00 to 23.00
Wrought pipe	33.00 to 34.00
No. 1 busheling scrap	33.00 to 34.00
No. 2 busheling scrap	21.00 to 22.00
Bundled sheet stamping scrap	22.00 to 23.00

British Steel Market

Pig Iron and Tin Plates Firm—Ferromanganese Strong—American Wire Rods High

(*By Cable*)

LONDON, ENGLAND, July 17.

The pig-iron market is generally firm with a heavy demand for hematite iron. Cleveland basic iron has been officially fixed at 97s. 6d. For American wire rods £28 has been paid c.i.f., third quarter, with parcels afloat quoted as worth £30. Tin plates are firm and sellers are scarce. Ferromanganese is strong and nominally unchanged. We quote as follows:

Tin plates, coke 14 x 20; 112 sheets, 108 lb., f.o.b. Wales, 35s. 6d.

Black sheets, £21 5s.

Ferromanganese, £45 nominal.

Ferrosilicon, 50 per cent, c.i.f., £35 upward

New York

NEW YORK, July 17.

Pig Iron.—The dullness in the pig-iron market noticed last week is more pronounced this week, and rumors of resale iron being offered are current. Virginia sellers have disposed of limited tonnages at $52.50, furnace, for this year and at $50 and higher prices for the first half of next year. Some sales of No. 2 X eastern Pennsylvania iron have been made at $55.75, tidewater, for this year and $53.75 for next year. The only sale of any considerable tonnage announced is 2000 tons of low phosphorus to the American Locomotive Co. for the last half of this year at a price not announced. The inquiry for 500 tons per month for the last quarter of this year and the first half of next year of high silicon iron for export, has not been satisfied, as the firm having the inquiry has not been able to buy the iron. New inquiries for 5000 tons of foundry and 5000 tons of basic for export have appeared. We quote, tidewater, for prompt delivery as follows:

No. 1 foundry	$54.25 to $56.25
No. 2 X	53.75 to 55.75
No. 2 plain	53.25 to 55.25
Southern No. 1 foundry	54.75
Southern No. 2 foundry and soft	54.25

Structural Material.—The market is a little more active, with more inquiries and contract lettings than in some time, but Government work continues to predominate. One indication of the extent to which present conditions have interfered with the bookings of new orders is afforded by the June report of the Bridge Builders and Structural Society, which shows that only 47½ per cent of the capacity of the bridge and structural shops of the country was contracted for in that month. This is estimated to mean contracts amounting to 85,800 tons, which compares with 99,300 tons in June, 1916. It is the smallest total in any month since July, 1916, when the estimated total was 81,800 tons. New Government projects on which bids have been asked are the following: 600 tons for a key bridge over the Potomac River; 400 tons for remodeling four buildings at the Rock Island Arsenal; 280 tons for two coal handling bridges at the Norfolk and League Island navy yards, respectively; 140 tons for a garage and stable at the League Island navy yard. Other inquiries outside of Government work are: The Boston Elevated Railroads wants 400 tons for delivery Sept. 10; the Buffalo Union Furnace Co., 320 tons for an ore handling bridge and the Pennsylvania Railroad, 300 to 400 tons for several small bridges. The most recent Government contracts embrace the following: The American Bridge Co. has taken 270 tons for seven small magazine buildings at Fort Mifflin, and it is reported that the remainder of the forty odd buildings have been taken by the McClintic-Marshall Co. and other fabricators; the Virginia Bridge Co. has taken 600 tons for the erection shop at the Washington Navy Yard and Bethlehem sections will be used; for the 1000 tons for the hangers at Pensacola, Fla., the McClintic-Marshall Co. will furnish 840 tons and the Richmond Steel Co. 150 tons; the low bidder for the 2400 tons for the new projectile plant at Charleston, W. Va., is Warren Moore & Co., of Philadelphia, but no award has been made; the Staten Island Shipbuilding Co. has awarded 200 tons for a small building, but the 600 tons for a new machine shop has not been settled. Industrial contracts of a general nature recently awarded are as follows: The American Bridge Co. has taken 400 tons for pier sheds in Brooklyn for Post & McCord, 1167 tons for a conveying gallery for the New York Northern Central Railroad and 500 tons for the Lawrence Street subway station, Brooklyn; the Ferguson Steel & Iron Co. has taken 125 tons for an engine house and signal tower at its Gardenville yards; the Derber Engineering Co. has taken 1000 tons for an office building at Twelfth and Chestnut Streets, Philadelphia; the Belmont Iron Works has taken 1200 tons for plant extension of the New Jersey Zinc Co. at Palmerton, Pa., and the Pennsylvania Railroad has awarded 600 to 700 tons to the Phoenix Bridge Co. and other fabricators for small bridges. It is reported that the low bidder on the second call for bids for the 2500 tons for the Philadelphia public library is John Gill & Sons of Cleveland, Ohio. An unofficial statement is to the effect that no award will be made for the 3800 tons for the Culver Line in Brooklyn for the Public Service Commission on which the American Bridge Co. was the only bidder. We quote plain material from mill at 4.669c. to 5.169c., New York, the lower price in three to four months and the higher for small lots in earlier deliveries. Shipments from warehouses are 5.25c. per pound, New York.

Plates—Because of the uncertainty over the outcome of the price-fixing investigation of the Federal Trade Commission and the lack of a settlement of the ship controversy, the domestic plate market is in a waiting attitude. Domestic business is of a hand-to-mouth character, but demand for export, especially to Japan, continues strong and prices for export are higher than a week ago. The uncertainty which existed as to how far the mills would be affected by Government control of exports has largely been dispelled, and a new crop of export inquiries has come out. China and Italy are in the market for finished steel, as well as Japan, whose requirements of plates and shapes are said to total very large tonnages. The Japanese Commission which is now reported to be on its way to this country, will, it is said, ask our Government to permit unrestricted shipment of ship plates and shapes to Japan. At present, considerable tonnages which were ready for shipment on July 15, when the export embargo went into effect, are awaiting acceptance by the railroads, which decline to undertake their transportation until the Exports Council at Washington has granted licenses. It is evident that our shipping program will not

absorb more than 50 per cent of the output of the plate mills, hence the mills are now opening their books more freely for contracts with deliveries at their own convenience. Five thousand tons of ship plates were sold for export at 11.50c., but the quotations more often heard are 12c. and 12.50c., though relatively small lots of ship plates are being sold, as these are being reserved for our own Government. Tank plates for export have been sold at 10.50c. and 11c. One concern is said to have refused a firm offer of 10.50c., and later accepted 11c. Some of the mills are not quoting, but will consider offers from buyers. It is still possible to obtain tank plates, particularly re-sale lots, at 10c., but this price is fast disappearing. However, many are inclined to believe that the top of the wave has been reached so far as prices are concerned. Contracts for cars have been recently placed, but it is probable that further business will await the outcome of the price-fixing investigation. The Union Railroad has ordered 1500 70-ton hopper cars for the H. C. Frick Coke Co. from the Ralston Steel Car Co. The Pennsylvania Railroad is building 2225 cars at its Altoona, Pa., shops. The Erie Railroad is having 500 cars, gondola and box, repaired by the American Car & Foundry Co. The National Steel Car Co. will build 1000 steel cars for the Canadian Government. The South Buffalo Railroad has 300 steel hopper cars under negotiation. On mill shipments of universal and tank plates the price is 10.169c., New York, and ship plates, 12.169c., New York. Plates out of store are 9c. to 10c., New York.

Iron and Steel Bars.—Mills are showing more of an inclination to quote on steel bars for shipment at mill convenience, the price on such contracts being about 4.50c., while on prompt delivery 5c. to 5.50c. is asked. The bar iron market is stronger, and 4.75c., Pittsburgh, represents about the minimum at which sales are now being made, while 5c., Pittsburgh, is more often quoted. Sales at 4.75c. are for fourth-quarter delivery. We quote steel bars in mill shipments at 4.669c. to 5.669c., New York, and bar iron at 4.919c. to 5.169c., New York. From New York district warehouses steel bars are sold at 5.25c. and bar iron at 4.75c. to 5c.

Ferromanganese.—Further submarine sinkings are reported of vessels containing ferromanganese. In the last 30 days three ships, the Haverford, the Sylvanian and the Dromore, have been reported as sunk and each one of these had consignments of ferromanganese to various representatives in this country. It is estimated that with the 1000 tons reported lost early in June with the sinking of the Southland, the total alloy that has gone down is somewhere between 2000 and 2200 tons, most if not all of it in June. When the receipt of every ton is so important to the American steel industry at the present time, the loss of such a tonnage is serious. Indications are that receipts in June will exceed in spite of this the total in May of a little over 2000 tons, but it will probably fall considerably short of the 6000 tons per month necessary to maintain the supplies estimated as necessary for the steel industry each month. Quotations for the domestic alloy seem more clearly defined this week than for some little time. While demand is not active and while sales are few, quotations are generally $400 for early delivery, $375 for the last quarter and $350 for the first half of next year, makers' works. A sale is reported of 300 tons for early delivery at $400. The British alloy is extremely scarce and most makers are sold as far ahead as July 1, 1918, with bookings probably up to the limit of their ability to deliver. A sale of one carload of British ferromanganese for shipment in November is recorded at $400, seaboard. Spiegeleisen, 20 per cent, is quiet at $85, furnace, for delivery this year. A sale of 600 tons of 50 per cent ferrosilicon at $130 per ton for delivery in the first half of 1918 is reported. The market is quiet, with the quotation for delivery this year at about $200 to $225, delivered.

Old Material.—The downward trend of the scrap market has become more pronounced during the past few days and nearly all kinds of material are depressed. This is particularly true of heavy melting steel and No. 1 railroad wrought. There is very little activity and brokers report that they can buy scrap at almost any price they care to name. Embargoes exist in several important centers and the car supply is unsatisfactory. Uncertainty as to government attitude concerning prices is given as the principal reason for the present depression. Brokers quote buying prices as follows to local producers and dealers, per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$30.00 to $32.00
Old steel rails (short lengths) or equivalent heavy steel scrap	31.00 to 33.00
Relaying rails	65.00 to 70.00
Rerolling rails	45.00 to 46.00
Iron and steel car axles	46.00 to 48.00
No. 1 railroad wrought	45.00 to 50.00
Wrought-iron track scrap	42.00 to 43.00
No. 1 yard wrought long	38.00 to 40.00
Light iron	10.00 to 12.00
Cast borings (clean)	18.00 to 20.00
Machine-shop turnings	18.00 to 20.00
Mixed borings and turnings	17.50 to 18.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long)	33.00 to 33.50

The weakness which was marked last week in steel and wrought iron has extended to a degree in cast iron, but the foundry market is holding up fairly well. There is a large amount of stove plate being offered. Dealers in New York City and Brooklyn are quoting as follows to local foundries, per gross ton:

No. 1 machinery cast	$34.00 to $35.00
No. 1 heavy cast (column, building material, etc.)	30.00 to 31.00
No. 2 cast (radiators, cast boilers, etc.)	28.00 to 29.00
Stove plate	20.00 to 21.00
Locomotive grate bars	20.00 to 21.00
Old carwheels	34.00 to 35.00
Malleable cast (railroad)	35.00 to 36.00

Cast-Iron Pipe.—The only municipal business placed during the past week was a contract for 125 tons for Yonkers, N. Y., placed with the Warren Foundry & Machine Co. The placing of orders by private buyers is fairly active. Carload lots of 6 in., 8 in. and heavier are quoted at $65.50 per net ton, tidewater, and 4 in., $58.60.

British Output of Crude and Finished Steel in 1916

LONDON, ENGLAND, July 17. (*By Cable.*)

Great Britain's production of finished and semi-finished steel in 1916, according to reports of the Iron and Steel Federation, was as follows: Blooms, etc., 1,945,000 gross tons; sheet bars, 1,272,000 tons; rails, 271,000 tons; plates over ⅛ in. thick, 1,153,000 tons; under ⅛ in., 78,000 tons; angles, etc., 757,000 tons; beams or girders, 346,000 tons; galvanized sheets, 132,000 tons; tin plates, 577,000 tons; and puddled bars, 960,000 tons. The output of electric ingots was 31,000 tons and of electric castings 18,000 tons; all other castings, 189,000 tons.

[The totals for pig-iron and steel output of Great Britain were published in THE IRON AGE, April 12, 1917.]

German Steel Prices

At the meeting of the German Steel Works Union on June 6, the selling prices of semi-finished steel were advanced by 50m. per ton for July delivery and by 60m. per ton for delivery in August and September, according to the London *Ironmonger*. The price of shapes was raised by 10m. per ton. These advances also apply to contracts which have not yet been executed and which will have to be carried over into the next quarter. The prices of basic Bessemer bar iron have been advanced by 30m. per ton for July and by 40m. per ton for August-September delivery. The prices of basic Bessemer rolled wire are advanced by 40m. per ton for July and by 50m. per ton for August and September. Drawn wire, nail wire, and wire nails are advanced from July 1 by 30m. per ton, and thick sheets by 30m. per ton for July and by 40m. for August-September.

Employees of the International Nickel Co., Bayonne, N. J., recently on strike, returned to work on July 10 at the same wage schedule as heretofore.

IRON AND INDUSTRIAL STOCKS

United States Steel Most Active Stock in a Very Irregular Week

Steel common was the most active list on the stock market last week and ended the week with a net decline of nearly four points. The market in general moved backward and forward and evidently was affected to a considerable extent by war developments in Europe. The Government crop report for July 1 promised a handsome increase over previous estimates of the grain crop. The condition of all crops was reported a little more than 2 per cent below the 10-year average as compared with 5.18 per cent below average reported June 1. The market was given something akin to a chill by the President's expression of views as to the duties of business men concerning prices and further developments in the price-fixing program are awaited with keen interest.

Among the industrial stocks that registered gains during the past week were the following: Allis-Chalmers, ¼; American Locomotive, 1; Crucible Steel, 5¼; International Harvester, 1¾; United States Steel Preferred, ⅝. Among the stocks that made losses during the week were the following: American Can, 1; American Car & Foundry, ½; American Steel Foundries, 2; Baldwin Locomotive, 2⅛; Bethlehem Steel, 15½; Bethlehem Steel, Class B, 8½; Colorado Fuel & Iron, ¾; Gulf States Steel, 1; Lackawanna Steel, 3½; Midvale Steel, 2⅝; National Enameling & Stamping, ¾; Pressed Steel Car, 1; Republic Iron & Steel, 1½; United States Steel, 3⅞.

The range of prices in active iron and steel stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com..	28¾- 31¾	Int. Har. Corp., pref.	102½
Allis-Chal., pref.	83½	Lacka. Steel	89⅛- 94⅜
Am. Can, com...	47¾- 51⅛	Lake Sup. Corp..	18⅛- 19½
Am. Can, pref....	106 -107	Lima Loco.	56
Am. Car & Fdry., com.	74¾- 78¼	Midvale Steel....	57¾- 62¼
Am. Car & Fdry., pref.	114⅝-115	Nat.-Acme	34 - 35¾
Am. Loco., com..	69¾- 73¼	Nat. En. & Stm., com.	39⅝- 43
Am. Loco., pref..	103 -103½	Nat. En. & Stm., pref.	99½- 99¾
Am. Rad., com.	280	N. Y. Air Brake..	130 -135
Am. Ship, com...	83 - 85¼	Nova Scotia Steel	94
Am. Ship, pref...	93½- 94	Pitts. Steel, pref.	100¼
Am. Steel Fdries.	66 - 70¾	Pressed Stl., com.	71 - 75¼
Bald. Loco., com.	66¾- 72⅝	Pressed Stl., pref.	102
Beth. Steel, com..	125 -133	Ry. Steel Spring, com.	49 - 53½
Beth. Steel, class B	122⅛-134¾	Republic, com...	85⅛- 92⅞
Beth. Steel, pref.	120	Sloss, com.	52½- 58
Carbon Stl., com.	94 - 95	Sloss, pref.	95
Case (J. I.), pref.	80¼	Superior Steel...	43½- 48½
Central Fdry., com.	35 - 35¾	Sup. Steel, 1st pref.	102 - 102½
Charcoal Iron, com.	8¾- 8⅞	Transue-Williams.	43 - 44
Colo. Fuel	47½- 52¼	Un. Alloy Steel..	42⅞- 44¼
Cruc. Steel, com.	77¾- 87	U. S. Pipe, com..	21⅝- 22¾
Cruc. Steel, pref.	102½-103	U. S. Steel, com..	119⅝-128¼
Deere & Co., pref.	100	U. S. Steel, pref..	117⅞-118⅝
Gen. Electric ...	156⅝-159¾	Va. I. C. & Coke.	65 - 66
Gt. No. Ore. Cert.	32 - 34⅜	Warwick	[illegible]
Gulf S. Steel....	117 -124	Westing. Elec....	49⅛- 50⅞
Int. Har. Corp., com.	69½- 70		

Lackawanna Steel Company's Earnings

The earnings of the Lackawanna Steel Co. in the quarter ended June 30 made a remarkable record, amounting to $7,879,412, compared with $6,203,233 in the preceding quarter and $4,051,033 for the same period in 1916. In the first half of the present year, the net earnings amounted to $14,082,644, an increase of $6,784,018 compared with 1916. After all deductions, the profit for the first half amounted to $12,198,215. In a report just issued, it is stated that provision has been made for all taxes payable under laws now in effect, but not for taxes which may be payable as a result of legislation now pending. The unfilled orders July 1 were 913,196 gross tons, a decrease of 19,661 tons compared with the close of the first half of 1916.

Republic Iron & Steel Co. Earnings Increase

The statement of earnings just issued by the Republic Iron & Steel Co., covering operations in the three months ended June 30, last, showed net profits applicable to dividends of $7,130,406, compared with $5,573,778 in the first quarter of the year. The surplus after payment of $845,365 in quarterly dividends on the preferred and common stocks was $6,285,041, compared with $3,501,561 in the first quarter of the year.

Like most of the other steel companies, the Republic's unfilled tonnage fell off in the second quarter, the total of unfilled business on hand on June 30 amounting to 528,976 tons, compared with 593,018 tons at the close of the first quarter.

The following table shows the company's net profits by months applicable to dividends, compared with the corresponding periods of 1916:

	1917	1916
April	$1,950,637.11	$1,053,025.52
May	2,720,918.62	1,234,411.35
June	2,458,850.87	1,341,198.08
Totals	$7,130,406.60	$3,628,634.95

Industrial Finances

The Canadian Car & Foundry Co., Montreal, Que., annual meeting will be held July 31. It is stated that the financial results from the completion of the Russian order will show profits, exclusive of salvage and amounts now in litigation, of over $3,000.000. It is believed that as much as $500,000 will ultimately be realized as profits on salvage from the Kingsland fire, besides which a large number of shells will be recovered which will add considerably to the $500,000. In addition, the company has now pending lawsuits for the recovery of moneys advanced, approximately $700,000. The company may follow the precedent established by many other industrial concerns and conserve its resources for the purpose of handling the large amount of business now on hand, amounting to between $15,000,000 and $18,000,000. As this requires a considerable amount of capital outlay, the directors will likely postpone the payment of the accrued dividends, and in all probability will commence the payment of the regular quarterly disbursements by the end of the calendar year.

The Crucible Steel Co. of America, Pittsburgh, has retired all but $500,000 of first mortgage, 5 per cent bonds of the Crucible Coal Co., and it is expected the remainder will be retired in a short time. The principle and interest on these bonds were guaranteed by the Crucible Steel Co. of America.

The Canadian Furnace Co., Port Colborne, Ont., has increased its capital stock from $500,000 to $1,500,000 by the issue of 10,000 shares of new stock at $100 a share.

The Mark Mfg. Co. has filed for record a trust deed to its property at Evanston, Indiana Harbor, and Zanesville, Ohio, to secure a bond issue of $6,000,000. The funds are to be used in the construction of the company's new steel plant at East Chicago, Ill.

The Crucible Steel Co. of America declared a 2 per cent dividend on the preferred stock at its regular monthly meeting July 16, thereby disposing of the accumulated dividend on the preferred, and placing the common stock in line for dividends. The regular quarterly meeting of the company will be held August 16.

The Trumbull Steel Co., Warren, Ohio, has issued $2,000,000 of preferred stock and $325,000 of common, subscription rights to which terminate July 25, with all preferred warrants accruing to common shareholders. Under new Ohio statute, common subscriptions must be paid in full by Oct. 1, and preferred subscriptions in four equal installments, Oct. 1, 1917, Jan. 1, April 1, and July 1, 1918.

Dividends

The Dominion Steel Corporation, quarterly, 1½ per cent on the preferred, payable Aug. 1.

The Taylor-Wharton Iron & Steel Co., quarterly, 1¾ per cent on the preferred, payable Aug. 1.

Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c. Denver pipe, 76.1c., minimum carload, 46,000 lb.; structural steel and steel bars, 76.1c., minimum carload, 40,000 lb. Pacific coast (by rail only), pipe 65c.; structural steel and steel bars, 75c., minimum carload, 60,000 lb. No freight rates are being published via the Panama Canal, as the boats are being used in transatlantic trade.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 4.50c.

Wire Products

Wire nails, $4 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire is $4.05 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.95; galvanized wire, $4.65; galvanized barb wire and fence staples, $4.85; painted barb wire, $4.15; polished fence staples, $4.15; cement-coated nails, $3.90 base, these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 43 per cent off list for carload lots, 42 per cent off for 1000-rod lots, and 41 per cent off for small lots, f.o.b. Pittsburgh.

Nuts and Bolts

Discounts in effect for large buyers are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days:

Carriage bolts, small, rolled thread, 40 per cent, small cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent; with c. p. nuts, 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq. blank, $2.10 off list, and tapped, $1.90 off; hex., blank, $1.90 off, and tapped, $1.70 off; nuts, c. p. c. and t. sq. blank, $1.70 off, and tapped, $1.50 off; hex. blank, $1.60 off, and tapped, $1.40 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Wire Rods

Soft Bessemer and open-hearth rods to domestic consumers at $95 to $100; high-carbon rods made from ordinary open-hearth steel, $100 to $110, and special steel rods with carbons running from 0.40 to 0.60, $100 to $110 at mill; above 0.60 carbon, $115 to $120.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $5.00 base; ⅜ in., 7/16 in. and ½ in., $7.50 to $8. Boat spikes are about 6.50c. to 7c., all per 100 lb. f.o.b. Pittsburgh, but some makers are quoting above these prices. Track bolts with square nuts 6.50c. to 7c. to railroads, and 8c. to 8.50c. in small lots, for fairly prompt shipment.

Steel Rails

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails, and on carload and smaller lots, 4c. to 4.25c. at mill. Light rails: 25 to 45 lb., $75 to $80; 16 to 20 lb., $80 to $81; 12 and 14 lb., $82 to $83; 8 and 10 lb., $83 to $84; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard Bessemer rails, $38; open-hearth, $40, per gross ton, Pittsburgh.

Tin Plate

Long terne plate, No. 28 gage base, $7.25 to $7.50; short terne plate, $12 to $12.50, maker's mill, prices depending on quantity and delivery wanted. The present schedule of prices on terne plate is as follows: 8-lb., 200 sheets, $14 per package; 8-lb., 214 sheets, $14.30 per package; 12-lb., I. C., $15.25 per package; 15-lb., I. C., $15.75 per package; 20-lb., I. C., $16.50; 25-lb., I. C., $17.25; 30-lb., I. C., $18; 35-lb., I. C., $18.75; 40-lb., I. C., $19.50

Iron and Steel Bars

Steel bars at 4.50c. to 5c. for delivery late this year, and 5c. and higher from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c.; railroad test bars, 5.25c. in carload lots and larger lots f.o.b. mill.

Wrought Pipe

The following discounts in steel are to jobbers for carloads on the Pittsburgh basing card in effect from May 1, 1917, all full weight except for LaBelle Iron Works and Wheeling Steel & Iron Co., which quote higher prices and National Tube, which adheres to card of April 1.

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	42	15½	⅛ and ¼	23	+4
½	46	31½	⅜	24	+3
¾ to 3	49	35½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	42	29½	2	26	12
2½ to 6	45	32½	2½ to 6	28	15
7 to 12	42	28½	7 to 12	25	12
13 and 14	32½	..			
15	30	..			

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	38	20½	⅛, ¼ and ⅜	22	5
½	43	30½	½	27	14
¾ to 1½	47	34½	¾ to 1½	33	18
2 to 3	48	35½			

Lap Weld, extra strong, plain ends

2	40	28½	2	27	14
2½ to 4	43	31½	2½ to 4	29	17
4 to 6	42	30½	4½ to 6	28	16
7 to 8	38	24½	7 to 8	20	8
9 to 12	33	19½	9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and five and one-half points on galvanized, but in some sections of the country discounts on less than carloads are three (3) points less (higher price) than the carload discount on both black and galvanized steel pipe.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

Nominal discounts on less than carloads, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes, and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in.	28	1¾ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3¼ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in.	No quotations
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths.

Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net, or 2 per cent discount in 10 days:

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer

	Cents per lb.
Nos. 3 to 8	8.00 to 8.50
Nos. 9 and 10	8.25 to 8.50
Nos. 11 and 12	8.50 to 8.75
Nos. 13 and 14	8.75 to 9.00
Nos. 15 and 16	9.00 to 9.25

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	8.30 to 8.50
Nos. 22 and 24	8.35 to 8.85
Nos. 25 and 26	8.40 to 8.90
No. 27	8.45 to 8.95
No. 28	8.50 to 9.00
No. 29	8.55 to 9.05
No. 30	8.65 to 9.15

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11	9.00 to 9.50
Nos. 12 and 14	9.10 to 9.60
Nos. 15 and 16	9.25 to 9.75
Nos. 17 to 21	9.40 to 9.90
Nos. 22 and 24	9.55 to 10.05
Nos. 25 and 26	9.70 to 10.20
No. 27	9.85 to 10.35
No. 28	10.00 to 10.50
No. 29	10.25 to 10.75
No. 30	10.50 to 11.00

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	7.80 to 8.30
Nos. 17 to 21	7.85 to 8.35
Nos. 22 to 24	7.90 to 8.40
Nos. 25 to 27	7.95 to 8.45
No. 28	8.00 to 8.50
No. 29	8.05 to 8.55
No. 30	8.05 to 8.55
Nos. 30½ and 31	8.10 to 8.60

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
July	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
11	30.50	30.50	63.00	11.00	10.75	9.12½	8.87½
12	30.00	30.00	63.00	10.87½	10.75	9.12½	8.87½
13	29.50	29.50	62.00	10.75	10.62½	9.12½	8.87½
14	28.50	28.50	....	10.75	10.62½	9.00	8.75
16	27.50	27.50	62.00	10.50	10.37½	9.00	8.75
17	26.50	26.50	62.50	10.50	10.37½	8.87½	8.62½

NEW YORK, July 18.

The markets are all difficult to gage. Prices are mostly nominal and business meagre. Increased uncertainty as to the Government's policy has nearly demoralized the metals. Copper has decidedly fallen. Tin is steady. Lead is weaker. Spelter is lower. Antimony is soft.

New York

Copper.—The President's statement on Friday, advocating a one-price-to-all policy for all purchases of steel, metals, etc., added more uncertainty to an already chaotic condition and since then the market, which had a tendency to be weak, has developed pronounced softness. Another unsettling factor was the statement that for the 60,000,000 lb. purchased recently by the Government at a tentative price of 25c. per lb. only 75 per cent, or 18.75c. per lb., would be paid with the settlement of any possible balance left to further investigation. The opinion is freely expressed in the trade that the Government will not pay as high as 20c. per lb. for this or any other purchases in the future. If this is to apply to the Allies and to regular consumers, the effect on the copper market as a whole is readily appreciated. A most important consideration in this connection is the fact that large numbers of consumers are under contract for millions of pounds of copper for delivery this year and into 1918 at around 25c. per lb. Under such conditions buyers are holding back and prices are more or less nominal. It is distinctly a buyers' market and one dealer expresses the opinion that almost any inquiry, sufficiently attractive, would probably receive favorable consideration from producers at almost any figure. Yesterday the quotation for both Lake and electrolytic was nominal at 26.50c., New York, for early delivery, a decline of over 4c. per lb. since a week ago. Quotations for last quarter vary, some placing it at 25c. to 25.50c. and some as low as 24.50c. per lb. Lower prices for all positions are to be expected. The London market remains unchanged at £142 for spot electrolytic and £138 for futures.

Tin.—Because tin is not as subject to Government control as other metals the market has behaved well and has been steady. It is not unlikely, however, that it will ultimately suffer if the present uncertain industrial conditions prevail. Though steady, the market is unsettled, due largely to the events of the past week at Washington. As a whole it is a narrow one, ranging in the past week between 62c. and 63c., with the quotation yesterday at 62.50c., New York, for spot Straits. Late last week a fair amount of business was quietly done in futures and early this week there was a moderate business for the same position with some spot demand in evidence but not large. Stocks of Straits tin have improved somewhat due to more liberal arrivals, which up to July 17 inclusive were 1975 tons, with the quantity afloat 3729 tons. Banca tin yesterday was quoted at 59.50c., New York. The quotation for spot Straits tin in London yesterday was £239 10s., a decline of nearly £8 since last week.

Lead.—Practically the same conditions govern the lead market which have been outlined as controlling the copper situation. With purchases already by the Government at 8c. per lb. and with the prospect of a one-price-for-all basis for all other purchases, it is not surprising that buyers are extremely cautious in committing themselves for only necessary needs in a market quoted nearly 3c. above the Government purchase. Considerable weakness has developed and the tendency is toward lower levels, with the future hazy and uncertain. On small buying and little demand the market has fallen daily in the past week until the quotation yesterday was 10.37½c., St. Louis, or 10.50c., New York. The sale of a carload was reported at 10.37½c., New York. The American Smelting & Refining Co. continues to quote 11c., New York.

Spelter.—Business is nearly paralyzed as a result of the uncertainty regarding the Government price situation. Buyers refuse to come into the market except where necessary, and the few sales that have been made have gone at varying prices. As one dealer puts it, "the market is all over the lot." It is stated that one lot of 100 tons of prime Western was sold in the past week at 8.62½c., St. Louis, for early delivery, while another sale is reported at 9c., St. Louis, also early shipment. The market is probably not far from 8.75c., St. Louis, or 9c., New York, for prime Western for early delivery, with no inclination by producers to sell for future delivery under present chaotic conditions. It is certain, however, that whatever the result of price fixing, the final prices cannot be lower than present quotations.

Antimony.—Stagnation as a result of poor demand characterizes this market. Quotations for Chinese and Japanese grades are 16c. to 16.50c., New York, duty paid.

Aluminum.—For No. 1 virgin metal, 98 to 99 per cent pure, 57c. to 58c. is the quotation, but the market is quiet.

Old Metals.—The market is very unsettled. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible	28.50 to 29.50
Copper, heavy and wire	28.00 to 28.50
Copper, light and bottoms	25.50 to 26.50
Brass, heavy	19.50 to 19.75
Brass, light	14.25 to 14.75
Heavy machine composition	26.00 to 26.50
No. 1 yellow rod brass turnings	18.25
No. 1 red brass or composition turnings	21.00 to 22 00
Lead, heavy	9.25 to 9.75
Lead, tea	8.00
Zinc	6.75

Chicago

CHICAGO, July 16.—The entire market has been flat, a situation which local dealers attribute to a decision on the part of consumers to await the outcome of the proposal that the Government fix prices. Some sellers are inclined to be bitter over the state of affairs. Almost without an exception metal quotations are lower. We quote as follows: Casting copper, 28.50c.; Lake, 29.75c.; electrolytic, 29.25c.; tin, carloads, 62.50c.; small lots, 65c. to 66c.; lead, 10.75c.; spelter, 8.62½c. to 8.75c.; sheet zinc, 19c.; Oriental antimony, 18c. to 20c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 23.50c.; copper clips, 23c.; copper bottoms, 21.50c.; red brass, 21.50c.; yellow brass, 15c.; lead pipe, 9c.; zinc, 6.50c.; pewter, No. 1, 35c.; tinfoil, 40c.; block tin, 45c.

St. Louis

ST. LOUIS, July 16.—Non-ferrous metals have been rather quiet during the week, closing to-day, for carload lots at 10c. to 10.50c. for lead and spelter at 8.87½c. In less than carload lots the prices were: Lead, 11.50c.; spelter, 10c.; tin, 66c.; lake copper, 32c.; electrolytic copper, 31.50c.; Asiatic antimony, 20c. In the Joplin district lead eased off during the week in the ore sales the top price being $115 per ton basis of 80 per cent metal. Some of the producers are continuing to hold their ore for better prices. The average for the week in the district was $111 per ton. Zinc blende was easy but held its top price at $75 per ton ranging down to $65 per ton basic of 60 per cent metal, with an average for the district of $69 per ton. In calamine the range was $35 to $42 per ton, basis of 40 per cent metal, with the average for the district $37 per ton. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 12c.; heavy yellow brass, 15c.; heavy red brass and light copper, 20c.; heavy copper and copper wire, 23.50c.; tin foil, 42c.; pewter, 25c.; lead, 7c.; tea lead, 6c.; zinc, 6½c.

NEW TRADE PUBLICATIONS

Band Wheel Grinding Machine.—W. C. Barnhart, 700 Westlake Street, North, Seattle, Wash. Circular. Relates to a grinding machine for metal band wheels and pulleys which was illustrated in THE IRON AGE Feb. 1, 1917. The special advantages claimed for the machine are that the wheels can be faced without removing them and the frictional contact with the face of the band wheel drives the abrasive wheel, thus doing away with any special driving equipment. A number of views showing the machine in use are included.

Mercury Vapor Lamps.—Cooper Hewitt Electric Co., Eighth and Grand Streets, Hoboken, N. J. Bulletin No. 78. Mentions the use of mercury vapor lamps and their accessories for photographic purposes. The various kinds of photography for which the lamps are suited are mentioned with brief statements of the advantages of the lamps for each particular kind of work. The several outfits that can be supplied are illustrated and briefly described, condensed specification and price tables being included.

Photomicrographic Apparatus.—Sauveur & Boylston, Cambridge, Mass. Circular MIV. Describes a line of photomicrographic apparatus including a metallurgical microscope, an inverted metalloscope and an aspheric condenser. All of the apparatus is illustrated and brief specification tables serve to supplement the text description. Mention is made of gas and electric illuminating outfits that can be supplied.

Steel Castings.—American Steel Foundries, McCormick Building, Chicago. Calendar hanger measuring 12½ x 27¾ in. Each leaf of the calendar is divided into four sections. The one at the top contains a reproduction of a drawing symbolizing some stage in the process of making steel castings from the mining of the ore to the finished product, while the remaining three have the dates for the past, present and next months respectively, the figures for the present month being printed in heavier type, while the size is practically the same for all three.

Tool Grinding Machine.—Gisholt Machine Co., Madison, Wis. Circular. Presents a brief statement of the advantages to be derived from the installation of one or more tool grinding machines in a central location in charge of a boy or handy man, instead of having the operators leave their machines and grind their own tools. Among the advantages claimed for this arrangement are that the idle time of machines is eliminated, correct grinding of tools is secured, and the investment in tool steel is reduced. A partial list of users is included.

Air Compressors.—Chicago Pneumatic Tool Co., Fisher Building, Chicago. Bulletin No. 34-Y. Covers a line of air compressors that are driven by gas and gasoline engines. Longitudinal sections showing the details of construction of the two compressors are presented with the various parts marked. Specification tables of the compressors, which can be supplied in the stationary type, tank mounted, or on skids for semi-portable use, are given, together with illustrations of the three types. The construction of the compressors is gone into at some length, the text being supplemented by numerous views of various parts.

Oil Engines.—McEwen Bros., Wellsville, N .Y. Catalog. Concerned with a horizontal four-cycle type high compression engine, operating on the Diesel principle and adapted to burn any kind of heavy crude oil or residue. The construction of the engine is gone into at some length, the text being supsupplemented by views of the several parts and the results of a series of fuel consumption tests and indicator diagrams are included.

Internal Grinding Machine.—Lansing Stamping & Tool Co., Lansing, Mich. Bulletin No. 3. Relates to a machine for the internal grinding of small pieces such as automobile parts, ball races, bushings, cam rollers, universal balls and many other types of work. One of the special claims made for the machine is rapidity and accuracy of production, the grinding wheel spindle revolving at from 15,000 to 30,000 r.p.m. and turning out work that is correct within 0 001 in. Illustrations of the machine itself and of installations in manufacturing plants supplement the text description and a condensed table of specifications is included. An illustrated description of the grinding machine appeared in THE IRON AGE, Feb. 1, 1917.

Steel Hardening.—Stroh Steel Hardening Process Co., 728 Monadnock Block, Chicago. Catalog. Size, 9 x 12 in.; pages, 24. Contains a brief account of the theory of the Stroh process of hardening steel castings, which is a method for casting alloy steels together with ordinary soft steel in a single, solid piece, the depth, location and hardness of the alloy being completely controlled and varied according to the size of the piece and the nature of service expected. Illustrations of various products made by this process, such as rolling mill gears and pinions, crusher rolls and heads, mine car wheels, grinding pans and track work, are presented with brief descriptions of the service that these parts were called upon to perform. A brief historical account of the development of wheels and illustrations and descriptions of the two plants of the company are included.

Electric Hoists.—Lidgerwood Mfg. Co., 96 Liberty Street, New York. Bulletin No. 20. Shows a complete line of electric hoists that have been developed especially for general contracting work as well as a few of the many types that have been designed and built for special hoisting duty. A brief general description of the construction of the hoists is presented and this is followed by illustrations, descriptions and tables of sizes of the different hoists. In practically every case a single page is given to each type, the illustration being at the top and the table of sizes at the bottom with the descriptive matter coming between.

Photo Engraving Machinery.—John Royle & Sons, Paterson, N. J. Circular No. 288. Describes briefly and illustrates a line of photo engraving machinery which includes saws of the column, cabinet and jig types, routing and beveling machines and a combination jig sawing and drilling machine. Mention is made of the various types of routing cutters that can be supplied for use, and reference is made to a complete booklet covering this line of machinery.

Payroll Machinery.—International Money Machine Co., Reading, Pa. Pamphlet. Illustrates a line of payroll machinery which includes mechanism for making change automatically and adding, listing, recording, payroll scheduling and money paying machines. A brief general description of the way in which the machines operate in conjunction with each other precedes brief descriptions of the machines themselves. A partial list of users and a number of testimonial letters are included.

Motor Vehicle Governors.—Monarch Governor Co., Detroit. Pamphlet. Pertains to a governor for automatically controlling the speed of motor vehicles which utilizes the rate at which the gases are drawn into the cylinder to operate the control member of the governor. Among the features upon which special emphasis is laid are the absence of any connection to any moving part of the engine or vehicle, elimination of all revolving parts and driving gears and shafts, automatic and instantaneous action with change in the load on the engine and ability to lock the governor at any desired speed. The construction of the governor is gone into at some length and instructions for its installation are presented, together with a dimension table and diagram.

Torsion Meter.—Cummings Ship Instrument Works, Boston. Pamphlet. Calls attention to the Gary-Cummings torsion meter which is designed to furnish an easy means of obtaining a record of the amount of horsepower transmitted by a propeller shaft. The construction of the meter is gone into at some length and the text is supplemented by numerous illustrations. Instructions on the care and operation of the meter are presented and a reproduction of a shaft calibration data sheet is included.

Grinding and Polishing Machinery.—Gardner Machine Co., Beloit, Wis. Catalog. Size, 6½ x 10 in.; pages, 121. Devoted to a line of grinding and polishing machinery and the various accessories and supplies employed in connection with them. The machines include disk and ring wheel types, band finishing machines and polishing and buffing lathes. Instructions on the use of abrasive disks are given, followed by illustrations, brief descriptions and condensed specification tables of the various machines. In practically every case a separate page is given to each machine. The plain and ball bearing spindles used with the machines are described at some length. Among the accessories listed are wheel presss, tables of various types, ring wheel chucks, wheel dressers, etc.

Tool Steels.—Colonial Steel Co., Pittsburgh. Catalog No. 16. Gives general description and specifications for a line of tool, alloy and special steels with methods of treatment, lists of extras and other useful information. Various steps in the process of manufacture are shown, as well as articles made from the different steels.

Threading Die and Holder.—Greenfield Tap & Die Corporation, Greenfield, Mass. Pamphlet. Contains an illustrated description of the Acorn type of threading die which has been recently developed by the company. Tables of the sizes manufactured are included and mention is made of the various other products of the corporation which include screw cutting tools, gages, reamers, lathes, pipe tools and threading, grinding, cutting-off and screw machines.

Boiler Preservative.—Boiler-Kote Co., 343 South Dearborn Street, Chicago. Pamphlet. Contains a short treatise on the use of a preparation called Boiler-Kote for the prevention of scale and corrosion in steam boilers. It is a mineral solution which is introduced into the feed lines. The sheets, flues and tubes are coated with a fine glaze to which the scale does not adhere and the preparation is also claimed to remove any scale that may have formed.

PERSONAL

Col. John Campbell Maben, chairman of the board of the Sloss-Sheffield Steel & Iron Co., who is living at the Waldorf-Astoria hotel, New York, is seriously ill. A general breakdown is the cause. His condition showed improvement this week.

W. J. Hughes, who for a number of years has been connected with the Schoellkopf Aniline & Chemical Works, Inc., Buffalo, and other Schoellkopf interests in that city, as general purchasing agent, has become general purchasing agent of the National Aniline & Chemical Co., with which the first named company has been merged, and will have his headquarters in New York City. Mr. Hughes was tendered a farewell banquet at the Statler Hotel, Buffalo, by his associates and representative business men of the city last week.

C. W. Oliver has resigned as general sales agent of the Virgina Iron, Coal & Coke Co., Roanoke, Va., to accept another position.

John N. Willys, of the Willys-Overland Co., Toledo, Ohio, has been formally elected president of the Curtiss Aeroplane & Motors Corporation of Buffalo. He succeeds Glen H. Curtiss, who has been elected chairman of the board. William A. Morgan, president of the Buffalo Copper & Brass Rolling Mill, Buffalo, has been elected a director to succeed George Palmer, resigned, and was also elected vice-president and general manager in charge of all operations. Mr. Willys was made a member of the executive committee, succeeding Harry Evers of Buffalo.

The International Oxygen Co. announces the appointment of R. M. Klein as sales manager, with headquarters at the company's main office, 115 Broadway, New York. Mr. Klein has been an engineer in United States Government employ, sales manager for the Diehl Mfg. Co., and manufacturers' representative handling a number of mechanical lines.

F. H. Tackaberry, general agent of the American Steel Export Co., sailed from New York July 7 for South America. He will cover a large portion of the Latin-American countries, visiting Rio de Janeiro, Sao Paulo, Buenos Aires, Montevideo, La Plata, Rosario, Valparaiso and Santiago, to collaborate with the company's various agents and to study market conditions in iron and steel, engineering and contracting.

J. H. McKelvey has been appointed sales manager of the Laclede-Christy Clay Products Co., St. Louis, succeeding H. K. Lackland, resigned.

Charles A. Paquet has resigned as president of the General Car & Machinery Works, Ltd., Montmagny, Que., to become the general managwer. Mr. Paquet succeeds W. E. Patterson, who has asked to be relieved on account of ill health. D. O. Lesperance, a director of the company, was unanimously elected president. The plant is operating to capacity, working day and night, and employs over 900 men.

Frank R. Bacon, president Cutler-Hammer Mfg. Co., Milwaukee, electric controlling devices, has been called into the federal commissary service as a captain in the quartermaster officers' reserve corps and left July 10 for Philadelphia.

P. L. Williams has become superintendent at the works of the Empire Steel & Iron Co., Mt. Hope, N. J., succeeding H. M. Roche, who has become superintendent of the Wharton Steel Co., Dover.

Frank Lynch, superintendent of the Peerless Tube Co., Locust Avenue, Bloomfield, N. J., has joined the government service in the Aviation Corps.

The Walter A. Zelnicker Supply Co. and affiliated companies are now represented in the Birmingham district by Thomas A. Hamilton, who for the past 14 years has been connected with Crane Co., prior to which he was superintendent of the East St. Louis plant of the Zelnicker Car Works. Mr. Hamilton will have charge of both buying and selling in the southeastern territory. His office will be at 1018 Woodward Bldg., Birmingham, Ala.

Russell Wykoff, who has been connected with the Detroit office of the United Alloy Steel Corporation, Canton, Ohio, has been appointed district sales agent at Chicago, succeeding Barton L. Little.

Harry A. McKnight has resigned as superintendent of the plant of the American Car & Foundry Co., Jeffersonville, Ind., to enter the operating department of the Canadian Car & Foundry Co. He is succeeded at Jeffersonville by Charles T. Hertzsch, assistant superintendent of the plant.

W. S. Jones, at present connected with the department of the general manager of sales of the Midvale Steel Co., has been elected to the vice-presidency of the Vanadium Alloys Steel Co., Pittsburgh and Latrobe, Pa.

C. P. Perin, New York, has returned from a trip of several weeks to Great Britain.

S. H. Chauvenet, formerly connected with the Robesonia and Sheridan blast furnaces in the Lebanon Valley, will be manager of the Island Park furnace, Easton, Pa., recently purchased by the Northern Ore Co. from the Thomas Iron Co.

James A. Parker, who has been connected for some years with the United States Steel Products Co., New York, has been appointed by Secretary Redfield as steel expert for the newly created Division of Export Licenses of the Bureau of Foreign and Domestic Commerce. Mr. Parker will assist in scrutinizing and passing upon applications for licenses to export those forms of iron and steel covered by the President's recent proclamation.

W. A. Bliss has become treasurer of the Kidd Drawn Steel Co., Aliquippa, Pa., and will take an active part in its affairs. For the past 10 years, he has been secretary, treasurer and general manager of the Keystone Sand & Supply Co., a subsidiary of the Dravo Contracting Co.

Anketell M. Henderson, manager Commonwealth Steel Products, Ltd., Melbourne, Australia, accompanied by A. Goninan, managing director of that company as well as of Goninan & Co., Newcastle, spent several days in the Milwaukee machinery field during the past week. Messrs. Henderson and Goninan left Sydney on May 10, coming to the United States by way of Hawaii and Vancouver. They are especially interested in machinery for the manufacture of axles and wheels for railroad cars, which they are to manufacture for the British government in Australia.

C. H. Hobbs has been appointed Detroit district sales manager of the Lackawanna Steel Co., succeeding Jay C. McLauchlan who represented both this company and Pickands, Mather & Co., in Detroit. Mr. McLauchlan is now associated with Pickands, Mather & Co. in Cleveland, and this firm is represented in Detroit by H. E. Blackwell as district sales manager.

H. Kirke Porter, president of the H. K. Porter Co., Pittsburgh, builders of light locomotives, has offered Oak Manor, a large estate in the East End, Pittsburgh, as a convalescent hospital for wounded soldiers. The home will be turned into a hospital and fully equipped by Mr. Porter, and will be in charge of the Red Cross.

Frank R. Frost, formerly assistant to the president of the Pittsburgh-Hickson Co., Butler, Pa., has resigned, and is now connected with the sales department of the Superior Steel Corporation, Union Arcade Building, Pittsburgh.

The Jones & Laughlin Steel Co., Pittsburgh, has retired from the market as an active manufacturer of chain. The chain department of this concern is located at its Soho Works in Pittsburgh, and the ground it occupies is needed, and must be used for the 128-in. plate mill being installed by this company, which it bought some months ago from the Algoma Steel Co. The work of installing this plate mill is going on rapidly, and it is expected to be ready for operation by Oct. 1 or possibly before. Contracts for chain now on the books of the Jones & Laughlin Steel Co. will be taken care of, and shipments made as promptly as possible.

THE BURNING OF FUEL OIL*

Some Details of Its Use Under Stationary Boilers to Produce Steam

OIL from which the lighter constituents have been distilled off will probably be the liquid fuel most used. This is due to the rapid increase in the use of gasoline in motor vehicles and of distillates in stationary engines, as well as the improvements in refining crude oil. Fuel oil may be classified according to the flash point, viscosity, specific gravity, heat value and sulphur content, all of which characteristics are more or less dependent upon each other.

The flash point is of interest from the standpoint of safety, especially on shipboard where inflammable vapors are apt to accumulate in the hull or to be freed in a closed boiler room, due to leaky piping. The viscosity is the principal consideration in the actual burning of the oil, since the success of the burner or atomizer depends largely on its ability to atomize the fuel into sufficiently fine particles to insure satisfactory combustion. Assuming that the equivalent evaporation from and at 212 deg. is 8 lb. and 14.5 lb. for coal and oil respectively, a ton of coal is equivalent in practical heating value to 3.34 bbl. of oil weighing 325 lb. each and having a heating value of 19,500 B.t.u. per lb. Aside from the cost oil has numerous other advantages over coal. Among these are less storage space for an equal number of heat units, absence of ashes, less help for firing, reduction of wear and tear on the furnace and repairs to grate bars, steam can be raised quickly with no loss due to banking fires and in case of an emergency the fire can be instantly extinguished.

The first consideration for reliability in the operation of an oil burning installation is the oil supply to the burners involving a storage tank, pumping outfit and heaters. The size of a storage tank varies, of course, with that of the boiler plant, but it should at least be large enough to hold carload of oil. As the insurance requirements call for the tank to be below the level of the pumps and the burners, it is usually buried in the ground and should preferably be not less than 50 ft. from the nearest building.

The oil pumps are the next consideration and the best results have been secured from a duplex steam pump of the piston pattern type with brass valves, metallic packing in the oil piston, special gaskets and piston rod packing. An air chamber should be fitted on the discharge side to steady its pulsations of pressure and a governor on the steam end to maintain a constant pressure. Strainers on the suction side should be provided to keep trash from getting under the pump valves. The pump should be set as near the level of the oil as possible to give minimum suction lift and the suction pipe should be as straight as possible, bends being preferred to elbows. Where the suction pipe is long a foot valve, preferably a horizontal swing check valve used in a vertical position, at the bottom of the suction line in the tank is recommended. A relief valve, set at a pressure heavier than the working one to minimize the danger of breaking the pump, is also desirable.

Heating in the suction tank is necessary to enable the pump to lift the heavier oils. Practically all of the oil now burned as fuel requires heating to reduce its viscosity and facilitate atomization at the burner. The principal considerations of a heater for this work are ample heating surface and the utilization of all of it. In heating oil with a steam coil in a vessel of oil there is a tendency to have the oil next to the coils very warm, but this heat is not readily transmitted to the adjacent oil. For that reason, a heater in which the oil is kept in rapid motion over all the heating surface of the oil will give the best results, and in one type the oil is sent at high velocity through a long coil of brass pipe heated by steam on the outside. Several pumping sets consisting of duplicate pumps with pressure governor, air chamber, gage, suction strainers on pumps, relief valve and heater, all combined in a single self-contained unit, are on the market at the present time.

In an installation where the burners are shut down for any length of time, a by-pass should be provided to enable the oil header to be filled with heated oil before the burners are lighted. The type of burner which has proved best for land installations is the steam atomizer burner with oil supplied to it under pressure. The burners may be of either the round-flame or flat-flame type, the latter being preferred as it uses less steam for atomizing and produces a flame of such shape as to permit proper mixture of air to support combustion without excess air. The general type of flat-flame burner is a tip in which the oil flows out of a horizontal slot in a fan shape and falls on a fan-shaped jet of steam issuing from a lower parallel slot. The position of the burner depends largely upon the type of boiler, the burner being set in the firing door where there is a long unobstructed furnace and at the back shooting toward the front of the boiler where the furnace is short and the gases travel upward. Steam and oil connections should be made to allow for expansion and contraction of the oil and the steam headers, unions being provided above and below the burner to enable the latter to be taken out quickly for cleaning. A steam connection should be provided on each burner for blowing out the oil when the burner is shut down, as otherwise the oil will carbonize due to the heat radiated from the hot furnace.

*From a paper recently presented by B. S. Nelson, at a joint meeting of the Louisiana Association of Members of the American Society of Civil Engineers and the New Orleans Section of the American Society of Mechanical Engineers. The author is an engineer with A. M. Lockett & Co., Ltd., engineers and contractors, New Orleans, La.

Hearings on War-Deficiency Appropriations

WASHINGTON, July 17.—The House Committee on Appropriations has begun hearings on a so-called war deficiency appropriation bill, which it is planned to pass at the present session. This bill will carry nearly $2,000,000,000, of which probably more than one-half will be used in the purchase and manufacture of big guns, ammunition and equipment for the second draft of men, which it is expected will be made within the next 12 months. The money for these appropriations will be obtained partly from the increased revenue to be produced by the pending war revenue act and partly from the new bond issue which will be floated some time after Oct. 1, next, and which is estimated at two or three billion dollars.

The Bath Iron Works, Bath, Me., a shipbuilding plant, has been sold by the estate of John S. Hyde, principal owner and for many years president of the company, who died last March, to a syndicate of Maine bankers who will develop the property. Ex-Governor William T. Cobb is president of the new corporation, which has contracts for building nine torpedo boat destroyers.

The Brier Hill Steel Co., Youngstown, Ohio, is adding two hot sheet mills to the plant formerly operated by the Western Reserve Steel Co., which it bought several months ago, and has also added a new warehouse. Directors of the Brier Hill Steel Co. leave on Saturday evening, July 21, for an inspection of the ore properties of the company in the Northwest.

The National Tube Co., Frick Building, Pittsburgh, has received a Government order for 8,000,000 ft. of bedstead tubing, to be used in the manufacture of beds for the cantonments and National Guard encampments. The company received this order about three weeks ago, and it will be completely filled and shipped by July 20, or very shortly after that date.

The new model town of McDonald, to be established by the Carnegie Steel Co., west of Youngstown, Ohio, will be connected by trolley lines with both Youngstown and Niles by a line to be built along the south side of the Mahoning River, it being extended to the present line of the Mahoning & Shenango Railway & Light Co.

About 700 employees at the machine shop of the New York Shipbuilding Co., Camden, N. J., and 5000 employees from other departments, held a flag raising at the machine works on July 11. This was the thirtieth flag raising event which has been held at the shipyards.

Pittsburgh and Nearby Districts

The Sotter Brass Foundry Co., South Eighteenth and Mary Streets, Pittsburgh, has recently been organized, and is prepared to furnish all kinds of brass, bronze and aluminum castings, also different grades of babbitt metal. C. J. Slotter is general manager.

The Jones & Laughlin Steel Co., Pittsburgh, has recently bought a large piece of ground adjacent to its Southside works in that city, which will likely be used for future extensions, plans for which have not been made.

Plans are still under way by the Sharon Steel Hoop Co., Sharon, Pa., for extensions to the plant of the Youngstown Iron & Steel Co. at Youngstown, Ohio, which it took over some months ago. It is probable two or three open-hearth furnaces will be added to the plant, besides extensions to be made to the finishing mills. Definite plans about these will probably be completed in a short time.

J. G. Hershey, for several years with Max Solomon, dealer in iron and steel scrap, Oliver Bldg., Pittsburgh, has resigned, and with an associate has formed the Acme Tube Co., for the purpose of handling, as jobbers, lap weld iron and steel and seamless steel boiler tubes, also mechanical tubing of all kinds. The new company has a warehouse in Pittsburgh, where it will keep tubes in stock, and will have facilities of cutting to lengths. It will sell direct to consumers in all parts of the country, not being restricted to any particular district. The company also represents the Elyria Iron & Steel Co., Cleveland, in Pennsylvania.

E. M. Herr, president of the Westinghouse Electric & Mfg. Co., East Pittsburgh, strongly denies that his company is seeking skilled mechanics to be interned in the works for 10 months, while making secret munitions for the United States Government. The following notice was posted in all the plants of the company in East Pittsburgh last week:

"The statement published in several newspapers to the effect that this company is to isolate certain employees for a period for the purpose of manufacturing secret war munitions is absolutely without foundation of fact. A. Taylor, manager of works."

The Federal Radiator Co., New Castle, Pa., is said to have received an order for 150 hot radiator heaters for the United States Government. These are to be delivered within 45 days from date of order, and are for use in the cantonment camps which are being built by the Government for the mobilization of the conscript troops.

The American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, has started some of the new double hot tin mills, which it is adding to its Shenango works at New Castle, Pa., and also to its Farrell works at Farrell, Pa. Ten of these double hot tin mills are being added to each plant, and it is expected that all of them will be ready for operation within a short time. It is believed that these double mills will turn out as much tin plate as two single mills. The company is also employing more female labor in its different sheet and tin plate mills than ever before, owing to the difficulty in getting men. The company is building 100 or more houses for its employees at its Farrell works.

The Diamond Forging & Mfg. Co., manufacturer of forges, stampings and galvanized iron and steel products, is now occupying its new plant on the Northside, Pittsburgh, which has been under construction for some months. The plant is located on the main line of the Pennsylvania Lines West, with which it has direct switch connection, and can also ship over the Baltimore & Ohio Railroad. In the new plant the company has more than doubled its galvanizing department and all the equipment in the galvanizing, forging and stamping departments is driven by individual electric motors, and overhead cranes and trolleys command the entire plant. The company has added a stamping department, which will have a capacity of 60 tons per day. New presses, designed for rapid and economic work, have been installed. The stamping department will specialize in pole line hardware. In addition, the company will manufacture a complete line of light forgings. The officers of the company are W. D. Henry, president; G. Wickersham, vice-president and general manager; D. M. Smith, secretary and sales manager, and Clarke Painter, treasurer.

The machine shops and foundry of the Thomas Carlin's Sons Co. of the Northside, Pittsburgh, were sold last week by public auction to the Modern Machinery Exchange and the Manhattan Machinery Exchange, both of New York City, for $120,000. Plans of the purchasers are not known, but it is believed the plants will be wrecked and the machinery sold in the open market.

The Howard Stove Co., Beaver Falls, Pa., will build an addition to its molding plant to cost $12,000, and will be in the market for some new equipment.

OBITUARY

WILLIAM G. BEE, vice-president of the Edison Storage Battery Co., and one of the pioneers in the automobile industry, died July 11 at his home, 477 Main Street, Orange, N. J., after an illness of about two years, aged 48. He was born in Hartford, Conn., and is said to have driven the first electric automobile at Newport, R. I. Mr. Bee was at one time connected with the Pope Mfg. Co., which later organized the Electric Vehicle Co., leaving the latter concern to join the Edison organization, of which he subsequently became vice-president and, until the time of his illness, sales manager.

N. L. C. KACHELMACHER, chairman of the board of directors of the Bessie Furnace Co., New Straitsville, Ohio, died at Philadelphia recently. The Bessie Furnace Co., which he organized, was taken over several years ago by the Allen S. Davison Co., of Pittsburgh. Mr. Kachelmacher was at one time president of the Hocking Coal & Iron Co., Columbus, Ohio. He was prominent in the effort to bring together several Eastern companies about two years ago, including the Thomas Iron Co., Empire Steel & Iron Co. and Wharton Steel Co.

J. C. KENNEDY, a retired veteran of the iron trade, died in Youngstown, Ohio, last week. He was born Sept. 16, 1829, in the district in which he died. After the war he entered the iron business, and became prominent in the development of the industry in the Mahoning Valley district. He operated the old Brier Hill furnace and furnaces in Struthers and Lowellville, all in the Mahoning Valley, and in the Pittsburgh and Buffalo districts. He was the uncle of Julian Kennedy, engineer of Pittsburgh.

VALENTINE NORTMANN, one of the organizers and for many years president of the Nortmann-Duffke Foundry Co., Milwaukee, retiring in 1915, died at his home in Milwaukee July 9, aged 60 years. Mr. Nortmann was born in Milwaukee Feb. 3, 1857, and established the present Nortmann-Duffke shop in 1880.

JOHN SPUCK, founder of the Spuck Iron and Foundry Co., died in St. Louis, July 15, after an illness of about three weeks. Mr. Spuck was born in Germany but settled in St. Louis in 1862. He is survived by a widow and daughter.

BENJAMIN F. COVEL, for nearly 50 years owner of the machine shop of the Covel Machine Co., Fall River, Mass., is dead at the age of 73 years. Mr. Covel was born in Fall River and had lived there all of his life.

On July 11 fire destroyed a section of the plant of the Wilmington Steel Co., Third and Herald streets, Wilmington, Del., comprising an 18-in. mill building, a repair and rigging shop and electrical department, with loss estimated at about $150,000. This company is a subsidiary of the Midvale Steel Co.

The Detroit Steel Products Co., Detroit, will open a sales office in the Union Building, Newark. This will be a sub-office under the New York office.

LIFE OF CAST-IRON PIPE*

Some Unusual Records in American Railroad Experience

SOME service records on cast iron pipe used in railroad water supply lines were recently developed which are of value to those concerned with water service installation. These data should also afford an opportunity for interesting comparisons with the basis used by the Federal valuation forces in estimating the depreciation on this material.

The long life of cast-iron pipe is a matter of rather general knowledge. There are records of pipe in use in Europe for over 200 years. In this country, and particularly on railroads, such long time service records are not to be had because of the limited time that these pipes have been in use. In the early years of American railroads, water service requirements were usually fulfilled with pipes of less than 3-in. diameter and the use of cast-iron pipe in consequence was limited to locations where 3-in. or larger pipe were used. The records which follow are secured from the few examples of cast-iron pipe lines over 50 years old available for investigation.

In the Ground 49 Years

Several instances of old installations of cast-iron pipe were recently made the subject of some study on the Illinois Central Railroad with the result that the life of several of these lines has been accurately traced down to the present time. The most interesting of these is a pipe line laid at Centralia, Ill., in 1855. This was a line of 4-in. cast-iron pipe approximately 10,000 ft. long. After 12 years of service in 1867, the pipe line became inadequate for the water consumption and upon examination it was found to be heavily encrusted. Efforts were made to improve its capacity by cleaning it and relaying a part of it with clean-out boxes at intervals of 100 ft. This provided only a temporary relief and the following year about 5000 ft. of the line was taken up and relaid with 8-in. pipe, which is still in service after being in the ground 49 years.

The 4-in. pipe relieved at Centralia was relaid in 1868 or 1869 at Ramsey, Ill., where it remained in service until 1903, when it again became too small for the demand and was replaced by 6-in. pipe. Since that time the old 4-in. pipe has been used at various places, principally as drains. A part of it is now in storage at Burnside, Ill. This pipe has a bell that differs in several details from the standard designs of the present time. Another interesting detail is the presence of two reinforcing rings or enlargements in the thickness of the pipe at the third point of the length.

A characteristic of early cast-iron pipe was an inequality in thickness, resulting from the practice of casting the pipe with the mold in a horizontal position. Measurements taken indicated an average thickness of about ⅜ in. As a means of getting some idea of the loss of section occurring during the 62 years of service, the dimensions of this pipe were compared with records of early designs of cast-iron pipe, and the conclusion was reached that it originally conformed to a design recorded in an early issue of the *Journal* of the Franklin Institute, having a length of 9 ft., diameter of 4 in., thickness of shell of 7/16 in. and depth of hub of 4 in.

Another installation of which authentic records are available is one of 7500 ft. of 4-in. cast-iron pipe at Little Wabash River, laid in 1857. This remained in service until July, 1893, when it was replaced by larger pipe. The old pipe was stored at Centralia until 1894 or 1895, when portions of it were relaid at that place and at Effingham and at Big Muddy. The installations at the last named places have since been removed but the pipe at Centralia is still in service. No signs of paint can be found on the pipe at the present time and apparently it never had been painted.

*From the *Railway Age Gazette.*

Pipe Relaid Again After 40 Years' Use

Some 6-in. cast-iron pipe laid at Centralia in 1868 and 1869 was taken up when the shops were abandoned in 1916. The pipe was found to be in such a good state of preservation after 40 years of service that most of it was reused, no distinction being made between the old pipe and the new cast-iron pipe. Other examples of long life for lines of cast-iron pipe on the Illinois Central include a 4-in. pipe line, 1740 ft. long, at Cherokee, Iowa, laid in 1870 and continued in service until 1900, when it was abandoned on account of a change in the location of water facilities; a line of 3-in. cast-iron pipe, 1175 ft. long, laid at Correctionville, Iowa, in 1887, and still in use; a line of 3-in. pipe 606 ft. long laid at Gaza, Iowa, in 1888 and abandoned in 1911 on account of the destruction of the water plant by fire; and a line of 4-in. cast-iron pipe 2962 ft. long laid at Webster City, Iowa, in 1869. A part of this pipe line is still in use.

Attention can well be called to the tendency of cast-iron pipe, in common with all types of pipe, to become more or less encrusted with lapse of time. This, however, has no bearing on the long life of such pipe, since the pipes can be cleaned from time to time. For example, the Illinois Central experienced difficulty of this kind in 1913 with an 8-in. cast-iron pipe line supplying water from the Big Muddy River at Carbondale, Ill. This pipe had been so encrusted that a pressure of 140 lb. per square inch was necessary at the pump to deliver 400 gal. per minute, which indicated that the pipe was reduced to approximately the capacity of a 5-in. pipe. Upon examination it was found that the diameter was reduced to about 7 in., indicating a large increase in the friction factor as a result of the increased roughness.

After studying the situation a contract was let for cleaning the pipe under a guarantee to restore it to 95 per cent of the discharge capacity of new pipe. The encrustations removed from the pipe were estimated to represent about 16 tons of material, and the work was done without taking the station out of service for more than a few hours at a time and with no interruption to a train service. After the cleaning was complete a test run on the pump gave a discharge of 498 gal. per minute for an average pressure of 70 lb. per square inch, the contractor having fully met with his guarantee to restore the pipe.

From the information presented it is clear that cast-iron pipe has not been in use long enough to demonstrate its actual service life. The data on loss of thickness are too limited to permit of any definite conclusions, although indicating that the ultimate life must be many times the total number of years represented in any of the records given.

Inventory of Automotive Plants

WASHINGTON, July 17.—A comprehensive industrial inventory of the automotive industries, including automobile, airplane and watercraft factories, to make available to the Government all possible information regarding the manufacturing facilities and the possibilities of expansion for war work, has been inaugurated by the Automotive Committee of the Council of National Defense. The inventory was set on foot several days ago and the first replies have already come in. The work will probably require at least three weeks. The committee states that the undertaking was inspired by the approaching great demand on the industries for airplane engines, motor trucks, tractors and motor boats for war purposes.

Alabama Iron to Chicago by Water

An experimental trip with a tow of pig iron from Sheffield, Ala., to Chicago, by way of the Chicago drainage canal, has been undertaken under direction of Capt. Swain, Peoria, Ill., with the river towboat Enterprise, which left Paducah, Ky., on Sunday, July 15. Engineers declare that the channel is sufficiently deep to accommodate barges of pig iron. If the trip is successful, it is proposed to organize a regular service.

The Readjustment of Steel Prices

Movement to See that "Raw Materials" Come Down

Results of the Conference at Washington—Prices to Be Decided by Federal Trade Commission's Cost Inquiry—Manufacturers as Government Advisers

WASHINGTON, July 17.—The leading representatives of the steel industry have promised to place at the disposal of the Government any desired amount of their products at prices to be fixed hereafter when the Federal Trade Commission shall have completed its investigation of costs of production in this and other basic industries. This agreement was reached after a series of conferences held here on July 11 and 12, the Government being represented by the Secretaries of War and Navy, the chairman of the United States Shipping Board and the chairman of the Committee on Raw Materials of the Advisory Commission of the Council of National Defense, while the spokesmen of the steel producers were the following members of a special committee appointed by the American Iron and Steel Institute: Elbert H. Gary, chairman, and James A. Farrell, president United States Steel Corporation; Charles M. Schwab, chairman, and E. G. Grace, president Bethlehem Steel Corporation; J. A. Burden, president Burden Iron Co.; E. A. S. Clarke, president Lackawanna Steel Co.; H. G. Dalton, Pickands, Mather & Co.; A. C. Dinkey, vice-president Midvale Steel & Ordnance Co.; John A. Topping, chairman Republic Iron & Steel Co.; James B. Bonner, Carnegie Steel Co., representing the above committee in the distribution of Government steel.

Official Statement on the Conference

Following the final conference, Secretary Baker, as chairman of the Council of National Defense, made the following official announcement:

At the conference this morning between the committee of the American Iron and Steel Institute and the Secretary of War, the Secretary of the Navy, Chairman Denman of the Shipping Board and Bernard M. Baruch of the Advisory Commission of the Council of National Defense, further discussion was had of the prospective demand upon the steel industry of the country for supplies of various steel products for carrying on the war.

The steel men repeated their assurances that their entire product would be available for the needs and they were doing everything possible to stimulate an increased production and speed deliveries. The price to be paid for the iron and steel products furnished was left to be determined after the inquiry by the Federal Trade Commission is completed, with the understanding that the price when fixed would insure reasonable profits and be made with reference to the needs of this vital and fundamental industry.

The representatives of the Government assured the committee of the steel institute that it was the intention of the Government to distribute the war requirements over the entire iron and steel producing capacity of the country.

President on One Price for Government and Public

The closing conference of the steel men with the Government officials was held soon after the publication here of a significant address of the President to the industrial leaders of the country, urging that profits be subordinated to patriotism, and the agreement of Judge Gary and his colleagues is regarded as the pledge of the steel industry to "do its bit" in the vigorous prosecution of the great war. Among other things the President said:

The Government is about to attempt to determine the prices at which it will ask you henceforth to furnish various supplies which are necessary for the prosecution of the war and various materials which will be needed in the industries by which the war must be sustained. * * *

A just price must, of course, be paid for everything the Government buys. By a just price I mean a price which will sustain the industries concerned in a high state of efficiency, provide a living for those who conduct them, enable them to pay good wages, and make possible the expansions of their enterprises which will from time to time become necessary as the stupendous undertakings of this great war develop. We could not wisely or reasonably do less than pay such prices. They are necessary for the maintenance and development of industry; and the maintenance and development of industry are necessary for the great task we have on hand. * * *

I hear it insisted that more than a just price, more than a price that will sustain our industries, must be paid; that it is necessary to pay very liberal and unusual profits in order to "stimulate" production; that nothing but pecuniary rewards will do it—rewards paid in money, not in the mere liberation of the world. I take it for granted that those who argue thus do not stop to think what that means. * * *

Let me turn for a moment to the shipowners of the United States and the other ocean carriers whose example they have followed and ask them if they realize what obstacles, what almost insuperable obstacles, they have been putting in the way of the successful prosecution of this war by the ocean freight rates they have been exacting. They are doing everything that high freight charges can do to make the war a failure, to make it impossible. * * *

And there is something more that we must add to our thinking. The public is now as much part of the Government as are the Army and Navy themselves. The whole people in all their activities are now mobilized and in service for the accomplishment of the Nation's task in this war; it is in such circumstances impossible justly to distinguish between industrial purchases made by the Government and industrial purchases made by the managers of individual industries; and it is just as much our duty to sustain the industries of the country, all the industries that contribute to its life, as it is to sustain our forces in the field and on the sea.

We must make the prices to the public the same as the prices to the Government. Prices mean the same thing everywhere now. They mean the efficiency or the inefficiency of the nation, whether it is the Government that pays them or not.

All Prices to Be Readjusted

The agreement of the steel men embodied in Secretary Baker's announcement is not to be taken as complete acquiescence in all the propositions laid down in President Wilson's address. For example, it does not specifically include in its scope the supplying of the steel requirements of the Allies and, especially, it does not promise that the requirements of private consumers shall be put on a parity, as regards price, with those of the Government. That the steel industry, however, will be called upon to go further and supply the Allies and the private American consumers at prices far below the present market, if not at the same figures as are required by the Government, may be taken for granted.

The unlimited power of the President under the enabling legislation recently enacted by Congress opens up an extraordinary vista of possibilities; but the steel men are hopeful that if the Government undertakes to dictate prices for practically the entire output of the industry it will, in both letter and spirit, so redeem the promise of reasonable profits made by Secretary Baker as to provide a stimulus to the necessary expansion of the industry. In this the Government will consult its own interest, and the chief concern of the steel producers will be that the adjustment of all the essential details of this important matter is placed in the hands of men sufficiently familiar with the industry to secure intelligent handling.

"Raw Materials" to Be Lowered in Keeping

Significant statements following the recent conferences have been made by representatives of the Government, that the war requirements will not be imposed upon any selected concerns but will be distributed equitably throughout the industry, coupled with the statement that the Government appreciates that finished steel cannot be produced at the prices suggested by Secretary Daniels and others if "raw materials"—meaning, presumably, pig iron, etc.—"cost from $40 to $50 a ton." It was added that the Government would take steps to see that steel producers are protected in their supply of raw materials and enabled to secure them at less than current prices. In view of the fact that the leading steel makers control the bulk of their own raw materials, these statements are highly suggestive and the question arises as to how carefully they have been considered.

Although the Federal Trade Commission has informally announced that its investigation into the cost of producing steel will be completed in two or three weeks, it is understood that the Government will not delay the placing of orders until the commission's data have been received, but will proceed upon the theory that the question of price need not be determined until the bills are to be paid. No great delay in fixing the scale of prices is anticipated, however, and all the points at issue will likely be settled before any considerable deliveries under new orders are made.

Whatever uncertainties may exist regarding the fixing of prices for the requirements of the Allies and the general consuming public, the understanding is perfect that the Government shall have the first call upon the output of every producer in the industry and that, without the formality of commandeering, it may take over any material it may need, no matter in whose hands it may be found. While no definite pledges have been given in this regard, it is understood that every reasonable effort will be made by the Government not to embarrass those enterprises of the country dependent upon the iron and steel industry and that a general spirit of co-operation shall prevail.

Baruch, Rosenwald and Scott for War Board

The agreement of the steel men concerning the Government needs, which has been to some extent anticipated by the understanding heretofore secured with the coal operators, is regarded as the forerunner of others that will ultimately embrace substantially every line of production relied upon for war material. This fact emphasizes the importance of the projected reorganization of the Council of National Defense and the appointment of the proposed Purchasing Commission to do all the buying of war material for the Government. The council during the past week submitted to President Wilson a definite plan for the reorganization of its committee system and action is anticipated in the very near future. The project provides for the elimination of the great majority of the council's 150 committees and the creation of a War Industries Board of three members directly answerable to the council. While the President has given no intimation on the subject, the three men whose names are most prominently mentioned for these places are Bernard M. Baruch, chairman of the council's Committee on Raw Materials; Julius Rosenwald, chairman of the Committee on Supplies; and Frank A. Scott, chairman of the General Munitions Board.

Manufacturers and Defense Council Committees

While President Wilson is understood to disapprove the provision of the Lever bill, now under discussion in the Senate, which would prevent men prominent in the leading industries of the country from serving on the committees of the Council of National Defense, some restrictive legislation on this score is expected. Senator Chamberlain, chairman of the Committee on Military Affairs, who is in charge of the Lever bill, has signified his willingness to accept a substitute for the provision referred to in the form of the so-called Pomerene amendment, which provides as follows:

Sec. 3. No person acting either as a voluntary or paid agent or employee of the United States in any capacity, including an advisory capacity, shall solicit, induce, or attempt to induce any person or officer authorized to execute or to direct the execution of contracts on behalf of the United States to make any contract or to give any order for the furnishing to the United States of work, labor, or services, or of materials, supplies, or other property of any kind or character, if such agent or employee has any pecuniary interest in such contract or order, or if he or any firm of which he is a member, or corporation, joint stock company, or association of which he is an officer or stockholder, or in the pecuniary profits of which he is directly or indirectly interested, shall be a party thereto. Nor shall any agent or employee make or be a member of any committee or other body which shall make or participate in making any recommendation concerning such contract or order to any council, board, or commission of the United States, or any member or subordinate thereof, without making to the best of his knowledge and belief a full and complete disclosure in writing to such persons or group of persons of any and every pecuniary interest which he may have in such contract or order and in any party thereto, nor shall he participate in making such contract or giving said order. Any willful violation of any of the provisions of this section shall be punished by a fine of not to exceed $10,000 or by imprisonment for not more than five years, or both.

Attacks on Manufacturers Answered

The attacks heretofore made on the business men of the country, and especially upon leading men in the iron and steel industry, who have given their time to service on the committees of the Council of National Defense, are warmly resented by many prominent Senators, and a vigorous defense of the steel men was made in the Senate on Friday by Senator Newlands of Nevada, who said in part:

In an atmosphere of suspicion and distrust, not warranted by a single thing that has been presented for our attention, not warranted by a single proven charge, we propose to penalize the members of these committees of sellers and say, "You can give your information, you can give your advice, but you can not take a contract, nor can any concern in which you are interested take a contract."

What do you do, then, with reference to the steel interests? Why, you prevent these captains in the steel industry from acting on the committee at all, and you go to men of less experience and less information for that which the Government seeks.

Where is there any evidence that the Government has suffered? Do not the Council of National Defense know that they are dealing with sellers? Does not each department chief know that he is dealing with a seller? Mr. Gary is chairman of one of the subcommittees regarding steel. When the Council of National Defense ask him whether the condition of the steel industry is such as will enable the Government to receive a prompt response to a demand for 1,000 or 10,000 or 1,000,000 tons of steel, do they not know that he is an interested party, and do they not go to him simply because he is an interested party and knows and understands the industry? But you propose to penalize that man and other men like him.

To whom would you go for information with regard to the steel industry of this country in preference to Mr. Gary and Mr. Schwab? We know that these two men have all the information at their disposal. Are you going to have the Council of National Defense take mere theorists and experts and send them all over the country to make inquiry, when the information can be collected and presented to them quickly and almost instantaneously by the parties interested in the industry? And, knowing that they are interested, will they not be on their guard with reference to the price?

What do we witness today? We know that the steel industry has mobilized itself with a view to meeting the demands of the Government. They know what plants can be enlarged, how their output can be enlarged and, mind you, it will be necessary to enlarge outputs and to make large expenditures in plants. Are you going to prevent the corporations in which they are interested from having any contract with the Government? And right here today, what evidence

have you of lack of careful methods of procedure upon the part of the Council of National Defense? Have they accepted the price per ton which the Steel Trust and the other plants insist upon as a fair price, a price which they can receive elsewhere in the market Not at all. The Federal Trade Commission, under the direction of the President, is now engaged in a careful inquiry as to costs. I have gone over some of that work with members of that commission, and I can see how careful and studious their attention to that job has been. We have in the papers an illustration of the care with which the administration is proceeding in this matter—an absolute refusal upon the part of the President and upon the part of the Secretary of War and the Secretary of the Navy to accept the price which is presented by this industry as a fair price, and an indication that rather than accept that price the Government will resort to the extraordinary power, given by the law, of commandeering their plants.

Mr. President, I hope there will be some adjustment of that matter. I hope there will be some adjustment of that matter through the Federal Trade Commission after they have ascertained their costs. I trust there will be such a settlement of it as will give the steel industry a fair profit and as will also stimulate the steel industry to enlarge its plants. We all know that there must be some stimulus. If they shall enlarge the plants at the expense of tens of millions of dollars, and the war should come to an end this week or next month, or next year, those plants might be idle. So that there are two things to be considered. These men, representing the stockholders, must see to it that there is a sufficient guaranty for the future if they are to increase their capital expenditure; and the Government, on the other hand, is warranted in fixing such a price as will stimulate them to increase their plants and to produce the products that are essential for the prosecution of the war.

An agreement has been reached looking to the elimination of steel, copper, lead and other articles from those provisions of the Lever bill authorizing the President to control the production, distribution and prices of foods, fuels and other "war necessaries." A vote will be taken on this measure in the Senate on July 21.

W. L. C.

TENNESSEE CO. EXTENSIONS

Plate and Combination Shape Mills and Large Fabricating Shops

President George G. Crawford of the Tennessee Coal, Iron & Railroad Co., has just made the following announcement at Birmingham, Ala., of the details of the new construction program of his company:

"Construction will begin at once upon a group of mills designated as the Fairfield Works of the Tennessee Coal, Iron & Railroad Co. An electrically driven, reversing blooming mill will roll slabs and blooms for two finishing mills. The finishing mills consist of an electrically driven 110-in. plate mill and an electrically driven combination mill designed to roll shapes, bars and light rails. The products of the shape and plate mills will be delivered by electrically operated telphers to large fabricating shops.

"The mills are selected to produce the products which are particularly required in connection with the conduct of the war. The location selected for the Fairfield Works is in Possum Valley, southwest of the Fairfield by-product ovens.

"The housing of the employees of the new mills will be provided for in part by the company through the construction of houses for about 600 families. The total number of houses required will be very considerably in excess of this number."

The Judson Iron Co., Oakland, Cal., has completed the first unit of its $1,000,000 steel plant. At an official try-out of the first unit, 22 tons of open-hearth steel were converted into ingots. The completed unit will have a capacity of 80 tons every 24 hours.

The Ashland Steel Co., Ashland, Ky., whose plants were closed July 1 to make general repairs and install new equipment, resumed operation July 16.

Domestic Production and Consumption of Spelter in 1916

The domestic production of spelter in the last quarter of 1916, according to data compiled by W. R. Ingalls and published in the *Engineering and Mining Journal*, was the largest ever recorded and was more than double that rate at the beginning of the war. The total was 189,572 net tons, as compared with 94,336 tons in the second quarter of 1913, the largest before the war. The output by quarters in the last four years was as follows in net tons:

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1913.....	92,082	94,336	83,062	88,782
1914.....	90,224	92,816	92,756	94,516
1915.....	100,844	121,624	133,916	150,758
1916.....	156,704	167,085	169,643	189,572

Ore receipts by smelters in 1916 are given as 1,777,891 tons against 1,257,528 tons in 1915 and 872,767 tons in 1914. Importations of ore in 1916 were 384,422 tons, or nearly three times those of 1915 and about 13 times those before the war, when they were only 26,946 tons is 1914.

A classification of the domestic consumption of spelter in 1916 from returns from 170 out of 317 consumers and estimating the rest, gives the following in net tons:

Galvanizing	207,849
Sheet zinc	40,053
Brass	175,435
Castings	2,359
Desilverizing lead	5,307
Other purposes	4,351
Unclassified	14,900
	450,304

It is not claimed that these last figures are correct. The requirements for brass purposes had been estimated previously at 17,700 tons per month for the first half of 1916 and at 22,500 tons per month for the last half, or a total for the year of about 240,000 tons, as against 175,000 tons given above. If it actually happened that the spelter used by galvanizers exceeded that used by brass makers last year, then all guesses were wrong, for the needs of the brass industry had been placed at more than 50 per cent and of the galvanizers at not over 35 to 40 per cent of the total.

Will Build Rolling Mill in New Orleans

The Dixie Steel Corporation, which was recently incorporated at New Orleans, La., with $500,000 capital, has elected the following officers: President, B. W. Seidel; first vice-president, J. A. Stubbs; second vice-president, John G. Grosz; treasurer, Joseph L. Walle; secretary and auditor, G. J. Capdevielle; attorney and counsel, E. T. Florance. The company will build a rolling mill in New Orleans and will at first specialize in bar steel, but later on bolts and nuts and other small products will be manufactured. The plant is to have a capacity of 200 tons daily, though the initial output will be limited to 2200 tons a month.

Lodge & Shipley Machine Tool Co. Officers

The new organization of the Lodge & Shipley Machine Tool Co., Cincinnati, resulting from the sale by Murray Shipley of his entire interests in the business, is as follows: President, Mrs. William Lodge; vice-president and general manager, J. Wallace Carrel; secretary and treasurer, L. A. Hall. Mr. Shipley had served as vice-president since the formation of the company.

The new tin plate plant of the Bethlehem Steel Co., Sparrows Point, Md., which will be under the management of J. M. Jones, is expected to be placed in operation during the week of July 23. It is electrically operated. It will begin with 6 hot plate mills, which it is planned to increase to 24 later. About 250 men will be employed at the outset. The company has a large number of orders on hand and it is said these will keep the plant going for the entire year.

ELECTRIC STEEL PRODUCTION

Marked Increase in 1916 in All Leading Countries and Greater Promise for 1917

The extent to which electric steel is at present being made in the world, together with some data previous to the war, is given for some of the leading countries, as follows, in the order of their magnitude in 1916, and in gross tons:

	1916	1915	1913	1912
Germany	180,335*	129,000	101,755	24,177
United States	169,918	69,412	30,180	18,309
Great Britain	49,256	22,000	.....	.....
Austria-Hungary†	47,247	23,895	26,837	21,556
Canada	43,790	61	.....	.....
France	.....	.....	18,000*	15,922
Totals	490,546	244,368	176,772	129,964

*Estimated metric tons.
†Metric tons.

Last year witnessed a doubling of the output as represented by these leading countries, a remarkable achievement. Germany's production is estimated for the last two months of 1916, the official total to Nov. 1, 1916, having been 148,777 metric tons, no reports having been issued since. The doubling last year of the previous year's output by both Great Britain and Austria-Hungary and the large increase in Canada's production are noteworthy. Previous to 1915 Great Britain did not publish any statistics for electric steel and Canada was virtually a non-producer. Data regarding France have been difficult to obtain and nothing has been published about this output since the war started. In 1909 the electric steel output of France was 6456 metric tons, and in 1911 it was 13,850 tons. Sweden, Italy and Russia are producers of electric steel, but data have not been ascertainable.

The great strides made in the United States are the outstanding feature of this compilation. Starting with a production of only 18,309 tons in 1912, the output of nearly 170,000 tons last year is about five and one-half times that of 1913 and two and one-half times that of 1915, the rate of increase being decidedly greater than the splendid showing of Germany. While our output last year did not come up to the calculated production of 225,000 tons and while Germany's undoubtedly was larger, the 1917 record for this country will easily greatly exceed that of any other country. Well-informed estimates place it at close to 300,000 tons for 1917.

Maximum Prices for the British Steel Trade

The latest published maximum prices, governing the sale of British pig-iron and steel, as given by the London *Iron and Coal Trades Review* of June 15, 1917, are as follows for gross tons, except in the case of high-speed tool steel:

Maximum Prices for Pig Iron

	Per Ton Net, f.o.b. Makers' Works
Hematite pig iron, East Coast, Scotch and Welsh	£6 2s 6d
Hematite pig iron, West Coast	£6 7s 6d
Cleveland pig iron, No. 1	£4 16s 6d
Cleveland pig iron, other grades	£4 12s 6d
Common Staffordshire	£4 20s 0d

Maximum Basis Prices for Steel

	Per Ton, f.o.b. Makers' Works
Ship plates, ¼ in. and over	£11 10s 0d
Boiler plates	£12 10s 0d
Subject to extras for special thickness, sizes and qualities not exceeding those customary in district of manufacture.	
Angles, ordinary sizes	£11 2s 6d
Joists, ordinary sizes	£11 2s 6d
Rails (railroad), over 60 lb. per yard	£10 17s 6d
Sheet and tin plate bars	£10 7s 6d
Blooms and billets, ordinary mild steel	£10 7s 6d
Blooms and billets, special	£11 0s 0d
Rounds and squares, 3 to 5½ in. diameter or square (untested)	£12 10s 0d

All subject to extras for special sizes and qualities not exceeding those published in any such list as above.

Heavy steel melting scrap...£5 5s per ton deld. buyers' works
Turnings and borings.....£2 10s per ton deld. buyers' works

Maximum Price for Bar Iron

Standard quality, ordinary sizes and merchants' lengths, £13 15s per ton net, f.o.t. makers' works.

Marked bars, £15 10s per ton, less 2½ per cent, f.o.t. makers' works.

Subject to extras for special sizes and qualities not exceeding those published in any such list as above.

To the above prices for bar iron and steel a sum not exceeding 2½ per cent on such prices may be added in the case of sales by persons other than the makers.

Maximum Prices for Highspeed Tool Steel

Finished bars, 14 per cent tungsten,
2s 10d per lb. deliv. buyers' works
Finished bars, 18 per cent tungsten,
3s 10d per lb. deliv. buyers' works
(Subject to usual extras for special sizes)

Scrap:
Millings and turnings, 5d per lb. net, deliv. steel makers' works.
Bar ends, 6d per lb. net, deliv. steel makers' works.

Changes since the publication of this list in THE IRON AGE, Aug. 3, 1916, have been very few. Both grades of Cleveland pig iron have been advanced 5s., as has also common Staffordshire pig iron. Prices for old material have been reduced 5s. per ton, while marked bars have been raised 10s. per ton.

U. S. Standard Thread Recommended for Pipe

The gradual substitution of the U. S. standard thread in place of the Briggs form now generally employed for pipe has been recommended by the committee of the American Society for Testing Materials on the revision of pipe threads. The committee forms a part of a joint one on this subject with representatives of the American Gas Institute, the American Society of Mechanical Engineers, the Manufacturers' Association on Standardization of Fittings, the Master Car Builders' Association and the Railway Signal Association. The proposed change from one thread to the other is to cover a period of years, and a system of tolerances and gages which will provide for changes in them every two years will be worked out.

Acquires Detroit Furnace Company

The Detroit Iron & Steel Co., Detroit, of which M. A. Hanna & Co., Cleveland, are selling agents, has purchased the Detroit Furnace Co. The company manufactures pig iron and has a capacity of about 20,000 tons a year. Joseph C. Clutts, Wellston, Ohio, is president, and Charles F. Fraser, Detroit, is secretary and treasurer of the Detroit Furnace Co.

The International Engineering Works, Inc., Framingham, Mass., has purchased the plant and business of the International Engineering Works, Ltd., a Canadian corporation, in the United States. The new company is organized under the laws of Massachusetts, with capital stock of $500,000, and has no connection with the Canadian company. J. Philip Bird, general manager of the National Association of Manufacturers, is president; Harry V. Bady, vice-president; Frew W. Chipman, treasurer; William H. Walker, sales manager.

The large shipyard of the Sun Shipbuilding Co., at the foot of Morton Street, Chester, Pa., is nearly completed, and preparations are being made to rush the work on several Government contracts. The company has contracts for two mine-sweepers and four other vessels for the Government. It also has several other contracts. The plant covers a tract of about 50 acres. The first keel was laid about three months ago.

The San Francisco office of the Blaw-Knox Co., a consolidation of the Blaw Steel Construction Co. and the Knox Pressed & Welded Steel Co., will be maintained in the Rialto Building in charge of Edward Ornitz.

The Savage Arms Co., Savage Street, Utica, N. Y., has placed an 8-hour day in effect at its works, commencing July 16.

WILL ENLARGE PLANT

Youngstown Sheet & Tube Co. Will Add to Its By-Product Coke-Making Capacity

The Youngstown Sheet & Tube Co., which installed last year four batteries of 51 Koppers by-product ovens each, or a total of 204 acres, has placed a contract with the H. Koppers Co., Union Arcade Bldg., Pittsburgh, for two additional batteries of 51 ovens each, which will give this concern a total of 306 Koppers by-product ovens. An illustrated description of the present by-product plant was given in THE IRON AGE, issue of Dec. 7, 1916. The new 102 ovens will be of a more general design than those in the plant installed last year. The oven chambers taper from 17 in. wide at the pusher end to 19½ in. wide at the coke end, and are 9 ft. 10⅝ in. high by 39 ft. 6 in. long. The type of oven is known as the Koppers horizontal cross regenerative by-product oven. The capacity of the present 204 ovens is about 2200 to 2300 tons of coke per day on 17 hours' operation, and the new 102 ovens will increase this to about 3400 tons of coke per day. This additional output of 1000 to 1100 tons of coke per day will be used at the two Andrews & Hitchcock blast furnaces at Hubbard, Ohio, which were bought by the Youngstown Sheet & Tube Co. early last year. The company will also increase the capacity of its by-product plant for making benzol, toluol, tar and sulphite of ammonia about 50 per cent. The Barrett Co. has a contract for the entire output of tar of the present by-product plant, and will also take the increased output of tar made by the addition to the by-product plant.

The Youngstown Sheet & Tube Co. is prepared to develop rapidly 7000 to 8000 tons of coal lands of Greene County, Pa., which it bought some years ago. It is sinking a shaft and building over 100 houses for miners, and will use this coal when it is ready to be shipped to its by-product coke ovens at Youngstown. The company is also installing what is known as a double plate mill, which will roll 96 and 84-in. wide plates, the contract for which was placed several months ago with the Mesta Machine Co., Pittsburgh. Some slight changes are being made in the open hearth stock house, tracks being straightened and other minor changes made to better facilitate the handling of stock. The Youngstown Sheet & Tube Co. has opened a sales office in Room 1032, Dime Bank Bldg., Detroit, in charge of G. W. Bostwick.

Metal Trades Outing

The Cincinnati Branch, National Metal Trades Association, held its mid-summer meeting at Magnesia Springs, Ind., July 11, President A. H. Tuechter presided. After routine business had been transacted, Mr. Tuechter spoke feelingly on the retirement of Murray Shipley from the machine-tool manufacturing field. In response, Mr. Shipley tendered his sincere thanks to the members both collectively and individually for their active co-operation during the term he served as president and later simply as a fellow member. He stated that the association would at all times have his active support. Secretary J. M. Manley, who arranged the outing, was given a rising vote of thanks.

Australian Steel Shortage is Acute

Stocks of steel plates, tin plate and galvanized iron are low throughout Australia and the demand is acute, according to U. S. Commercial Attache Philip B. Kennedy of Melbourne. There is at present very little prospect of outside relief and an effort is being made to manufacture these goods in Australia. Recently representatives of a company in Newcastle and one in Melbourne were sent to the United States to purchase machinery for making steel. The high freights and shortage of supply offer a great incentive to the manufacture of lines that would have been considered impossible to produce before the war.

TAKE HILL IRON MINES

Properties Will Be Operated by M. A. Hanna & Co. of Cleveland

Most of the Hill iron ore properties on the Minnesota ranges have been taken over by M. A. Hanna & Co., Cleveland, who have been selling agents for the Hill interests for some time. The lease includes a number of operating mines, properties now under development, and some that will be developed later.

The mines now under operation that were transferred are principally those which were operated by the United States Steel Corporation before surrendering its Hill lease. These include the Harold, Leonard, Mississippi, North Uno, South Uno and Thorne properties. Other properties involved are the Fay, Wabigon, Dale and Feigh. Hanna & Co. will operate the Hill mines under a recently organized subsidiary, the Hanna Ore Mining Co., of which J. D. Ireland, who has been in charge at Duluth of the Hanna mines, will be general manager, and W. E. Hunner, formerly with the Arthur Iron Mining Co., the Hill mining organization, will be assistant general manager.

After the surrender of its lease by the Steel Corporation, new leases of some of the Hill properties were made to the Tod-Stambaugh Co., Butler Brothers, and others, and more recently to the Jones & Laughlin Steel Co. and Inland Steel Co. It is stated that the Hill interests retain only about 15 per cent of their original holdings, which are largely low grade ore.

M. A. Hanna & Co. have also taken over the Hill interests in three lake freighters that are now under construction. Much difficulty was experienced last year in obtaining vessels in which to ship the Hill ore and for that reason operations at Hill mines were greatly curtailed.

A $4,000,000 Machine Shop at Norfolk

WASHINGTON, July 17.—The Navy Department is preparing to expend approximately $30,000,000 within the next two years for the improvement of the Norfolk Navy Yard and the establishment of a new naval base on the recently acquired site of the Jamestown Exposition. Twenty millions will be spent on the Navy Yard, according to a statement made here by Rear Admiral Harris, Chief of the Bureau of Yards and Docks. Among the items to be covered by the proposed expenditures are a machine shop, designed to be the largest in America and to cost $4,000,000, with five acres of floor space; a structural shop with tools and equipment to cost $2,000,000; a mammoth power plant to cost $1,500,000; a dry dock to cost $5,500,000, and various auxiliary buildings. One million will be spent for the improvement of the water front at the present Navy Yard.

The Bureau of Yards and Docks on July 16 opened bids for the construction of the naval projectile plant at Charleston, W. Va., embracing four large buildings. Bids were received from the following contractors: C. W. McNulty Co., Charleston, W. Va.; Boyle-Robertson Construction Co., Washington, D. C.; F. W. Mark Construction Co., Philadelphia, Pa.; James Stewart & Co., Inc., New York City; R. H. Arnold Co., Washington, D. C.; Ketler-Elliott Erection Co., Chicago, Ill.; Warren Moore & Co., Philadelphia, Pa., and John W. Cooper Co., Buffalo, N. Y. Aside from the John W. Cooper Co., which presented a proposal to build the plant on a cost-plus-profit basis, all the bidding contractors presented itemized bids without totals, and as a result the experts of the Bureau of Yards and Docks will have to make a careful analysis of all the proposals before they can determine the lowest bidders or the respective aggregates of the several bids.

The cities of Bethlehem and South Bethlehem, Pa., have overwhelmingly voted to consolidate, and the new form of government will go into effect Jan. 1, 1918. Charles M. Schwab was chief sponsor of the consolidation. The city will be known as Bethlehem.

MANY ORDERS BEING PLACED

Government Work Is Principal Factor

Shipbuilding Business Pending Will Add Greatly to Other Extensive Purchases of Machinery and Tools

Considerable shipbuilding business is pending, and word from Washington that the United States Shipping Board Emergency Fleet Corporation is going ahead more actively with its steel shipbuilding program leads many in the trade to believe that additional contracts for ships will be placed this week, and that the resultant demand for yard and shop equipment will be large.

New shipbuilding concerns are continually being heard of, but upon investigation it is found that no definite announcement of plans can be made until the Government authorizes them to go ahead. One of the projected plants is that of the American International Corporation, which is to build 50 wooden ships at a time, and which will have the backing necessary to make it a success. Inquiries for equipment have already been made by this concern. Plans which the Submarine Boat Corporation and the Lackawanna Bridge Co. have been jointly making for a shipbuilding plant on Newark Bay are believed to be in behalf of the Government, and to be identical with the yard which General Goethals mentions will be begun by the Government at Newark. The Foundation Co. of New York is reported to have obtained a contract to build about 100 ships for the Allies, and these, it was said, would probably be constructed at the plant near Vancouver, B. C.

The Newport News Shipbuilding & Dry Dock Co. added to its already extensive purchases last week by closing for about $50,000 worth of punching and shearing machinery. The recent purchases by the Union Iron Works in this market are for the equipment of a large machine shop to be used in the construction of submarines, torpedo boat destroyers and cruisers for the United States Navy. The Westinghouse Electric & Mfg. Co. has been making extensive purchases for its new plant at Lester, Pa., which will make turbines for naval vessels.

The American Brake Shoe & Foundry Co. has issued a list of about 240 machines required for its Erie, Pa., plant, which will make shells. The Erie Forge Co. wants machines for making 6-in. guns. An Ohio manufacturer has issued a list of about 60 machines. The T. H. Symington Co., Rochester, N. Y., which has a contract for 2,000,000 shrapnel, has been a large buyer in the New York market. The Bethlehem Steel Corporation is reported to have received a contract for 1,000,000 shrapnel, in preparation for which large purchases of machine tools have been recently made. The equipment bought by the Worthington Pump & Machinery Corporation for its shell-making plant at Hazelton, Pa., is said to total about $50,000. The Sprague Electric Works of the General Electric Co. has bought a large number of automatic tools for the Bloomfield, N. J., plant. The Savage Arms Co., which has recently bought heavily, will build a $1,000,000 addition to its Sharon, Pa., plant, and will also add to its Utica, N. Y., plant, to take care of large war orders. The American Radiator Co. has completed purchases aggregating about $150,000. Five leading Milwaukee metalworking manufacturers have, at the request of the Government, organized a company and will equip a plant for the manufacture of 3-in. field pieces.

Motor truck manufacturers, especially in the Central West, are making purchases of tools for building Government trucks, but the pleasure car industry is inactive, and one large order for tools placed by a manufacturer of pleasure cars has been cancelled. The Fifth Avenue Coach Co., New York, has been buying a few tools and is expected to come into the market soon to buy equipment for a $1,000,000 motor bus factory, which will be erected in the Harlem district of New York, and which will manufacture motor buses for the Army. Plans being made by automobile manufacturers in Detroit indicate that that city will take pre-eminence in the airplane industry.

The Pennsylvania Railroad Co. has revived an inquiry for tools for a blacksmith's shop at its Altoona, Pa., car works. This inquiry has been in the market several times within the past 18 months, but it is understood that purchases will now be made in order to provide the additional facilities required for the 2225 freight cars, which the railroad company will build at the Altoona works.

Crane builders are not seeking business very actively because they are already sold up for many months, and they do not want to commit themselves any farther ahead in view of the probable demand that will be made upon them to provide quick deliveries of cranes to the shipyards which will construct merchant ships for the Emergency Fleet Corporation. In bids recently submitted to the Navy Department for furnishing electric traveling cranes for the structural shop, Navy Yard, New York, the periods of delivery specified ranged from 180 to 400 days. The Youngstown Sheet & Tube Co., Youngstown, Ohio, has purchased a few cranes and the Jones & Laughlin Steel Co., Pittsburgh, has bought six 15-ton cranes. The Alan Wood Iron & Steel Co., Philadelphia, has bought one 30-ton crane. The Shaw Electric Crane Co. received the contract for nine electric traveling cranes for the Watertown Arsenal. These cranes range in capacity from 5 to 150 tons. Similar equipment will be required soon for the Rock Island Arsenal, Rock Island, Ill. The purchasing department of the American Smelting & Refining Co., with its subsidiaries, the Chile Exploration Co.,, the Braden Copper Co. and the Utah Copper Co., 120 Broadway, New York, has bought a number of cranes and has inquiries out for a number of others. Some of these are for shipment to South America and Mexico. The Fletcher-Thompson Co., Bridgeport, Conn., and Newark, which is building the new plant of the Union Smelting & Refining Co., is in the market for cranes.

New York

NEW YORK, July 18.

The opinion prevails in the trade that the sold-up condition of machinery and machine-tool building plants will make it difficult to equip shipyards with the speed which many of the shipbuilders seem to believe is possible. There is no hint as yet that the Government will commandeer plants or their output, but there is an expectation that such a program may be necessary in order to provide equipment quickly.

Business continues active. Some large orders have been placed and others of good size are pending. There has been an urgent demand recently for grinders, with the result that the Norton Grinding Co. and the Heald Machine Co., both of Worcester, Mass., have bought new equipment here to increase output.

The export embargo will not greatly disturb the machinery trade inasmuch as sales recently have been largely confined to the allied countries, and it is understood there will be no restriction on these shipments. In a few instances permits have been denied for shipments of machines to Sweden.

The Diamond Furniture Co., Jamestown, N. Y., has had plans prepared for a four-story factory, 25 x 105 ft., to be erected this summer. H. F. Love is manager.

The Northeast Electric Co., Syracuse, N. Y., has let contracts for erection of a two-story and basement factory, 60 x 120 ft.

The Jupiter Machine Mfg. Co., Richmond, N. Y., has been incorporated with capital stock of $50,000 by E. A. Dippel, C. A. Stick and G. N. Thompson to manufacture punching and shearing machinery.

The Shepherd Crane & Hoist Co., Montour Falls, N. Y., will build a one-story addition, 90 x 200 ft., to its pattern building to cost $75,000.

The Ludlum Steel Co., Watervliet, N. Y., will build an addition to its plant on Spring St. Edward Corning is president.

The W. A. Mills Brass Co., Inc., Port Chester, N. Y., has been incorporated with capital stock of $25,000 to manufacture articles from brass, copper and other metals. W. A. Mills, W. A. Mills, Jr., and C. W. Stevens, Port Chester, are the incorporators.

Frederic D. Bourke, 701 McBride Street, Syracuse, N. Y., will erect a machine shop and armature factory, 55 x 130 ft., two stories, on Marcellus Street.

The Seneca Electric Furnace Corporation, Albany, has been incorporated with a capital stock of $100,000 to manufacture electrical furnaces, etc., with F. W. Cameron, D. B. Wade and F. W. Gebhard, Albany, as directors.

The Fold-Easy Mfg. Co., Inc., Elmira, N. Y., capitalized at $600,000, has been organzied to manufacture folding beds, folding merchandise and patented articles. M. C. P. Parker, R. W. Parker, 527 Lake Street, and C. W. Tome, 505 Magee Street, are the incorporators.

The Hudwill Corporation, New York, has been incorporated with a capital of $50,000 to manufacture machinery for contractors' use. W. K., H. P. and M. W. Rose, 7 West Forty-fifth Street, are the incorporators.

The P. H. Gill & Sons Machine Works, 2 Lorraine Street, Brooklyn, N. Y., have had plans prepared for a two-story machine shop addition.

The Evertite Locknut Corporation, New York, has been incorporated with a capital of $150,000 to manufacture lock nuts and similar specialties. G. F. Jebbet, A. F McCabe and A. E. Moore, 37 Wall Street, are the incorporators.

Anselm P. Anderson and K. R. Norton, New York, have incorporated in Delaware the Chase Adding Machine Corporation, with capital of $1,000,000 to manufacture adding and recording machines and typewriters.

The Adriance Machine Works, Inc., 254 Van Brunt Street, Brooklyn, N. Y., specializing in the production of presses, dies, etc., is building a six-story, reinforced-concrete addition, 100 x 200 ft., on Richards Street. A one-story extension, 50 x 100 ft., will be used as an erecting shop. The cost is estimated at $200,000. Benjamin Adriance is president.

The Hungerford Brass & Copper Co., 80 Lafayette Street, New York, has filed plans for the erection of a new two-story building, 46 x 103 ft., at 90-92 White Street, to cost about $25,000.

E. D. Anderson, Inc., has been incorporated to manufacture machinery. Announcement of plans will be made soon by Mr. Anderson, whose office is at 120 Broadway. Associated with him as incorporators are Hamilton M. Dawes, O. J. Wagner, C. M. Chester, Jr., C. Westley Abbott and S. Alpert, all of the same address.

The Fire Gun Mfg. Co., Huntington, L. I., has been incorporated with a capital of $500,000 to manufacture fire extinguishers. A. V. Sammis, W. N. and R. S. Baylis, Huntington, are the incorporators.

Parke L. Woodward, Great Kills, Staten Island, N. Y., and associates, have incorporated in Delaware the Falcon Mfg. Co., with capital of $750,000, to manufacture aeroplanes and other aircraft. Joseph P. Shelby, Edgemere, L. I., and Howard Seay, New York, are also interested.

The Crouse-Hinds Co., Seventh and North streets, Syracuse, N. Y., manufacturer of electrical appliances, has completed the erection of a new foundry on Wolf Street.

The Miller-Jones Corporation, Syracuse, has been incorporated with a capital of $20,000 to operate a general machine shop and specialize in the manufacture of sheet metal goods. Frank E. Miller and Arthur L. Jones, are the incorporators.

The Niagara Sprayer Co., Elizabeth Street, Middleport, N. Y., has increased its capital from $50,000 to $500,000. It specializes in the manufacture of spraying machines.

The Porter-Cable Machine Co., 501 East Water Street, Syracuse, manufacturer of machinery and machine tools, has acquired property at Dewitt, near Syracuse, for the construction of a new plant. The initial building will be one story, about 150 x 200 ft., and is expected to be ready for occupancy before the close of the year. Walter A. Ridings is president.

The Syracuse Washer Corporation, Syracuse, N. Y., has been incorporated with a capital of $15,000 to manufacture washing machines. J. Garrett Hotaling, John N. Dersching and Walter J. Zwill are the incorporators.

The Warsaw Elevator Co., Warsaw, N. Y., has increased its capital from $50,000 to $250,000.

The Kingston Shipbuilding Corporation, Kingston, N. Y., has been incorporated with a capital of $500,000 to operate a local shipbuilding works. J. D. Schoonmaker, M. J. Look and J. O. Winston, Kingston, are the incorporators.

The Savage Arms Corporation, Savage Avenue, Frankfort, N. Y., manufacturer of firearms and ammunition, has had plans prepared for four new additions to its plant, to consist of three machine shops, two four stories, 50 x 280 ft. and 50 x 220 ft., respectively, one one-story, 35 x 270 ft., and a two-story office building. An electric power plant will also be constructed. F. R. Phillips is assistant manager. John G. Brown, Witherspoon Building, Philadelphia, has the contract for erection.

The Buffalo Foundry & Machine Co., East Ferry Street and Fillmore Avenue, Buffalo, N. Y., manufacturer of machinery and castings, will build a new pattern shop on Fillmore Avenue.

The World Aeroplane Co., Buffalo, has been incorporated with a capital of $1,000,000, to manufacture aeroplanes and hydroplanes. E. H. and H. E. Crowder and J. H. Kalnar, Buffalo, are the incorporators.

Louis Sacks, Newark, N. J., operating a foundry on Hamburg Place for the production of gray iron castings, will make extensions and alterations in his core ovens.

The Universal Caster & Foundry Co., 574 Ferry Street, Newark, has been organized to manufacture metal and steel posts and similar specialties. Daniel B. Diso heads the company.

Carrington & Co., 42 Walnut Street, Newark, manufacturers of jewelry, have acquired property adjoining their plant and are said to be planning for extensions.

The Foley Motor Car Co., Newark, has been incorporated with a capital of $25,000 to manufacture motor cars and parts. E. J. and F. P. Foley, Montclair; and Peter A. Bannigan, Paterson, are the incorporators.

The General Electric Co., Harrison, N. J., has taken bids for the construction of a one and two-story, reinforced-concrete addition, 135 x 235 ft., to its Edison Lamp Works plant, Sussex Street, estimated to cost $200,000.

The National Hoisting Engine Co., Harrison, is having plans prepared for a one-story addition, about 200 ft. long, to its hoisting engine works.

Jacques Wolf & Co., Lexington Avenue, Clifton, N. J., manufacturer of chemicals, will build a one-story machine shop addition to their plant at Lexington Avenue and Center Street, 30 x 50 ft. A three-story extension, 60 x 77 ft., will also be constructed.

The Union Rubber Co., Kenilworth, near Cranford, N. J., has been incorporated with a capital of $35,000 to manufacture rubber products. William Pettit and J. Hiller, Jr., are the principal incorporators.

The American Automotive Co., Camden, N. J., has been incorporated with a capital of $35,000 to manufacture aeroplanes. William B. MacDonald, 19 Broadway, William H. Ambuhr and Burt K. Brandle, Camden, are the incorporators.

The Marion Metal Co., Jersey City, N. J., operating a plant at 988 Newark Avenue, has filed notice of organization to manufacture metal, iron and rubber specialties. Louis Schreiber, 143 Tonnele Avenue, Jersey City, and Louis Rosenhaus, 628 Boulevard, Bayonne, head the company.

Henry Byrne, 392 Mercer Street, Jersey City, N. J., contractor, will build a new one-story, brick machine shop at 396-8 Mercer Street.

The Electro-Dynamic Co., Avenue A, Bayonne, N. J., manufacturer of motors, dynamos, etc., has filed plans for the construction of the proposed one-story addition to its works at Avenue A and North Street, to be 100 x 120 ft. John W. Ferguson, 152 Market Street, Paterson, has the contract.

A. A. Kelley, Montclair, N. J., and associates, have incorporated in Delaware the American Safety Nut Lock Co., with capital of $100,000, to manufacture a special nut lock. Arthur C. Platt and W. J. Arkell, New York, are also interested.

New England

BOSTON, July 16.

The week has been marked by a sudden lull in the demand for machine tools and an absence of inquiries of any size. Reports from machine tool builders indicate that this condition is purely local, as inquiries from their New York and Western agents have increased in volume in the last 10 days. Orders show some increase, which would be much larger if New England factories were not generally sold up for months ahead and in no position to make prompt deliveries outside of Government business.

While Government orders are being held under cover as much as possible by manufacturers who have them, it is becoming known that the number of metal working plants in this section that are turning a large part of their production to Government work is increasing rapidly. Labor shortage is becoming a pressing problem again as the larger industrial centers are responding to the demands of our war program. Bridgeport papers report that there has been a 30 per cent increase in the city's factory payroll in the last two months and that the present weekly payrolls total more than $1,500,000. If figures were available for the other munition and machine tool centers, a corresponding increase would be shown.

The Skinner Chuck Co., New Britain, Conn., has issued additional shares of stock to the value of $100,000. The outstanding stock is $175,000.

The Phelps & Farr Mfg. Co., Woodbury, Conn., has bought a factory formerly used as a silk mill, together with eight employee's houses, and is equipping the plant to make small metal goods. J. W. Phelps, Waterbury, is president and treasurer, and Leon Farr is general manager.

The Portland Shipbuilding Co., South Portland, Me., is beginning the construction of two beam trawlers for the East Coast Fisheries Co. The Portland Co., Portland, will furnish the boilers and engines.

The Moss Pump & Engine Works, Boston, has been incorporated with authorized capital stock of $50,000. The directors are Louis L. Green, president; James W. Moss, 41 South Market Street, treasurer; and C. G. Weld.

The Springfield Carburetor Co., Springfield, Mass., has been incorporated with authorized capital stock of $500,000. The directors are Anton C. Schmelzer, president; Frank W. Arthur, treasurer; and George H. Morgenstern.

The Woburn Machine Co., Woburn, Mass., has awarded a contract for an addition, 40 x 57 ft., one story.

The Steam Motors Co., Springfield, Mass., has been incorporated with authorized capital stock of $25,000. The directors are E. F. Gebhardt, Jr., president; Irving B. Hitchings, Lynn, treasurer; and William J. A. London.

The Universal Grinding Co., 67 Walnut Street, Fitchburg, Mass., has awarded a contract for an addition, 40 x 83 ft., one story, to be used as an erecting room.

The Freeport Shipbuilding Co., Freeport, Me., has been incorporated with authorized capital stock of $100,000 by Julius S. Soule, president; Norman C. Soule and Albert C. Soule.

The Fore River Shipbuilding Corporation, Quincy, Mass., has awarded a contract for a machine shop, 135 x 250 ft., one story, and a boiler shop, 72 x 150 ft., one story.

The New London Ship & Engine Co., Groton, Conn., has awarded a contract for a pipe shop addition, 64 x 117 ft., one story.

Landers, Frary & Clark, New Britain, Conn., have awarded a contract for an addition, 47 x 220 ft., one story.

The Spring Perch Co., Stratford, Conn., is to erect a factory building, 132 x 360 ft., one story.

The Bath Iron Works, Bath, Me., a shipbuilding plant, has been sold by the estate of John S. Hyde, principal owner and for many years president of the company, to a syndicate of Maine bankers, who will develop the property in an effort to help meet the growing demand for tonnage. William T. Cobb, former Governor of Maine, chairman of the Maine Shipbuilding Committee, was elected president of the new corporation, which is said to have contracts to build nine torpedo boat destroyers for the United States Navy at a cost of $10,00,000.

Philadelphia

PHILADELPHIA, July 16.

The H. Belfield Co., 435 North Broad Street, Philadelphia, manufacturer of steam fittings and plumbers' supplies, is having plans prepared for its proposed new plant at Nineteenth, Twentieth and Cambria streets. It will consist of a five-story reinforced-concrete building, 100 x 280 ft.; one-story building of like dimensions, and one-story foundry about 100 x 275 ft. A one-story power plant will also be constructed. The William Steele & Sons Co., 1600 Arch Street, is the architect.

The John Illingworth Steel Co., Tacony and Lewis streets, Philadelphia, specializing in the production of iron and steel bars, has filed plans for the construction of an addition to its machine shop.

The Bureau of Yards and Docks, Navy Department, has awarded a contract for the erection of three new shell houses and four magazine buildings at its Fort Mifflin, Philadelphia, works, to cost about $500,000. J. Henry Miller, Eutaw and Franklin streets, Baltimore, Md., has the contract.

The Niagara Mfg. Co., 323 North Second street, Philadelphia, manufacturer of plumbers' fittings and supplies, has had plans prepared for a one-story and basement addition, about 80 x 80 ft., at 5432 Lancaster Avenue. Frank E. Hahn, 1112 Chestnut Street, is the architect.

The Penn Chemical Works, 1332 Washington Avenue, Philadelphia, will erect a new one-story power house, about 20 x 45 ft., and engine house, 46 x 48 ft., at 1326 Washington Avenue, to cost $22,000.

The DeLong Hook & Eye Co., Broad and Wallace streets, Philadelphia, manufacturer of metal specialties, has awarded contract for the construction of its proposed new plant at Twenty-first and Clearfield streets, at a cost of $160,000, to consist of a four-story reinforced-concrete building, 88 x 225 ft. The William Steele & Sons Co. is the contractor.

The United States Government has awarded a contract for the erection of three new buildings at the Frankford Arsenal, Philadelphia, to comprise a two-story artillery ammunition plant, 50 x 180 ft., with wing 47 x 50 ft., and two one-story structures 47 x 150 ft., and 47 x 47 ft.

The Henry Disston & Sons Co., Tacony, Philadelphia, manufacturer of saws, files, etc., has awarded a contract for the construction of a one-story brick and concrete addition.

The Arguto Oilless Bearing Co., Wayne Junction, Philadelphia, manufacturer of pulleys, bearings, etc., has taken bids for the erection of a new factory at Berkeley and Wayne avenues.

The S. S. White Dental Mfg. Co., Twelfth and Chestnut streets, Philadelphia, manufacturer of dental and scientific instruments, has awarded a contract for the construction of a four-story reinforced-concrete addition, 60 x 75 ft., to its plant at 212-20 South Quince Street. The Turner Concrete Steel Co., 1713 Sansom Street, is the contractor.

The Herez Light Supply Co., Philadelphia, has been incorporated under Pennsylvania laws with a capital of $25,000 to manufacture electric and gas fixtures. Samuel Straussmann, 1523 Poplar Street, is the principal incorporator.

Hord & Co., Inc., 100 Broadway, New York, has announced plans in connection with the acquisition of the property of the Keystone State Fair & Industrial Exposition Co., Middletown, Pa., by the Keystone Industrial Corporation, Harrisburg, Pa., recently organized with a capital of $1,500,000. It is proposed to commence the immediate erection of the first unit of a plant for the manufacture of aeroplanes, hydroplanes, etc., including the production of engines for aircraft. Following the erection of the aeroplane works, it is planned to build a plant for the manufacture of special steam turbine engines for industrial service.

The Hale Fire Pump Co., Conshohocken, Pa., has been incorporated with a capital of $25,000 to manufacture pumping machinery. Everett J. Wendell, Wayne, is the principal incorporator.

Directors of the Lehigh Stove & Mfg. Co., Lehighton, Pa., manufacturer of stoves, heaters, etc., have authorized an increase in the present plant capacity to cost about $60,000.

The Pottstown Steel Plate Products Co., Pottstown, Pa., has commenced the erection of a new plant. F. H. Feister & Co., Pottstown, have the contract.

The O. K. Clutch & Machine Co., Columbia, Pa., manufacturer of hangers, bearings, etc., has taken bids for the construction of a one-story addition, 60 x 130 ft., on Florence Street.

The Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa., states that five acres which it recently purchased are not to be used for extensions, but are simply dumping grounds for slag and ashes.

The Benjamin Iron & Steel Co., Hazleton, Pa., is erecting a new iron foundry for general work, and is also building a plant to be devoted to pattern work and the manufacture of mine and stripping cars and steam shovel repair parts. This work was recently announced as being done by the Central Pennsylvania Quarry, Stripping & Construction Co.

The Jeanesville Iron Works, Hazleton, Pa., manufacturer of pumps, has awarded a contract for the erection of a new one-story machine shop, 50 x 335 ft. John G. Brown, Witherspoon Building, Philadelphia, is the contractor. The Worthington Pump & Machinery Corporation, 115 Broadway, New York, operates this company.

The Pusey & Jones Co., Poplar Street, Wilmington, Del., has leased land from the city at Sprute Street and Christiana River. It is reported that the site will be used for an addition to its shipbuilding works.

The Tourgees Specialty Co., Williamsport, Pa., has been incorporated with a capital stock of $10,000 to manufacture incinerators, castings, stampings and forgings. The incorporators are Elizabeth H. Gibbs, C. Edmund Gilmore and Walter C. Gilmore.

The Frankford Machine Co., Philadelphia, has been incorporated with a capital stock of $20,000 to manufacture devices from iron, bronze or brass. The incorporators are Frederick J. Wilkes, 5348 James Street, and others.

The H. A. Bauer Co., Lansdowne, Pa., has been incorporated with a capital stock of $30,000 to manufacture gas and electrical fixtures and supplies. The incorporators are H. A. Bauer, 22 South Lansdowne Avenue, Lansdowne; Guy F. Bauer, 219 South Farragut Terrace, Philadelphia, and James H. Bell, 1815 Land Title Building, Philadelphia.

The Ralph E. Weeks Co., Scranton, Pa., has been incorporated with a capital stock of $200,000 to manufacture plumbers', steamfitters' and tinners' supplies. The incorporators are Ralph E. Weeks, Martin F. Corcoran and Arthur W. Close.

The Penn Electric Service Co., Johnstown, Pa., has commenced the erection of a new power plant at Rockwood to furnish power in the southern part of Somerset County.

The Philadelphia Electric Co., Tenth and Chestnut streets, Philadelphia, has awarded a contract for the erection of a one-story reinforced concrete addition, 20 x 40 ft., to its powerhouse at Delaware Avenue and Robbins Street.

The Quakertown Stove Works, 321 West Broad Street, Quakertown, Pa., has been incorporated with a capital stock of $300,000 to manufacture stoves, heating equipment and castings. The incorporators are William P. Roberts, William P. Winner, Norman H. Moyer, Quakertown, and William B. Conrad, 4419 Uber Street, Philadelphia.

Catalogs Wanted

The Chester Shipbuilding Co., Bristol, Pa., desires to receive catalogs of shipbuilding machinery and equipment. L. W. Carver is general storekeeper.

Baltimore

BALTIMORE, MD., July 16.

Morton McI. Dukehart & Co., 100-102 West Fayette Street, Baltimore, manufacturer of pumps and engines, has been awarded a Government contract for 700 vertical boiler feed pumps and their parts, on a bid of $400,000. Delivery is to be started in five months and to be completed in 16 months. The company acted as agents for the McGowan Pump Co.

The Baltimore Gas Appliance & Mfg. Co., Bayard and Hamburg streets, Baltimore, will erect a two-story factory building, 135 x 374 ft., on Wicomico Street near Carey, to cost about $50,000.

The Norfolk & Western Railway Co., Norfolk, Va., will build a 46 x 70-ft. power house.

The H. E. Crook Co., Inc., 28 Light Street, Baltimore, which recently purchased the shipbuilding plant of the McLean Contracting Co., announces that it will not make any additions at the present time. The property comprises a water frontage of about 900 ft and about 600 ft. depth of land, and is improved with a pier about 75 x 500 ft. There are several shop buildings and an office building on the ground. The company has constructed three ship ways and is ready to lay keel. It has been incorporated with $250,000 capital. The officers are: H. E. Crook, president; Clarence H. Crook, vice-president; W. S. Handy, secretary; H. R. Bushman, treasurer.

The Maryland Brass & Metal Works, Guilford Avenue and Federal Street, Baltimore, is having plans prepared for a two-story addition to its plant, about 46 x 90 ft.

The Bureau of Yards and Docks, Washington, D. C., has taken bids for the erection of three new shop buildings at the Charleston, W. Va., navy yard, to consist of a one-story machine shop, 111 x 402 ft., forge and foundry shop, 135 x 562 ft., and heat treating plant, 92 x 150 ft.

The Nox Automatic Air Governor Co., Charleston, W. Va., has been incorporated with a capital of $50,000 to manufacture internal combustion engines and automobile specialties. Wade E. Guthrie, T. C. Townsend, T. S. Clark and T. H. Ballard are the incorporators

Chicago

CHICAGO, July 16.

No large orders have come to the trade, but the general run of business continues satisfactory. The demand for second-hand tools has been good, especially for heavy machines, more of which are wanted than are available. Manufacturers are in great need of heavy planers.

Shipments on most tools are proceeding in a satisfactory way, indicating that the labor situation at tool-building plants is at least fair, also that cars are more readily obtainable for shipments.

No new munitions orders are reported, but it is known that the Rock Island Arsenal, Rock Island, Ill., must soon require equipment for the large plants on which contractors are at work.

Standard makes of tools are difficult to obtain promptly, especially milling, shaping and grinding machines, radial drills, planers and large turret lathes. Hand-screw machines and the smaller sizes of lathes are easy to find. Horizontal boring and drilling machines are scarce, while some makes of vertical boring mills cannot be had inside of eight months.

Automobile truck manufacturers have found Government specifications for army motor trucks to be extremely rigid, as the trucks are designed for unusually hard service. The requirements are much more severe than those of commercial trucks. New orders will be more easily handled. There is no change in the pleasure automobile industry, and one seller of tools had the situation brought home to him by the cancellation of an order this week. Considerable thought is being given to the effect on labor supply of the draft which is soon to become effective, the general opinion being that it will slow up manufacturing operations until conditions are readjusted.

The Ocean Floating Safe Co., 803 West Madison Street, Chicago, has purchased land at Grand and Kilbourne Avenues, 146 x 221 ft., where it plans to build a factory to cost $70,000 for the manufacture of floating safes. Nenotti Nanni is president.

The Carbo-Hydrogen Co. of America, Pittsburgh, has purchased about three acres in South Chicago, upon which a factory is being built. The cost is estimated at $15,000.

A one-story mill construction factory, 75 x 100 ft., costing about $15,000, is to be constructed at 1650 Walnut Street, Chicago, for Harry I. Holton, real estate, 140 South Dearborn Street.

The Gerlach Barklon Co., Joliet, Ill., will erect a three-story reinforced concrete factory, about 94 x 200 ft.

The Gary Motor Truck Co., Gary, Ind., is installing machinery and soon will begin operations in its new plant with about 50 men. The company started in a temporary plant at Hobart over a year ago.

The Great Lakes Mfg. Co., North Chicago, has been incorporated with a capital stock of $12,000, by H. C. Pomeroy and William A. Witt, Chicago, and Frank N. Tomlinson.

The Midland Electric Steel Co., Chicago, has been incorporated with a capital stock of $10,000 by Joseph S. Samuels, Stanley Filip and R. I. Davis. Associated with the company is J. B. Moos, Lakeview Building, Chicago. Equipment will be supplied by the recently organized Booth-Hall Co., Chicago.

The Twentieth Century Brass Works, Bellevue, Ill., has been incorporated with a capital stock of $25,000 by William Althoff, Henry A. Lengfelder and Walter J. Ruediger.

The Mine Shaft Signal Co., Carrier Mills, Ill., has been incorporated with a capital stock of $10,000 by J. A. Schellenger, Samuel W. Latham and Harry Mandrell.

The Remy Brothers Co., recently organized to manufacture tractors, has leased the buildings and grounds of the Kokomo Foundry & Machine Co., Kokomo, Ind.

The Weaver Mfg. Co., Springfield, Ill., manufacturer of automobile accessories, is about to begin the construction of an addition to its plant. It will be of brick, one story, and cost $15,000.

The Oblong Machine Co., Oblong, Ill., whose business has been principally with oil well companies, is moving its plant to Marietta, Ohio, where there is a greater demand for oil well equipment. The company was established at Oblong at the beginning of the oil boom in that section.

The Besaw Rubber Co., and the Ardmore-Akron Rubber Co., makers of automobile tires, have selected sites along the Santa Fe Railroad at Adrmore, Okla., and are planning new factories.

The Duluth Iron Works, Duluth, Minn., has let a contract for the construction of a foundry with a view of undertaking the manufacture of marine engines.

The Chicago & Eastern Illinois Railroad shops at Danville Junction, Danville, Ill., idle for several years, have been leased to an airplane manufacturing company, which has a Government contract. The shops have five acres of floor space.

The Steamotor Truck Co., Chicago, a Delaware corporation, has increased its capital from $100,000 to $10,000,000 for expansion.

Milwaukee

MILWAUKEE, WIS., July 16.

The past week has been one of the most active in the local machine-tool trade since the declaration of war. Orders for milling machines and other tools on Government account, which required in numerous instances the dispatch of machines by express, are the distinct feature of the week. At the same time the rush for tools by private industries, which had slackened somewhat, again has set in. Inquiries and orders of the week constitute the largest volume of any similar period in three months or more. Government requirements are given precedence, but purchasing on this account has not reached a point where private requirements are yet appreciably affected. On some sizes and types of milling machines, especially the universal, local shops are unable to quote nearer than six or seven months ahead.

Manufacturers in all lines are being warned that it is imperative to order raw materials immediately and to urge their customers to stock up now, as prospects are that after Sept. 1 carriers will be overwhelmed with the business of transporting troops, foodstuffs, ammunition, ordnance and other war necessities, and will have practically no surplus facilities for the ordinary business of the country.

The Globe Seamless Steel Tubes Co., Milwaukee, which is improving and enlarging its plant, will begin first with the erection of a new curing and cooling shop, 50 x 480 ft., of steel and brick, designed by Klug & Smith, consulting engineers, Mack Block. Bids are now being received by the engineers. The cost has not been announced, but is estimated at $100,000 with equipment. F. J. O'Brien is general manager.

A. W. Snyder, Burlington, Wis., is completing the organization of a corporation at Milwaukee to manufacture light castings and automobile parts. It is proposed to erect a foundry and machine shop, 120 x 240 ft., one and two stories, at Greenfield Avenue and Barclay Street, Milwaukee. Mr. Snyder has opened offices on the site and will award contracts within a week or 10 days.

The Milwaukee Auto Engine & Supply Co., 841 Twenty-ninth Street, Milwaukee, has increased its capital stock from $50,000 to $100,000 to accommodate its growing business and to provide for future extensions. John B. McCabe is secretary-treasurer.

The Four Wheel Drive Tractor Co., Clintonville, Wis., is closing bids this week for the erection of the first unit of its tractor and engine manufacturing plant, 70 x 175 ft., one-story, with saw-tooth roof. The company will produce farm and general purpose tractors employing a duplex drive transmission system.

The Fox River Cornice Co., Green Bay, Wis., manufacturing art and corrugated sheet metal goods, is increasing its capacity about 33 per cent and has taken over an adjoining building and installing new equipment. The addition gives the company an area of 66 x 120 ft., with a warehouse, 45 x 90 ft.

The Silent Washer Co., Clintonville, Wis., manufacturer of washing machines, formerly of Appleton, Wis., has plans prepared for a two-story factory, 40 x 120 ft., of reinforced concrete and brick, to cost about $30,000 complete. The Appleton works will be moved to Clintonville as soon as the factory is completed. Robert Fischer is secretary.

The Chippewa Foundry & Machine Co., Chippewa Falls, Wis., which recently completed work on a new plant, will confine itself to small pumping engines and motor-driven pumps upon the completion of the larger types now being built on order. Frank Mertel has been appointed general manager following the resignation of Fred Ziegahn, who established the works with his son and now returns to Minneapolis, Minn., to engage in the foundry and machine-shop business.

The Langlade Lumber Co., Antigo, Wis., intends to rebuild immediately the roundhouse, machine and blacksmith shops at Bass Lake, Wis., destroyed by fire July 5.

The Sivyer Steel Casting Co., Milwaukee, has awarded the contract for an addition, 150 x 260 ft., to its foundry to the Robert L. Reisinger Co., 1327 First National Bank Building, Milwaukee. A 3-ton electric furnace will be installed, as previously noted.

Westinghouse Church Kerr & Co., New York, have the contract for erecting and equipping a new power plant, costing $40,000, for the Great Northern Railway, Belknap Street, Superior, Wis.

The Mohr-Jones Hardware Co., Racine, Wis., is erecting a shop for working sheet metal. The company recently increased its capital stock from $60,000 to $150,000.

George Freiburger & Sons, New London, Wis., have broken ground for a one-story addition, 50 x 75 ft., to their machine-shop and wagon works.

The Burlington Truck Co., Burlington, Wis., has been organized by members of the Burlington Blanket Co. and will establish a plant in the Ebbers Building to manufacture truck units for Ford chassis.

The Maibohm Wagon Co., Racine, Wis., which engaged in the manufacture of passenger automobiles about a year ago, has reorganized as the Maibohm Motors Co., with a capital stock of $500,000, under a Maine charter.

The Charles Kidd Mfg. Co., Kenosha, Wis., maker of dairy machinery and milk coolers, contemplates moving its plant and offices to Janesville, Wis., where the Commercial Club is raising a fund of $4,000 to defray moving expenses. If the change is made the company will occupy one of the buildings of the Wisconsin Carriage Co., which will be taken over under purchase. It is hoped to start operations in Janesville by Sept. 1.

The Turbo Carburetor Co., Milwaukee, organized six months ago by I. M. Smith and associates, has completed the equipment of a foundry and machine-shop at 150 Clinton Street, and is manufacturing gas engine carburetors. The capital stock is $60,000. Frederick L. Sivyer, head of the Northwestern Malleable Iron Co., is president, and I. M. Smith, general manager.

The Globe Shipbuilding Co., Superior, Wis., incorporated with a capital stock of $50,000, has re-incorporated under Delaware laws with $500,000 capital, divided into $100,000 of 7 per cent preferred and $400,000 common stock. The officers and stockholders remain unchanged. No preferred stock has been issued. The company is rushing work on the equipment of its shipyards and boat construction will begin in about 10 days. Bookings include eight ocean-going trawlers and construction of two ocean-going cargo vessels of the Frederickstadt type will begin immediately. The Globe company has bought the steamer C. S. Barker for $10,000 and will fit it out as a repair-ship. B. C. Cooke is president; C. A. Massey, vice-president, and M. L. McMahon, secretary-treasurer.

The Independent Foundry Co., Milwaukee, organized with $25,000 capital, has elected the following officers: President, Julius Raniszewski; secretary, August Fons; treasurer, Frank Sprader. Contracts will be awarded immediately for the erection and equipment of a gray-iron foundry, 75 x 120 ft., at Fifty-fourth Avenue and Burnham Street, West Allis. The initial investment will be about $20,000.

It is reported that the Racine Rubber Co., Racine, Wis., is preparing to enlarge its steam-generating plant, and will buy a new engine, generator, boiler and automatic stoker equipment. L. Carlson is engineer in charge.

Libby, McNeil & Libby, Chicago, have purchased a site at Ripon, Wis., upon which to build a milk condensing and refrigerating plant costing about $50,000.

The Wisconsin Carriage Co., Janesville, Wis., has changed its style to the Janesville Products Co., and increased the capital stock from $100,000 to $130,000.

The Bukolt Mfg. Co., Stevens Point, Wis., maker of steel-shod tire protectors for motor vehicles and trailers, last week moved into the plant formerly occupied by the

Automatic Cradle Mfg. Co. Its output will be increased tenfold immediately.

Ralph Howland and L. E. Utter, Nashotah, Wis., have organized the Trailer Truck Co., to manufacture a new type of trailer for motor trucks.

Lawrence College, Appleton, Wis., will award contracts soon for the construction and equipment of an addition to the boiler house, 40 x 60 ft., costing $20,000 complete. The architects are Van Ryn & DeGelleke, Caswell Block, Milwaukee.

Peter Beungers, Racine, Wis., has plans for a welding and machine repair shop, to be erected at Eleventh and Villa Streets

The Pan-American Rubber Co., Milwaukee, has been incorporated with a capital stock of $200,000 to manufacture cellular rubber inner tires and tire tools and accessories. A plant has been established at 409-411 Third Street. Joseph Huebner, Sr., is president and general manager.

The Independent Foundry Co., West Allis, has engaged L. M. Gurda, architect, 478 Mitchell Street, to prepare plans for the first unit of its new foundry, to cost about $20,000, with equipment for gray iron production.

The plant of the Thermat & Monahan Co., Oshkosh, Wis., which has been closed since March because of financial difficulties, will be reopened by a reorganization committee representing a new corporation known as the Thermat & Monahan Mfg. Co.

The Federal Rubber Co., Cudahy, Wis., has awarded a contract for a six-story reinforced concrete factory addition, 50 x 295 ft.

A machine shop addition will be erected by the Ransom Mfg. Co., Oshkosh, Wis., manufacturer of disk grinders.

The Boone Tire & Rubber Co., Chippewa Falls, Wis., will spend $200,000 on the construction and equipment of a plant.

The Burlington Brass Works, Burlington, Wis., has closed a contract whereby it becomes the sole manufacturer of the Knudsen patent non-packing valve and other devices invented by J. B. Knudsen and controlled by the Universal Valve Co. The latter company has established offices in Burlington. Frank H. Quail is president of the Universal Valve Co., and Mr. Knudsen vice-president and treasurer. It is expected that the plant of the Burlington Brass Works will soon be enlarged.

The Ampco Shipbuilding Co., Milwaukee, has been incorporated in Delaware with a capital of $1,000,000 to operate a shipbuilding plant. The incorporators are W. H. Gillen and E. E. Warner, both of Milwaukee.

Detroit

DETROIT, July 16.

The machine-tool demand is not strong. An increased number of inquiries and small orders the past week, however, indicates that the market is improving. Big industries are running to capacity, but installing little new equipment until the nature of their output is definitely decided by Government orders. Labor is extremely scarce, and wages are setting a new high record. Deliveries have not improved. Banks are inquiring closely into all loans, and money is not so free, resulting in the establishment of fewer new industries. The Pennsylvania Railway Co. is letting contracts for construction work on its line into Detroit, which, when in operation, will assist greatly in relieving transportation congestion at the Toledo gateway.

The Republic Motor Truck Co., Inc., Alma, Mich., plans immediate construction of an addition to plant No. 2, which will double the capacity and add 100,000 ft. of floor space to the motor division. Charles Rhodes is secretary.

The Higrade Motors Co., Harbor Springs, Mich., manufacturer of ¾-ton trucks, has secured a tract of land in Grand Rapids, Mich., and construction work will be rushed on a factory to be ready for occupancy early in September. J. Elmer Pratt is president.

The Wadsworth Mfg. Co., Detroit, manufacturer of automobile bodies and accessories, has increased its capital stock from $250,000 to $650,000.

The United Refrigerators Co., Detroit, has been incorporated by Thomas J. Clentia and Henry I. Forsythe, with a capital stock of $10,000.

The Wolverine Motors Co., Inc., Kalamazoo, Mich., has been organized to manufacture motor cars. The company is an outgrowth of the Wolverine Detroit Motors Corporation, and is headed by A. H. Collins, formerly with the R. C. H. and Locomobile companies. The capitalization is $125,000.

The Brown Machine Co., Lansing, Mich., manufacturer of machine parts, is building a new plant, into which it will move shortly.

The Detroit Edison Co., Detroit, will build an additional unit to the D. U. R. power house at Monroe, Mich., which it will use for a generating plant. Additional equipment will be installed.

The pipe shop of Murray W. Sales & Co., Detroit, suffered a loss by fire last week, amounting to about $20,000.

The Advance-Rumely Co., Battle Creek, Mich., is arranging to greatly increase its manufacture of oil-pull tractors this year. The force of 400 men now employed will be doubled.

The Day-Hamlin Mfg. Co., Jackson, Mich., has been organized with a capital of $50,000, to manufacture tractors and parts.

The Campbell Transmission Co., Buchanan, Mich., has been organized, and is erecting a plant to cost $25,000. L. L. Campbell is president.

The National Engineering Co., Saginaw, Mich., has increased its capitalization from $30,000 to $200,000.

The American Cash Register Co., Saginaw, has reorganized and is preparing for an expansion in business.

The United Motors Co., Grand Rapids, Mich., announces it will build a six-ton road tractor. The company is completing an addition to its plant which will be devoted to the building of tractors. The present schedule of production is 200 a month.

The Detroit Pressed Steel Co., Detroit, will erect a four-story addition and make a number of changes in its plant.

The National Twist Drill Co., Detroit, is building a four-story reinforced concrete plant at a cost of $12,000.

The Hoover Steel Ball Co., Ann Arbor, Mich., is contemplating the erection of a number of units of the same type as its present plant.

The Ann Arbor Machine Co., Ann Arbor, is planning to build a new factory.

The Copeman Electric Stove Co., a subsidiary of the Westinghouse Co., will erect a factory at Lapeer, Mich. About 200 employees will be employed at the start.

The Detroit Edison Co., Detroit, is making extensions approximating $2,000,000, to its service. The first unit of a $1,000,000 heating plant is being erected at Congress Street and Cass Avenue, and a $1,000,000 addition to its Connors' Creek plant is also being constructed.

The Doble Detroit Steam Motors Co., Detroit, has been incorporated in Delaware with capital of $10,000,000 to manufacture automobiles, trucks, airplanes, etc. Abner Doble, T. P. Myers and Claud L. Lewis are the incorporators.

It is announced that the Differential Clock Co., capitalized with $400,000, will locate in Muskegon, Mich. The clocks manufactured operate time stamps, time recorders, meters and similar devices. About 150 men will be employed at the start.

Cleveland

CLEVELAND, July 16.

A large volume of new inquiry has come out for machine tools for Government work, much of this being for heavy type machinery for gun making. A number of small lots of machines were placed in Cleveland the past week by Ohio and Detroit manufacturers for work on airplane motors and parts. None of the munition business pending in this section appears to have been placed as yet, and the purchase of the required machinery is awaiting the closing of Government orders. Among the larger inquiries is one from the American Brake Shoe & Foundry Co. for about 240 machines for its Erie, Pa., works for making shells, one for the Erie Forge Co., for machines for making 6-in. guns, and one from an Ohio manufacturer for 60 machines of standard types. There is a fair demand for small lots of machines from motor truck manufacturers, machine tool builders and from other scattered sources.

The White Co., Cleveland, will build an addition, 125 x 500 ft., of brick, steel and reinforced concrete, one and two stories with basement, to be used for a finishing department for motor trucks. Some additional equipment will probably be required.

The Pittsburgh Steamship Co., Cleveland, will enlarge its steamboat repair plant at Erie, Pa., and an adjoining site has been purchased. It will be used particularly for winter repair work. Some machine tool equipment will be required, but it is probable that second-hand machinery will be purchased.

The Cleveland Milling Machine Co., Cleveland, will erect a one-story addition of irregular shape, 100 x 100 x 300 x 15 ft.

The City Machine Co., Cleveland, has purchased a build-

ing site on St. Clair Avenue, near East Fifty-second Street, on which it plans to erect a factory.

The J. C. Ulmer Co., Cleveland, will shortly begin the erection of a new plant at Thirty-eighth Street and Kelly Avenue, where it will move from its present quarters and engage in jobbing machine work and the manufacture of surveying instruments.

The Ideal Tire & Rubber Co., Cleveland, will build a plant to cost $150,000. Plans have been prepared by the Osborn Engineering Co., and the contract awarded to the Hunkin-Conkey Construction Co.

The Hydraulic Pressed Steel Co., Cleveland, will shortly begin the erection of a welfare building, which will involve an expenditure of about $60,000. It will be two stories and basement, 50 x 150 ft., of brick and steel, and will include a restaurant, bowling alleys, and an assembly hall.

The William McClellan File Co., Cleveland, is having plans prepared for a brick and steel factory, two and three stories. It will be built in units, the first being 32 x 190 ft.

The Massillon Steel Casting Co., Massillon, Ohio, has been incorporated with a capital stock of $250,000, and plans the erection of a steel foundry. The incorporators include E. H. Birney, president of the Peerless Drawn Steel Co.; Floyd C. Snyder, F. W. Arnold, Oscar D. Miller and L. M. Taggert.

The American Furnace Engineering Co., Toledo, Ohio, has been incorporated with a capital stock of $10,000 by William E. Galvin, Edward J. Lynch, John A. O'Dyer and others.

The Ohio Wire Goods Mfg. Co., Akron, Ohio, has been incorporated with a capital stock of $100,000 by C. F. Schnee, John C. Grim, Joseph Thomas and others, to manufacture wire goods.

The Defiance Machine Co., Defiance, Ohio, is having plans prepared for an additional factory to provide about 50,000 sq. ft. of floor space.

The Sunlight Electrical Mfg. Co., Warren, Ohio, has been organized with a capital stock of $50,000 to make electrical goods. Among the incorporators are C. L. Wood, C. H. Mills, C. N. Sadler and R. B. Wick.

The Buckeye Aluminum Co., Wooster, Ohio, will enlarge its plant by the erection of a one-story addition, 50 x 150 ft., bids for which will be taken about Aug. 1.

The purchase of the machinery and equipment of the Griffith & Wedge Co., Zanesville, Ohio, by the Mark Mfg. Co., has been concluded, the price paid the receivers being slightly over $77,000. The company has taken a four years' lease on the building, and will install additional equipment. H. L. Fulkerson, formerly general manager of the Griffith & Wedge Co., will be manager.

The Massillon Rubber Co., Massillon, Ohio, will enlarge its plant by the erection of a two-story brick building, 50 x 50 ft.

The Hughes-Kennan Co., Mansfield, Ohio, has closed negotiations with the Bellevue, Ohio, Chamber of Commerce, and will remove its plant to Bellevue and absorb the Klein Iron Works Co. The consolidated company will have a capital stock of $300,000.

Wadsworth, Ohio, will install an ice plant in connection with the municipal light and water plant, and is planning the erection of a filtration plant.

The Atlas Chemical Co., Toledo, Ohio, has been incorporated with a capital stock of $1,000,000, and has acquired the gas plant of the Toledo Railway & Light Co., which will be used for the manufacture of coal tar products.

Pittsburgh

PITTSBURGH, July 16.

Dealers in machine tools and local manufacturers of heavy lathes, planers and other iron and steel working tools believe the Government demand for this equipment over the next six months or a year will be very heavy. Large inquiries have appeared in this market for machine tools from concerns making munitions for the Allies for many months, and now expect to be engaged in making munitions for our own Government over the next year or two. Among local companies with heavy inquiries out for machine tools are the Pressed Steel Car Co., Standard Steel Car Co. and the Westinghouse Electric & Mfg. Co. These firms sold part of their equipment when they finished contracts for munitions for the Allies, and are now compelled to come into the market again and replace many tools. All domestic machine shops and foundries are running to as full capacity as possible, but report a great shortage in the supply of skilled mechanics. The Westinghouse interests are advertising every day in the local papers for men, and have agents out all over the country trying to get skilled mechanics for their different works. The demand for machinery equipment is enormously heavy, and cases have been frequent where companies installing heavy steel works equipment have agreed to pay large bonuses to builders for quick delivery.

The Standard Bridge Tool Co., Fulton Building, Pittsburgh, which for the past 10 years has specialized in the building of the Thomas spacing table and other equipment for handling structural shapes and plates, has been incorporated under a Pennsylvania charter with a total capital of $320,000, and the name of the company has been changed to the Thomas Spacing Machine Co. The company has purchased a site of 19 acres at Glenshaw, Pa., near Pittsburgh, on the main line of the Baltimore & Ohio Railroad, on which a fireproof machine shop is now being built, and will be completed in about 60 days. The equipment has been purchased and most of it delivered. The new shop will have direct switch connection with the Baltimore & Ohio Railroad, and will have excess capacity over its own needs. The company is prepared to contract for work suitable to its equipment. It is installing planers of the following sizes: 72-in. x 48-in. x 16-ft., 64-in. x 48-in. x 30-ft., and 36-in. x 36-in. x 8 ft.; also vertical boring mill 8-ft. heavy pattern, lathes 36-in. x 26-ft., 26-in. x 17-ft., 24-in. x 14-ft., 18-in. x 16-ft., 16-in. x 8-ft., 17-in. x 7-ft., and 14-in. x 8-ft.; turret lathes, 24-in. Gisholts, 4¼-in. bore, Greenlee 3¼-in. bore and Greenlee 2¼-in. bore; drills, 5-ft. Prentiss and 3-ft. Prentiss, and smaller drills. It is also installing shapers, milling machines, universal grinders, cold saw, keyseaters, and a full list of miscellaneous machine shop equipment. In its blacksmith shop it has one No. 3 Nazel forging hammer, with heating and heat treating furnaces. It can also handle light forgings and small tools.

Indianapolis

INDIANAPOLIS, July 16.

The Studebaker Corporation, South Bend, Ind., is erecting a new building at Kendall and Garst streets, to cost $150,000, to be used as a forge room and heating plant.

The Sterling Metal Co., Auburn, Ind., has changed its name to the Sterlite Metal Co.

The Quaker Oil Co., Plainfield, Ind., has been incorporated with $50,000 capital stock to manufacture paints and automobile accessories. The directors are General F. Calbert, Robert G. Edwards and Frank M. Calbert.

The Kokomo Gas & Fuel Co., Kokomo, Ind., has been incorporated with $500 000 capital stock, to furnish light, heat, fuel and power. The directors are A. B. Smith, M. J. Foley, O. C. Johnson, F. L. Blackinton and G. W. Hoss.

The H. N. Ness Co., Indianapolis, Ind., has been incohporated with $5,000 capital stock to manufacture talking machines and musical instruments. The directors are William C. Carroll, Horatio N. Ness and Edwin B. Kenngott.

The Columbus Machine Works, Columbus, Ind., has been incorporated with $25,000 capital stock to manufacture plumbing and heating systems. The directors are Augustus Boyd, Frank P. Boyd and J. R. Dunlap.

The Central South

LOUISVILLE, KY., July 16.

A demand for equipment for small sawmills and woodworking plants has been a recent feature of the market. Motors for use in changing local plants from steam to electric drive are also much sought.

Jacob Weber's Sons, Louisville, have completed an addition to their wagon and motor truck plant, and contemplate further betterments.

The Shawnee Coal Co., Harlan, Ky., will receive bids until July 20 on a 1500-ft. motor-driven air compressor, second-hand, and other coal mine equipment.

The Cambridge Coal Co., Harlan, Ky., will purchase a second-hand hoisting engine, 20 hp., with single drum, and 40-hp. boiler, in good condition for immediate delivery.

Birmingham

BIRMINGHAM, ALA., July 17.

Deliveries continue the chief consideration and worry of machinery dealers. The coal and ore mine equipment business is especially large and general trade conditions are good.

The J. F. Coleman Co., engineers, New Orleans, have options on land worth $470,000 on Mobile Bay, presumably as site for a shipbuilding plant at an estimated cost of $5,500,000. The deepening of the Warrior River to allow ocean-going craft to ply between the Ensley and Fairfield works of the Tennessee Coal, Iron & Railroad Co. and the gulf at Mobile is contemplated.

The United States Marine Co., Brunswick, Ga., will erect a

shipbuilding plant at a cost of $200,000. A. H. Eastmonde and A. G. Lampke, New York, are respectively president and treasurer.

The Florida Shipbuilding Co., Jacksonville, Fla., J. M. Cohlonbach, secretary, will begin the construction of a plant in the immediate future.

The Georgia Railway & Power Co. will build a sixth hydroelectric unit at Tallulah, Ga., at a cost of $330,000 and increasing the capacity by 12,000 hp.

Capt. Rolf Seeberg of the Seeberg Ship Chandlery, Mobile, Ala., announces that Norwegian capitalists will build a shipyard on the Dog River, near Mobile, at a cost of about $2,000,000. The tentative plans for the plant provide for a drydock to accommodate vessels of 10,000 tons, another drydock for the accommodation of smaller vessels, beddings for building steel ships up to 6000 tons, and a foundry, machine shop and boiler shop. The company will be capitalized at $12,000,000 and incorporated in Alabama. The site of the porposed plant embraces 500 acres.

St. Louis

ST. LOUIS, July 16.

The machine tool market continues to show improvement as pressure of business calls for imperative extension or replacement, but only vital requirements are being placed, as there is still a disposition to await the Government's plans. This market is affected by the pressure upon the tool-making facilities from other centers, and delivery inquiries continue to meet with increasingly unsatisfactory replies. Operations of industries in this distrct are very active.

The St. Louis Screw Co., St. Louis, will build a machine shop in connection with its plant.

The Semmelmeyer Belting Co., St. Louis, has been incorporated with a capital stock of $20,000 by J. A. and E. T. Semmelmeyer and E. J. Staube to manufacture belting and mill supplies.

The Surety Mfg. Co., St. Louis, has been incorporated with a capital stock of $25,000 by Leon Weinstein, Edward Henschel and Andrew Wolf to manufacture tools, plates, etc.

The One-Wheel Truck Co., St. Louis, has been incorporated with a capital stock of $35,000 by Otto F. Stifel, H. B. Krenning, Louis Goodhart, and J. D. Howe, to manufacture automobiles, tractors, etc.

The Lasswell & Coble Electric Co., Bernie, Mo., will install about $5,000 worth of machinery, for which it is now in the market.

The City Light & Traction Co., Sedalia, Mo., will improve its electric plant, installing a generating unit to cost complete about $60,000.

The L. M. Machinery Co., Kansas City, Mo., has been incorporated with a capital stock of $50,000 by M. L. McRean, Rene Lindemann and A. R. Neal, to manufacture printing machinery.

The Citizens Ice & Cold Storage Co., Little Rock, Ark., has been incorporated with a capital stock of $50,000 by C. M. Conway, Chris Ledwidge and Stuart Wilson, and will install ice-making and cold-storage equipment.

The Commissioners of Water and Light Improvement, District No. 1, Batesville, Ark., will install equipment for a filter plant. Frank L. Wilcox, Syndicate Trust Building, St. Louis, is engineer in charge. A daily capacity of 500,000 gal. is contemplated with alternative emergency unit.

The Alva Light & Power Co., Alva, Okla., will increase its capacity, erecting a larger power house and installing additional machinery.

The Cushing Tiger Oil Gas & Refining Co., McAlester, Okla., has been incorporated with a capital stock of $750,000 by Robert N. McMillen, McAlester; W. B. Gray, Montgomery, Ala., and J. L. Wilkie, Anniston, Ala.

The Oklahoma, Kansas & Missouri Interurban Co., H. J. Miller, superintendent, will equip a roundhouse and repair plant at Miami, Okla.

Lawton, Okla., R. T. Sanders, commissioner of public works in charge, will expend a total of $380,000 on water works extension and plant improvement. John D. Kennard is engineer.

L. Waldauer & Son, O'Reilly, Miss., will equip an 8-stand cotton ginning plant at a cost of about $30,000.

The Gulfport Shipbuilding Co., Gulfport, Miss., with capital of $200,000, will equip a plant investing $100,000 in initial installation. Henry Piaggo and B. E. Eaton are chief owners.

The Gulf Shipbuilding Co., Madisonville, La., has acquired yards and will install equipment for the construction of wooden vessels.

The Appalachian Corporation, Louis B. Magid, Atlanta, Ga., president, and James L. Wright, New Orleans, vice-president, will invest approximately $1,000,000 in equipping a cold-storage plant, loading and unloading machinery, electric elevators, etc.

The Richardson Aeroplane Co., New Orleans, La., F. T. Richardson, Hibernia Bank Building, president, will install equipment to manufacture about two tandem hydro-aeroplanes weekly.

Texas

AUSTIN, TEX., July 14.

Several shipbuilding companies that are installing plants at Beaumont, Houston and other Gulf ports of Texas have received contracts to build hulls for the Government. These yards will require considerable machinery and other equipment. The machinery and tool trades show improvement the past week.

The Farmersville Independent Gin Co., Farmersville, will build a cotton gin to cost $12,000. M. W. Stewart is a stockholder.

The Lone Oak Gin & Warehouse Co. will build a cotton gin at Lone Oak to cost $20,000. H. P. Etter is a stockholder.

Beaumont and Port Arthur have approved consolidation of the holdings of the Beaumont Electric Light & Power Co., the Beaumont Traction Co., the Jefferson County Traction Co., and the Port Arthur Light & Power Co., subsidiaries of the Stone & Webster Engineering Corporation. The consolidated interests will install additional machinery in the electric light and power plants and make other improvements.

The Lone Star Shipbuilding Co. has received a contract to build eight wooden hulls for the Government, each to cost approximately $300,000.

The City Commission, San Antonio, will install a sewage pumping station at Camp Wilson to cost $35,000.

The Universal Shipbuilding Co. is clearing the site for a shipbuilding plant bordering the ship channel at Houston and will soon have the work of construction under way. It has obtained the contract for the construction of 12 hulls for the Government, each to cost about $300,000.

James Stewart & Co. have under consideration plans for the construction of a shipbuilding plant at Houston.

The San Antonio Public Service Co., a merger of the San Antonio Traction Co. and the San Antonio Gas & Electric Co., has been incorporated with a capital stock of $4,700,000 and will immediately begin the construction of an extension of its electric railway system to Camp Kelly. It is reported that it will take over franchises of the San Antonio & Austin Traction Co. and carry out the project of constructing an interurban electric railway between San Antonio and Austin, a distance of 85 miles, which involves the erection of a large electric power plant. The new company is controlled by Emerson McMillin of New York and associates.

The Beaumont Shipbuilding & Dry Dock Co., Beaumont, has obtained a contract from the Government to build four wooden ships, each to cost about $300,000. It is preparing a site for the shipbuilding plant, which it will construct at an initial cost of more than $150,000.

The Transcontinental Compress Co., Paris, will rebuild its cotton compress, recently destroyed by fire. The new plant will cost approximately $50,000.

The Cuero Gin Co. will build a cotton gin at Cuero to cost $15,000. C. C. Smith is a stockholder.

The Simmons Gin Co., Memphis, will construct a cotton gin to cost $10,000.

California

LOS ANGELES, July 10.

The Republic Motor Truck Co., Alma, Mich., has acquired factory buildings and 12 acres of land on Santa Fe Avenue, Vernon, near Los Angeles, formerly used by the Pacific Coast Planing Mill Co. The main building, 275 x 450 ft., will be equipped for an assembling plant, with capacity of about 2000 trucks during the coming year; the other structures will be used for general machine and shop work. Pacific coast trade will be supplied from this point. It is said that the initial works will give employment to about 200 hands. The company is also planning for the erection of an addition to its main plant at Alma, to double the present capacity. George W. Moore is secretary and treasurer.

The Los Angeles Galvanizing Co., Palmetto and Carolina Streets, Los Angeles, specializing in galvanizing metals, has arranged for the construction of a new two-story plant, 60 x 120 ft., at Sixth and Mateo streets. Considerable new

machinery will be purchased at once. L. W. Barnett is secretary.

The Cartwright Mfg. Co., Los Angeles, has been incorporated with a capital of $25,000, to manufacture meat cutters, etc. T. P. Cartwright, Charles Hackler and John E. Pitts are the incorporators.

The California Aviation Co., Los Angeles, recently incorporated with a capital of $600,000, is planning for the immediate operation of a plant for the manufacture of aeroplanes. The company has acquired property at Vernon, consisting of existing structures and land for the initial works, which will specialize during the coming months in the production of training machines for Government service and training schools. The present capacity will be one finished machine a day, to be increased to about 10 with the installation of proposed machinery. Earle Remington is general manager. Headquarters have been established at 536 H. W. Hellman Building.

The Pacific Electric Railway Co., Pacific Electric Building, Los Angeles, has filed plans for the construction of a new one-story car repair shop, 159 x 160 ft., at 800 Mission Road, to cost about $18,000.

The Hobbs Storage Battery Co., Los Angeles, recently incorporated with a capital of $100,000, has acquired a two-story building at 1231-35 South Olive Street, and will establish a plant for the manufacture of a special storage battery, primarily for motor car service, and is also planning to engage in the manufacture of batteries in larger units. It is said that machinery for the new plant will be purchased at once. A. A. Hobbs is president, and H. V. Andrews an officer.

The California Automatic Sprinkler Co., Los Angeles, has been incorporated with a capital of $10,000, to manufacture automatic sprinklers. M. J. Spencer, P. M. and J. M. Mathews are the incorporators.

The Pacific Pipe & Supply Co., 1007 Santa Fe Avenue, Los Angeles, will build a shop addition at its works.

The Craig Shipbuilding Co., Long Beach, Cal., is said to be negotiating for a site, with waterfront of about 1200 ft., at San Diego, for the construction of a new shipbuilding plant. John F. Craig heads the company.

The Engineering Products Co., representing the Permutit Co. of New York, manufacturer of soft water filters for the prevention of boiler scale, and the R. U. V. Co., of New York, which produces water sterilizers for bacterial purification of water, has opened an office at 251 Rialto Building, San Francisco, with W. D. Forbes as manager.

The Pacific Northwest

SEATTLE, WASH., July 10.

The foreign trade from the port of Seattle, for the fiscal year ended June 30, aggregated $216,000,000, a gain of more than $600,000. Lumbermen in this section will probably furnish most of the spruce required in manufacturing airplanes for the Government. It is estimated that 25,000,000 ft. will be needed. The Hurley-Mason Co., contractor for the American Lake cantonment, has recently placed orders with the lumbermen's association for 10,000,000 ft. of fir lumber.

Collins & Byerly, Ostrander, Wash., have purchased 3000 ft. frontage on the Columbia River, on which will be erected a sawmill to have a daily capacity of 150,000 ft.

Work has begun on the new $35,000 plant of the Capital City Iron Works, Olympia, Wash., which will include machine shops, erecting rooms, pattern storage building, drafting rooms, and a foundry. Work will be completed about Sept. 15, and machinery costing $20,000 will be installed.

The Patterson-Macdonald Shipbuilding Co., Seattle, has completed plans for its new plant, which will occupy 22 acres. The buildings will include a two-story office, costing $6,000; two-story mold loft, 50 x 200 ft., costing $10,000; storehouse, 50 x 50 ft., costing $2,000; blacksmith shop and machine shop.

The Sandstrom Shipbuilding Co., Seattle, has received contract for two wooden hull full-powered ocean-going motorships, costing $800,000, from the Italian Government. It also holds contracts for two vessels for Norwegian interests.

Plans have been completed for the proposed rod and wire mill to be erected by the Anaconda Copper Mining Co., Great Falls, Mont. The plant will be 125 x 400 ft., of brick and steel, and will cost more than $500,000. It will have capacity of 200,000 lb. of copper rods, and 85,000 lb. of copper wire.

The Henrici Reversing Gear & Mfg. Co., Vancouver, Wash., has been incorporated for $5,000, and will erect a factory to manufacture gas engines and a reversing gear. The incorporators are Rudolf Henrici, James E. Keith and Hugh B. Apperson.

Plans have been completed for the proposed plant of the Pacific Marine Iron Works, Portland, Ore. The company holds contracts for 26 marine boilers and 16 engines of 1500 hp. each, totalling $1,500,000. The Supple & Ballin Shipbuilding Co. is principal owner of the iron works.

The Granite-Poorman Mining Co., Nelson, B. C., plans to immediately install a compressor plant, with capacity of 1500 cu. ft. of air, and 300-hp. electric motor.

Olympia Steel Works, Seattle, plans the establishment of new iron foundry on Horton Street, to cost about $5,000 for initial buildings.

The Pacific Scale & Show Case Co., Spokane, states that the report that it has sold its plant to C. J. Reed of that city is not true.

The Nilson & Kelez Shipbuilding Co., Seattle, is constructing a wooden shipbuilding plant on the East Waterway, to cost $250,000. Three initial slips will be built.

The Eagle Brass Foundry, Seattle, has let a contract for a foundry building and pattern shop, 90 x 105 ft., to cost $6,000.

The steel life boat manufacturing plant of Wynkoop Brothers, Portland, which was recently burned, with a loss of $3,500, will be rebuilt at once.

The Stewart Brothers Co., Portland, Ore., has let contracts for two machine shops, 45 x 80 ft. and 40 x 60 ft., respectively. It will manufacture logging and railroad equipment.

The Portland Brazing & Machine Works, Portland, has increased its capital stock to $20,000.

Canada

TORONTO, July 14.

The first steel ocean-going steamer built in Nova Scotia has been successfully launched by the Nova Scotia Steel & Coal Co., New Glasgow, N. S. It has a carrying capacity of about 2000 tons, and has been sold to the British Government. A second vessel about 25 per cent larger, is now under construction, and a third will be begun immediately.

The A. R. Williams Machinery Co., Ltd., 64 Front Street West, Toronto, has issued the following list of machine tools for its requirements: One 90-in. x 20-in. open-side planer; one 84-in. x 20-ft. wall-type traveling tool-head planer; one 72-in. x 20-ft. open-side planer; one 48-in. x 16-ft. planer with side heads; two 84-in. boring mills; one 42-in. boring mill; two 7-ft. plain radial drills; three 6-ft. plain radial drills; one 16-ft. gap or pit lathe; one 1-in. keyseater; one 48-in. x 24-ft. sheared-head engine lathe; one horizontal boring, milling and drilling machine with 5-in. spindles; one 24-in. slotter; one 12-in. slotter; six plain milling machines, one No. 1½, one No. 2, two No. 3, two No. 4 and two No. 5 vertical milling machines; three 3-ft. plain radial drills; one 3-ft. to 4-ft. plain radial drill; four 24-in. to 36-in. x 10-ft. to 12-ft. planers without side heads; three 24-in. vertical boring mills; three 36-in. vertical boring mills; one No. 7 horizontal cylinder-boring machine; one No. 5 horizontal cylinder-boring machine; one 16-in. x 84-in. plain grinder.

The plant of the International Engineering Works, Amherst, N. S., was damaged by fire July 11, with a loss of between $75,000 and $100,000.

The Union Iron Works, San Francisco, is negotiating with the Grand Trunk Pacific Railroad for a two-year lease of the Prince Rupert, B. C., drydock and shipbuilding plant, where it proposes to build 25 steel freighters of 12,000 tons each.

The Montreal Machinery & Supplies, Ltd., Montreal, has changed its title to the Standard Machinery & Supplies, Ltd.

E. Leonard & Sons, London, Ont., will build an addition for the manufacture of engines, boilers, etc., at a cost of $25,000.

The Canadian Copper Co., Copper Cliff, Ont., has commenced the erection of a pumping station in connection with its sewage disposal works.

The Vulcan Iron Works, Vancouver, B. C., will commence at an early date the erection of a machine shop on Industrial Island, to cost $30,000.

The new plant which the International Harvester Co. of Canada is constructing at Hamilton, Ont., is for foundry purposes only, and will provide a place for work which has heretofore been carried on in leased quarters. The company has a wagon factory at Chatham.

The Victoria Talking Machine Co., Ltd., Winnipeg, has been incorporated with a capital stock of $20,000 by J. Horn, J. T. Maloney, May C. Smith, and others, to manufacture musical instruments, talking machines, etc.

The Westbury Electric Light & Power Co., Cookshire,

Que., will build a hydro-electric plant. Construction will be started immediately.

The National Shipbuilding Co., Goderich, Ont., is arranging for the use of the Paget factory at Goderich, as an addition to its plant.

Additions are being made to the plant of the Cameron Genoa Mills Shipbuilder's plant, at Victoria, B. C.

B. A. Saker, Montreal, is making arrangements for the establishment of a shipyard at St. John, N. B., and has secured the Warner Mill property on the river front. Mr. Saker will spend $100,000 equipping and improving the plant to turn out three wooden vessels at the same time. When materials are again available, he will undertake the construction of 3000-ton tramp steamers, and $200,000 more will be spent on the plant.

The McKinnon Dash Co., St. Catharines, Ont., is in the market for 3 air hoists, 3-in. diameter by 4-ft. lift.

McGregor & McIntyre, Ltd., 1139 Shaw Street, Toronto, is in the market for a 300-ton press suitable for nosing 4.5 Howitzer shells, complete with triple pump, accumulator and fittings.

J. C. Wilson & Co., Belleville, Ont., are in the market for a thread miller for nose of 4.5-in., mark 7, shell.

The Canadian Linderman Co., Ltd., Woodstock, Ont., is in the market for a 10 or 7½-hp. motor; three phase, 25 cycle, 550 volt, 750 r.p.m.

E. Drinkwater, 23 Lafayette Boulevard, St. Lambert, Que., is receiving bids for a waterworks plant to be installed at Montreal South, Que., at a cost of $180,000.

The H. Mueller Mfg. Co., River Road, Sarnia, Ont., will soon commence the erection of a brass rolling mill to cost $200,000.

The Electric Products Light & Power Co., will build a brick addition to its plant at Shawinigan Falls, Que., to cost $36,000. R. Lindsay is engineer.

The Three Rivers Shipyard Co., Three Rivers, Que., is completing arrangements for the erection of a shipbuilding plant at Three Rivers to cost $125,000.

The Dominion Products Co., New Westminster, B. C., has let the contract to Booker, Campbell & Whipple, 413 Granville Street, Vancouver, B. C., for the erection of an addition to its plant, to cost $18,000.

The Herbert Morris Crane & Hoist Co. has awarded the contract to the Dominion Bridge Co., 20 Victoria Street, Toronto, for its plant to be erected at Niagara Falls, Ont., at a cost of $80,000. It will manufacture hoists, cranes, etc.

The Swift Canadian Co. has awarded contracts for the erection of a refrigerating plant at Toronto, Ont., to cost $125,000.

The Imperial Munitions Board, Ottawa, Ont., has secured two sites for aerodromes on the Fraser Delta, one of 275 acres on Lulu Island, and the other 300 acres near Boundary Bay, B. C. The former will be developed first. The estimated cost is $3,000,000. Construction work will be carried out by Bate & McMahon, Ottawa, Ont., under the supervision of Col. R. S. Low.

A. B. Jardine & Co., Ltd., Hespeler, Ont., has been incorporated with capital stock of $300,000 by William Jardine, James Jardine, Peter Jardine and others, to manufacture machinery, boilers, tools, implements, etc.

The Motor Products Corporation, Ltd., Walkerville, Ont., has been incorporated with a capital stock of $500,000 by John H. Coburn, Albert J. Gordon, William E. Jones and others, to manufacture iron, steel, copper, motors, engines, etc.

The Canada Emery Wheels, Ltd., Hamilton, Ont., has been incorporated with capital stock of $50,000 by Frank Radigan, George G. Sutherland, Charles Nield and others of Hamilton, to manufacture abrasive material, products, grinding machinery, tools, etc.

The Hosmer Stamping & Die Works, Ltd., Toronto, has been incorporated with capital stock of $10,000 by William Seward, William G. Winchester, Stephen M. Hosmer and others, to manufacture wood and metal products.

H. Stainton, Ltd., Toronto, has been incorporated with capital stock of $40,000 by Herbert Stainton, William A. Michael, William F. Heideman and others, to manufacture electric, gas and waterworks supplies, etc.

The Dominion Distributing Co., Ltd., Hamilton, Ont., has been incorporated with capital stock of $40,000 by Edwin J. Brown, Toronto; Robert H. Simpson, Sanford D. Biggar and others of Hamilton, to manufacture automobiles, parts, accessories, etc.

The Chelsea Green Iron Works, Ltd., Fergus, Ont., has been incorporated with capital stock of $200,000 by William G. Beatty, Wesley L. Ham, Robert D. Kerr and others, to manufacture iron, steel, machine tools, etc. It is building an iron foundry at London, Ont., to cost $50,000.

The Canadian Fasteners, Ltd., Hamilton, has been incorporated with a capital stock of $50,000 by George W. Ballard and Muriel Martin, Hamilton; William Morrison, Burlington, Ont., and others, to manufacture fasteners, hooks, etc.

T. J. Moore, box 122 Wiarton, Ont., is in the market for a 6 ft. x 14 or 16 ft. boiler.

Government Purchases

WASHINGTON, July 16.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until July 31, schedule 1329, for 72 blacksmiths' forges and 62 rivet forges for various points of delivery; schedule 1340, opening date unassigned, for one motor-driven vertical 36-in. turret lathe for Philadelphia; schedule 1341, opening date unassigned, for four high-duty, 24-in. swing drills, ten heavy duty engine lathes with geared headstocks, one motor-driven tool-room lathe, two motor-driven two-spindle flat turret lathes, one horizontal boring and milling machine, one 84-in. boring and turning mill, all for Mare Island, Cal.

Bids will be received by the Bureau of Yards and Docks, Navy Department, Washington, until July 25, specification 2443, for electric traveling cranes for Mare Island, Cal.

Bids were received by the Bureau of Supplies and Accounts, Navy Department, Washington, July 6, for supplies for the naval service as follows:

Schedule 1295½, Steam Engineering, Class 21, Philadelphia—Lathes: Bid 15, $2,654; 20, $1,496; 24, $3,225; 29, $2,945; 33, $2,897; 38, $3,105.20; 39, $900; 42, $2,975.

Class 22, Philadelphia—Lathes: Bid 15, $3,566; 24, $4,000; 29, $3,835; 30, $3,100 and $3,165; 33, $3,897; 38, $4,329.75; 42, $3,250.

Bids were received by the Bureau of Supplies and Accounts, Navy Department, Washington, on July 10 for supplies for the naval service as follows:

Schedule 1289, Steam Engineering, Class 61, Philadelphia—One milling machine: Bid 56, $4,710; 72, $3,548.

Class 62, Philadelphia—One milling machine: Bid 56, $4,530; 72, $4,130.

Class 63, Philadelphia—One slotting machine: Bid 44, $8,780; 47, $12,240.

The names of the bidders and the numbers under which they are designated in the above list are as follows:

Bid 15, The Fairbanks Co.; 20, Kemp Machinery Co.; 24, Manning, Maxwell & Moore, Inc.; 29 and 44, Niles-Bement-Pond Co.; 30, D. Nast Machinery Co.; 33 and 56, W. E. Shipley Machinery Co.; 38, Vandyck-Churchill Co.; 39, Ward & Co.; 42, Swind Machinery Co.; 47, Newton Machine Tool Works, Inc.; 72, Brown & Sharpe Mfg. Co.

Bids were received by the Bureau of Yards and Docks, Navy Department, Washington, on July 9, under specification 2444, for furnishing electric traveling cranes for New York as follows:

Item 1, two 15-ton bridge cranes, complete; 2, add for each additional bridge crane up to four.

Penn Bridge Co., Washington, item 1, $49,887, 250 days; 2, $24,375, 14 days for each additional crane. Morgan Engineering Co., Alliance, Ohio, item 1, $63,830, 260 days. Cleveland Crane & Engineering Co., Wyckliff, Ohio, item 1, $59,320, 180 days; 2, $29,660, 30 days additional for each crane. Pawling & Harnischfeger, Milwaukee, Wis., item 1, $44,599, 300 days; 2, $22,250, 30 days. Niles-Bement-Pond Co., 111 Broadway, New York, item 1, $40,750 365 days; 2, $20,375 each, 400 days.

Bids will be received by the Navy Department until July 25 for purchases of old material consisting of 3,000,000 lb. of brass foundry ashes to be removed as accumulated up to Dec. 31, and until Aug. 9 for purchases of old material consisting of engines, machine tools, ice machines, air compresses, oil testing machines, 1,000,000 lb. scrap steel, 30 tons boiler tubes, 100 tons iron and steel borings, and 700 tons scrap iron and steel. The schedules containing form of proposal and terms of sale may be obtained from the Supply Office, Navy Yard, Washington.

J. J. Harty, vice-president of the Canadian Locomotive Co., Kingston, Ont., states that the business of the company is excellent, and that the plant is running to capacity and has orders on hand that will keep it busy until next March. An order for 6 switching engines for the Toronto, Hamilton & Buffalo Railway, weighing about 166,000 lb., has just been closed.

The Granite City Steel Works and the plant of the National Enameling & Stamping Co., at Granite City, Ill., which has been closed pending the annual settlement of the wage scale, resumed operations full force July 14. The two plants employ about 3,800 men.

THE IRON AGE

New York, July 26, 1917

ESTABLISHED 1855 VOL. 100: No. 4

Equipment for Expediting Shell-Forging

How the Curtis & Co. Mfg. Co., by a Unique Combination of Rollways and Cranes, Doubled Its Plant Capacity for Making Rolled and Cast-Steel Shells

DESIGNED and equipped to establish general efficiency, the two forge-shell plants of Curtis & Co. Mfg. Co., St. Louis, whose process and patented shell-forging press were described in THE IRON AGE of July 5, are of particular interest to engineers as incorporating ideas which have been put in practice within the past year and are applicable to steel works. In no small measure the company's proficiency is due to the successful application of features in steel-handling methods, plant design, heating furnaces, etc., which have added to the ease with which its workmen have done their tasks and speeded up its production.

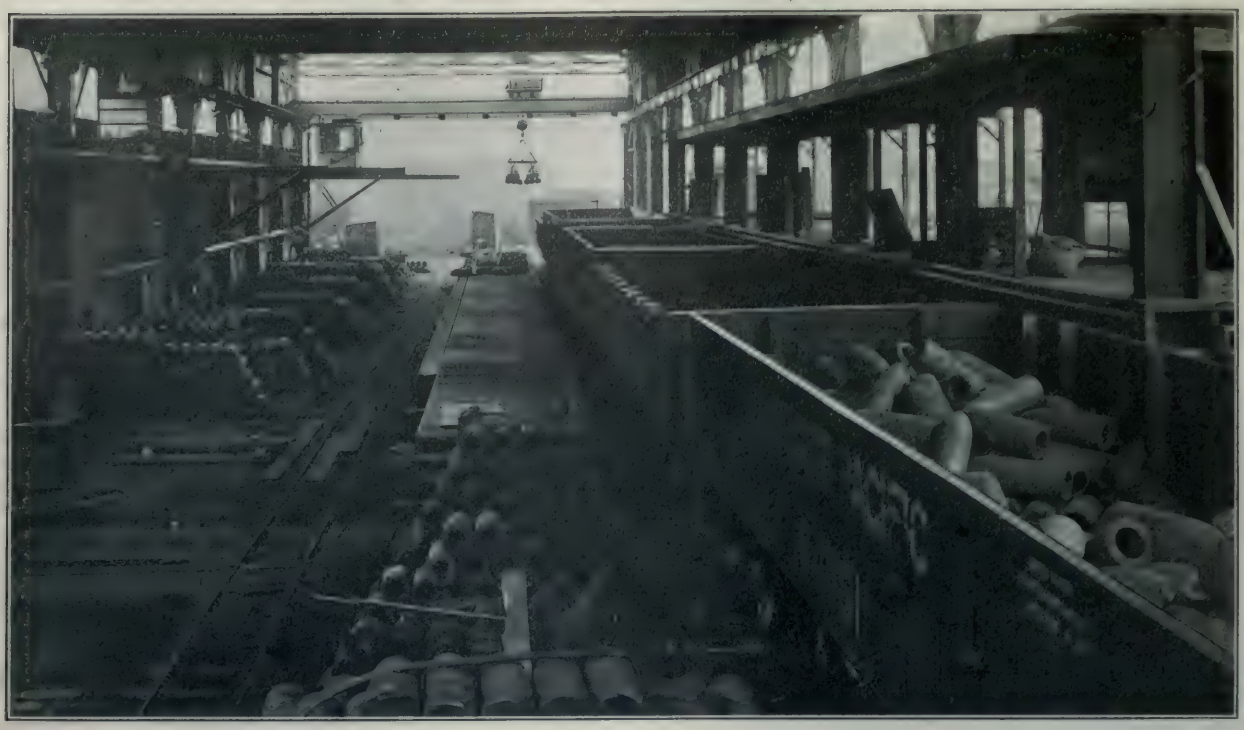
Rollways constitute an important part of the equipment for handling material, as demonstrated in the original shell-forging plant. What is known as forge plant No. 1 was at first equipped with light overhead travelers to carry the blanks from the furnace to the presses and the forgings away from the presses. Its capacity, with this apparatus, was 600 forgings per day, but experience soon showed that the plant, outside of the conveyor equipment, had a capacity of 1000 forgings a day, and that the overhead carrier system was the only obstacle to a considerable further increase in capacity. Rollways, therefore, were substituted for overhead carriers, and this enabled adding a fourth furnace, doubling the number of cooling chambers, and increasing the capacity to approximately 2000 8-in. forgings per day, even though one of the original forge presses was removed.

Forge plant No. 2 was designed after plant No. 1 had been in operation for seven months, and the arrangement is considered more efficient than that of the latter. The floor level at the heating furnaces of plant No. 2 is 2 ft. higher than the floor level where the presses are situated, making the application of gravity rolls to the presses very easy. Also, the ground space available for this plant was ample, whereas plant No. 1 was built in a constricted space. The capacity of plant No. 2 in 8-in. forgings is from 2200 to 2600 per day of 20 hr., or in 9.2-in. forgings from 1800 to 2200 per day of 20 hr.

The manner in which the workmen have been protected from excessive heat during the hot summer months in St. Louis is considered by the management to be most successful. In the months of July and August, 1916, the thermometer, for many



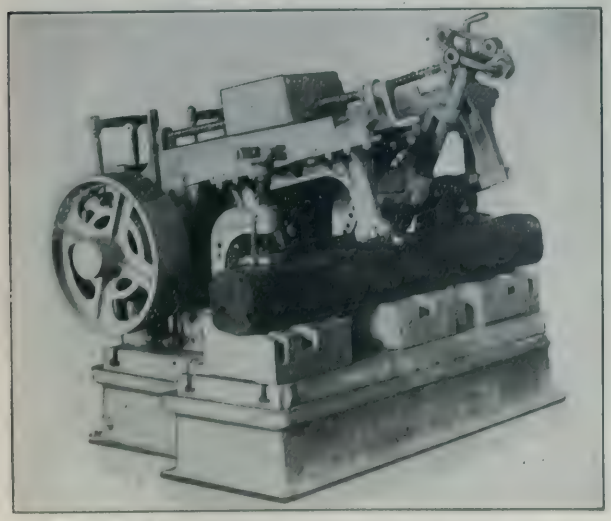
Light Overhead Cranes Do All Lifting and Cross-Traveling While Rollways Transfer Blanks Lengthwise of the Shop. Outside the wall are jib cranes which transfer blanks through open windows to the rollway at the right



Ingots Are Moved Lengthwise of the Receiving Platform by a Rollway and Piled by Movable Wall Jib Cranes. Finished forgings are easily rolled from the shipping platform to box cars

days, reached a maximum of 95 to 105 deg., and plant No. 1, which was turning out 1000 forgings a day of 20 hr., did not lose an hour because of shutdowns on account of the heat. A few men whose backs were turned toward the furnaces were prostrated, but when it was discovered that the heat on the spine was the dominant factor in heat prostration the working positions of the men were changed to eliminate this cause.

The company believes that the freedom from heat difficulties is due to the combination of the following factors: First, high buildings with removable sides, insuring good ventilation in hot weather, when the sides are removed; second, powerful electric fans sucking in cool air from a shady place and creating a draft toward the furnaces; third, efficient hoods over the furnaces, with ventilators opening in the roof; fourth, water shields front and back of the furnaces; fifth, automatic chain screens in front of the furnaces, which lower as the furnace door opens and are raised as the furnace door closes; sixth, powerful air-blast curtains in front of the furnaces blowing upward and rearward to co-operate with the water shields; seventh, efficient preliminary cooling chambers, so that hot forgings are cooled in brick chambers with good ventilating stacks; eighth, brick or concrete cooling tunnels with good stacks, in which the hot shells from the normalizing furnaces are cooled.

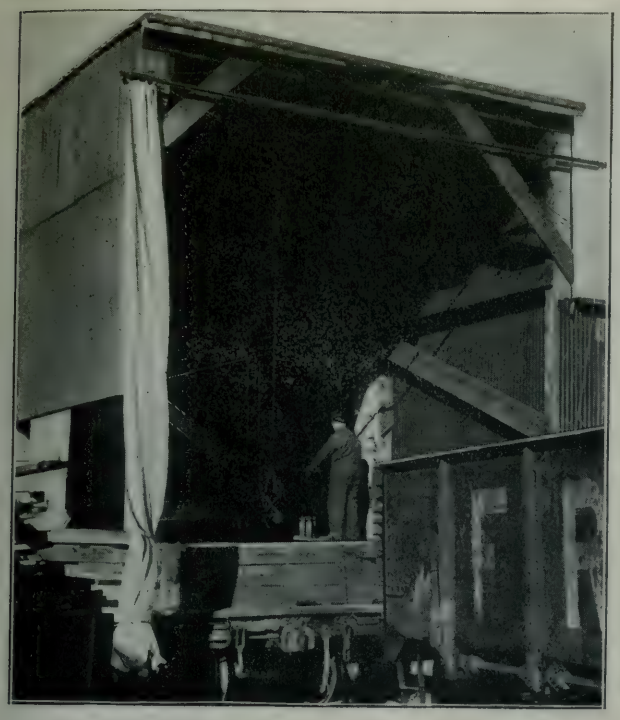


From the Viewpoint of Inspection, Hack-Saws Were Very Satisfactory as They Made Clean, Mirror-like Cuts showing the Slightest Imperfection in the Steel

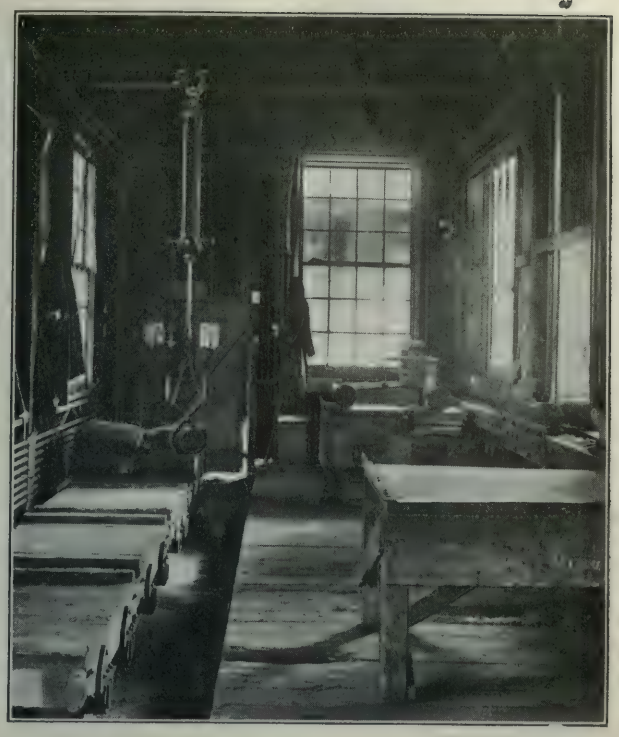
The hydraulic system of each plant is provided with shock absorbers to protect the piping. Also both accumulators are fitted with overtravel control at both ends of travel in addition to being equipped with a centrifugal device which prevents the accumulator lowering at an excessive speed. The company attributes its good fortune in not having had an accident of any kind to the hydraulic piping, to the use of shock absorbers, and the non-use of electrically-driven pumps.

The combination of rollways and overhead carriers, shown in an illustration of the heating furnaces of forge plant No. 2, has proved very efficient for handling the blanks which are to be pre-heated previous to being forged. The blanks ready for heating are piled at the back or receiving end of the furnaces. When these blanks are to be transferred to the furnaces one of the overhead hand-propelled traveling cranes, which carry air hoists and magnets for handling the blanks, is brought over a pile, and remains there while the light, easy-running trolley goes forward and backward from the pile to the rollway until the entire pile has been transferred to the rollway in front of the hearth. The hoists and trolleys, therefore, do the lifting and cross traveling while the ingots move lengthwise of the shop on the rollways.

Ingots are also stored in a receiving shed outside the wall of the furnace building, along the inside of which runs a rollway, shown in the illustration. When these ingots are to be passed to the furnaces they are picked up by the jib cranes on the outside wall, placed on the rollway, and then transferred by the hoist and trolley of the overhead bridge cranes to the rollway in front of the furnace hearths. Also, when a heat of ingots just received is being piled back of the furnaces, the wall jib crane transfers the ingots to the rollway and the



This Simple Unloading Shed Is Well Protected from the Weather and the Light Tongs of the Air Hoist Have Proven Rapid, Safe and Dependable



Ingots Are Received for Inspection Through Open Windows and Transferred to Either Inspection Table by the Rollway. Inspected ingots are removed by trucks

ingot moves up or down this rollway until opposite the space where the heat is to be piled, and is then picked up by the trolley and the hoist on the bridge crane and piled, the heavy bridge remaining stationary while the light trolley and hoist do all the moving.

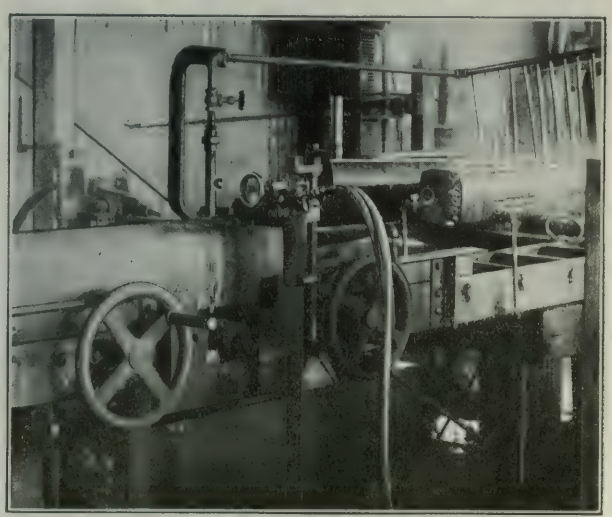
The two traveling cranes shown were at first used without the rollway, but their capacity was entirely inadequate, so the two rollways were added. The combination of the rollways and cranes has a capacity far beyond the capacity of the four furnaces. The receiving hearths on these furnaces are 4 ft. deep and extend entirely across the width of the furnaces, and have a large storage capacity. The small diameter bars shown on the rear end of the rollway next to the furnaces are used for separating the heats in the furnace, and are termed separating bars.

The scheme of handling material in plant No. 1 differs materially from that of plant No. 2, as shown in one of the illustrations. The blanks are carried in on trucks and piled on hearths by a magnet or tongs and hoist on light overhead bridge cranes. This arrangement, though satisfactory, does not compare with the arrangement for feeding the furnaces at plant No. 2 as to capacity or cost of operation. The discharging ends and hearths of the furnaces in plant No. 1, however, are similar to those of plant No. 2.

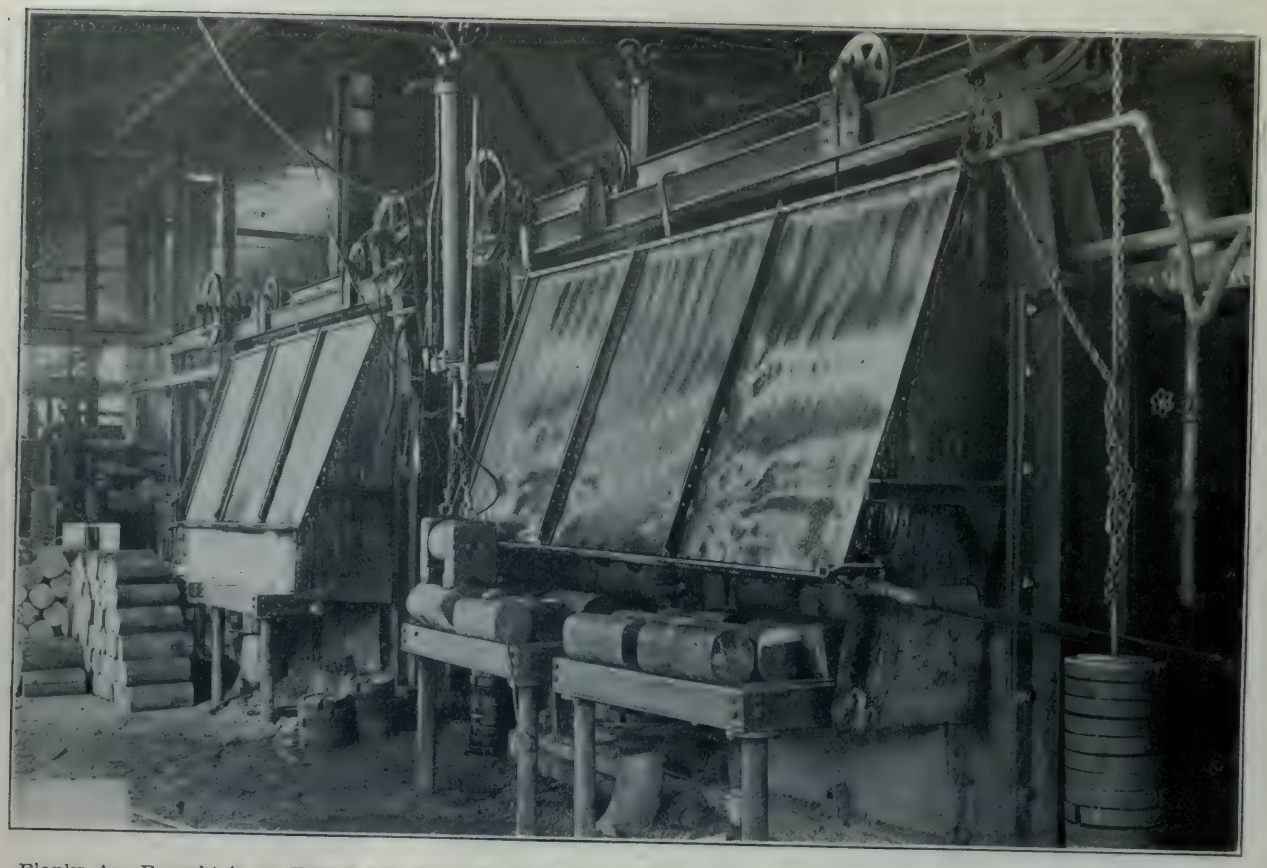
The company believes that it has obtained satisfactory service from its furnaces and greater output with the least inconvenience to the men. It has never had a single cracked forging due to too quick heating of the blank, and has never had a burnt blank; and also the total forgings rejected because of eccentricity is but a very small fraction of 1 per cent. By having a short but wide furnace it is believed that all the benefits of a long and narrow furnace are obtained without any of its defects.

The cutting of long blooms of forged or rolled steel into short blanks, which was at first a troublesome problem, has now been reduced to a very simple process. The first method used was by powerful hacksaws designed and built for this purpose. Mechanically, these saws were very satisfactory. A single saw would cut through a Gothic bloom 7½ in. across the flats in 20 min., and made on the average, including handling, 40 cuts in 20 hr. A battery of 32 saws was required to cut 1200 blanks a day. As the hacksaw made a cut only 3/32 in. wide, compared to a ⅜-in. kerf of a modern rotary saw, the saving in steel by the use of hacksaws was considerable.

The saws, now no longer used, were designed and built by the company, were 16 in. long from center to center of hole, 1½ in. wide, and 0.065 in. thick, having six teeth per inch. The total stroke of the saw blade was 6 in. Two saws were placed side by side on a common base, making two cuts simultaneously. The bloom was held in place by three heavy screw clamps. Each battery of four saws was served by a rollway and a steel-topped table leading to each pair of saws. Two batteries of saws were driven by a 20-hp. motor. The cuts



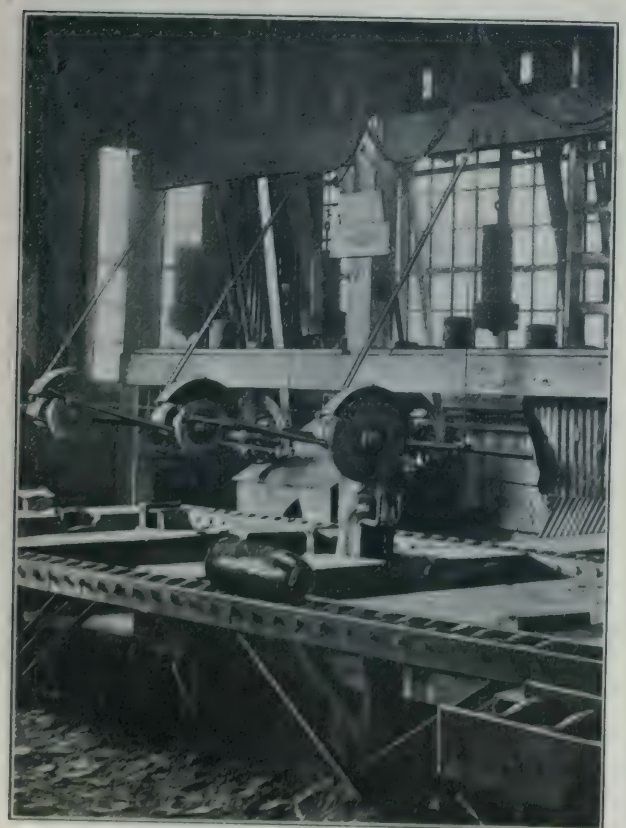
Oxy-Acetylene Torches for Nicking Blooms, Later to Be Broken into Blanks by a Press, Have Proved More Expeditious than Hack-saws



Blanks Are Brought in on Trucks and Piled on Hearths by Overhead Cranes in Plant No. 1, But This Does Not Compare with the Arrangement of Plant No. 2 as to Capacity or Cost of Operation

made by the hacksaws were clean and mirror-like, showing up the slightest imperfection in the steel, and were, therefore, very satisfactory from the viewpoint of inspection.

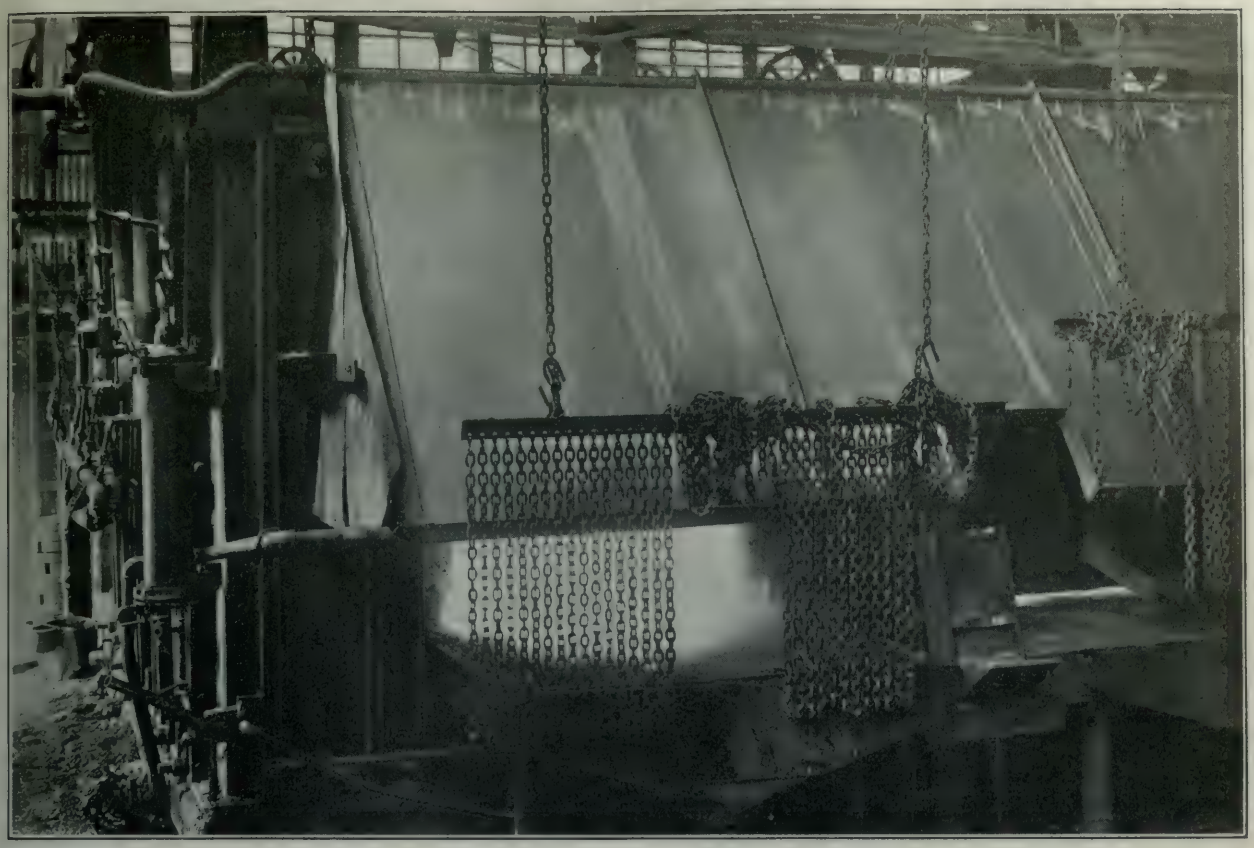
When the doubling of the forging capacity was undertaken, the company resorted to the use of the oxy-acetylene torch for nicking the blooms and a press for breaking them. After using several designs of torching machines it finally adopted the machine shown in our illustration, which proved very satisfactory. The blooms are inspected and marked for length of blank to be cut, then passed along a rollway to the torching table. Two rolls of the rollway are equipped with hand wheels, so that the bloom can be accurately moved along these until the mark on the bloom comes directly under the torch. The torch is moved up and down by a screw, and in and out by a rack and pinion. The bar is nicked about ⅞ in. deep on one side only, and as soon as the nick is made the bloom is moved one length and the nick cooled by cold water, after which it is rolled to the breaking press, nick down, and accurately placed so that the breaking blade is directly over the nick. The power is then turned on and the bloom broken clearly and squarely. The press has 300 net tons capacity, which is sufficient to break 8¼-in. Gothic bars. The lower breaker anvils on the press are adjustable in and out with a maximum distance between anvils of about 20 in. and a minimum distance about 6 in.



The "Ingot Hospital." The tilting cradle under the foremost grinder is upright to facilitate grinding the nose

An unusual shed is used for unloading individual cast ingots from the cars in plant No. 1. It is a box-shaped structure, open at both ends, and bridging tracks so that cars can easily be run in and out. Under this shed 2000 ingots can be unloaded in 20 hr. Two light tongs, similar to ice tongs, each operated by an air hoist, are used, each tong catching one ingot at a time. A man standing near the end of the freight car, on a board running from the side of the car to a ladder at the side of the shed, has a full view of the interior of the car as well as the receiving platform, and operates the air-hoist valve. This arrangement is well protected from the weather, and has proved to be safe, rapid and dependable. The tongs have been found both quicker and safer for handling ingots than magnets when unloading cars.

Adjacent to this unloading shed is the inspection

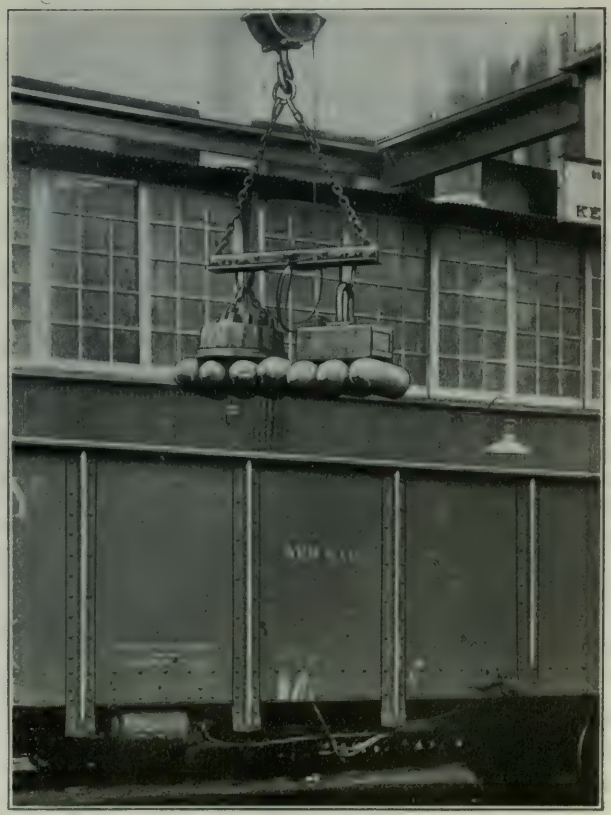


Powerful Air Blasts Directed Upwards and Rearwards, Chains and Water Shields Protect the Workmen from Excessive Heat During the Hot Summer Days of St. Louis

room, an interior view of which is shown. As the ingots are lowered by the tongs from the freight car they land on an iron shelf just outside of the open windows. They are then passed along the rollways to one of the inspection benches, where they are examined to see that each ingot bears the foundry examiner's acceptance stamp, that the steel fracture shows no piping, blow holes, segregation or sponginess, that the surface is free from cracks, splits or other defects, that the surface is free from cast iron from the ingot molds adhering to the surface of the ingot, and that the weight of the ingot is within specified limits. If the ingot passes inspection it is placed on one of the trucks. If defective, it is put in a scrap heap at one side. If it is light in weight, it is put into a reclaimer pile, later to be forged into a special small-diameter die making a thin-walled forging. If the ingot requires grinding, chipping or torching before it can be forged, it is put on a truck and sent to the "hospital," described later. The inspection room has three tables, and a capacity of 100 ingots an hour.

The receiving, inspection and storing of all steel used at plant No. 2, and, in addition, the shipping of all the forgings from this plant, is done in a single shed. This shed has a long central platform, shown in one of the illustrations, with railroad tracks on either side, and on this platform the ingots are unloaded and inspected. At the left of the platform is a long rollway for transporting the ingots lengthwise. Ingots that fully pass inspection are moved along the rollway to a point opposite to which they are to be piled, and then piled by means of a small magnet on an air hoist carried by a movable wall jib crane. These jib cranes are readily movable without a load from one piling position to another.

Ingots that require hospital treatment travel to the far end of the receiving platform, and are carried by a wall jib crane located there to the opening in the wall leading to the hospital. Any rejected ingots are held on the receiving table temporarily and then loaded by a wall jib crane or by the overhead crane on a truck on the industrial track and taken to the scrap yard. The wall jib cranes also carry ingots from the receiving platform



Twin Magnets on Overhead Cranes Expedite the Loading of Finished Forgings into Cars for Shipment

rollway to receiving doors in the forge-shop wall, where they pass on to the rollways inside the building for storage back of the furnaces. Rollways are used by the principal longitudinal movement of the ingots, while the wall jib cranes take care of the piles, leaving the traveling bridge cranes free for other work.

The loading of cars with forgings for shipment is done principally from the shipping platform. A gravity rollway passes underground and carries the forgings from the storage floor of the furnace building to a pit under the shipping platform. From here a pneumatic hoist elevator lifts three forgings at a time to the shipping-platform level, after which they are rolled from the platform into the cars. The crane in this shed has a capacity of 3 tons, and is equipped with a pair of 24-in. magnets. These arrangements for receiving and shipping, it is claimed, have proved very satisfactory.

Ingots which inspection has shown to have removable blemishes are sent to the so-called ingot hospital, there to be remedied by grinding, chipping or burning, as the need may be. Grinding of an ingot is principally confined to the nose, where cast iron from the ingot mold is likely to adhere. This cast iron must be removed before forging, or it is said a non-machinable nose will result. It is also necessary to remove all lumps appearing on the nose of an ingot, though in some cases these lumps are steel, being formed in the depression made in the mold by the breaking away of the cast-iron part adhering as a lump to an ingot. The nose of the ingot is ground with the ingot standing free on a tilting cradle. This cradle, when horizontal, is virtually a portion of the flat table as shown under the middle emery wheel.

When surface blemishes can best be removed by grinding, the ingot is rolled on the cradle, but both the ingot and the cradle are kept in a horizontal position during the grinding operation. Some ingots may have cracks or blemishes that can be removed by pneumatic chipping hammers, and others have blemishes or fracture irregularities that are best removed by the oxy-acetylene torches. Such ingots are carried by the rollway to the tables where they are chipped or torched. When ingots leave the hospital they pass to the rollway next to the wall and move down this rollway until opposite the pile in which their heat is located, which may be either inside the building or under the receiving shed.

The view of the ingot hospital shows in detail the rollways used throughout the plant for moving blanks, ingots or shells. These rolls are 4½ in. at their largest diameter, are 10 in. long, operate on a 1-in. shaft, and are placed 6 in. center to center. When it is desired to roll the blank sideways off of the rollways the side angles are 3 in. by 4 in., and when high sides are wanted on the rollway to prevent the ingots or blanks rolling off, the side angles are 3 in. x 5 in. For ordinary flat rollways the rolls have plain drilled bearings and turn directly on their shafts, but for inclined rollways they are bushed with a simple ball bearing, and turn with low friction, so that the ingot or forging moves by gravity. A slope of 1 in. in 12 in. is required for these rollways.

For the purpose of obtaining test specimens from their 8-in. shells the company makes use of a hollow drill, the design of which was suggested to them by the British Inspection Department. The test core, remaining in contact with the shell after the drill is removed, is easily broken off by a few blows from a sledge on a handled cold chisel, and it is claimed that one man can cut 45 test blanks in a 9-hr. day. In order to obtain test specimens from the 9.2-in. forgings a 1-in. ring is cut from a long forging by means of a cutting-off lathe. These rings are cut into bars 1 in. square, by means of a milling machine. This method was used as there were not sufficient numbers of scrap 9.2-in. forgings to provide vertical test specimens, and a horizontal specimen enables the use of a forging which is longer than the required finished length, and is not damaged by cutting.

A series of 12 tests were made on 8-in. and 9.2-in. forgings made from cast ingots of various analyses by cutting two vertical and two horizontal specimens from each forging. The vertical specimens were taken, one near the outside and one near the inside of the forgings, separated 90 deg. The horizontal specimens were cut at 90 deg. to each other. These 48 specimens were pulled one after the other by the same man on the same machine, so that conditions were as nearly uniform as possible, and in every one of the 12 forgings the results obtained from the four specimens were practically identical, and the company's conclusion is that for forgings made from cast ingots test specimens taken horizontally or vertically, inside or outside, all give identical results. The vertical test specimen is preferable from a production viewpoint, as the horizontal specimen requires more expensive machinery and longer time.

Previous to undertaking munition work the Curtis & Co. Mfg. Co. manufactured sawmill machinery and saws, pneumatic machinery, and iron, brass and steel castings, the major part of the steel castings being heat-treated manganese steel for use in railroad frogs, switches and crossings. The technical men and executives were experienced in the design and manufacture of a wide variety of machinery, in the metallurgy of iron and steel, the tempering of saws and heat treating of manganese-steel castings, but were not experienced in making shell forgings. The first contract was taken October, 1915, for 150,000 8-in. shells, on which work was begun in February, 1916. At the present time the company has 1400 employees, occupies 12 acres of ground, and has a normal capacity of 4000 8-in. shell forgings per 20 hr., or 3200 9.2-in. shell forgings.

Many Reservations

Reservations made to date by exhibitors who expect to have exhibits in the Mechanics' Building, Boston, in connection with the convention of the American Foundrymen's Association, Sept. 28 to 29, total between 500 and 1000 sq. ft. more than last year's exhibit at Cleveland. An average of 320 sq. ft. each has been reserved by 120 exhibitors and that number of exhibitors ten weeks prior to the opening day is also a record.

It is announced that a part of the new rolling capacity of the Mark Mfg. Co. at Indiana Harbor, Ind., will go into operation this quarter, the open-hearth department in the fourth quarter of this year, and the 600-ton blast furnace, now building, in the first half of 1918. Its new Bessemer plant is in operation. Reference was made to these improvements in THE IRON AGE of June 28.

The Vilter Mfg. Co., Milwaukee, maker of ice and refrigerating machinery, Corliss engines, etc., has been awarded several large contracts by the Government for the equipment of refrigerating plants at military encampments of the United States and at the French front. The contracts aggregate about $375,000 in value.

Coke-Oven Gas and the British Fuel Problem

Discussing the economical use of coal in Great Britain as a war measure before the Incorporated Municipal Electric Association, J. A. Robertson said in substance regarding coke-oven gas:

The distillation of coal at low temperatures for the primary purpose of producing metallurgical coke and yielding a quantity of surplus gas of high calorific value in addition to other by-products has been advocated as a universal solution of the fuel economy problem. The low temperature at which the coal is distilled permits of the recovery of by-products which are lost in the producer system. A little consideration, however, shows that as a means of producing power, the coke oven can have only a limited application. The demand for electricity in the form of light, power and heat is bound to exceed enormously the demand for coke and by-products and while the surplus heat from coke-oven gas should be fully utilized, either in independent power stations or where convenient in conjunction with larger power systems, the process cannot be looked on as more than a partial solution of the fuel economy problem.

It is claimed that instead of metallurgical coke, a soft smokeless fuel can be produced, which is suitable for domestic purposes, and proposals have been put forward to combine an installation for producing such a fuel with a central power station, the surplus gas being employed to fire the boilers. An arrangement of this kind can have only a local and temporary application and the burning of fuel for domestic purposes must ultimately be superseded by electricity. To set up a process with the object of producing fuel for cooking and heating is to perpetuate a custom which all are agreed should be superseded, not only for reasons of fuel economy, but also with the object of saving labor now employed in unnecessary domestic drudgery.

The Shepard Electric Crane & Hoist Co. has found it necessary to procure larger offices in New York, and will move from its present location at 50 Church Street to 30 Church Street on Aug. 1. The Philadelphia office of the company will move for the same reason from the Stephen Girard Building to the Bulletin Building.

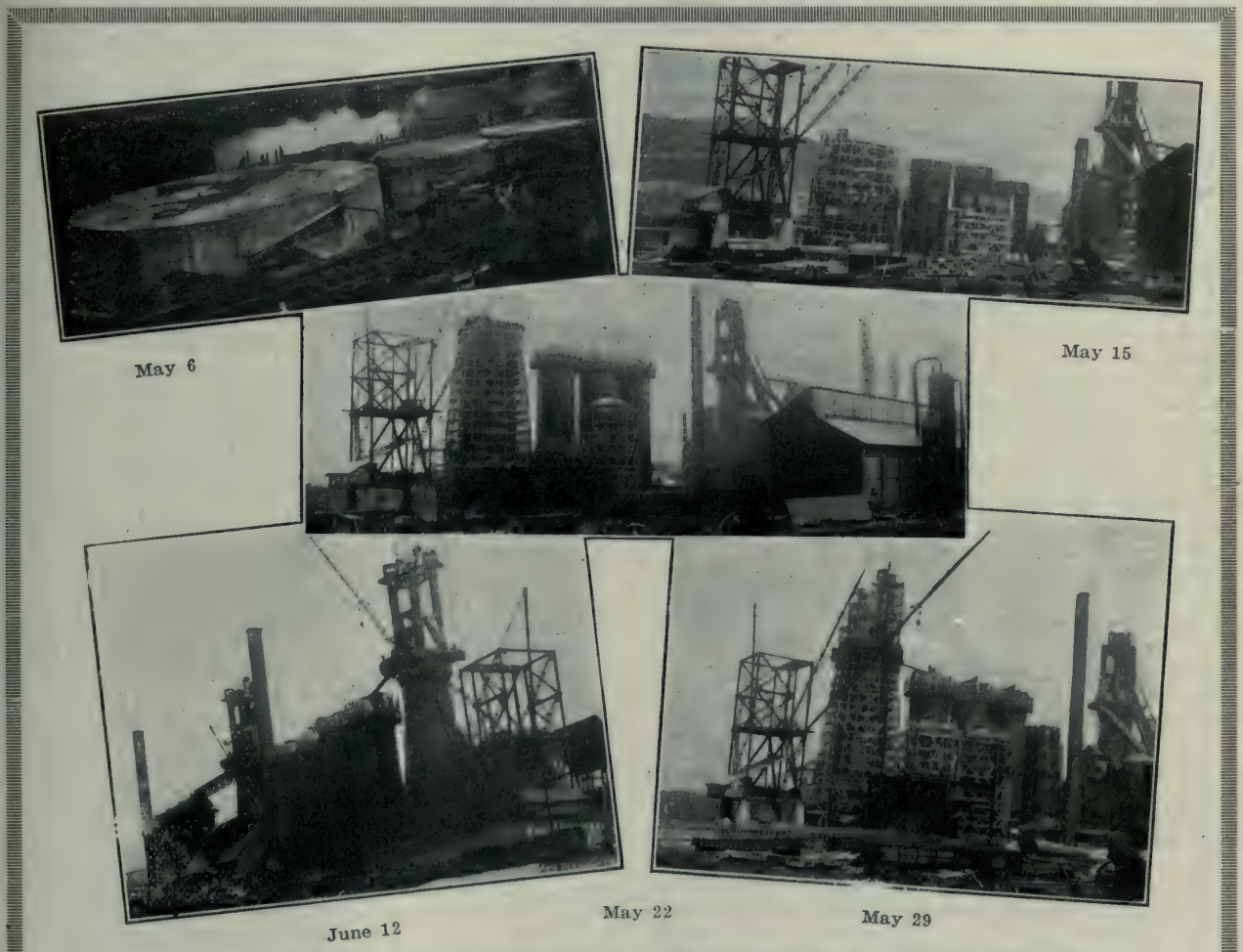
CAMBRIA'S NEW RECORD

Completion of No. 11 Blast Furnace with Its Stoves in Fifty-seven Days

Since the record breaking construction of Cambria Steel Co.'s No. 9 blast furnace, which was started March 12, 1916, and completed in 85 days, two additional furnaces, Nos. 10 and 11, with entirely new equipment, have been rushed to completion.

The erection of No. 11 blast furnace, with its four 20 x 100 ft. stoves and stack, was started May 7 on the foundations, as shown on photograph dated May 6, 1917, and on July 3 the furnace was put in blast, establishing the marvelous record of constructing a 500-ton blast furnace in 57 days, as stated in THE IRON AGE of July 12.

These furnaces are of the same general design as No. 9 blast furnace, a description of which was published in THE IRON AGE, June 15, 1916.



PROGRESSIVE STAGES IN THE BUILDING OF BLAST FURNACE NO. 11, CAMBRIA STEEL CO.

The equipment of Nos. 10 and 11 stacks differ from that of No. 9, inasmuch as they are provided with gas washing equipment for supplying clean gas to the stoves, and in addition to this, these furnaces are blown by three 40,000 cu. ft. General Electric turbo-blowers, one of which is a spare. The stock is supplied to the stacks by the Otis Electric skip hoists.

Steam for the furnace plant is generated by 10 768-horse power B. & W. boilers, which are fired by blast furnace gas. Nos. 10 and 11 blast furnaces are located at the Franklin plant in direct line with Nos. 7, 8 and 9. The construction of Nos. 10 and 11 was under the supervision of John C. Ogden, general superintendent. No. 11 furnace was lighted by Edwin E. Slick, Jr.

The Southern Foundry Co., Owensboro, Ky., has begun installation of a new cupola of 20 tons capacity, replacing the present 10-ton cupola.

War Tasks of the German Steel Industry

Raw Materials and Substitutes—Plans for Technical Research — Post-War Economic Contest—Manganese in Slags

AN important meeting of the Association of German Ironmasters (Verein Deutscher Eisenhuttenleute) was held in Düsseldorf, Germany, on March 4, 1917, and detailed reports of it are just reaching this country. The most important discussion centered about the notable efforts the German iron and steel industry has put forth during the war and the steps that are being taken to prepare for the future struggle for the world's markets. Sir Robert Hadfield has translated a report of the meeting which has been printed in pamphlet form and throughout which the organization is referred to as the German Iron and Steel Institute. In an introduction to the translation he says:

"It can hardly be imagined that the speakers at the meeting could have thought that within a short time afterwards their views would be read in this country, so probably they were freely expressing their opinions.

"The translation represents statements well worth careful reading, not only because of their direct but also of indirect bearing.

"In the proceedings there is apparent a fear that Germany after the war is going to lose or have her trade seriously crippled, also that she must so organize her empire as to be independent of outside supplies. It also appears to be admitted that our enemy has become aware of the fact that in the future she will not be allowed to prey upon other countries' trade and that she recognizes what a serious difference will exist after the war, quite apart from the question of tariff or no tariff in other countries. This is probably the reason why Germany is fighting so desperately, and why she is so uneasy, and prepared to go to any lengths in this great struggle.

"The article indicates shortage of essential materials, as is evidenced by the urgent necessity of providing substitutes in many branches of technical requirements. It is interesting to note, one might say with some surprise, seeing how Germany has been held up as a pattern of organization, that she is suffering from the same ailment as ourselves—that is, the multiplication of commissions and committees."

The Institute's War Tasks

The principal paper of the meeting was a report by Dr. Otto Petersen on "The War Tasks of the German Iron and Steel Institute." A translated abstract follows:

The speaker in the first place pointed out that he had to confine himself to dealing with the war tasks of the institute *per se*, as these tasks, in their wider connection with the activity of the iron industry during the war, could not be reported upon until after the records of the war had been completed.

Supply of Raw Materials

Among the war tasks of the institute the question of the supply of raw materials was a very wide one. More especially the supply of coal lately played an important part, above all other questions, concerning the supply of raw materials for the iron industry. Luckily it was only during the very last few months that hitches occurred which were not due to the natural conditions of the mining industry or to lack of labor, but solely attributable to difficulties of transport and to the exceedingly severe winter which completely paralyzed coal traffic on the waterways. Moreover, the extraction of lignite, which for about 10 years past has been used in increasing measure in the western industrial establishments, was greatly impeded by the frost.

Iron and Manganese Ores.—A more gratifying aspect than that of the coal supply is presented by the supply of iron ore during the past year, in so far as it may be considered assured under present conditions. On the other hand, the supply of manganese ore again called for further efforts, which, notwithstanding good progress realized partly by increasing the home production and partly by endeavors to utilize all manganiferous substances to the utmost extent, cannot yet be considered to have fully achieved their end. The supply of ferrosilicon promises, subject to certain reservations, to become very satisfactory in future.

Electrodes and Aluminum.—The efforts towards increasing the capabilities of output of the electrode works by standardization of carbon electrodes, have led to a satisfactory result through the co-operation of all concerned. As regards the supply to steel works of aluminum for the deoxidation of steel, the institute has continued to act as an intermediary.

Magnesite and Refractories.—The institute has also co-operated towards regulating the importation of magnesite from Austria and will continue to exert itself in this question. Similarly, the institute has endeavored to assist, conjointly with the representative bodies of these branches of industry, in the solution of problems confronting the German manufacturers of refractory bricks, etc., and the limestone and dolomite quarries in matters concerning labor, transport and raw material, more especially by recommending the utilization of available refractory materials lying in the occupied territories.

Lubricants.—A troublesome question was the supplying of our works with suitable lubricants, more especially seeing that certain sources of supply of oil, which seemed to be available, cannot yet be used at present. However, by the manufacture of briquettes of mineral wax, the rolling-mills at least have obtained a lubricant serviceable for war-time purposes, and further experiments at obtaining, in our gas-producers, so-called "low temperature tar" have led to a successful result which imperatively calls for the widest possible application of this process in practice. The importance of supplying the iron industry with lubricants in sufficient quantities has induced the association to establish, in conjunction with the Mining Association of Essen and the northwestern group of the Assocation of German Iron and Steel Manufacturers, a department specially entrusted with the solution of the multifarious questions in the domain referred to. This so-called Office for Advice Concerning Lubricants and for the Control and Licensing of Supplies Thereof for the Rhenish-Westphalian Mining and Metallurgic Industry will, above all things, give advice to the works by specialists sent to the spot. The question, which was becoming serious for a time, as to how oil for large gas-engines could be procured for the works may be considered to have lately been solved satisfactorily by suitable measures taken by the War Lubricating Oil Company.

Vitriol of Copper.—Although during the past year it was found possible to supply the wire-drawing mills satisfactorily with vitriol of copper—a task in which the institute took part under the distribution scheme—further attempts have been made at reducing the consumption of vitriol of copper, and also at the same time replacing vitriol of copper by other wire-drawing mediums, and they give good grounds for hope that perhaps a tangible result may still be attained hereafter.

Calcium Carbide.—The measures taken for safeguarding the supply of calcium carbide led to the institute being entrusted with the distribution of this material to the western iron industry, and this function is being taken up by the institute, commencing from April 1.

Supply of Special Alloys.—In the work which our institute had to perform for the Association of German High-Grade Steel Works, it was afforded an opportunity of co-operating in the meritorious discharge of the tasks of the war raw materials supply department

and of the Aktiengesellschaft Kriegsmetall (War Metal Co., Ltd.) for the purpose of supplying the works with metals for alloying. Hitherto it has been possible, partly thanks to the fortunate co-operation of our commercial U-boats, to meet the requirements of alloy metals, such as chromium, tungsten, molybdenum, etc. However, it became necessary to create quite a special organization in order to regulate the consumption of high-speed tool steel, which organization is as yet too new to admit of forming a definite judgment. At any rate the efforts of the industry at effecting economies in the consumption of high-speed tool steel have been very successful.

Provision of Steel

An exceedingly large place among the war problems of the institute was taken by the provision of steel for the various branches of the war office and the shell factories. The statements made by the speaker on this subject showed what enormous efforts had to be made on the part of the iron industry in order to cope with the increasing demands of the army, that various organizations had to be created in order to carry out the large program drawn up, and that, in the course thereof, numerous functions fell to the share of the institute as an intermediary agency between the public authorities and the works concerned. In this connection, attempts have recently been made to relieve the additional strain to which our engineering works would otherwise have been subjected by the extra work required for the enlargements of plants—by resorting to the *utilization of iron-works plants existing in the occupied territories*—with regard to which measure the institute has again offered its co-operation.

Suggestions made by the institute with a view to improving the arrangements for the husbanding of the so-called economy metals have led to the result that a decentralization has been adopted as regards the preliminary examination of applications for licenses for the supply of such metals, which has fully met the expectations, more especially as the departments carrying out the tests of experiments as regards these economy metals at the works have co-operated in a wholehearted and intelligent manner.

Replacing of Copper Tuyeres.—The question of replacing copper blast-furnace tuyeres by iron ones has been busily occupying the institute, and has led to the standardization of their dimensions with a view to the more advantageous production of blast-furnace tuyeres and to the extension thereof to the tuyere box (blast box) as well.

Other Substitutes.—Besides serving as adviser to the industry in general the institute in many cases advised individual works who consulted it on various special questions, more particularly as regards bearing metals and substitutes for rubber and leather. Also the diversity of interpretations of the regulations concerning the traffic in economy metals led repeatedly to the intervention of the institute between the public authorities and the works. Similarly the institute was frequently requested by the authorities to investigate preliminarily and give an opinion on applications for licenses for supplies of copper articles required by the works—a task which was not always easy of solution if justice was to be done from all points of view.

The large dimensions gradually assumed by the work in the department for the control and licensing of supply of belting, induced the institute, in conjunction with the Mining Association of Essen, to contemplate the establishment of a special branch office of this control department (similarly as done with regard to lubricants) for the district of the Rhenish-Westphalian mining and metallurgical industry, in order to be able to meet more promptly the requirements of this industry.

Lastly, the executive of the institute has volunteered its service in connection with the new arrangement for control of the consumption of iron and steel.

The Institute's Activities

The president of the institute, Dr. Fr. Springonum, in presenting his business report, had the following to say regarding the activities of the organization:

Use of Blast-Furnace Slag

The labors, mentioned last year, of the Blast-Furnace Commission, concerning the uses of blast-furnace slag, have been continued. As may be known to you, the Minister of Public Works has, on our petition, appointed a commission which is to inquire into the applicability of lumpy blast-furnace slag as a material for addition in the preparation of concrete, and as a bedding material.

At the last meeting of this commission, last February, the Royal Institute for Tests of Materials in Lichterfelde, which was entrusted with the carrying out of the experiments, submitted a report which will shortly appear in print. This report says, as regards the final results:

> With blast-furnace slag, provided that it possesses the properties of that experimented with in this instance, a good concrete (rammed and ferro-concrete), and under circumstances even a better one, can be prepared than with gravel material. Even suspect concrete, that is to say, concrete prepared with slag having a tendency to disintegration, has proved serviceable. Iron embedded in concrete prepared with blast-furnace slag behaves in the same way as in concrete prepared with gravel. The slag exerts no direct influence as regards the rusting of iron embedded in concrete.

I may also point out, in this connection, that there exists in our institute a department for the investigation of bad results obtained in the use of blast-furnace slag, to which any such cases should be reported. Investigations made by this department have already been able to pronounce in several cases of complaint of alleged unfavorable results produced by slag in concrete, that the slag was unexceptionable.

In order to test the suitability of slag as a bedding material for permanent way formation-levels, experimental track sections will probably be laid down this year in order to ascertain in an unexceptionable manner to what extent the State Railway Administration may reckon with slag as a bedding material.

The Blast-Furnace Commission has, moreover, occupied itself with the question of replacing copper by iron as material for blast-furnace tuyeres and with the standardization of blast furnace tuyeres. This also applies to the experiments for rendering Siegerland manganese slag-sand lumpy.

Steel-Works Tar

The question already discussed at length of steel-works tar was once more taken up on the initiative of the technical committee of the Sales Association for Tar Products, in Essen on Ruhr. As the former labors had shown that it was impossible to lay down generally applicable data as regards a suitable composition of steel-works tar, on account of the varying local conditions, it is now intended to develop, in joint consultation, fixed methods of analysis for the examination of steel-works tar, in order that the results of tests obtained in different places may be comparable with each other.

The activity of the Chemists' Commission has, as hitherto during the war, been continued on the former lines. The first part—dealing with gravimetric methods of analysis—of the critical revision of the processes for the determination of phosphorus in iron and iron ores, has been completed; the experiments for the second part, dealing with volumetric methods of analysis, are progressing satisfactorily.

Mild Steel for Copper Fire Boxes

The technical commission of the Association of Thick Iron-Plate Rolling-Mills, whose business we are transacting, has repeatedly met in the past year. Their deliberations continued to deal chiefly with the substitution of mild steel for copper as a material for fire-box plates for locomotives. The results hitherto obtained with iron fire boxes may be called satisfactory, although a longer period of trial will be required before a definitive judgment can be found.

As regards promoting the home production of anchors and chains, we have repeatedly negotiated both with German manufacturers and with the consumers, more especially the Association of German Shipyards.

in order to secure for our home industry the supply of our requirements of anchors and chains after the war. I think I can hold out hopes of a satisfactory solution of this question, in which respect we are further relying on intelligent co-operation of the consumers, more especially of the shipowning concerns and also of the inspection societies.

Union of Technical Societies

The war has intensified the need, already felt before, of closer co-operation of the German technical societies, and preliminary negotiations on this question have led to a combination of the technical societies into a German Union of Technical-Scientific Associations. We have gladly joined this union and promised our co-operation, feeling sure that the purposes and aims of the union are the right ones. The union leaves to its individual members complete liberty in the special domain which each association has hitherto been dealing with, but wishes to insure joint action of the associations (whose number has now risen to eleven) on all important questions.

Organization for the Future

The titanic struggle of nations has confronted our iron industry in every direction with particularly great difficulties, and I hope that some day, when the war-time records of our works and our associations may be more freely disclosed, not only the full tribute of recognition will be paid for the great things which have been achieved, but that it will also be possible, immediately, to find ways and means of further pursuing, in the interest of the Fatherland, the thousandfold problems which, arising from the emergencies of war, could, perhaps, be solved only in part during the war.

We shall, after the war, far more than hitherto, have to rely on our own strength. Accordingly, the demands on us will be enormous. Industry will only be able to meet them by strenuous work, and will, above all, have to study better utilization of fuels and the further perfecting of the metallurgical processes. Coordination between metallurgical practice and metallurgical research, which has always been insisted on and promoted by us, will in future be imperatively needed.

The necessity of promoting with all energy, by scientific research, the progress of metallurgy, with an eye to the exceedingly keen competition in the world's market to be anticipated after the war is recognized. The only divergency of opinions still existing is as to how such promotion can be effected in the best and most effectual manner, whether by the establishment of a special research institute, possibly attached to the Kaiser Wilhelm Society, or by the expansion of an already existing similar institution, or by studying the problems of research, as they arise, in one or the other scientific laboratory, but always while maintaining the requisite relations with the practical working establishment.

Discussion of the Report

Captain A. Thiele, manager, of Esch, said in regard to the creation of an Institute for Metallurgical Research: Quite a number of research institutions, both at our German academies and at the great iron works, are continually engaged, and with good results, in laboring to perfect our processes for the production of iron and steel. Nevertheless a want in this respect—the lack of a very wide-ranged, all-embracing research institution—has never made itself felt more strongly than just now, during the war, when a large number of new problems has confronted us which, sprung from an emergency, had to be tackled there and then, and which, in fact, have partly been brought to a certain provisional solution, but for want of the necessary collectedness and calmness are still awaiting a definitive solution.

Very rightly, attention has been drawn just now to the gravity of the fight which our German iron industry will have to carry on on all fronts after the war. And I think no one can doubt any longer to-day, that after the victory of our arms our enemies will endeavor with all their strength to inflict on us subsequently an economic defeat of the severest possible nature. Hence let us mount guard, in order that these machinations of the enemy may be countered from the outset with the requisite energy.

Problems to Be Approached

A plethora of problems will confront the Institute for Metallurgical Research about to be founded. Among them are the desulphurization of blast-furnace coke and the saving entailed thereby of manganese in blast-furnace working, the elimination from the ores of their water of crystallization and of chemically combined water, as well as the mechanico-chemical dressing of our ores in general, the development of the mixer to make it serve as a preliminary refining apparatus, the desulphurization of and elimination of manganese from Thomas slag, and the better utilization of the waste products of metallurgical working in general, the improvement of the deoxidation process as hitherto known, thermic control in steel-works and roll-mill working, and other matters.

Loss of Manganese and Iron in Slag

Permit me to discuss briefly, in particular, one of these many problems. Just picture to yourselves that, with the present utilization of our Thomas slag, we are causing each year 300,000 tons of iron and 150,000 tons of manganese, in the form of their oxides to be scattered on the fields and meadows of foreign countries, which is not particularly gratifying to these, nor can it afford any gratification to our economic life, seeing that it represents an annual loss of 20 to 30 million marks. If we can succeed in abstracting the manganese and iron from the Thomas slag we shall not only save a great part of this loss, to the benefit of our national economy, but in consequence thereof we shall, moreover, reduce by many hundred thousands of tons the quantity of manganese and iron ores to be extracted from our mines by us per annum. I will only mention incidentally that in the end this will also afford some relief with regard to the whole labor question, which after the war will confront us in an accentuated form.

Every practical man will clearly understand how important the solution of these questions is for our whole economic life. And, thanks to the high esteem in which we hold science, we may confidently hope that we shall find the key to the solution of most of them.

In conclusion I would once more second the urgent wish of our president that, as soon as possible, funds should be rendered available for creating such an institute for metallurgical results, and this already during the war, as the raising of very considerable funds will, after all, be easier to the iron industry now during the war than later on after the war, under the incomparably more difficult economic conditions likely to exist then. Taking all in all, what is in question here is an intellectual mobilization of our particular industry.

Large Vanadium and Tungsten Exports

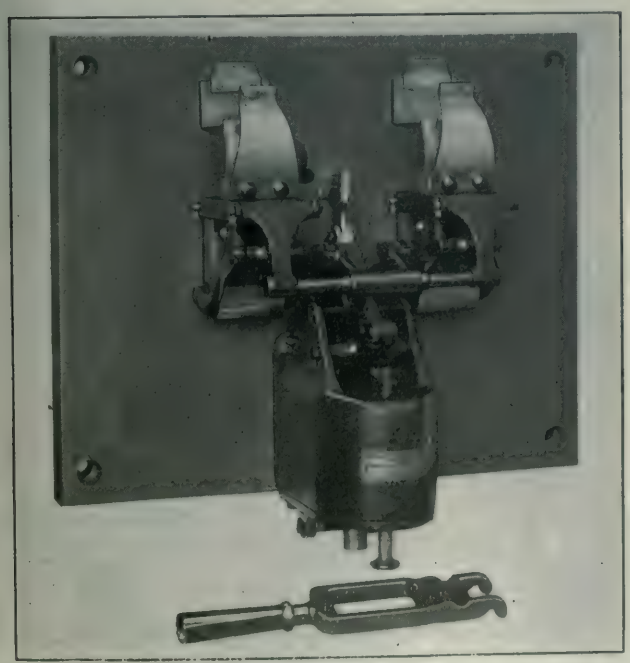
The United States is fast becoming a large source to foreign countries of two new important steel-making alloys. The exports of both ferrovanadium and ferrotungsten and tungsten metal have grown to surprisingly large proportions since the war started. The May exports of ferrovanadium were 311,360 lb., the largest with one exception ever recorded, when they were 358,639 lb. in March, this year. The May exports of ferrotungsten were 463,680 lb., or the largest ever reported, the next previously large total this year having been 169,583 lb. in April. The following table shows the extent of recent exports in pounds:

	May, 1917	11 Months Ended May 31, 1917
Ferrovanadium	311,360	2,412,072
Ferrotungsten and tungsten	463,680	1,612,122

Previous to the war practically no tungsten was exported. Vanadium exports before the war were less than one-quarter the present outgo.

Solenoid Operated Field Switch

A line of double-pole field switches arranged for solenoid operation has been brought out by the General Electric Company, Schenectady, N. Y. The switches are similar in construction to a non-automatic solenoid operated air circuit breaker and are designed to be mounted on a base near or attached to the field rheostat, or on the exciter board which is located some distance from the main control board as a rule. They differ from the circuit breakers in having the carbon secondary contacts omitted and a field discharge switch added, the latter to introduce a resistance of sufficient value across the field to prevent injury to the field coil windings by the inductive kick which follows the opening of the circuit. If it is desired to trip the switch by hand an insulated button attached to the tripping coil plunger and easy of access can be used, while removable handles are provided for closing the switch by hand.



Double-Pole Solenoid Operated Field Switches for Remote Control Are Opened and Closed by Push Buttons on the Main Control Boards, the Switch Itself Being Mounted Some Distance Away on the Field Rheostat or the Exciter Board

Small Industrial Caterpillar Tractor

For hauling in and around factory buildings the Cleveland Tractor Co., Cleveland, has developed a small tractor of the caterpillar type. It is designed as a substitute for the narrow gage industrial railroads operated in connection with large plants. The fact that the tractor does not require roads or tracks for its operation enables it to pass obstacles and move material rapidly from one department to another.



Uneven Ground Is No Obstacle to the Caterpillar Tractor Which Can Be Employed in Manufacturing Plants as an Aid to or a Substitute for the Industrial Railroad

The tractor is of the conventional caterpillar type that has come into extensive use for agricultural purposes in this country. As it does not travel on wheels but lays its own track the surface over which the tractor passes, it is emphasized, is not marred. This feature enables it to be used for hauling inside factory buildings, and as the over-all width is only 50 in. and the height is but 2 in. greater, the tractor can go through factory doors of the ordinary size. For use around industrial establishments where the ground is not even the tracks conform to the ground surface and do not require the laying of smooth pavements between the various buildings of the plant. The tractor can also be employed in the shipping room or loading platform for bringing material from the factory to cars that are to be loaded or in facilitating the unloading of incoming shipments.

Determining Moisture in Coke

In co-operation with the committee on coke of the American Society for Testing Materials experiments have been made by the U. S. Bureau of Mines to develop methods of determining moisture in shipments of coke. It was found that the moisture in coke could be determined by much simpler methods than those required for coal, because water in coke is all superficial moisture and in no way combined with the coke substance. As a result of these experiments the Bureau recommends that the moisture in coke be determined by drying the sample to constant weight at any temperature between 105 and 200 deg. C. The sample should not be crushed to pieces smaller than 1 in. No special oven is required. The foundryman may use a core oven to advantage or a warm place in the boiler room. The principal precaution to be observed is to dry the sample as quickly as possible after it is taken and to keep it in a tight container while it is conveyed to the place for drying. The experiments have further shown that wet coke can not be crushed without losing moisture. The results of this investigation will appear in a published report.

Government Will Build Many Steel Vessels

Unofficial Reports of Large Plants Near Philadelphia and Newark—Labor Problem Apt to Retard the Work—Numerous Other Projects

Plans of the Emergency Fleet Corporation for two Government shipyards to build 400 steel vessels within the next 18 months or two years are well under way, according to the best unofficial information obtainable by THE IRON AGE. Official confirmation is not to be had.

General Goethals recently announced that there would be two yards, one near Philadelphia and one near New York or Newark. It has become known within the past few days that the Government has acquired a large site on the Delaware River, near Fort Mifflin, said to comprise 900 acres, and that it will have the co-operation of the American International Corporation, Stone & Webster and the National City Bank of New York and the New York Shipbuilding Corporation. L. D. Lovekin, chief engineer of the New York Shipbuilding Corporation, has been "loaned" for the Government project and with a corps of assisting engineers has been busily engaged for weeks on plans for the plant. The size of the contract to be taken by the American International Corporation is, according to unconfirmed report, about $250,000,000. It is proposed to employ 15,000 men at the Delaware River plant.

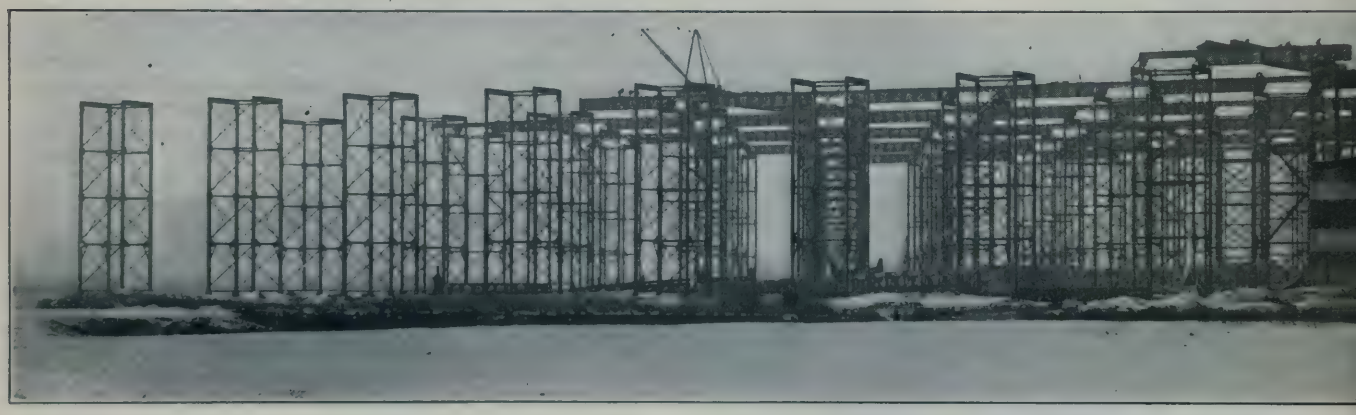
The other Government plant will be established on Newark Bay, where a large tract of land has been leased by the Submarine Boat Corporation, which, with the assistance of the Lackawanna Bridge Co., will undertake to build a large number of steel ships. That there is every intention of beginning work soon on this plant is indicated by the fact that the Lackawanna Bridge Co. last week sent out an inquiry for four five-ton cranes, specifying delivery within two months. During the past two months, the engineers of the Lackawanna Bridge Co., with the co-operation of General Goethals, have been entering into tentative contracts with fabricating steel plants for the furnishing of the fabricated plates and shapes for the steel merchant ships. It is said that more than 100 fabricating plants will be engaged in making standardized sections, which will be assembled at the Newark yard. It is presumed that a similar plan will be adopted by the American International Corporation, inasmuch as it has been announced that the Government yards will both be fabricating and assembling yards rather than shipyards in the general acceptance of the word.

Rapid Work Expected

It is admitted that it will take from six to eight months before a ship will be ready to launch at either Government yard, but after the first launching, the pace will become rapid, and about 100,000 tons a month will be the approximate output at each yard until the contract is completed. Of the 400 ships to be built in this manner, it is understood that 200 will be of 5000 tons register and 200 of 7500 tons register. It is said that the Submarine Boat Corporation will build about 1,000,000 tons of 5000-ton boats and the American International Corporation 1,500,000 tons of 7500-ton vessels.

Closely rivalling the Government yards are the plants affiliated with the Bethlehem Steel Corporation, with the decided advantage in favor of the Bethlehem yards that they are now actually building ships, while many of the other projected shipyards, including the two Government plants, are still on paper. The Bethlehem yards, which include the Fore River Shipbuilding Co., Quincy, Mass., the Union Iron Works of San Francisco, the Maryland shipbuilding plant of the Bethlehem Steel Corporation at Sparrow's Point, Md., Harlan & Hollingsworth of Wilmington, Del., and Samuel L. Moore & Sons, Elizabethport, N. J., are now engaged on a great deal of work both for the United States Navy and on private merchant vessels, and their managers stand ready to undertake any further shipbuilding program that the Government suggests.

Many of the new companies which have been organized in the expectation of receiving Government contracts will not discuss their plans for fear of the effect such discussion might have at Washington. There should not be too much optimism regarding the ability of such concerns to turn out any very large tonnage during the next year because of the difficulties they will have in obtaining equipment for their plants. Several companies are going ahead regardless of assurances of Government contracts and hope to be in a position to convince the Emergency Fleet Corporation of their ability to fulfill their promises.



The New Steel Shipbuilding Plant of the Sun Ship

Other Plants Planned

The Groton Iron Works, 50 Broad Street, New York, of which C. W. Morse is the head, is planning the construction of a steel shipbuilding plant at New London, Conn., to cost about $2,000,000. This company already has a plant at Noank, Conn., where wooden ships are now being built. It is said that the Groton Iron Works has not as yet received a Government contract for steel ships, but is making a bid for one.

Whittlesey & Whittlesey, naval architects, who for some time past have had plans ready for a steel shipbuilding plant to be operated under the name of the Southern Shipbuilding Corporation, 17 Battery Place, New York, have presented to the Emergency Fleet Corporation a plan for steel vessels of a standardized type. Whittlesey & Whittlesey are said to have worked out a design that will make it possible to dispense with long ship rolls necessary for bending plates. There will be

from stem to stern but a single bent plate and such plates, it is said, can be turned out in any bridge plant and can be shipped flat on railroad cars. Whittlesey & Whittlesey purpose to construct cargo ships 375 ft. long with a 52-ft. beam, and with a capacity of 7500 tons. The plans and specifications are said to have been approved by Theodore E. Ferris, naval architect of the Emergency Fleet Corporation and by the American Bureau of Shipping. It is proposed to lay down 16 ships at a time for which a yard is to be established at a southeastern Atlantic port. The fabricating is to be done in the Birmingham district. Whittlesey & Whittlesey promise to have ready for delivery between 32 and 48 of these vessels within 18 months.

Formal transfer of the steel fabricating plant of Milliken Bros., Inc., on Staten Island to the Downey Shipbuilding Corporation, 120 Broadway, New York, took place last week. The announcement that the sale would be made was published in THE IRON AGE several weeks ago. Mr. Downey said that $1,300,000, as a final payment on the contract entered into several months ago, had been turned over to Lorenzo C. Bilks, president of Milliken Bros., Inc. The Downey Shipbuilding Co. took possession at once and will convert the plant into a shipbuilding yard capable of manufacturing 100,000 tons of standardized steel steamships a year. The Downey Shipbuilding Corporation has a contract to build ten 7500-ton steel steamships for the Emergency Fleet Corporation.

A member of the editorial staff of THE IRON AGE visited several of the shipbuilding plants on the Delaware River last week. Most of these plants are extremely active with work which they have had on hand for some time past, the most serious drawback to 100 per cent efficiency being the shortage of skilled labor. For example, the New York Shipbuilding Corporation's plant at Camden, N. J., is employing 5000 men and could use about 2500 more if they could be obtained. Appeals have been made to the Government at Washington by the Atlantic Coast Shipbuilders' Association, which represents most of the large yards, for Federal assistance in obtaining a greater number of workmen. It has been impossible to obtain these by ordinary means and a policy of conscription was suggested to the Government but did not meet with an enthusiastic reception. The attitude of the Government officials is said to be one of let well enough alone so far as the labor question is concerned during the war, but Government officials glibly talked of equipping two yards each with 15,000 workmen. Those who are now building ships are asking, "Where are they going to get the men?" Unless some sort of labor conscription plan is adopted, it is believed by shipbuilders that the success of the whole Government's shipbuilding plan is threatened.

Large Amount of Government Work

The New York Shipbuilding Corporation has $50,000,000 worth of Government work on hand, mostly naval vessels. In addition it is at work on more than 20 merchant boats of various tonnages and sizes. As yet this plant has not been asked to build any vessels for the Emergency Fleet Corporation, but doubtless many of the ships now being constructed there will be commandeered by the Shipping Board.

The William Cramp & Sons' Ship & Engine Building Co., Philadelphia, is completing plant enlargements which have cost in the neighborhood of $1,500,000. This company, like the New York Shipbuilding Corporation, is very actively at work on ships for the Navy, in addition to which it has many contracts and a number of boats building for private concerns. Every ounce of energy is being put forth to complete naval vessels as early as possible and whether the Cramp yard will build any vessels for the Emergency Fleet Corporation is, so far as THE IRON AGE has been able to learn, not yet determined.

One of the most complete of the new shipbuilding plants along the Delaware River is that of the Sun Shipbuilding Co. at Chester, Pa. This company is an affiliation of the Sun Oils Co. of Philadelphia. Early in 1916, the shipbuilding company bought the engine works of the Robert Wetherill Co. and organized a shipbuilding plant with this works as a nucleus. An adjoining site of 80 acres with 2500 ft. water front was purchased and five shipways, each 600 ft. long, a mold loft 600 x 80 ft., a plate shop of the same size, a boiler shop and other buildings were erected. The Sun Shipbuilding Corporation is building three types of steel vessels, all of 10,000-ton capacity. One is an oil tanker, another is a cargo boat of 10½ knots and the third a cargo boat of 13½ knots. Eighteen other merchant vessels are under contract and three mine sweepers will be built for the U. S. Navy. Four of the 18 merchant ships under contract are for the Emergency Fleet Corporation. The operations of this plant are handicapped somewhat by a lack of labor. Eighteen hundred men are now employed and 1000 more could be used. At the present rate of employment, it will require six months before the plant can reach a thoroughly efficient working basis.



building Co. on the Delaware River, at Chester, Pa.

Ship Building at Chester

The Chester Shipbuilding Co. of Chester, Pa., is also building a number of steel merchant vessels. This concern recently bought another shipbuilding site including a number of shops at Bristol, Pa., and was granted a permit by the Commissioner of Navigation at Philadelphia to build 12 new shipways at the Bristol plant and four new shipways at the Chester plant. It is understood that these are to be erected in anticipation of the concern receiving a Government contract to build steel merchant vessels. There have been rumors that Harriman capital has been invested in this enterprise and that its plant will ultimately be one of the largest in the United States. Officials of the company decline to discuss these rumors at present and are withholding any definite announcement of their plans pending the decision of the Emergency Fleet Corporation on Government ship contracts.

The Pennsylvania Shipbuilding Co., Land Title Building, Philadelphia, and its affiliated concerns, the New Jersey Shipbuilding Co. and Pusey & Jones, are understood also to be expecting a Government contract

(*Continued on page* 236)

Women Employees in British Steel Works

Responsible Work in Making Munitions and Machine Tools—Classification of Their Capabilities as a Result of the War

THE extent to which women are employed upon responsible work of all kinds in England in engineering and other industries in making munitions has been prominently illustrated by means of an exhibition of photographs and samples of women's work recently held at Bristol, England. The London *Iron and Coal Trades Review* gives an extended account of it in a recent issue, together with illustrations, two of which are here reproduced as clearly as possible in the absence of the original photographs. The exhibition is one of a series arranged for various industrial centers by the Labor Supply Department of the Ministry of Munitions.

In various quarrying and building work views are exhibited showing women excavating, mixing lime, stone breaking, sieving, and feeding slag crushers for mixing concrete, mixing mortar and acting as bricklayers' laborers. In the manufacture of explosives and chemicals they are seen loading raw materials into ships, picking cotton waste, charging nitric acid stills with nitrate and stoking them, etc.

Women in Foundry Work

In foundry work they are shown making cores, operating a variety of molding machines, stump-molding and carrying molds from the machine to the trolley. In other views they are fettling, riddling and transporting sand.

In constructional engineering women are seen both as helpers and as operators on heavy as well as light work; cutting steel bars on a circular saw and on a band saw, drilling angle and T-bars, operating a large punching and shearing machine on junction and tie plates, etc. In one view four women are in charge of 12 drilling machines, working on a steel boom for bridge girders; in another a woman is in charge of three radial drills on a lattice girder for a railway bridge; in another drilling a cast-iron bedplate. In a further view a woman is helping with a hydraulic riveter, steadying and placing the machine on hot rivets; in another a woman is marking out channels for the main boom of a girder for a railway bridge.

In shipbuilding and marine engineering photographs show women electric-wiring on board, counter-sinking plates, operating radial drills, grummeting, tubing and expanding condensers for marine engines.

A still greater variety of work is seen in general engineering. Women are shown attending power plant up to a 1000-i.h.p. Belliss engine, taking charge of electric generating plant and large switchboards, operating electric overhead and jib cranes up to 60 tons, and driving electric trucks. In the machine shop various views show women boring a boiler shell, placing boiler plates on an edge planer, etc. In a locomotive shop they are seen working slotting, milling, shaping and other machines on motion details and other locomotive parts, and a variety of other machines. Specimens are shown of a finished engine axle-box, a bogey wheel center, and other locomotive parts, made by women.



Women Unloading and Piling Refractories at a British Steel Plant

The section of tool-room, gage and allied work deserves particular attention, because many of the specimens shown illustrate strikingly what is also to be found in other sections—the ability of women to undertake not only repetition work, but also individual jobs with short runs, for which the operator sets up both the work and the tools.

Making Machine Tools and Shells

In machine-tool making, women are seen lining the fast heads of lathes to micrometer, scraping the beds and saddles and headstock bearings of lathes, scraping and bedding down slides of radial drills, erecting lathes and fitting and assembling counter-shafts, etc.

The operations now undertaken by women in the production of shells and fuses cover practically the whole manufacture of the smaller sizes and many of the larger. It is therefore needless to specify the various operations that are illustrated and exhibited.

The exhibition shows a great variety in the photographs and specimens of the parts of internal combustion engines, including parts of the Clerget, Diesel and other engines, as well as of types used in "Tanks," tractors and motor omnibuses and lorries.

Various appliances and a number of photographs are exhibited in connection with the welfare work, which is an increasingly important element in the introduction of women into industrial establishments.

By special permission of the Ministry of Munitions, the London paper referred to was able to reproduce photographs showing women at work in and about iron and steel works. To the stay-at-home Briton these photographs may represent strange sights, though they may recall to the globe-trotter scenes he has seen abroad, as in India, where he may witness female coolies unloading manganese ore from railway trucks with their "dulangs" (pans) on the quayside, or carrying material to fill the concrete mixer in a blockyard; or in the nearer East, where women of the Slavonic race may be seen in voluminous skirts stacking bricks or slaking lime or carrying bricks and mortar up inclined paths on to the top of high buildings in course of erection, where these primitive methods of handling material still prevail. Hitherto British women have been spared this class of manual labor, but with men wanted for other urgent work and for the colors, the women have readily responded to the call, and taken their places, making efficient substitutes in many branches of various industries.

The presence of ladies in the counting house, the tracing office, and even in the laboratory and testing room is now a familiar sight, but their services in the machine shop, the yard, and about railroad sidings bring home the far-reaching effects of the great war.

A deputation from the National Gas Council had an interview recently with the Reserved Occupations Committee, who were joined by representatives of the Ministry of Munitions and of the Director of National Service, for the purpose of discussing whether any more men could be released from the gas industry for the army and what class of men it was essential should

be exempted from military service. As a result of this interview, a classification of men is to be published, engaged inside and outside the works, covering those who should be retained at their civil occupations if over certain age limits or if not fit for "general service," and of others who should be so retained unless and until satisfactory substitutes are found, with a reservation as to the release for service of any of the men if, in the opinion of the Dilution Officer of the Ministry of Munitions, they can be replaced by women.

Women's Industrial Work Classified

To assist managers in determining the utmost extent to which they can go in the direction of employing women, the National Gas Council has published some notes, supplied by the Reserved Occupations Committee, and has added thereto a list of varieties of work upon which from their own knowledge women have already been employed successfully.

As some of the work in and about iron and steel works and in engineering shops is similar to many of the occupations in and about gas works, some of these notes are reproduced in an abridged form, and here and there suitably modified. They are in the form of replies to the general query: "Can women be employed, and if so to what extent, in the undermentioned occupations?" and are as follows:

Coal Handling.—Unloading ships and barges with grabs or skips worked by cranes.—Barges can be emptied by women, who can fill skips and wheel away. Handling grabs is not suitable work for women; but they can be employed as crane drivers.

Unloading of railroad cars.—Women are successfully employed in emptying railroad cars. Operating self-tippers and capstans might also possibly be done by women. Small shovels and suitable clothing are essential.

Weighing.—Quite suitable, except where the position of the weighbridges makes it undesirable.

Pushing and tipping trucks.—Yes, in most cases.

Attendants on coal conveyors, elevators, and breakers.—Yes, in some cases.

Filling trucks by shovel.—Yes.

Coke Ovens.—Handling of hot coke, quenching, and trimming.— No.

Attendants on coke conveying, elevating, and screening plants.—Yes, in some cases.

Coke Handling in Yard.—Filling sacks from hoppers or with forks.—Yes.

Stacking sacks on vans.—Yes, if the sacks are not too heavy.

Filling trucks, carts or barrows.—Yes.

Weighing.—Yes.

Sack repairing.—Yes.

Coal picking and washing, and bagging.—Yes.

Wheeling from coke breakers.—Yes.

Coke-crushing machine.—Yes.

Screening and Packing Breeze.—Yes, where the work is done by hand. Where it is done by machine, the man in charge is sometimes a "handy-man," capable of doing repairs, who could not be replaced by a woman.

Engine-room Attendants.—Cleaning, and as assistants.—Yes. Not in charge.

Time Keeping.—As assistants.—Not in charge, except in small works. Yes, as a rule; not where the "assistant" is responsible for the keeping of complicated wage records.

General Laboring.—Such as sweeping-up, tarring and painting, cleaning firebricks and general cleaning.—Yes. Cleaning windows by women is regarded as summer work only in some works.

Scraping, Tarring, and Painting.—Yes. Summer work only.

Lacquering and Polishing.—Yes, with skilled male supervision.

Skilled Repair Staff.—Bricklayers, carpenters, engine-fitters, etc.—No. As mates to above.—Yes, in many cases.

Workshops.—Women can attend to drilling, planing, and shaping machines and lathes; also for simple work on vice. They have been successfully employed in munition factories, particularly where the work is of a repetition character. Tool-setters and a skilled overlooker are, however, necessary. The suitability of the work for women would depend upon the kind of work being done; and this varies greatly between large and small works.

Works Testings.—Routine tests.—Yes, under skilled supervision, and after a few months' preliminary training.

Storekeeping.—Yes, to a large extent.

Driving Light Motor-Wagons, etc.—Yes.

Other Work.—Attending sulphate of ammonia plant.—Yes, as assistants and for bagging sulphate.



British Women Unloading and Stacking Limestone at Air Blast Furnace Plant

Concentrated ammonia plant.—Yes, for watching gages and temperature to regulate steam.

Tar Distillery.—Yes, for cleaning pitch bays and bagging methylene crystals.

A New Permanent Magnet Steel Containing Chromium

What would probably be exploited as a wonderful substitute alloy steel, if made in Germany, has been quietly and successfully produced by two or three American steel makers for over a year. It is a new magnet steel as a substitute for the older product of tungsten steel.

Not long after the war started and the price of tungsten advanced, efforts were made to find a steel that would be cheaper and also as efficient as the permanent magnet steel then being used, containing anywhere from 5 to 10 per cent tungsten and sometimes even up to 25 per cent. The demand was insistent from both magneto makers and electric companies making meters, because the tungsten magnet steel was reaching prohibitive prices. It was even stated that automobile makers were substituting batteries instead of magnetos because American steel makers could not make as good magnet steel as foreigners, manifestly an incorrect statement.

The new steel, which is reported to be not less than 90 per cent as efficient as the old permanent magnet steel, is a 0.90 per cent carbon steel containing about 2 per cent of chromium and is now being made in electric furnaces in this country and extensively used by many consumers.

This new type of steel is based on investigations made by Dr. John A. Mathews, president Halcomb Steel Co., Syracuse, N. Y., and published by the American Society for Testing Materials about three years ago, in which it was pointed out for the first time that certain types of steels are better magnetically when quenched in oil than when quenched in water. This statement was entirely contrary to all previous ideas regarding the hardening of steel for permanent magnets.

Magnetically this new chromium steel is equal to tungsten magnet steel in permanence and somewhat lower in residual density. Users have found it possible to substitute it for the older steel without making any change whatever in their windings or in the cross sections of the magnets used.

Practically chrome magnet steel, as the new steel is called, is not as good as the tungsten magnet steel, because it requires oil hardening, which is not as convenient as water hardening and also because chrome steel in its natural state is much harder to drill or machine and the steel itself must be handled with greater care and uniformity in heat treatment than is necessary with tungsten steel.

A large electric manufacturing company in this country has this to say regarding the new steel: "We have been using this material for permanent magnets

for some time past. By close co-operation with the manufacturers of the steel and careful development of the necessary methods and processes for its treatment, we have obtained results which are entirely satisfactory."

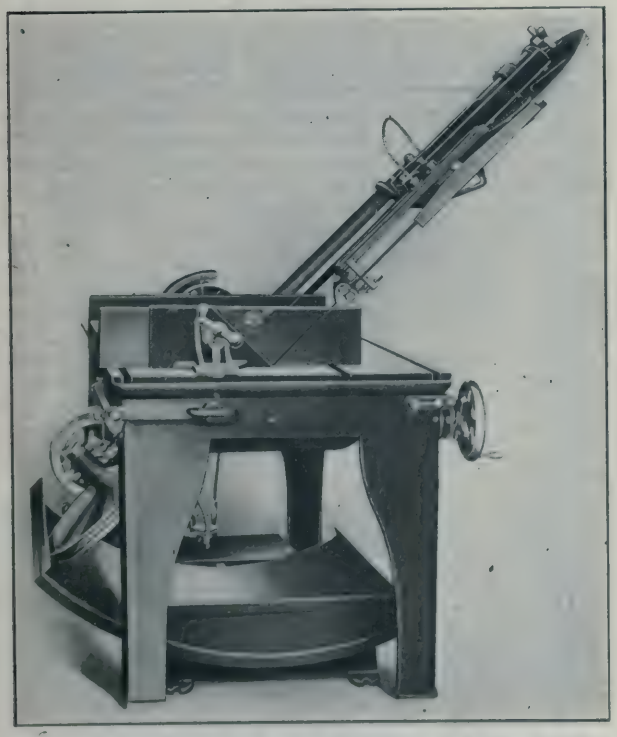
Universal Metal Cutting Band Saw

A band saw in which the blade can be tilted to a maximum of 45 deg. on either side of the vertical has been brought out by the Armstrong-Blum Mfg. Co., 333 North Francisco Avenue, Chicago. The design of the machine is somewhat unusual and is said to provide for easy operation and a wide range of work.

The saw blade is mounted on two flanged wheels supported by a frame which is carried on pivots in a cage under the table. The wheels may be tilted to alignment with the saw blade. The cage supporting the blade frame has four hardened roller bearings and the rollers which guide the blade are of the double ball bearing type with dirt-proof felt oil rings.

The saw table is 32 x 60 in. and is provided with four ¾-in. T slots, the two in the center being machined and notched to accommodate the jaws of the vise. These jaws are 6 in. high and 12 in. wide and can be shifted quickly to give a maximum opening of 18 in. It is possible to reverse the jaws and shift them from one of the center slots to the other, or remove them entirely if it is desired to fasten fixtures or pieces of unusual shape directly to the table.

The feed is controlled by a thumb lever at the front of the machine, the pressure being transmitted to the saw blade through a bronze worm gear with cork inserts, two friction disks, a spring and an adjusting nut. A handwheel is employed for manual operation of the feed. The swinging of the blade is easily accomplished, a set of graduations being provided to



Right or Left Miters Up to a Maximum of 45 Deg. Can Be Cut by Tilting the Band Saw Blade and Guide Wheels while Straight Work Is Handled in the Ordinary Way

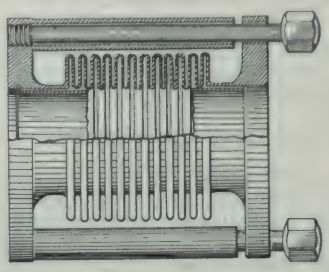
indicate the exact angle at which the blade is tilted. The machine can be stopped at any required depth of cut by varying the position of the knock-off dog.

A centrifugal pump located underneath the table and driven by a belt from the main shaft forces lubricant to the blade at the point of cutting. The lubricant that drips down is caught by a telescoping pan which is relied upon to catch all the surplus regardless of the position of the saw blade.

Belt drive is regularly provided, together with a pump and connections and pan. If desired the machine can be furnished for dry cutting and also with motor drive.

A One-Piece Machined Expansion Joint

As a substitute for loops and U-bends and stuffing box and long sweep expansion joints, the R. D. Nuttall Co., Pittsburgh, has brought out a one-piece joint. The action of the joint is similar to that of an accordion or bellows, limiting bolts being provided to prevent expansion beyond the safe limit.



Machine Finished Corrugations Are Relied Upon to Take Care of the Expansion or Contraction of a Pipe Line

The joint is made from a solid hammer forged steel blank and the corrugations are machined both inside and out. It is emphasized that great care has to be taken in doing this work, and after it is completed the blank is tempered in oil. Packing has been eliminated and it is emphasized that the possibility of leakage has been done away with, as well as securing a joint which is readily responsive to slight changes in the length of the pipe line of which it forms a part and capable of withstanding high pressures. The joints are made for use on high pressure piping ranging from 4 to 18 in. in diameter and for low pressure work the pipe sizes range from 20 to 48 in. The high pressure joints have a total movement of 2 in. while that of the low pressure joint is ⅝ in. Standard flanges are provided for both classes of joints.

A breakdown test of a corrugated copper joint and one of the type illustrated was made under similar conditions to determine the comparative life. The number of expansions for which the copper joint lasted was 28, while the steel joint had a life of 950 expansions.

Government Shops to Cost $7,500,000

Secretary of the Navy Daniels is asking Congress for an appropriation of $7,500,000 to increase the capacity of the Washington Navy Yard, where the big guns for the navy are finished and assembled. New shops are to be built for the manufacture of guns, mounts, torpedoes, mines, telescopes, sights, optical instruments and miscellaneous ordnance supplies. It is planned to spend $5,000,0000 on new buildings and $2,500,000 for machinery. The Secretary said:

> Contracts for guns, mounts and other ordnance supplies are becoming increasingly difficult to place. The proposed work includes the construction of a large six-story machine shop for mines, mounts, and torpedoes; a five-story pattern and woodworking shop, an extension to the power plant, a new brass foundry, an extension of the steel forging plant, an optical shop, range finder towers, administration building, quarters for enlisted personnel under instruction, and the extension of the yard service system to supply adequately these new structures.
>
> With the accomplishment of the extensions contemplated, ample manufacturing facilities will be provided for the manufacture of from 300 to 900 torpedoes per annum, at least 3000 mines per month, a large increase in the manufacture of guns, mounts, and other ordnance accessories, and the manufacture and repair of the larger part of the optical work for the entire naval establishment.

The Youngstown Sheet & Tube Co., which has 55 puddling furnaces at East Youngstown, Ohio, and the A. M. Byers Co., Inc., Pittsburgh, which has 88 puddling furnaces at Girard, Ohio, will both pay the Amalgamated rate of $12.80 per ton for boiling for July and August. Both these plants are operated non-union, but have always paid the Amalgamated rate or a higher rate.

Under a compromise agreement, about 3000 employees of the National Conduit & Cable Co., Hastings-on-Hudson, N. Y., have returned to work after being out on strike. The men will receive an advance of two cents an hour, with nine-hour day. The men sought an eight-hour day. Machinists at the plant have received an increase of 3 cents an hour.

TRADING WITH THE ENEMY

Elaborate Provisions in Regard to Patents and Other Matteers in Pending Bill

WASHINGTON, July 23.—A measure of far-reaching consequence to the business men of the country, forbidding trade intercourse with the enemy under severe penalties and providing for the conservation of the property of enemy aliens in the United States, has been passed by the House and is about to be reported by the Senate Commerce Committee, with the expectation that it will become a law within the next 30 days. The bill is based upon the doctrine of Anglo-American law that one of the immediate consequences of war is the interdiction of commercial relations between the citizens or subjects of the belligerent nations, with certain negligible exceptions covered by special licenses.

The trading with the enemy bill, as it is called, defines the word "enemy" to be (a) any individual, partnership, or other body of individuals, of any nationality, resident within the territory (including that occupied by the military and naval forces) of any nation with which the United States is at war, or resident outside the United States and doing business within such territory, and any corporation incorporated within such territory of any nation with which the United States is at war or incorporated within any country other than the United States and doing business within such territory; (b) the government of any nation with which the United States is at war, or any political or municipal subdivision thereof, or any officer, official, agent, or agency thereof; and (c) such other individuals, or body or class of individuals, as may be citizens or subjects of any nation with which the United States is at war, wherever resident or wherever doing business, as the President, if he shall find the safety of the United States or the successful prosecution of the war shall so require, may, by proclamation, include within the term 'enemy.'" Allies of the enemy are included in the same general category.

The term "to trade," as employed in this measure, is given a very broad significance, including all the following transactions: "(a) pay, satisfy, compromise, or give security for the payment or satisfaction of any debt or obligation; (b) draw, accept, pay, present for acceptance or payment, or indorse any negotiable instrument or chose in action; (c) enter into, carry on, complete, or perform any contract, agreement, or obligation; (d) buy or sell, trade in, deal with, exchange, transmit, transfer, assign, or otherwise dispose of, or receive any form of property; or (e) to have any form of business or commercial communication or intercourse with." It is made unlawful by the bill for any person in the United States, except with a license from the Secretary of Commerce, to trade or attempt to trade with an enemy or with an ally of the enemy or to transport an enemy or an ally of the enemy.

All persons coming within the category of enemies or allies thereof, including individuals, partnerships, corporations, etc., are forbidden to assume or use any name other than that employed at the beginning of the war, except by special permission.

To provide for the conservation of the property of enemies and allies of enemies and to enable citizens of the United States to discharge obligations thereto, the Secretary of Commerce is authorized to appoint an official, at a salary not exceeding $5,000 per annum, to be known as the alien property custodian, who will be empowered to receive all money and property in the United States due or belonging to an enemy or ally of an enemy.

An important feature of the trading with the enemy bill is an elaborate provision with respect to the patent rights of enemies and allies thereof and the privileges bestowed upon American citizens to manufacture during the war articles covered by patents held by enemies or their allies. Applications for letters patent or for registration of trademark, print, label, or copyright may be filed and prosecuted in the United States by an enemy or ally thereof. Any such person who is unable during the war, on account of conditions arising out of the war, to file such application or to pay the official fees, may be granted an extension of nine months after the war "provided the nation of which said applicant is a citizen, subject or corporation shall extend substantially similar privileges to citizens and corporations of the United States." Any citizen of the United States, or any corporation organized therein, may pay to an enemy or ally thereof any tax, annuity or fee in relation to patents, trademarks, prints, labels and copyrights.

The use of enemy-owned patents or copyrights during the war is provided for in detail. Licenses are to be issued by the Federal Trade Commission.

The money paid to the alien property custodian by the licensee is not to be turned over to the owner of the patent or copyright until the latter has secured a judgment upon filing a bill in equity in a District Court of the United States for the recovery of royalty. Should no action be brought within one year after the end of the war, the licensee will be entitled to receive back all funds deposited by him with the alien property custodian.

It is not the purpose of the pending measure to provide a method for the distribution after the war of money or other property acquired by the alien property custodian and it is expressly stipulated that all law claims to any such money or property "shall be settled as Congress shall direct," the object being, presumably, to provide merely for the conservation of enemy-owned property during the war, its final disposition to be determined in accordance with the terms of the peace treaties by which the war is concluded and the reciprocal legislation enacted by the signatory powers in pursuance of such conventions.

Severe penalties for the wilful violation of the proposed law or of the provisions of any license, rule or regulation thereunder are provided by the bill, including fines not to exceed $10,000 or imprisonment for not more than ten years, or both. The Secretary of Commerce is authorized to create a division in his Department for the execution of the law and an appropriation of $250,000 is made for the payment of salaries of all persons employed therein. W. L. C.

The World's 1916 Copper Output

The world's production of copper in 1916, according to a recent issue of Pester Lloyd, was 1,396,600 tons as compared with 1,061,300 tons in 1915, an increase of 335,600 tons. The 1914 output was 923,909 tons and that of 1915 was 1,066,000 tons. Of the 1916 total 880,880 tons is credited to the United States; this was 556,000 tons in 1913. (The U. S. Geological Survey recently estimated the U. S. production of smelter copper for 1916 at 1,927,850,848 lb. or 860,647 gross tons.) Next in importance ranks Japan with 90,000 tons in 1916, followed by Chile with 66,500 tons and Mexico with 55,000 tons.

Changes in Roebling Co.'s Selling Organization

Ira J. Francis has been appointed Pacific coast sales agent, with entire charge of the selling organization of the John A. Roebling's Sons Co., of California. His headquarters are at 646 Folsom Street, San Francisco. For the past 16 years he was manager of the Los Angeles branch of the company, and will be succeeded by J. N. Colkitt. S. W. Gilman, who was formerly assistant manager of the San Francisco store, has been placed in charge. No changes have been made in the management of the Portland or Seattle branches, which are in charge of L. H. Parker and W. F. Richardson, respectively.

The Aborn Steel Co. will build a one and two-story warehouse and office building on the site recently purchased at 22 Clarke Street, New York. The cost will be about $18,000. The company will occupy the new building about Oct. 1, 1917, and will enlarge its warehouse stock of high speed steel, carbon tool steel, spring steel, music wire, drill rods, alloy steels, shafting, etc. Branch offices will be at 269 Drexel Building, Philadelphia, and 133 Andrews Street, Rochester, N. Y.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the DAVID WILLIAMS CO., 239 West Thirty-ninth Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: Equitable Building. Philadelphia: Real Estate Trust Building. Cleveland: Guardian Building. Cincinnati: Mercantile Library Building.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year. Entered at the New York Post Office as Second-class Mail Matter.

Regulation of Prices or Conditions?

While the steel making and consuming industries were kept on the anxious seat during the pendency of the food bill in the Senate, in doubt whether or not a provision for iron and steel-price regulation would be part of the measure as finally enacted, and while the President's "one-price-to-all" suggestion of a fortnight ago increased the uncertainty, the iron and steel market without any ado quietly settled the matter itself. It simply stopped. When it resumes it will be with the full consent and approval of the buyers. That has not been their attitude or frame of mind during the major portion of the spectacular price advance of the past year and a half. By the end of 1915, when steel prices reached the top level that had been attained in 1907, steel buyers had reached the position of buying under protest. They were actuated by fear rather than judgment, and simply hoped that in buying they were choosing the lesser of two evils.

When steel buying stops, it requires a great deal of force to start a fresh movement. In the past there has always been a drastic readjustment of prices together with a period of greatly restricted production. No restriction of output through lack of orders can be considered, in the present temper of the trade, as even a remote contingency during the war, though perhaps stranger things have occurred. As to a readjustment in prices, it is a matter of opinion whether there exists to-day a set of prices which can be regarded as "the market" and from which a readjustment would proceed. The rational view would seem to be that there is no semblance of a regular forward delivery market, hence when a fresh buying movement starts the price structure will simply be a new one.

One of the objects of the lights in Washington who desired iron and steel price regulation was to prevent a market runaway due to the Government taking so much material out of the situation. At the moment no such need exists. The market is not running or even walking. Another argument in favor of price regulation was that there was danger of some consumers being put out of business, either through some being less fortunate than their competitors in buying ahead, or through all yielding to the desire to be "protected" and undertaking to pay higher prices for steel than the market for their finished wares would eventually justify. However, if the steel market continues a sufficient time in its present state, such dangers will be largely removed. When buyers resume buying in a large way they will do so with their eyes open.

Government dictation of prices for the iron and steel industry would have certain definite effects, but it would not be remedial in its action. With the free operation of the law of supply and demand and with free and unlimited competition (among buyers) prices of pig iron, coke and various finished steel products have been made to occupy very curious relations to each other, the relations changing from time to time. Two years ago Connellsville furnace coke sold at less than one-eighth the price of basic pig iron at Valley furnaces. One year ago, with all prices higher, it sold at one-seventh the price of pig iron. At the beginning of this month, with pig iron quadrupled in value, coke sold at two-sevenths the pig-iron price. The relation between pig iron and billet prices has changed in equally anomalous fashion. Billets have brought more than wire rods, wire rods more than wire nails, skelp more than pipe, and galvanized sheets more than spelter.

To dictate harmonious prices would not be difficult, so far as concerns the making up of a logical schedule, but that would not remove the fundamental conditions that have disarranged the market. Certainly it is reasonable to assert that if the Government were to undertake to smooth out conditions, whereby the free play of market conditions would produce reasonable and logical prices, it would be doing a much better work than the mere dictation of prices. As to coke, the greatest offender in both price and supply, there is no scarcity of productive capacity, but rather a considerable excess. It is merely a case of car and labor supply. With its great powers the Government should be able to apply a remedy. With cheaper coke there could be cheaper pig iron, and with more coke there would be more pig iron. If still there were not enough pig iron, the Government should be able to expedite the erection of blast furnaces. In the matter of finished steel products there has been opportunity, entirely neg-

lected thus far, for the Government to cause an increase in the production of the classes particularly required. A wooden ship program was put forward, partly because ship plates and the facilities for building enough steel ships were not available. Then, by hook or crook the steel mills were required to find plates for steel ships, which they could do only by taking the plates from other consumers. Then came a plan to build a large number of freight cars to be leased to the railroads, with more plates still, and these could not be found. There was no one to take them from. Three months ago the Government could have exercised its influence to provide material and equipment for the building of slabbing and plate mills, which could have been built in relatively short order with the necessary influence.

Of prime importance in bringing about a better supply of all needed commodities in the iron and steel industry is the matter of labor. There is a shortage in the number of men and a lack of adequate performance on the part of those holding jobs. If the materials are essential to the conduct of the war, it is difficult to see why the Government is not as free to call upon men to work as to call upon them to fight.

It may be possible, by educational work, to bring about a realization that more effective work can be done toward establishing rational market conditions in iron and steel by stimulating the operations of production than by dictating prices.

Government Help on Labor

In England the government and industry have obtained the co-operation of labor to such an extent that production has been increased despite the sending of several million men to war. The use of female labor in places left by men is but one factor in this result. In the United States labor has not awakened to the seriousness of the situation confronting the nation. While the results in England have come largely by government effort, the officials at Washington have adopted a "hands off" policy so far as concerns aid to manufacturers in providing sufficient labor.

One of the most serious obstacles to maximum production, as has been pointed out many times, lies in the inclination of many workmen to labor only as many days a week as is necessary to secure a living. In England it is a violation of the defense of the realm act for a workman or business executive to absent himself without good cause from any work in which the government has an interest, wilfully to miscarry instructions, or to impede production in any way.

Our shipbuilding industry illustrates glaringly the lack of co-operation on the part of labor. Several of the large yards which are building warships and merchant vessels not only are handicapped by an insufficient number of men, but are unable to get full performance from the men they have. A yard on the Delaware employs 5000 men and could use 2500 more. Meanwhile instructions come from the Secretary of the Navy to "speed up." Bonuses have been offered to the men for overtime and Sunday work. Some of the workmen will work on Sunday for double-time pay and "lay off" on Monday, so that actual production is not increased but costs are. In fact, this disposition of the workmen to take one or two days off every week in addition to the Sunday rest is a problem that may only be solved by government action.

Shipbuilders have gone to Washington to get advice on methods of increasing the number of workmen and preventing waste of time, but the attitude of shipping authorities there is that they have troubles enough on their hands at present without taking up the labor problem. Nevertheless shipbuilders are convinced that something in the nature of conscription of shipbuilding labor must eventually come if our ship program is to be a success. They have regarded the labor question as of even greater seriousness than the differences in the Shipping Board and the Emergency Fleet Corporation. That trouble has at last been settled by the President's belated action, but the present attitude of labor threatens the activities of the government throughout the war unless decisive steps are taken.

Steel Profits by Processes

In any scheme of price fixing in the iron and steel industry, the difficult matter, once the total profit is fixed, is to distribute this along the line—to determine how much should go to the iron mine, how much to the coke works, how much to the blast furnace, and so on. Should the Government undertake to regulate prices at which all finished steel should be sold, it would be absolutely essential to make this distribution. Even in the case of the steel purchased directly by the Government this must be done, for amid the many uncertainties surrounding the Government program, if there is one, there has been one unequivocal statement, that orders for steel are to be distributed among producers according to their steel making capacity.

Prices made to the Government thus far on plates, shapes and bars have been much lower than those obtainable in the open market. It would be manifestly unfair to expect a concession from the steel mill that purchases its pig iron and expect nothing from the blast furnace which supplies the pig iron. That would be tantamount to saying that if a capitalist has elected to invest money in a merchant blast furnace, in a coke works or in an iron mine, he has no duty to the Government—he can go ahead and make all the money the market suggests possible; but if he has elected to put his money in open-hearth furnaces with a plate mill then he has a great duty to his country and must cheerfully make sacrifices.

The injustice of the procedure would be made the greater if the price of the finished steel were determined by the cost showing of the integrated companies, whose profits would be automatically telescoped so far as the Government was concerned.

In 1916 the portion of the total output of Bessemer and basic iron, ferromanganese and spiegeleisen that was sold, not consumed by the producer, was 14.3 per cent. A small portion of this material was sold for iron and steel foundry use and for the manufacture of ingot molds, which were bought by some steel producers while others made molds from their own pig iron. On the other hand, the steel makers who buy pig iron generally use a larger proportion of scrap than those who produce their pig iron. Thus

it may be said that about 15 per cent of the steel produced is made from purchased raw materials.

The proportion of the total coke consumed that is purchased by blast furnaces has been decreasing rapidly with the erection of by-product ovens at furnace plants, and probably lies at present between 20 and 25 per cent; but as the blast furnaces producing foundry iron purchase a larger proportion, those producing iron for steel making purchase a smaller percentage, perhaps not far from 15 per cent.

The proportion of the total iron ore that is purchased is not readily computed, because many furnaces are part owners of iron mines. Thus, if the total output of iron ore were 100,000,000 tons and a blast furnace should purchase 200,000 tons from an ore company in which it had a one-half interest, the purchase would rate as one-tenth rather than as two-tenths of one per cent of the total output. A fair guess would be that from 10 to 15 per cent of the iron ore is purchased.

A serious difficulty the Federal Trade Commission will encounter is the wide diversity of practice in cost finding. Moreover, there is no fixed rule, or anything approaching a common practice, as to the allotment of profits to the different operations, and this is true even though the subject is a very familiar one. The integrated companies have it with them all the time, as it is necessary in their accounts to show what profit each department is making. More often than not the inter-company or inter-department price that is used in making up the accounts is less than the open market price; very rarely is it higher. In this there is tacit recognition of a general principle, that in market movements the raw and intermediate products are prone to advance by a greater proportion than the finished product which is sold to the public outside the steel making industry, and thus further emphasis is laid upon the necessity of fixing prices on the raw and intermediate products if a price is fixed for the finished product.

If capital that is invested in one branch or another of the iron and steel industry is entitled to a fair return, irrespective of which branch the investor has selected, then the markets in the past two years have inflicted greater injustices than could be compassed by the veriest tyro in price fixing. Some of these injustices, however, have been tending to equalize. For instance, while billets advanced $30 a ton, pig iron advanced only $5, but lately pig iron has been having its inning. Again, Lake Superior iron ore at mine is this season bringing no more than about double its lowest price in the past ten years, whereas Connellsville coke has sold at as high as $14 to $16 a ton at ovens, against previous low prices of $1.40 or $1.50, or at ten times the low price instead of twice. The market does not correct this divergence, which is all the more unreasonable from the fact that the ore company has sunk large sums of money in development, to be returned at best over a period of many years, while less than two years ago there was good ground for the Connellsville coke operator to believe that the development of the by-product industry had eliminated all prospect of even moderate profits in future.

The fixing of prices for finished steel involves the question how much money an integrated steel producer should earn in the circumstances. It is a difficult question, but not one of accounting methods, the accounting merely determining the application of the rule once laid down, as to profits. The allotment of profits among the different processes is a much more difficult one, and it is one that has been studied only by the accountants of the integrated producers. To the national question they could not apply their own rules, and it is certain that they have not been agreeing with each other in actual practice; but it is they who should be called upon for advice and suggestion as to how the allocation should be made, so that if a burden is to be borne the distribution throughout the industry should be fair and equitable.

Some Results of Co-operation

The splendid results of co-operation in improving the efficiency of the railroads and other means of transportation in this country are already being demonstrated in a most impressive manner. On the Great Lakes, a very poor showing was made for some time after the opening of the season owing to the unusually cold weather and other causes, but under the plan of co-operation of iron ore, coal and vessel interests which has been working harmoniously, shipments have increased to such an extent that it now seems probable that as much ore will be shipped from the Lake Superior mines this year as was handled in the record breaking year 1916.

The operations of the War Board under which the railroads of the country have been managed jointly show a surprising increase in the freight handled. In a circular which has just been issued by the board, it is stated that although only about half of all the mileage had been heard from at the time of the report, it was known that this fraction had produced, for the public, more than 3,000,000,000 ton-miles more of freight transportation in April, 1917, than in the same month of 1916. There was shown an increase of 66 tons or 10.4 per cent per train and 2.4 tons or 10 per cent per average lading of cars, equivalent to an addition of 126,000 cars to the equipment of the roads reporting. There was an increase of 16 per cent in the one month in the mileage covered by the report, the equivalent of adding 35,000 miles of railroad to the lines in the United States. Cars have been more fully loaded, roads having an abundance of equipment have been ordered to turn over cars to roads needing them and the car shortage has been greatly reduced.

The showing which has been made by the Railroad's War Board is being highly praised, but some critics do not understand why the work was so long delayed. For example, the *Evening Sun*, New York, says: "Cordial praise is due to the railroads and their clients who are co-operating with them. Only one word of criticism suggests itself at the moment; simply this: Why in the world did they wait for war to wake them up and put these economies in operation?" The fact is that the railroads, like many other lines of activity, did not cooperate because they were afraid to do so. As long as the Sherman law and many other national and state laws remained on the statute books and attempts were being made to enforce them, manufacturers and other business men were in danger of going to prison if they acted in harmony. They

did not wait for a war to wake them up, but the war is waking the country up to the wonderful possibilities of co-operation.

Our Half-Yearly Index

The index of THE IRON AGE for the past half year, January to June inclusive, has been compiled and printed and is now ready for distribution. It will be forwarded promptly to those who have entered their names on our list as desiring it. Others who may have use for copies can secure them by addressing our Circulation Department.

HEAVY WAR DEMANDS

Secretary Daniels Asks for Large Additional Appropriations

WASHINGTON, July 24, 1917.—The Secretary of the Navy has transmitted estimates to Congress calling for $137,366,000 additional for the war needs of the Navy, including guns, ammunition, ordnance supplies, improvements of the yards and docks and the substantial enlargement of the naval gun factory in Washington. The largest item is $105,566,177 for the naval establishment which includes $12,446,000 for procuring, manufacturing and handling ordnance material and for the armament of ships; $25,000,000 for procuring, manufacturing and handling ammunition for vessels; $22,000,000 for batteries and outfits for naval vessels, patrols, aircraft, merchantmen, etc.; $30,000,000 for reserve and miscellaneous ordnance supplies and $12,000,000 for repairs, preservation and renewal of machinery in accordance with the plans of the Bureau of Steam Engineering.

The sum of $5,000,000 is to be spent in the enlargement of the Washington Navy Yard to increase its capacity for the production of guns, mounts, torpedoes, mines, optical instruments and miscellaneous ordnance supplies. The necessary buildings, craneways, storage and handling facilities will absorb the sum mentioned, while the requisite machinery will cost $2,500,000 additional.

A separate appropriation of $23,400,000 to be expended by the Bureau of Yards and Docks is requested by the Secretary, the chief items being as follows: For the construction and equipment of training camps $12,600,000, for heavyweight handling appliances at navy yards $1,650,000, for marine railways at navy yards and stations $500,000, and for improvements at stations for the Bureau of Ordnance $3,950,000.

W. L. C.

New Mill Approaching Completion

The blooming mill of the new plant of the Keystone Steel & Wire Co., Peoria, Ill., was started July 13. Two open-hearth furnaces began operations May 20 and 21, and a third is now building. The rod mill will be ready to begin in about four weeks.

The Anaconda Copper Mining Co. has selected a site for a rod and wire mill to be built at Great Falls, Mont., and it will be ready for operations next spring. Machinery has been ordered. The new mill will be housed in a building 400 x 125 ft., of brick and steel construction. The capacity of the mill will be 200,000 lb. of copper rods and 85,000 lb. of copper wire, working on eight-hour shifts. The investment will be about $500,000.

The American Locomotive Co. has commenced the dismantling of the Rogers locomotive shops, Paterson, N. J., and will distribute the machinery and equipment at its different plants. Equipment from the erecting shop will be divided between the local Cooke works and the plant at Pittsburgh. The tank shop machinery will be placed at the Dunkirk, N. Y., works.

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Opposition to Senate War Revenue Bill

Basis for Excess Profits Tax Opposed by Industries Not Prosperous in 1911-13—A Tax on the Excess Profits Tax Itself

WASHINGTON, July 24.—A battle royal is being staged in the Senate over the income and excess profits tax features of the war revenue bill, which will soon be made the "unfinished business" and will probably be debated for at least three weeks. The bill was formally reported to the Senate July 3 and subsequently withdrawn for further consideration. It has again been reported, but without any modification of the income and excess profits tax provisions which have drawn so many protests from the leading corporations of the country, and prominent Senators on both sides of the chamber are preparing to insist that important changes be made in these imposts.

The Finance Committee has reaffirmed the provision of the act of Sept. 8, 1916, which prescribed that stock dividends should be treated as income. This was a radical innovation when originally enacted and it was believed that as soon as the effect of this provision was explained to Congress it would be repealed by the new law. Attorneys for the Bethlehem Steel Co., the Lackawanna Steel Co. and other corporations appealed to the committee to amend the statute on the grounds that a stock dividend is not a dividend at all and that to levy a tax thereon would be, in effect, to tax capital and a very narrow class of capital at that. Cogent reasons were urged why a stock dividend really is not a dividend at all. It gives the recipient no money and no income that he can spend. It simply gives him something to represent his prior interest in the surplus of the corporation. As suggested by Paul D. Cravath, speaking for the Bethlehem Steel Co., if a corporation having a surplus equal to 100 per cent of its capital declares a stock dividend of 100 per cent, a stockholder has nothing more than he had before, the only change in his situation being that he has two shares of stock to represent what was represented before the division by one share of stock. With the same distribution of profits he gets the same income, but the rate per share of stock is cut in half.

Notwithstanding the arguments urged by Mr. Cravath and others, the Finance Committee has decided that stock dividends must be taxed—a decision that is likely to have an important effect upon the distribution policies of dividend-earning corporations throughout the country.

Added Tax on Earnings Carried to Surplus

An entirely new principle of taxation is exemplified in a provision of the bill added by the Finance Committee just before it was reported to the Senate. Reports had reached Chairman Simmons and his colleagues that certain corporations were preparing to assist their stockholders in evading the income tax law by carrying their earnings to surplus account, presumably with the intent to impound them until after the war when, it is probable, the income tax will be materially reduced. To meet this situation, the committee wrote into the bill a new provision, imposing upon the net earnings of all corporations, in addition to the 4 per cent income tax, a tax of 15 per cent "upon the amount remaining undistributed 60 days after the end of each calendar or fiscal year." Realizing that this provision would prove very drastic in the case of certain classes of corporations, and particularly to those requiring considerable surplus for special purposes, the committee provided that the additional 15 per cent should not apply to (1) that portion of the undistributed profits used for the establishment or maintenance of reserves required by law; (2) that portion of the undistributed profits of railroads used for extensions, renewals or betterments; or (3) an amount of the undistributed profits equal to 20 per cent of the net income of corporations (not including railroads) directly engaged in the production or distribution of commodities or in banking, but only while, and to the extent that, such exempted amount is derived from such activities and so employed.

Why Surpluses Must Be Large

The committee further provided that the 15 per cent additional tax should apply "to the undistributed net income received by every taxable corporation, joint stock company or association or insurance company in the calendar year 1917 and in each year thereafter, except that, if it has fixed its own fiscal year under the provisions of existing law, the foregoing rate shall apply to the proportion of taxable undistributed net income returned for the fiscal year ending prior to Dec. 31, 1917, which the period between Jan. 1, 1917, and the end of such fiscal year bears to the whole of such fiscal year."

Protests against this new provision have been numerous and emphatic. The charge that corporations are accumulating surplus for the purpose of enabling their stockholders to evade the income tax is vigorously denied. It is asserted that the extraordinary conditions under which business is now being conducted, with unprecedented fluctuations in demand, in prices, and in cost of material and labor, require the retention in the treasury of comparatively large surpluses; and there is no certainty that these accumulations will ever be distributed to the stockholders in the form of dividends. To tax them as possible income, therefore, it is contended, is both unfair and illogical.

A Tax on Excess Profits Tax Itself

That the Finance Committee has blundered in framing the section referred to is contended by leading corporation lawyers, who point out that the language of the provision will result not only in a tax on undistributed surplus, but upon the excess profits tax imposed by the pending bill. This contention, which is of interest to every corporation in the country, is set forth by a Boston attorney, whose letter has been filed with the Finance Committee by Senator Weeks of Massachusetts, in part as follows:

> Under the language above quoted a corporation must pay a 15 per cent tax upon the excess profits tax itself. This could not have been the intention of the framers of this section. The purpose of the section obviously is to prevent stockholders from avoiding an income tax by leaving earnings undistributed in the treasury of the corporation.
>
> Now, in the aggregate of the previous year's income undistributed at the end of 60 days, you will inevitably find not only what might properly be distributed to the stockholders as dividends, but also you will find the amount of the excess profits tax imposed upon the previous year's earnings not yet paid, for it cannot be paid until the middle of the year. The effect of the section is, therefore, to impose the excess profits tax and then in addition to impose a tax of 15 per cent upon the excess profits tax itself.
>
> To make this situation concrete, we take the figures of a corporation with an average earnings during 1911, 1912 and 1913 of $180,000, and with net earnings in the year 1917 of $1,500,000. The excess profits tax under the above conditions will amount to $582,870. Assume that the corporation distributes $500,000 in dividends; it has been left $1,000,000 upon which to reckon the 15 per cent tax imposed by the language quoted above. It is allowed to deduct 20 per cent of its net income, if utilized in its business, leaving $700,000 subject to the tax. Now, out of this $700,000 it must pay later in the year the excess profits tax of $582.870, leaving only $117,130 of accumulated profits tax, to which the 15 per cent tax should properly be applied. As a matter of fact, the language quoted above makes the 15 per cent tax applicable to the whole $700,000, so that the 15 per cent tax amounts to $105,000, and takes all of the balance except the meager sum of $12,130.
>
> The corporation went further and distributed in the form of dividends all its earnings except the excess profits tax

and the 20 per cent which it is allowed to retain in reserve, it would have to pay this additional 15 per cent tax out of the 20 per cent which would be reductio ad absurdum.

This mix-up comes from applying to the excess profits tax the same principle which is applied in the act to the income tax itself. One may argue properly enough that, in figuring the income and excess profits tax for any year, the amount of tax paid out of that year's earnings on account of the income of the previous year should not be deducted, but there is no sense in applying this principle to this additional 15 per cent tax.

Notwithstanding the fact that several Senators have drawn the attention of the Finance Committee to this form of double taxation, Chairman Simmons expresses the opinion that the committee will resist its elimination from the measure. The section referred to was drafted by the Internal Revenue Bureau and during the interval after the bill was recommitted the Finance Committee discussed it at some length, but decided not to modify it, and it remains intact in the measure as finally reported to the Senate.

Opposition to Excess Profits Tax

The radical change in the basis for the assessment of the war excess profits tax adopted by the Finance Committee is now being energetically opposed by corporations that have calculated the effect of the change. They find in some cases that it means a doubling or even trebling of the tax levied under the House provision, which imposed a rate of 16 per cent on all earnings in excess of 8 per cent plus $5,000. The Finance Committee rejected the House provision in toto, adopting in its place the English system, with slight modifications, basing the tax on the profits currently earned as compared with the average earnings during the three calendar years 1911, 1912 and 1913, denominated in the bill the "pre-war period." On the excess profits thus determined the rates range from 12 per cent on profits not exceeding 15 per cent, up to 50 per cent on profits which exceed 250 per cent.

Protests against this provision are based upon several counts. In the first place, while the bill provides that if a corporation or partnership was not in existence during the whole of the pre-war period the portion of such period during which it was engaged in business may be taken as the basis for the tax, the measure does not contemplate at all the status of many corporations which have been organized since the beginning of the war and which have done a very large war business. In the second place, the contention is made that the rates of tax to be imposed upon the excess profits to be determined as provided in the Senate bill will impose far heavier burdens upon moderately successful corporations than the rates as fixed by the House measure. On this account much pressure will be brought to bear upon the Ways and Means Committee to stand out against the adoption of the English system in conference if the action of the Finance Committee is indorsed by the Senate.

Iron and Steel Trades Affected

Perhaps the strongest protest against the adoption of the English basis for calculating excess profits has come from corporations which suffered several years of depression prior to the war, especially in 1912 and 1913 when Congress was engaged in revising the tariff and in enacting other legislative measures restricting the operations of corporations in all lines of business. The iron and steel trade suffered severely during the pre-war period and it is obvious that a comparatively high rate of tax levied on all earnings in 1917 in excess of the average of 1911, 1912 and 1913 will impose heavy burdens on this industry and on all others similarly circumstanced. The suggestion has been made that the pre-war period be extended to include the ten years from 1903 to 1913, which, in the case of certain industries, would give a higher basis for comparison with current earnings and would, therefore, result in lower aggregate taxes. The Finance Committee has not been greatly impressed with these suggestions, however, and, being determined to exact liberal contributions from corporations that have prospered during the war, will resist all efforts to change the system adopted.

W. L. C.

INSTITUTE OF METALS

Tentative List of Papers to Be Read at the Meeting in Boston

The tentative program for the meeting of the American Institute of Metals, to be held Sept. 25-28, at Boston, has been issued. Separate sessions will be devoted to the discussion of crucibles and furnaces, the melting and casting of nonferrous metals, casting in connection with munition making, the testing of nonferrous metals and metallography. The tentative list of papers is as follows:

Crucibles and Furnaces:

"The Crucible Situation," by Prof. A. V. Gleininger, Bureau of Standards, Pittsburgh.

"Melting Yellow Brass in New Form of Induction Furnace," by G. H. Clamer, Ajex Metal Co., Philadelphia.

"The Crucible Situation," by M. McNaughton, Joseph Dixon Crucible Co., Jersey City, N. J.

"The Electric Furnace and Nonferrous Metals," by Dwight D. Miller, the Society for Electrical Development, New York.

"My Experience with Metal Melting Furnaces," by W. H. Parry, National Meter Co., Brooklyn.

Melting and Casting Nonferrous Metals:

"Casting Bearings in Sand and Metal Molds," by R. R. Clarke, Pittsburgh.

"The School End of the Job in Training Foundrymen," by C. B. Connelly, Dean, Carnegie Institute of Technology, Pittsburgh.

"The Flux and Cleaner Question of Brass," by E. A. Frohman, S. Obermayer Co., Pittsburgh.

"Negative Experiments on Waste Core Sand," by Dr. H. W. Gillett, Bureau of Mines, Ithaca, N. Y.

"Pyrometers—Their Construction and Application," by John P. Goheen, Brown Instrument Co., Philadelphia.

"Surface Tension and Deoxidizing of Metals," by W. J. Knox, Metals Deoxidizing & Refining Co., New York.

"The Briquetting of Nonferrous Light Metal Scrap," by A. L. Stillman, General Briquetting Co., New York.

"The Swelling of Zinc Base Die Castings," by H. M. Williams, National Cash Register Co., Dayton, Ohio.

Munitions, Etc.:

"The Present Status of Tin Fusible Plug Manufacture and Properties," by Dr. George K. Burgess, Bureau of Standards, Washington.

"Stellite," by Elwood Haynes, Haynes Stellite Works, Kokomo, Ind.

"Fire Prevention in Large Industrial Establishments," by C. W. Johnson, Westinghouse Electric & Mfg. Co., Pittsburgh.

"The Use of Die Casting in Munitions," by Charles Pack, Doehler Die Casting Co., Brooklyn.

"A Few Points on Alloy Patents," by William J. Rich, Patent Office, Washington.

"Shrapnel Bullets," by Harold J. Roast, the James Robertson Co., Ltd., Montreal.

"Recent Industrial Uses of Aluminum," by F. G. Shull, Aluminum Co. of America, Boston.

Testing Nonferrous Metals:

"Some Comparative Tests on Test Bars and Actual Castings," by W. M. Course, the Titanium Alloy Mfg. Co., Niagara Falls, N. Y., Buffalo.

"Analysis of Babbitts and Brasses," by E. W. Hagmaier, Buffalo.

"Standard Test Bars of 88-10-2 and 88-8-4, Being the Result of Co-operative Work of Six Foundries; a New Series of Tests," by C. P. Karr, Bureau of Standards, Washington.

"The Expansion Coefficients of Alpha and Beta Brass" and "The Corrosion of Manganese Bronze Under Stress," by Dr. Paul D. Merica, Bureau of Standards, Washington.

"Corrosion of Brasses of the Muntz Metal Type," by H. S. Rowdon, Bureau of Standards, Washington.

"Analysis of Cadmium in Brass," by Dr. F. Schramm, Bureau of Standards, Washington.

Metallurgy and Metallography:

"The Electrolytic Production of Antimony," by Prof. D. J. Demorest, the Ohio State University, Columbus.

"The Electrical Properties of Some High Resistance Alloys," by Prof. M. A. Hunter, Rensselaer Polytechnic Institute, Troy, N. Y., and F. M. Sebast.

"The Amorphous Theory in Metals," by Prof. Zay Jeffries, Case School of Applied Science, Cleveland.

"The Uses and Metallurgy of Antimony," by K. C. Li, Wah Chang Mining & Smelting Co., Inc., New York.

"Development and Reabsorption of the Beta Constituent in Alloys Which Are Normally of the Alpha Type," by Prof. C. H. Mathewson, department of mining and metallurgy, Yale University, New Haven, Conn., and Philip Davidson.

Iron and Steel Markets

BUYERS STILL WAITING

Weakness in Pig Iron, More in Scrap

France Buys Plates, but Italy's Orders Wait for Lack of a Price

Buyers of pig iron and of all forms of finished steel continue for the most part to hold aloof from the market, and their fear of what may happen to prices as the result of Government action is in sharp contrast with their willingness only lately to pay any price the producer might name.

It is evident that finished steel in the hands of manufacturers and jobbers is of fair proportions, and the latter in particular are disposed to work down their stocks in the interval of waiting.

Meanwhile the Government's cost inquiry goes on, with evidence that the problem of determining a representative cost of any form of finished steel is found to be more complicated than was counted on at the outset.

The summary ending of the shipbuilding controversy means an early and sharp increase in Government demand upon plate and structural mills and the Steel Corporation's formation of a shipbuilding subsidiary points in the same direction. The 3,000,000 tons of steel vessel capacity to be built in the coming year will take about 1,000,000 tons of plates, or about 50 per cent of what the ship plate mills can produce. In no other line will so large a part of the total output be taken by the Government, in spite of some loose statements from Washington as to the "Government requiring the entire maximum output of the mills for some time to come."

There is some comment on the slowness of specifications on Government steel which manufacturers were officially told several weeks ago must be put through at once, one such lot being 40,000 tons of rails for the Government's use abroad. No order for these has been received.

For Italy an inquiry for 10,000 tons of plates and a considerable tonnage of wire and other products has come through Washington, but no mill was found willing to take the business with the attached stipulation that the price would be fixed later by the United States Government. This is the first test of the attitude of the steel makers on the proposal that the Government and its Allies come in on the same basis.

On the other hand there has been buying for France through the old channels, the French Mission through J. P. Morgan & Co. having already placed 25,000 tons of plates, out of a total of 50,000 tons, for naval vessels and canal and river barges, deliveries to be made in September and October at the Washington Government's special request. For hull steel 6c. was paid and for boiler plates 9c.

Japan's requirements in ship steel are a matter of negotiations between the two Governments, but for the present the needs of this country and of France and Russia are having precedence, with particular urgency for steel for the 500 Russian locomotives.

It is estimated that 1,000,000 tons of iron and steel products for export, including machinery, are now on the Atlantic and Pacific coasts or in transit to shipping ports. With such congestion and the delays in export licenses, there has been some reselling of pig iron and of products rolled for export.

It is understood that the French Government has been willing to have deliveries on its shell steel held up and precedence given to rails and track supplies of which a large tonnage will go forward for the rehabilitation of its railroad system under the direction of an American expedition of 1000 men.

The expected taking up of a large part of the capacity of leading fabricating companies with ship work offsets the effect of high building costs on the structural trade. The present price of structural steel erected is around $150 per ton, as against $50 three years ago.

The production of enough tin plate to take care of the packing of perishable foods is now assured. Mills are still declining offers of export trade at attractive prices. Recent sales from stock have been at $13 per base box.

Dullness and in some districts evidences of weakening have been the pig iron market's response to the discussion of Government regulation. It is recognized that for the present actual Government regulation of the general market has been averted, but the moral effect of low prices to the Government on large quantities of finished materials is a matter of wide concern in view of the extreme advances in pig iron. At Pittsburgh on some resales of Bessemer iron as low as $53, Valley, was done, and basic iron is nominally $52. In Northern Ohio some sellers have put a limit of $55 on No. 2 foundry iron as against $57 and $58 recently asked. Southern iron resales have shown a range of $45 to $48, but business has been very much restricted.

Old material, always sensitive to changes in sentiment, has steadily declined since the markets for new steel halted. For a time covering of dealers' short sales regulated the downward movement, but in the past week such helps have been absent. In Northern Ohio heavy melting steel has fallen $6 in the week, as low as $30 being reported.

Pittsburgh

PITTSBURGH, July 24.

The opinion is very general in this district that the crest in prices has been reached, and on some lines, notably pig iron, semi-finished steel and several finished products, on which prices went unduly high, there may come a decided decline. It is recognized that prices on pig iron are too high, but this is probably true of any article that could be named in either iron or steel. There is almost an utter lack of new buying in pig iron and steel products, the entire trade holding off until it is known what the Government will do in the matter of fixing prices. As stated before, the trade here cannot figure out how the Government can fix prices on pig iron and steel products sold to domestic consumers and be fair to all concerned. In the case of

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	July 25, 1917.	July 18, 1917.	June 27, 1917.	July 26, 1916.
No. 2 X, Philadelphia....	*$53.00*	$54.50	$50.75	$19.75
No. 2, Valley furnace....	*53.00*	55.00	53.00	18.25
No. 2 Southern, Cin'ti...	49.90	49.90	47.90	16.90
No. 2, Birmingham, Ala.	47.00	47.00	45.00	14.00
No. 2, furnace, Chicago*.	55.00	55.00	55.00	19.00
Basic, del'd, eastern Pa..	50.00	50.00	50.00	19.00
Basic, Valley furnace....	*52.00*	53.00	50.00	18.00
Bessemer, Pittsburgh....	*55.95*	57.95	55.95	21.95
Malleable Bess., Ch'go*..	55.00	55.00	55.00	19.50
Gray forge, Pittsburgh..	*46.95*	47.95	47.95	18.70
L. S. charcoal, Chicago..	58.00	58.00	57.00	19.75
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	38.00	38.00	38.00	33.00
O.-h. rails, heavy, at mill	40.00	40.00	40.00	35.00
Bess. billets, Pittsburgh.	100.00	100.00	100.00	42.00
O.-h. billets, Pittsburgh..	100.00	100.00	100.00	45.00
O.-h. sheet bars, P'gh...	105.00	105.00	105.00	45.00
Forging billets, base, P'gh	125.00	125.00	125.00	69.00
O.-h. billets, Phila.....	110.00	110.00	110.00	45.00
Wire rods, Pittsburgh....	95.00	95.00	95.00	55.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	4.659	4.659	4.659	2.659
Iron bars, Pittsburgh....	4.75	4.75	4.75	2.50
Iron bars, Chicago.....	4.50	4.50	4.10	2.35
Steel bars, Pittsburgh...	4.50	4.50	4.50	2.50
Steel bars, New York...	4.669	4.669	4.669	2.669
Tank plates, Pittsburgh..	9.00	9.00	9.00	3.50
Tank plates, New York..	10.169	10.169	9.169	3.669
Beams, etc., Pittsburgh..	4.50	4.50	4.50	2.50
Beams, etc., New York..	4.669	4.669	4.669	2.669
Skelp, grooved steel, P'gh	4.00	4.00	4.00	2.35
Skelp, sheared steel, P'gh.	6.00	6.00	6.00	2.45
Steel hoops, Pittsburgh..	5.25	5.25	5.25	2.75

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	July 25, 1917. Cents.	July 18, 1917. Cents.	June 27, 1917. Cents.	July 26, 1916. Cents.
Sheets, black, No. 28, P'gh	8.50	8.50	8.00	2.90
Sheets, galv., No. 28, P'gh	10.00	10.00	9.75	4.25
Wire nails, Pittsburgh..	4.00	4.00	4.00	2.50
Cut nails, Pittsburgh....	4.65	4.65	4.65	2.60
Fence wire, base, P'gh..	3.95	3.95	3.95	2.45
Barb wire, galv., P'gh...	4.85	4.85	4.85	3.35
Old Material, Per Gross Ton:				
Iron rails, Chicago.....	*$41.50*	$44.00	$49.00	$18.50
Iron rails, Philadelphia..	45.00	45.00	52.00	20.00
Carwheels, Chicago.....	*32.00*	35.00	43.00	12.00
Carwheels, Philadelphia..	35.00	35.00	35.00	15.50
Heavy steel scrap, P'gh.	*36.00*	38.00	45.00	16.25
Heavy steel scrap, Phila	32.00	32.00	39.00	15.00
Heavy steel scrap, Ch'go	*30.00*	32.00	39.00	15.25
No. 1 cast, Pittsburgh...	32.00	32.00	38.00	15.00
No. 1 cast, Philadelphia.	35.00	35.00	39.00	16.00
No. 1 cast, Ch'go (net ton)	28.50	28.50	32.00	11.50
No. 1 RR. wrot, Phila....	48.00	48.00	57.00	19.50
No. 1 RR. wrot, Ch'go (net)	*35.00*	37.00	44.00	15.25
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	$11.00	$11.00	$13.00	$2.75
Furnace coke, future....	10.00	10.00	9.50	2.50
Foundry coke, prompt...	**13.00**	12.00	14.00	3.25
Foundry coke, future....	10.00	10.00	10.00	3.50
Metals,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.	*26.00*	26.50	32.50	25.25
Electrolytic copper, N. Y.	*26.00*	26.50	32.50	25.00
Spelter, St. Louis.....	*8.50*	8.62½	9.12½	10.25
Spelter, New York.....	*8.75*	8.87½	9.37½	10.50
Lead, St. Louis.....	*10.25*	10.37½	11.50	6.00
Lead, New York.....	*10.25*	10.50	11.70	6.20
Tin, New York.....	62.50	62.50	62.00	38.00
Antimony (Asiatic), N. Y.	*15.00*	16.00	19.00	13.50
Tin plate, 100-lb. box, P'gh.	$12.00	$12.00	$12.00	$6.00

merchant blast furnaces that buy their ore, coke and limestone, the Government might fix a price on pig iron that would be below cost of such furnaces, while on the other hand, steel works furnaces that own and mine all their own raw materials might have a cost that would be considerably below the price fixed by the Government. Bessemer pig iron has declined at least $2 per ton, some resale Bessemer iron having touched $53, Pittsburgh, but it is not believed any more could be had at this price. It is certain the market on Bessemer to-day is not above $55, but there is not enough doing to establish a price. Basic and foundry are holding fairly steady in the absence of sales. Southern No. 2 foundry has sold in competition with Valley furnace at $51.55 delivered. New demand for finished steel products has almost stopped, consumers not taking a pound of anything they can avoid. Prices on coke are again lower, best grades selling to-day at $10 at furnace, while all grades of scrap have again declined from $1 to $2 per ton.

Pig Iron.—The local pig-iron market is extremely dull and prices on all grades are weak. There have been resales of Bessemer iron at as low as $53 and $54, but most of it has brought $55, Valley furnace. There is no new demand for either Bessemer or basic, but prices on basic are ruling fairly steady. Foundry iron is also weaker, and is being offered from $53 up to $55 at Valley furnace. Furnaces are still strong in their ideas as to prices, but it is very doubtful whether they could sell Bessemer iron to-day at $55, although some sellers are still quoting $57. In the absence of sales, basic iron is nominally $52, and No. 2 foundry $53 to $55. The pig-iron market will no doubt remain very dull, with prices weak, until something definite comes from the Government as to its position in fixing prices. We note sales of Bessemer in the past week of 5000 to 6000 tons at $54 to $55 at furnace.

We quote Bessemer iron at $55; basic, $52; malleable Bessemer, $53; No. 2 foundry, $53 to $55, and gray forge, $46 to $47, all f.o.b. at Valley furnace for delivery this year. The freight rate from Valley furnaces on pig iron to the Cleveland and Pittsburgh districts is 95c. per ton.

Billets and Sheet Bars.—The local steel market is extremely dull and we do not hear of any sales of billets or sheet bars in the last week. Consumers are getting fairly good deliveries on contracts, but no consumer will buy steel unless forced to do so, under present conditions. It should be remembered that while soft Bessemer and open-hearth billets are quoted at $95 to $100 and soft Bessemer and open-hearth sheet bars at $105, probably 50 per cent of shipments of sheet bars to tin-plate mills are going in at $50 or less. It would simply be impossible for tin-plate mills to pay anything like $100 for bars and sell their tin plate at $7.50 per box, which was the price fixed some months ago for delivery over last half of this year. The greater part of the output of the tin-plate mills is being shipped on the contracts taken at this price. In conditions like those ruling at present, quoted prices on semi-finished steel are largely nominal.

We now quote soft Bessemer and open-hearth billets at $95 to $100 and soft Bessemer and open-hearth sheet bars at $105 to $110, maker's mill, Pittsburgh or Youngstown. We quote forging billets at $125 to $135 per ton for ordinary sizes and carbons, f.o.b. maker's mill.

Steel Rails.—The new demand for light rails is reported active, and the mills rolling new light rails from billets and also the rerolling rail mills are pretty well sold up over the remainder of this year. Any mills that can furnish either new or rerolled light rails can get premiums of $5 to $10 per ton over what are regarded as regular prices. No orders are being placed for standard sections. Prices on new light rails and standard sections are given on page 219.

Ferromanganese.—The new demand is very dull, indicating that consumers are well covered ahead on ferromanganese and are getting prompt deliveries. For delivery over last half of this year, we quote 80 per cent ferromanganese at $350 to $375 and for first half of

next year $250 to $325, f.o.b. cars, maker's furnaces. We quote 18 to 20 per cent spiegeleisn at $80 to $85 per gross ton at furnace. New demand for Bessemer ferrosilicon and silvery iron is quiet, consumers being well covered over the remainder of this year. We note a sale of 1000 tons of 10 per cent Bessemer ferrosilicon at the reported price of $95 at maker's furnace for delivery over the remainder of this year.

We quote 9 per cent Bessemer ferrosilicon at $89, 10 per cent $90, 11 per cent, $95, 12 per cent $100, 13 per cent $105, 14 per cent $115, 15 per cent $125, and 16 per cent $135. We now quote 7 per cent silvery iron at $84 to $89, 8 per cent $85 to $90, 9 per cent $86 to $91, 10 per cent $87 to $92, 11 and 12 per cent $88 to $93. All f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having a uniform freight rate of $2 per gross ton for delivery in the Pittsburgh district.

Plates.—New inquiry on plates has quieted down. Consumers who can are holding off until it is known what prices on plates the Government is going to fix on its purchases. At the same time, mills that can make fairly prompt deliveries can get 10c. or more for ¼-in. and heavier sheared plates at mill. A few steel car orders came out in the past week. The H. C. Frick Coke Co., which recently placed an order with the Ralston Steel Car Co. of Columbus, Ohio, for 1500 70-ton steel gondola cars, needs these cars for quicker movement of coke to the blast furnaces of the Carnegie Steel Co. The Standard Steel Car Co. will build 250 steel gondolas for the Phelps-Dodge Co. The Republic Iron & Steel Co. is in the market for 50 coke and 50 steel gondolas. It is believed that within a very short time the Government will announce the prices it will pay for plates, and as soon as this is done there may be a readjustment to a lower basis in prices on plates charged by the mills to domestic consumers. We quote ¼-in. and heavier sheared plates for delivery over the remainder of this year at 9c. to 10c. at mill, but small lots from warehouses bring 12c. to 13c. and higher.

Structural Material.—Very little new business is being placed and inquiry is light. Local fabricators say they are well filled up over the remainder of this year and are not very anxious to take on much new business from the domestic trade, as they feel sure the Government will be calling on them before long for considerable tonnage. The McClintic-Marshall Co. has taken about 2200 tons of Government work at Saint Julian Court, Fla., and a magazine and shell building at Hingham, Mass. The American Bridge Co. is taking a good deal of Government work, mostly in the East. Prices on structural steel are given on page 219.

Sheets.—Fairly heavy direct orders for sheets are being placed by the Government, and also indirect orders by manufacturers for making goods of various kinds for Government use in cantonments and other purposes. One inquiry is referred to as being in the market for 16,000 tons of sheets for camp stoves, but this quantity is thought to be too large. So far, the sheet mills have furnished to the Government all the sheets it asked for within the time specified and in a few cases even more promptly. Should the Government fix prices on steel it intends to buy, it is not believed the prices will be much, if any, below what the Government has been paying for sheets for some time, these prices, as noted last week, being 6.25c. for blue annealed; 6.50c. for Bessemer black, and 8.50c. for galvanized, all No. 28 gage. Sheet mills report deliveries of steel are better, while the output of sheets is larger and would be still heavier, were it not for the shortage of labor, which is getting more serious. Sheet mill labor is now being paid the highest wage ever known in the history of the sheet business, rollers making $20 per day, and more. The output of sheets of all grades is pretty well sold up for the remainder of this year. Mill prices for carloads and larger lots to the domestic trade are given on page 219.

Tin Plate.—The export demand is heavy. Italy has one inquiry out for 15,000 boxes, and another for 10,000. One tin plate mill was recently offered 14,000 boxes for export business, that would have netted close to $17.50 per base box, at mill, but had to turn it down. Meat packers this year will take possibly double the quantity of tin plate used last year. One leading packer, who three years ago used 150,000 boxes of tin plate, expects to use this year about 425,000 boxes. The American Sheet & Tin Plate Co. is now operating six of its 10 double hot tin mills in its Shenango works at New Castle, Pa., and expects to have all the mills operating in August. It is also operating some of the double hot tin mills being added to its Farrell works at Farrell, Pa. The output of enough bright plate this year for packing perishable foods is assured, and packers of non-perishable foods are now receiving almost their requirements. The new demand for tin plate will no doubt be heavy during the war and it is expected that after the war a good part of the tin plate needed by England, France, Italy and Japan will come from the United States, as those countries will not be able for some years to make enough to supply their needs. For this reason it is figured that the American tin plate trade for some years to come will be very heavy in England. One mill sold 1500 boxes recently for shipment from stock at $13 per base box. We quote primes from stock at $11 to $13 per base box, depending on size and quantity wanted.

Iron and Steel Bars.—The new demand is dull, most consumers being covered by contracts, and any users that have to buy will purchase only what they absolutely need on account of the uncertainty as to what action the Government will take concerning prices. Specifications against contracts are reported active, and the output of iron and steel bars for this year is pretty well sold up. The new demand for reinforcing bars is heavier than for some months. It is believed that prices on iron and steel bars have about reached the high point. These are given in carloads and larger lots to regular domestic customers on page 219.

Hoops and Bands.—There is very little new buying, and what is being done is only in small lots. Prices on steel hoops range from 5½ to 6 cents to regular customers, but sales have been made as high as 7 cents. Steel bands range from 5c. to 6c., but sales of small lots for fairly prompt shipment have been made at as high as 6½c. to 7c.

Muck Bar.—There is no inquiry in this market, but high-grade muck bar, made from all pig iron, would bring very close to $100 per gross ton, at mill.

Wire Rods.—The export demand is still very heavy, and orders for rods for export to Japan and South America, and also to Canada, have been booked recently by several local mills. There have been recent domestic sales of soft, Bessemer and open-hearth rods at $95 to $100, and also high carbon rods at prices ranging from $110 to $120, maker's mill. Prices on rods are given in detail on page 219.

Wire Products.—So far as known, none of the independent makers of wire and wire nails has indicated that he will reduce prices in order to protect jobbers against the lower prices on wire and wire nails being quoted by the leading interest, which are $3.25 for nails, and $3.25 for bright basic wire, or $16 per ton under what the independent mills are quoting. It is said that some jobbers who get a part of their requirements of wire and wire nails from the leading interest have agreed to sell the same percentage to their trade at prices suggested by the leading interest, which are $3.70 for nails and $3.75 for bright basic wire. In other words, if a jobber is getting 25 per cent of his needs from the leading interest, he will sell that percentage at the price named above. Orders for wire nails are being placed at $4 and for bright basic wire at $4.05, but the new demand is dull. The American Steel & Wire Co. has entered orders from its regular trade for wire nails at $3.20 per keg and bright basic wire at $3.25 per 100 pounds, but will make no promise of definite delivery. Prices quoted on wire and wire nails by independent mills, some of which can ship out fairly promptly, are given on page 219.

Shafting.—The new demand is quiet. This being true also of nearly all lines of finished steel, but consumers of shafting are well covered for the year, and specifications are fairly heavy. On the smaller sizes, some makers can ship out in eight to 10 weeks from date of order, but on the larger sizes not for three to four months. Discounts on shafting remaining at

10 to 5 per cent off, depending on quantity, and whether the buyer is a regular customer.

Railroad Spikes and Track Bolts.—An inquiry is in the market from the Ann Arbor Railroad Co. for 1500 kegs of spikes for delivery over the first half of next year. The new demand is dull and railroads are not specifying freely against contracts for spikes placed some time ago. It is believed that prices on both spikes and track bolts have probably reached the limit. These are given on page 219.

Cold Rolled Strip Steel.—A meeting of cold rolled strip steel manufacturers was held in Atlantic City last week, in which trade conditions were discussed. It developed that the new demand was only fairly heavy, most consumers being covered over the remainder of the year. The policy is still in force on insisting that specifications for 50 per cent must accompany new orders and the other 50 per cent be received within 60 days. The Phillips Sheet & Tin Plate Co., Weirton, West Virginia, is doubling its capacity in the manufacture of cold rolled strip steel and before long will be able to turn out about 6000 tons per month.

On contracts, mills are quoting 9c. at mill, but on small current orders, prices range from 10c. up to 12c. at mill. Terms are 30 days, less 2 per cent off for cash in 10 days when sold in quantities of 300 lb. or more.

Nuts and Bolts.—As is the case on all other lines of finished steel, the new demand for nuts and bolts has fallen off, but makers have enough business on their books to carry them pretty well over the remainder of this year. It is believed prices on nuts and bolts have reached the top, and the new demand for some time is likely to be small, and only for actual needs. Shipments are fairly heavy, but the shortage in labor and steel is keeping down output to some extent. Discounts adopted on April 12 last, which give prices to the large trade in car loads, over which advances are charged for small lots, are given on page 219.

Rivets.—The new demand has fallen off a good deal, but makers have their output pretty well sold up for remainder of this year. Specifications against contracts are heavy, and it is said some fairly large orders have lately been placed by the Government.

Prices on structural rivets for delivery up to Oct. 1 only are $5.25 per 100 lb., base, and on cone head boiler rivets $5.35 base, per 100 lb., f.o.b. Pittsburgh. Terms are 30 days net, or one-half of 1 per cent off for cash in 10 days.

Wrought Pipe.—It developed that the recent order for 6-in. steel placed by the Tubular Committee for the Government was for 640,000 ft. instead of 400,000 ft. and the committee has also placed 138,000 ft. of 4-in. steel pipe, all to be used for building water lines for cantonments and National Guard encampments. Several of the larger mills are not quoting on new business, except to regular customers, and for such deliveries as they can make. Requirements of the Government in pipe are expected to be very heavy and the mills are conserving as much of their future output as they can to meet this demand. On lapweld pipe, mills are well sold up for this year, but on butt weld pipe can make deliveries in 10 to 12 weeks. Discounts on steel pipe, as adopted May 1, and on iron pipe, as adopted July 1, are given on page 219.

Boiler Tubes.—It is said the Government is taking at present at least 30 per cent or more of the output of iron and steel tubes, and that it will take a larger percentage when work has been started on projects now under way. For many months, the National Tube Co. and other makers of tubes have been furnishing millions of feet to the Government, and the quantities to be furnished in the future are certain to be larger. Nominal discounts on iron and steel tubes as adopted Nov. 1, 1916, but which give prices very much below what are actually ruling, are given on page 219.

Old Material.—Reports received here indicate that prices on scrap at other important consuming centers are relatively lower than in the Pittsburgh district. It is true prices here have declined from the high values of three or four weeks ago, but not to the extent they have at other places. Dealers here will not sell short, even at the lower prices now ruling, nor will they go long on scrap at present prices, feeling that the Government may possibly take hold and regulate prices. However, scrap is in a class by itself, and it is not believed it is feasible for the Government to regulate prices, as it proposes to do on pig iron and some forms of steel. It often happens that one important scrap center is active and prices ruling firm, while at other places the market may be dull, and prices weak from purely local causes. Whatever may be done by the Government in the direction of regulating prices on scrap, the fact remains that the local market is dull, there being very little new buying, but prices in the past week have held fairly steady, having gone off only $1 to $2 per ton. About the middle of last week there were sales of 1250 tons of heavy steel scrap at $38 per gross ton, delivered to consumers' mills, 500 tons of low phosphorus scrap at about $48, and 1000 tons or more of hydraulic compressed sheet scrap at $32 per gross ton, delivered. It is doubtful, however, whether as high as the above prices could be obtained to-day. Large consumers are not buying, and the accumulation of scrap in the hands of small dealers who desire to get rid of it is getting larger, and this may further depress prices. Dealers quote for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$36.00 to $38.00
No. 1 foundry cast	32.00 to 33.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	43.00 to 44.00
Hydraulic compressed sheet scrap	30.00 to 31.00
Bundled sheet scrap, sides and ends, f.o.b. consumer's mill, Pittsburgh district	24.00 to 25.00
Bundled sheet stamping scrap	22.00 to 23.00
No. 1 railroad malleable stock	30.00 to 31.00
Railroad grate bars	19.00 to 20.00
Low phosphorus melting stock	48.00 to 50.00
Iron car axles	50.00 to 52.00
Steel car axles	50.00 to 52.00
Locomotive axles, steel	60.00 to 62.00
No. 1 busheling scrap	28.00 to 29.00
Machine-shop turnings	22.00 to 23.00
Cast iron wheels	34.00 to 35.00
Rolled steel wheels	44.00 to 45.00
*Sheet bar crop ends	44.00 to 45.00
Cast iron borings	22.00 to 23.00
No. 1 railroad wrought scrap	40.00 to 41.00
Heavy steel axle turnings	27.00 to 28.00
Heavy breakable cast scrap	27.00 to 28.00

*Shipping point.

Coke.—The placement of cars in the coke regions last week was about 90 per cent, but the loading and shipping were only about 70 per cent of cars furnished. Due to a full car supply, and also because of the fact that operations at some blast furnaces are slowing down on account of the hot weather, the demand for prompt furnace coke has fallen off to some extent, but is still fairly active. Labor conditions in the coke regions are bad, there having been strikes the last week in the Westmoreland and Irwin fields, the miners and coke workers demanding that their unions be recognized, but this was refused by the operators. In the hot weather, coke workers, especially drawers, whose work is very hot, usually lay off and try to find cooler work. This has cut down the labor supply, and in addition coke workers are making so much money at present that most of them want to work only about four days per week. Usually for a day or two after pay-day, more than half the coke workers fail to report for duty. Prices on high grade prompt blast furnace coke have further declined, and on Monday and Tuesday of this week there were sales of 100 to 125 cars of best grade blast furnace coke for prompt shipment at $10 per net ton at oven. Prompt 72-hour foundry coke of best grades is selling at about $13 per net ton at oven for prompt shipment. Nothing is being done in either furnace or foundry coke on contracts, as coke producers still feel that the Government may step in and regulate prices of coke, and also of coal. We quote best grades of prompt furnace coke at $11 and 72-hour foundry at $13 per net ton at oven. The Connellsville *Courier* gives the output of coke in the upper and lower Connellsville regions for the week ending July 14 as 345,519 tons, an increase over the previous week of 301 tons.

Chicago

CHICAGO, July 23.

The lull in buying is pronounced, and its effect has been felt by the banks. They expect the tide to turn with a rush with the harvesting of the crops. The iron and steel trade, nevertheless, is showing a decided feeling of optimism which was not in evidence a couple of weeks ago. The change in mental attitude undoubtedly is due to more numerous Government orders in this territory, a belief that amicable understanding and not statute will determine the prices which private consumers will pay, and the knowledge that the requirement of export licenses has not interfered to any great extent with foreign business. The Government order for thousands of automobile trucks has already resulted in business running into hundreds of thousands of dollars for manufacturers of steel castings. Local mills have received orders for ship plates for the Mare Island and Puget Sound Navy Yards, the latter yard also requiring concrete reinforcing bars, but only a few hundred tons. The Rock Island Arsenal enlargements are taking bars, rails and other materials. It is understood that considerable Government business is being placed, with the understanding that the prices governing transactions will be fixed later. Pig iron, though quiet, shows no declines. Southern makers of iron are having their troubles over the short supply of coke, of labor and of cars. Nearly every item in the old-material list shows a decline. Several important mills are steering clear of the scrap market, and dealers show no disposition to take on heavy commitments at this time. Just why scrap prices should make such a radical descent is not altogether clear in view of prices obtained for finished iron and steel products.

Plates.—An order for something over 2300 tons of ship plates is to be placed with a local mill by the Government for delivery at Mare Island, Cal., and the Puget Sound Navy Yard. The Goethals-Denman controversy is held responsible for delaying many similar orders. Thousands of tons of plates are waiting license to ship, particularly to Japan. Quotations on plates for export range from 10.75c. to 11c., mill. An order for several hundred gross tons was taken this week with the proviso that shipment would be made within 60 days after the lifting of the embargo, or the granting of a license. For delivery this year, ordinary tank plates are quoted at 10.189c., Chicago, but business is much restricted.

We quote for Chicago delivery of plates out of jobbers' stocks, 8c.

Structural Material.—The leading interest reports no structural lettings whatever this week, and much the same condition seems to prevail in all directions. On limited lots, an Eastern mill quotes 6.189c., Chicago. The 100 cars wanted by the Santa Fe are what are termed concentrate (not composite) cars and are presumably for mine use. They will be built by the Pullman Co. Two or three interests are asking for prices on 1200 cars for the Russian Government, the inquiry apparently being a fresh one, but not much is known about it. The C. & O. inquiry for 1000 hoppers is still pending.

Jobbers quote 5c. for material out of warehouse.

Pig Iron.—Business has been almost at a standstill since the last report, but there is no firm suggestion of lower prices and the market is not likely to decline unless holders of speculative iron become over-eager to sell. Some little talk of resale iron has been heard, but it is more or less intangible. The strength of first hands is maintained by the sold-up state of the furnaces. Northern basic, malleable Bessemer and No. 2 foundry is held at $55, furnace, any delivery, while the leading seller of Southern iron quotes $50, Birmingham, or $54, Chicago, for last quarter, and $48, Birmingham, for next year, for standard No. 2 iron. An occasional lot not conforming to standard, might be found at $48 to $50, Birmingham, for this year, and $45, for the first half. The shortage of coke is causing distress in the South, while freight cars are hard to find. Many furnaces in both Alabama and Tennessee have been obliged to bank for a few days because of insufficient fuel. Some of those which operate their own coke ovens have not been much better off than those which buy their coke, inasmuch as the oven owners cannot get enough labor and have been compelled to enter the market for coke. After a furnace has been put in blast after being down for a week, it is invariably another week before it is regularly producing standard iron, in consequence of which the monetary loss is greatly increased. Furnaces are piling iron because they cannot get enough cars to ship. In one case where it was sought to procure some "empties," it was learned that the cars in question were to be sent "light" to a lumber camp to be loaded with timber required at one of the cantonments. It is reported that standard low phosphorus business has been done recently at $89, delivered at Chicago, but quotations run up to $95, Chicago. No change in respect to prices has occurred in charcoal iron. One leading maker is reserving about 25,000 tons for its regular customers who have not yet covered, and who will need iron between this time and July 1, 1918. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 1 to 4	$58.00 to $62.00
Lake Superior charcoal, Nos. 5 and 6 and Scotch	58.00 to 62.00
Northern coke foundry, No. 1	55.50
Northern coke foundry, No. 2	55.00
Northern coke foundry, No. 3	54.50
Northern high-phosphorus foundry	55.00
Southern coke No. 1 f'dry and 1 soft	55.00
Southern coke No. 2 f'dry and 2 soft	54.00
Malleable Bessemer	55.00
Basic	55.00
Low-phosphorus	93.00 to 95.00
Silvery, 8 per cent	82.75

Ferroalloys.—The minimum for 80 per cent ferromanganese is unchanged at $400, delivery late this year or in 1918, but prompt material probably could be had around $425, against $450 a few days ago.

Bars.—The Government has ordered 637 tons of concrete reinforcing bars for a dock at the Puget Sound Navy Yard, and through Stone & Webster, engineers and contractors, is inquiring for about 2800 tons of plain round rods for the Rock Island Arsenal, presumably for concrete work. Mild steel bars are unchanged at 4.589c., Chicago, with but little activity. Rail carbon bars range from 4c. to 4.50c., Chicago, there having been some sharp competition among the makers. Bar iron is steady, and quoted at 4.50c. to 5c., Chicago. Jobbers have not changed their quotations.

We quote prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c. to 5c.; reinforcing bars, 4.50c., base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Wire Products.—The leading interest has announced no change in its price policy. It continues to quote on the basis of 3.20c. for wire nails, and has made known to its jobbing customers its belief that 3.95c. is a fair basis on which to sell to retailers. Officers of the leading company confirm their intention of discontinuing direct mill shipments of less than carload lots to jobbers' customers, thereby compelling the jobbers themselves to distribute the smaller lots. The plan was designed to economize in the use of cars, but despite this result it has aroused much protest in some directions and possibly led to the conclusion that it is impossible to please everybody. Independent wire mills continue to quote on the basis of 4c., Pittsburgh, for nails, their quotations to jobbers, per 100 lb., being as follows:

Plain fence wire, Nos. 6 to 9, base, $4.189; wire nails, $4.189; painted barb wire, $4.339; galvanized barb wire, $5.039; polished staples, $4.339; galvanized staples, $5.039; all Chicago, carload lots.

Rails and Track Supplies.—Stone & Webster, the contractors having in charge the erection of a large plant at the Rock Island Arsenal, are inquiring for about 600 tons of 80-lb. standard section rails. Carloads, and lots of rails up to 600 tons, have sold at fancy prices of late. For 500 tons $60 has been paid for rails accumulated by a mill which is not taking on new business. Another mill has sold carloads at $80, and it is reported that in the East small lots have

brought $100. Spikes are in tremendous demand for shipbuilding.

Quotations are as follows: Standard railroad spikes, 4.25c. base; small spikes, 4.50c., base; track bolts with square nuts, 5.25c., all in carloads, Chicago; tie plates, $70 to $90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base; open hearth, $40; light rails, 25 to 45 lb., $65; 16 to 20 lb., $66; 12 lb., $67; 8 lb., $68; angle bars, 3.25c., base.

Bolts and Nuts.—Manufacturers are agreeably surprised by the fact that their foreign business has not been interfered with to any serious degree by the requirement of export licenses. Business is good and their chief trouble is scarcity of labor and material. Their reports show that activity is the greatest in the East. For prices and freight rates see finished iron and steel, f.o.b., Pittsburgh, page 219.

Store prices are as follows: Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to ⅝ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to ⅝ x 6 in., 40-2½; larger sizes, 30-5; hot pressed nuts, square, $3, and hexagon $3 off per 100 lb.; lag screws, 50 per cent off.

Sheets.—The situation is without change, galvanized sheets being particularly difficult to find. No. 10 blue annealed can be had in limited quantities at 8.50c. to 9c., Pittsburgh, or 8.689c., Chicago, and No. 28 black at 8.75c. to 9c., Pittsburgh, or 8.939c. to 9.189c., Chicago. Jobbers' quotations are unchanged.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 9.50c.; No. 28 black, 9.50c.; and No. 28 galvanized, 11c.

Cast-iron Pipe.—Duluth, Minn., cut its purchase of cast-iron pipe down to 500 tons (instead of 900 tons) and placed the order with the United States Cast Iron Pipe & Foundry Co. Aside from some small municipal propositions involving, in the aggregate, only about 100 tons, no new business is pending. Quotations are unchanged.

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., $68.50; 6 in. and larger, $65.50, with $1 extra for class A water pipe and gas pipe.

Old Material.—The market continues quiet, and prices are still on the down-grade. Dealers have been devoting themselves principally to filling orders for odds and ends, and are not anxious to take on large commitments under present conditions. It goes without saying that consumers' needs are sufficiently covered for the present, and that when they do show renewed interest, prices will work up again. The plants of an important consumer at East Chicago and Grand Crossing are under a partial railroad embargo. The railroad lists are inconsequential, small lists being offered by the Soo Lines and the Monon Route. We quote for delivery at buyer's works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$41.50 to $42.50
Relaying rails	59.50 to 60.00
Old carwheels	32.00 to 33.00
Old steel rails, rerolling	42.00 to 43.00
Old steel rails, less than 3 ft	41.00 to 43.00
Heavy melting steel scrap	30.00 to 32.00
Frogs, switches and guards, cut apart	30.00 to 32.00
Shoveling steel	29.00 to 30.00
Steel axle turnings	22.50 to 23.50

Per Net Ton

Iron angles and splice bars	$41.00 to $42.00
Iron arch bars and transoms	43.00 to 44.00
Steel angle bars	36.00 to 37.00
Iron car axles	45.00 to 46.00
Steel car axles	45.00 to 46.00
No. 1 railroad wrought	35.00 to 36.00
No. 2 railroad wrought	31.00 to 32.00
Cut forge	31.00 to 32.00
Pipes and flues	24.00 to 25.00
No. 1 busheling	25.50 to 26.50
No. 2 busheling	19.00 to 20.00
Steel knuckles and couplers	41.00 to 42.00
Steel springs	42.50 to 43.00
No. 1 boilers, cut to sheets and rings	22.50 to 23.00
Boiler punchings	34.50 to 35.00
Locomotive tires, smooth	50.00 to 50.50
Machine-shop turnings	17.00 to 18.00
Cast borings	17.50 to 18.00
No. 1 cast scrap	28.50 to 29.50
Stove plate and light cast scrap	18.50 to 19.50
Grate bars	21.00 to 22.00
Brake shoes	21.00 to 22.00
Railroad malleable	29.00 to 30.00
Agricultural malleable	25.75 to 26.75
Country mixed scrap	15.50 to 16.50

Philadelphia

PHILADELPHIA, July 23.

New business, save on Government specification and on ship materials, is light in this market, as buyers are apparently holding off to see whether the Government's price-fixing ideas harden into a concrete policy. So far as the steel mills are concerned, this lull is not unwelcome, for they are sold so far ahead that the lack of new business at this time is having no effect on prices. In other lines the slowing down has had its effect in reducing quotations, this being true in some lines of old materials and in foundry irons, though the latter are being subjected to influences generated by the appearance of re-sale tonnages. Government orders are being received in increasing volume by mills in this district, and not only are new specifications coming in but rearrangements are being ordered in the sequence of deliveries on contracts already on the books. Under the new export arrangements, shipments of finished materials are going to Canada with hardly a break, while materials destined for Great Britain, France and Italy are apparently having no trouble in obtaining a clear path so far as the embargo is concerned. It is confidently expected here that when the shipping snarl in Washington is disentangled work will begin on the erection of a Government-promoted shipbuilding plant here in the vicinity of League Island on one of the few first-class deep-water fronts still available on the west bank of the Delaware between Philadelphia and Wilmington.

Pig Iron.—Things are dull in the whole list of standard irons. Re-sale iron is affecting the market to some degree, and so is the influence of a few sellers who are not fully sold ahead. There is a good deal of inquiry for export, chiefly to Japan, and Southern iron seems to be wanted for this purpose, though other export inquiries include basic and Bessemer in lots of 3000 to 5000 tons. It is reported that a fair tonnage of Southern iron originally intended for Scotland has been diverted to meet a Japanese inquiry, but no license to ship has been received. Part of the iron offered for re-sale is on the account of exporters who failed to obtain all the shipping room they required, and part is said to be offered on account of small foundries who prefer to take profits on their raw material rather than work it up into castings. Under the circumstances eastern Pennsylvania No. 2 X is quoted to-day at $55, delivered, as the market top, though makers who have no iron to sell maintain the figure of $55, furnace. Virginia irons remain about where they have been, with $52.50, furnace, about the top of the market, though there are reports of small sales at $54, furnace, for delivery within the calendar year and $57 for prompt. One large Virginia interest has put out a list of special irons, high manganese and high silicon, in which prices ranging from $58.50 to $66, furnace, are asked for the small tonnages available in each analysis. Some small tonnages of Alabama No. 2 have been sold here at $45 to $48, Birmingham, for first half, but an inquiry of 1000 tons for export was declined by the house which received it. Steel-making irons share the general quietness, basic holding to a nominal quotation of $50 to $52, with low phosphorus maintaining its price of $90. Quotations for standard brands, prompt shipment, and delivery in buyers' yards, are about as follows:

Eastern Penna. No. 2 X foundry	$53.00 to $55.00
Eastern Penna. No. 2 plain	52.50 to 54.50
Virginia No. 2 X foundry	54.25 to 55.25
Virginia No. 2 plain	53.75 to 54.75
Basic	50.00 to 52.00
Standard low phosphorus	90.00

Ferroalloys.—Conditions are somewhat easier in alloys, and a considerable amount of re-sale ferromanganese has made its appearance. Sales of ferromanganese for third quarter are reported at prices ranging from $410 to $430. There is still a good volume of inquiry for 50 per cent ferrosilicon.

Coke.—Spot furnace coke was sold to-day at $11, a substantial decrease from the prices asked a week ago. Foundry coke was quoted as high as $13.50, but this

spread was considered rather too great on the basis of actual furnace coke sales.

Plates.—Tonnages ordered during the week have been heavy, but the great bulk of the work came directly or indirectly from the Government, which is virtually monopolizing the output of the plate mills. Prices are still maintained at 10c., Pittsburgh, for tank and 12½c., base, mill, for ship steel, but these are the minimum and some civilian business was taken on this week on a basis of 11c., base, Pittsburgh, for tank. Such instances are rather rare, for one maker turned down an order for 1000 tons of tank steel at 11c., base, mill, on the ground that the buyer was not a regular customer. Mills are making a record output, but will make no promises on material for domestic use. It is made clear that all such business is taken at mill convenience, with ten or twelve months likely to elapse before delivery, and that Government orders are to have the preference even if this term is lengthened. It is understood that among the Government specifications in this district during the week was one for about 4000 tons of plates from ¼ in. to ½ in.

Iron and Steel Bars.—An inquiry for about 1400 tons of steel bars for use in the new shipyard at Cornwells, above Philadelphia, on the Delaware River, was made here this week. Prices on soft steel bars remain firm on the basis of 4½c., base, Pittsburgh, with 5c., base, Pittsburgh, asked on bar iron, and little business being taken. Makers of bar iron hesitate at new contracts for the remainder of the year. One large maker of steel bars received an inquiry this week on 150 tons of standard spikes for export but declined to make a quotation.

Sheets.—Government orders have taken up all the sheet capacity in this district and only very exceptional circumstances could make it possible to get a civilian order on the books. The nominal price, based on the last reported transaction, is 8¾c., Pittsburgh, for No. 10 blue annealed.

Old Material.—Business has been slow and prices are off, but dealers profess to think that the bottom has been reached, or at least nearly reached. Mills are out of the market, but it is generally thought that they will be obliged to buy soon, whether a price-fixing program is adopted or not. Some idea of how prices have shaded off since the big rise of a few weeks ago can be seen in the quotations on turnings for blast furnace use. From a quotation of about $23 in June they fell off to a price of $20 to $21 during the first two weeks of July and to-day are held at $19 to $20. Odd sales in different numbers on the old materials list afford prices better than the market, as in the case of No. 1 heavy melting steel, in which some small transactions were reported to-day at $35. Prices per gross ton, delivered in eastern Pennsylvania territory, are about as follows:

No. 1 heavy melting steel	$32.00 to $33.00
Old steel rails, rerolling	45.00 to 47.00
Low phosphorus heavy melting	45.00 to 50.00
Old iron rails	45.00 to 47.50
Old carwheels	35.00 to 38.00
No. 1 railroad wrought	48.00 to 50.00
No. 1 forge fire	24.00 to 25.00
Bundled sheets	24.00 to 25.00
No. 2 busheling	16.00 to 17.00
Machine shop turnings (for blast furnace use)	19.00 to 20.00
Machine shop turnings (for rolling mill use)	21.00 to 23.00
Cast borings (for blast furnace use)	19.00 to 20.00
Cast borings (clean)	23.00 to 25.00
No. 1 cast	35.00 to 38.00
Grate bars	21.00 to 22.00
Stove plate	22.00 to 23.00
Railroad malleable	32.50 to 35.00
Wrought iron and soft steel pipe (new specifications)	34.00 to 35.00

Cleveland

CLEVELAND, July 24.

Iron Ore.—The car situation at lower Lake ports, which has been very serious and has caused the holding up of cargoes from three to five days at docks, shows some improvement, but shippers are considerably behind on their schedules owing to the delays. A few small lot sales of ore are reported. Rail rates on ore from the Gogebic and the Menominee ranges to upper Lake ports were advanced 6c. a ton this month, and an advance of 8½c. will be made July 27 on the rail rate on ore from the Mesaba range. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, $5.95; Mesaba Bessemer, $5.70; old range non-Bessemer, $5.20; Mesaba non-Bessemer, $5.05.

Pig Iron.—Leading producers have taken a stand against further advances in pig-iron prices, and have decided on $55 as the maximum price they will quote on basic, foundry and malleable iron. This means a reduction in prices by some interests that have been making sales at $57 and $58 and in one case at $60. The aggregate tonnage sold above $55 has not been large, being mostly small lots for this year's delivery. Most of the resale iron that was a disturbing factor in the market last week appears to have been disposed of. In view of the present unsettled condition regarding price regulation the market is extremely dull. Very few sales are reported, these being for small lots for early shipment and no new inquiries of any size have come out. The Southern iron market is inactive, with prices ranging from $45 to $50, Birmingham, for this year's delivery, and $48 to $50 for the first half of next year. Foundries are endeavoring to stock up on Southern iron as much as possible in order to avoid the danger of a shortage later, should shipments be delayed. Bessemer ferrosilicon has sold at $100 for 10 per cent for a small lot. Small lot sales of low phosphorus iron are reported at $85 to $87. We quote, f.o.b. Cleveland, as follows:

Bessemer	$55.95 to $56.95
Basic	52.30 to 54.30
Northern No. 2 foundry	53.30 to 55.30
Southern No. 2 foundry	49.00 to 54.00
Gray forge	50.95 to 52.95
Ohio silvery, 8 per cent silicon	88.62 to 91.62
Standard low phos. Valley furnace	85.00

Coke.—There is a fair demand for foundry coke for prompt shipment which is selling as high as $14 per net ton at oven, the price being kept up to near the recent level in spite of the sharp decline in furnace coke. No contract prices are being quoted. Some Indianapolis by-product foundry coke was sold in this territory during the week on the basis of $12.50, Connellsville, for delivery over three or four months. Furnace coke is quoted at $10 to $10.50 for prompt shipment. Coke shipments are now fairly good.

Finished Iron and Steel.—Buyers are holding off as much as possible awaiting developments in regard to the price regulation, and the demand in most lines is quiet. The proposal of Government regulation is having a tendency to keep prices down. The most active demand at present appears to be coming from the motor truck and tractor manufacturers whose plants are crowded with work. The White Co., Cleveland, is understood to have just closed an order with the French Government for several hundred motor trucks. No new inquiry has developed for steel for Government work. In structural lines, T. H. Brooks & Co. have taken the contract for an addition to the plant of the Illuminating Co., Cleveland, requiring 2000 tons of steel. Bethlehem sections will be used. John Gill & Sons, Cleveland, have taken a general contract for the Public Library building at Philadelphia. This will require 4500 tons of steel. The fabricating contract has not been placed. A local sale of a small lot of forging billets at $120 at mill is reported. Standard rails have sold as high as $89 for a car lot in the Cleveland market. The demand for plates continues active, and the Cleveland mill price is unchanged at 10c. for this year's delivery. Among new inquiries is one for 500 tons for export to China. Hard steel bars are quoted at 4.25c. There is practically no demand for iron bars. The sheet market is very firm and active. Considerable tonnage awaiting export shipment has been thrown on the market during the past few days because of the Government embargo. As it takes some time to secure Government license for export, the mills decided to sell these sheets and fill export orders from later rollings. Sheets are quoted at 8.50c. to 9.25c., Pittsburgh, for No. 28 black, 8.50c. to 9c. for No. 10 blue annealed, and 10.75c. to 11c. for No. 28 galvanized. Warehouse prices are 5c. for steel bars, 5.25c. for structural material, 9c. for plates, and 9c. for blue annealed.

Bolts, Nuts and Rivets.—The demand for bolts, nuts and rivets has quieted down. New rivet orders are coming largely from ship yards. No understanding has been reached as yet as to prices that will be charged for rivets used in making Government boats. Ship builders are trying to place orders for next year's delivery, but makers are declining to quote for delivery after Jan. 1. The output is being curtailed by a shortage of labor. We quote rivets at 5.25c., Pittsburgh, for structural, and 5.35c. for boiler rivets. Bolt and nut discounts are as follows, round lot buyers being allowed from 5 to 10 per cent discount from these prices:

Common carriage bolts, ⅝ x 6 in., smaller or shorter, rolled thread, 35 off; cut thread, 30 and 5, larger or longer, 20. Machine bolts, with h. p. nuts, ⅝ x 4 in., smaller or shorter, rolled thread, 40; cut thread, 35; larger and longer, 25. Lag bolts, cone point, 40. Square h. p. nuts, blank, $1.90 off list; tapped, $1.70 off list. Hexagon, h. p. nuts, blank, $1.70 off; tapped, $1.50 off. C. p. c. and t. hexagon nuts, all, sizes blank, $1.25 off; tapped, $1 off. Cold pressed semi-finished hexagon nuts, 50 and 5 off.

Old Material.—The market is inactive and weak. Heavy melting steel has declined about $6 a ton, and there has been a sharp decline on other grades. Practically the only activity is between dealers and the trading between these is light, owing to the fact that they have about all covered on short sales, which helped to support the market for some time after prices began to move downward. Local dealers are offering $32 for heavy melting steel scrap, although sales are reported as low as $30. There is practically no demand for busheling, and dealers are offering around $25 for this grade. Sales of borings and turnings are reported by Cleveland dealers in the Pittsburgh district at $20, per gross ton. We quote f.o.b., Cleveland, as follows:

Per Gross Ton

Steel rails	$31.00 to $32.00
Steel rails, rerolling	45.00 to 46.00
Steel rails, under 3 ft.	41.00 to 42.00
Iron rails	43.00 to 44.00
Steel car axles	50.00 to 52.00
Heavy melting steel	32.00 to 33.00
Carwheels	34.00 to 35.00
Relaying rails, 50 lb. and over	50.00 to 55.00
Agricultural malleable	26.00 to 27.00
Railroad malleable	31.00 to 32.00
Light bundled sheet scrap	24.00 to 25.00

Per Net Ton

Iron car axles	$48.00 to $50.00
Cast borings	17.50 to 18.00
Iron and steel turnings and drillings	17.00 to 17.50
No. 1 busheling	25.00 to 26.00
No. 1 railroad wrought	44.00 to 45.00
No. 1 cast	30.00 to 31.00
Railroad grate bars	21.50 to 22.00
Stove plate	20.00 to 21.00

Cincinnati

CINCINNATI, July 24—(*By Wire*).

Pig Iron.—Urgent calls for shipment of foundry iron on contracts previously made are now frequent. In most cases, this iron is needed, but in other instances it is simply a desire on the part of melters to lay in sufficient yard stocks to carry them through any future emergency that may arise to curtail the supply. No inquiries are out for anything except small lots of foundry iron for prompt shipment. Melters seem to have lost all interest in the first half of next year, and few, if any, contracts have been made for that delivery within the past week. Southern iron is not being firmly held at $50, Birmingham, for this year's shipment, as sufficient resale iron has appeared at lower figures to take care of the small business that is offered. The absence of any sales of consequence renders it difficult to state what the minimum price for the first half is, and the slack inquiry has convinced furnace operators that it would be futile to attempt forcing the market under present conditions. The uncertainty as to the Government program for regulation of prices is undoubtedly the basic cause of the present situation. Northern iron is stagnant. The furnaces have practically none to offer for this year, with the exception of a few odd lots of off iron, and with comfortably filled order books they view the future with indifference. The principal trouble now is to move to old customers as fast as they need it. The Ohio silvery irons are unchanged, as far as prices are concerned, with practically no sales of consequence to report. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, as follows:

Southern coke, No. 1 f'dry and 1 soft.	$51.40 to $52.40
Southern coke, No. 2 f'dry and 2 soft.	49.90 to 50.90
Southern coke, No. 3 foundry	49.40 to 50.40
Southern coke, No. 4 foundry	48.90 to 49.90
Southern gray forge	48.90 to 49.90
Ohio silvery, 8 per cent silicon	86.26 to 91.26
Southern Ohio coke, No. 1	56.26 to 57.26
Southern Ohio coke, No. 2	56.26 to 57.26
Southern Ohio coke, No. 3	55.26 to 56.26
Southern Ohio malleable Bessemer	56.26 to 57.26
Basic, Northern	56.26 to 57.26
Lake Superior charcoal	56.75 to 57.75
Southern carwheel foundry	48.90 to 49.90

(*By Mail*)

Finished Material.—Jobbers report that there is a general good business and the call for small structural material is encouraging for this time of the year. The large buildings now under construction and contemplated are, of course, provided for as far as structural material is concerned, but the demand for twisted steel bars shows that there is yet considerable work to be done before the coming winter. The construction of a number of Government temporary buildings in this vicinity has created a demand for nails and builder's hardware, but the total amount is not of much consequence. The jobber's price on nails this week is lower than last week and $3.90 per keg base can be done on nails from stock, while the leading manufacturer is quoting $3.20 per keg base, Pittsburgh, but this figure has not yet been met by the independents. Black and galvanized sheets are now getting too high for a great deal of work and as far as roofing is concerned, there is a strong tendency to substitute composition roofing in places where it has not heretofore been used. We quote No. 28 black sheets at 8.65c., Cincinnati or Newport, Ky., and No. 28 galvanized 10.65c. The jobber's quotation on steel and iron bars is unchanged at 5c. base, and on twisted steel bars 5.05c.; structural shapes, 5.25c. and ¼-in. plates and heavier 9½c. Cold rolled shafting for which there seems to be a better demand is sold at the list price plus 15 per cent. Machine bolts ⅜ x 4-in. and smaller are quoted from stock at 45 per cent discount, larger and longer 30 per cent discount. Round head steel rivets are unchanged at 5.05c. base and cone head rivets, 5.60c. The mill supply business has lately slackened to some extent.

Old Material.—Prices are still on the downward grade, and dealers report that the larger users of scrap, such as the rolling mills, are not willing to place orders just now. This hesitancy is said to be due entirely to the uncertainty of prices on finished material that might be regulated by the Government. Incoming shipments are a trifle light. The following are dealer's prices, f.o.b. at yards, southern Ohio and Cincinnati.

Per Gross Ton

Bundled sheet scrap	$20.00 to $20.50
Old iron rails	35.00 to 35.50
Relaying rails, 50 lb. and up	45.50 to 46.00
Rerolling steel rails	38.50 to 39.00
Heavy melting steel scrap	33.50 to 34.00
Steel rails for melting	34.00 to 34.50
Old carwheels	31.00 to 31.50

Per Net Ton

No. 1 railroad wrought	$34.00 to $34.50
Cast borings	13.00 to 13.50
Steel turnings	13.00 to 13.50
Railroad cast	24.00 to 24.50
No. 1 machinery cast	24.50 to 25.00
Burnt scrap	15.00 to 15.50
Iron axles	43.50 to 44.00
Locomotive tires (smooth inside)	37.00 to 37.50
Pipes and flues	18.00 to 18.50
Malleable cast	24.50 to 25.00
Railroad tank and sheet	16.00 to 16.50

Coke.—Reductions have been made on both furnace and foundry spot coke in all of the producing districts. However, contract figures in some instances seem to have gained strength. For instance, the average quotation on No. 48-hr. coke in the Connellsville field for future shipment range from $9 to $10 per net ton at oven and for immediate shipment $10.50 to $11. Foundry coke for future shipment in that field is around $12 to $13, and for spot movement from $13 to $14. These quotations will about fit in with those made in other fields where spot foundry coke is still held at a premium of about 50c. above the figures named for

Connellsville coke. The car situation is not giving as much trouble as the labor shortage and the hot weather is not a factor to alleviate this last named condition.

Birmingham

BIRMINGHAM, ALA., July 24 (*By Wire*).—The iron market is listless, but well sold up interests ask the same price as prevailed last week, and prompt iron sells around $50, with some re-sale metal slightly lower. Last half ranges from $48 to $50. Apparently the lowest on 1918 iron is $45.

(*By Mail.*)

Pig Iron.—Iron operators appear to agree that there is going to be Government regulation and, for that reason, incline to believe that the soaring process has stopped. Consumers are evidently awaiting developments. The inquiry during the week was scattering and there was little selling. One company had not entered an order between July 9 and July 20. The leading seller continues to quote $45 and $46 for 1918 delivery without especially seeking business. Sales on that basis have been made. This company's 1917 price is $50. The leading seller of foundry iron is on a schedule of $48 for 1918 with very little business being transacted. Spot iron is about as firm, owing to well-sold up condition of furnaces. One maker asked $52 on a small prompt order, a price which the broker declined. The prompt minimum is around $50, with the exception of a limited amount of resale iron available only in certain sections, which goes at $49. There was a prompt sale by a furnace interest of a car of 3 per cent silicon at $51, which is about $49.50 No. 2 foundry basis. The Woodward Iron Co. is shipping 1200 tons of pig iron by rail to Sheffield, Ala., whence the consignee, who is understood to have either bought or leased a steamer and barges, is towing it up the Tennessee, Mississippi and Illinois rivers to Peoria, Ill., where the purchaser has a plant. Some of this iron, it is understood, will move on to Chicago via the drainage canal. It is the first shipment via that route. For two years the Sloss-Sheffield Steel & Iron Co. has shipped iron from its Florence and Sheffield furnaces up the Tennessee River to Metropolis, whence rails took it to destination in St. Louis, Chicago and northwestern consuming centers. Lack of transportation facilities and occasional low water have prevented this business assuming large proportions. The rates via both these river routes are lower than by all-rail. The Woodward Company has completed repairs on the Vanderbilt stacks, which will at once resume, giving that company five active stacks. Arrangements to repair and operate the furnaces of the Sheffield Coal & Iron Co. at Sheffield, Ala., are under way. W. L. Kluttz, former manager of the Central Coal & Iron Co.'s plants at Holt, will be in charge. We quote per gross ton, f.o.b., Birmingham district furnaces, for prompt delivery as follows:

No. 1 foundry and soft	$50.50 to $51.50
No. 2 foundry and soft	50.00 to 51.00
No. 3 foundry	49.50 to 50.50
No. 4 foundry	49.25 to 50.25
Gray forge	49.00 to 50.00
Basic	50.00 to 51.00
Charcoal	55.00 to 56.00

Steel Bars.—Steel bars in carloads, f.o.b., Birmingham, 4.50c. to 4.75c.; iron bars, 4.20c. to 4.40c.

Cast Iron Pipe.—Cast iron pipe makers are principally concerned with the rush orders for the Government, which still keep plants busy. Other than the Government business, there has been little activity. Municipal business is conspicuous by its absence. We quote per net ton, f.o.b., Birmingham district plants, as follows: 4 in., $63; 6 in. and upward, $60, with $1 added for gas pipe and extra lengths.

Coal and Coke.—There have been no changes in the coal or coke market for some time. Standard bee hive foundry coke is bringing $11.50 to $12 for contracts and $14 to $16 for spot. The shipments to Mexico as well as Pacific Coast are fairly regular. Steam coal brings $2.50 to $3, f.o.b., mines.

Old Material.—The scrap market has undergone more recessions and is considered weak when comparison is made with prices of pig iron. The entire list outside of steel axles and carwheels was trimmed again this week. We quote per gross ton, f.o.b., dealers' yards, as follows:

Old steel axles	$50.00 to $52.00
Old steel rails	28.00 to 29.00
No. 1 wrought	31.00 to 32.00
No. 1 heavy melting steel	23.00 to 24.00
No. 1 machinery cast	25.00 to 25.50
Carwheels	27.00 to 29.00
Tram carwheels	25.00 to 25.50
Stove plate and light	18.00 to 18.50
Turnings	12.50 to 13.00

St. Louis

ST. LOUIS, July 23.

Pig Iron.—Although reports are reaching here that agreements have been reached whereby the Government is to get its iron and steel at special prices, nevertheless the buyers and the sellers in this market are unwilling to commit themselves on contracts until a more definite state of affairs exists. In consequence, the sales of pig iron during the past week have been very light and the inquiries almost as insignificant. Such transactions as were closed were of little moment, such, for instance, as one car of No. 2 Southern for January delivery at $48, Birmingham, and like quantities, deliveries and prices. It is doubtful whether more than 1000 tons were sold during the week of all grades and all deliveries. One feature of interest, however, was the appearance in this market of a considerable number of offers of certificates in 1000 to 1500 tons lots, apparently from brokers who have become nervous over their holdings and want to get rid of their responsibilities. They met with little encouragement, consumers preferring to await developments. Consumers holding contracts are urging forward their allotments sharply.

Old Material.—Absence of actual transactions makes quotations in the scrap market a very difficult matter—indeed the figures given are estimates rather than quotations, for so little business is being done that the dealers are getting anxious to sell at almost any price to keep expense of yard operation from eating too far into the capital account, especially as the aforesaid capital account has been sharply handicapped by the prices which have had to be paid for the most recent purchases. Consumers are melting their material rapidly, there having been no cessation of operations, but they have been content to reduce supplies in their yards or contracted for and await a settling of the situation and a return of prices to a more reasonable basis. Some industries are taking bargains where offered and these are getting more frequent as dealers are compelled to realize on holdings. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton

Old iron rails	$39.00 to $40.00
Old steel rails, re-rolling	42.00 to 43.00
Old steel rails, less than 3 ft.	39.00 to 40.00
Relaying rails, standard section, subject to inspection	50.00 to 51.00
Old carwheels	33.00 to 33.50
No. 1 railroad heavy melting steel scrap	36.50 to 37.00
Heavy shoveling steel	28.00 to 28.50
Ordinary shoveling steel	27.00 to 28.00
Frogs, switches and guards cut apart	37.00 to 38.00
Ordinary bundled sheet scrap	18.50 to 19.00
Heavy axle and tire turnings	22.00 to 22.50

Per Net Ton

Iron angle bars	$36.00 to $36.50
Steel angle bars	36.50 to 37.00
Iron car axles	43.00 to 43.50
Steel car axles	42.00 to 42.50
Wrought arch bars and transoms	40.00 to 40.50
No. 1 railroad wrought	33.50 to 34.00
No. 2 railroad wrought	31.00 to 31.50
Railroad springs	30.00 to 30.50
Steel couplers and knuckles	41.00 to 41.50
Locomotive tires, smooth inside, 42 in. and over	42.50 to 43.00
No. 1 dealers forge	28.00 to 29.00
Cast iron borings	14.50 to 15.00
No. 1 busheling	24.00 to 24.50
No. 1 boilers cut to sheets and rings	19.50 to 20.00
No. 1 railroad cast scrap	22.00 to 22.50
Stove plate and light cast scrap	17.00 to 17.50
Railroad malleable	27.50 to 28.00
Agricultural malleable	22.50 to 23.00
Pipes and flues	20.50 to 21.00
Heavy railroad sheet and tank scrap	20.00 to 20.50
Railroad grate bars	18.00 to 18.50
Machine shop turnings	14.00 to 14.50
Country mixed scrap	14.00 to 15.00

Coke.—A decidedly easier feeling has developed in coke and while spot is held at $12 to $14, Connellsville, for best selected 72-hour foundry grades buyers are finding little difficulty in getting supplies. No contract coke, however, is being signed up, neither the beehive ovens nor the by-product plants being willing to commit themselves in distant deliveries. Consumers, too, are willing to wait for a clearer atmosphere.

Finished Iron and Steel.—No new business is appearing in finished products and there is no desire to sell, either for prompt or future deliveries, the mills apparently being content to leave all new business to the warehouses, at least until the general situation is clearer. The movement out of warehouse is very free, up to capacity in fact, at the prices quoted, which meet with no objections. We quote for stock out of warehouse as follows: Soft steel bars, 4.55c.; iron bars, 4.50c.; structural material, 5.05c.; tank plates, 8.05c.; No. 10 blue annealed sheets, 9.55c.; No. 28 black sheets, cold rolled, one pass, 9.85c.; No. 28 galvanized sheets, black sheet gage, 11.25c.

Buffalo

BUFFALO, July 23.

Pig Iron.—The Buffalo Union Furnace Co., which recently leased the blast furnace of the Burden Iron Co. at Troy, N. Y., is rapidly putting the stack in condition for operation and will start making iron some time in August. It has already sold a considerable portion of the output for the fourth quarter, with deliveries commencing at the time of blowing in. For the purpose of securing a "back log" of orders for the starting up of the furnace, this iron was offered at $50 per ton at furnace; but so large a proportion of capacity for this year's delivery was quickly taken for New England points and for export that the company to-day announces that the price for the remainder of the output for this period will be advanced to $55 in the immediate future. Aside from the above incident, the market is without important features, the few small sales made being for first half delivery and at last week's prices. Generally speaking, producers and users alike are waiting for definite decision, or manifestation, showing what the Government's attitude with respect to price-making is to be. We quote as follows for first quarter and first half 1918 delivery, f.o.b. furnace, Buffalo:

High silicon irons	$55.00 to $56.00
No. 1 foundry	54.00 to 55.00
No. 2 X foundry	53.00 to 55.00
No. 2 plain	52.00 to 54.00
No. 3 foundry	51.00 to 53.00
Gray forge	51.00 to 53.00
Malleable	53.00 to 55.00
Basic	53.00 to 55.00
Lake Superior charcoal, f.o.b. Buffalo.	55.00 to 60.00

Old Material.—Very few sales of any tonnage have been made during the week and business transacted was comprised principally material on cars that dealers preferred to move at concession prices rather than to place in stock. Lack of demand from mills has caused further shrinkage in prices covering, with few exceptions, the entire list, and such new business as is done at present is largely between dealers. Nearly every dealer has unfilled orders on his books at the high prices prevailing during the last month or two sufficient in volume to cover the period of dullness in new demand which is expected to prevail for the remainder of July and possibly all through August and absorb available tonnage. Consequently, dealers are bending their efforts to completing existing orders rather than endeavoring to place new business. The prices quoted below are largely nominal, but represent dealers' asking prices per gross ton, f.o.b Buffalo:

Heavy melting steel	$34.00 to $35.00
Low phosphorus	48.00 to 50.00
No. 1 railroad wrought	46.00 to 48.00
No. 1 railroad and machinery cast	30.00 to 31.00
Iron axles	50.00 to 55.00
Steel axles	50.00 to 55.00
Car wheels	35.00 to 37.00
Railroad, malleable	32.00 to 33.00
Machine shop turnings	18.00 to 19.00
Heavy axle turnings	26.00 to 27.00
Clean cast borings	20.00 to 21.00
Iron rails	43.00 to 44.00
Locomotive grate bars	22.00 to 23.00
Stove plate	20.50 to 21.00
Wrought pipe	30.00 to 31.00
No. 1 busheling scrap	31.00 to 32.00
No. 2 busheling scrap	21.00 to 22.00
Bundled sheet stamping scrap	21.00 to 21.50

Finished Iron and Steel.—The market is absolutely quiet, as sales agencies, as a rule, are selling nothing except a few odds and ends. Dead calm in buying prevails, while both sellers and buyers await developments from Washington. There is apparently less inclination to do business by either the mills or consumers than was noted a week ago, when the waiting policy began to be strongly entrenched.

The Donner Steel Co., this city, announces that its new plate mill will be placed in operation this week.

British Steel Market

Ferromanganese Higher for 1918—Maximum Tin-Plate Price Fixed

LONDON, ENGLAND, July 25.—(*By Cable.*)

The pig-iron market is firm with hematite iron in active and general demand. More furnaces are expected to start soon. Tin plates are nominal with the basis price for the home trade officially fixed at 30s. net at makers' works. American wire rods for early shipment have been sold at £29 c.i.f. Ferromanganese is strong at $400 c.i.f., quoted for delivery in the first half of 1918. We quote as follows:

Tin plates, coke 14 x 20; 112 sheets, 108 lb., f.o.b. Wales, maximum, 30s.
Black sheets, £21 5s.
Ferromanganese, £45 nominal.
Ferrosilicon, 50 per cent, c.i.f., £35 upward.
On other products control prices are as quoted in THE IRON AGE of July 19, p. 171.

Government Controls Nearly Every Branch—Ferromanganese Position Acute

LONDON, ENGLAND, July 3.—Concentration of productive capacity on war requirements is becoming intensified. There is no end of orders confronting steel plants, so that merchant trade is suffering. Attempts are being made to carry this on by the use of shell discards, the available supply of which is eagerly snapped up, and does not go very far. Apart from huge Government demands, the speeding up of the mercantile shipping program continues. Government control now extends to practically every branch of the steel industry, and overseas' merchant business is paralyzed.

In pig iron, conditions continue irregular with further evidence of ease regarding the supply of foundry and forge descriptions. The output of Cleveland iron is ample, and there has been further improvement in the clearances to the Continent. There is less pressure on the English foundries, and it is possible a larger tonnage will be released to the Allies, whose demands continue heavy, while this month's home needs will be lighter due to the Scottish holidays. Additional pressure has been put upon hematite producers and current output is moving into consumption rapidly. Every effort is being made to develop output in order to cope with the intense domestic and foreign demand.

Semi-finished steel is tight. The great bulk of the output is being systematically absorbed by Government needs. The surplus supply of Welsh sheet bars is small. In American material, business in billets remains completely at a standstill while only few and limited transactions have been heard of lately in wire rods on c.i.f. terms varying between £28 and £30.

The supply of raw material reaching the finishing branches falls short of requirements. Official prices are unchanged, although the tendency outside the control has been firmer with irregular fluctuations. The question of terms is now a secondary consideration, due to the demand far outstripping the supply.

Steel Companies Combining

There have been further developments to combine interests. It is understood that negotiations have now been pretty well completed for the amalgamation of the Frodingham Iron & Steel Works with the Steel, Peech & Tozer and Samuel Fox, consumers of Sheffield, which were amalgamated about a year ago. The new combination will now have their own supply of pig iron as the Frodingham works are located on rich ore fields with good supplies of lime and ironstone. It is sug-

gested that this union will include one-half of the Appleby property in Lincolnshire, which was acquired a few years back by the Frodingham company in conjunction with the Steel Co. of Scotland.

The position of ferromanganese is more acute. Special licenses for export are practically confined to United States and Canadian ports. F.o.b. quotations are virtually nominal although up to £68 has been bid for forward shipment to Continental ports. Sellers are very scarce and ask up to £80 for shipment next year. Some business has been done recently at $350, c.i.f. North American ports, and sellers are now asking $375 to $400.

There is some demand for Indian manganese ores, but business is badly handicapped by lack of tonnage and the market is much firmer.

Demand for tin plates is in excess of the supply and the tone is strong. Urgent orders estimated at about 80,000 boxes were placed quite recently for immediate and early shipment to France, and the United States has also made sales to France. There is a heavy drain on makers' stocks and the scarcity of offers for near months is more pronounced, while works are frequently fully booked into the autumn. The outlook for consumers is going from bad to worse because of small output and threatened exhaustion of stocks. Execution of urgent orders by packers is seriously handicapped. Current quotations are now on the basis of about 35s. per basis box, f.o.b. Wales, and stock lots free from permit restrictions command a big premium, with sales round about 40s.

New York

NEW YORK, July 25.

Pig Iron.—Except for fill-in lots of very moderate tonnages, there is no demand for pig iron for domestic consumption. Some iron is being offered for resale at lower prices than recently quoted, but furnaces are adhering to their quotations and are not worried about the future. In fact, they are glad to have a little breathing spell. Pressure for deliveries is as strong as ever, and the railroad situation as to cars shows little, if any, improvement. Alabama iron has been resold for prompt delivery at $48 Birmingham for No. 2 foundry. Some iron has been sold in the Buffalo district at $50 furnace, and is understood to be from a furnace soon to be blown in. A sale of 3000 tons has been made for shipment to Japan and will be shipped via San Francisco. Inquiries amounting to from 25,000 to 30,000 tons of foundry and steel-making irons are pending. We quote tidewater for prompt delivery as follows:

No. 1 foundry	$54.25 to $55.25
No. 2 X	53.75 to 54.75
No. 2 plain	53.25 to 54.25
Southern No. 1 foundry	52.75 to 53.75
Southern No. 2 foundry and soft	52.25 to 53.25

Cast Iron Pipe.—The market is dull, with no municipal business of importance pending. Cast iron pipe plants are being called upon to furnish fittings for wooden pipe which is to be installed in Government cantonments. Carloads of 6-in., 8-in. and heavier are quoted at $65.50 per net ton tidewater and 4-in. at $68.50.

Ferroalloys.—The ferromanganese market is quiet and quotations are unchanged from those of last week. For early delivery $400 is asked, with $375 and $350 the ruling prices for last quarter of this year and first half of next year respectively. Sales of several hundred tons of domestic alloy for delivery in the first half have been made at $350. Receipts of the British alloy for June, from reports furnished THE IRON AGE from three of the five ports of entry indicate a smaller importation than was expected or not much of any in excess of 3000 tons. No further reports of submarine losses of the alloy are noted. Spiegeleisen is strong but quiet at $85, furnace, for 20 per cent, delivery this year. Ferrosilicon, 50 per cent, is in active demand for large quantities for delivery abroad next year. The quotation continues at $130 for 1918 delivery with $200 to $225 asked for material needed for early delivery.

Structural Material.—Outside of Government contracts the general situation is quiet. Large fabricators are disinclined to furnish material for anything outside of that necessary for war purposes or those allied thereto. A number of projects for new theaters will reach maturity if steel can be obtained and it is also noted that owing to the large demand for apartment houses at even higher rents projects of this kind would go forward if it were thought possible to obtain the steel, no matter if the price is high. Government contracts recently awarded are the following: The American Bridge Co. has taken 700 tons for additions to Bancroft and Isherwood halls at the Naval Academy, Annapolis, Md., from the general contractor announced as low bidder two weeks ago; the same company will probably furnish the 2400 tons for the new projectile plant for the Government at Charleston, W. Va., from the low bidder, Warren Moore & Co., Philadelphia. It is estimated that the awards have all been made for the remainder of the 40 or more magazines in various parts of the country, the McClintic-Marshall Co. having taken about 1900 tons in addition to 400 tons already announced as awarded to the American Bridge Co. for the same purpose. For the stables and garage for the League Island Navy Yard, involving a small tonnage, William Linder is low bidder, and for eight magazines at Lake Denmark the Columbus Circle Construction Co. is named as low bidder. In addition to the foregoing the American Bridge Co. has taken 300 tons for three bridges for the Pennsylvania Railroad and the same railroad is inquiring for 250 tons for two bridges. Several manufacturing plants are taking bids on about 1700 tons for plant extensions and a few of the railroad companies are in the market for a small amount of steel for bridges and other necessary work. We quote plain material from mill at 4.669. to 5.169c., New York, the lower price in three to four months and the higher for small lots in earlier deliveries. Shipments from warehouses are 5c. to 5.25c. per pound, New York, according to sizes desired.

Plates.—The French Mission, through J. P. Morgan & Co., is purchasing 50,000 tons of plates, of which about 25,000 had been placed up to Tuesday. Shipments in September and October have been specified, the United States Government asking the mills to give these deliveries owing to the urgent need of the French Government, which will use the plates for naval vessels and for barges for carrying supplies on the rivers and canals. On hull steel the low bid is said to have been 7c., while 13c. was asked for boiler plate, but these prices were not low enough to satisfy our Government, and the mills taking the business finally accepted 6c. for the hull steel and 9c. for boiler plates. The tonnage placed was pretty well split up among a number of mills. The contracts which J. P. Morgan & Co. offered the mills specify that if for any reason shipment is delayed and it becomes necessary to store the plates, the mills shall receive 90 per cent of the purchase price at the time they are placed in storage. One concern has also asked that $2 per ton a month be paid if storage becomes necessary. The United States Government has sent requisitions to the mills for plates for 24 submarines and 24 torpedo boat destroyers, which will be built at various shipyards. It is said that there will be a distribution of large requisitions for steel plates for Government merchant ships very soon by the committee of the American Iron & Steel Institute, which has this matter in charge. The Government has sent out requisitions for plates for locomotives being built by the American Locomotive Co. and the Baldwin Locomotive Works for the Russian Government. There are still inquiries in the market for plates for the Japanese shipbuilding interests, but mills are declining to quote on this business in view of the attitude of this Government, which at the present time is said not to be favorable to the granting of export licenses for steel which was not in some stage of manufacturing on or before July 15, when the export embargo went into effect. The mills have a great deal of Japanese business on their books, and feel that neither they nor the Japanese have anything to lose by waiting until this tonnage is fairly well cleaned up.

Some of this business is for shipment within the next few months, while many orders on the books are for deliveries as far ahead as the second quarter of 1918. It is reported that the Japanese Commission, now on its way to the United States, will bring with it lists of steel for large requirements of that country, and orders will be placed here providing a satisfactory agreement is reached with our Government as to shipments. Domestic business is virtually at a standstill. The South Buffalo Railway is reported to have ordered 300 steel hopper cars from the American Car & Foundry Co. Nominal prices on mill shipments, if a mill could be found to accept the business, are 10c. Pittsburgh for tank quality and 12c. to 12½c. for ship steel. On resales prices are whatever buyer and seller may agree upon, but there are few buyers this week at any price. On mill shipments, we quote on tank plates 10.169c., New York, and ship plates, 12.169c., New York. Plates out of store are 8c. to 9c. for tank plates and 8.50c. to 9.50c. for ship plates.

Rails and Track Supplies.—The French railroads are in the market for a large tonnage of rails and track supplies, which, it is reported, are wanted for early shipment to France to be ready for a party of about 1000 American railroad men going abroad to assist in the rehabilitation of France's railroad system, which has been seriously affected by the strain of war transportation. It is understood that the French Mission has asked steel mills to delay orders for shell steel now on their books and give them the rails and track supplies instead.

Iron and Steel Bars.—The steel bar market is very quiet. Few concerns have any steel bars to sell for deliveries which would interest the average buyer. The bar iron market is active, and contracts are extending into the first quarter of next year. Many jobbers have not as yet closed for their fourth quarter requirements. We continue to quote steel bars in mill shipments at 4.669c. to 5.669c., New York, and bar iron at 4.919c. to 5.169c., New York. From New York district warehouses, steel bars are sold at 5c., and bar iron at 5c. to 5.50c.

Old Material.—The scrap market, except for foundry grades, is very much depressed and prices have been marked down rapidly. Heavy melting steel for shipment to Pittsburgh is now quoted at $28 to $29. There is very little demand even at that price. Sharp declines have taken place in rerolling rails, car axles and wrought iron track scrap. Brokers quote buying prices as follows to local producers and dealers per gross ton New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$29.00 to $30.00
Old steel rails (short lengths) or equivalent heavy steel scrap	28.00 to 29.00
Relaying rails	65.00 to 70.00
Rerolling rails	39.00 to 40.00
Iron and steel car axles	42.00 to 43.00
No. 1 railroad wrought	42.00 to 43.00
Wrought-iron track scrap	32.00 to 33.00
No. 1 yard wrought long	32.00 to 33.00
Light iron	10.00 to 12.00
Cast borings (clean)	18.00 to 19.00
Machine-shop turnings	18.00 to 19.00
Mixed borings and turnings	16.50 to 17.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long)	31.00 to 32.00

Despite the very marked weakness in other grades, cast-iron scrap is holding up very well and quotations do not show much change. Dealers in New York City and Brooklyn are quoting as follows to local foundries per gross ton:

No. 1 machinery cast	$34.00 to $35.00
No. 1 heavy cast (column, building material, etc.)	29.00 to 30.00
No. 2 cast (radiators, cast boilers, etc.)	28.00 to 29.00
Stove plate	20.00 to 21.00
Locomotive grate bars	20.00 to 21.00
Old carwheels	33.00 to 34.00
Malleable cast (railroad)	33.00 to 34.00

Fire, July 21, at No. 1 furnace of the Wharton Steel Co., Dover, N. J., caused a loss estimated at $20,000. The fire was caused by the failure of a floor in the furnace building, and resulted in the death of one employee and injury to eight others.

WILL BUILD LARGE PLANT

Curtiss Corporation Breaks Ground for the First Two Units

The Curtiss Aeroplane & Motor Corporation broke ground in Buffalo Tuesday for the first two units of a new factory, which when entirely completed will represent a cost of about $5,000,000. William A. Morgan, vice-president and general manager of the reorganized airplane company, of which John N. Willys of the Willys-Overland Co., is president, and Glenn H. Curtiss chairman of the board of directors, said that the company's plans contemplate the erection of an immense plant with about 1,000,000 sq. ft. of floor space to cost approximately $5,000,000. Employment will be given to 15,000 men.

The units now being built are the metalworking and woodworking shops, each to be of about 100,000 sq. ft. and of steel and concrete construction. The site for the plant comprises 33 acres, on which an option was exercised only last Saturday. The Austin Co. of Cleveland, and Bridgeport, Conn., has the contract for the buildings and promises to have the first two completed in 45 days. An experimental airplane laboratory will soon be erected somewhere on Long Island by Mr. Curtiss, who is in charge of airplane experiments.

During the past week the Curtiss corporation has sold to stockholders $2,100,000 worth of shares of common stock, the issuance of which was authorized at a recent meeting of the board of directors. It is stated that the Curtiss corporation is assured of about $150,000,000 worth of airplane contracts.

The Wright-Martin Aircraft Corporation, which has been expecting a Government contract, is said to have received a trial order for 500 Hispano-Suiza airplane engines. The General Vehicle Co. is at work on a large number of Gnome rotary motors and a number of other plants, including a great many automobile factories, are making parts of the U. S. A. 200-hp. motor, with which experiments will be made to determine its serviceability for battle planes.

Buy Coal Properties

M. A. Hanna & Co., Cleveland, has purchased the entire anthracite coal properties, including mines and collieries, of the Pennsylvania Railroad, and will operate these properties and market the product. The greater part of the coal property involved has been operated by the Susquehanna Coal Co. The output of the mines transferred is said to be about 5 per cent of the entire anthracite production of the country. The sale is the result of the decision of the Pennsylvania Railroad some time ago to dispose of its interests not directly concerned in the transportation service. Another important transfer of coal properties was announced this week. This is a sale by Pickands, Mather & Co., Cleveland, of 1500 acres of coal land in Belmont County, Ohio, to the Clarkson Coal & Dock Co., St. Paul, Minn. It is stated that $5,000,000 was involved in this transaction.

To Buy 20,000 Browning Machine Guns

WASHINGTON, July 24.—The purchase of 20,000 Browning automatic rifles, made in accordance with the revised model of this arm, has been approved by the Machine Gun Board of the War Department. Of these guns 10,000 are to be of the light and the remainder of the heavy type, the former being designed to be carried by infantry and used in the front line trenches. The board has also recommended the purchase of 25,000 Lewis machine guns. These guns will be available for use for the infantry and for mounting on airplanes. It is understood that the most effective of the German fighting airplanes carry from one to three Lewis guns.

The Keith Furnace Co., Des Moines, Iowa, has purchased a site for a new factory building, which will be erected some time within the next four years, when the lease of its present building expires.

IRON AND INDUSTRIAL STOCKS

Unexpected Advance in Money Rates Was Feature of the Week

The most interesting feature of the stock market last week was a rapid advance in money rates, which on Monday carried the price of call loans up to 10 per cent. Most of the day's business was done at lower rates, but considerable money was loaned at 8 per cent or higher. The unexpected advance was attributed to the Government's withdrawals of cash from the banks. The situation improved rapidly and call money later in the week did not command more than 6 per cent. There was much irregularity in a number of stocks throughout the week. United States Steel moved through a range of five points, but closed the week with a change of only one-eighth point, as compared with the close of the preceding week. Money now promises to be plentiful.

Among the industrial stocks that registered gains during the past week were the following: American Can, ⅝; American Car & Foundry, ½; American Locomotive, 1¼; Baldwin Locomotive, 1⅝; Bethlehem Steel, 2; Bethlehem Steel, Class B, 2½; Colorado Fuel & Iron, ½; Crucible Steel, 1¼; Lackawanna Steel, 2½; Midvale Steel, 2⅛; National Enameling & Stamping, 1¼; Pressed Steel Car, 2; Republic Iron & Steel, 3¾; United States Steel, ½; United States Steel Preferred, ¼. Among the stocks that made losses during the week were the following: Gulf States Steel, 3; International Harvester, ¾. Allis Chalmers and American Steel Foundries remained the same at the end of the week as at the beginning, the former being at 29⅝ and the latter at 68½.

The range of prices on active iron and steel stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com..	28½- 29½	Int. Har. of N. J., pref.	118
Allis-Chal., pref..	83 - 83¼	Int. Har. Corp., com.	72⅛- 75¼
Am. Can, com...	46⅞- 49⅜	Int. Har. Corp., pref...	105
Am. Can, pref...	106¼-107	Lackawanna Stl.	89⅛- 93½
Am. Car & Fdry., com.	74¾- 76⅝	Lake Sup. Corp..	17 - 18½
Am. Car & Fdry., pref.	116½	Lima Loco.	56
Am. Loco., com..	68¾- 72¾	Lukens, 1st pref.	102½
Am. Loco., pref.	103	Midvale Steel....	57¼- 60⅞
Am. Rad., com.	280	Nat.-Acme	34 - 34½
Am. Radiator, pref....	133	Nat. En. & Stm., com.	40½- 44⅞
Am. Ship, com.	83	N. Y. Air Brake.	128 -132
Am. Steel Fdries.	66 - 68½	Nova Scotia Stl.	94 - 95
Bald. Loco., com.	66⅝- 71½	Pitts. Steel, pref.	100 -100⅛
Bald. Loco., pref.	100¾-100⅞	Pressed Stl., com.	70¾- 73¼
Beth. Steel, com.	129 -132	Ry. Steel Spring, com.	51 - 52
Beth. Steel, class B	123 -129½	Ry. Steel Spring, pref.	98 - 98⅜
Carbon Stl., com.	94 - 98	Republic, com...	86 - 92⅛
Case (J. I.), pref.	80	Republic, pref...	102⅛-102½
Central Fdry., com.	34 - 35	Sloss, com.	52 - 53
Charcoal Iron, com.	8⅝- 8⅞	Sup. Steel	43 - 45
Chic. Pneu. Tool.	70 - 70¼	Sup. Steel, 1st pref.	102 -102½
Colo. Fuel	47⅜- 50	Transue-Williams	43
Cruc. Steel, com..	77¾- 82¾	Un. Alloy Steel..	42½- 43½
Cruc. Steel, pref.	102¼-103	U. S. Pipe, com.	20⅞- 21
Gen. Electric....	149¾-156	U. S. Steel, com..	118⅞-123⅞
Gt. No. Ore. Cert.	32 - 34⅛	U. S. Steel, pref.	117⅞-118¼
Gulf States Steel.	115 -120	Va. I. C. & Coke.	66
Int. Har. of N. J., com.	111 -114⅞	Warwick	9⅛
		Westing. Elec...	48 - 49⅞

Pittsburgh Rolls Corporation

It is expected that on Aug. 1 details will be closed by which the business of the Phoenix Roll Works, at Pittsburgh, operated for about 60 years by the Seaman-Sleeth Co., will be transferred to a new interest, to be known as the Pittsburgh Rolls Corporation. The new company will be capitalized at $3,000,000 of which $1,000,000 will be 6 per cent first mortgage gold bonds, $500,000 7 per cent cumulative preferred stock, and $1,500,000 common stock. There is also $1,000,000 common stock, reserved for conversion of bonds. The Seaman-Sleeth Co. was organized originally in a small way, and has steadily grown for over 60 years, having, it is stated, net assets at present of $1,700,000. For about 47 years, the company has specialized largely in the manufacture of chilled and sand iron rolls and pinions, used by steel and iron works. It has a large trade among the leading steel companies in this country, and has also exported for some years large quantities of rolls to Canada, Mexico, Australia and Japan. The net profits of the company for the five years 1912-1916 are given as $742,992.57. The net earnings for the year 1916 alone, which was the most prosperous in the history of the company, are given as $296,144.58. The net profits for the first four months of 1917 are given as $104,993.59. The company is now adding a large new open-hearth furnace, which, it is expected, will increase its output fully 50 per cent. The management of the Pittsburgh Rolls Corporation, it is stated, will remain practically the same as in the former Seaman-Sleeth Co. J. S. Seaman, who has been president of the Seaman-Sleeth Co. for many years, will be chairman of the board of directors of the Pittsburgh Rolls Corporation, and David L. Eynon, who was general manager of the same company for many years, will be president.

Industrial Finances

The earnings of the Port Arthur Shipbuilding Co., Port Arthur, Ont., are reported as being extremely satisfactory, with raw material arriving ahead of requirements. The company now has contracts on its books prior to the close of navigation in 1918, which total approximately $6,000,000. A few months ago this company commenced the erection of a large addition to its plant so as to double the output and rapid progress is being made on the undertaking. The company has recently received large orders for ships for the Imperial Munitions Board and Dominion Government.

The Electric Steel & Engineering Co., Welland, Ont., recently incorporated with a capital stock of $2,000,000, is the merger of three concerns. The three companies included in the corporation are the Electric Steel & Metals, Ltd., of Welland; the Boving Hydraulic Engineering Co. of Lindsay, Ont., and the Wabi Iron Works of New Liskeard, Ont. No announcement as to plans will be made until after a meeting of directors, which is to be held shortly.

The Termaat & Monahan Mfg. Co., Oshkosh, Wis., has been duly authorized to succeed to the business of the Termaat & Monahan Co., Oshkosh, which has been in the hands of a receiver about eight months. The plant, manufacturing marine and other types of gasoline engines, lathes and machinery of all kinds, has been operated to a small extent under a temporary lease, pending the reorganization, and will now be reopened with a full crew. The new company was formed by the reorganization committee of stockholders and paid $30,000 in cash, assuming all encumbrances.

Involuntary bankruptcy proceedings have been begun against the Chattanooga Iron Works, Chattanooga, Tenn. Petitioners have claims aggregating about $6,200. No estimate of liabilities or assets are made.

In paying up all back dividends on its preferred stock, the last 2 per cent being payable Aug. 31, the Crucible Steel Co. of America, Pittsburgh, will have paid out $7,875,000 in accumulated disbursements. The last declaration brings the total to 14¾ per cent this year in addition to 13 per cent paid off late last year. Net earnings in the fiscal year ending Aug. 31, last, were $13,223,655, or 46 per cent on the common. The preferred rate is 7 per cent or $1,750,000. It is expected that this company will soon start paying dividends on its common stock, but nothing official about this has been given out.

Dividends

The Atlantic Steel Co., extra 5 per cent on the common, payable Aug. 2.

The Canadian Locomotive Co., quarterly, 1½ per cent on the common, and 1¾ per cent on the preferred.

The Cleveland-Cliffs Iron Co., quarterly, 2½ per cent, payable July 25.

The Crucible Steel Co. of America, 2 per cent on account of accumulated dividends on the preferred, payable Aug. 31.

The Pittsburgh Steel Co., quarterly, 1¾ per cent on the preferred, payable Sept. 1.

The Republic Iron & Steel Co., quarterly, 1½ per cent on the common, payable Nov. 1, and 1¾ per cent on the preferred, payable Oct. 1.

The Stewart-Warner Speedometer Corporation, quarterly, 1½ per cent on the common, payable Aug. 15.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c. Denver pipe, 76.1c., minimum carload, 46,000 lb.; structural steel and steel bars, 76.1c., minimum carload, 40,000 lb. Pacific coast (by rail only), pipe, 65c.; structural steel and steel bars, 75c., minimum carload, 60,000 lb. No freight rates are being published via the Panama Canal, as the boats are being used in transatlantic trade.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 4.50c.

Wire Products

Wire nails, $4 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire is $4.05 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.95; galvanized wire, $4.65; galvanized barb wire and fence staples, $4.85; painted barb wire, $4.15; polished fence staples, $4.15; cement-coated nails, $3.90 base, these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 43 per cent off list for carload lots, 42 per cent off for 1000-rod lots, and 41 per cent off for small lots, f.o.b. Pittsburgh.

Nuts and Bolts

Discounts in effect for large buyers are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days.

Carriage bolts, small, rolled thread, 40 per cent, small cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent; with c. p. nuts, 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq. blank, $2.10 off list, and tapped, $1.90 off; hex., blank, $1.90 off, and tapped, $1.70 off; nuts, c. p. c. and t. sq. blank, $1.70 off, and tapped, $1.50 off; hex. blank, $1.60 off, and tapped, $1.40 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Wire Rods

Soft Bessemer and open-hearth rods to domestic consumers at $95 to $100; high-carbon rods made from ordinary open-hearth steel, $100 to $110, and special steel rods with carbons running from 0.40 to 0.60, $100 to $110 at mill; above 0.60 carbon, $115 to $120.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $5.00 base; ⅜ in., 7/16 in. and ½ in., $7.50 to $8. Boat spikes are about 6.50c. to 7c., all per 100 lb. f.o.b. Pittsburgh, but some makers are quoting above these prices. Track bolts with square nuts 6.50c. to 7c. to railroads, and 8c. to 8.50c. in small lots, for fairly prompt shipment.

Steel Rails

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails, and on carload and smaller lots, 4c. to 4.25c. at mill. Light rails: 25 to 45 lb., $75 to $80; 16 to 20 lb., $80 to $81; 12 and 14 lb., $82 to $83; 8 and 10 lb., $83 to $84; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard Bessemer rails, $38; open-hearth, $40, per gross ton, Pittsburgh.

Tin Plate

Long terne plate, No. 28 gage, base, $7.25 to $7.50; short terne plate, $12 to $12.50, maker's mill, prices depending on quantity and delivery wanted. The present schedule of prices on terne plate is as follows: 8-lb., 200 sheets, $14 per package; 8-lb., 214 sheets, $14.30 per package; 12-lb., I. C., $15.25 per package; 15-lb., I. C., $15.75 per package; 20-lb., I. C., $16.50; 25-lb., I. C., $17.25; 30-lb., I. C., $18; 35-lb., I. C., $18.75; 40-lb., I. C., $19.50.

Iron and Steel Bars

Steel bars at 4.50c. to 5c. for delivery late this year, and 5c. and higher from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c.; railroad test bars, 5.25c. in carload lots and larger lots f.o.b. mill.

Wrought Pipe

The following discounts in steel are to jobbers for carloads on the Pittsburgh basing card in effect from May 1, 1917, all full weight, except for LaBelle Iron Works and Wheeling Steel & Iron Co., which quote higher prices, and National Tube, which adheres to card of April 1.

Butt Weld

Steel: Inches	Black	Galv.	Iron: Inches	Black	Galv.
⅛, ¼ and ⅜	42	15½	⅛ and ¼	23	+4
½	46	31½	⅜	24	+3
¾ to 3	49	35½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	42	29½	2	26	12
2½ to 6	45	32½	2½ to 6	28	15
7 to 12	42	28½	7 to 12	25	12
13 and 14	32½	..			
15	30	..			

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	38	20½	⅛, ¼ and ⅜	22	5
½	43	30½	½	27	14
¾ to 1½	47	34½	¾ to 1½	33	18
2 to 3	48	35½			

Lap Weld, extra strong, plain ends

2	40	28½	2	27	14
2½ to 4	43	31½	2½ to 4	29	17
4 to 6	42	30½	4½ to 6	28	16
7 to 8	38	24½	7 to 8	20	8
9 to 12	33	19½	9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

Nominal discounts on less than carloads, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes, and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in.	28	1¾ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3¼ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in.	No quotations
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths. Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net, or 2 per cent discount in 10 days.

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer

	Cents per lb.
Nos. 3 to 8	8.00 to 8.50
Nos. 9 and 10	8.25 to 8.50
Nos. 11 and 12	8.50 to 8.75
Nos. 13 and 14	8.75 to 9.00
Nos. 15 and 16	9.00 to 9.25

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	8.30 to 8.80
Nos. 22 and 24	8.35 to 8.85
Nos. 25 and 26	8.40 to 8.90
No. 27	8.45 to 8.95
No. 28	8.50 to 9.00
No. 29	8.55 to 9.05
No. 30	8.65 to 9.15

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11	9.00 to 9.50
Nos. 12 and 14	9.10 to 9.60
Nos. 15 and 16	9.25 to 9.75
Nos. 17 to 21	9.40 to 9.90
Nos. 22 and 24	9.55 to 10.05
Nos. 25 and 26	9.70 to 10.20
No. 27	9.85 to 10.35
No. 28	10.00 to 10.50
No. 29	10.25 to 10.75
No. 30	10.50 to 11.00

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	7.80 to 8.30
Nos. 17 to 21	7.85 to 8.35
Nos. 22 to 24	7.90 to 8.40
Nos. 25 to 27	7.95 to 8.45
No. 28	8.00 to 8.50
No. 29	8.05 to 8.55
No. 30	8.05 to 8.55
Nos. 30½ and 31	8.10 to 8.60

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
		Electro-	New	New	St.	New	St.
July	Lake	lytic	York	York	Louis	York	Louis
18	26.50	26.50	62.62½	10.37½	10.25	8.87½	8.62½
19	26.50	26.50	62.50	10.25	10.12½	8.75	8.50
20	26.50	26.50	62.50	10.00	10.00	8.62½	8.37½
21	26.50	26.50	....	10.00	10.00	8.75	8.50
23	26.50	26.50	62.50	10.00	10.00	8.75	8.50
24	26.00	26.00	62.50	10.25	10.25	8.75	8.50

NEW YORK, July 25, 1917.

Probable Government purchases and price regulations continue the dominant factor. Business is light and prices largely nominal. Copper is nominally a little lower but steadier. Tin is very quiet but fairly firm. Lead has been weak but is growing stronger. Spelter is still very quiet but a little firmer. Antimony still declines.

New York

Copper.—In the past week very little business has been reported, hardly enough to establish a market. Prices are nominal and are made by offerings and not by transactions. The influences controlling the situation are the same as those discussed last week and definite information as to Government policy and prices seems as far away as ever. Under the circumstances buying is only from hand to mouth and very cautious. The only interesting feature is a drop in the London market the past week of £5 per ton, spot electrolytic being now quoted at £137 with futures at £133. The effect of this fall in price is expected in some quarters to have a beneficial influence in bringing about a closer co-operation in prices between large and small producers in this country. With exports of copper for June estimated at 40,000 tons the total for the first half of this year will be 265,967 tons, or nearly twice those for the same six months of 1916 when they were 147,943 tons. Refinery production of copper for June is estimated at 200,000,000 lb. with the total for the first half of this year at 1,055,000,000 lb. Some business for September-October delivery is reported at 24.50c. to 25.50c. with the quotation for the last quarter generally regarded as 24c. The price of Lake and electrolytic copper yesterday was 26c., New York. The strike situation is not regarded as very serious.

Tin.—The tin market has been dull and quiet the entire week. Sales have been moderate, made up mostly of early shipments from England and future shipments from the Straits Settlements. The market is almost a nominal one at 62.50c. New York. Sellers and buyers are generally cautious, but there has been some desire to sell in some places. The feature of the market has been the scarcity of spot tin, caused by an unwillingness to grant permits in England, and to the slowness of American buyers to commit themselves. The familiar question of Government price regulation continues to restrain the market. Arrivals up to July 24 have been 2365 tons, with the quantity afloat on that day 3454 tons. The London quotation for spot Straits is unchanged from last week at £239 10s.

Lead.—Until Monday of this week the lead market had not recovered from its scare of last week, and the tendency was downward. The market reached a level of 10c., New York and St. Louis, on Monday, due to fairly liberal offerings from second hands and from consumers, with buyers assuming a safe attitude. Lead was obtainable practically all the week until yesterday at 10c., New York, at which some sales were made for August shipment. The trade is firm in the conviction that a large amount of lead will be wanted for war and other purposes. Due to the fact that the offerings referred to were either withdrawn or sold, the market stiffened yesterday, so that it was difficult to obtain lead under 11c. for any position. Small quantities, however, were sold here and there yesterday at 10.25c., New York and St. Louis, with 100 tons going as low as 10c. The leading producer continues to maintain its quotation at 11c., New York, and an advance in the outside market is looked for in the coming week.

Spelter.—Because of a realization on the part of some that spelter is cheap at prevailing levels, there has been more inquiry than in the recent past. The market is a little stronger, but actual new business has been light, especially for prompt or early delivery. There have been sales of small lots of 50 to 100 tons each for future delivery, for which anywhere from 8.50c. to 8.62½c., St. Louis, or 8.75c. to 8.87½c., New York, has been realized. There have been a few sales as low as 8.37½c., St. Louis, or 8.62½c., New York. The quotation yesterday was generally recognized as 8.50c., St. Louis, or 8.75c., New York, for prime Western spelter for early delivery, with future delivery at almost the same level. The question of the Government's needs and what it will pay is expected now to be cleared up in a few days—a much desired settlement. It is possible that an order for the remainder of the year may soon be settled, and this will tend to stabilize the entire market. It is reported to-day that the Government has negotiated a purchase of 25,000 tons of prime Western at 8.75c. per lb., St. Louis, for delivery over the remainder of the year. No confirmation is obtainable.

Antimony.—Yesterday and Monday, sales of 25 tons each day of Chinese and Japanese antimony under the hammer on the Metal Exchange were made at 13.37½c. per lb. in bond, which is about 14.50c. to 14.75c., duty paid, New York. Demand is slack, and the market is quiet and nominal at about 15c., duty paid, for those grades.

Aluminum.—In the absence of demand and because of offerings, the market is lower at 53c. to 55c., New York, for No. 1 virgin aluminum, 98 to 99 per cent pure.

Old Metals.—The market is very unsettled. Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible	27.00 to 28.00
Copper, heavy and wire	26.00 to 27.00
Copper, light and bottoms	24.00 to 24.50
Brass, heavy	18.00 to 19.00
Brass, light	13.50 to 13.75
Heavy machine composition	25.00 to 25.50
No. 1 yellow rod brass turnings	17.50
No. 1 red brass or composition turnings	20.00 to 21.00
Lead, heavy	9.00 to 9.25
Lead, tea	7.75
Zinc	6.75

Chicago

CHICAGO, July 23.—Copper quotations are nominal. Reflecting conditions which prevail in the East, they are much lower, but it is not easy to find metal at the lower prices. Complaint is made that purchases cannot be made at levels quoted by some big Eastern sellers. Tin is in fair demand and a little higher. Spelter continues soft, although it is a trifle more active. No interest is shown in lead, and antimony is unchanged. We quote as follows: Casting copper, 26c.; Lake, 29c.; electrolytic, 27c.; tin, carloads, 63c.; small lots, 65c. to 66c.; lead, 10c. to 10.25c.; spelter, 8.50c.; sheet zinc, 19c.; Oriental antimony, 18c. to 20c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 21c.; copper clips, 20.50c.; copper bottoms, 19c.; red brass, 19c.; yellow brass, 14.50c.; lead pipe, 8c.; zinc, 6c.; pewter, No. 1, 35c.; tinfoil, 40c.; block tin, 45c.

St. Louis

JULY 23.—Non-ferrous metals have been quiet during the week just passed, with the closing prices to-day on car load lots as follows: Lead, 9.87½c. to 10c.; spelter, 8.25c. to 8.50c. In less than car load lots quotations were as follows: Lead, 11.50c.; spelter, 9.75c.; tin, 63c.; Lake copper, 31c.; electrolytic copper, 30.50c.; Asiatic antimony, 19c. In the Joplin district producers were paid practically the same prices as a week ago, the basis range for zinc blende being $65 to $75 per ton for 60 per cent metal, with the average for the district at $70 per ton. Many of the sheet ground mines have shut down, but the Oklahoma district production is keeping up the supplies for a time. If more sheet ground mines close, however, it is believed that the supply of ore will run short enough to start

sharper bidding for the output. Calamine ranged from $35 to $42 per ton, basis of 40 per cent metal, with the average for the week for the district $40 per ton. Lead was steady at $115 per ton, basis of 80 per cent metal, and the average for the district for the week was $115 per ton. On miscellaneous scrap metals we quote as follows: Light brass, 12c.; heavy yellow brass, 15c.; heavy red brass and light copper, 20c.; heavy copper and copper wire, 23.50c.; lead, 7c.; zinc, 7c.; tea lead, 6c.; pewter, 25c.; tinfoil, 42c.

French Method of Tinning Cast-Iron Vessels

A method of tinning cast-iron pots and other utensils for domestic use is offered from a French source, *La Chronique Industrielle*. For household utensils only pure tin should be employed and not tin and lead, as the latter forms poisonous salts with the acids of food products. To insure adhesion of the tin the iron should be treated to remove the carbon or otherwise it should be polished by mechanical means. To remove the carbon, the iron is coated with a layer of oxide of iron or manganese or else the iron is enclosed in a box with the oxide and maintained at a high temperature to burn out the carbon. After four to six hours the iron is sufficiently decarbonized to permit the adhesion of the tin. After this procedure the iron is cleaned with dilute sulphuric acid to which is added a small amount of blue vitriol. The iron is then immersed in molten tin; or, if the interior of a vessel is to be coated, molten tin with a little sal-ammoniac is vigorously rubbed over the surface. It is preferable to heat the iron before applying the tin. This must be done with care otherwise the surface will be oxidized and impair the adhesion of the tin.

A new process for the fixation of atmospheric nitrogen which produces sodium cyanide and on further treatment ammonia, has been put forward by Prof. John E. Bucher. Coke, sodium carbonate and iron borings are raised to a red heat in an atmosphere of nitrogen or producer gas, forming sodium cyanide. By boiling this with caustic soda, ammonia is readily obtained. While this process is only in the experimental stage now, it is understood that an operating plant is being erected and that a nitrogenous product of some character will be placed on the market soon.

The Sai-nei iron mines in Corea, owned by the Japanese Government, produced 73,611 tons of ore in the first nine months of 1916. It was shipped to the Government blast-furnace plant at Wakamatsu, Japan. The Mitsubishi Co., another Japanese company, owns mines at the same place, but no ore is yet being mined. The company is reported erecting a furnace at Kengi-ho in the same locality.

The polishers at the Remington Bridgeport Works, Bridgeport, Conn., are on strike as a protest against the employment of women at a lower wage rate than paid the men. The management has refused to see representatives of the Polishers' Union and the men are firm in their position that they will not return to work until the differences are adjusted.

The Oliver Chilled Plow Co., South Bend, Ind., announces a plan of pensioning employees who have been with the company 20 years or more. Those reaching the age of seventy will be retired and those 65 years of age or more may retire on pension, if circumstances warrant. No pension is to be more than $100 or less than $12 a month.

The Sterling Products Co., Inc., of Chicago, distributor of high-speed drills and hack saw blades, has opened a branch office in St. Louis at 938 Syndicate Trust Building, in charge of R. O. McGraw.

The offices of Ernest S. Cox, manufacturers' direct representative for mill supply and hardware specialties, have been removed from 326-328 Diamond Street, to 1322 Oliver Building, Pittsburgh.

Pittsburgh Expects No Labor Shortage

PITTSBURGH, July 25—(*By Wire*).—Prominent steel interests in the Pittsburgh district say they do not expect a very large shortage in men by reason of the draft. They are relying upon the Government's industrial exemption system to protect the steel interests against a shortage in labor. The Government at Washington recognizes fully the pressing needs of a full output of steel at all the plants in order that Government work may be turned out promptly, and nothing will be done to cut down output that can possibly be avoided.

The Phillips Sheet & Tin Plate Co. is installing extensive coal handling equipment at its Clarksburg, W. Va., plant.

Asbestos-Cement Sheets as a Substitute for Corrugated Iron

An asbestos cement roofing material which is offered as a satisfactory substitute for corrugated iron, is being made now in Great Britain. In the course of the last 12 months a factory has been built and equipped by the British Everite & Asbestilite Works (Limited) at Farnsworth and Bold, near Widnes, in Lancashire, for the manufacture of this product. It is made as follows:

After being finely ground and freed from extraneous matter the asbestos, which acts as a reinforcing agent, is mixed with Portland cement in the proportion of about 1 to 6, and made into a kind of paste with water. This paste is then taken to a machine of the paper-making type where, on a large revolving drum, it is formed into sheets or felts. After being trimmed to size these sheets, if they are to be made into corrugated roofing, next have the corrugations impressed on them, the important condition of this operation being to insure that the tops of the corrugations are as strong as other parts of the sheets. Finally the sheets are subjected to a seasoning process. The corrugations are made to the 3-in. pitch which is usual with corrugated iron sheeting, not to the 2½-in. foreign pitch, and they can therefore be readily used to repair roofs composed of corrugated iron sheets.

One of the chief advantages claimed is durability and resistance to climatic conditions, especially to an acid-laden atmosphere, which rapidly destroys corrugated iron. The sheets are also fire-proof and poor conductors of heat. The factory is well situated as regards supply of water, of which large quantities are required. The machinery is driven by electricity, current being obtained by means of a 200-h.p. National gas engine, and the power house is designed so that additional sets can be installed as demand develops.

Ready to Start New Plant

The Valley Mold & Iron Co., Sharpsville, Pa., expects to start this week its new plant at West Middlesex, Pa., for making ingot molds, which has been under erection for some months. The company will secure its entire supply of Bessemer iron for this new plant from E. W. Mudge & Co. of Pittsburgh, who will furnish it from their Ella blast furnace at West Middlesex, giving the concern the entire output of Bessemer iron from this furnace, about 400 tons per day, with the exception of the Sunday metal. The iron will be furnished on a sliding scale basis. The Valley Mold & Iron Co., when this new plant is in full operation, will have a capacity for turning out close to 1500 tons of ingot molds per day.

E. E. Marshall, Philadelphia, associated with the Newport Iron Co., will place the Lochiel blast furnace at Harrisburg, Pa., in operation on Aug. 1. The plant has been undergoing extensive repairs and improvements. The furnace has been idle for about 15 years. Mr. Marshall is president of the American Manganese Mfg. Co.

The new plate mill of the Donner Steel Co., at Buffalo, has been completed and will be placed in operation this week.

PERSONAL

Chairman E. H. Gary of the United States Steel Corporation will spend several weeks in Alaska, leaving New York Aug. 2.

John A. Topping, New York, chairman Republic Iron & Steel Co., leaves next week for Canada and will be absent through the month of August.

J. A. Flood, formerly connected with the Venango Mfg. Co., Franklin, Pa., has resigned to become general manager of the Producers' Supply Co., that city, which recently built a new gray iron foundry with a daily capacity of 25 tons.

George Ramsey, recently identified with the Babcock-Wilcox Co., at Barberton, Ohio, and the General Fireproofing Co., at Youngstown, Ohio, has been appointed a captain in the Ordnance Department of the United States Army, with headquarters at Washington.

Howard Britton, Jr., formerly in the New York sales offices of Manning, Maxwell & Moore, is now located in the Pittsburgh offices of that concern in the Park Building, handling brass goods in the Pittsburgh district, and the Central West, also as far East as Altoona, Pa. Mr. Britton will handle the brass goods made by the Ashcroft Mfg. Co., the Consolidated Safety Valve Co., the Hayden & Derby Mfg. Co., and the Hancock Inspirator Co., these four concerns being owned and operated by Manning, Maxwell & Moore.

N. P. Hyndman, general sales agent for the Washington Coal & Coke Co., Dawson, Pa., is in California on a pleasure trip, and will return about Aug. 1.

Tom J. Muir, of the sales department of the Morgan Engineering Co., Alliance, Ohio., is temporarily in charge of the company's New York office, 120 Broadway, until a successor to E. J. Parker is appointed. Mr. Parker recently joined the staff of the Vulcan Steel Products Co., New York.

R. A. Byrns, manager of the New York office of the Northern Engineering Works, Detroit, has joined his regiment of the National Guard.

E. F. Entswile, mechanical engineer at the Bethlehem Steel Co., Steelton, Pa., has been promoted to general superintendent of the Donaghmore plant at Lebanon. He will be succeeded by Frank E. Howells, who is now assistant mechanical engineer at the Steelton plant. Mr. Entswile succeeds W. L. Wolf, who has resigned to accept another position. He went to Steelton from the plant at Sparrows Point about 15 months ago.

Edgar N. Dollin, organizer and president of the Acme Die-Casting Corporation, Brooklyn, N. Y., has sold his holdings in that company and is retiring from active management. Mr. Dollin was formerly secretary of the Doehler Die-Casting Co., and president of the Kalak Water Co. He is planning a short vacation but expects to be back in business in the near future.

Harry E. Harris, president Harris Engineering Co., Bridgeport, Conn.; John H. Barr, consulting engineer Remington Typewriter Co., New York, and William A. Viall, Brown & Sharpe Mfg. Co., Providence, R. I., have been appointed a committee to co-operate with the National Bureau of Standards in the making of gages for munitions manufacture. Mr. Barr has been named chairman of the committee.

James N. Hunter, Pottsville, Pa., has been appointed an inspector of the Labor and Industry Department of Pennsylvania. Ernest C. Smith, Turtle Creek, has also been appointed to a similar position.

John K. Miller, Jr., associated with E. J. Lavino & Co., Bullitt Building, Philadelphia, has resigned to join the United States Signal Corps.

S. M. Tolbert, of Chattanooga, Tenn., has been appointed general manager of the Sewanee Fuel & Iron Co., succeeding John E. Patton.

Fred L. Watson, who held the position of treasurer of the American Steel & Wire Co. from 1897 to 1915, has removed his headquarters from Chicago to New York, where he has become assistant to the president of the Federal Export Corporation and treasurer of the Commercial Iron & Steel Corporation. He has been closely identified with the steel and wire interests of the United States since the first Baker patent flat barbed wire was produced commercially in 1880. He was actively engaged in all the consolidations of the Columbia Wire Co., the American Steel & Wire Co. of Illinois, and the final incorporation of that organization in the United States Steel Corporation. In his present connection, Mr. Watson will direct the financial affairs pertaining to the large contracts for American steel products which the Federal Export Corporation has with its selling houses abroad.

Ritaro Hirota, Tokyo, Japan, lecturer on mining machinery, Imperial University, spent several days in Milwaukee last week on a tour of the United States in the interests of the Japanese Government.

H. A. Wagner, president Wisconsin Bridge & Iron Co., North Milwaukee, Wis., entertained a party of 60 in the dining room of the office building in honor of the employees of the company who have enlisted in the military service and are about to leave for the mobilization camp. Each of the soldiers was presented a wrist watch.

James W. Lyons, former president of the Lyons Boiler Works, DePere, Wis., and later associated with the Lyons-Atlas Co., Indianapolis, has been elected vice-president and general manager of the Whitman-Bull Tractor Co., St. Louis.

Carleton R. Dodge, recently of C. R. Dodge & Co., New York, has been appointed assistant sales manager of the Lakewood Engineering Co., Cleveland, in charge of the Philadelphia territory. The offices are in the Widener Building.

Aall & Co., of Tokyo, the Japanese agents for the American Steel Export Co., have added B. Orum Andresen to their engineering staff. Mr. Andresen, prior to leaving for Japan, spent several days acquainting himself with the organization and the facilities which the American Steel Export Co. have for export engineering and contracting.

R. J. Doty, who for the last three and one-half years has been in charge of the steel foundry of Isaac G. Johnson & Co., Spuyten Duyvil, N. Y., has severed his connection with that company to become associated with the Sivyer Steel Casting Co., Milwaukee, Wis., which is enlarging its plant and installing an additional 3-ton electric furnace.

Harry A. Reichenbach, who has been efficiency engineer for the Bethlehem Steel Corporation, has resigned to accept a similar position with the Alpha Portland Cement Co., Easton, Pa.

B. L. Yepsen has been elected second vice-president and general manager of sales of the National Fireproofing Co., Pittsburgh.

Sharon Steel Hoop Co. Improvements

PITTSBURGH, July 25—(*By Wire*).—The Sharon Steel Hoop Co., Sharon, Pa., which took over some months ago the plant of the Youngstown Iron & Steel Co., East Youngstown, Ohio, will make a number of improvements. A new pit furnace will be built. Additions will also be made to the finishing mills and electric motive power will be installed to replace steam in some departments.

The Machine Tool & Supply Co., Davenport, Iowa, distributor of machine tools and machine shop equipment, has removed into a new three-story building which affords largely increased facilities. The company was organized last October.

The Tock Screw Machine Products Corporation, which was recently incorporated, has established an office at 199-203 Eighth Street, Long Island City, N. Y., and is building a factory building, 50 x 100 ft., one story, at that address.

ARTIFICIAL FUELS FROM DUST

British Suggestions to Conserve Coal and Coke Ashes and Fines

Artificial coals made from coal or coke ashes and dusts was discussed recently at a meeting of the Society of Architects (British) by R. Goulburn Lovell, in a paper, "Coal Briquetted from Ashes or Dusts." He exhibited five samples of such coals which he described as having been respectively briquetted from (1) coal dust alone, (2) from coke dust alone, (3) from destructor ash alone, (4) from destructor ash and coal dust, and (5) from clinker, bar ash and sawdust.

Dealing with their qualities, he said it would be seen in the fire that the better grades burnt like Nature's coal, the lower grades like coke; they all flared, coked and became incandescent. Further, these artificial coals would be found to be lasting in the same way as a good artificial stone was more lasting than most stones made by Nature. The machinery and plant required practically existed in all industrial centers. The essentials were crushers or breakers, screens, drying tables, mixers and moulds such as cast-away pails, baths, etc. For the coking process either ovens or boilers could be used, the main object at the present time being to utilize any existing plant with unskilled labor.

Cost of Production

The cost depended mainly upon the value put upon the bases, the cost of the matrices, such as glucose, pitch and other bitumens, and the cost of the chalk or other calcium carbonates. For instance, the destructor ash and clinker at Eastbourne was valued at 6s. per ton, whereas at Birmingham an allowance was made of 2s. 6d. per ton.. The coke breeze in London was valued at 6s. per ton, and in Birmingham at 1s. The price of hard pitch was quoted 38s. a ton at Eastbourne, 22s. at London, and 18s. at Birmingham. On the other hand, the price of chalk was 3s. 6d. a ton at Eastbourne, 6s. at London, and 16s. at Birmingham. Speaking generally, the cost of the materials of these seven typical examples would be roughly:

Calorific Values in B.t.u.	Samples	Shillings per Ton
7,500	No. 1 Eastbourne destructor ash.....	11.0
8,040	No. 2 Maples destructor and coal dust..	4.6
10,320	No. 3 Maples destructor and sawdust...	9.0
10,540	No. 4 Birmingham destructor and coal dust	8.0
11,840	No. 5 Birmingham coke dust.....	7.0
12,600	No. 6 London coke dust.....	10.0
12,820	No. 7 Staffordshire coal dust.....	10.0

The cost of the labor and establishment charges in the British Isles would not be more than 5s. a ton.

Discussion

In a discussion of the paper, H. W. Bowden, chief electrical engineer to the Poplar Borough Council, said that the removal of ashes and clinker was a very serious item. He had 150 tons from his boilers to dispose of every week, and had to pay 3s. 6d. to 4s. per ton to have them removed. As to what happened to the ashes after the artificial fuel was burned, in his case the riddlings that went through the chain grates contained a considerable amount of useful coal, which went away with the ashes. He had tested this and proved it to contain about 4000 B.t.u. If that were used under the author's method what increase would he expect in its value? He also had some 30 tons per day of destructor clinker, in which he did not think there was much calorific value. Did the author think this material likely to be of value in his process? What would be the cost of a plant dealing with about 40 tons per day?

Mr. Lovell said it was only the ash from destructor works that was used in the process. The clinker would be useful for road-making. He believed that he could improve the ash from the Poplar destructor works from 4000 to 10,000 B.t.u. As to cost of plant, he proposed that where the process was adopted old plants at present lying idle all over the country should be used. The residue from burning this artificial fuel could be used again in the same way. The great point of the process was proper mixing and for that purpose a concrete mixer was to be preferred. He had received an estimate from a responsible quarter to make the fuel at 6s. per ton, apart from the cost of the materials. Calcium carbonate was an essential of the binding material and with it was used any form of bitumen or any form of sugar waste. With bar ash and clinker added to sawdust he had produced a fuel having 11,000 B.t.u. and with Gas Light and Coke Company's coke dust alone, plus the binder, a fuel containing 13,000 B.t.u. The binder in the latter case was pitch, but he was not dependent upon that. Equally good results had been obtained with sugar waste.

W. R. Cooper said it must not be assumed that slack and coke breeze were not already used for steam-raising purposes. As a matter of fact they were. As to coal dust, he was not so sure that there was so much value in that as the author seemed to imply. It was very often found to contain a high percentage of ash which was very much against it for general use. There was a popular idea that there was a great deal of waste coal of a valuable character to be found at the pits, but that was not the case.

Another speaker mentioned that the author had assumed the value of slack at 10s. per ton, whereas in London at the present time it could not be purchased under 18s., and that would alter the value at which it was suggested the fuel could be sold.

Mr. Lovell said he had been offered slack in Birmingham recently at 8s. per ton, and, naturally, it varied throughout the country. In any case this should not increase the cost to more than 20s., so that the fuel should be on sale at 25s. per ton.

OBITUARY

George E. Youle, western manager for the S. A. Woods Machine Co., Boston, died at his home in Seattle, July 11. Mr. Youle was a pioneer woodworking machinery man. Born at Saybrook, Ill., 54 years ago, he went to the Pacific Coast in 1884, where he engaged in selling sawmill and shingle-mill machinery. He had been connected with the Woods Machine Co. for more than 20 years, of which the past nine years had been spent in Seattle.

Frederick Burr Hawley, president Spring Perch Co., Bridgeport, Conn., died July 19 at his home in that city of old age. He was born in Bridgeport, Oct. 28, 1838, and succeeded his father as head of the Spring Perch Co.

H. R. Fothergill, master mechanic of the Carbon Steel Co., Pittsburgh, died at his home in that city on Saturday, July 21, of pneumonia.

Phillips Sheet & Tin Plate Co. Additions

The Phillips Sheet & Tin Plate Co. has recently finished, and is still making some large additions to its plants at Weirton, W. Va. The company has lately finished building a 20-in. roughing mill, which serves a 16-in. semi-continuous mill on which it will roll bands up to 16 in. wide. The company is also building a 10-in. mill on which it will roll bands from 1 in. to 5 in. wide, but does not expect to complete the building of this mill before December. To its cold rolled strip steel department the company is adding 22 12-in. and 16-in. mills, which will be completed early in September. These will double the output of the company in the manufacture of cold rolled strip steel, which will be from 3000 to 6000 tons per month, in sizes from ½ in. wide up to 18 in. wide. The Phillips Sheet & Tin Plate Co. owns three tin plate mills, one at Clarksburg, having 12 hot mills, one at Weirton with 24 mills, and another at Steubenville with 12 mills, giving the concern a total of 48 hot tin mills. When all its new cold rolled strip mills at Weirton are finished, it will be the largest single maker of cold rolled strip steel, and is also the largest independent maker of tin plate.

Our Steel Industry's Manganese Supplies

Mining Engineers Discuss American and Brazilian Ores—Metallurgy of Manganese in Steel—Substitutes and the Present Supply

ONE of the most valuable meetings of the local section of the American Institute of Mining Engineers was held Friday evening, July 20, in the rooms of the Machinery Club, New York. The subject under discussion was the supplies of manganese and chromium for the steel industry of the United States.

The Manganese Necessary

The subject was introduced by D. F. Hewett, of the United States Geological Survey, Washington, who was present especially to review the situation regarding the mining of manganese ore in the United States up to the present time. In opening Mr. Hewett said that the alloy committee of the Council of National Defense had advised that enough manganese be aimed at for the production in 1917 of 50,000,000 tons of steel. That would mean 400,000 tons of ferromanganese and 200,000 tons of spiegeleisen. To make 400,000 tons of ferromanganese would call for 900,000 tons of manganese ore and to produce the 200,000 tons of spiegeleisen not less than 500,000 to 600,000 tons of manganiferous iron ores would be required.

Discussing the price of manganese ore, the speaker stated that before the war this had been influenced by quotations at Antwerp and in England and also by those of the Carnegie Steel Company in this country. Before the war 40 to 50 per cent manganese ore ranged about 22c. per unit, or $9 per ton. At the present price it is $1 to $1.10 per unit, or about $48 per ton, over five times that before the war.

Ore Supplies in the United States

Discussing the question of supplies in the United States from its own mines, Mr. Hewett exhibited slides showing data up to July 1, 1917. He estimates the output of the United States for 1917 at 79,600 gross tons, of which Montana is credited with 38,500 tons, Virginia, 15,430 tons; Arkansas, 9500 tons; California, 7300 tons. In 1916 the total production was only 28,345 tons, of which Montana furnished 14,206 tons; Virginia, 3705 tons; Arkansas, 4361 tons, and California, 3012 tons. Not only is the rate of production in the United States this year about three times that of 1916, but certain States have increased their output to three to five times that of 1916.

An interesting statement was that in 1913 there were only two shippers in the United States of manganese ore averaging about 40 per cent manganese, whereas in 1916 this number had grown to 53. The marked increase in the domestic production of high-grade manganese ore is also paralleled by the increased output of manganiferous iron ores ranging from 15 to 40 per cent manganese. The output of such ores in 1917 will probably be about 475,000 tons.

Mr. Hewett discussed in an interesting way the genesis of the formation of manganese ore, stating that it is a product produced by secondary enrichment. Practically no large deposits are known in the United States and none of those in the world are more than 600 ft. below the surface of the earth, while most that are producing ore to-day are yielding at a depth of not over 200 ft. He spoke of the rather unusual achievements of the Noble Electric Steel Co. at Heroult, Cal., in successfully producing ferromanganese from high silica ores in an electric furnace, something ordinarily considered impossible in a blast furnace.

Mr. Hewett's conclusions were that it is impossible for the United States to supply the steel industry with enough manganese if the present practice of using manganese remains as it is. If it were possible, he said, to use the manganese in manganiferous iron ores, there would be enough manganese in these ores in the United States, if converted into such alloys as were possible, to last three years.

The Geological Survey at present has eight men in field work on this subject and all mining projects are being carefully investigated. Mr. Hewett alluded to a singular fact in the history of this devolpment, namely, that of the ore mined between 1912 and 1916, the source of 75 per cent changed ownership many times, in some cases over five. He said that it had been suggested also by Mr. Newton of the experiment station of the Minnesota School of Mines as another line of attack that some method might be possible of conserving the manganese in the bath of the steel furnace so that less manganese would be necessary as an addition in finishing the steel. Another important consideration would be the perfection of a method of making ferro-manganese out of manganese ore high in silica.

Brazil as a Source of Ore

Brazil as a source of high-grade manganese ore was interestingly discussed by Kirby Thomas, mining engineer, New York, who has recently made an investigation in that field. After briefly describing the extent of the deposits and showing how shipments had grown from 1300 tons in 1894 to over 350,000 tons in 1915, he made the important statement that there is enough ore of the best grade in that country, not only for war needs, but to last our steel industry for 25 and possibly 50 years.

Discussing the factors controlling this supply, Mr. Thomas said that first the question of railroad transportation is important. There is only one railroad, which is owned by the government. The equipment is poor, but the capacity for handling possibly 500,000 tons a year might be increased to 650,000 or 700,000 tons. The second factor is the handling of the ore at the harbor of Rio de Janeiro. Mr. Thomas stated that this port is not equipped to handle bulk shipments like manganese ore; that the ore had to be transferred from the railroad to an island at the harbor and from this island again by means of lighters to the boats bringing it to this country. A rather serious phase of this situation is that no changes are being made. Another important fact is that port charges have nearly doubled until at present they are $2.50 to $3 per ton. Railroad freight charges on this ore have increased from $1.50 to $2.50 and $3 a ton.

Ore Freight Charges

An idea of other advances bearing on this subject was conveyed by the statement that, whereas ocean freight before the war to Europe and the United States for carrying this ore was $3.50 to $3.75 per ton, it increased after the war started to $7.50, then to $10 and $15, and within the last two or three months to $20. Mr. Thomas stated that the boats that are used ordinarily can take only a small amount of ore and that many companies in this country are now using their own boats to transfer the material, which ordinarily takes 19 days from Brazil to this country. He believed the situation to be increasingly critical in that the shipping situation is growing worse and also because many vessel owners are preferring to take other freight than manganese ore except for ballast.

The suggestion has been made that the Brazilian Government use a large number of enemy boats at present in its possession, aggregating some 600,000 tons of shipping, as a means of transferring this ore to the United States. It has also been suggested that the question of smelting Brazilian ores in Brazil itself by an electric process be carefully considered. Power there is reasonable, power near the mines could be

obtained and water power in the interior is abundant. The production of ferromanganese in Brazil in blast furnaces is prevented by the fact that only charcoal is available as a fuel.

Brazilian Iron-Ore Deposits

In concluding his remarks, Mr. Thomas called attention to the wonderful deposits of iron ore in Brazil, deposits which exceed in extent and in quality any in the world. He predicted that the present owners of these mines, American, British and local capitalists, will some day in the not distant future develop these mines so that they would be a most important source of supply. An important consideration in this connection is the fact that some of the large manganese mines are located not far from this iron ore, so that the predicted developments could make the manganese ore still more easily available.

Manganese in Central America

Discussing deposits of manganese ore in Costa Rica, Mr. Thomas stated that they were very promising on the west coast, but that while shipments already made had not been of a satisfactory grade, he had been assured that good material exists in reasonably extensive quantities in that district. One disadvantage is that the ore had to be loaded on lighters and carried to vessels some distance from the shore. Other deposits in that country are under investigation and will probably turn out to be important. The Panama deposits, he said, are also promising.

The Metallurgy of Ferromanganese

The metallurgy of the production of ferromanganese was lucidly presented by J. E. Johnson, Jr., consulting engineer, New York. It is an acknowledged fact, he stated, that more heat is necessary in the blast furnace to smelt manganese ore than iron ore, as much as two times and possibly three times more. More carbon is necessary, partly because of the fact that carbon has a greater affinity for manganese than manganese has for iron. As a result, in making both spiegeleisen and ferromanganese, the carbon absorbed and existing as a constituent of these products is greater than in the case of making pig iron. In spiegeleisen the percentage of carbon is around 5 per cent, and in ferromanganese around 6 per cent. It is practically impossible to use spiegeleisen as a substitute for ferromanganese in making certain carbon steels relatively low in carbon, because in adding the spiegeleisen, so great a percentage by weight of carbon is added at the same time. Because of the bulk necessary to obtain the desired amount of manganese, the spiegeleisen must be added hot in most cases, and while this practice is entirely feasible in rail making, present steel plants are not laid out to do this generally. It is an impossibility to meet certain specifications, when using spiegeleisen, which demand certain carbon and manganese percentages.

The Role of Manganese

The role of manganese is largely as a deoxidizer, the speaker said. Experiments to use ferrosilicon as a substitute have not been very successful. The silicon appears to be less efficient as a deoxidizer, and it had been his experience that oxygen remains in metal when 2 to 3 per cent of silicon is present, whereas it would immediately vanish in the presence of 1 per cent of manganese. Aluminum as a deoxidizer could not be used in large quantities. Another important consideration is the fact that manganese seems to affect the rolling properties of the steel. Mr. Johnson did not believe that any adequate substitute was possible.

In the metallurgy of ferromanganese the question of silica in the ore is an important one. Manganese is more active than iron. Under certain temperature conditions, the manganese is easily lost, whereas under other conditions of heat or cold, other serious results occur. It had been stated at one time that it required 120 units of manganese to make 80 per cent ferromanganese or a loss of 30 per cent, although Mr. Johnson stated that he understood that this loss had in some practice been reduced to 6 per cent.

Discussing the use of charcoal as a fuel in making ferromanganese, he stated that theoretically it was not desirable, but from his own experience in smelting manganiferous ores from the Cuyuna range, he had been able to make spiegeleisen with a low fuel consumption, much to his surprise.

Importance of Manganese in Steel

Bradley Stoughton, secretary American Institute of Mining Engineers, discussed the effect of manganese on steel. As an explanation of the apparent fact that a substitute cannot be found for manganese, the speaker said that manganese takes oxygen completely out of the steel, whereas silicon often remains in the steel as silica and aluminum as aluminum oxide or alumina. Manganese not only takes the oxygen out, but it also removes the silica as a silicate. Oxide of manganese remaining possibly in the steel is also not as harmful. An important fact is the neutralization of sulphur by manganese, a very necessary role.

Much has been said concerning German substitutes for manganese, but Mr. Stoughton did not believe these statements. Reports coming to him led him to believe that German steel as at present made is low in manganese and poor in quality. If the German situation is bad, said Mr. Stoughton, our situation would be still worse under similar circumstances.

Possible Stoppage of Our Steel Industry

It is not perhaps generally known, but he understood it to be a fact that at one time only a few pounds of dynamite stood between the United States steel industry and almost complete paralysis. The railroad bringing the ore from the mines in Brazil crosses several large bridges and on representations from this Government these are now being carefully guarded.

Mr. Stoughton believed that there might be many ways of solving this important question. The possibility of the electric production of pure manganese from manganese dissolved in iron salts had been suggested, the manganese going to the cathode. Possibly pure manganese could be formed from low-grade ores existing in this country in large quantities. He believed the real problem is a method of using these ores. He stated that any suggestions that members of the institute might have, no matter of what nature, if forwarded to him would be brought to the attention of the authorities at Washington and carefully investigated.

Henry D. Hibbard, consulting engineer, Plainfield, N. J., in the general discussion stated that many years ago, at a suggestion from P. H. Dudley of the New York Central Railroad he had attempted to replace manganese in steel by silicon. In 1885 he made a steel of about 0.30 per cent carbon, containing 0.25 to 0.30 per cent silicon. The addition of the silicon, of course, completely killed the steel, but when re-heated in the shape of ingots or rolled it broke up like so much glass.

Control of Manganese Loss in Steel Bath

Mr. Hewett again brought up the question of the control of manganese in the steel bath, saying that it had been suggested to him that this could be done before the regular additions of ferromanganese and that American practice differed from that of Germany and some other countries. In American steel making, he understood that the manganese in the bath towards the end of the heat was as low as 0.10 or less, whereas in Germany it was maintained as high as 0.40 or 0.50. He asked if the use of high manganese pig iron would not tend to maintain a higher percentage of manganese in the bath as suggested in the foregoing as well as prevent a certain amount of oxidation and therefore the necessity of using so much ferromanganese.

J. E. Johnson, Jr., said that for a long time it has been acknowledged that better steel is made from pig iron containing manganese than from pig iron containing none. He did not see how it was possible in present American practice to maintain the manganese at a high point near the end of the heat. In Bessemer practice the manganese is reduced to 0.10 before the carbon goes, but in open-hearth practice, it might be possible to keep up the manganese to some extent.

Henry D. Hibbard stated that in Swedish practice

pig iron, containing 3 to 4 per cent manganese, had been used in Bessemer practice so that the steel made contained enough manganese in it without any further addition to make good steel. This fact, he said, had really saved the life of the Bessemer process, which otherwise would have had to be abandoned because in England its use without the presence or the addition of manganese had had disastrous results.

Professor Rousch of Lehigh University, South Bethlehem, Pa., gave some interesting testimony regarding the sequence of the elimination of various elements in Swedish and American practice in both Bessemer and open-hearth steel making and also brought up the question of the use of a calcium-silicon-aluminum alloy. It had been advocated that this compound, when acting as a deoxidizer, at the same time formed a slag which removed itself easily from the steel.

Present Supply of Ferromanganese

Some facts as to the actual supply of ferromanganese for the steel industry of the United States at the present time were given by Edwin F. Cone, associate editor THE IRON AGE. It is a fair assumption, he said, that the output of steel in this country in 1917 will not exceed 45,000,000 tons. Assuming the average amount of ferromanganese necessary in making various grades of steel to be 17 lb. to the ton, and taking into account the fact that probably two-fifths of the Bessemer steel output can be satisfied entirely by the use of spiegeleisen, the amount of ferromanganese necessary for the steel industry of the United States in 1917 would be about 316,000 gross tons, of which 10,000 tons is used by the iron foundries of the country.

The alloy committee of the Council of National Defense, in a recent canvass of the situation, has determined that the steel industry at present consumes 28,000 tons of ferromanganese per month. The question of the British supply had not been brought into the discussion, he said, but it is an important one. So far this year the domestic production of ferromanganese, according to the blast furnace returns of THE IRON AGE, has averaged 20,000 tons per month. This was increased to 21,000 tons in June, but it is hardly probable that this figure will be greatly exceeded. Therefore, to meet the calculations of the alloy committee nearly 8000 tons of alloy must be imported. Statistics so far this year indicate that this supplementary amount is not being supplied. While in 1916 British imports had averaged 7500 tons per month, and while for the first four months in 1917 the imports had only been about 6000 tons per month, in the last two months these had been under 3000 tons, with only slightly over 2000 tons in May. The sinking of over 2000 tons by submarines in the last six weeks was mentioned as showing the seriousness of the shipping situation.

Motor Truck Contracts Awarded

Contracts for 10,650 motor trucks, aggregating in value $33,179,026, were placed last week by the War Department for the U. S. Army. The largest contract was for 3750 chasses, which was awarded to the Four-Wheel Drive Auto Co., Clintonville, Wis., at $3,248 each, or a total of $12,180,000. The contracts were as follows:

Four-Wheel Drive Auto Co., 3750 three-ton chasses, at $3,248 each, to be delivered at the rate of 175 per month.

Packard Motor Car Co., 1500 three-ton chasses at $3,197 each, delivery 500 per month, starting in October; 300 three-ton chasses, at $2,804 each, delivery 100 in August and 200 in September.

Locomobile Co., 400 three-ton chasses at $4,225 each, delivery 125 per month, beginning in October.

Nash Motors Co., 3000 one and a half-ton chasses, at $2,805 each, delivery by July 1, 1918.

Garford Motor Truck Co., 900 one and a half ton chasses at $2,730 each, all delivered by the end of December.

Pierce-Arrow Motor Co., 800 one and a half-ton chasses at $3,500 each.

NEW RAILROAD PROBLEMS

Storage and Transportation Matters Now Are Receiving Attention

WASHINGTON, July 24.—Storage and transportation problems are looming large as the result of rapid progress of manufacturers of munitions and the contractors engaged in building the thirty-two cantonments for the National Army and the National Guard. The Transportation Committee of the Council of National Defense, under the direction of the veteran traffic expert, Daniel Willard, president of the Baltimore & Ohio Railroad Co., is meeting the difficulties of the situation by standardizing the practice of all the railroads of the country in accordance with rules recently promulgated and expresses confidence in the ability of the carriers to do everything that is required of them. The storage problem, however, is a new one and is of vital concern, not only to the General Munitions Board, which is giving it continuous consideration, but also to every manufacturer in the country who is contributing in any way to the recruiting, arming, housing, and feeding of the American military and naval forces.

Allotments of war funds aggregating more than $50,000,000 are soon to be expended for terminal storage areas at or near the seaboard. The equipment necessary to provide for each soldier going over seas is estimated at about 5½ tons, and the maximum of this storage load will be put upon the Nation before the end of the year. The Storage Committee of the Council of National Defense calculates that to provide the necessary facilities will require carefully designed and equipped areas, probably 2000 acres in extent. Adequate provision in this respect will permit the rapid unloading and loading of both freight cars and steamships and, obviously, the facilities must be made available before, and not after, deliveries in volume begin.

The General Munitions Board, which is studying the storage and transportation problem with great care, declares that the railroad situation is to-day the weakest link in the storage problem and that, unless we begin at once to take steps to safeguard the railroad situation, by next January we will have no storage problem because there will be nothing to store. Because of the car shortage manufacturers will be unable to secure raw materials or ship their finished products, facts which explain why the railroad factor is so strongly emphasized at this time.

Chairman Willard of the Transportation Committee is very optimistic that the railroads will be able to meet the demands upon them for the reason that all the rail systems of the country are now nationalized, the 693 companies operating in 48 States and controlling 263,000 miles of road responding admirably to central direction from the War Board, meeting every suggestion made by the Council of National Defense.

Mr. Willard calls upon shippers and business men in all lines to meet the new conditions in a philosophical spirit and not complain of reduction in facilities made necessary by the demands of the war. People, he says, become accustomed to receiving their freight at certain times and also to traveling on certain trains on every day schedule. The War Board has found it necessary to advocate to the railroad companies a careful examination of their schedules for the purpose of discovering if there are any passenger trains or trains of any other class being run that are not absolutely necessary, and if so that these trains be discontinued so that men and equipment may be made available for more important trains and the coal thus saved be used for other purposes.

The Dodge Mfg. Co., Mishawaka, Ind., has advanced wages 10 per cent, up to a maximum increase of 25 cents a day, or 2½ cents an hour. Piece work rates will carry a similar advance.

Forced to Order Guns in France

Years of Delay Result in Government Being Compelled to Have Artillery Made Abroad —War Department Explains the Situation

WASHINGTON, July 24.—Congressional indifference to the urgent representations of the most accomplished ordnance experts of the War Department extending over a period of more than 15 years has finally forced the American Government to the humiliating expedient of arming our forces in Europe with heavy artillery of French type manufactured in France in place of superior weapons designed by the Ordnance Bureau. This incident, taken in connection with the forced adoption of the British Enfield rifle in place of the superior Springfield, as heretofore described in THE IRON AGE, tells a story of stupidity, subservience to demagogues and almost criminal inattention to the needs of the nation on the part of both Senators and Representatives that will probably be one of the most salutary lessons of the war.

Soon after the close of the Spanish-American war, General Crozier, Chief of the Ordnance Bureau, drew the attention of the committees of Congress to the importance of providing for the manufacture of small arms and field artillery on a scale that would permit of very great expansion on short notice in the event that the United States should be threatened with a foreign war. He emphasized especially the necessity of having at hand and in perfect running order all the equipment necessary to produce rifles, pistols, field artillery and ammunition in great quantity. He also pointed out the inadequacy of the federal arsenal system to meet any such contingency, laying stress upon the fact that to meet the possible emergency of a suddenly precipitated war it would be necessary in time of peace to maintain a manufacturing establishment in a high state of efficiency capable of producing several thousand per cent more material than the Government would have any use for or could economically store.

The equipment of a reasonable number of private plants with special machinery and the necessary gages, dies, etc., to manufacture arms, artillery and ammunition to United States Army standards was the answer to the problem, in General Crozier's opinion, and in urging legislation to that end upon Congress, he drew attention to two salient facts: first, that the equipment could be provided for a very small sum, probably less than $5,000,000, and kept in a state of efficiency by the placing of small so-called "educational orders" for the output thereof, and second, that a year or more would be required for the manufacture and installation of the necessary appliances. The repeated rejection of these suggestions has heretofore been described in connection with the abandonment of the Springfield rifle in favor of the Enfield. There were special reasons, however, why General Crozier was strongly insistent upon his recommendations with respect to facilities for the production of field artillery. In common with European ordnance experts he was convinced that the battles of the future would be fought with guns far exceeding in power and rapidity of fire and other elements of efficiency anything previously known to warfare.

The first month of the European war fully justified this view. The German army battered its way through Belgium with heavy and light artillery, the efficiency of which far surpassed anything known to military science a decade ago. The War Department quickly drew the attention of Congress to the first lessons of the war in Belgium and France, but it was not until a year ago that the military committees were aroused from their lethargy and induced to appropriate a small sum of money, approximately $2,000,000, to enable the War Department to fit up a few private plants to assist in the work of arming such forces as the United States might be obliged to put in the field. When the money became available, however, every concern in the country capable of making gages, dies, and the necessary automatics was swamped with European contracts and little or nothing could be done with the belated appropriation. The situation with respect to rifles was met, as has been told, by the purchase from the British Government of equipment for the manufacture of the Enfield at a cost of $10,000,000, or more than twice the appropriation sought by the War Department four years ago.

The problem with respect to artillery was not susceptible of so easy a solution. The experts of the Ordnance Bureau had developed field guns in some respects superior to those of any other army, but while the capacity of American plants to produce ammunition for these guns was practically unlimited, there was no equipment in existence outside the arsenals to build the guns themselves. The War Department has therefore yielded reluctantly to absolute necessity and has decided to place orders in France for this artillery, chiefly 3 and 6-in. guns, which it is believed can be supplied almost as rapidly as our troops can be trained in the tactics employed in the Western theater of war. In explanation of its plans for the utilization of the surplus capacity of the French plants making artillery, the War Department has issued an official statement in part as follows:

> It has long been known to those who have paid any attention to the efforts of our military authorities at preparation for war that the supply of field artillery has been wholly inadequate and has not been growing at a rate which seemed to be sufficient to accord with ordinary prudence. The shortage has been the subject of urgent presentation by the Chief of Ordnance for the past 15 years, but it has been only since the passage of the national defense act that measures have been authorized looking to anything like an immediate correction of the situation. Field guns can not be produced in a short time, and the plants for making the forgings and for afterwards machining and assembling the parts into finished guns require time for their erection and equipment.
>
> In addition to the unsatisfactory stage of advancement of the pre-war program, the war itself has brought about an almost revolutionary increase in the use of artillery, both in the number of guns and in the amount of ammunition expended, so that on both accounts the officers of the War Department found themselves in greater straits for supplying the needs of the existing and prospective armies in field artillery than in regard to any other class of war material. The most obvious step, of course, was to give orders for manufacture such as to occupy the entire capacity of the country, particularly for the production of gun forgings, for which the capacity was the most limited and the requirements the most special, and in addition to provide for the greatest expansion of existing plants which the limits of justifiable dilution of their organizations rendered prudent. This had to be done in such manner as to interfere in the least possible degree with the orders of our allied nations for gun forgings, upon which they were and are still relying for the maintenance in artillery equipment of their armies in the field. After providing for the enlargement of existing plants, it was necessary to take measures for the construction of new plants, making use of the personnel of mechanical industries somewhat similar to that of gunmaking, under the organizations of officials and employees which were conducting them.
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> Under these circumstances a solution has been found which, fortunately, will go far toward meeting the situation. The gun factories of France have been highly developed, and in the matter of machining and assembling guns and carriages, as distinct from the manufacture of the steel out of which they are made, some surplus capacity has been attained which is now available for other than her own necessities. The ordnance department has taken advantage of this opening and has placed with the French Government orders for the manufacture of an initial supply of field pieces of the most necessary types, and of the most thoroughly demonstrated efficiency, namely, the 75 mm. gun and the 155 mm. howitzer (about 3 in. and 6 in., respectively, in caliber).

It is confidently believed that, as the result of this humiliating experience, Congress will be willing to make adequate provision for the preservation, after the war,

of the special equipment and productive capacity of a sufficient number of private plants to prevent a recurrence of the situation which the War Department has struggled in vain to meet since the United States became involved in the great conflict. W. L. C.

REVISED STEEL EXPORT LIST

Additional Products for Which Licenses Must Be Secured

WASHINGTON, July 24.—With a view to meeting the requirements of exporters whose applications for licenses are reaching the Export Council in rapidly increasing numbers instructions have been given to arrange, as soon as possible, for the issuance of licenses at Philadelphia, Norfolk, Charleston, Savannah, Galveston and Los Angeles, in addition to the branch offices of the Department of Commerce at which applications have heretofore been received. It is anticipated that some applications filed at these ports may require reference to Washington, but as many as possible will be handled locally, and where questions arising under applications can be determined by communicating with Washington by telegraph, this will be done; otherwise the application will be referred to the headquarters here of the Export Council.

In view of the experience of the first fortnight under the embargo law, it is probable that it will be necessary to extend still further the list of ports at which licenses may be obtained and the council will give careful consideration to any representations of business men concerning the necessity for such extension.

Great confusion has arisen among exporters as the result of an official announcement made July 17, to the effect that many commodities had been added to the list of those specified in President Wilson's export control proclamation. In the statement referred to it was said that the Administrative Board of the Export Council had added the following articles:

Sulphur, saltpetre, nitrate of potash, benzol, rice, dried beans, peas, condensed milk, structural steel, shapes, and mild steel, including angles, tees, beams and channels; steel plates of ordinary tank quality, rolled-steel floor plates, rosin and turpentine, washing powder, hand-lantern oil, toluol, lubricating oil, steel plates, malt, tank plates and boiler plates, soap and soap products, and vegetable oils.

It is now officially stated by the Export Council that publication of the above list was unauthorized, and it is intimated that the incident was in some way responsible for the resignation of Dr. E. E. Pratt as chief of the Bureau of Foreign and Domestic Commerce. It is understood that the list was not intended to include any articles not already embraced in the President's proclamation, but merely to summarize a series of rulings of the Administrative Board holding that the articles enumerated in the supplemental list were embraced in the category of the President's proclamation. To-day the following revised list has been given out as representing iron and steel products for which export licenses are required:

Pig iron, steel billets, steel sheet bars, steel blooms, steel slabs, ship plates and structural shapes, iron plates, I-beams, mild steel plates, rolled steel plates, steel channels, steel angles, mild steel plates, ordinary tank quality; steel beams, steel plates, ⅛ in. thick or heavier; steel sheets, ⅛ in. thick or heavier are classified as steel plates; steel tees and zees, structural steel shapes, boiler plates, tank plates, steel doors, steel car frames, steel towers, scrap iron and scrap steel, ferromanganese.

Since the resignation of Doctor Pratt, C. A. Richards of the executive staff of the council has been designated to act as secretary. Edward N. Hurley, formerly chairman of the Federal Trade Commission, has taken up his work as a member of the Export Council, representing the Department of Commerce. Vance McCormick, chairman of the Democratic National Committee in the last campaign, who represents the State Department on the Council, has been chosen as chairman. It was originally announced that Mr. Hurley would serve as chairman, and it is surmised that the office may rotate after the manner followed by the Federal Trade Commission.

Copper Tubes for Airplanes

British aircraft makers have been experiencing difficulties in obtaining supplies of copper tubing. An investigation has shown, says the London *Times*, that the causes are the great variety of sizes called for and the fact that tube makers received orders very irregularly and for small quantities. The specification committee of the Air Board has decided that in future copper tube for aircraft shall be specified in terms of external diameter and the legal standard wire gage. So far as possible, tubes of 20-gage (0.036 in.) will be used to the exclusion of other thicknesses, but where for special considerations it is desirable to use other thicknesses the choice will be restricted, so far as it can be, to gages 16, 18 and 22. The last, being difficult to manufacture, will be avoided so far as possible. A new Air Board specification for copper tube is to be issued, giving as an appendix a list of sizes and gages which the Air Board regard as standard. Beginning with 3/16 in. the 20-gage tubes will increase by sixteenths of an inch up to ½ in., and then by eighths of an inch up to 1¾ in., with a 2-in. size. The 18-gage will increase by increments of ¼ in. from 1 in. to 2 in.; the 16-gage by increments of ⅛ in. up to 1 in. and then by ¼ in. up to 2 in., with a 2½-in. size, and the 22-gage increments of ⅛ in. from 1 in. to 1½ in., and then by ¼ in. to 2 in.

Indiana Rolling Mill Co. Changes Hands

The stock of the Indiana Rolling Mill Co., New Castle, Ind., has been purchased by the present stockholders of the Galesburg Coulter-Disc Co., Galesburg, Ill., manufacturer of coulter blades, disks, pressed steel wheels and agricultural implement shapes. For the present the Indiana Rolling Mill Co. will be continued as an Indiana corporation in its present form, but will be controlled by the Galesburg Coulter-Disc Co., the reason for the purchase being to insure for the latter company a supply of steel. The new owners expect to enlarge the capacity of the mill at a later date in order to take care of its old customers. It probably will be made an Illinois corporation also. The deal involved about $500,000. C. W. Mouch of New Castle has been president of the company taken over, but will retire. S. A. Ingersoll is president and treasurer of the Galesburg Coulter-Disc Co.

The Chippewa Iron Mining Co., Duluth, Minn., has purchased mining machinery for the immediate development of its Vermilion range hematite iron ore mine adjoining Section Thirty Mining Co.'s property, east of Ely. It is its intention to stock-pile the Bessemer ore for shipment next season. All of the stockholders and officers are Duluth and Cincinnati business men. F. W. Farnsworth is secretary and general manager of the company, with offices at 1001 Mercantile Library Building, Cincinnati.

At present the Youngstown Sheet & Tube Co. has 204 Koppers by-product coke ovens, and will build 102 more, giving it a total of 306 ovens. The Republic Iron & Steel Co. has 168, and the Brier Hill Steel Co. 84, so that when the new 102 ovens of the Youngstown Sheet & Tube Co. are completed, there will be a total of 558 Koppers by-product coke ovens in the Youngstown district.

The Wharton Steel Co., Dover, N. J., is planning for improvements at its new shaft at Upper Hibernia. A section of the shaft, totaling about 400 ft., will be retimbered. New pumping machinery is to be installed.

Consumers' Interest in Iron and Steel Prices

Washington Investigators Emphasize It in Calling Attention Again to the Dangers of Present High Levels—After-War Effects Feared

WASHINGTON, July 24.—Hearty indorsement is voiced here, in and out of Congress, of the suggestion made editorially in the last issue of THE IRON AGE that the views of consumers should be considered in any project for the fixing by the Government of iron and steel prices. Whether it is practicable, in view of the tremendous pressure for haste, to give formal hearings to representatives of the great consuming interests is a serious question, but that the users of iron and steel have as much, if not more, at stake than the Government, is a view that is gaining ground everywhere and is forcibly expressed in the following statement made to the correspondent of THE IRON AGE by Senator Newlands of Nevada, chairman of the Senate Committee on Interstate Commerce, which recently began a series of hearings respecting prices, cost of production and general trade practices in the industries engaged in the production of coal and other fuels, iron and steel, copper, lead, etc.:

Senator Newlands Fears After Effects

It is my firm opinion that in any plan for the control or fixing of prices the interests of the consumers of iron and steel should be kept constantly in view. This has been my thought from the inception of this discussion, and I have constantly urged that the users of these important basic materials should have the benefit of any arrangement that might be made that would check the sky-rocket prices of these very necessary commodities. It would be most unjust and exceedingly unfortunate from the standpoint of the national welfare if any attempt by the Government to fix prices for its own needs should leave private consumers out of the account or perhaps force them to make up for the reduced prices accorded the Government.

I regard the present situation of the iron and steel industry as embracing elements of real danger to the industries of the country, and I believe that the condition of the iron and steel industry itself is most unwholesome and that a sharp check upon present tendencies would be of material benefit to the entire trade from top to bottom. A wholly artificial condition of affairs has developed as the result of the rapid and unjustifiable advance of prices. Every element of labor has risen in cost and every item of raw material has shared in the rise. The workers in the industry have demanded and have been readily conceded a scale of wages far in excess of normal standards, and it would be difficult, if not impossible, for the managers in the industry to return to the scales in force before the war. To some extent these increases appear to justify higher prices, but what will be the result when the war ends? These hot-house conditions cannot continue, and when the break comes it may be attended by widespread suffering if not industrial disaster.

Iron and steel enter so largely into our leading industries that any danger confronting this great trade must necessarily involve many collateral branches of business, and it is impossible to conceive that any general disturbance in the iron and steel industry will not affect the entire country to a most serious extent. I do not think that either our business men or our legislators have given this subject the attention it deserves, and I hope it will be very carefully considered in any further action the Government may take at this time.

I had hoped that my committee would speedily resume the work of investigation recently undertaken and would soon take up the subject of iron and steel. The pressure for the passage of several important measures, including the revenue bill, the food control legislation, etc., has become so great, however, and the desire to adjourn at the earliest possible date is so general in both Houses, that I doubt that we shall be able to go any further with our inquiry at this time. I have personally favored the inclusion of iron and steel and other metals in the Federal control contemplated by the food and fuel regulation bill, which has just passed the Senate and which is now in conference, but the majority of the Senate appeared to be of the opinion that the measure should not be complicated by adding other subjects to its provisions. I sincerely hope that, as the result of the work of the Federal Trade Commission, the President will be able to devise a satisfactory basis for the fixing of iron and steel prices and especially that in this adjustment the interests of the private consumer shall be kept constantly in view and fully safeguarded.

The decision not to continue the investigation begun by the Senate Committee on Interstate Commerce, referred to by Senator Newlands, is reluctantly acquiesced in by a majority of the committee. The initial hearings, which were devoted to coal, developed much information that was of value to the Senate in the consideration of the Lever bill for the control of food, feed and fuel, and many Senators have felt that a public investigation by a Congressional committee would have a more salutary effect upon conditions in the iron and steel industry than the confidential inquiry now being conducted by the Federal Trade Commission.

Coke Regulation as Related to Steel

In this connection Senator Pomerene of Ohio, a leading member of the Interstate Commerce Committee, said to the correspondent of THE IRON AGE:

I regret exceedingly that it should ever become necessary for the Government to fix prices for commodities, and I hope that those who are dealing in the basic products of the country will be wise enough to keep their prices within such reasonable limits that it may not be necessary for the Government to attempt to control them.

I have just recently gone very carefully into the prices of coal and coke. The producers of these products, which enter into every home, and into every industry, have become so exorbitant in their demands that it is absolutely necessary for the Government to take steps looking toward fixing of prices of these products; otherwise, the poor will freeze and the industries of our country will be paralyzed.

The enormous increase in the price of coal and coke has added from $15 to $20 per ton to the cost of every ton of steel that is being produced. This increase in the price of fuel necessarily adds to the cost of iron and steel, but in my judgment there is no sound reason for the present enormous prices in iron and steel. My belief is that unless a change shall soon be made looking toward reasonable prices in iron and steel, it will be necessary for the Government to take a hand. This I shall regret, but it looks as if it would be necessary in order that other industries may be permitted to continue and prosper. The Senate on Saturday by a vote of 72 to 12 declared in favor of the regulation of the prices of coal and coke by the Government. This ought to be something of a warning to the producers of iron and steel.

Senator Pomerene is strongly of the opinion that consumers should be consulted in the fixing of prices of iron and steel. On this point he said:

The fixing of prices undoubtedly is a serious problem, and whatever agency undertakes it should be fully informed before taking any action. The purpose should always be to fix prices so as to prevent interference with the reasonable prosperity of any industry. We do not want our industrial activities unnecessarily disturbed.

Metal Industries Inquiry

As foreshadowed in THE IRON AGE, the Senate in finally passing the food control bill struck out all reference to iron and steel, copper, lead and other articles not included in the category of food, feed and fuel. In expressing his views as to this decision of the Senate, Senator Newlands, prior to the passage of the bill, delivered a speech, in the course of which he said:

Speaking for myself, I favor adding aluminum, copper, iron and steel to the control provisions of this bill because they are basic commodities which enter into almost all the industries, and which are essential to the successful prosecution of the war, as they are largely used in munitions. The reason why I urge that these commodities should be included is that they are under quasi-monopolistic control. We all know that the control of copper, aluminum, iron and steel is in great corporations which practically, though not perhaps in a legal sense, monopolize these industries, and such an extraordinary demand has been imposed upon these products as to enable the producers to secure sky-rocket prices, the height of which can hardly be measured. . . . It is said we have only to deal with the Government wants. I insist that a virile war can only be conducted by a virile nation; that not only must your army be strong, but that your people must be strong; that your army must not only be well fed and well equipped, but that your people also must be well fed and well equipped, and that it is folly to attempt in the emergency of war to make a distinction between the treatment that should be accorded to the army and that accorded to the people at large. Big men ought to see this.

These men who are big enough to conduct the copper, the steel, and the aluminum industries of the country ought to be able to see this. Besides this, as economists they ought to realize the fact that they themselves are inaugurating a price level which will provoke a constantly increasing wage level, and that the end of the war will find us, as the result of the struggle between the wage earners on the one hand and the producers on the other, with a wage level raised to some correspondence with the price level. We will find at the end of this war a wage level far above that of any other country in the world; and just then, when competition will again come between nations for the commerce of the world, we shall find the United States at a disadvantage which will involve a struggle between the wage earners and the producers, and lock up the entire industries and energies of the country.

Steel Cost Inquiry Complicated

The Federal Trade Commission is not yet able to forecast the date upon which it will deliver to the President the data concerning the cost of producing iron and steel, which, presumably, will be used as the basis for fixing prices for the Government's requirements, and possibly for the Allies and the general consuming public. Complications have arisen, notably with respect to costs of production in large and small concerns, and the whole problem looks bigger to-day than when it was undertaken. The agents of the commission are working very industriously, however, and hope to finish their task at an early date.

Committee on War Expenditure

After striking iron and steel and other metals from the control provision of the Lever food, feed and fuel bill, the Senate added an important section creating a joint committee of Congress on war expenditures. This section is as follows:

Sec. 23. A joint committee of the Senate and House of Representatives shall be appointed, composed of five Members of the Senate, including three Democrats and two Republicans, and five Members of the House of Representatives, including three Democrats and two Republicans, to be known as "the joint committee on expenditures in the conduct of the war."

It shall be the duty of said committee to keep itself advised with regard to the expenditure of all appropriations bearing on the conduct of the war made by Congress and the contracts relating thereto made by officers of the executive departments, and it shall be the duty of the executive departments, on request, to keep said committee fully advised as to such expenditures and contracts.

Such committee shall confer and advise with the President of the United States and the heads of the various executive departments, commissions, voluntary boards, or other organizations connected with the conduct of the war, with a view to safeguarding expenditures, and shall report to Congress from time to time in its own discretion, or when requested to do so by either branch of Congress.

The membership of such committee shall be designated by the respective committees of the Senate and House which select the members of the regular standing committees.

Such committee shall have power to act by subcommittee or otherwise, and to send for persons and papers, and administer oaths, to summon and compel the attendance of witnesses, and to employ such clerical, expert and stenographic assistance as shall be necessary; and to pay the necessary expenses of such committee there is hereby appropriated, out of any money in the Treasury not otherwise appropriated, the sum of $50,000, to be paid out upon the audit and order of the chairman or acting chairman of said committee.

The President's Opposition

This provision, which was adopted by a vote of 53 to 31, is now before the conference committee, where it promises to prove a bone of sharp contention. Although supported by a number of Democratic Senators, it is strongly opposed by President Wilson, who has written a letter to Representative Lever, author of the original bill, in which he says in part:

Section 23 is not only entirely foreign to the subject matter of the food administration bill in which it is incorporated, but would, if enacted into law, render my task of conducting the war practically impossible.

I cannot believe that those who proposed this section scrutinized it with care or analyzed the effects which its operation would necessarily have.

The constant supervision of executive action which it contemplates would amount to nothing less than an assumption on the part of the legislative body of the executive work of the administration.

There is a very ominous precedent in our history which shows how such a supervision would operate. I refer to the committee on the conduct of the war constituted by the Congress during the administration of Mr. Lincoln. It was the cause of constant and distressing harassment, and rendered Mr. Lincoln's task all but impossible. . . .

I sincerely hope that upon the reconsideration of this matter both houses of Congress will see that my objections rest upon indisputable ground, and that I could only interpret the final adoption of section 23 as arising from a lack of confidence in myself.

Many Members and Senators favor the appointment of a committee on war expenditures, with power to sit during the recess of Congress, as a basis for the adjournment of both Houses as soon as the war revenue bill has been enacted. It was felt that some agency directly responsible to the House and Senate should remain in Washington continuously during the period of the war, and this feeling will undoubtedly be reflected in pressure upon the Conference Committee to accept section 23 in spite of the President's opposition.

W. L. C.

Pittsburgh and Nearby Districts

Six of the 10 double hot tin mills of the Shenango Works of the American Sheet & Tin Plate Co., at New Castle, Pa., were in operation last week, and it is expected that the other four mills will be started in a short time.

The William B. Pollock Co., Youngstown, Ohio, has received a contract for the building of a blast furnace for the Alan Wood Iron & Steel Co., at Swedeland, Pa. This will be a 500-ton furnace of the Julian Kennedy type "F" design, and will be equipped with four stoves, 23 x 110 ft. It will also have four additional Pollock standard metal ladle cars. The 500-ton blast furnace which the William B. Pollock Co. is building for the Whitaker-Glessner Co. at Portsmouth, Ohio, will be equipped with a Pollock type metal ladle transfer car, which takes the molten metal from the furnaces and charges it direct into the open-hearth furnaces without the usual use of an overhead crane and portable charging spout. The William B. Pollock Co. recently received a contract from the Carnegie Steel Co., Pittsburgh, for remodeling two of its Edgar Thomson's furnaces at Bessemer, Pa.

The Frick Coke Co., Pittsburgh, has made some adjustment in working conditions in mines and coke ovens in Western Pennsylvania, putting into effect an eight-hour work day as far as possible. This new move became effective last week.

The Kirk Supply Co., Pittsburgh, has recently taken a contract for equipment as follows: 25 charging box cars built by the Easton Car & Construction Co., Easton, Pa., for delivery to the Canton Sheet Steel Co., Canton, Ohio; six cars of similar type for the Edgewater Steel Co., Pittsburgh, with works at Oakmont, Pa.; complete foundry flask requirements to be furnished by the Sterling Wheelbarrow Co., Milwaukee, Wis., for the Producers Supply Co., Franklin, Pa.; three ¾-yd. concrete mixers of the Marsh Capron type, and 1000 Sterling column clamps for the Union Switch & Signal Co., which is building a new plant at Swissvale, Pa.

Contracts for electrical equipment for the plants of the Chile Copper and Braden Copper companies in Chile, have been taken by the Westinghouse Electric & Mfg. Co., East Pittsburgh, and involve 15 rotary converters, each having a capacity of 3750 kilowatts. Most of the original machinery in Chile came from Germany, but since the war, most of the equipment has been purchased in the United States. It is expected that when the Chile Company plant is completed it will have a capacity of 118,000 kw. The Braden Copper Co., which like the Chile Copper Co. is a Guggenheim interest, is doubling its plant in the southern part of Chile.

Unusual Explosion in an Iron Foundry

The following account of a remarkable explosion in an Italian iron foundry has been published in the London *Iron and Coal Trades Review*, with the request that its readers throw any light on the cause they can or refer to a similar accident:

In an Italian foundry in which shells of semi-steel are being cast, a group of cupolas is served by Root blowers. On a recent occasion, after the cupolas had been set going with the natural draft, the electric starting switch of the blower was closed, whereupon a violent explosion took place, shattering the casing, but not injuring seriously the moving parts of the blower. The explosion was so violent as to displace several heavy tanks from their bases. The explanation offered by the management is that an explosive mixture had been produced by carbon monoxide finding its way from the cupola into the blower and that the mixture was fired by a spark produced by friction by one of the rotors of the blower. The explanation seems to be feasible but the possibility of an electric spark due to leakage is not altogether excluded in our opinion.

The *Revue de Metallurgie, Paris*, for January-February, 1917, has a detailed article by the well-known French author, M. Leon Guillet, on "The History of the Basic Process in the Manufacture of Steel," with life and portraits of Sidney Gilchrist Thomas, and photographs of his tomb and epitaph in the Passy Cemetery.

Steel Corporation to Build Ships

The United States Steel Corporation has announced plans for a steel shipbuilding plant to be established on the Hackensack Meadows, near Newark. A subsidiary company has been incorporated as the Federal Shipbuilding Co., of which the incorporators are William W. Corlett of New York, assistant solicitor of the corporation, and Kenneth B. Halstead and Edward F. Briggs of Hoboken. The Federal Shipbuilding Co. is capitalized at $3,000,000, but unlimited capital for the plant will be supplied by the Steel Corporation. There will be an initial outlay, Judge Gary says, of $6,000,000. Twelve steel shipways will be built, and it is expected to have the plant ready to build steel ships in six months.

Eighty-six acres of land were purchased through Joseph P. Day, a few days ago, and this, added to another strip recently acquired, makes a total of 150 acres to be used by the new plant. There will be ample space for one of the biggest shipbuilding plants in the United States.

Robert MacGregor, a marine engineer, who has been connected with the Steel Corporation in an advisory capacity, will have charge of shipbuilding operations. While the plant will be made ready to accept Government contracts, it will probably also engage in the building of vessels on private contract. These vessels will be of a standardized type, and of a capacity ranging from 6000 to 10,000 tons deadweight.

AVIATION BILL PASSED

War Department Hopes to Have 3500 Airplanes This Year

WASHINGTON, July 24.—The Senate on July 21 passed without amendment the House bill appropriating $640,000,000 for the creation of an Aviation Corps of 100,000 men, the construction of 22,000 airplanes equipped with high-powered engines, and the manufacture of approximately 40,000 machine guns to be used as armament for the airships. The bill will probably receive the President's approval before this issue of THE IRON AGE reaches its readers. As the aviation bill was introduced in the House less than a fortnight ago its speedy passage by both houses constitutes a conspicuous record for war legislation.

The bill clothes the President with extraordinary power to take steps, through the War Department, "for the purchase, manufacture, maintenance, repair, and operation of airships and other aerial machines, including instruments and appliances of every sort and description necessary for the operation, construction, or equipment of all types of aircraft, including guns, armament, ammunition, and all necessary spare parts and equipment connected therewith; and all necessary buildings for equipment and personnel in the Aviation Section and for the purchase, maintenance, repair, and operation, through the Chief Signal Officer of the Army, of all motor-propelled passenger and equipment carrying vehicles which may be necessary for the Aviation Section of the Signal Corps." The bill further authorizes the appropriation to be used for the acquisition of land and the erection of any buildings necessary to be used as a barracks, hangars, magazines, storehouses, shops, garages, etc., and for the "purchase, manufacture and installation of all kinds of machinery, tools, materials, supplies and equipment for the construction, maintenance and repair of aircraft, buildings, and improvements in aviation stations, or property, or appliances to be used in connection with aviation."

The officials of the War Department hope during the remainder of the present calendar year to produce at least 3500 airplanes, the majority of which will be for the instruction of fliers, and there is some talk of bringing British and French aviator student officers to the United States as instructors.

CORRESPONDENCE

Cast Steel Electrically Welded Ships

To the Editor.—In view of the publicity which the daily papers gave the recent article in THE IRON AGE on the proposal to build cast-steel ships, it may be pertinent to make a few comments on the merits of such an undertaking.

To repeat the scheme in a few words, it is proposed to make the ship hull out of standardized cast steel sections of say 8 ft. by 30 ft. random sizes, bolt these at convenient places, and then weld by electricity the abutting edges into a homogeneous unit. A footnote informs the reader that there is nothing marvelous or extraordinary about this; in fact, it is an everyday affair—except that as proposed it is on an unusually large scale.

I beg to differ materially from Myron F. Hill and to say that if undertaken such a project would be the death warrant of the entire electric welding industry. However, there is no immediate danger of such an outcome, inasmuch as even Mr. Hill admits that it will take him some five months time to build the necessary shipyards, runways, cranes and a few minor details—for a 6,000,000-ton annual production.

This part of the project being settled, we might turn our attention to the welding end of the scheme. It is stated by Mr. Hill that one shipyard will be able to turn out a hundred 5000-ton vessels per month. It is assumed that by tonnage, cargo carrying capacity is meant. One such vessel would be about 300 ft. long, about 40 ft. beam and, say, 30 ft. deep from the top of the plates to the upper main deck. Assuming furthermore that the yards will work day and night, Sundays and holidays as well, and leaving off all fractional parts, one yard must turn out during 24 hours three ships as per the above given approximate dimensions. (This stunt might prove to be of some interest to General Goethals.)

Roughly speaking, it will take about 115 pieces, each 8 ft. by 30 ft., to form a hull—providing, of course, that such sizes could be conveniently cast, handled and used on all parts of the ship. On this basis we have about 5000 ft. of welded seams per hull. We are informed that by using the system of the Wilson Welder & Metals Co. this 1100 miles of annual welding will be far superior to riveted joints and watertight, of course. I dare to make a guess that the Wilson Welder Co. uses a constant potential multiple arc-welding system. Judging from its experience, it must have had some slight difficulties with porous welds. This we are justified in assuming, because Mr. Wilson says:

"An operator finds difficulty in holding the tool at a fixed distance from the work. An unsteady hand causes the distance to vary, thus varying the resistance over which the arc from the tool to the work has to pass. This variation may cause a variation in the current sometimes as much as 15 amp., with the result that the weld becomes porous."

This brief statement of Mr. Wilson gives the clue to the entire situation, which is that the Wilson Welding & Metal Co. has the same difficulties with its system that all other arc welding systems have, whether Bernardos, Slavianoff, constant potential, constant current, series or multiple—namely, stability of the arc and porousness.

I have no space to go into the details of the good, bad or indifferent means for improving the stability of the arc or to avoid porousness. Neither is it my intention to belittle arc welding as an art. I am myself somewhat of a welding man, and it is but natural that I should be enthusiastic over the immediate future of welding. I only wish to point out that arc welding is not as yet ready to be adapted to such a titanic task as Mr. Hill proposes.

Upon investigation I found that the Wilson welding system is not any better than any of the other arc welding systems now in the market. I also wish to call Mr. Hill's attention to a slight oversight in his patent specification No. 1,187,404. The generator shunt field as well as the pencil feed cable has the same identification number. This seems to have escaped detection at the Patent Office.

While I must confess my ignorance about the proposed type of cast steel ships (information withheld on account of strategic reasons), even if I am underestimating by 100 per cent the actual welding work, it seems somehow that 720 welders ought to do about twice as much work as Mr. Hill estimates. Granting, without accepting it as a fact, that welded joints are stronger than riveted ones, I would also recommend to Mr. Hill to make a few rough calculations as to where the transversely running seams on his standardized ships will come and avoid placing one in what is called the resonance line. He might find there that his welds are not stronger, only more rigid, and in that case he might have some startling experiences.

In conclusion allow me to say that in the interest of the welding art it is most important before venturing into new fields to advocate conservatism rather than radicalism. The greatest difficulty in the welding industry is usually to overcome the prejudice which still exists among professional outsiders. Venturing into untried fields and in competition with well-known and well-tested methods requires first of all being able to prove beyond doubt the validity of our claim. No matter how much to my regret, I am forced to say that for certain fields welding is not as yet adapted. Welding cast-steel ships for such service, size and quantity as proposed by Mr. Hill is one of those fields.

SANDOR I. OESTERREICHER,
Assoc. American Institute Electrical Engineers.
NEW YORK, July 20, 1917.

Interesting History of a Furnace

To the Editor: Last week the Jefferson Iron Co. shipped from its furnace near Oak Hill in Jackson county, Ohio, the last iron on the yard and formally went out of business.

The Jefferson Iron Co. was organized early in 1845, the plant being built and the first iron being made that year. The stockholders were altogether of Welsh people, Jackson and Gallia counties in Ohio having, between the years of 1818 and 1840, received a very large number of emigrants from Wales. The stockholders of the Jefferson company were deeply religious men and when the furnace was started they held a formal meeting and agreed among themselves that the furnace would never operate on Sunday. And this agreement was never, during all the years of its operation, broken. Every Saturday night, the furnace was banked, and with the exception of the watchman, there was no workman about the place.

The furnace ran continuously from 1854 to the early part of 1917 except during occasional periods of depression in business, when it was out because the iron could not be sold. At first the furnace produced the genuine old-fashioned cold blast iron. More recently the iron has been warm blast, and from an output of three or four tons a day they raised to 12 tons a day. This furnace survived the period when the Hanging Rock region was the greatest producing iron district in the United States. In the Hanging Rock district, which included the Ashland section in Northern Kentucky, there was a total of 90 blast furnaces shortly after the Civil War. Day by day the competition of coke iron forced them out of business. A few became coke furnaces, but most of them simply closed up shop, were dismantled and sold for scrap.

The Jefferson Iron Co. after the Civil War cut a melon ($300,000) making all of its stockholders rich. At that time, this sum of money was a tremendous amount. At the end of the Civil War, it sold iron for $90 a ton. The original capital stock of the company was $50,000, and it has divided since it started business more than a million dollars in dividends. All of its stockholders, very early in the history of the company, received back in dividends their entire subscription, so that for a period of practically 57 years the stockholders have been on velvet.

The Jefferson furnace gave employment to at least four generations, and during the years when general business was so very dull and Jackson county suffered so severely from a lack of industrial development, the chopping of wood and the mining of native ore were constant sources of revenue to the farmers and to the town people generally.

With the shutting down of Jefferson ends the last word of one of the most interesting industrial chapters in the history of the United States.

Of course, with the great modern coke furnaces at Ironton, Ashland and Jackson, the Hanging Rock district does not cease to make iron. In tons it is making much more iron to-day than it did when all of the 90 charcoal furnaces were running, it is giving employment to many more men, it is making more money for the stockholders of the companies than in the days that went by. But the flavor, the romance and adventure that marked the Hanging Rock district have disappeared. Everywhere the old foundry men in this country remember the Hanging Rock charcoal iron as superior to anything else that they have ever used—superior at least in the traditions of its excellence.

THE MATTHEW ADDY CO.,
James A. Green, President.

CINCINNATI, July 23, 1917.

Pedagogical Influence

To the Editor: An incident which has just come to the writer's attention, together with conversations which he has had from time to time with different instructors, seems to indicate a practically unknown influence which is working against industrial production.

We have lately offered some good opportunities to graduates of high schools, particularly those who have taken the vocational courses. One of these applicants wrote that he could not consider any proposition of less than $2.50 a day and no piece work. It is, of course, the latter stipulation which is significant.

The instructors referred to express a firm belief that the workman is being exploited and should take a stand for his rights. These rights are described as being entitled to more compensation without increased production. If these sentiments are being instilled into the boys while receiving their instruction, the systems of piece work or bonus are, no doubt, being cited as examples of exploitation. Not only is this hurtful as abetting the general attitude of trades unions, but it is harmful to the boy as an individual in that he is sent out with the idea of obtaining reward without effort.

While there may be little or nothing in the coincidence, the matter will, at least, bear watching.

H. D. MURPHY.

Jersey City, N. J., July 19, 1917.

Japan's copper ore output in 1916 was 111,562 tons, as compared with 83,017 tons in 1915 and 78,700 tons in 1914, according to the British commercial attache at Yokohama, furnished to him by one of the largest copper mine owners in that country. Exports amounted to 57,402 tons in 1916, as compared with 56,528 tons in 1915 and 43,305 tons in 1914. Russia now buys 60 per cent of Japan's copper exports; the United Kingdom takes 20 per cent, while France, the United States and India share the remainder. The consumption of copper ore in Japan has increased considerably during the last three years, amounting in 1916 to 59,690 tons, as compared with 27,723 tons in 1915 and 32,045 tons in 1914.

Edward T. Edwards, Columbia, Pa., operating the East End Rolling Mills, has completed remodeling and improvement work at the Union Street rolling mill, recently acquired, and plans to place the plant in full operation at an early date.

The San Francisco office of the Sullivan Machinery Co. is now in the Hobart Building, 582 Market Street, having removed from its former location in the Sheldon Building, 461 Market Street. Ray P. McGrath is manager.

CONTROVERSY IS ENDED

Goethals and Denman Succeeded by Admiral Capps and E. N. Hurley

WASHINGTON, July 24.—President Wilson sharply terminated the Goethals-Denman controversy to-day by accepting the resignation of General Goethals as manager of the Emergency Fleet Corporation and suggesting to Chairman Denman of the Shipping Board that he too resign, a suggestion that was promptly complied with. At the same time, the President accepted the resignation, tendered some weeks ago on account of ill-health, of Captain J. B. White, a member of the board. Admiral Capps, a naval constructor of high reputation, is slated to succeed General Goethals as the general manager of the Emergency Fleet Corporation and Edward N. Hurley, formerly chairman of the Federal Trade Commission and now a member of the Export Council, has been chosen to succeed Mr. Denman. Bainbridge Colby, of New York, will be appointed to succeed Captain White as a member of the board.

Admiral Capps, who succeeds General Goethals, is one of the most experienced constructors in the naval service and, although his abilities have never been tested by any such task as the building of the Panama Canal, it is the opinion here that the President could not have found a more capable man without going outside the Government service.

Before the President's action was made known, the Senate had taken a hand in the Shipping Board controversy and had adopted a resolution offered by Senator Smoot, of Utah, for information concerning the plans of the board, as follows:

> Resolved, That the President be, and he hereby is, requested to transmit to the Senate such information as may be in the hands of the Shipping Board to show what contracts have been let or are pending for the construction of ships under the authority of that board, the names of the contractors, the location and capacity of their yards, the price per ton to be paid to them, the nature and amount of any advances to be made to them from Government funds, together with any other information which will indicate the disposition of appropriations already made for the uses of the Shipping Board or which will assist the Senate in the consideration of requests from the said board for further appropriations.

There are ample precedents for the refusal of the President to supply the information called for in this resolution if it should be deemed inadvisable to make it public at this time. On the other hand, both the President and the members of the Shipping Board will be keenly alive to the fact that if Congress is to be requested to supply another half billion dollars to be spent by the board, it will be exceedingly poor diplomacy to refuse it information unless the public interest unquestionably requires it. It is probable that the board will furnish at least part of the data called for in the Smoot resolution.

A collateral matter of much interest here is an agreement which it is announced has been entered into by Shipping commissioners designated by President Wilson and the British Foreign Office and acquiesced in by all the Allies with the possible exception of Japan. This agreement proposes the radical downward revision of ocean freight rates and the practical taking over by Great Britain and the United States of the operation of all allied merchantmen in the Atlantic. The Japanese Government is said to have demurred at entering into this arrangement on the lines proposed, but has promised to place as many Japanese merchant vessels in the transatlantic trade as can possibly be provided to help render ineffective the submarine warfare. The position of Japan in this matter will be definitely determined when the Japanese mission headed by Vice-admiral Takeschita reaches the United States.

It is stated that negotiations looking to this agreement were begun at the instance of President Wilson and in line with his open letter to the industrial leaders of the country, published July 11, in which he dwelt with much emphasis upon the embarrassment caused by the almost prohibitory ocean freight rates demanded

by ship-owners during the past year. The details of the agreement will probably be worked out in the course of a few days when an official announcement will be made respecting the matter.

The Manufacture of Phosphor Bronze

While phosphor bronze and its properties have long been known, its method of manufacture has been carefully guarded, writes Prof. W. W. Rogers, metallurgist Stamford Rolling Mills Company, Stamford, Conn., in a pamphlet published by that company. He gives the following description of the way in which it may be produced:

The phosphor bronze that has the best all-round properties for rolling and drawing into wire has the following approximate composition:

	Per Cent
Copper	95
Tin	5
Phosphorus	0.05 to 0.15

This alloy when annealed has a tensile strength of about 47,000 lb. per sq. in. and an elongation of about 70 per cent. When rolled or drawn to spring temper, it will show 120,000 lb. to the sq. in., with an elongation of only 2 per cent or less. Fine wire will give 160,000 lb. tensile strength and over. At maximum spring temper the ultimate breaking strain and the elastic limit are almost identical, with practically no elongation.

In its manufacture the first step is to prepare the phosphor copper. This is done by heating copper ingots in a graphite crucible to almost their melting point, but not allowing it to flow. When this temperature is attained, yellow stick phosphorus is thrown in, which at once combines with a portion of the copper with a sufficient rise in temperature to melt it. The throwing in of phosphorus is continued until the charge has melted and covered the copper unacted upon. It is then poured into shallow slab molds, and when cold may be easily broken up. This process yields a phosphor copper containing from 4½ to 5 per cent phosphorus.

The next stage is to alloy this phosphor copper with tin in the following proportions:

	Per Cent
Phosphor copper	51½
Tin	48½

The phosphor copper is first melted in a graphite crucible, the tin added, heated until thoroughly fused, well stirred, and poured into shallow slab molds. To complete the process it is only necessary to alloy copper with the phosphor-copper-tin alloy, the making of which has been described above. A hundred pound charge would consist of 90 lb. of high-grade copper and 10 lb. of the phosphor-copper-tin alloy. To do this, melt the copper under charcoal, add the phosphor-copper-tin alloy, raise the temperature to the required pouring heat, mix thoroughly and pour into molds of convenient size and shape.

Great caution must be exercised in handling the phosphorus used in the making of the phosphor-copper The contents of the tins in which the phosphorus is sold should be emptied into a bucket containing water, and the sticks of phosphorus completely submerged. The hands should be protected with asbestos gloves, for, if the phosphorus ignited, it would cause serious burns.

It is announced by Frank B. Baird, president of the Buffalo Union Furnace Co., Buffalo, that the blast furnace of the Burden Iron Co. at Troy, N. Y., recently leased by him on behalf of his company is being put in condition for operation as rapidly as possible and will commence making iron between the middle and the latter part of August. The capacity is about 250 tons daily.

The Mayer Bros. Co., Mankato, Minn., manufacturer of tractors, power hammers, etc., is enlarging its plant by the addition of a foundry addition, 36 x 116 ft., and a machine shop, 40 x 80 ft. The company has installed about $6,000 worth of new machinery since February.

NEW TRADE PUBLICATIONS

Portable Flood Light.—Coffin Valve Co., Boston. Pamphlet. Concerned with a portable flood light for use in factories and machine shops where temporary special lighting is required. The device consists of a standard with two swivel and one ball joints and a telescoping arm, enabling the light to be easily and quickly adjusted for illuminating any desired spot. A number of views showing the adjustments possible for use on machines or on the floor are included.

Belting.—Stanley Belting Corporation, 32 South Clinton Street, Chicago. Pamphlet. Devoted to a line of solid woven cotton belting impregnated with a special compound. The advantages claimed for this belting are flexibility, uniform thickness, cheapness and absence of continual stretch and plies or laps to come apart. A table giving the horsepower transmitted by the belting at various speeds is presented, together with a price list of the sizes. Mention is made of the different fastenings for use with the belt and brief instructions for its care are presented.

Tackle Blocks.—Western Block Co., Lockport, N. Y. Pamphlet. Refers to an extensive line of blocks for manila and wire rope. Views of the various blocks that can be regularly supplied are presented with a table of prices and sizes on either the facing page or underneath the illustration. Mention is made of the various iron and sheaves that can be furnished, as well as special blocks, phosphor bronze bushings and small eye hooks.

Superheaters.—Power Specialty Co., 111 Broadway, New York. Bulletin No. M-1. Devoted to a line of superheaters for use on marine boilers. Among the advantages claimed for the superheater are maximum fuel and water economy at moderate temperatures, accessibility and the elimination of any necessity for change to boiler or tubes. The construction of the superheater is gone into at some length, and a number of views of the superheater and vessels upon which it has been installed are included.

Balancing Machine.—N. W. Akimoff, Philadelphia. Pamphlet. Gives general description and specifications for a dynamic balancing machine for various types of rotating apparatus, such as motor armatures, crankshafts, etc. The description of the machine is brief but complete and the text is supplemented by numerous illustrations.

Cleaning Compound.—Oakley Chemical Co., 22 Thames Street, New York. Information sheet No. 860. Points out the advantages of using Oakite plater's cleaner for all sorts of metal work. A general discussion of the subject of cleaning and the equipment required is presented, followed by instructions for cleaning various kinds of metal products.

Automatic Solenoid Brakes.—General Electric Co., Schenectady, N. Y. Bulletin No. 48,900. Illustrations and descriptive matter explain the operation of a line of solenoid brakes which are used for stopping rotating parts more or less quickly. When the power is cut off the brake sets and applies a retarding force to the shaft through friction between the brakeshoes and the wheel. The solenoids employed with the brakes are also illustrated and briefly described.

Cotter Pins.—American Chain Co., Inc., Bridgeport, Conn. Pamphlet. Calls attention to the Campbell hammerlock self-spreading cotter pin, which is locked by a light blow on the head. A brief description of the pin and the way in which it is inserted, locked and removed is presented, the text being supplemented by illustrations of the three steps. A price list covering all the sizes made with the different sizes of packages and the weight of 1000 pins is included.

Reflectors.—National X-Ray Reflector Co., 235 West Jackson Boulevard, Chicago. Catalog No. 20. Describes and illustrates a line of reflectors for directing and controlling light in commercial and flood illumination. A brief description of the reflectors, which are made from a single piece of blown glass with corrugations designed to break up and diffuse the light rays, is given, and numerous engravings of the various reflectors and diagrams of the light distribution are presented, together with a number of illustrations of actual installations. Mention is also made of a line of reflectors for show windows and cases and the different fittings and fixtures employed.

Second-Hand Machinery.—S. Nemirovsky & Son, 136 North Third Street, Philadelphia. Folder. Mentions the line of new and second-hand machinery and tools, dynamos and motors which are regularly carried in stock.

Machinery Markets and News of the Works

MAY COMMANDEER TOOLS

Sidetracking of Private Work Likely

Government Business Occupies Attention of Trade Almost Exclusively—Shipbuilding, Motor Truck, Airplane and Munitions Concerns Buy

Commandeering of machinery and machine tools for the benefit of Government work is forecasted by the action of several builders in sending out letters to their customers inquiring as to the purposes to which recent orders are to be put. If such purchases have been made for private manufacturing, it is the understanding the information will be given to the Priority Board at Washington, which will probably, in some instances, divert such shipments to plants engaged in Government work. This is only one of many indications of the almost complete side-tracking of private business in favor of the Government.

Shipbuilding contracts, which it was expected might be awarded last week, will probably soon be awarded, now that the emergency fleet controversy is settled. It is said that progress is being made on the plans for the Government shipyards near Philadelphia and Newark, in which the American International Corporation, the Submarine Boat Corporation and the Lackawanna Bridge Co. are unofficially said to be co-operating. The Federal Shipbuilding Co., which is financed by the United States Steel Corporation, will build a $6,000,000 shipbuilding plant, with 12 shipways, on the Hackensack Meadows. The Groton Iron Works will build a $2,000,000 steel shipbuilding plant at New London, Conn., and is in the market for equipment, including cranes and machinery and tools for plate and machine shops. Reports from Seattle say that four plants in that city and three in Portland, Ore., are now at work building steel ships, and that two more plants are being equipped in Seattle.

Passage of the bill appropriating $640,000,000 for airplanes is bound to bring out a large demand for machine tools, some of which has already appeared. The Curtiss Aeroplane & Motor Corporation is buying and the Wright-Martin Aircraft Corporation and the General Vehicle Co. are understood to be preparing to take Government contracts for motors. The Packard Motor Car Co. of Detroit and the Willys-Overland Co. of Toledo, Ohio, last week placed orders aggregating $65,000 with Cleveland dealers for tools for airplane motors and another similar order is pending in the Cleveland market for $40,000.

Motor truck contracts aggregating 10,650 chasses, with a total value of $33,179,026, will stimulate demand for tools and machinery. The General Motors Co., Detroit, will build a new forge shop and wants nine 10 to 15-ton cranes and shop machinery.

The Government will spend $5,000,000 for buildings at the Washington Navy Yard to manufacture torpedoes, mines, mounts, etc., and $2,500,000 in equipping these shops. The General Electric Co., Schenectady, N. Y., is in the market for about $1,000,000 worth of equipment for making turbines; this in addition to orders placed within the past few months aggregating $3,000,000. The Singer Sewing Machine Co., New York, wants 300 to 400 machines. The American Ammunition Co., A. Schrader's Son, Inc., and the Marlin Arms Corporation are in the market for tools for making munitions. Westinghouse, Church, Kerr & Co. and Stone & Webster, who are building shops at the Rock Island Arsenal, Rock Island, Ill., will buy a large quantity of equipment. The Brier Hill Steel Co., Youngstown, Ohio, is in the market for 15 machine tools, about half of which are lathes from 16 to 42 in.

There is an active demand from shipyards for cranes. The Lackawanna Bridge Co. wants delivery in two months of four 5-ton cranes to be used in equipping the Government shipyard on Newark Bay. The General Electric Co. has closed for 12 cranes.

Among export inquiries is one for 60 42-in. lathes for Italy, duplicating a former order which was submarined. A statement which is believed to be reliable is to the effect that 40 per cent of export shipments of machinery and machine tools in recent months have been sent to the bottom by Germany's U-boats. Takata & Co., New York, have concluded purchases aggregating $800,000 for the equipment of a tube and pipe works in Japan. Tools for Calcutta, India, have been inquired for in Boston.

New York

NEW YORK, July 23.

Government orders aggregating $2,500,000 will probably soon be placed for the equipment of new shops to be built at the Washington Navy Yard for the manufacture of mines, mounts, torpedoes, telescopes, sights, optical instruments and miscellaneous ordnance supplies. An appropriation of $7,500,000 has been asked for to erect and equip the buildings.

This and similar large orders which are either directly or indirectly for the Government are occupying the attention of the trade almost to the exclusion of all private business. In fact, orders recently placed for machinery and machine tools by manufacturers are being investigated to determine whether they are to be used on Government or private work, and, if for the latter, they will probably be commandeered for the Government.

Manufacturers of airplanes, motor trucks and munitions are in the market. The passage of the $640,000,000 airplane appropriation by Congress has stimulated a great deal of inquiry from manufacturers of airplane motors. The General Vehicle Co. and the Wright-Martin Aircraft Corporation have been "feeling out" the market and are understood to be expecting Government airplane contracts. The Curtiss Aeroplane & Motor Corporation is buying for its Buffalo and Hammondsport factories.

The closing of U. S. Army contracts with the Four-Wheel Auto Drive Co., the Packard Motor Car Co., the Locomobile Co., the Nash Motors Co., the Garford Motor Truck Co. and the Pierce-Arrow Motor Co. for 10,650 motor trucks, at a cost aggregating $33,179,026, was noted with interest by the trade, as it will stimulate some demand for machine tools.

Expected contracts for steel ships had not materialized at this date (Tuesday) owing to the failure of Chairman Denman of the Shipping Board and General Goethals to settle their differences. Some progress is being made, it is said, on plans for the Government shipyards, which will be

established near Philadelphia and Newark. The American International Corporation is understood to have placed tentative contracts for machinery for the Philadelphia plant, and the Lackawanna Bridge Co., which, in co-operation with the Submarine Boat Corporation, is to establish the Newark plant, indicated that it is going ahead with the work of equipping the yard by sending out an inquiry last week for four 5-ton cranes, and it is understood that an inquiry for other cranes will follow. The Downey Shipbuilding Corporation, 120 Broadway, has formally taken possession of the fabricating plant of Milliken Bros., Inc., Staten Island, and will at once equip it for a shipbuilding plant. The Groton Iron Works, 50 Broad Street, is understood to be expecting a Government contract for steel ships in addition to the wooden-ship contract it received some time ago, and will spend $2,000,000 in equipping a plant at New London, Conn. It is in the market for bridge, yard gantry and locomotive cranes and equipment for a plate shed and machine shop. The Foundation Co., Woolworth Building, New York, is reported to have taken a contract to build 40 wooden ships for the French Government, with a possibility of this order being doubled or tripled, and is inquiring for equipment. The American U-Boats Co., 21 Park Row, New York, a new company, is inquiirng for about a dozen machines for a plate shop. It is said that this company plans on building undersea cargo boats.

The General Electric Co. is again in the market, having only recently closed on the last of a lot of equipment for the Schenectady works totaling about $3,000,000. Its inquiries at present call for about $1,000,000 worth more. All of this equipment, it is understood, will be utilized in the manufacture of turbines for the United States Navy. The Singer Sewing Machine Co. is inquiring for 300 to 400 milling machines, drill presses and automatic screw machines, which are said to be for export to one of its foreign factories. The American Ammunition Co., 25 Broad Street, New York, is inquiring for tools for its plant at Bordentown, N. J., where munitions will be manufactured for the Government. A. Schrader's Son, Inc., Brooklyn, which also has a Government munitions contract, is in the market for automatic screw machines. The Marlin Arms Corporation, Philadelphia, formerly the Standard Roller Bearing Co., is inquiring for a list of tools wanted for munitions making. Westinghouse Church Kerr & Co., New York, are inquiring for about 90 machines wanted for buildings being erected at the Rock Island Arsenal, Rock Island, Ill. Stone & Webster are also in the market for machinery for this arsenal.

Crane builders are receiving requests for early deliveries from shipyards and others, but are unable to promise anything shorter than six months in most instances. Second-hand cranes are being purchased in numerous cases to obtain earlier shipments. The American International Corporation and the Submarine Boat Corporation and Lackawanna Bridge Co. will require a large number of cranes for the Government shipyards, and it probably will be necessary to commandeer these if the expected progress is to be made in equipping these plants. There is a good demand for cranes for all purposes, including those used for the handling of coal, ore, etc. Locomotive crane builders are sold up for six months, but have quite a lot of business in private contracts which can be diverted to Government account, if required. The General Electric Co. last week closed for 12 cranes of 5, 10 and 15-ton capacity. The Penn Seaboard Steel Corporation, Philadelphia, bought a 10-ton crane.

Export inquiry continues very active. Takata & Co., 50 Church Street, have concluded purchases of machinery aggregating $800,000 for a tube and pipe works in Japan.

The Downey Shipbuilding Corporation, 120 Broadway, New York, has concluded arrangements for the acquisition of the structural steel and iron works of Milliken Brothers, Inc., Milliken, Staten Island. The company has a contract for the construction of 10, standardized type, 7500-ton steel steamships, and will make extensive additions and improvements in the plant for shipbuilding operations. The work will include the installation of shipbuilding berths, construction of which has been commenced. Plans for a group of six new machine shops and construction buildings are now being prepared by the engineering department of Milliken Brothers, 111 Broadway. Wallace Downey is president. The company has an authorized capital of $10,000,000.

The Miller-Morris Corporation, New York, has been incorporated with an active capital of $52,500, to manufacture automobile carburetors and kindred specialties. G. Miller, T. A. Morris and H. C. Harris, 51 Chambers Street, are the incorporators.

The Hourwich Aircraft Corporation, New York, has been incorporated with a capital of $50,000 to manufacture aeroplanes and other aircraft, engines and accessories. I. A. and I. Hourwich and F. Reyher, 17 Christopher Street, are the incorporators.

The Gorham Co., Fifth Avenue and Thirty-sixth Street, silversmith and manufacturer of architectural bronzes, has leased property at 140-142 Sixth Avenue, near Eleventh Street, for a new manufacturing plant. Improvements costing $25,000 will be made to the building.

The National Water Motor Corporation, New York, has been incorporated with a capital of $250,000 to manufacture water motors. F. E. Sturgis, R. Sherman and R. W. Evans, 14 Wall Street, are the incorporators.

The Imperial Machine & Foundry Corporation, New York, has been incorporated with capital of $300,000, to manufacture machinery, metals, etc. H. Robinson, J. G. and R. A. Abramson, 60 Church Street, are the incorporators.

The J. J. Crawford Co., West New Brighton, Staten Island, has been incorporated with a capital of $10,000, to manufacture shock absorbers for automobiles. J. J. Crawford, W. Johnson and B. E. Lyons, West New Brighton, are the incorporators.

F. W. Jesup & Co., New York, have been incorporated with a capital of $10,000 to manufacture agricultural equipment, harrows, plows, etc. F. W. and A. S. Jesup, 416 Macon Street, Brooklyn, are the principal incorporators.

The Ludlam Steel & Spring Co., Fifth Street, Watervliet, N. Y., manufacturer of crucible cast steel specialties, has had plans prepared for a two-story addition. Edward Corning is president.

Pass & Seymour, Inc., Solvay, N. Y., manufacturer of electrical specialties, is making rapid progress in the erection of a three-story and basement addition to its plant, providing about 60,000 sq. ft. of floor space, which with equipment will cost in the neighborhood of $100,000. It is expected to be ready for occupancy early in the fall.

The Auto Ride Easy Co., Jamestown, N. Y., has been incorporated with a capital of $10,000 to manufacture shock absorbers and automobile specialties. A. I. Nordstrom, H. A. Sandberg and A. I. E. Kettle are the incorporators.

The Newton Falls Paper Co., Newton Falls, N. Y., will build a new hydroelectric power plant to cost about $50,000. Charles E. Easton, Sherman Building, Watertown, is the engineer.

The M. L. Oberdorfer Brass Co., East Water Street, Syracuse, N. Y., manufacturer of brass and aluminum castings, has filed plans for alterations and improvements in its plant.

The Perfect Fuse Co., Buffalo, N. Y., has increased its capital from $10,000 to $100,000.

The Smith Elevator Co., Buffalo, N. Y., has been incorporated with a capital of $75,000 to manufacture elevators and hoisting machinery. C. W. and M. E. Smith and G. E. Burford are the incorporators.

The Seneca Rubber Co., Buffalo, N. Y., has been incorporated with a capital of $50,000 to manufacture rubber products. H. T. Auerbach, H. A. Forbes and L. B. Dietz are the incorporators.

The Hall Printing Press Co., Dunellen, N. J., manufacturer of printing machinery, has completed plans for a one-story foundry addition, 60 x 100 ft.

The Stableford Truck Sales Co., Plainfield, N. J., has been incorporated with a capital of $125,000 to manufacture motor trucks and other vehicles. Frank T. and Marcus L. Clawson, Plainfield, and Neil W. Benedict, Newark, are the incorporators.

The Borough Council, Pompton Lakes, N. J., has approved the acquirement of a site on Pompton Lake for the installation of a hydroelectric power plant for municipal service, estimated to cost about $35,000.

The Hall Switch & Signal Co., Garwood, N. J., has had plans prepared for a one-story extension to its plant on Centre Street, about 40 x 100 ft. H. W. Wolff is general superintendent.

The Grant Hammond Arms Co., Jersey City, N. J., has been incorporated with a capital of $100 000 to manufacture firearms. Arthur W. Britton, Samuel B. Howard and Harry B. Davis, 65 Cedar Street, New York, are the incorporators.

The Magnolia Novelty Co., Rahway, N. J., has been incorporated with a capital of $125,000 to manufacture unbreakable metallic toys and has acquired a factory on Campbell Street, near Elm Avenue, for its initial plant. Frank C. Engelhart, Rahway; J. Louis Cisneros, Cranford, and Charles C. Francis, New York, are the incorporators.

The Aeromarine Plane & Motor Co., East Keyport, N. J., manufacturer of aircrafts, is planning for the erection of an addition to its plant. It has acquired property on Manchester Avenue, pending the proposed extension.

Cole & Morgan, Inc., Caldwell, N. J., has been incorporated to manufacture electrical equipment. Arthur B. and E. M. Cole, and Alfred P. Morgan, Caldwell, are the incorporators.

The International Arms & Fuse Co., Bloomfield Avenue,

Bloomfield, N. J., will build an extension to its plant to cost about $4,000.

The Edison Storage Battery Co., Bloomfield, N. J., has taken out a permit to build an addition to its plant in the Silver Lake section.

The Upson-Walton Co., 462 Riverside Avenue, Newark, N. J., manufacturer of wire rope, will build a one-story addition, 30 x 66 ft., to cost about $4,000.

A. C. Belknap, Inc., Newark, has been incorporated with a capital of $100,000 to manufacture engines, automobile parts, etc. A. C. Belknap, East Orange; Frank Van Syckle and Harold Van Syckle, Perth Amboy, are the incorporators.

The High Power Piston Ring Corporation, Newark, has been incorporated with a capital of $50,000 to manufacture piston rings and similar products. Philip J. Schotland, 9 Clinton Street, is the principal incorporator.

The Heller Brothers Co., 879 Mt. Prospect Avenue, Newark, manufacturer of files, will make improvements and extensions to its plant at 231 Verona Avenue to cost about $3,500.

The Smith-Wilde Mfg. Co., Newark, has been organized to manufacture automobile accessories. Winton L. Smith, 70 Freeman Avenue, East Orange, and Alexander Wilde, 141 Linden Avenue, Arlington, head the company.

The Western Aero Corporation, Newark, has been incorporated with a capital of $250,000 to manufacture aeroplanes, engines, etc. C. W. Johnson, Jersey City; G. A. Eckstardt, Newark, and J. W. Eckstardt, Orange, are the incorporators.

The West New York Tool & Machine Co., Newark, has been incorporated with a capital of $15,000 to operate a local plant. A. F. Wagner, Newark; Alois Seybo, West New York, N. J., and E. Kolken, Orange, are the incorporators.

The David Machine & Motor Co., Newark, has been incorporated with a capital of $125 000 to manufacture machinery. David Davis and Edwin C. Goodwin, Newark, are the incorporators.

Durand & Co., 49 Franklin Street, Newark, manufacturing jewelers, have increased their capital from $150,000 to $400,000.

The Porter-Cable Machine Co., Walter A. Ridings, manager, 501 East Water Street, Syracuse, is having plans prepared for a factory, 150 x 200 ft., one story, to be erected at DeWitt, N. Y., at an estimated cost of $35,000.

The General Optical Co., 538 First Avenue, New York, will erect a three-story addition to its factory at Mt. Vernon, N. Y.

The Rochester Can Co., Rochester, N. Y., is building a two-story addition, 91 x 130 ft., to its factory.

The Sanford Motor Truck Co., Syracuse, N. Y., has completed plans for additions to be made to its plant on West Fayette Street. It manufactures motor trucks of 1 to 5-tons capacity.

The Gleason Works, Rochester, N. Y., manufacturer of gear planers, is having plans revised and will probably take new bids for its projected one-story addition, 120 x 350 ft., on University Avenue.

The George Schautz Engineering Co., Ellicott Square Building, Buffalo, has recently been incorporated with a capitalization of $30,000 to manufacture cranes and to engage in a general engineering and construction business. George and J. A. Schautz and J. Leuthner are the incorporators.

New England

BOSTON, July 23.

The local machinery market is being thoroughly combed in an endeavor to obtain machine tools for export. One inquiry for 60 42-in. lathes for Italy, to be used in turning 6-in. guns, is reported as an order to replace a similar shipment which fell a victim to a U-boat. Another fairly large inquiry is for Calcutta, India. The Fore River Shipbuilding Corporation is still buying extensively and the Newport Torpedo Station is another active buyer. With the exception of one local machine shop which is making an unusual success in building machine tools and special machinery on contract, the New England machine tool builders are adding but little to their equipment. Orders from New York and other sections are keeping all the machine tool plants from gaining on their deliveries, but the labor situation is such that little expansion of plants is being undertaken or contemplated.

Small sizes of universal grinders are a little easier to obtain but deliveries of plain and universal milling machines show no improvement. There is little demand for 18-in. and 20-in. lathes, and these sizes can be secured quite promptly. The call for large sizes for gun work is unabated and deliveries are far into the future. A dropping off in the orders for 22, 24 and 28-in. upright drill presses has made deliveries a little easier. Deliveries on these larger sizes are not better than 10 to 12 months, a recent sale of 5 machines to the Watertown Arsenal calling for delivery in eight months. Universal horizontal boring machines cannot be obtained under five to six months. Dates for deliveries of small automatics continue far off, but large automatics can be bought for shipment in two months.

Sales of second-hand machine tools in reasonably good condition are a prominent factor in the local market, as many machine shops have found it true economy to buy such tools and rebuild them in their own plants to fit their needs. The continuing advances in the prices of new tools is an added incentive to buy second-hand tools.

The Standard Brass & Copper Co., New London, Conn., has increased its capital stock from $35,300 to $50,300.

The B. & B. Iron Works, Inc., Boston, has been incorporated with authorized capital stock of $10,000. The directors are John F. Sutherland, president and treasurer; C. M. Sawyer and E. E. Mullen.

The Blevney Machine Co., Boston, has been incorporated with authorized capital stock of $300,000. The directors are George J. Ganer, president; Thomas Brennan, 47 West Cedar Street, treasurer; and William R. Scarrett, Jr.

The International Tool & Gauge Co., Bridgeport, Conn., has been incorporated with authorized capital stock of $10,000 by John A. Wahberg, Bennie Svetkey, Frank B. Carlson, Claus A. Palmquist and Charles J. Borg.

The Framingham Machine Works, Framingham, Mass., is raising the height of its foundry and building a cupola house 20 x 40 ft.

The New Haven Rivet Co., New Haven, Conn., has been incorporated with capital stock of $5,000 to manufacture hardware and electrical supplies. Henry C. Smith is president and Frank S. Day secretary and treasurer.

The Hubbard Machine Co., Worcester, Mass., has been incorporated with authorized capital stock of $25,000 to operate a foundry and machine shop. F. C. Smith, Jr., is president and Chester E. Williams treasurer.

The Dauntless Shipyard, Inc., Essex, Conn., has been incorporated with authorized capital stock of $50,000 by Charles A. Goodwin, George H. Day and Ida M. Topliff.

The Hudson Machine Screw Co., Hudson, Mass., has been incorporated with authorized capital stock of $15,000. The directors are A. H. MacBriar, president; Harry C. Moore, treasurer; and M. H. Litchfield.

The Superior Mfg. Co., Gloucester, Mass., has been incorporated with authorized capital stock of $60,000, to manufacture machines, tools and hardware. The directors are Benjamin A. Smith, president; Thomas P. Bolger, treasurer; and F. H. Tarr.

The United Lined Tube & Valve Co., Boston, has been incorporated with authorized capital stock of $100,000. The directors are D. William Wade, 162 Congress Street, Boston, president and treasurer; M. S. Coggan and J. W. Troy.

Philadelphia

PHILADELPHIA, July 23.

The Baldwin Locomotive Works, Philadelphia, has filed plans for the erection of an addition to its works at Seventeenth and Buttonwood streets.

The Pennsylvania Shipbuilding Co., Land Title Building, Philadelphia, is planning for the early construction of a new machine shop and boiler works at its shipbuilding plant at Gloucester City, N. J.

The Paul M. Evans Co., Philadelphia, has been incorporated with a capital of $25,000 to manufacture electric storage batteries. S. H. Evans is treasurer.

The Midvale Steel Co., Widener Building, Philadelphia, is taking bids for the construction of its new two-story pattern shop, 46 x 130 ft., at the Nicetown works. A cooling tower, about 30 x 30 ft., will also be erected.

The Chester Shipbuilding Co., Chester, Pa., will build two new shipways at its Chester works and 12 at the proposed shipbuilding plant at Bristol, where it has a large frontage on the Delaware River and plans for the construction of an extensive plant.

The Delion Tire & Rubber Co., East State Street, Trenton, N. J., has taken bids for the erection of a two-story addition to its plant, 65 x 250 ft., to cost about $70,000. J. Osborne Hunt, 114 North Montgomery Street, is the architect.

Luria Brothers & Co., Lebanon, Pa., operating a plant

for handling scrap iron and steel, have awarded contract for the erection of a two-story addition, about 27 x 35 ft.

The New Jersey Zinc Co., Palmerton, is having plans prepared for the erection of a three-story addition, 60 x 130 ft. Donn & Deming, 808 Seventeenth Street, Baltimore, are the architects. The headquarters of the company are at 55 Wall Street, New York.

Quakertown, Pa., has approved a bond issue of $45,000 for the installation of new equipment and improvements at the municipal electric power plant.

Lloyd Wells, Royersford, Pa., is having plans prepared for the construction of a one-story addition to his foundry. Arthur Kepner, Pottstown, is the architect.

The Traylor Shipbuilding Co., Allentown, Pa., affiliated with the Traylor Engineering & Mfg. Co., Allentown, will build 10 shipbuilding cradles at its new works at Cornwells. The company recently acquired the plant of the Enterprise Mfg. Co. for its proposed shipyards. Samuel W. Traylor is president.

Fire, July 13, destroyed one of the buildings of the plant of the Emerson-Brantingham Co., Waynesboro, Pa., manufacturer of traction engines, threshing machinery, etc., with loss estimated at $75,000.

The Barrett & Haentjens Co., Hazleton, Pa., has been consolidated with the Benjamin Iron & Steel Co., of that city, a subsidiary of the Pennsylvania Stripping, Quarrying & Contracting Co. The merger is to perfect arrangements for the manufacture of patented iron and steel specialties of the two companies, for mining, breaker and quarrying service.

The Electric Hose & Rubber Co., Eleventh and Dure streets, Wilmington, Del., is having plans prepared for extensions to its plant. Brown & Whiteside, Wilmington, are the architects.

Chicago

CHICAGO, July 23.

The action July 19 of Col. A. D. Kniskern, head of the quartermaster depot, 115 East Ontario Street, Chicago, Central Department, U. S. A., in placing orders for motor trucks and motor cycles valued at approximately $33,000,000, will be good news to the machine tool trade, inasmuch as several manufacturers of trucks issued lists against which, it was understood, orders would be placed provided they obtained contracts. The orders call for between 10,000 and 11,000 motor trucks to cost between $2,500 and $4,000 each, and 5000 to 5500 motor cycles, costing from $150 to $200 each, the aggregate being the largest ever placed at one time by the Government for motor vehicles. Deliveries are to begin immediately, continuing until the last of the year, and orders were distributed among factories all over the United States. Two Western companies reported to have received orders are the Four Wheel Drive Auto Co., Clintonville, Wis., and the Nash Motors Co., Kenosha, Wis.

Requirements of the large arsenal buildings being constructed at the Rock Island Arsenal are fast developing. One of these is being erected by Westinghouse Church Kerr & Co., and one by Stone & Webster. The local machinery trade is in more or less uncertainty as to where orders for the large amount of equipment needed will be placed. Some rumors are that the buying will be done in New York and Boston, while others indicate that the business will be placed at Washington. A representative of Stone & Webster is quoted as saying that while his firm had asked for quotations, the orders would be placed at Washington.

Good-sized inquiries have been received from manufacturers of agricultural implements, and the opinion is quite freely expressed that renewed activity on a large scale is near. The volume of small and miscellaneous buying has contracted considerably in the past week or 10 days, although a good demand is noted for large machines, new or second-hand. How far Government buying, which must be given precedence, will postpone deliveries to private buyers is one of the problems before the trade. All depends on the promptness with which Government orders must be filled. Some tool builders are not anxious at present for more orders from any direction.

The tool trade is interested in the report that the Baldwin Locomotive Works, Philadelphia, will build a large plant in East Chicago, Ill., where for some years it has owned acreage. Some time ago the company contemplated erecting a plant on the site.

Bids have been taken on a one-story machine and forge shop 130 x 147 ft., in Kedzie Avenue, Chicago, for the Oetigan Drop Forge Co., 2430 Lowe Avenue. T. P. Oetigan is president.

The plant of the Union Molding Co., 3544 South Western Avenue, Chicago, which was destroyed by fire July 9, will be rebuilt. D. C. Marggraft, 1728 West Twenty-first Place, is president.

Plans have been prepared for a two-story reinforced concrete boiler and engine house, 30 x 128 ft., to cost $20,000, and a one-story addition to a roundhouse and coal shute to cost $38,000, for the Illinois Central Railroad, Clinton, Ill. D. F. McLaughlin and A. S. Baldwin, respectively, are architect and chief engineer.

The World Phonograph Co. has leased a five-story and basement factory, containing 35,000 sq. ft., at 736 and 738 Tilden Street, Chicago, for the manufacture of talking machines.

The Eastern Metal Refining Co. has leased about 80,000 sq. ft. in Fortieth Street, between Fifth and Princeton avenues, Chicago, and will make alterations and build a smelter to cost about $20,000.

Contract has been awarded to N. Wiltamuth for a two-story factory building at Grinnell, Iowa, for the Dodge Tool Co.

Baltimore

BALTIMORE, MD., July 23.

Sites in this vicinity are being considered by Government officials for the establishment of shipyards to be built under the supervision of the Emergency Fleet Corporation. Representatives have been in communication with waterfront property owners and it is understood that reports will be made to officials within the next few days. The Factory Site Commission, City Hall, is taking an active part in a search for a suitable location. A tract of about 1500 acres of land on Marley Creek, Anne Arundel County, is attracting considerable attention, as it has been rumored that it will be the site of an immense shipbuilding plant in the near future.

The Baltimore Buggy Top Co., 107-113 West Mount Royal Avenue, Baltimore, is receiving bids on the construction of a four-story, 75 x 100-ft. factory at Calvert Street and Mount Royal Avenue.

The Chesapeake Shipbuilding Co., 607 Calvert Building, Baltimore, has been incorporated with $100,000 capital stock. The incorporators are Sheldon H. Tolles, King Tolles and Roger C. Hyatt.

Goucher College, St. Paul and Twenty-third streets, Baltimore, will build a one-story brick and concrete powerhouse, 40 x 64 ft. Ellicott & Emmart, 1102 Union Trust Building, are the architects.

It has been announced that all private contracts held by the Sun Shipbuilding Co., Chester, Pa., will be dropped and the plant used for the construction of vessels for the Government only.

The Howard Refractories Co., Dorsey, Md., is having plans prepared for two new additions to its works. Sparklin & Childs, Law Building, Baltimore, are the architects.

The Bureau of Yards and Docks, Washington, D. C., has awarded a contract for the construction of a new experimental and research plant for aeronautics at Hampton, Va., to include machine shop, instrument building, pattern shop and other structures. The J. G. White Engineering Corporation, 43 Exchange Place, New York, has the contract.

The Reliance Electric Co., Norfolk, Va., has been incorporated with a capital of $50,000 to manufacture electric fixtures. F. W. Sharp and W. J. Cannon are the principal incorporators.

Milwaukee

MILWAUKEE, WIS., July 24.

Probably at no time in the history of the metal-working industry of Milwaukee and vicinity has so much activity been evident as now. The placing of Government contracts has been accompanied by a wide demand for machine tools of all kinds, and during the past week this demand has amounted practically to a scramble. Tool builders, especially of milling machines, who now are working to the fullest capacity to make delivery of Federal contracts, or orders which virtually amount to Government business, within the time limits specified, have been overwhelmed with new business. In the face of probably the most extraordinary demand for tools which has been known, greater even than during the earlier days of the European war, private interests are bidding for machines in a measure rarely known. A feature of the situation is the incorporation of many new concerns to engage in some division of the metal-

working industry. The establishment of new works doubtless will bring a heavy draft upon tool builders, who for this reason can see no relief from the immediate high-pressure conditions for a long time ahead, regardless of the duration of the war. The mobilization of State troops and the prospective withdrawal of a considerable number of men by reason of the selective draft is creating even more stringent conditions in the labor market than have been evident for some time past. It has been found that many men who would have a just claim for exemption on occupational grounds have demanded that they be permitted to go into active service.

The Lipman Refrigerator Car & Mfg. Co., Beloit, Wis., has purchased a site, containing 25 acres, on Rock River at Shirland Avenue, for its proposed new refrigerator car and installation plant, the first unit to cost $100,000 and consist of a machine-shop, tool-room, iron foundry, sheet metal shop, welding shop, wood-working plant and two-track car shed, 200 ft. long. Contracts will be awarded within a few days. The Lipman company is capitalized at $500,000 and its officers are: President, Carl E. Lipman, Beloit; vice-president, E. L. von Suessmilch, Delavan, Wis.; secretary-treasurer, Ernest Lipman. It holds the sole manufacturing rights for the United States and Canada of an automatic brine circulation system of refrigeration and will not only build complete "freezer" rolling stock, but install the system in old cars. Carl E. Lipman also owns the Lipman Mfg. Co., Beloit, maker of air, oil and water compressors and pumps.

The Mitchell Motors Co., Racine, has purchased the plant of the Mitchell Wagon Co., Racine, and will devote it to the manufacture of automobile bodies and coach work. The stock of materials, patents, trade-marks, patterns and good-will of the wagon company have been purchased by Deere & Co., Moline, Ill., who will continue the manufacture of Mitchell standardized wagons at their plant in Fort Smith, Ark.

The Northwestern Battery Co., Milwaukee, has been incorporated with capital stock of $40,000 to take over the storage battery manufacturing business of the Northwestern Storage Battery Co. and the business of the Willard Battery Service Co., 130 Mason Street, Milwaukee. A three-story factory and office building is being erected for the new company at 530 Jefferson Street and will be ready Aug. 1. Win H. Cameron, Chester B. Pierce and J. H. Gugler are the proprietors.

The Oshkosh Foundry Co., Oshkosh, Wis., has been incorporated with capital stock of $10,000 by Frank T. Turner, Joseph W. Radl and Hugo M. Stueck.

The Western Metal Specialty Co., Milwaukee, has been organized with capital stock of $30,000 under the laws of Wisconsin. Louis E. Fichaux, A. U. Stetten and C. H. Benton are incorporators.

The Neenah Brass Works, Neenah, Wis., has awarded contracts for an addition to its foundry and machine-shop, costing about $20,000.

A report from Oconomowoc, Wis., the seat of one of the largest plants of the Carnation Milk Products Co., Seattle, Wash., says that the company is contemplating the establishment of a factory for the manufacture of tin cans to supply its own requirements. It is stated that the investment will be about $250,000. Official confirmation of the report is lacking.

The Safety Truck Brake Co., Waukesha, Wis., has been incorporated with capital stock of $20,000 to manufacture a patented braking system for motor trucks. The incorporators are W. S. Halladay, J. T. Abel and Elmer L. Arnold.

The Wisconsin Gas & Electric Co., Racine, Wis., controlled by the same interests as the Milwaukee Electric Railway & Light Co., a North American subsidiary, has increased its capital stock from $2,750,000 to $3,350,000 to accommodate extensions of its power generating and transmission system at Racine and throughout southern Wisconsin. S. B. Way, Milwaukee, is in charge.

The Specialty Brass Co., Kenosha, Wis., has plans for a foundry and shop addition, 40 x 40 ft., one story, of reinforced concrete and brick.

The Wisconsin Tool & Supply Co., Milwaukee, has filed articles of incorporation. The capital stock is $20,000 and the incorporators are John W. Mapel, John S. Stover and E. B. Arnold.

The Optenberg Iron Works, Sheboygan, Wis., has taken contracts for a 10,000-gal. water softener tank for the University of Wisconsin, Madison, and a 5000-gal. tank for the Mission House at Franklin, Sheboygan County. The Franklin contract includes a 70-hp. engine and two hoisters.

The Nekoosa-Edwards Paper Co., Port Edwards, Wis., has awarded contracts for enlargements and improvements estimated to cost about $200,000. The work includes, among other buildings, a two-story machine shop, 60 x 80 ft.

The Regal Oil-Gas Burner Co., Milwaukee, has filed articles of incorporation. The capital stock is $5,000 and the incorporators are O. A. Clark, George P. Noble and W. H. Parish.

The New Way Machinery Co., Eau Claire, Wis., has filed articles of incorporation. The capital stock is $25,000 and the incorporators are Ernest Wege, O. A. King and Alfred J. Hirtz.

The Goodrich Transit Co., Milwaukee and Chicago, is reported to be seeking a new location for its drydock and machine-shop, now located at Manitowoc, Wis., because of the requirement of the present quarters by the Manitowoc Shipbuilding Co., which is more than doubling the size of its plant to handle Government work. The Manitowoc Chamber of Commerce is at work on a plan to keep the Goodrich yards in that city by providing a new location.

Detroit

DETROIT, July 23.

Improvement was noted in the machine tool market the past week. A number of large orders were received by dealers, and more inquiries came in than have been received for months. Additional strength to the belief that Detroit will become the airplane center of the United States is given by the report of Government officials to the effect that this city will manufacture a large proportion of airplanes for the army. Automobile manufacturers are prepared to turn out air machines in large numbers, and several have developed satisfactory motors.

No improvement is noted in machine tool deliveries. Labor is extremely scarce and well employed. Several hundred more skilled mechanics and more than 1000 unskilled workmen could be placed immediately.

The Michigan Drop Forge Co., Pontiac, Mich., will immediately improve its plant and increase its capacity to handle an additional volume of business. The company makes steel forgings, and has just completed arrangements for increased capital. Paul A. Leidy is secretary and treasurer.

The Continentals Motors Corporation, Detroit, will manufacture trucks as well as passenger car engines, and will provide increased activity.

It is reported that the plant of the Racine Boat Mfg. Co., Muskegon, Mich., sold during bankruptcy, is soon to be remodeled and enlarged for shipbuilding.

The Gorham & Goddard Co., 45 Congress Street West, Detroit, capitalized for $75,000, has begun the manufacture and salvaging of tools.

The Young High Velocity Carburetor Co., Charlevoix, Mich., has begun the manufacture of automobile supplies. The authorized capital is $250,000.

The Peerless Foundry Co., Detroit, has been incorporated with a capital stock of $10,000, to do a general foundry business.

The Saginaw Shipbuilding Co., Saginaw, Mich., has been incorporated with a capital stock of $350,000, of which $200,000 has been subscribed. When in full operation, 1000 men will be employed. F. W. Wheeler is president.

The Saginaw Automobile Climb-Put & Shovel Co., Saginaw, has been organized with a capital stock of $25,000, to manufacture a device for drawing out automobiles and motor trucks when mired. C. N. Albee is general manager.

The Cooley Casting Co., formerly the Roeller Foundry Co., Bay City, Mich., will complete within a few months additions to its plant, consisting of two large buildings and a cupola. The company manufactures iron products, aluminum and brass devices, including parts for automobiles, bushings, etc.

The Olds Motor Works, Lansing, Mich., has let contracts for the erection of factory, 80 x 400 ft., making the second building now under construction. It expects to triple its production.

The Pioneer Trailer Corporation, Detroit, has been incorporated with $30,000 by W. M. Cornelius, Daniel E. Leiderbrandt and Arthur S. Squires.

The Marble Arms & Mfg. Co., Gladstone, Mich., will erect a plant to manufacture motors and dynamos.

It is announced by J. Elmer Pratt, president, Higrade Motors Co., manufacturer of a ¾-ton truck, that the company will build a factory at Grand Rapids, Mich. It is at present operating a temporary factory at Harbor Springs, Mich., with executive offices in the National City Bank Building, Grand Rapids.

A factory to cost $100,000 is to be erected in Arcadia, Mich., by the Arcadia Furniture Co., whose plant was recently destroyed by fire.

The Linderman Machine Co., Muskegon, Mich., which has naval ordnance contracts, will soon award contracts for an addition, 100 x 500 ft.

The Detroit Pressed Steel Co., Detroit, is spending about $200,000 in additions to present buildings to provide for a new tool room, stock room, receiving room and the initial unit for buildings for the manufacture of single disk steel wheels. C. H. L. Flintermann is vice-president and secretary.

Cleveland

CLEVELAND, July 23.

A large volume of business is being placed in machine tool equipment for making airplane motors. The past week, the Packard Motor Car Co., Detroit, and the Willys-Overland Co., Toledo, purchased about $65,000 worth of machinery for this purpose, orders being placed with a Cleveland dealer. Another inquiry is pending for about $40,000 worth of machinery for airplane work. A heavy demand is noted for multiple spindle drilling and boring machines for work on airplane motors, and for single spindle high-speed drilling machines for airplane and other Government work. Information comes from Detroit that the General Motors Co. will build a large forge shop in that city as soon as plans can be prepared. This company has an inquiry out for nine 10 to 15-ton electric traveling cranes for the proposed plant, and is expected to require a large amount of forge shop equipment. Detroit machinery dealers are looking here for considerable machinery equipment to supply the demands of automobile plants taking on Government work. The Brier Hill Steel Co., Youngstown, has an inquiry out for about 15 machines, mostly large type. About half of these are lathes, ranging from 16 to 42 in.; the remainder are planing, milling and slotting machines, and a hydraulic wheel press. Inquiry for cranes continues very heavy, the bulk of the demand being from shipyards.

The Peters Machine & Mfg. Co., Cleveland, is erecting an addition, 60 x 136 ft., on Pear Avenue.

The National Tool Co., Cleveland, will enlarge its plant by the erection of a one-story brick factory, 52 x 132 ft.

The Cuyahoga Varnish Co., 8820 Bessemer Avenue, Cleveland, will build a brick and steel addition.

The Massillon Steel Castings Co., Massillon, Ohio, recently incorporated with a capital stock of $250,000, has elected the following officers: E. H. Birney, president; Fred H. Snyder, vice-president; I. M. Taggart, treasurer; Walter White, secretary; and H. F. Anthony, general manager. The company expects shortly to select a site for a plant.

The Portage Foundry Co., Akron, Ohio, has been incorporated with a capital stock of $150,000 by S. W. Harris, W. E. Wilson, C. G. Wise and others, to engage in the foundry business.

The Thompson Machine Co., Canton, Ohio, has been organized by W. C. Belden, William Bauman, D. H. Rose and others, to conduct a jobbing machine shop.

The International Tool Co., Warren, Ohio, has been incorporated by D. A. Geiger, C. P. Nye and others. It is primarily a sales organization and will handle tools made in Warren plants.

The Federal Machine & Welder Co., Warren, has been incorporated with a capital stock of $200,000 by A. Prickman, Ralph S. Lounsbury, R. Klingman and others.

The Buckeye Dryer Co., London, Ohio, has been incorporated with a capital stock of $30,000 by W. E. Prindle, H. M. Chaney, Thomas Mattinson and others.

The Toledo Machine & Tool Co., Toledo, Ohio, is taking bids for the erection of its new one-story machine shop and foundry, about 158 x 375 ft. Day & Zimmerman, 611 Chestnut Street, Philadelphia, are the engineers.

Cincinnati

CINCINNATI, July 23.

Labor conditions at Hamilton are somewhat improved. Foundrymen at the Niles Tool Works returned on the old basis, with no agreement with the union. Another smaller foundry is also operating, but the basis of settlement is not known. Other idle plants are expected to resume operation in a few days.

Some sizes of lathes can be delivered more promptly, due to a slackening in demand from both domestic and foreign sources. Most firms are sold ahead, however, and are not soliciting business for nearby delivery. Shaping machines are still in good demand, mostly from concerns having die and tool work, which is now very plentiful, but also from repair shops. Second-hand machine tools are more plentiful. Shipbuilders have lately been buying all kinds of equipment, principally in scattered lots, and are not advertising their wants by sending large lists broadcast.

The Bahmann Iron Works Co., Cincinnati, maker of sugar machinery, will build a one-story brick and steel addition, 60 x 100 ft., to its plant on Spring Grove Avenue.

The Southern Railway Co. states that no immediate plans have been made for enlarging its shops in Ludlow, Ky.

The John B. Morris Foundry Co., Cincinnati, will remodel part of its foundry, installing new lockers for employees, as well as making other changes.

The Sayers & Scoville Co., Cincinnati, has acquired a manufacturing building at Gest Street and the Cincinnati, Hamilton & Dayton Railroad, and will establish an automobile plant at an early date. Particulars are not yet available.

The Sidney Power Press Company, Sidney, Ohio, W. E. Whipp, president, recently organized to build power presses, advises that it is in the market for one each of the following machines:

24 in. x 24 in. x 8 ft. planer, or up to 30 in.
42 in. either open-side or regular planer, with about 10 or 12 ft. table.
Sensitive drill.
Drill press, about 20 in.
No. 2 universal milling machine.
No. 3 plain milling machine.
Large band screw machine for chucking work.
Hack saw.
Horizontal boring, milling and drilling machine.
Vertical boring mill, about 50 in.
Radial drill, speed box drive, about 2½ ft. or 3 ft.
Radial drill, speed box drive, about 3 ft., 4 ft. or 5 ft.
24-in. back-geared shaper.

The Ram Engineering Co., Columbus, Ohio, recently organized to handle die and tool work, has leased quarters at 95 Gay Street, and will also manufacture a patented lock for automobiles. J. W. Anderson is vice-president and manager.

The Monitor Motor Car Co., Columbus, is preparing to enlarge its plant at Mt. Vernon and Cleveland avenues. F. S. Cummins is president.

The Columbus Lift Truck Company, Columbus, has been incorporated with $200,000 capital stock by F. H. Angell and others. It formerly operated under a partnership arrangement. It is rumored that a factory will be installed for making a patented lift truck.

Work on the addition to the plant of the Robbins & Myers Co., Springfield, Ohio, is now well under way, and will be ready for equipment before Aug. 15.

The John H. McGowan Co., Cincinnati, pump manufacturer, has received a Government order for vertical simplex pumps to be installed in merchant vessels.

The New World Mfg. Co., 120 West Third Street, Cincinnati, die and tool maker, is planning to increase the capacity of its factory.

The Estate Stove Co., Hamilton, Ohio, has increased its capital stock from $550,000 to $825,000, and will enlarge its stove foundry at an early date.

The proposed addition to the plant of the Ohmer Fare Register Co., Dayton, Ohio, will be 90 x 245 ft., two stories, of brick and concrete.

The Pasteur-Chamberland Filter Co., Dayton, has purchased the machinery and plant of the Foote Mfg. Co., and will manufacture electric searchlights for the Government.

The Dayton Handle Co., Dayton, will erect a new plant. Buildng details are not yet available.

The Blackwood Foundry Co., Springfield, Ohio, has plans under way for an addition to its plant.

The La French Spark Plug Co. has removed its plant from Dayton to First Avenue and High Street, Columbus.

Reese & Strong, Columbus, will make an addition to their gray-iron foundry that will nearly double its present capacity.

The Columbus Anvil & Forging Co., Columbus, has increased its capital stock from $20,000 to $60,000. Nothing is known as to plant extensions.

Indianapolis

INDIANAPOLIS, July 23.

The Indiana Truck Co., Marion, Ind., has reduced its capital stock from $250,000 to $1,000.

The Logansport Heating Co., Logansport, Ind., has changed its name to the Logansport Heat & Power Co., and has issued $250,000 of preferred stock.

The main factory building of the Knight-Brinkerhoff Piano Co., Brazil, Ind., has been sold to A. L. Stout of Indianapolis, and will be converted into a furniture factory. Mr. Knight retains the foundry building and ground contiguous, and will remodel the foundry and equip it for the manufacture of a new phonograph.

The Anderson File Co., Anderson, Ind., has been in-

corporated with $10,000 capital stock. The directors are F. M. Wilson, S. R. Wilson and C. E. Wilson.

The Crawfordsville Wire & Nail Co., Crawfordsville, Ind., is putting up an addition to its plant, 60 x 200 ft.

The Globe Steel & Range Works, Kokomo, Ind., has obtained a $55,000 contract for hotel ranges for army cantonments.

The plant of the Indiana Rolling Mill Co., Newcastle, Ind., has been sold to the Galesburg Coulter Disc Co., Galesburg, Ill. The shovel plant was included in the deal. The business will be continued at Newcastle.

The Hayes Wheel Works Co., Anderson, Ind., is enlarging its plant.

The Central South

LOUISVILLE, KY., July 23.

Miscellaneous equipment for manufacturing plants is in demand, with a shortage of materials for oil well operations. The labor situation is becoming increasingly difficult and Louisville manufacturers are employing women workers in numerous instances.

The Roy C. Whayne Supply Co., Louisville, is in the market for a locomotive crane, two or more traveling cranes, steam or electric, to handle 1¼ cu. yd. to 1½ cu. yd. orange peel buckets at 25 ft. Also two stiff leg traveling derricks, 75-ft. boom, capable of operating a 4-cu. yd. clam shell bucket; two 1¼ or 1½-yd. orange peel buckets, and two 4-cu. yd. clam shell buckets.

Fire destroyed the plant of the Hardy Buggy Co., Paducah, Ky., with a loss of $50,000 to equipment and contents, exclusive of the buildings. W. T. Hardy is president.

The Union Motor Co., Lexington, Ky., has been incorporated, with capital stock of $25,000, by C. H. Berryman, H. R. McEldowney and R. F. McEldowney.

The Dixie Foundry Co., Cleveland, Tenn., has been incorporated with capital stock of $40,000 by S. B. Rymer, J. P. O'Neill, J. S. O'Neal, P. B. Mayfield and Charles S. Mayfield.

Birmingham

BIRMINGHAM, ALA., July 23.

The Kilby Frog & Switch Co., Birmingham, will add to its capacity for frogs and switches by new construction involving $40,000.

The Tampa Dock Co., Tampa, Fla., capital stock $1,000,000, will build yards to construct wooden ships and probably steel ships later.

The Dantzler Shipbuilding & Dry Docks Co., Moss Point, Miss., capital stock $100,000, will build yards to construct wooden ships. A. F. Dantzler, Moss Point, Miss., and G. B. Dantzler, Gulfport, Miss., are interested.

St. Louis

ST. LOUIS, July 23.

Little if any increase was noted in the machine tool transactions the past week, the tendency still being to go slow during the readjustment period. This might as well be the case, since deliveries are now in such a condition as to make contracts for equipment a doubtful matter so far as availability of the machinery is concerned. Such demand as is developing in this section for equipment for war manufactures is for general machinery, and not machine tools. Ammunition-making machinery is not in special call, though there are a number of plants engaged in such manufacture. Electric equipment is in some demand, and pressure is still being felt here from the call for shipbuilding machinery at other points. Collections are reported very good, and both loan and investment funds are reasonably available.

The News Vending Machine Co., Kansas City, Mo., has been incorporated with a capital stock of $20,000, by Edward Richards, Thomas H. Payne and James S. Summers, to manufacture vending machines.

The Pine Bluff Compress & Warehouse Co., Pine Bluff, Ark., has increased its capital stock from $65,000 to $130,000, and will increase its plant equipment.

The Citizens Ice & Cold Storage Co., Little Rock, Ark., C. M. Conway, Texarkana, president, has acquired the Little Rock Ice Co.'s plant, and will expend $100,000 on remodeling and re-equipping it as a re-icing and cold storage plant.

The Jonesville Lumber & Veneer Co., Jonesville, La., will build a hardwood mill with a daily capacity of 40,000 ft. A. W. Stewart is president.

The Chicago, Rock Island & Pacific Railway will erect a coaling station at Trenton, Mo., and install mechanical loading apparatus. C. A. Morse, chief engineer, Chicago, is in charge.

The Quick Ice Making Machine & Mfg. Co., Lake Charles, La., has been incorporated with a capital stock of $40,000 by W. C. Grant, president, Abilene, Tex., and others, and will equip a machinery manufacturing plant. Frank M. Terrell, Lake Charles, is treasurer.

The Appalachian Corporation, Atlanta, Ga., which has acquired the Brooklyn Cooperage Co.'s plant at New Orleans, La., will remodel at an expense of $900,000, of which $200,000 will be expended for cold storage machinery.

Texas

AUSTIN, TEXAS, July 21.

As a result of the great increase of acreage of peanuts and the large demand for peanut oil and similar products, many plants are being installed to manufacture peanut oil, cake and meal. There is also an increase in the demand for cottonseed oil mill machinery. Crop conditions generally over the State continue very satisfactory.

The National Hydro-Electric & Conservation Co., which is constructing a hydro-electric plant, recently submitted an offer, through its president, C. H. Alexander, to the city commission of Dallas to supply that city with 20,000 continuous horsepower of electrical energy at 1 cent per kilowatt hour for a period of thirty years. The plant will be ready for operation in about eighteen months. The company expects to develop about 40,000 horsepower, which will be distributed to cities and towns within a radius of more than two hundred miles.

The Texas Saw Works Co. will build a plant at Beaumont for the manufacture of saws. A. T. Chenault is interested.

The Beaumont Shipbuilding & Dry Dock Co., Beaumont, has been incorporated with capital stock of $300,000, to build and operate shipbuilding yards. S. A. Mageath of New York, John H. Kirby and B. F. Bonner of Houston are largely interested.

California

SAN FRANCISCO, July 17.

The demand for most lines is good, and for some it is extremely active. Deliveries continue uncertain, causing considerable complaint. Last week local manufacturers notified customers of an average advance of 10 per cent on small tools, but this has not deterred buyers from placing orders, which just now are unusually heavy.

The War and Navy departments are in the market constantly for material and equipment, and Government buyers are accepting the changed condition regarding values. On July 13 the Navy Department opened bids and awarded a contract for $31,000 for lathes, for the Mare Island Navy Yard, to Pratt & Whitney of this city. Other Government orders placed here include a number of caterpillar tractors, to be made by the Holt Mfg. Co., Stockton, Cal., for delivery in the Hawaiian Islands; and a rush order of airplane motors, to be made at the Berkeley factory of the Hall-Scott Motor Car Co.

The Byron Jackson Iron Works, Sharon Building, San Francisco, has awarded a contract for a one-story machine shop at Berkeley, at a cost of $33.750. It is now filling a Government order for 12 5- and 6-in. centrifugal heavy duty pumps for use at Eastern cantonments.

The East Bay Water Co., Oakland, is building machine, blacksmith and carpenter shops and pipe fitting rooms at Twenty-second and Adeline streets, at a cost of $12,000.

The Western Pipe & Steel Co. of California will increase its capital stock by $63,000.

The Dow Pump & Diesel Engine Co., San Francisco, has received an initial order for 300 marine pumps from the United States Emergency Shipping Corporation for use on the first unit of the merchant squadron.

Plans are being drawn for an addition, 100 x 200 ft., to the main factory of the International Harvester Co., Fifteenth Street and Potrero Avenue, San Francisco.

The Holt Mfg. Co., Stockton, has begun the manufacture of a caterpillar combined harvester. It is strictly self-contained, being self-propelled and furnishing power for all the operations usually performed by a combined harvester.

The Union Construction Co., Oakland, Cal., has asked the Oakland authorities for a lease on a 25-acre site on the Oakland water front, on which to establish a shipbuilding plant. An ordinance providing for the lease has been drawn up.

The Western Screw & Lock Nut Co., San Francisco, is installing a factory at 1401 Folsom Street.

The Los Angeles Shipbuilding & Dry Dock Co., Los Angeles, which has contracts for eight steel steamers for the

Emergency Fleet, has begun the construction of a machine shop and compressor building.

The Lillie-Fletcher Co., Los Angeles, has applied for a lease on a five-acre shipbuilding site on Wilmington basin, near Los Angeles.

Charles V. Crellin, Los Angeles, has let a contract for a brick machine shop to cost $3,818.

The Cutter Laboratory, Inc., Berkeley, has bought 15 acres, and will erect additional factory buildings.

It is reported that the Union Iron Works, Alameda, Cal., will install a gas system of rivet heating in its plant.

The Llewellyn Iron Works, 1100-1218 North Main Street, Los Angeles, manufacturer of elevators, tanks and structural steel, has filed plans for the construction of a shop addition, 50 x 100 ft., and a power house, about 35 x 80 ft.

The Pacific Refractories Co., Los Angeles, has been incorporated with a capital of $50,000 to operate a local plant. C. W. Hill, John C. Thomas, W. L. Hardin, O. C. Kingsley and J. H. McKnight, all of Los Angeles, are the incorporators.

The Dauch Mfg. Co., Sandusky, Ohio, manufacturer of tractors, trucks, motors, engines, etc., has been incorporated to operate at Los Angeles and other sections of California. J. J. Dauch, president, Hinde & Dauch Paper Co., Sandusky, heads the company.

W. E. Hampton, 1106 Trust & Savings Building, Los Angeles, will construct a plant, 60 x 120 ft., at 602 South Mateo Street, for galvanized metal specialties. It will cost about $5,000.

C. E. Fulton, Los Angeles Harbor, San Pedro, operating a local shipbuilding plant on Mormon Island, has incorporated the Fulton Shipbuilding Co., with capital of $100,000. C. E. and M. S. Fulton, E. H., G. L. and J. E. Seaver, Los Angeles, are the incorporators. The company recently received a contract for the construction of four vessels.

The Pacific Northwest

SEATTLE, July 17.

Labor conditions present the most serious problems in the manufacturing and lumber industries in the Northwest at the present time. Shingle manufacturers of western Washington are facing a strike for eight-hour day, and both sides have refused to arbitrate. Sixteen logging camps in the Grays Harbor district are closed down, and more than 1600 men are out on strike. Conditions now point to a general strike and complete tie-up of the mills in that section.

Statistics for the water-borne commerce of the Seattle port for the month of June show a gain of more than $10,000,000, compared with the previous record month. The June total was $58,306,650, a daily average of $1,943,555.

Recent figures show that Seattle has been awarded more contracts for construction of steel ships for the Government than any other city in the United States. Of the thirty-four contracts let on the Pacific coast for steel ships, Seattle concerns have been awarded sixteen. Eighteen months ago, Seattle had one steel shipbuilding plant, employing less than 1,000 men. There are now four plants, constructing steel vessels, with working forces of more than 10,000 men. At present, two new plants are being built, and four or five wooden shipbuilding plants are being equipped and preparing to lay keels for the Government or on private account within the next thirty days. The city of Portland has three modern steel shipbuilding plants, which will be used for Government ship construction. Portland firms now hold contracts for 38 wooden vessels.

The Tacoma Shipbuilding Co., Tacoma, Wash., has received a contract for four vessels for the United States emergency fleet.

The Seattle Machine Works, Seattle, have taken out a permit for a one-story machine shop, 70 x 200 ft., costing $14,000. The shop will be equipped with new machinery.

The Canadian Northern Railway Co.'s car shops at Port Mann, B. C., are being rapidly prepared for operation, and the work of installing machinery is being rushed. The company will generate its own electricity to operate the plant and light the shops.

A sawmill with a capacity of 50,000 ft. daily will be built near Newport, Wash., by the Summers Brothers Match Co., Saginaw, Mich.

The Pacific Marine Iron Works, Seattle, will have its new plant in operation within 60 days. Triple expansion engines for the standard type of Government wooden steamers and Ballin watertube boilers will be built. The company now holds contracts for the construction of 50 boilers, costing $15,000 each, and for sixteen engines, costing $1,500,000, for a shipbuilding plant in Portland.

Wynkoop Brothers, Portland, will immediately rebuild their plant, recently destroyed by fire. They now have contracts for 70 metal lifeboats.

Charles Hall, North Bend, Ore., is at the head of a company which will immediately equip a shipbuilding plant at North Bend, Ore. The company has contracts for several vessels.

The Eagle Brass Foundry, Seattle, has let a contract for a factory building, two stories, 90 x 105 ft., costing $10,000.

The Thomas Paper & Pulp Co., Centralia, Wash., has purchased 300 acres of coal land, to supply fuel for a power plant to be built in Centralia. The company plans to erect a big paper mill in Aberdeen, Wash., to manufacture paper from red fir by a new process.

The Motorship Construction Co., Vancouver, Wash., has secured contracts for 60 lifeboats, each 24 ft. long, to equip various Government vessels now under construction on the Columbia River.

The Empire Copper Co., Mackay, Idaho, has awarded to the American Steel & Wire Co. a contract for an aerial tramway, 16,300 ft. long, costing $80,000.

The Griswold-O'Donnell Co., Portland, will construct a shipbuilding plant at Vancouver, Wash., with four ways. The company will handle both Government and private work.

The Columbia River Shipbuilding Corporation, Portland, Ore., has received contracts for the construction of several steel vessels for the French Government.

The Northern Pacific Railway Co. has completed at Tacoma, Wash., a plant to reclaim all the waste in the division west of Paradise. The plant cost $50,000 to $60,000, and includes a rolling mill, forging shop, and machine shops.

The Elliott Bay Shipbuilding Co., Seattle, has received contracts for four auxiliary schooners, to cost $1,400,000. Work on them will begin at once at the Seattle plant of the company.

The Star Machinery Co., Seattle, will erect a three-story addition to its plant, at a cost of $20,000. The machine shop will be newly equipped, and will occupy the first floor.

P. J. Stone, William Leyhold, K. B. Kellogg and others, Tacoma, Wash., will construct a sawmill on the waterfront to manufacture ship materials. The plant will have a capacity of 50,000 ft. daily, and will be equipped to cut timber 120 ft. long. The company will have capital of $25,000.

J. F. Duthie & Co., shipbuilders, Seattle, Wash., have received a contract from the French Government for two 8800-ton steel steamships to cost about $3,500,000. The vessels will be powered with 3000-hp. turbine engines.

The Portland yards of the Foundation Co. of New York will build 20 wooden vessels for the French Government, half of the contract recently awarded. The Foundation Co. will immediately construct a shipyard with ten ways at Portland.

L. H. Gray, vice-president and treasurer of the Anderson Shipbuilding Corporation, Seattle, has retired from that company, and will construct a large shipbuilding plant at Seattle. Eastern capital is associated in the enterprise.

The Oregon Shipbuilding Co. and the Motorship Construction Co., both of Portland, have consolidated, and the latter company's plant at Vancouver will be greatly enlarged. Several new buildings will be constructed at once, and new machinery installed. The two concerns have contracts on hand for 160 lifeboats, costing $100,000.

Pittsburgh

PITTSBURGH, July 23.

Conditions in the local machinery market are quieter at present than at any time for some months. One reason is that many concerns contemplating building new plants or making additions, for which many machine tools would be needed, are holding off until it is more definitely known what the Government will do in the matter of regulating prices on iron and steel products. Another is that buyers of machine tools feel top prices have been reached, and that by waiting they may be able to buy the tools needed at lower prices. No important lists of machine tools are in this market at present, aside from a new list sent out recently by the Briar Hill Steel Co., Youngstown, Ohio, which has asked for prices on the following tools:

One 16-in. and one 28-in. shaper.
One 96-in., 600-ton, hydraulic wheel press.
One 2-in. single bolt cutter.
One 16-in., one 20-in., one 30-in., one 36-in. and one 42-in. lathe.
One No. 3 universal milling machine.
One 18-in. slotter.
One 5-ft. open side planer.

The Pennsylvania Lines West are in the market for a fairly large lot of machine tools for its Indianapolis shops,

and the Heppenstall Forge & Knife Co., Pittsburgh, is inquiring for some tools. On large machines, such as planers, boring mills and slotters, most makers are sold up for 18 months to two years, and will accept orders only on condition that prices paid shall be those ruling at the time shipment is made. On some smaller machine tools deliveries can be made promptly from stock. It is stated that machine tools are more active at present in other leading machinery centers than in the Pittsburgh district.

The Service Supply & Equipment Co. of Pittsburgh has changed its name to the Duquesne Electric & Mfg. Co., which has been incorporated with a capital of $50,000. Its shops are located opposite East Liberty Station and the main offices are in the Bessemer Building. A branch office is located in the Marshall Building, Cleveland. The company rebuilds electrical machinery, motors, generators, locomotives, switchboards, gas engines and steam engines and has a completely equipped shop. It also handles new machinery for immediate delivery. The manufacture of a complete line of railroad switches is contemplated in the near future. D. A. Casey is general manager.

The General Foundry & Mfg. Co., whose plant at Youngstown, Ohio, was recently destroyed by fire, will be rebuilt at once on a larger scale. It manufactures metal specialties and light gray cast iron, and will likely be in the market for considerable equipment. L. J. Mittinger is vice-president.

The Non-Derrick Drilling Machine Co., Pittsburgh, has been incorporated with a capital of $200,000 to manufacture non-derrick drilling machines. Wilber A. McCloy and others are the incorporators.

The Sanitary Appliance Co., Braddock, Pa., has been incorporated under Delaware laws with capital of $10,000 to manufacture sanitary food choppers and other specialties. F. R. Pershing and H. F. Leighton, Braddock; and Joseph Helsoner, East Pittsburgh, are the incorporators.

Work on the new shops of the Union Switch & Signal Co., at Swissvale, Pittsburgh, is going on at a rapid rate, and they are expecting to be fully completed early in 1918. It is possible that some departments may be ready for operation by October. The entire plant was not destroyed by fire last winter, and it has been able to fill orders fairly promptly.

Canada

TORONTO, July 23.

The increased demand for steel for the manufacture of munitions places the private consumer in a difficult position, and in order to obtain his requirements he has to pay high prices, reports the Canadian Bank of Commerce. All steel mills continue to be very active. A large number are greatly extending their plants and installing additional equipment in order to meet the present demand, but in most cases the demands are beyond their capacity. Labor troubles are common to all industries, and as a result production in some plants is not up to capacity. This is particularly the case with regard to mining companies. The production of all the Canadian coal fields is much less than normal, and some anxiety exists as to the winter supply at points distant from the mines, where lack of transportation facilities adds to the difficulties of the situation.

The Canadian Engineer & Contracting Co., Hamilton, Ont., is in the market for 15½-yard, 24-in. gage dump cars, also 4000 ft. of light rails.

The St. Maurice Foundries, Ltd., Trois Riveres, Que., has been incorporated with capital stock of $49,000 by H. G. French, W. J. Miller, P. Dumoulin, and others, to manufacture iron, steel, machinery, etc.

The Chester Basin Shipbuilders, Ltd., Basin, N. S., has been incorporated and proposes to establish a shipbuilding plant at Basin. Howard Oxner is secretary of the company.

The Magnolia Metal Co., 225 St. Ambroise Street, Montreal, Que., is making arrangements for the erection of a plant estimated to cost $60,000.

Tenders are in for the erection of a $140,000 plant at Windsor, Ont., for the Maxwell Motor Co., of Detroit.

The International Harvester Co. has awarded a contract for the erection of an iron foundry at Chatham, Ont., at a cost of $14,000.

Contracts have been awarded in connection with the erection of a $25,000 addition to the plant of the Hamilton Steel Wheel Co., Hamilton, Ont.

E. Leonard & Sons, York Street, London, Ont., manufacturers of boilers, engines, tools, etc., have awarded a contract in connection with the erection of a $5,000 addition to their plant.

The Nicu Steel Corporation, Ltd., Toronto, Ont., has been incorporated with capital stock of $200,000 by Donald R. Hossack, 44 King Street West; Joseph Murrae, Gordon; Alicia Hill, and others, of Toronto, to build and operate plants for manufacture of steel, iron, machinery, etc.

The New Mfg. Co., Ltd., Ottawa, Ont., has been incorporated with capital stock of $45,000 by Thomas A. Beament, Alan K. Armstrong, Robert J. Smith, and others, to manufacture heating devices, appliances, instruments, etc.

The General Automobile Equipment, Ltd., Montreal, Que., has been incorporated with capital stock of $50,000 by Joseph H. Fortier, Quebec, Que.; Henry J. Hummell, Emil Delage, and others, of Montreal, to manufacture motors, automobiles, parts, accessories, etc.

The Canadian Incinerator Co., Ltd., Toronto, Ont., has been incorporated with capital stock of $50,000 by Samuel Rogers, Henry M. Finkle, Alan G. G. Keith, and others, of Toronto, to manufacture boilers, tanks, engines, incinerators, etc.

Engholm & Partners, Ltd., Toronto, Ont., has been incorporated with capital stock of $100,000 by Frank G. Engholm, Howard A. Hall, Lilian M. Heal, and others, to carry on the business of structural, civil and mechanical engineers, and to build hydraulic and electric plants.

The Dann Spring Insert, Ltd., Hamilton, Ont., has been incorporated with capital stock of $40,000 by George R. Harvey, Cecil V. Langs, Ewart G. Binkley, and others, to manufacture accessories and parts for automobiles, vehicles and machinery.

The foundry owned by the Hull Iron & Steel Co., Ltd., Hull, Que., was damaged by fire with a loss of $5,000. The plant will be rebuilt immediately.

The British Columbia Metal Trades Association, Victoria, B. C., has been furnished with two sets of plans giving the details of the main engines required for the standard wooden steamers to be built by the Imperial Munition Board. Bids have already been asked by representatives of the Board for 50 winches, and upon the arrival at Victoria of Messrs. Chisholm and Russell, representatives of the Munitions Board, for the purpose of looking into the facilities of British Columbia, it is expected that large orders will be placed in the province.

The new plant of the Dominion Abrasive Wheel Co., at Mimico, Ont., the largest factory of its kind in Canada, has been completed and practically all the machinery has been installed. The plant will manufacture abrasive wheels and stones for grinding and sharpening, at the rate of 150 000 per week. The plant cost, including machinery, $110,000, and will employ 60 men, also a large amount of female help. E. W. Sawyer is manager of the company.

The Canada Emery Wheels, Ltd., Hamilton, Ont., recently incorporated, is at present operating a large plant at Hamilton.

The Canadian Sprinkler Equipment Co., Toronto, Ont., recently incorporated, reports that it does not intend at present to establish a manufacturing plant in Toronto.

The West Milwaukee locomotive and car shops of the Chicago, Milwaukee & St. Paul Railway Co. have received orders to start the construction of 1500 gondola cars, upon the completion of which work will start on 1000 freight cars. Walter Alexander, general superintendent, has issued a call for 500 men for the metal and woodworking departments to make possible an increase in production from four cars a day to six. The Marsh Refrigerator Service Co., Milwaukee, has taken a contract to build cars for the Milwaukee road and is calling for 200 workmen.

The General Electric Co. is devoting a new building having 20,000 sq. ft. of floor space at its Schenectady works to the manufacture of industrial electric heating devices. The output of the new shop ranges from the smallest heating unit to complete equipments for industrial ovens for core baking, japan baking and for baking and drying miscellaneous materials and complete ovens for sheradizing and air tempering. The shop also produces melting pots for lead and tin alloys and many other devices for applying electric heat in the metals industries.

The Four Wheel Drive Auto Co., Clintonville, Wis., is rushing work on the construction and equipment of a large machine-shop addition, undertaken a short time ago, to enable it to make the earliest possible delivery of 3250 Class B army trucks to the Government, at the rate of 175 trucks per month, beginning Aug. 1. The trucks will be equipped with ordnance towing hooks and the contract price is $3,248 each.

URGES SALES AGENCY

Sir William Peat Discusses Plans for Extending British Trade

In testifying before the British Board of Trade Committee on Iron and Steel Industries with reference to the establishment of a selling agency and to regulate and control sales of manufactured steel for delivery abroad, Sir William B. Peat described at length methods which other countries adopt to regulate the sale of their products. In the case of the United States, he referred to the activities of the United States Steel Products Co. and to the advantages arising through the organization of this company as a subsidiary of the United States Steel Corporation. He quoted at length from the annual report of the Corporation for 1915 and from Government reports in regard to foreign commerce of the United States. He urged the importance of co-operation between the producers of raw material and those turning out the finished product and advocated the establishment of a sales agency. His testimony was in part as follows:

"If the steel manufacturer in this country has to compete for exports with Germany and the United States he will want every assistance that the trade of the country can give, which would include assistance from the producers of fuel as well as from the manufacturer of raw steel. Such a scheme should be initiated by a meeting of parties interested in the production of raw steel and in the production of fuel and iron ore, to arrange for a rebate from all these sources on material to be exported. This, of course, presupposes that the home markets are assured by adequate protection to British manufacturers; otherwise it is a hopeless proposition because the foreign makers will dump, as they have done in the past.

Needs Government Help

"In my opinion, individual effort will never secure the share of export trade to which British makers are entitled. Where is there a firm big enough to go in for the propaganda necessary to secure foreign trade? Propaganda and representation in foreign buying countries are an absolute necessity, and it must be borne in mind that it should not be propaganda meaning a matter of £200 or £300 a year, but propaganda and representation which will ensure an entrance into the highest quarters in the kingdom where it is desired to do business. If every separate firm was represented abroad, it would not only be extremely wasteful in the matter of expenditure, but it would be ineffective, because the man whom each firm could appoint to represent it abroad could not possibly have the standing of an agency which had behind it the United States Steel Corporation, with nearly £400,000,000 engaged in its business and making $100,000,000 profit during 1915. There is no firm in this country or any reasonably small combination of firms which could establish an agency with the influence of the agency operated by the German Verband, assisted and encouraged by the German Government.

"Assume the scheme to be voluntary, and I do not suppose there is a possibility of its being other than volunary at the moment, I think the method by which it is to be done is to arrange for each department of the steel trade, rails, plates, angles, joists, tires, axles, wheels, springs and sheets, to be jointly represented abroad, the cost being paid by the departments concerned. If the Government arranged with its commercial attachés abroad that they were to render every assistance to representatives of a British selling agency, that would be of great assistance to us in the various countries where we desire to sell our products.

"If all the steel and iron associations are prepared to recommend an expenditure on suitable representation abroad, it should not be left to one man to take all the cheap orders for export and to another to do all the nice business at home. The man who takes the home trade must contribute for the general benefit to secure the export orders, by which alone the mills can be kept fully occupied. The equalization of prices for home and export has, in my experience, worked quite satisfactorily and successfully.

"If you are agreed there is a need for a selling agency of this description, the next thing to do is to summon the various trade associations to meet and include with these various associations the fuel and iron ore producers. You could then place the facts before them and see to what extent they are prepared to consider the matter."

Arrangements to reduce railway rates for exports were discussed, and Sir William, continuing, said:

"I do not consider that extensions of existing works can be stopped, and I am not sure that it would be wise to attempt to do so. The principal point would be for the British to increase their sales in the same ratio as their extensions. This has actually occurred with the German Verband, whose members went on increasing their capacity, thereby compelling the organization to find an output for it. If the Germans had not had a Verband, they would not have been able to have extended."

Sir William spoke of the extensions being made in the United States.

In conclusion he said: "It must be remembered that we live more upon exports than the Americans do. The United States has a population of 100,000,000 and their home market is far greater than ours can ever be. British manufacturers cannot exist on home trade alone and we must do our level best to secure our export trade against our competitors. A big expansion of the British steel trade is anticipated and social programs concerning the welfare and comfort of the workpeople will have to go with it. This means a comprehensive effort of a big body of capital.

"In the formation of a selling agency we should have Government support, or, at any rate, the goodwill of the Government, so that the members combining may not be supposed to be engaged in an illegal proceeding. It would be much better if meetings of that character should have the blessing of the Government. It is probably not possible to have legislation in favor of it, but there is a great difference between Government opposition and Government encouragement. I am quite convinced that a selling agency would lead to greater prosperity and would result in a greater benefit to both manufacturers and workmen. No selling agency, however, would be of great value unless our home markets are protected from dumping by foreign manufacturers not depending, like ourselves, upon export work.

"It is essential for the national security that iron and steel should be made in this country."

Government Will Build Many Steel Vessels

(*Continued from page* 195)

and are bending their energies in preparation. The Pennsylvania Shipbuilding Co. has 14 ships under construction, mostly for the Cunard Steamship Co., at its plant at Gloucester City, N. J., and the plant of the New Jersey Shipbuilding Co. on an adjoining site is being equipped with the expectation that the first keels for steel ships will be laid about Nov. 1. The first launching at the yard of the Pennsylvania Shipbuilding Co. will take place in about two weeks. This will be a 7000-ton tanker. Six tankers of this capacity are being built and eight 12,500-ton cargo boats. At the Pusey & Jones plant at Wilmington, Del., several wooden freight steamers, motor schooners and two dredges are being constructed. This plant also has a contract to build three mine-sweeping tugs for the U. S. Government.

The Harlan & Hollinsworth plant at Wilmington, Del., is building 13 merchant vessels of 10,000 tons capacity and has a contract to build three mine sweepers for the U. S. Government. It is said that this plant has extensive enlargements in contemplation, but whether these plans will be carried out depends upon the action of the Emergency Fleet Corporation.

Other smaller plants along the Delaware River include the Jackson & Sharp plant at Wilmington, which is building wooden vessels, and the John H. Mathis Shipbuilding Co. at Camden, N. J., which is building a number of submarine chasers for the Navy.

THE IRON AGE

New York, August 2, 1917

ESTABLISHED 1855

VOL. 100: No. 5

Grinding as a Substitute for Milling

The Role Played by Disk and Surface Grinding Machines in the Production of Motor Truck Parts at the Federal Plant

A RADICAL change in the machine shop methods in the manufacture of motor trucks with a view of materially reducing the cost has recently been adopted by the Federal Motor Truck Co., Detroit, which has substituted disk and cup wheel grinding for milling wherever possible in the machining of castings. The change was decided upon when new models were developed and the design was studied from a manufacturing point of view in order to apply disk grinding to as many castings as possible. The brackets for various purposes, as well as some other parts, are now disk ground instead of milled.

The change in the method started with the design, and the first application is in the pattern shop where the bracket patterns are made so that the castings are relieved wherever possible and only the edges and where the bolts go through have an actual flat contact. This design reduces greatly the amount of the surface to be machined and this surface is ground on a disk grinding machine. The results obtained are claimed to be better than where a flat machined surface is provided by the milling operation.

One type of brackets used are angle brackets, such as those for the steering gear, radius rod and rear springs. It has been the general practice to mill these brackets from the solid stock and the machine work on them is claimed to have been one of the greatest problems in motor truck manufacturing, the difficulties being due to the large surfaces that have to be machined, the heavy milling machines and large diameter cutters required, expensive fixtures and high-grade labor.

In making the pattern and casting no allowance is made for metal to be removed by grinding, the over size of the casting being sufficient to take care of this. Brackets are ground within 0.002 or



The Grinding Room at the Federal Motor Truck Co.



Angle Brackets Can Be Produced by Grinding with a Cup Wheel in One-Sixth the Time Required for Milling and Expensive Machines, Cutters and Labor Are Eliminated

0.003 in., which is regarded as accurate as is necessary. Covers of transmission cases are also disk ground instead of being milled and the end flanges of transmission covers are ground instead of turned. The company is now experimenting with quick-acting cam fixtures for holding such awkward pieces as dash and cam brackets, etc., and is also experimenting in disk grinding the flat top face of transmission cases.

The grinding is done on a battery of four plain double disk Gardner grinding machines used for flat grinding, a Gardner cup wheel grinding machine for angle grinding, and a Wilmarth & Morman Co. surface machine that is used for grinding small angles. One of the illustrations shows a cup wheel grinding machine equipped with a special table finishing an angle bracket. This illustrates the method of grinding bracket castings on all right angle pieces that are riveted to the chassis frames, these brackets having formerly been milled. From the photograph it will be noticed that the castings have been relieved and no parts except the rim and the rivet spaces are ground. The metal removed is negligible and the grinding is claimed to give a truer job than can be obtained on a milling machine. It is stated that the output of this machine on the bracket shown is about 250 pieces per day.

Another photograph shows the method of grinding cone clutches, which it is stated is found superior and quicker to machining on a lathe. This operation requires about one-fourth the time taken for machining the part on a lathe and there is no scrappage. It is stated that the lathe tool has been found to tear the leather from the cone pressing and that it was found that the only way to overcome the difficulty was to grind the part.

The grinding room is equipped with a very complete dust-collecting system. The grinding wheels are covered, with the exception of sufficient space left for the work, and the abrasive and cuttings are drawn from the machine through 4-in. pipes which connect with a 15-in. pipe located on the floor back of the machines. This pipe is carried overhead to an adjoining room, where it connects with a Sly dust arrester. The grinding machines are driven from one motor, which also drives the suction fan connected to the dust arrester. The arrester is equipped with special separating and baffling devices for handling the refuse. The fine particles pass directly to the hopper and into sacks beneath. The heavier material is deposited against the baffles, from which it is shaken out by a mechanical movement of the baffles after an accumulation has collected, and it drops into the hopper beneath, from which it passes into refuse sacks.



A Disk Grinding Machine Turns Out Cone Clutches Four Times as Fast as a Lathe

The company states that its substitution of grinding for the milling method has resulted in a very large saving in labor, doing the same work in one-sixth the time it formerly required, and a great saving in tools and material, eliminating the need of large milling machines, large diameter cutters and elaborate jigs and fixtures required in taking the heavy milling cuts.

There is also some saving of metal in the design of the castings. It is also pointed out that under the old method of milling, the casting had to be held very tightly during the milling and that it would spring back after being released, thus not retaining its shape. This is avoided in the grinding operation, as it is not necessary to hold the part as tightly as when taking a heavy milling cut.

Chicago Machinery Club Leases Quarters

The Machinery Club of Chicago has leased the fourth floor of the building known as Machinery Hall, Washington Boulevard and Clinton Street, practically in the heart of Chicago's machinery district, and the organization hopes to occupy its home about Sept. 15. The work of altering the space for club purposes is well started and some of the equipment has been purchased. The lease is for ten years. The club will open with a dining room capable of seating 160 people at tables of four each, a lounge, a billiard room, a library, etc.

The club has 300 members and hopes to have 500 when the rooms are thrown open. It is still seeking contributions to insure its success, as the initial cost will be between $8,000 and $9,000. It has raised something over $7,000. When in operation, the cost of membership will be $20 initiation fee and $20 annual dues, for resident members, and $10 initiation fee and $10 annual dues for non-resident. Plans for the formal opening are not yet perfected, but it is probable that an official of national prominence will make an address. About Aug. 15 the club will hold a picnic. Clyde W. Beardsley of the Abrasive Material Co. is president, and Norton A. Booz of the Machinists' Supply Co. is secretary.

The Ireland & Matthews Mfg. Co. of Detroit has completed its new plant and is about ready to move into it. The main building is four stories; the first story is 120 x 656 ft., while three upper stories are 60 x 656 ft. There is also a large press building 73 x 568 ft., one story. The brass cast foundry is 56 x 128 ft., two stories, and the power house 56 x 178 ft. The total floor space of the plant is 250,000 sq. ft. and the approximate cost, $600,000. The capacity is about 50 per cent more than that of the old plant. The company manufactures stove trimmings, sheet metal goods and automobile supplies.

The Alberger Pump & Condenser Co., 140 Cedar Street, New York, advises THE IRON AGE that it has numerous propositions under consideration for the establishment of a new plant in the vicinity of Newburgh, N. Y., but up to the present time no selection of land has been made.

MANGANESE IN STEEL MAKING*

Its Important Role—Value of High-Manganese Low-Carbon Steel

BY DR. HENRY M. HOWE

PASSING by the deoxidizing and desulfurizing effect of manganese as foreign to our present purpose, its effect on the mechanical properties of the steel seems to me in the last analysis due primarily to its retarding action both on the transformations and on the coalescence of the micro-constituents into progressively coarser masses, which while increasing the ductility lessens the cohesion in general, including the hardness and the elastic limit, and thus lessens the effective strength.

Before considering the retarding of the transformations by manganese let us refresh our memory as to these transformations, and as to the three prominent states of steel, between which they play:

The common low-temperature alpha or pearlitic state;

The high-temperature or non-magnetic austenite state into which the metal passes spontaneously when heated up through the transformation range, say 725 to 900 deg. C., Ac^1-Ac^3;

The intermediate or martensitic state, in which carbon steel is caught in transit from the austenite to the pearlite state by means of a rapid cooling, as for instance on hardening by quenching small pieces in water.

The alpha state is magnetic and relatively soft and ductile, as in annealed carbon steel; the intermediate or martensitic state is magnetic, hard, and brittle as in hardened steel; while the non-magnetic high temperature or austenitic state when preserved in the cold, as in manganese steel, combines great ductility with hardness of a peculiar kind to which I will refer shortly.

In carbon steel this transformation is so rapid that it occurs to a very marked degree even in the water quenching of thin pieces, as is familiar to us in the fact that when this steel is made non-magnetic and austenitic by heating say to 900 deg. C., and is then quenched in water, it transforms as far as the magnetic, hard, brittle, martensitic state of common hardened steel even in this rapid cooling.

Most of the alloying elements, and notably carbon, manganese and nickel, retard this transformation greatly. Thus 2 per cent of manganese plus 2 per cent of carbon retard it so that in the water quenching of thin pieces the austenite state is preserved. With 5 to 7 per cent of manganese it is so slow that even in air cooling it goes only as far as the intermediate martensitic state. Hence the brittleness of these steels of intermediate manganese content. With about 12 per cent of manganese the transformation is so sluggish that the austenitic state is preserved even through a common slow cooling.

The water-quenching of manganese steel in current manufacture is not to prevent the loss of the austenitic state, but to suppress the precipitation of the iron-manganese carbide, cementite, which would occur during slow cooling. The broad plates of this cementite would embrittle the mass by forming partings of low cohesion. It is derived from the large carbon content of the ferromanganese used, the cheapest source of manganese. Carbon-free manganese steel should not need quenching.

Industrial Value of Manganese Steel

The industrial value of this manganiferous austenite or manganese steel seems to be due to its combination of great ductility with great effective hardness. I say effective hardness, because initially it is rather soft. My own experiments indicate that the Brinell hardness of an undeformed specimen is only 125, or that of steel of about 0.22 per cent of carbon when annealed, that of ultra low-carbon steel being about 75. But the hardness increases very greatly on the slightest deformation. Even that incidental to the Brinell test increases the observed Brinell hardness to 223 easily, or to that of 0.60 per cent carbon steel when annealed.

This hardening under deformation is one of the first things that forces itself on the user of this material. The first strokes of the hack saw cut it rather easily, but the deformation thus set up in the path of the saw quickly causes such hardness as to bring the sawing to an abrupt end, thus giving the absolutely false impression that the material has a soft skin. This hardening causes the apparently contradictory combination of effective hardness with very low proportional limit, even as low as 28,250 lb. per square inch. The proportional limit represents the cohesion of the undeformed material, the effective hardness represents the cohesion as exaggerated by the deformation incidental to service. In the same way the act of tensile rupture may increase the Brinell hardness to 540, or that of about 0.50-per cent carbon steel when hardened.

The surface of the jaw of a manganese-steel rock crusher, deforming under the great pressure, quickly hardens itself, so that the combination of a very hard surface with a ductile back develops spontaneously. As fast as this hard surface wears away it is replaced by a new one made equally hard by the deformation which it at once receives.

This hardening probably represents in part the same cause which leads to the increase of cohesion in general, including the hardness, of all the malleable metals under all forms of deformation, such as wire drawing, and in part the martensitization of the austenite. That is to say, the arrested transformation from austenite through martensite to the alpha state which is due in cooling through the transformation range but is restrained by the retarding action of the manganese, is now stimulated by the deformation sufficiently to cause it to proceed as far as the martensitic state, with consequent hardening and embrittling effect. This martensitization through the stimulation of the arrested transformation by deformation is a common property of austenitic steels which have only a moderate excess of the retarding elements over the quantity needed for causing the retention of the austenitic state. It occurs strikingly in austenitic 20-per cent nickel steel.

The retarding effect of manganese on the structural changes of carbon steel shows itself by leading in general to finer structure, to finer ferrite masses, finer network structure, and finer pearlite, indeed probably often to the replacing of lamellar pearlite with sorbite. This greater fineness leads to better quality in general and to a higher elastic limit in particular, though of course with a corresponding sacrifice of ductility.

Value of High-Manganese in Low-Carbon Steel

The great value of manganese for this purpose has not begun to receive the attention which it deserves. It is probable that a manganese content of say 1.25 per cent, with a correspondingly lessened carbon content, may be used so as to lessen the danger of cracking and the residual stresses when a high elastic limit is sought, because this large manganese content in and by itself raises the elastic limit by giving a fineness of structure which otherwise would be sought by increased violence of cooling or by the use of a lower drawing temperature. In other words, the use of 1.25 per cent of manganese lessens the needed violence of cooling, and permits the use of a higher drawing temperature, in both ways tending to mitigate the residual stresses, and in the former way lessening the chances of cracking.

*A paper, substantially in full, presented at the twentieth annual meeting of the American Society for Testing Materials at Atlantic City, N. J., June 27, 1917.

The Chicago, Milwaukee & St. Paul Railway Co. will build an additional 500 railway cars at its Tacoma, Wash., shops, according to A. M. Ingersoll, assistant to the vice-president of the road. The company is now constructing 1000 cars at its Tacoma shops. All the cars will be gondola type.

Employees of the Skinner Chuck Co., New Britain, Conn., numbering 167 men, are on strike. The men seek a 10 per cent wage increase, a 10 per cent bonus and an adjustment of alleged time clock troubles.

Transverse Tests and Steel Structures

Equalizing of Crystallization Necessary Before the Best Physical Results Are Possible—How This Is Accomplished

BY GEO. W. DRESS*

ACCORDING to the use to which steel is put, many specifications call for a transverse test. The physical properties desired are often attained with much difficulty, and in many cases the steel is rejected because of failure to meet the specifications. Failures of steel tested transversely may be due to the chemical composition, but too frequently such failures are due to grain structures, because the steel from which the test was taken was not equalized preparatory to its being heat-treated.

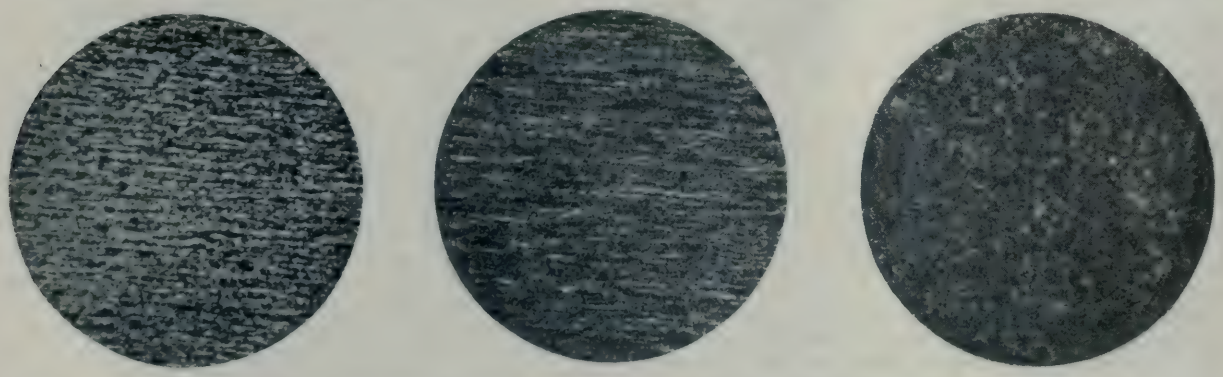
In order to obtain the maximum physical properties of steel on a transverse test, it is essential first to equalize the structure. Before explaining the method used in accomplishing this equalization so that the microconstituents in a given piece will have approximately the same arrangement transversely as longitudinally, a review of the structures will not be out of place.

During the rolling or forging of a bar of steel, the grains and microconstituents are elongated in the direction of the rolling. The smaller the cross-section and the colder the bar when finished, the more pronounced is the elongation of the grains. In a cold-rolled bar the elongated grain and microconstituent are very marked and the structure is laminated. When the steel is medium hard, having a carbon content of about 0.40 per cent, the extent of this lamination is readily seen at a magnification of 50 diameters. These laminations will be composed of alternate layers of the microconstituents, pearlite and ferrite. The harder constituent pearlite will be arranged to form one layer whereas the ferrite or softest constituent in steel will form the other layer. Hence we have a steel made up of many layers of hard and soft constituents. It is due to these layers of alternately hard and soft constituents, pearlite and ferrite, that the physical properties of a transverse test show a decided weakness.

The general physical characteristic of a transverse test is that the steel breaks short in a testing machine with a low percentage of elongation and reduction of area. Moreover, the steel will not bend successfully. From what has been said concerning the structure of steel transversely we do not wonder that the elongation and reduction of area are reduced to a minimum.

A large-grained structure breaks with a low elastic limit, poor elongation and reduction of area. This applies to a longitudinal test equally as well as a transverse test. The reason for the poor physical properties of a large-grained structure is because of intergranular weakness.

By this is meant a weakness between the grains, or rather a weakness in the cell walls which surround the grains. The cell walls of commercial steel generally consist of ferrite, the softest constituent in steel, and because of this fact they are naturally weak and yielding. The larger the grains and the wider the cell walls of ferrite, the less cohesion between the grains. If the cohesion between the grains is greatly lessened because of this, we can readily see why such a steel will yield suddenly when strains are applied. The elongated grain in the transverse test suffers intergranular weakness directly proportional to the extent to which the grains are elongated. If the grains are decidedly elongated, the cohesion between the grains will be weakened similar to that of a steel having a cellular grain as large as is the greatest diameter of the elongated grains.



The Photomicrograph at the Left Represents Rolled Plate and Reveals the Laminated Structure. The photomicrograph at the center is the same steel annealed at 720 deg. C., while the third one shows the same steel with the structure equalized at 900 deg. C., then annealed at 720 deg. C. The composition of this steel was 0.32 per cent carbon, 0.54 per cent manganese 0.039 per cent sulphur and 0.020 per cent phosphorus. The photomicrographs are all 50 diameters

As to the structure of each individual grain, let us take as an example a steel containing approximately 0.40 per cent carbon, the grain being pearlite. Ferrite being the softest and cementite the hardest constituent of steel in the untreated condition, it is reasonable to conclude that pearlite is a medium-hard constituent. The structure of pearlite may be either granular or lamellar. In the rolled or forged steel, the structure of the pearlite grain is granular whereas lamellar pearlite is a characteristic of thorough annealing.

The remarks in this discussion apply principally to extreme cases, yet at the same time a transverse section from any rolled or forged bar comes within its scope.

There must be a complete structural change before any marked difference in the physical properties of a transverse test can take place. The elongated grain must be made cellular and the laminations and intergranular weakness must be elimi-

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nated. In order to accomplish this change the steel must be equalized—it must be treated similar to that of a steel which was overheated or burned. Ordinary annealing will not suffice, since it will have little or no influence on the structure. The temperature most commonly used in annealing is not high enough to expand the elongated grains nor high enough to break up the laminated structure.

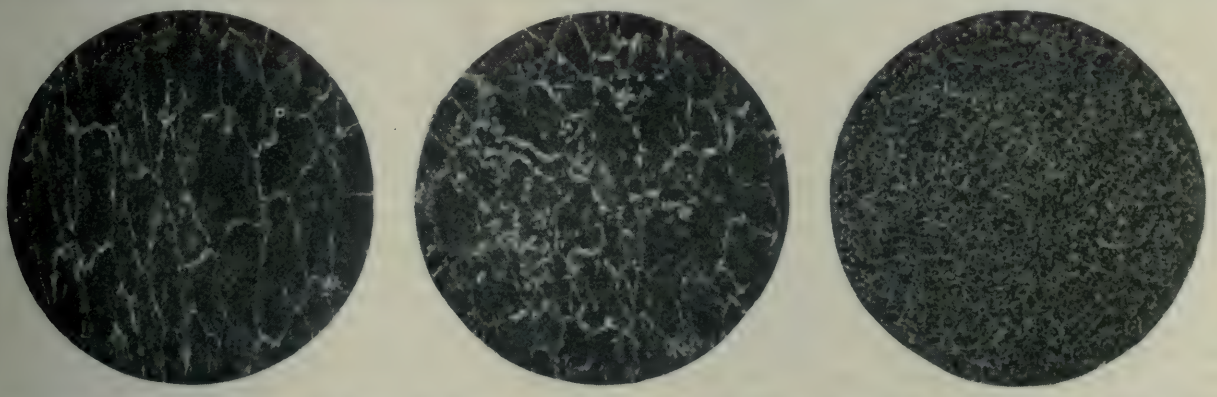
It is a recognized fact that each increment of heat above the critical point in steel increases the grain size. Therefore a temperature of not less than 900 deg. C. or 1652 deg. Fahr. must be used in order to enlarge the grain beyond the size to which it is elongated. Simultaneously with the enlarging of the grain size we have likewise disturbed the laminations. After the steel has been uniformly and thoroughly heated, it is essential that this temperature be maintained at least one hour and, in the case of large pieces of steel, a considerably longer time is required. The rate of cooling at this stage of equalizing the structure is immaterial, the steel may cool down with the furnace or it may be taken out of the furnace and allowed to cool in air.

A microscopic examination of the steel in this condition will show that the elongated grains and the laminations have entirely disappeared and in their place is a uniformly large and cellular grain. Let it be understood that the transformation of the elongated grains and the laminated structure into that of the large cellular grain has left the steel in a decidedly weak condition. We have equalized the structure and the steel is now in good condition to respond to a simple annealing in order to refine the grain structure.

The temperature for a simple annealing is based on the critical point of the steel and in no case should the annealing temperature exceed the critical point by more than 25 deg. C. In annealing to refine the structure and to eliminate the strains it is best to allow the steel to cool down very slowly and undisturbed in the furnace.

A microscopic examination of the steel after equalizing the grain structure and subsequently refining the same shows that the structure is uniformly small and that the pearlite grain is of the lamellar variety. Also the microconstituents have approximately the same arrangement transversely as longitudinally. The steel is in good physical condition, having increased the maximum strength, the elastic limit, the percentage of elongation and the reduction of area.

As illustrating the foregoing statements, photomicrographs are offered, representing structures at various stages of treatment at a magnification of 50 diameters, of a section of plates, ¼ in. thick by 18 in. wide, of varying composition.



The Photomicrograph at the Left Shows the Structure of a Steel Rail as Rolled, Revealing the Elongated Grains. The center photomicrograph represents the same steel annealed at 710 deg. C. The third photomicrograph shows the same rail equalized at 900 deg. C. and then annealed at 710 deg. C. The composition of this steel was 0.0514 per cent carbon, 0.68 per cent manganese, 0.042 per cent sulphur and 0.017 per cent phosphorus. The photomicrographs are all 50 diameters

MANY PLANTS ARE IDLE

Serious Labor Disturbances in the Pacific Northwest

SEATTLE, July 24.—Manufacturing industries and shipbuilding in the Pacific Northwest, particularly the Puget Sound section, are being seriously hampered by strikes and labor troubles of every kind. The street car system of the city has been completely paralyzed for the last week.

A deadlock has been reached in the state-wide lumber and shingle mill strike, both sides expressing confidence of victory and belittling the advances made by the other. It is understood that more than 20,000 workers are out on strike, with hundreds of mills closed down. The demand is for the 8-hour day, with 10-hour pay. The situation threatens to become a serious one, as upon the operation of the camps and sawmills throughout the State depends the activities at the shipbuilding plants which are building wooden ships for the Government. The State Council of Defense is making strenuous efforts to bring employers and striking employees together for a conciliatory conference, but to date has been unsuccessful. A continuance of the strike for any length of time will mean that practically every wooden shipbuilding plant in the Puget Sound country will be forced to close. More than $90,000,000 worth of wooden ships has been contracted for by shipbuilders in the States of Oregon and Washington, to be built for the Government. Six of the largest lumber plants in the city of Seattle have been forced to close or operate with greatly diminished forces. Included in the above were several plants that cut only ship timber.

To add to the present serious situation is a threatened strike of union men of the metal trades on Aug. 1, which will result in complete and immediate close-down of shipbuilding plants in Seattle. The metal trades workers refuse to handle materials from the Washington Iron Works, Seattle, which operates on an open shop basis. The iron works produces materials that are essential to the shipbuilding industry in the city, and a boycott would mean serious delays at the plants. A federal commissioner of conciliation is endeavoring to bring about a settlement, but workers assert the strike cannot be avoided. Their blanket agreement with the shipyards expires on that date, and a strike seems certain. More than 15,000 workers would be affected.

The Cleveland Wire Cloth & Mfg. Co., Cleveland, is enlarging its plant by the erection of a two-story brick and steel addition, 44 x 100 ft., to be used as a weaving room and warehouse.

The Philadelphia & Reading Railroad Co. has placed an 11-hour day in force in its Schuylkill Haven, Pa., shops.

WATER SOFTENER PLANT

Republic Iron & Steel Co. Installing Complete System at Youngstown

The Republic Iron & Steel Co., Youngstown, Ohio, is installing a complete water softening and purifying system, the design and equipment for which is being furnished by the Wm. B. Scaife & Sons Co., Pittsburgh. The system covers a ground area 80 ft. wide by 260 ft. long. The capacity of the apparatus is 300,000 gallons of water per hour, or sufficient for boiler feed for 75,000 boiler horsepower, on the basis of 4 gallons per horsepower per hour. The system is so arranged that a further increase in capacity can be made, if required. It consists of 8 reaction and settling tank units, built of steel; 8 filter units, built of concrete, and 6 reagent mixing tanks, built of steel. The reaction and settling tank units are equipped with mechanically operated stirring devices, driven by independent motor units for each tank. Each tank is equipped with electrically-operated high-water bell alarms, and with a recording gage which registers the operating cycle of the tank. Each tank is also equipped with two pipe connections, through one of which the raw water is introduced, and out of which the precipitated sludge is drawn from the tank. The other pipe connection delivers the chemically-treated and settled water which is drawn from the tank by means of a hinged floating outlet pipe; so that in emptying the tank the water from the top is first drawn off, the floating pipe falling with the water level as the tank is emptied. These pipe connections to the tanks are equipped with hydraulically-operated gate valves, which are operated from an independent water pressure system with automatic control. The Petroleum Iron Works Co., Sharon, Pa., is furnishing the tankage for this plant, which consists of eight 37-ft. diameter by 35-ft. high tanks. A concrete and steel house will contain the filter units and pumping equipment for supplying water to the system, and for distribution of the softened and purified water, and a large concrete basin under the filters will receive the softened and purified water, from which it will flow to the service pumps. In the pump and filter house, all of the alarm bells, switches, recording gages and operating dials for hydraulic valves will be located. These will be placed on a white marble operating board, and from this operating board all of the mechanical operations will be carried out. The filter and pump house is a two-story structure, the second floor of which is to be used for the storage of chemical reagents. All handling and weighing of reagents is to be done on this floor. The reagent mixing tanks will occupy a separate room, and each tank will have a hopper, and from the chemical storage room the reagents will be delivered through hopper and spout to each mixing tank. The introduction of reagents from the mixing tanks into the reaction and settling tanks will be accomplished by means of 3 motor-driven centrifugal pumps with suction and discharge connections cross-connected, so that reagent mixtures from any tank or any pump can be delivered into any of the reaction and settling tanks. The filter units are of the gravity type, equipped with manifold special brass strainer, and brass pipe air wash system, which includes a pressure air blower direct-connected to an electric motor. All of the electrical equipment is direct-drive, and the installation represents in all details the best modern practice. The water supply is to be obtained from the Mahoning River.

Other installations of the we-fu-go intermittent water softening and purifying systems being made by the Wm. B. Scaife & Sons Co. include the following:

Phillips Sheet & Tin Plate Co., Weirton, W. Va. Capacity—40,000 gal. per hour.
Michigan Alkali Co., Wyandotte, Mich. Capacity—50,000 gal. per hour.
Wheeling Steel & Iron Co., Benwood, W. Va. Capacity—36,000 gal. per hour.
Wheeling Steel & Iron Co., Yorkville, Ohio. Capacity—24,000 gal. per hour.
Empire District Electric Co., Riverton, Kan. Capacity—60,000 gal. per hour.
Utah Power & Light Co., Salt Lake City, Utah. Capacity—51,000 gal. per hour.
American Sheet & Tin Plate Co., Farrell, Pa. Capacity—28,000 gal. per hour.
United Furnace Co., Canton, Ohio. Capacity—60,000 gal. per hour.
Jones & Laughlin Steel Co., Soho Works, Pittsburgh. Capacity—80,000 gal. per hour.
Duquesne Light Co., Pittsburgh. Capacity—30,000 gal. per hour.

These installations of intermittent water softening and purifying apparatus of large capacities resulted from the great demand for power and the necessity laid upon power producers of obtaining from their boiler equipment the highest possible efficiency.

Report on British Iron Ores

At the instance of the Advisory Council for Scientific and Industrial Research a report on the resources and production of the iron ores and other principal metalliferous ores used in the iron and steel industry of the United Kingdom has been prepared by G. C. Lloyd, secretary of the Iron and Steel Institute. The report collects from many scattered sources and presents in a summarized form the main facts concerning the known resources of iron and other ores required in iron and steel manufacture, indicating their composition and character, and giving as many analyses as possible of the minerals in every locality, with information as to their geographical position and accessibility. The first part describes the iron ore deposits of the United Kingdom and British dominions oversea, and the second part contains similar information as regards other countries of Europe, Africa, Asia and North and South America. The third part deals with the occurrence and composition of ores other than iron used in the iron industry, such as chromium, cobalt, nickel, manganese, molybdenum, titanium, tungsten, vanadium and zirconium, with references to the composition of the ferroalloys made from some of these metals.

Awarded Contract and Will Build Yard

The Kelly-Atkinson Construction Co., 189 West Madison Street, Chicago, erector of iron and steel structures, including bridges, has been awarded a Government contract for 20 cargo steamers to cost about $9,000,000. The company will build a shipyard at some point on the Atlantic seaboard, and assemble the parts, which will be fabricated at various plants. The company is not yet prepared to state its plans in detail.

The Falls Rivet Co., Kent, Ohio, has purchased the plant and business of the Kent Machine Co., Kent, and has reorganized the latter with the following officers: M. G. Garrison, president; W. S. Kent, vice-president; Roy H. Smith, treasurer; Myles E. Ewing, secretary. The business of the Kent Machine Co. will be operated separately from the Falls Rivet Co. Extensions and improvements are being made in the foundry and machine shop of the Kent company.

The Traylor Engineering & Mfg. Co., Allentown, Pa., has everything in readiness for the building of marine engines and boilers to furnish the power to the 10 wooden ships being built by the Traylor Shipbuilding Co. at Cornwells. The keel of the first boat will be laid within a month and it is to be launched not later than Feb. 1. The engines will be 1400 hp. and will give the vessels a speed of 12 knots and upward an hour.

The Columbian Hardware Co., Cleveland, is distributing a very handsomely printed page entitled, "American Fundamentals," containing extracts from the Declaration of Independence, President Washington's Farewell Address, President Lincoln's Gettysburg Address and President Wilson's War Message.

Henry K. Lackland and James K. Payne, composing the firm of the Lackland-Payne Refractories Co., have opened an office at 1603 Boatmen's Bank Building, Broadway and Oliver Street, St. Louis.

The Belfont Iron Co., Ironton, Ohio, is installing a new Curtis turbo-blower, which is the first installation of its kind at any of the furnaces in the Hanging Rock district.

A New Form of Optical Pyrometer

The Leeds & Northrup Co., Philadelphia, has developed an optical pyrometer for works use in which the luminous radiation from a heated body is balanced against that from a standardized light source. The instrument is designed for measuring temperatures from approximately 1100 deg. Fahr. to the highest known, a screen being employed to reduce the light from bodies having temperatures in excess of 2500 deg. The instrument is portable, weighing but a few ounces and can be sighted, it is emphasized, as easily as an opera glass. The case containing the storage battery, rheostat and milliammeter, employed in connection with the pyrometer, weighs approximately 10 lb., and is designed to be slung around the neck of the operator.

In use, the pyrometer is sighted at the body, the temperature of which it is desired to measure, and light rays from the body pass through a lens in the pyrometer tube and are brought to a focus at a point where a tungsten lamp filament is located. This filament, which is made incandescent by current from a storage battery, contained in a case slung about the observer's neck, appears to lie upon the image of the hot body just as the cross hairs in a surveyor's telescope appear upon the distant object looked at. The current through the lamp is adjusted by a rheostat in the battery case until the filament blends with the background formed by the hot object. At this time the observer notes the reading of the milliammeter, which can be provided with a special scale to read in degrees of temperature or the temperature corresponding to the current may be read from a calibration curve supplied with the instrument.

As the light emitted by both the hot body and the filament would become dazzling at high temperatures, thus increasing the difficulty of comparison, a red glass is placed in the eye piece with a view to reducing the amount of light. This arrangement, it is pointed out, possesses the further advantage that light of only one color reaches the eye and the process becomes one of matching brightness of light rather than color. The brightness of the image of the hot body, it is pointed out, is nearly constant irrespective of the distance from the body, although the size of the image of course varies.

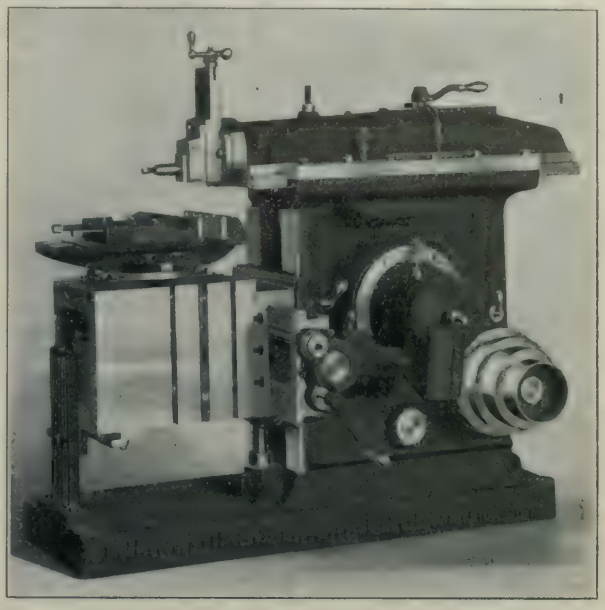
In observing bodies having temperatures ranging from 2500 to 10,000 deg., the light even through the red glass of the eye piece would be too great for direct observation, and a screen placed between the lens and the image is provided to reduce the light from the hot body, but not that from the filament. This screen can be thrown into or out of the field of vision by a milled disk projecting through an opening in the tube of the instrument.



Varying the Brightness of an Incandescent Lamp Filament Serves to Measure Temperature with a New Optical Pyrometer

A Flush Column Type Shaping Machine

The Columbia Machine Tool Co., Hamilton, Ohio, has lately designed a shaping machine that is manufactured in 16-in., 20-in. and 24-in. sizes. The machine



The Absence of Column Overhang at the Front of the Machine Enables the Head to Be Set at an Angle and Still Obtain the Full Length of Stroke

is liberally proportioned, and the manufacturer claims that it differs somewhat from ordinary construction in that the column is flush in front without any overhang to interfere with setting the head at an angle. This does away with the usual projection at the top of the column, which makes it impossible to set the head at an angle and still obtain the full rated stroke of the machine. The flush column permits the head to be set at any desired angle and still obtain the maximum stroke.

Another feature worthy of notice is the V-shaped guides on which the rail travels. This is especially advantageous in connection with the power vertical feed that is provided and is also convenient in that the rail is clamped and may be readily locked or unlocked from the front or operating side of the machine.

Efficient table support is provided, which is clamped both to the base and the table and arranged so that the bearing surfaces are protected from chips. It also holds the table firmly at all times, and prevents deflection in any direction. It will also be noticed that the table is large and the working surface measures fully 20 in. in length. It is also made heavy, with considerable metal around the T-slots, so that when cuts are taken over it for truing up there is no danger of weakening the slots.

The feed mechanism consists of an adaptation of the well-known ratchet feed and is arranged so that the changes can be easily and quickly made. It is rigidly supported and the housing is made so as to cover the gears fully and protect them. Provision is also made so that the direction of the feed may be controlled as required, the location of the controlling lever also indicating the direction of the feed.

For lubrication the various shafts have ring oiling bearings, the feed gears run in oil, and the countershaft pulleys and bearings are self-oiling.

The 20-in. machine, which is the one illustrated, has a total weight of 4500 lb. when boxed.

The Davis-Bournonville Co., Jersey City, N. J., manufacturer of oxy-acetylene welding and cutting apparatus, will on Aug. 1 open a school at its plant for the instruction of purchasers of its equipment in oxy-acetylene practice.

Secretary McAdoo Gives Congress a Shock

Asks for Appropriation of Five Billion Dollars in Addition to Previous Large Amounts —Tremendous Task Confronts Legislators

WASHINGTON, July 31.—Congress is now facing the most colossal financial task ever undertaken by any legislative body in the world, the completion of a program that includes the appropriation of not less than $17,000,000,000 for the fiscal year ending June 30 next and the framing of revenue laws and bond authorization measures to provide this huge sum. These figures are not hastily compiled estimates, but the actual totals brought together by the Senate Committee on Appropriations as a guide to the Congressional leaders in laying out the work to be accomplished during the remainder of the special session.

The total lack of preparedness for war is largely responsible for these enormous disbursements during the first year that the United States has become involved in the conflict, and it is significant of our helpless position that before we are able to strike an effective blow in the great war, we must spend more money than any of the European nations actively engaged in military operations since August, 1914, has expended in any one year. England, which is paying 25 per cent of the cost of the war by taxation, has issued in bonds only $15,515,000,000 during the two years and nine months ending April 30, 1917. During the same period France has put out $10,532,000,000 in bonds, Russia $11,896,000,000, Italy $2,520,000,000, Germany $13,276,000,000, Austria $3,653,000,000 and Hungary $1,730,000,000. It is apparent therefore, that our expenditures for the first year of our entrance into the war will equal, if they do not exceed, the bond issues of Great Britain for the first three years of the conflict.

What the Request Shows

It is no exaggeration in terms to say that Congress has received a severe shock as the result of the presentation by the Secretary of the Treasury, during the past week, of estimates for appropriations not heretofore contemplated amounting to $5,000,000,000, accompanied by the urgent suggestion that at least two billion of this sum be provided by new taxing projects and the remainder by additional bond issues. The great bulk of the sum asked by the Secretary of the Treasury is needed to cover estimates prepared by the Ordnance Bureau of the War Department, some of the leading items suggesting that little or no progress has heretofore been made looking to the national defense and that the great task of equipping our forces for the war and of putting the nation in shape for defensive operations has been just undertaken.

The largest and most disquieting item in the estimates submitted calls for $2,468,613,000 for armament of fortifications. This demand comes upon Congress like lightning from a clear sky. The amount is more than has been spent upon coast and harbor fortifications in the past 20 years, and the fact is being emphasized here that the Chief of Engineers of the Army, in his annual report submitted to Congress last December, stated that our sea coast fortifications were satisfactory so far as attack from the sea was concerned and only needed protection against aerial attacks or assaults from the rear. It is well known that the Ordnance Bureau has contemplated the strengthening of the fortifications with 17-inch guns at a few points along the coast, but it has been the freely expressed opinion of ordnance experts that no advance in marine gunnery has been made that would render our coast defenses vulnerable. The expenditure of two and a half billion dollars for these defenses, however, can mean but little less than their complete rebuilding, in the opinion of the best informed members of the military committees of the two houses, and not only will the development of the plans of the Ordnance Bureau be awaited with interest but the details will be examined into with much particularity before the appropriations are authorized.

Armored Trucks

Another significant item in the secretary's estimates is the sum of $170,277,000 for so-called "auto machine rifles," this item being closely followed by an estimate for $21,750,000 for armored motor cars. It is understood, however, that the machine guns referred to will be utilized for various purposes and will be of various types, ranging from the light machine gun carried by infantry into the trenches up through the heavier models used on land for the arming of airplanes and up to the high-power rifles employed for the equipment of armored motor cars. Other important items embraced in these estimates include the following: Ordnance service, $1,825,000; ordnance stores, ammunition, $39,520,000; small arms target practice, $2,000,000; ordnance stores and supplies, $70,000,000; submarine mines, $700,000; proving grounds, $3,000,000; Benicia arsenal, Benicia, Cal., $91,500; Frankford arsenal, Philadelphia, $2,630,000; Picatinny arsenal, Dover, N. J., $40,000; Rock Island arsenal, Rock Island, Ill., $1,645,200; San Antonio arsenal, San Antonio, Texas, $185,000; Springfield arsenal, Springfield, Mass., $445,000; storage facilities at armories and arsenals, $500,000; terminal facilities, $25,000,000; Watertown arsenal, Watertown, Mass., $741,500; testing machines, $10,000; Watervliet arsenal, West Troy, N. Y., $789,500; Ordnance depot, Panama Canal, $59,700.

The appropriations to be made available for the Ordnance Bureau will be less restricted than ever before in the history of the Government by requirements as to the exact method of their disbursement. All idea of tying the hands of the Government officials to prevent the equipment of private plants for the manufacture of war material has been abandoned and the War Department will be free to place orders where it can and to provide as forehandedly as possible for future requirements that may run several years. Congress now realizes when it is too late than a large part of the enormous appropriations now being made could have been saved and the war probably materially shortened had the advice of ordnance experts been taken several years ago and private establishments equipped to co-operate with the Government in providing small arms, artillery, coast defense and naval rifles and the thousand and one other items which must now be supplied on the shortest possible notice and in quantities heretofore undreamed of. The suggestion has frequently been heard here of late that if, during the lean industrial years prior to 1914 when the war cloud was gathering on the horizon, a few million dollars had been invested in equipment and a few hundred million or so in reserve stocks of war material, the Government and the taxpayers would have been saved billions and the effectiveness of the American Army and Navy tremendously increased.

Senators Are Disconcerted

No one in Congress has been more disconcerted by the presentation of Secretary McAdoo's supplemental estimates than the members of the Senate Finance Committee. Chairman Simmons and his colleagues had just ordered the war revenue bill to be reported to the Senate for a second time and a revised print had been received from the Government Printing Office when the secretary laid his figures before the committee and asked that the revenue producing capacity of the pending measure be increased by two billion dollars. The pending measure was designed to raise $1,650,000,000, or about $300,000,000 less than the House bill. The committee at once decided not to add the desired two billion dollars nor to make any addition approximating

that amount, but it was determined to give the bill a careful upward revision with a view to adding several hundred million dollars. Increases in income and excess profits taxes were naturally suggested and will probably be features of the measure as finally reported.

The second revision of the war revenue bill will probably delay its consideration another week or more and will make it difficult, if not impossible, to secure the passage of the measure by the Senate before the end of August notwithstanding the fact that Finance Committee leaders talk of using whip and spur and with a show of confidence predict that the bill will be disposed of in the Senate in a fortnight. The new conditions that have arisen with respect to appropriations and revenue requirements foreshadow a long wrangle in the Conference Committee and will greatly strengthen the hands of the House conferees in their efforts to secure the retention of such House rates as have been cut by the Finance Committee. No one expects to see the bill disposed of by the Conference Committee within a week or 10 days, and considerable more time may be consumed. September 15 is conservatively regarded as about the date when the new tax law will go into force. The delay will cost the Government many millions of dollars, owing to anticipatory withdrawals from warehouse of distilled spirits, tobacco and other goods subject to internal revenue tax and to a general advance speeding up of operations that will be subject to impost when the new statute becomes effective.

The Treasury balance, which approximated a billion dollars on July 1, has melted away to half that sum and the Treasury Department is now preparing to issue short-time certificates to tide the Government over until another bond issue can be floated. The date and amount of this issue cannot now be stated, but it is believed that the next flotation will take place in October or November, and that two or three billion dollars will then be issued.

The Canadian Government is preparing to make a loan in this country of about $100,000,000 to pay for raw material purchased here for official account. Much of this is for the cruder forms of iron and steel utilized in Canada for the manufacture of war material. The Secretary of the Treasury, who has been consulted by the Canadian authorities with respect to this loan, states that in view of the fact that the balance of trade between the United States and Canada has been running strongly in favor of the United States he realizes that it is desirable for Canada to establish credits in our market to meet these adverse balances and, therefore, there will be no objection on the part of this Government to the proposed offer. He adds that inasmuch as the United States Government must keep control of the financial situation here by determining each foreign offering on its own merits and with reference to the financial conditions prevailing at the time, this acquiescence cannot be taken as covering future operations. W. L. C.

The International Motor Truck Co., Allentown, Pa., has completed the order received from Great Britain for 150 Mack 'Bulldog" trucks. Each will have a capacity of five tons and is meant for service at the French front. All the trucks went to New York on their own wheels for shipment across the ocean. During June the plant turned out 140 trucks, but in the future will not try to exceed the usual rate of 125 a day. The Allentown trucks are said to have proven very valuable in the moving of heavy artillery.

The Engineers' Club of Philadelphia is waging a campaign to raise $75,000 for a new clubhouse. The plan of the board of directors is to purchase property at 1315 Spruce Street, adjoining the present clubhouse, and connect the properties to make a commodious building adequate for the present membership, which numbers more than 2000.

The A. M. Byers Co., Pittsburgh, operating Mattie furnace, also puddling and skelp mills at Girard, Ohio, has organized a safety department and placed H. H. Henry in charge.

Scrap Nickel Anodes Reclaimed by Welding

THE practice of utilizing every pound of nickel anodes for service by welding the scraps together is saving considerable money in many plating departments and establishments.



Until recent years many firms sold their worn anodes as scrap for want of a thoroughly satisfactory method of utilizing them—a source of considerable loss to platers, for their junk value is less than one-half their original cost. By welding the scraps together every pound of the costly metal is utilized for plating purposes at a trifling welding cost. The practice of welding such anodes is usually as follows:

The worn anodes, as they are withdrawn from the tanks, are turned over to some workman who does the welding. A scrap of suitable size and shape is selected as a hanger and other scraps are tacked to it by welding until the desired size and weight are secured. The tacking consists of melting the scraps, at the point of welding, by the heat of the oxy-acetylene flame, allowing them to fuse into one piece. The tacking of a joint requires but a moment as the temperature of the oxyacetylene flame, which is approximately 6300 deg. Fahr., causes the metal to fuse quickly. No flux is used. Where necessary another piece of scrap nickel is used as a filling rod.

The same flame is also used to remove the brass hooks from the scraps, the solder melting rapidly, leaving the pure anode to be welded.

Several other methods of utilizing scrap anodes have been tried in the past, but with uncertain results. The method of fastening them together by means of rivets and similar methods are seldom thoroughly dependable because of uncertain conductivity. It is impracticable for anyone but the manufacturer to re-melt and re-pour anodes because in so doing the composition is changed. A decided advantage in welding the scraps together is that the original composition is not changed and the fused joints insure conductivity equal to that of new anodes.

Another advantage is the fact that no skill or experience in the art of welding is required to weld up scrap nickel anodes—any workman of average intelligence can do the work without previous knowledge of the process. The welding apparatus required is inexpensive. The illustration shows the welding of scrap anodes by the Prest-O-Lite Process of oxyacetylene welding. Welded anodes are seen in the foreground.

The Baily & Allen Co., 122 South Michigan Boulevard, Chicago, has been incorporated to carry on the business in structural steel and machinery formerly conducted by R. W. Baily. The incoming member of the firm is M. E. Allen, formerly secretary and contracting engineer with the Central States Bridge Co., Indianapolis, Ind. The change went into effect Aug. 1.

The Marietta Casting Co., Marietta, Pa., has announced a voluntary advance of 5 per cent in the wages of its molders.

Use of Producer Gas Without Regenerators

Temperature of 2100 Deg. Fahr. Obtained by Surface Combustion in Continuous Heating Furnaces at Buffalo Bolt Co.

BY JOHN H. BARTLETT, JR.*

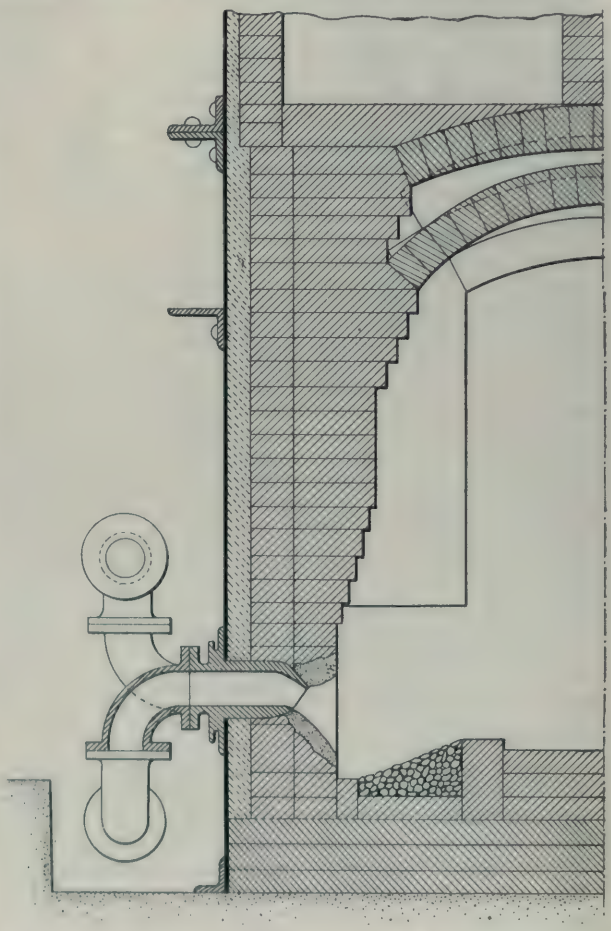
PRODUCER gas has recently been successfully applied without regeneration to a continuous forging operation in the plant of the Buffalo Bolt Co. at North Tonawanda, N. Y., a few miles from Buffalo. An installation of Smith bituminous up-draft producers was made at this plant about a year ago, to furnish fuel for rolling mill and forge shop furnaces, but until the recent equipment of a coil furnace with surface combustion burners, its use has been restricted to the rolling mill.

Bolts of standard sizes up to ½ in. that are manufactured in large quantities are forged by a group of five continuous header units of the Buffalo Bolt Co.'s own design. Each unit consists of a bolt header machine, which heads and cuts off a bolt at each revolution, and a coil furnace from which stock is fed continuously to the machine. This method of making bolts was invented and developed by W. B. Peirce, general superintendent Buffalo Bolt Co., with a view to rapid and economic production, and each unit is capable of forging about 85,000 bolts per 9-hr. day.

The iron is fed to the furnace in the form of wire coils of about 30 in. diameter by a revolving drum device, which forms the back of the furnace and is driven by an electric motor. Inside the furnace the coils hang over a water-cooled arm and one by one are pulled off, straightening as they are drawn out through a small opening in the front of the furnace by the machine feed. The process is made continuous by electrically welding together the ends of the coils before they are fed into the furnace. By this means a considerable amount of wire is always in the furnace, allowing ample time for the metal to come to a uniform heat. The furnace is approximately 5 ft. long by 5 ft. high by 4 ft. wide, inside dimensions, and, with the largest size stock the metal is forged at a temperature of 1800 to 1900 deg. Fahr.

Previous attempts to fire these furnaces with producer gas proved unsuccessful in obtaining a satisfactory temperature, although checker brick regenerators were installed. Oil fuel has heretofore been used which, however, is more expensive than the gas and at high temperatures produces an objectionable scaling of the iron.

One of these furnaces has now been equipped with four gas burners of special design by the Surface Combustion Co. of Long Island City, N. Y. Each of these burners is provided with a proportioning inspirator which utilizes the pressure of 8 oz. at which the gas is supplied from the main to entrain the necessary air for combustion. This mixture of air and gas, passing through the air-cooled burner castings, is baffled and burned in a refractory bed of broken carborundum, which insures proper combustion and radiates heat to the walls and arch of the furnace. A cross-sectional sketch of the furnace construction and details of the inspirators and burners are shown in the illustrations. Gas is supplied by control cocks to nozzles in the inspirator bodies. Air admitted through the inlets at the Venturi tubes is entrained by the gas through the Venturi throats, in which the air and gas are thoroughly mixed before passing to the burners. Flanges are provided for air-cooling the burners.



Producer Gas Properly Mixed with Air Is Directed Against Incandescent Carborundum Insuring Complete Combustion

The gas consumption and furnace temperature are controlled by control cocks, the air entrained being at all times proportional to the amount of gas supplied. The shutters or dampers, shown on the air intakes, are provided to accommodate variations in the gas quality and, when lean gas requiring less air for combustion is supplied, they are partly closed. The water gages, showing the pressure to which the gas is throttled, afford an index of the consumption of each

*The author is engineer, Surface Combustion Co., Long Island City, N. Y.



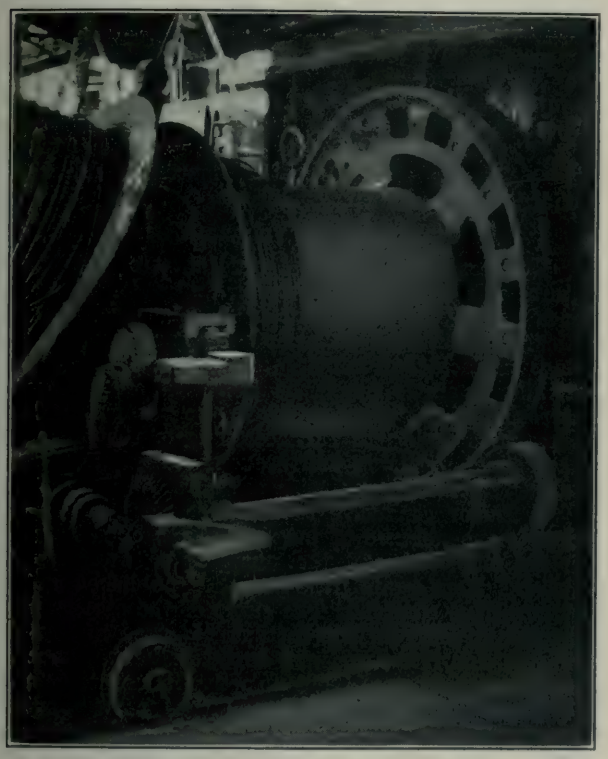
Adjoining the Bolt Heading Machine Is the Heating Furnace. The Venturi tubes with air inlets through which the gas passes before reaching the burners insure proper proportioning of air and gas

burner. When it has been determined, through operation, that a certain pressure is sufficient to maintain the heat when working on a certain size of wire, this burner capacity can always be quickly duplicated from the pressure gage reading without guessing at the proper setting for the control cocks.

To keep scale on the metal at a minimum, the burners are arranged to operate with a slight excess of gas and, when running the furnace at high temperature with this rich mixture, the oxidation has been found to be considerably less than the best results obtained with the oil furnaces. The metal also appears to be somewhat softer, probably due to a more thorough heating through, and is easier to work.

No exact comparison of operating costs with oil and gas can be made, as accurate data on the amount of oil consumed and the cost of the gas are lacking, but a rough estimate was made as follows:

Average oil consumption, 20 gal. per hr., at 5c. = ...$1.00
Average gas consumption, 20,000 cu. ft. per hr., at 3c. = 0.60



Large Revolving Drums at the Rear of the Heating Furnaces Feed in the Wire from Which Bolts Are Forged

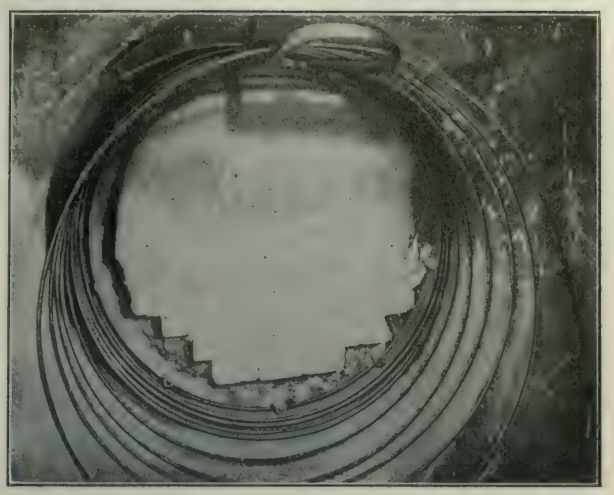
The calorific power of the gas fluctuates somewhat, but averages about 150 B.t.u. per cubic foot.

The machines are operated 9 hr. per day, and the furnaces are started about an hour and a half before work is commenced. Sufficient burner capacity is provided to bring them up to 2100 deg. Fahr. in this time.

It is believed that a substantial economy can be effected over the present operation by recuperation and plans are under consideration for preheating both the air and gas in steel chambers placed above the present flue outlets in the casing formerly used for the checker work regenerators.

Duplicate equipment for two more coil furnaces has been ordered and other producer gas burners are at present being made by the Surface Combustion Co. to equip a large vertical annealing furnace for the Buffalo Bolt Co. This will have eight burners located to give a uniform heat to all parts of the furnace, each two burners having an inspirator similar to those used on the coil furnaces. Where it is desirable to use smaller burners a single inspirator may be used to supply a number of these through manifold piping. As a device for correctly proportioning and mixing air and gas the inspirator is simple and reliable, and has no moving parts that can be damaged by back fires or choked by tar and mixture carried in the gas.

Producer gas burners are also being designed for use in a tong-header furnace, to replace one of the present coal-fired forges. This operation consists in



Inside the Furnace the Entering Wire Is Drawn from a Water-cooled Arm on Which It Hangs in Coils

heating the ends of small rods for heading in a hand-fed machine, and is used for bolts of sizes other than those handled profitably in the coil machines. In this forge the ends of the bars will rest upon the top of the refractory material in which combustion of the mixture of air and gas takes place, and they will thus be close to the source of heat, duplicating the conditions in the coal forge. The furnace will be fired by six burners equally spaced along the rear, and connected alternately through two manifolds to inspirators as on the annealing furnace.

Benzol and Toluol Markets

Large quantities of benzol are piling up in storage warehouses awaiting shipment to Europe, the scarcity of bottoms making it impossible to ship consignments which heretofore have been going on regular monthly specifications. The same situation holds true with regard to phenol and picric acid, and there is no relief in sight. Producers of benzol are sold for many months ahead on contract, and prices remain firm on the basis of 55c. to 60c. per gallon for the pure.

The United States Government is taking practically the entire toluol output of the by-product ovens, and this product is being shipped as rapidly as present conditions will permit to plants where it is made into trinitrotoluol. This Government is supplying the needs of its Allies for trinitrotoluol. The price to the Government is $1.50, but on private contracts and in re-sale lots for spot shipment it brings from $1.75 to $2 per gallon.

The sulphate of ammonia market is firm, fertilizer manufacturers having contracted for many months ahead.

Orders for airplane motors, taken recently by the Willys-Overland Co., Toledo, Ohio, include 4500 motors for the United States, 4500 for Canada, and 1000 for England. Work on these motors will be distributed among the various plant departments. Some plant extensions are contemplated for work in the airplane department.

Singer, Reel & Taylor have opened offices at 304 Wabash Building, Pittsburgh, and will engage in the sale of iron and steel, alloys, coke and scrap. It will act as sales agent for the Acme Steel Co., Pittsburgh, which plans to erect a new plant at Glassmere, Pa.

The City of Kingston, Ont., is granting permission to the Kingston Shipbuilding Co., to extend its plant 75 feet further into the harbor. The company requested this concession on account of the big increase in shipbuilding operations.

A. A. Heilman, a Reading architect, is making plans for extensive improvements at the plant of the Light Cycle Company, Pottstown, Pa., which manufactures castings of various kinds and automobile parts.

Refractories in the Steel Industry*

Necessity for Scientific Research—How It May Best Be Directed—Important Points to Be Studied—German Achievements

BY COSMO JOHNS

WRITERS so rarely state exactly what they mean by refractory materials that a definition may not be out of place even though its terms may not find general acceptance. As the metallurgical processes employed in the iron and steel industry involve heat exchanges, and high temperatures are necessary for most of the reactions that occur, special materials are required for the construction of the portions of the furnaces, ovens, and vessels employed that are exposed to high temperatures and are in contact with the solid liquid and gaseous substances taking part in the reactions. These special materials are refractory if they are capable of fulfilling the structural duties required while subjected to the high temperature necessary for the process employed, and are themselves unaltered during its progress.

The conditions that prevail when metallurgical processes are being carried out vary so much, and the problems presented by the occurrence of slags sometimes basic and sometimes acid, of atmospheres now reducing and again oxidizing, call for so many mutually exclusive properties in the refractory material employed, that only an infusible and non-volatile substance, with no volume change during variations of temperature, inert from a chemical standpoint, and with sufficient structural strength yet a non-conductor of heat, would be considered ideal. No such substance is known and very probably does not exist. Hence any refractory materials employed in the metallurgical art will be the nearest approach available to the ideal for the particular process employed. And as metallurgical processes are in practice conducted on commercial lines, the refractory material employed will be that which enables a given unit of final product to be produced at the lowest cost.

Available Materials

With the exception of carbon, and its compounds with silicon, which have a limited application, the available refractory substances are chiefly the oxides SiO_2, Al_2O_3, CaO, MgO, Cr_2O_3, or mixtures of these with oxides of iron, K_2O, Na_2O, and traces of other substances, regarded as impurities, some of which may function as catalysts. The materials available are therefore strictly limited; they never occur in a state of purity in nature.

The final product, as delivered to the user, is always a mineral aggregate, often of great complexity. They possess no fusion point, but rather a range during which softening, at first incipient, at last, with increasing temperature, causes the material to fail to perform its functions. The constituents have varying melting points, and during heating they invert and new phases appear. Some inversions, involving serious volume changes, should be completed during manufacture, but often are not. This is not imputing blame to the manufacturer, for the temperatures required for such changes are rarely known, and even when known as a result of experiments under laboratory conditions, it does not follow that they apply to manufacturing processes.

The art has been so long in front of the science of the refractory industry that the most urgent need at present is for an expression, in terms of scientific precision, of the most successful practice in manufacturing the refractory product and of the physico-chemical changes which take place when they are used.

Tenacity and Compressive Strength

Tenacity and compressive strength at ordinary temperatures are valuable only in so far as they permit the refractory products to be transported and enable them to withstand the structural stresses to which they are exposed when used. This is not difficult to attain. It is when the material is exposed to high temperatures that the value of these properties becomes most important. The abrasion caused by the movement of solid substances while in contact with their heated surfaces is important, while the erosion caused by the passage of dust-laden gases at high velocities becomes serious in time. Little or nothing is known of the conditions that favor or retard abrasion and erosion.

Compressive strength is rarely a cause of failure, for the bulk of the refractory material is at a lower temperature than the face and therefore less affected. There is, however, urgent need for accurate determination of these two properties at wide ranges of temperature for the more important materials under both oxidizing and reducing conditions.

Corrosion and Volume Changes

Not less important than resistance to high temperature with concurrent abrasion and erosion is resistance to the corrosion caused by slags or gases. The effect of acid slags on basic refractories and of basic slags on acid refractories is familiar, while a most striking example might be indicated on the marked corrosion of the silica bricks in the gas ports and uptakes in open-hearth furnaces, due to the alternating passage of oxidizing and reducing gases with the resulting formation of fusible silicates.

A factor conducive to rapid corrosion in the last case is the absence of large particles of silica in the bricks employed and the presence of excessive pore spaces. Here again little has been published and few observations recorded. The effect of the alkalies found in certain coals on the refractories used in coke-oven construction is serious, and here too little is known as to the real nature of the destructive influences at work.

Every element or compound used as a refractory undergoes changes in volume during heating and cooling. In the case of coke-ovens the retention of gas-tight partitions is absolutely necessary, and this involves the use of a refractory material which does not undergo appreciable volume changes. This apparent contradiction of the first statement simply means that a mixture of substances with volume changes of opposite sign are employed, viz., clay and silica. But while the contraction of the burnt clay is fairly regular with increased temperatures, quartz, which is the form of silica found associated with it in nature, has an inversion point at which it becomes trydimite. In the presence of certain compounds this inversion takes place at a temperature lower than that at which coking is carried on. In their absence the inversion is retarded and does not take place until a temperature higher than that usual in coking practice is attained.

Heat Conductivity, Texture and Porosity

If the refractory materials used possess a fusion point or softening range higher than the maximum temperature to which they are exposed, it would in most instances be desirable that they should be non-conductors of heat, for radiation losses would then be at a minimum. More often the prevailing temperatures approach and sometimes exceed that at which fusion or softening occurs. In those cases it is necessary to encourage radiation from the surface farthest removed from the heated surface, in order to cause a steep temperature gradient from the heated to the cooler face. Good conductivity for heat is most desirable where the material is used to form walls which transmit heat from the burning fuel to the contained charge

*From a paper presented before the Iron and Steel Institute, London, May 3, 1917.

which is being heated. The melting of steel in crucibles and the coking of coal are instances where a refractory material with good heat conductivity is required.

These physical characteristics of refractory materials determine in large measure their suitability or otherwise for particular duties. Owing to the complex nature of most of the materials used in practice their properties are not those of the simple minerals of which they are composed, but the resultant of variations which are sometimes of opposite sign and are always varying at different rates. The relative size of the grains employed, the extent of the surface exposed by the more resistant constituents to the others used as bond or matrix, are most important factors in contributing to the ability of the material to perform useful service. Another point of some importance is the influence of mass in promoting or retaining inversions. Some of these inversions take place almost instantly once the critical temperature has been reached, but with others marked hysteresis occurs.

Porosity must always occur when the refractory material is composed of more than one constituent, and where their chief volume changes are dissimilar or occur at different temperatures. Little is known of the effect of porosity on the properties of refractory materials. That the pores encourage the deposition of extraneous substances in the interior of the bricks, and that they render the structure permeable to gases, is of course obvious.

Stresses Caused by Temperature Changes

The stresses caused by temperature changes are due to the volume changes which take place during heating. If the refractory material happens to be a good conductor of heat these are not serious, unless one face is rapidly heated and the distortion produced exceeds the tenacity of the material. The remedy available is to avoid rapid temperature changes, and whenever possible to raise the temperature of the material during the burning stage of manufacture well above that at which the inversion to which the principal volume change should take place, and to hold it at that temperature long enough for the inversion to be completed. The "spalling" of megnesite bricks which sometimes occurs has been thus explained, and it is certain that the excessive expansion of silica bricks would be avoided if the manufacturer could insure the completion of the quartz-trydimite inversion during burning. Despite the considerable advances in our knowledge of the inversions of silica made recently, their bearing on the problems that face the manufacturer are not yet sufficiently clear.

Need for Further Research

Advances in the art of metallurgy are largely conditioned by the nature of the refractory materials available. The manufacture of these materials is based almost entirely on empirical rules and the experience of the men employed. Such rules are the result of experiences gained during a century or more by a rude process of trial and error, but where means of correlation were very inadequate. The methods employed to-day represent the survival of the fittest by the searching test of commercial success, but it by no means follows that they represent the best attainable. Further progress, if made at all, can only be slow and uncertain, and by consent it is now admitted that only by adequate and well-directed scientific research can such progress be accelerated.

The first step—and in all probability the one easiest to take—would be to prepare specifications for the most important refractory products expressed in terms capable of precise measurement or description, basing the specification on the best current practice. But specifications at their best only serve to stereotype the best current practice of their day. These specifications should be the starting point of systematic research which should cover, not only the problems that occur during manufacture, but the occurrence in nature and characteristics of the raw materials. Their concentration and purification, proximate and ultimate analysis, mineralogical description and thermal analysis are all points on which additions to our present knowledge would be of great value. But the refractory materials are so complex, and the problems involved are so difficult of direct attack, that any contributions to our knowledge of the properties of the pure minerals, or of the impure aggregates which are used in practice, would be welcomed even if their immediate application did not happen to be possible.

Discussion

The author said that his paper was the result of a conference following a meeting of the Faraday Society last autumn. He represented the Institute at that conference, and had been asked to prepare the schedule, embodied in the paper, of the requirements of the iron and steel industry. He now wished to share the responsibility with the members, and invited their criticism. In reading an abstract from his paper the author observed that there was a big future before dolomite bricks if some scientific worker could discover a suitable means of using native deposits of dolomite in a satisfactory way for making bricks. The scientific study of bricks, and especially silica bricks, was extremely complex. For example, the wearing of nozzle and runner bricks was not a simple problem, to be solved by the general use of magnesite. It was largely a matter of the composition and temperature of the steel.

Sir Robert Hadfield said the paper was of unusual value. Not so long ago some makers of refractory materials did not even take the trouble to have analyses made of their product, but analyses were quite as essential as in the case of steel. Many makers, also, had no means of determining the temperatures at which they burned the bricks. All the makers of refractory materials in the kingdom should buy pyrometers.

German and American Research

Prof. W. A. Bone said that everybody felt that enough research had not been done on refractory materials in the past in this country. He referred to the work of German and American investigators, and mentioned that an investigation on coke-oven linings and firebricks was being made at the Imperial College by his colleague, W. C. Hancock and himself. He made an eloquent plea for organized research on a wholesale scale throughout the country, with financial support from the industry which would benefit thereby, and asked that in forming research committees the men who were actually doing the work should not be left out.

Professor Arnold stated his own experience 11 years ago in trying to stimulate interest in refractory research. When putting down the experimental open-hearth furnace at Sheffield University, he lined part of it with German bricks, which after 11 heats stood out two inches above the British bricks. He endeavored to interest the local brickmakers, but they declined to have anything to do with bricks containing only 92 per cent of silica. He was attacked in the local papers as unpatriotic. He used German bricks in his furnaces for nearly two years, and then two British makers challenged the German bricks. On testing the British bricks against the German, all came out equal. Composition alone was not enough as a guide to the value of refractory materials, correct grading and fine texture being of great importance. He thought it was necessary to separate research from teaching, and said Sheffield University was not asleep, referring to a big scheme for research to which Hadfields (Ltd.) had given £2000.

Poor Clays Made Better by Germans

H. M. Ridge said that in his experience British clays were not inferior to those on the Continent, but were not used to the best advantage. The Germans were very skilful in making inferior clays available and in eliminating alkalies. The clay from Griesen, in Austria, for example, was in the ordinary way not sufficiently plastic or refractory, but by adding about 10 to 15 per cent of ordinary fireclay the properties improved most remarkably, and the product was exten-

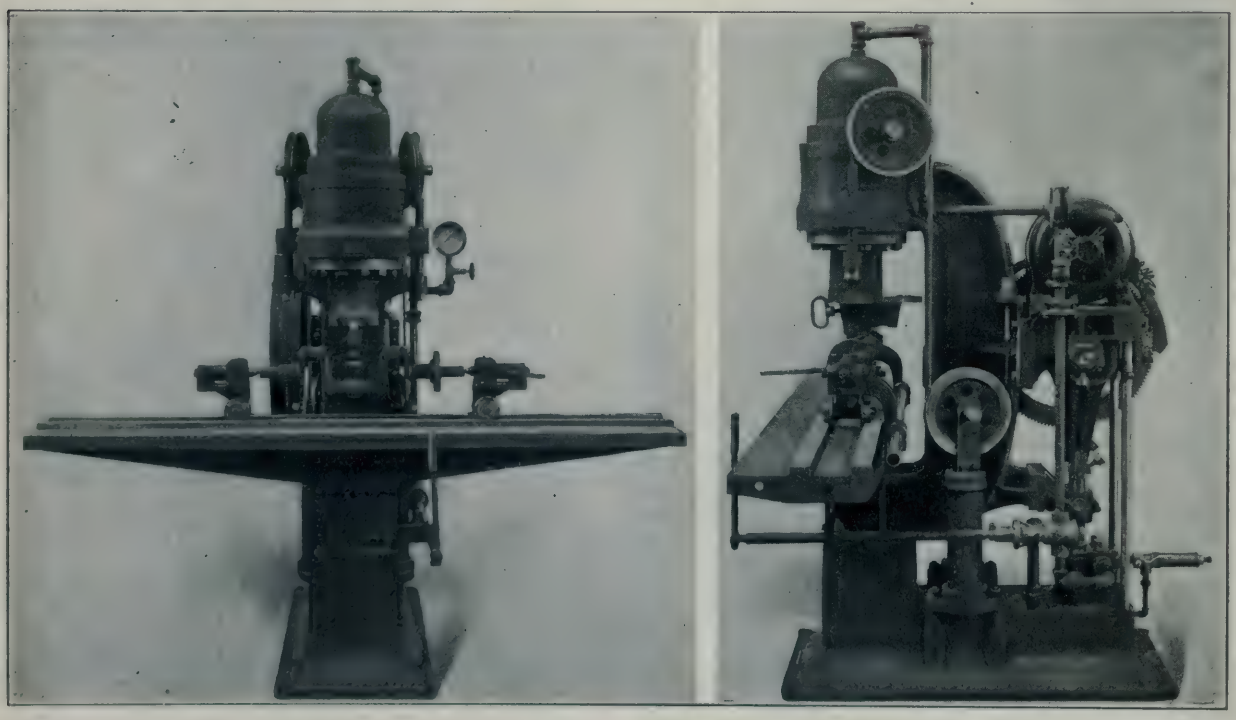
sively used for coke ovens and retorts. Bohemian kaolin was also extensively used for improving the quality of German firebricks, and it would stand up to Segar cone No. 36. The Germans had experimented largely on the correct amount and size of particles of the burnt fireclay or "grog" to add to the raw clay in making bricks. He had found some difficulty in obtaining from British makers continuous supplies of properly burnt firebricks, and complained that there was no place in this country, comparable to the plant at Charlottenburg, where he could send a firebrick for scientific testing. He also referred to the careless way in which firebricks were exposed to the weather in open trucks in sidings and by being stacked in the open air at the works.

Press for Straightening Crankshafts

The Metalwood Co., Detroit, has developed a line of presses for straightening crankshafts. Two sizes, 20 and 35 tons, are built. Either belt or motor drive is provided for the pump or the pressure can be supplied from an accumulator.

The table upon which the work is placed is of heavy box section reinforced by ribbing and is made of semi-steel. Renewable steel strips on which centers for holding the work are placed and which also take the thrust of the ram when pressure is applied to the work are provided. The centers are of the yielding type and are adjustable for length, and the thrust of the work is taken by tapered steel wedges placed underneath on steel tracks. Both the top and sides of the table are finished so that indicators may be used.

The sub-base upon which the pump is mounted forms a tank for liquor. The pump, which is of the two-plunger type, is built directly into the press. The body is of special bronze, with large valve areas, and the plungers are of hardened and ground tool steel. Phosphor bronze bearings are used throughout. The press is controlled by the builder's single lever, quick operating valve which gives control of the speed of the ram, its return and the amount of pressure applied. The ram nose is fitted with sliding chrome-nickel steel resistance block with two steps for crank work, this arrangement being relied upon to conserve the stroke of the ram and the use of liquor, as well as increasing the speed of the press. A heavy spring arranged for differential pull with adjustable tension provides for the return of the ram.



Special Motor-Driven Press for Straightening Crankshafts

Railroads Disagree

Baltimore, the official publication of the Merchants' and Manufacturers' Association, Baltimore, Md., publishes the following:

For a number of years the manufacturers of iron and steel articles in Baltimore have enjoyed the benefits of a privilege offered by the carriers, notably the Baltimore & Ohio Railroad, known as the fabrication in transit of bridge and structural iron and steel. This material, under this arrangement, is brought into Baltimore from the mills in Pennsylvania, Ohio and West Virginia in the raw state and holes are punched, rivets and bolts inserted and the raw material is otherwise worked into shape for the buildings and bridges for which it is ultimately intended and then shipped out at the same rate that would have applied had the material gone to the destination direct from the mill, plus a charge of one (1) cent per 100 lb. for the stop-off privilege. Our members have created a substantial business thereby and are enabled to compete successfully with plants in other sections favored, under other circumstances, by the rate adjustment. The Southern Railway Co. has been a party to these tariffs since their inception, but due to a disagreement between them the Baltimore & Ohio Railroad as to the proper division of the rate, the Southern Railway has canceled its participation in the arrangement and the Baltimore & Ohio has issued tariffs eliminating the Southern Railway, effective June 16, 1917. As this elimination works a hardship upon our members, the Traffic Bureau Committee, upon complaint, considered the matter, having representatives of the manufacturers present, and voted to ask the Interstate Commerce Commission to suspend the tariffs and also ask the President as an emergency measure under Section 5 of the by-laws to obtain the consent of five members of the Executive Committee so that immediate action could be taken. This was done and an application for suspension has been filed under the rules of the Commission asking for the suspension of Baltimore & Ohio Railroad Interstate Commerce Commission Nos. 15055 and 15057. The Baltimore & Ohio Railroad is simply named a party to complete the record.

At a recent meeting of the stockholders of the Hamilton Machine Tool Co., Hamilton, Ohio, the following officers were elected: President, Charles F. Hilker; vice-president, M. L. Milligan, and secretary and treasurer, John K. Hilker. The board of directors consists of Charles F. Hilker, M. L. Milligan, John K. Hilker, H. Belmer and O. W. Kuhn.

The 500 striking polishers at the Remington plant, Bridgeport, Conn., have voted not to obey the orders of their general officers to return to work.

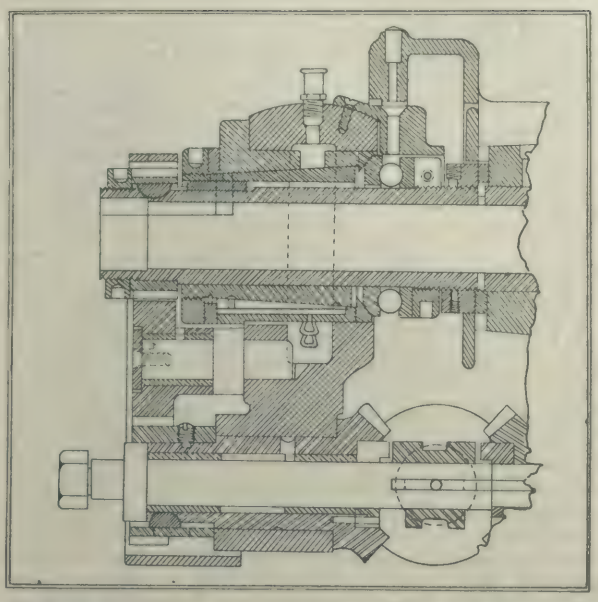
A 12-In. Lathe for Toolroom Work

A 12-in. lathe in which the back gears are mounted in a special yoke has been brought out by the Davis Machine Tool Co., Inc., Rochester, N. Y. This arrangement for mounting the back gears and bringing them into mesh with the cone gears by a cam operated by a handle on the front of the lathe has given the tool its designation of close coupled.

The bed of the lathe is dropped down at the rear end to enable the tailstock to be slid off without disengaging the clamping bar or removing any bolts. Transverse double wall cross girts of heavy section are relied upon to enable the bed to resist strains. The headstock is a heavy one-piece casting in which the front and rear walls of the bearing extend to the center line of the spindle. This construction, it is pointed out, ties the headstock together. The cone pulley is covered by guards which are integral with the head, and a brake for stopping the rotation of the spindle is mounted in the top of the guard. The back gears are located under the headstock at the front end of the spindle, an arrangement which it is emphasized provides a drive from the cone through the gears without a long eccentric shaft and quill. These gears are mounted in a yoke which swings from a point at the back of the headstock and are thrown into mesh by a handle placed at the front of the lathe, thus making it unnecessary for the operator to reach over the cone. The small cone gear, which is usually placed at the end of the cone next to the small step, is placed at the opposite end adjacent to the large step and securely keyed in position, the cone driving plate being carried on its other face.

The spindle, which is of crucible steel, revolves in phosphor bronze bearings mounted in the headstock that are relied upon to give a rigid support for the spindle. Lubrication is provided by oil rings dipping into large pockets cored in the walls under the center of each bearing. The front bearing for the spindle is of the taper type and wear is taken up by drawing the spindle into the taper. The rear bearing is keyed to the spindle and slides on it, the adjustment being made by a collar on the end which draws the spindle into a taper bronze box. Hardened steel washers and self-aligning ball bearings are provided to take the end thrust.

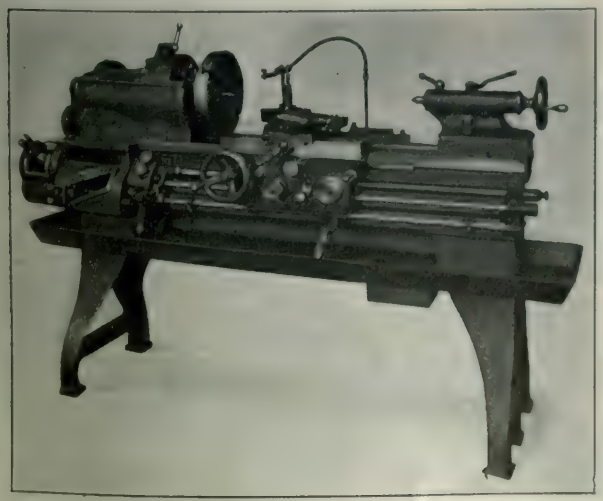
The carriage has a bearing of 19¼ in. on the ways and the cross bridge is 6 in. in width. The compound rest swivel base is graduated and has four clamping bolts, a construction which is relied upon to permit heavy cuts to be taken without deflection. Wear in the cross and compound slides is taken up by taper gibs having an end screw. The apron is of the conventional double plate type, providing two bearing supports for all shafts. Longitudinal and cross feeds are controlled from the apron and both can be released while cuts are being taken. Provision is made to prevent a simultaneous engagement of the feed and the half-nut. All of the apron bearings are lubricated from a central oil pocket and the rack pinion stud can be withdrawn when the lathe is used for screw cutting. The mechanism for reversing the carriage is operated by a lever at the right end of the apron which controls a sliding clutch under the headstock that provides carriage travel in either direction through a set of bevel gears. This arrangement, it is pointed out, enables the spindle to run in the one direction and doubles the number of speeds available by driving both countershaft pulleys in the same direction. An automatic stop for the carriage is obtained through the same rod that operates the reverse mechanism, and can be employed with either the screw or the feed rod. The use of adjustable collars enables the lathe to be employed for duplicate or shoulder work.



The Back Gears Are Carried in a Yoke and Are Swung into Mesh by a Cam and the Small Cone Gear Is Located at the End of the Cone Adjacent to the Large Step and Has the Cone Driving Plate on Its Other Face

The tailstock is of the cutaway type and permits the compound rest to be set parallel with the bed. Two ⅝-in. bolts are provided for locking the tailstock to the bed. The tailstock is of heavy construction and the upper part is arranged to set over for taper turning.

A quick-change gearbox, which is a self-contained unit, provides for 36 feed changes. The feeds are obtained without the use of the lead screw through an independent feed rod which can be locked in or out by a clutch adjacent to the gearbox. The gearbox also supplies 36 leads for threads ranging from 1½ to 80 per in. including the standard 11½ pipe thread, and others can be secured by changing gears on the quadrant at the end of the lathe. The lead screw is 1¼ in. in diameter and can be locked out when not in use.



A Special Arrangement for Mounting the Back Gears Characterizes a New 12-In. Lathe for Toolroom Work

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The exports of tin from the Federated Malay States in June were 3489 tons as compared with 3413 tons in May. In June 1916 and 1915 respectively they were 3435 tons and 4048 tons. The June exports this year were the largest for the year except the 3558 tons in January. To July 1, 1917, the total exports have been 19,752 tons against 21,725 tons and 23,318 tons to July 1, 1916 and 1915 respectively.

The Bethlehem Steel Co. has placed No. 3 blast furnace at its Steelton, Pa., works in operation, following extensive improvements. The entire battery of six furnaces at the plant is now being operated.

Hamilton & Hansell, 17 Battery Place, New York, have been appointed Eastern sales agents for the Hoosier Rolling Mill Co., Terre Haute, Ind., which produces high grade refined iron.

The Bullard Machine Tool Co., Bridgeport, Conn., has announced an increase of 10 to 16 per cent in wages, affecting all employees.

Managing Alien Workers in War Time

Human Element Must Be Given Consideration in Solving Problems Which the World War Has Brought upon Industry

BY WINTHROP TALBOT, M. D.

WORLD-WIDE war confronts industry, and managers of industrial plants face new human problems. Man power and woman power are at a premium and seem likely to remain so. The casualties of war are largely estimated at 45,000,000, a number equal to the total population of Great Britain, and America is only just beginning to contribute her quota. The next few months will see the best manhood of the nation withdrawing from the industrial field to be drafted for active work abroad. Every industrial establishment faces readjustment of its working force. Every industrial manager is compelled by war pressure to study human conservation. Every director, every superintendent, every foreman and gangboss fails unless he turns his attention to solving employment problems and solving them intelligently along modern lines of human engineering.

Do lines of workmen seek jobs at your gate? No, for the job seeks the man. Where formerly a great metropolitan daily carried 20 columns of "Situations wanted" and but eight columns of "Help wanted," to-day the case is reversed, there are 20 columns of "Help wanted" to six columns of "Situations wanted." On July 15, a Sunday edition had 29 columns advertising for male help contrasted with eight columns of situations wanted by men. There were nearly 30 columns of advertisements for female help, with only five columns of situations wanted by women. Are you able to pick and choose, or hire and fire at will? Not in the basic industries. Moreover, increased demands for output are pressing as labor shortage increases.

Problem of Labor Supply

These commonplaces are disheartening unless some solution can be found. The problem of adequate labor supply can be met, but only by leaving the well-worn ruts of old-time employing methods, and by finding better ways and wiser adjustments in the handling of men —and now of the women who are taking the place of men.

In those industries where many aliens are employed, labor shortage is especially noticeable because of the diminution of immigration since 1914. Instead of a million new toilers a year coming to our shores to seek employment, the net immigration in 1916 was less than 100,000.

Heretofore industrial management has been satisfied to treat the alien somewhat cavalierly. Aliens have been "hunkies" or "polaks" or "wops" to the average employing agent. Few concerns have taken the trouble to make records of shifting alien labor, for there were always men at the gate to be picked up for a day's work. If a man didn't suit he was discharged. The smallest living wage was given and that grudgingly. To-day there are seldom men at the gate and the demand for wage increase comes often enough and must be heeded or your working force walks out.

It has been found by many concerns already, and others are going through the painful process, that increased wages and shortened hours are not enough. To the old-time industrial autocrat the awakening has come as an unwelcome surprise, but the manager who is a student of men and times has adopted improved employment methods, in some degree at least. During the past few years, welfare plans have been abandoned in favor of more scientific methods. Industry has begun to look upon the labor problem as one demanding exact observation, intensive study, and careful thought, like any other industrial engineering problem.

The Alien Laborer

As immigration has decreased the alien laborer has become a source of keener interest. We are hearing more about Americanization, a handy word, which, like the mantle of charity, covers a multitude of economic sins both of omission and commission. We are gradually realizing that our labor must be less masterfully employed; that labor expense must be differentiated more clearly from labor cost; that the value of labor cannot be measured merely by the wage paid without taking into consideration the work accomplished and increment of gain, for probably all agree that never has there been a time when less return in the form of work was given for so large a wage. It may be that someone has analyzed the matter and has learned the reasons why this is so. Probably there are many reasons, and perhaps the most important may be indifference to the whole human problem in industry, not only of the manager, but especially of the non-resident director.

Scattered throughout the Eastern States are thousands of communities where immigrants since 1900 outnumber the native born. They do not speak English much, a quarter of them not at all, and an equal number cannot read or write even in their native language. We have allowed communities to be built up which are as foreign in language, habits, thought and action as villages in Russia, Poland, or Italy. This is no news. Everyone has known it for years, and familiarity seems to have steadily bred contempt, but war-increased wages, slack workmanship, and driving demand for increased production are bringing industrial management up with a round turn to study the alien residential and employment problem with more intelligence. Some of the largest employing companies are still mighty dull of apprehension and have not waked up yet in spite of several severe jolts in the recent past. Few directors have learned to think in terms of community responsibility as an element of private gain and it is difficult for such belated individuals to realize that no industrial concern to-day is strong enough laborwise to act independently of other employing concerns. For instance, such communities as Bayonne, Bridgeport, Newark and Paterson are typical of many others where numerous industries are now competitors in a labor market which is insufficient to meet war needs. In such communities, the first requirement is a get-together campaign on the part of managers to form a clearing-house for information and self-education on these new industrial and alien human problems.

Seeking Expert Knowledge

Expert knowledge is available, but the American manager is only just beginning to learn the importance of seeking expert knowledge. The war is teaching him, for the industrial world has come to have a wholesome respect for the staying power and the ruthless vigor displayed by German industrial organization, the secret of which lies in the fact that for years Germany has followed an unswerving policy, first, of getting together, and, second, of training and employing expert knowledge in solving special problems.

If there is one thing as certain as truth, it is that American industrial organization must surpass German organization in these two respects: namely, co-operative methods and the employment of expert knowledge in every form of industrial activity, and especially on the human side. These are winning cards. American science has played them and is winning. American industry can also.

It is futile for any one industrial concern in a given locality to attempt to cope with the alien problem single-handed. It is a problem that requires co-operation

on the part of all the industrial leaders of the community. Raising wages isn't enough; shortening hours isn't enough, and the reason why higher wages and shorter hours will not suffice is that the alien problem in industry is one which concerns not so much the men as the women and children—in other words, the home of the alien; but the home is a community problem, and the community which alone can provide the solution depends for its leadership upon the managers of its industries. Professional men such as lawyers, physicians, educators and the clergy do not hold the purse-strings, nor pay the bulk of the taxes. The industries do. Therefore industrial managers must assume a constructive leadership in community matters.

When Conditions Are Bad

Let us analyze the subject further. Here is a community which employs thousands of aliens. There are refineries, woodworking establishments, metal trades, cloth mills, and dozens of minor factories. The city administration is largely in the hands of professional politicians. Housing conditions are bad. Air pollution is bad. Drainage and removal of waste is bad. Water supply is below standard. Food adulteration is bad. Food cost is exorbitant. Recreation facilities are meager. There are 30 races speaking 40 different languages and dialects. Is the case overstated for immigrant centers? Probably not, for the bare facts have scarcely been touched upon; they are too obvious in our industrial towns even to require stating. What is wanted is a remedy; that it is our business to supply.

The first step is for the local managers to get together, establish a loose but effective form of organization with headquarters for gathering together, with the aid of some well informed mind, the existing data on the aliem problem in industry; not to waste time in making intensive local surveys for dramatic purposes, valuable as such surveys have been in the recent past, but to use the existing expert knowledge which will suffice to meet and cure any local difficulty if made locally available. The first essential is that some person who has given the subject comprehensive study, capable of thinking in large terms as well as in details, shall be enabled to give his time and thought unhampered to the work in hand. The next step is to map out a plan of campaign, to find out first just what the industries should do, how much cash and collaboration they must proportionately subscribe in order to assume their proper share of community responsibility.

Functions of the Manager

These are the preliminary steps. The manager selected to become the community advisor, friend, organizer, educator and guide must furnish the vision, tact, energy, enthusiasm, interest and information to weld the community into a living unit. He will enlist the help of opposing factions in the spirit of common service.

This is a method which has been adopted in those cities where the alien and labor problems have reached most nearly a satisfactory conclusion.

Wartime demands unity of action; wartime demands intelligent co-operation; wartime demands the utmost growth of every individual together with the submergence of personal aims of the individual to community service; wartime demands a get-together program. Now is the time for clear thinking. It is the time for a strong pull, and a long pull, and a pull all together. It is the time to get rid of old fogey notions. It is a time to throw over the autocracy in industry based on privilege, to centralize the responsibility of authority while decentralizing initiative and action. Now what does this mean? It means that the industrial manager must be the responsible authority, but that every one in his working force shall be provided with the largest opportunity to make the most of himself and so be able to give his best. By decentralization of initiative is meant that individual initiative shall be encouraged to its utmost limit. We speak of this as an age of machinery, but it is rather an age of men, for it is the man behind the machine who counts. No matter how simple the job, intelligence is an economy. It is the intelligence of the shoveler, the yardman, the operator no less than of the boss, foreman, superintendent, manager, director and president, that counts. Although the responsibility for direction rests with tremendous weight upon the industrial manager, the capacity for direction must be equally developed in his coworkers.

Deepening the Human Touch

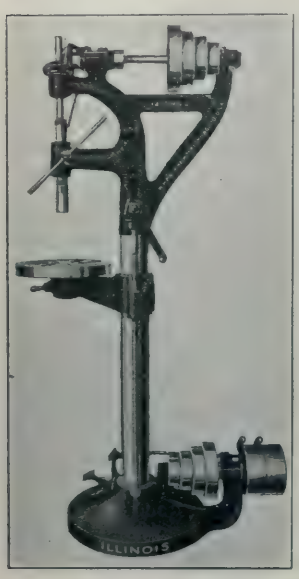
Let us face the proposition squarely and honestly. Let us recognize the necessity for deepening the human touch. Is your system of employment such that it provides you automatically with the knowledge necessary about all who are at work so that not only may the square peg be placed in the square hole, but in the right square hole too? If work conditions are faulty, unhygienic, inconvenient and irritating, if the relation of fatigue to efficiency is not studied, if it is thought that long hours of uninterrupted labor are proportionately productive, if matters of food, ventilation and lighting are not definitely in the hands of trained, informed and responsible executives, if the approach to the works is sordid, unkempt and repellent, if, in other words, your organization and work conditions are not arranged primarily to utilize the human factor to the best advantage, are you not really a back number as a manager, and should you not make good or else step down and out? If you are this passé person and your directors are really directing, you will be shelved, pensioned, retired, or otherwise pushed into a position of innocuous desuetude. We all know the manager who runs his works on the old fashioned military plan. His word is law. He is a martinet, a precisian. He wants no suggestion from any subordinate, and certainly gets none. His plant is effective in the old fashioned sense of the word, but he has been recently laid aside because the recurring strikes under his management were too costly. Such strikes come from the fact that autocracy in industrial management is out of date. We know, too, the other type of manager who as president of his company never has any labor disputes, and enjoys the largest success because he gives his entire thought to the selection of responsible human helpers, each a specialist in his own small or large field and all knitted close together by the intense human personality of the chief—chief by right of the fact that he is a man who realizes the high wages and short hours will never satisfy anyone and who recognizes that what a man wants is the largest freedom and opportunity for his own best activities and the well-being of those who are dependent on him.

If we have analyzed the situation correctly, we are brought to the conclusion that in every industrial center there should be a clearing house of information for the benefit of the management of every industry to put at the service of any executive a clear conception of just what the most recent developments have been with regard to every detail of the human factor in industry, because so rapid have been the strides of the art of industrial management on the human side in the last five years that without some such system no manager can keep himself up to date on this point and have time for anything else.

As a matter of fact, many industrial centers are beginning to appreciate this need and some have begun to provide in their chambers of commerce, boards of trade, or managers' associations, a method of supplying this needed information. Some large concerns have gone a long way in this direction individually, but they are hampered by the very fact that they are not putting themselves into close co-operative touch with other employers of labor. In this period of readjustment of employment, some industries are becoming paralyzed by the war and are throwing out of employment many thousands, while the war industries, on the other hand, are pushed to the limit to use every available human and mechanical aid to increase production. It is important in the extreme and would be an evidence of sanity, balance and business acumen if in every manufacturing center there could be instituted this get-together policy with regard to human administration on the human side in general and for employment of alien labor in particular.

New Drilling Machine for Light Work

The W. W. Machine Works, Chicago, is manufacturing a 14-in. upright drilling machine specially designed to handle small and medium-sized work. In its design care has been taken to supply a machine of a durable character. Its height to top of cone pulley is 68 in., and it requires floor space 20 x 30 in. It will drill to the center of a 15-in. circle. The spindle has a No. 2 Morse taper hole and drills up to ¾ in. The speed of the countershaft is 400 r.p.m.



Small and Medium Sized Work Is the Field of a Recently Developed Vertical Drilling Machine

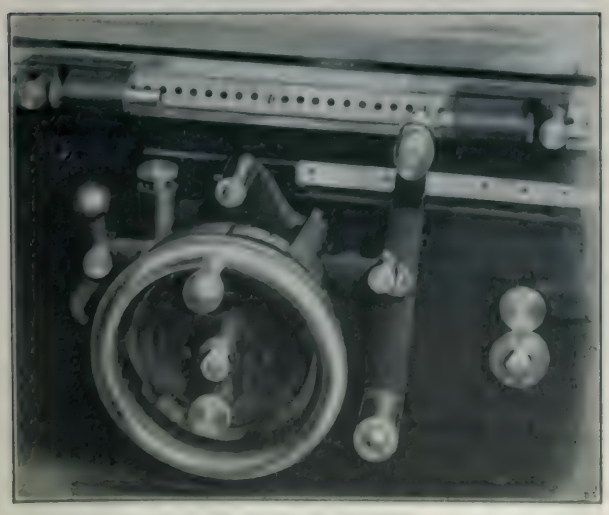
The base is provided with ribs on the inside and is unusually large and heavy, measuring 20 in. in diameter. The stationary head is cast integral with the column, affording great stability. The spindle is provided with a ball thrust bearing on the lower end to take up pressure when drilling. The spindle driving gear is fitted with a double-headed key of large size sliding in the splineway of the spindle. The gear has a hub 3-in. long, running on a flanged bronze bushing. The machine is distributed by the Stocker-Rumely-Wachs Co., Chicago.

Improved Grinding Machine Cross Feed

Notable improvements have been devised by the Ott Grinder Co., Indianapolis, on its No. 2 universal grinding machine. The most notable feature is the cross-feed mechanism. Simplicity and ease of adjustment, it is emphasized, have been attained by using a single rocker arm, a spring plunger and a stop screw.

At the reversal of the table, the cross-feed rocker arm is tipped to its lowest position by a hardened pin on the reverse lever. As the table reverses the rocker arm is free to move upward, being actuated by a compression spring until the adjustable screw stop is reached. At the left end of the rocker arm a pawl engages the cross-feed ratchet wheel and causes it to rotate, giving the feed, which can be varied from 0.00025 in. to 0.003 in. It will be seen that the grinding wheel is fed in under power while the spring is relied upon only to give the feed adjustment.

The feed may be thrown out by rocking over the feed pawl or screwing down the adjustable stop. As formerly, the feed has an automatic throw out and also a positive stop when feeding by hand. The feed mechanism is simple, accurate and free to make adjustments while the machine is in operation.



A Single Rocker Arm, a Spring Plunger and a Stop Screw Control the Operation of the Improved Automatic Cross Feed

Pre-melting Ferromanganese in an Electric Furnace

The efficiency of an electric furnace in melting down charges of ferromanganese has been studied by Dr. F. Bittner of Breslau, Germany. He used a 3-ton Nathusius furnace and published his results in *Stahl und Eisen*. The *London Iron and Coal Trades Review* gives the following abstracts of his report.

Three-phase current was employed. It can be used of any convenient frequency. There were three pairs of electrodes. The three top or surface carbon electrodes were connected to the outer terminals of the secondary windings of the furnace transformer and the mild steel bottom electrodes to the inner terminals of the secondary coil. When working without a booster transformer the bath had to be heated almost exclusively by the electric arc as only about 4 per cent of the current input goes towards heating the bottom. With this system of connection the average load at the arc circuit is about 190 kw., while that of the bottom circuit is only about 8 kw. If, however, the bottom circuit is strengthened by the use of a booster transformer the average load at the arc circuit will be 171 kw., and at the circuit through the bottom electrodes 48 kw., or about 22 per cent of the total energy input.

As the principal advantage claimed for the Nathusius furnace lies in the possibility of heating the bottom, it is recommended to strengthen the bottom electrode circuit by means of a booster transformer. The following table compiled by the author shows the percentages of the total input, producing useful effects and loss respectively:

Portion of Total Input	Kw.-hours	Calories	Per Cent of Total Input
Used for melting the ferromanganese.	354.0	826,000	42.5
Used for melting the lime and forming slag	7.4	17,300	0.9
Lost in transformers	33.3	77,700	4.0
Lost in conductors	58.3	136,100	7.0
Lost in water cooling of electrodes	50.0	116,900	6.0
Lost in conduits and by radiation, including maintaining the heat of the bath	330.0	770,000	39.6
Totals per ton of metal	833.0	1,994,000	100.0

It will thus be seen that the efficiency of the furnace is very low (43.4 per cent), but in the author's opinion an electric furnace, working with a neutral zone, is eminently suitable for melting ferromanganese for, notwithstanding the high cost of current, the melting can be effected economically and without much loss of manganese, an important consideration when dealing with a deoxidizer. It should also be explained that the molten ferromanganese was used in connection with a basis Bessemer plant and had to be kept at a temperature of 1300 to 1350 deg. C. in readiness for the purpose.

The loss of manganese was only 0.385 per cent, a negligible quantity. The costs of melting a metric ton of ferromanganese in the electric furnace are given as follows:

	s.	d.
Current, 833 units	15	0
Electrodes	1	9
Wages	1	6
Depreciation of lining	0	6
Total per ton	18	9

Both the primary and secondary windings of the transformers were star-connected. The mean value $\cos \phi$ was found to be 0.766 for the arc circuit and 0.740 for the bottom circuit.

For firebox steel for both locomotive and stationary service the manganese requirement under specifications of the American Society for Testing Materials has been put tentatively at 0.30 to 0.60 per cent.

Book Review

Office Organization and Management.—By Carl C. Parsons, manager Shaw-Walker Co., New York. Pages 313, 5½ x 8¼ in.; illustrated by charts and half tones. Published by the La Salle Extension University, Chicago.

This volume discusses a large number of subjects relating to office work, including such topics as laying out the office, office employees, office training, rules and regulations, methods of payment, promotions, vacations, records and the office manager. It contains much good advice, but naturally there are many points on which many who have had experience in office management will disagree with the author. One of the important features of the book is a discussion of employees from the human side, and this unquestionably is a subject that deserves the constant attention of an office manager as well as of others in authority. In regard to constructive discipline, the author believes it is a settled principle that the honor list, with its awards, will correct bad habits in an organization more quickly than any penalty which may be imposed. He cites the case of one office where there had been difficulty in handling lateness which was reduced at least 50 per cent by a system of credits for promptness and rewards for conformity to the rules. Probably no one would question the importance of an office manager having the numerous qualifications of mind and heart which the author says he must have in order to be really successful. He expresses the opinion that successful office administration requires leadership which is able, intelligent, sympathetic, progressive and constructive.

Addressed to the undergraduate, but having a message to everybody, Clarence H. Stilson, Yale, 1897, has written a little book on getting on in the world. He has given it the title "After Graduation—What Then?" It is a compilation of terse bits of advice, which give the impression of coming from an experience and from observations which the author is desirous of putting at the disposal of others. While naturally the younger the person to whom the book may come, the better it is for him, it follows that he who has made the mistakes pointed out will more genuinely realize the value of the hints. The booklet, which is bound in paper covers and obtainable at 25 cents per copy from the author, who may be addressed at Waterbury, Conn., is one of that series of books of epigrams, truisms and quotations which are readable at any point. As appealing to the one at the beginning of his career, the book touches on in order: a purpose in life; what success really is; the school of life; the power of the present; the time element; right thinking, etc.

To the one who has been jolted to find himself possessed of no clear notion of a fact which he should have obtained and retained, say, from a book, a little pamphlet of 65 pages by Dr. George Fillmore Swain, prominently known in the civil engineering field from his long time teaching service on the staff of the Massachusetts Institute of Technology, will have an appeal. The booklet is entitled "How to Study," and is published for sale at 25 cents per copy by the McGraw-Hill Book Co., New York. It is, of course, intended chiefly for students and teachers, but it will bear perusal by the average man, who can hardly afford to stop studying. It is rather elaborately subdivided, so the reader may refer directly to any heading which meets the need at the time.

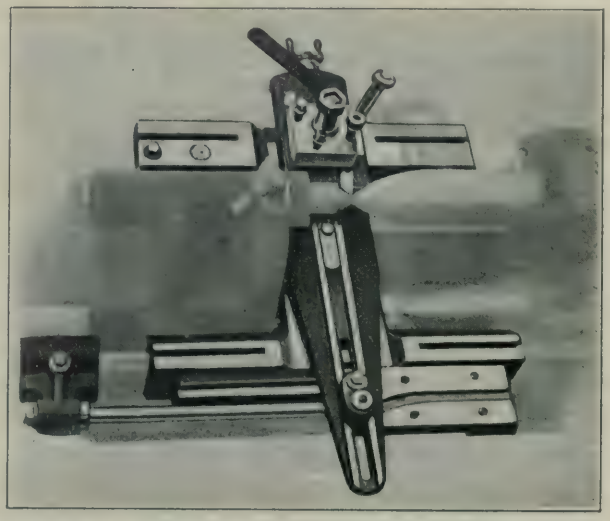
"The Primary Volatile Products of the Carbonization of Coal" is the title of an important technical paper, No. 140, by Guy B. Taylor and Horace C. Porter, issued by the Bureau of Mines. It is a continuation of the work described by Bureau of Mines Bulletin No. 1 on the character of the volatile matter of coal. In this later discussion the experimental methods have been refined and more precise results obtained. It is a study of basic phenomena in carbonization rather than of the ultimate results of these phenomena as a whole.

Heavy Duty Lathe for Shell Production

The Cincinnati Lathe & Tool Co., 3207 North Street, Oakley, Cincinnati, is equipping its 18-in. lathes for the rapid production of shells. The equipment provided includes a 9-in. universal chuck, a square European tool post and a forming attachment with a cam to form shells of any radius.

The lathe is of heavy construction, the bed being reinforced by a number of internal box section girths. The headstock spindle is a high carbon steel forging finished by grinding and lapping. A collar is provided at the nose end which is relied upon to provide a stiff bearing when chucks and faceplates are used. The bearings are of bronze and a thrust bearing, consisting of a hardened tool steel collar with an adjustment for wear, is located at the rear end of the spindle, the end thrust being taken against the front end of the rear bearing. Lubrication of the bearings is provided by self-closing dust-proof caps in connection with grooves in the bearings.

The apron is of box type construction, thus providing a double support for all the shafts and studs. The rack pinion is of steel and located close to the rack on the bed and receives power through compound gearing. The longitudinal and cross feeds which are of the friction type can be started, stopped or reversed while the lathe is running, but cannot be engaged while thread cutting is being done, and an automatic stop is provided for throwing out the feeds whenever desired. A thread chasing dial enables the carriage to be run back by hand and the thread caught at any point without reversing the lathe.



Shells of Any Radius Can Be Formed Rapidly by This 18-In. Heavy Duty Lathe Equipped with a Square Tool Block

The reverse plate for cutting right and left-hand threads is on the outside of the headstock and is employed for reversing the lead screw only. A quadrant on the end of the lathe permits a combination of extra or metric pitches with the United States standard lead screw or vice versa, in addition to those obtained in the gearbox. The changes from one standard thread to another are readily made without duplicating or removing a gear by operating two levers conveniently placed a few inches apart. Operating a single lever provides nine feed changes. The gears are of forged steel and are assembled in a box which is mounted on the front of the bed and can be removed and replaced with another whenever desired.

The tailstock is of the offset type, permitting the compound rest to be set in a plane parallel with the bed. The spindle is large in diameter with a bronze nut for the screw and is locked in position by a clamping device.

In a test made of one of these lathes with the shell forming equipment, a shell of 0.50 per cent carbon steel with a 12-in. radius was machined at the rate of 204 ft. per min. at the point and 69 ft. at the end of the radius. The shell was completed in a trifle under 17 min., the depth of cut being ½ in. with a 1/32-in. feed and a spindle speed of 130 r.p.m.



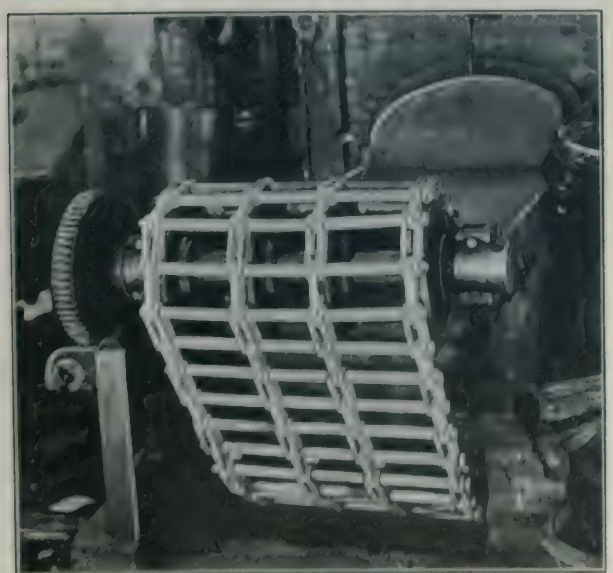
Assortment of Carburizing and Annealing Boxes, Tubes, Baskets, Etc., of Cast Nichrome

Castings That Withstand High Temperatures

An Alloy Which Under Heat Maintains Its Strength and Resists Scaling as Well as Change in Form

THERE is a demand for a metal or an alloy that will withstand high temperatures without any large alteration in tensile strength or especially any great change in its physical appearance such as scaling or oxidizing. If toughness and resistance to change of form are combined with the above-mentioned qualities, then a wide field of usefulness at once becomes possible. If it is also machinable, then its value is increased. A new alloy is being successfully made on a fairly large scale in the form of castings by the Driver-Harris Co., of Harrison, N. J. It is offered as possessing the properties named and is being used to advantage in several fields of industry.

The alloy is composed of about 60 per cent nickel and 14 per cent chromium, the remainder being principally iron. It is being melted in crucibles and poured in sand molds in a special foundry for this purpose. It can be cast easily and in various shapes and in any weight up to 1200 lb. It is known to the trade as "Nichrome." The fact that it can be used in practical service at high temperatures with extremely long life in the form of castings, as compared with iron or steel, has enabled the company gradually to find many important industrial uses for it. The new alloy has now been made as castings for some time. Patents have been assigned to the company by John C. Henderson, an engineer of the company.



The Nichrome Conveyor Chain at the End of the Wire Annealing Furnace at the Plant of Driver-Harris Co.

Besides its ability to withstand high temperatures up to 1800 to 2000 deg. Fahr. without alteration in form and with negligible oxidation, it possesses at these temperatures a strength of about 30,000 lb. per sq. in., according to the claims. Nichrome melts at about 2800 deg. Fahr. and when cold it has a tensile strength of about 45,000 to 50,000 lb. per sq. in. In addition the metal is very tough at 1800 deg. Fahr., and will bend considerably before breaking, even when red or white hot. A demonstration of this quality is often made by the company by heating to a red heat a plate of the alloy, ¾ in. thick, and then striking it often with a 20-lb. sledge on the unsupported center of the plate. Stubborn resistance to bending has been the result in each case.

The general industrial application of this new alloy has broadened until it embraces annealing and carburizing boxes, heating retorts and conveyor chains used at high temperatures and other similar uses. It is being incorporated in the valve seats and valves of internal combustion engines, wire baskets and other utensils where either heat or acids and chemicals, or both at once, must be withstood.

The illustration at the head of this article represents a miscellaneous collection of various forms of boxes, baskets and containers used in carburizing, annealing, heat treating, etc. In fact, the use of the alloy as annealing and carburizing boxes is one of the important present industrial applications. It is the claim of the company that, as compared with cast-steel boxes under similar conditions, the Nichrome annealing or carburizing shapes last about 6000 hours as compared with 200 to 250 hours for the steel. The fact that it does not oxidize and scale off enables the Nichrome boxes to be made thinner and lighter, still maintaining the strength and also insuring more efficient heat conductivity.

The company itself has a practical application of this alloy which is interesting. In the heat

treatment of its Nichrome wire it is necessary to pass it through a wire annealing furnace to a temperature of approximately 1600 deg. Fahr. It is necessary to seal the ends of the furnace with water to prevent oxidation by air. The wire is carried slowly through and out of this annealer on an endless chain. Because repeated heating and cooling would soon destroy an ordinary chain, the company uses one made of Nichrome which has met the conditions extremely well. One of the illustrations shows this chain installation in operation.

Another illustration shows the use of Nichrome dipping baskets used in immersing heated iron or steel in cyanide baths for carburizing. Similar baskets or utensils are used for pickling purposes and heat-treating work. One is reported to have been used six months in acid dipping where it was subjected to 40-deg. nitric acid, 40-deg. muriatic acid and 66-deg. sulphuric and as well as a mixture of several acids. Signs of the metal being affected were lacking in all these instances.



A Dipping Basket of Cast Nichrome Used in Immersing Iron in a Cyanide Bath

Another important application is the use of this alloy as pyrometer protection tubes. This type of tube in the cast form is said to be extensively used and to be rapidly displacing the easily broken porcelain ones. In one case such metal tubes showed a life of 4000 hours.

The question of the use of this alloy as crucibles is now a matter of research. Experiments thus far indicate the possibility of its adaptability to containers for melting brass, bronze, phosphor copper and other alloys successfully. Such a substitute for graphite crucibles would be a decided advantage under present conditions.

A new foundry, equipped with a 2-ton Heroult electric furnace for melting the alloy, is now under construction at a cost of over $100,000.

Ferromanganese $mports Low in June

The imports of ferromanganese for the month of June were the lowest of any month this year excepting May. The total for June was 2717 gross tons as compared with 2019 in May and an average of 6190 tons for the first four months of the year. The June receipts were received as follows: Through the port of Philadelphia, 500 tons; through the port of Baltimore, 1735 tons; through the port of New Orleans, 482 tons. Total receipts for the first six months of this year have been at the rate of 4916 tons per month as compared with 7577 tons per month in all of 1916.

TO ABANDON SANDY HOOK

Kent Island Proposed Proving Ground for Cannon, Armor and Ammunition

WASHINGTON, July 31, 1917.—The War Department has decided to abandon Sandy Hook as a proving ground for big guns and Secretary of War Baker has transmitted to Congress through the Treasury Department a request for an appropriation to purchase Kent Island in Chesapeake Bay "to be employed for the testing of cannon, ammunition and accessories." This announcement has drawn a vigorous protest from Senators and Representatives from Maryland, in which Kent Island is located, and who have been appealed to by some 3000 residents of the island who are unwilling to surrender their homes, although guaranteed liberal indemnity.

The decision to abandon Sandy Hook, which for many years has been employed for the testing of big guns, has been foreshadowed for some time in the reports of ordnance officers. Two important considerations have moved the War Department to act in this matter. From a military standpoint Sandy Hook is badly located for defensive purposes and the recent tendency in both War and Navy departments has been to place all manufacturing, testing and storing establishments far enough from the seacoast to prevent them from being captured or damaged in the event of a sea attack by an enemy. The other consideration, which is becoming daily more pressing, is the danger from gun fire to the shipping congested in the vicinity of Sandy Hook. There have been several narrow escapes from serious damage to vessels and the necessity for avoiding this menace imposes drastic restrictions upon the officers in charge of the testing operations.

Kent Island, which it is proposed to purchase for use as a proving ground, has been fixed upon by a board of ordnance experts after the examination of many localities. It is said to afford the only available range for the firing of guns carrying up to 17 miles that would be entirely safe to life and property. The department's plan is to acquire the entire island, purchasing the property from private holders, and to establish all necessary facilities for the handling, mounting and testing of big guns, ammunition, etc. It is also possible that a storage depot for ammunition reserves may be located on the island. While the projected site can be easily approached through deep water from the Atlantic, it is regarded as amply protected by fortifications at the Capes, and the fact that it is an island would facilitate War Department officials in preventing any form of hostile espionage.

Opposition to the acquisition of Kent Island will be encountered in both houses of Congress. Senator Smith of Maryland and Representative Price, who resides in the district in which the island is located, have already taken the matter up with the War Department and have announced that they will fight any measure carrying the proposed appropriation that is presented. The island is said to be exceedingly fertile and this fact will be urged as an argument against the War Department's plans. If Secretary Baker's project is adopted it will mean the passing of historic Sandy Hook as a proving ground for big guns, but the Government will probably retain its reservation indefinitely. W. L. C.

The Cutler-Hammer Mfg. Co., Milwaukee, maker of electric controlling devices, lifting magnets, etc., has made a gift of a fellowship of $400 for research work in physics to the University of Wisconsin, Madison. The deed states that the object of the gift is to initiate co-operation between the industries of the state and the university in working out problems of a scientific nature.

The annual congress of purchasing agents under the auspices of the National Association of Purchasing Agents, will be held at Pittsburgh, Oct. 9, 10 and 11. The program includes business sessions for the mornings and visitation and inspection of industrial works during the afternoons.

Pushing Destroyers and Merchant Ships

Plan for Submarine Chasers Abandoned—Shipping Board Activity with Edward N. Hurley as Chairman

WASHINGTON, July 31, 1917.—An important change in the plans for fighting the submarine has been decided upon by the Navy Department and as the result the project of constructing a large fleet of 160-ft. submarine chasers heretofore determined upon has been abandoned, and orders will be speedily given both to navy yards and private shipbuilding plants to concentrate their efforts upon the production of the largest possible number of torpedo boat destroyers. Construction experts from all the navy yards have been summoned to Washington for conferences on the new building program and representatives of private yards have already given assurances not only as to their ability to turn out a large number of destroyers but as to making deliveries in record-breaking time.

Many Destroyers to Be Sent

The new move of the Navy Department is understood to have two objects, namely, the protection of the commerce of the Atlantic from the submarine and the strengthening of the American Navy with a view to its participation in what is referred to here as the "big spring drive" against the German fleet and naval bases which, according to rumor, is scheduled for next March or April. The experience of the past three months has demonstrated that the destroyer is by far the most effective opponent of the submarine. This fact has been emphasized by the work of the American destroyer flotilla operating in European waters under Admiral Sims, which has drawn high compliments from European naval authorities. Recent experience has also made it perfectly clear that the small submarine chaser, approximately 100 ft. in length, is much less effective either in attacks on submarines or for convoying purposes than was hoped, and while all these vessels now on the ways will be completed, it is probable that very few additional boats of this type will be built. So unsatisfactory have these small vessels proved that the Navy Department will build few, if any, 160-ft. boats of this type. While these vessels are swift they are practically unprotected, and they cannot carry armaments enabling them to cope with the latest type of German submarine, which not only carries comparatively heavy guns but is well protected with a 3 or 4-in. belt of armor and is provided with a heavy conning tower.

Advantages of Destroyers

The destroyer, on the other hand, is built to stand a great deal of punishment. She is fitted with watertight compartments and makes an excellent gun platform in spite of the fact that she is designed primarily for speed. The fact that she is much faster than any submarine gives her a tremendous advantage, while the placing of her batteries and the rapidity with which they can be handled render it almost a certainty that she will sink any submarine that comes up within range.

Few details of the new program for attacking the submarines are available, Secretary Daniels contenting himself with the announcement that it has been decided to "build more destroyers than we ever dreamed we could build." The entire quota authorized by the last naval appropriation act was contracted for several months ago, and at that time the department also placed orders for an additional number to be paid for out of the emergency appropriation of $150,000,000 which Congress placed at the disposal of the President. This fund has been heavily drawn upon during the summer, but it is understood that less than half of it has been mortgaged and that a large part of the remainder will be used to pay for the newly projected destroyers. These vessels are estimated to cost about $1,250,000 each, and experienced observers here will not be surprised to learn that the Government contemplates building at least fifty in the shortest possible space of time. The estimates to be submitted to Congress next December will include an unusually large item for more destroyers, and in the improvements and extensions of Government navy yards, for which Congress is now providing, special attention will be given to facilities for the rapid building of vessels of this type.

Shipping Board Problems—Steel, Wood and Labor

The reorganization of the Shipping Board, which took place during the past week, is counted upon to expedite greatly the construction of the big emergency fleet, the function of which will be to offset the inroads on commerce made by the submarine. At a meeting of the board on July 27 Edward N. Hurley was elected chairman and Rear Admiral Washington L. Capps was appointed general manager of the Emergency Fleet Corporation. The resignation of Thomas Brent, vice-president of the board, was accepted by the President and R. B. Stevens, a member of the board, was tentatively designated to act as vice-president. Chairman Hurley is reticent in discussing the plans of the board and is devoting himself entirely to familiarizing himself with what has already been done and with the condition of the industries he must call upon for speeding up the construction program. There are three problems now confronting the board, he says: adequate supplies of steel, wood and labor. The labor, especially that intended for the steel ships, will be provided without serious difficulty, although it will not be easy to find an adequate force to build a large number of wooden ships. There are also limits to the supplies of steel for immediate delivery and of seasoned lumber, and there are transportation difficulties to be encountered as to the latter.

An early task before Chairman Hurley and Admiral Capps is the formulation of a definite program with respect to the two shipbuilding establishments to be equipped for Government construction. General Goethals developed these plans rapidly and they must be carefully gone over before they are finally approved. This action will be taken at the earliest possible moment.

Eighty Weeks' Riveting for 1000 Ships

An expert of the Bureau of Construction of the Navy Department has made the interesting calculation that the building of 1000 steel ships would require the labor of 7000 steel riveters working steadily for 80 weeks. This estimate is based on experience both in navy yards and in private shipbuilding plants which accept the number of rivets to be driven in the building of a ship as a unit of measure for determining the factors of labor and date of delivery. After a contract for a steel ship is entered into about two and a half months are consumed in preliminary construction before the riveting begins, but from that time on it proceeds without interruption until the vessel is substantially completed. The steel ships planned by the Shipping Board are estimated to require approximately 400,000 rivets or 400,000,000 for a fleet of a thousand such vessels. On this basis, rivets must be driven at the rate of 5,000,000 for eighty weeks to finish the work on time. Naval experts doubt that a sufficient number of skilled riveters and other mechanics familiar with structural and plate work for shipbuilding can be found to meet the requirements of the Shipping Board, but it is understood that Admiral Capps is planning to use experienced men as foremen and with their aid to instruct large gangs of structural steel riveters familiar

with bridge and building work so that in a short time they will in turn become experts.

Direct Methods in Getting Ships

The encouraging intimation has been given out here that Admiral Capps is planning to dispense with much of the red tape with which naval construction is surrounded and that he will employ many of the direct time-saving methods adopted by General Goethals. The element of prime importance, especially in the construction of the projected steel ships, will be standardization of every possible detail. This principle will be kept in mind in the layout of the yards, in the selection of equipment, in the designing of hulls and, so far as practicable, in the building of motive power units. The use of large fabricating plants for the preparation of the structural material will assist in this movement, and it has been decided to employ steel templates throughout to insure accuracy in the construction of the large number of vessels to be built. Difficulties will undoubtedly be encountered in securing a sufficient number of engines, boilers and other items of equipment of a uniform type and it is probable that there will be many departures from the standards in this respect. At the suggestion of former Chairman Denman the board has already contracted for a large number of wooden hulls without machinery or equipment of any kind, and to fit out these ships will constitute a separate problem.

It is understood that the first work to be taken up in the Government shipyards will be the construction of a master ship, which will be built by continuous work and carried to an advanced stage of completion while preparations are being made for other ships, including the fabrication of steel and the assembling of material. While the adoption of this method may delay the laying of keels somewhat, it is believed it will result in earlier and more rapid deliveries of completed vessels.

W. L. C.

DEFECTS IN BRASS TUBES*

Evidence Against the View That They Are Causes of Corrosion

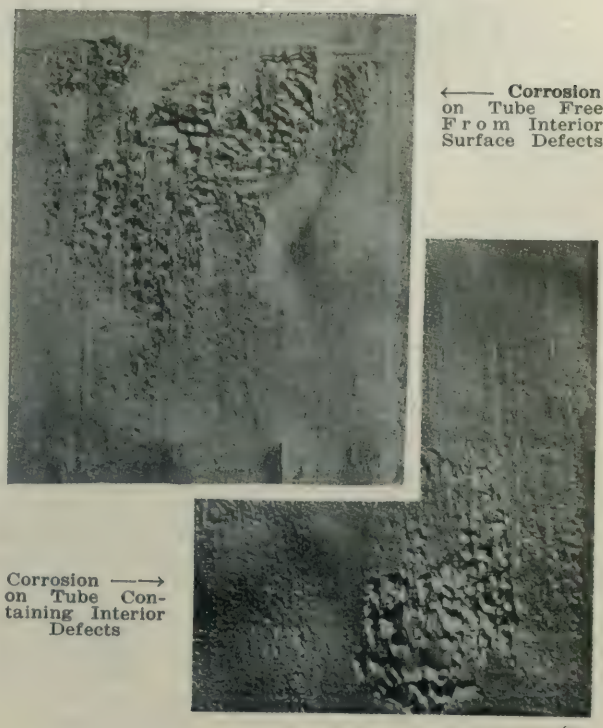
IT is a common experience to find clauses in specifications which have been adopted by the writer thereof because the requirements which they demand appear to be reasonable but which have, as a matter of fact, no basis either in theory or experience.

Certain users of brass condenser tubes have been impressed with the belief that interior surface defects operate to produce corrosion which exhibits itself as local pitting, terminating in perforation. The writer at one time held this belief and took occasion to make a careful examination of every case of corrosion of this character which came under his notice, with a view of observing whether there was any evidence in support of it. No case, however, has ever been found by him which would support any such view.

It has further been observed that there is no tendency whatever for areas of corrosion to localize in the vicinity of such defects. Moreover, many cases have been found in which severe pitting had occurred in the vicinity of such defects, but absolutely no tendency of the corroded areas to follow along the lines of defect has ever been noticed.

A recent case of severe corrosion was observed which furnishes very strong evidence that no such connection exists. The tubes had been in service in the condenser of a large stationary plant for six months and were removed because of perforations caused by local corrosion on their interior surfaces. Of a lot of 11 tubes, eight were found to be absolutely free from surface defects near the corroded areas, while three samples were found to contain such defects. These tubes were sawed longitudinally and opened out flat so as to show

*From a paper presented at the twentieth annual meeting of the American Society for Testing Materials at Atlantic City, N. J., June 26 to 29, 1917. The author, W. Reuben Webster, is general superintendent, Bridgeport Brass Co., Bridgeport, Conn.



← Corrosion on Tube Free From Interior Surface Defects

Corrosion → on Tube Containing Interior Defects

the interior surfaces. Characteristic samples from the unblemished tubes were taken and photographed for comparison with those containing surface defects, two of these photographs being reproduced herewith. They are approximately eight-tenths the size of the tubes. They show very clearly the surface defects and the location of the corroded areas with respect to them.

Even where a corroded area crosses a defect, no tendency whatever for the corrosion to follow the defect is observable. In most of the samples the corroded area was confined to a distance not over 4 in. from the inlet end of the tube; the remainder of the tube being as free therefrom as when first made. In one or two cases the corroded area was similarly confined to a short distance in the length of the tube, but was some distance from the end thereof.

The effect which temperature has upon corrosion is very well shown by the fact that the corroded area in most cases stops quite abruptly on reaching that portion of the tube which is in contact with the tube sheet. There would be naturally a very considerable difference in temperature between the portion of the tube which was in contact with the tube sheet and that which was in contact with the steam.

This evidence is not intended to be considered as arguing in favor of the presence of defects of this character. It is, however, a fact that evidence of their existence can be largely removed by treatment which detracts from the resistance of the tube to corrosion, while on the other hand they are rendered more highly visible by treatment which tends very materially to increase this resistance.

As a consequence, tubes treated in a manner tending to decrease their serviceability will frequently be accepted under specifications containing restrictions of the character in question, but would be rejected when made in accordance with methods calculated to give them the maximum endurance.

It, therefore, follows that a rigidly interpreted clause of this nature may operate to weaken rather than strengthen the specifications of which it is a part.

The Dreis & Krump Mfg. Co. is constructing a one-story brick addition to its factory, 22 x 83 ft. This building is to be used as a steel warehouse and will be equipped with a 3-ton crane.

The Pangborn Corporation, Hagerstown, Md., has purchased and taken over the sand-blast department of the Curtis Pneumatic Machinery Co., St. Louis.

Devices to Facilitate Shell-Machining

Unique Tool for Centering Forgings—Improved Mandrel to Expedite Lathe Work and Better the Quality of the Product

BY ENOS MOORE*

IT is quite likely that there are not two good mechanics in the world who will agree on any one device as being the best of its kind. If there is a good mechanic who has an argument to offer in support of the driving plug for turning shells, illustrated in Fig. 1, hundreds of which I have seen in use, then it would be interesting to hear from him.

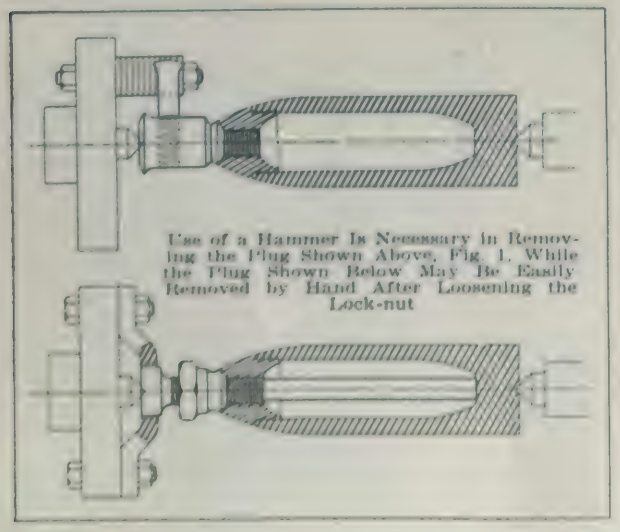
It has several bad features. The worst is that after a shell has been turned with it, nothing but the skillful use of a hammer will get it out, and in about half of the work done with it the socket is loosened with the plug. This means that a new socket must be screwed in and the turning done over again. Again, unless all plugs are of the same length, the short ones will ruin the shells on which they are used, unless the operator has discovered the difference and made the necessary change in his taper attachment.

With one operator running two lathes on finishing work, it is customary to furnish four plugs of the kind shown, two in the lathes and two for shells on the floor. The taper attachment should, of course, never be touched after it is set correctly. The method shown for driving these plugs is so primitive that I would not have called attention to it unless I had seen it in use on new lathes.

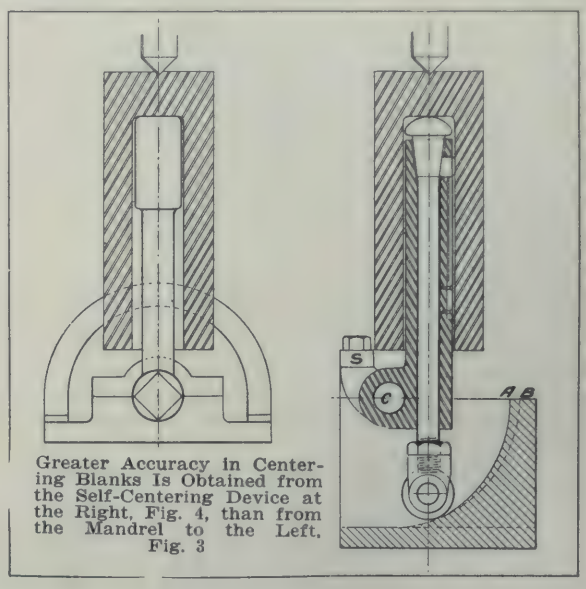
From Fig. 2 it will be seen that a shell could easily be turned without the lock nut because the mandrel is jammed against the bottom of the bore, where all lengthwise measurements should be based. For quick work, however, the thread on the mandrel should run easily through the thread in the socket, and the lock nut serves to center the shell. As soon as the finishing cut is taken the least resistance will loosen up the nut while the shell is still turning and the removal of the mandrel is but a matter of turning it by hand.

This simple device would have saved at least one large manufacturing concern, with whose operations I was acquainted, many thousands of dollars on certain contracts that were gotten out for the Allies, and there was not a day during almost two years when the change could not have been effected. The old plugs, however, were turned out in hundred lots and the destruction of sockets went merrily on.

*Birmingham, Ala.



Use of a Hammer Is Necessary in Removing the Plug Shown Above, Fig. 1, While the Plug Shown Below May Be Easily Removed by Hand After Loosening the Lock-nut



Greater Accuracy in Centering Blanks Is Obtained from the Self-Centering Device at the Right, Fig. 4, than from the Mandrel to the Left, Fig. 3

I have called attention to this, simply for the saving that it would effect to the manufacturers. But there is a more serious fault illustrated in Fig. 3 through which the Government, or the purchaser of the shells, is made to suffer a certain very definite loss in the quality of the product. This should be eliminated and a change enforced by the United States officials.

The primary operation in any shell shop, where the forgings are delivered for finishing, consists in centering the blanks, ready for rough turning and boring. If this centering is done correctly, it insures a truly concentric job on the whole series of operations which follow; but if the centering is not done correctly, with reference to the piercing, then a black spot follows the boring and there is no way in which such an imperfection can be remedied. The common method of procedure in such a case consists in hiding the defect by means of a small emery wheel with which the rough edges of the cavity are ground off and the surface polished.

This, however, does not remove the lopsidedness of the shell, but rather accentuates it, so that the path of such a shell, leaving a rifled gun, will be a spiral instead of the expected trajectory.

For this centering operation there is usually employed an attachment to an ordinary drill press, something as shown in Fig. 3, by means of which the rough forging, weighing about 125 lb., is slipped on to a mandrel which, by means of a lever (not shown) and an arc, is first brought to a horizontal position for receiving the forging. When the forging is slipped over the mandrel the operator grasps his lever and, by means of a notch and a dog on the lever, he brings the shell to a vertical position and holds it there while the drill is brought down to do the centering. This is laborious work because the lifting of the forg-

ings on and off the mandrel involves handling about 25 tons of metal per day.

A glance at Fig. 3 will satisfy any kind of a mechanic that the chances for centering any forging on such a fixture are all against doing it correctly. In the first place, there must be a rough allowance for getting the shell over the end of the mandrel and, when the mandrel is in a horizontal position, that clearance is just doubled on one side. If allowance be made for the lost motion in the notch in the arc and the dog on the lever, it can easily be understood how ¼ in. might be lost on one side of the hole and the shell rendered eccentric by that much. If the shell is centered ¼ in. off, no matter how rigid the boring machine the shell will come out with a black spot and be eccentric.

The remedy for this is a self-centering device such as that shown in Fig. 4. Regarding this, it will be seen that the shell is brought to a stop by a positive member, or rather two of them, S, one on each side of the opening through which the shell travels. The weight of the shell and the pressure of the drill both tend to hold the mandrel in the only position that is left to it.

If an arc is described around the trunnion center, as shown by dotted line, nothing will happen to the plunger, but by making a track for the castor, A, about a half inch forward of the arc, B, it will be seen that, when the shell is lowered to a horizontal position, the plunger is forced out with the shell, releasing the three centering dogs, so that the shell will be perfectly free.

Conversely, if the rough shell is placed on the mandrel while in a horizontal position and then raised to a vertical position, the weight of the shell will drive the tapered plug down until the three sharpened dogs will find a solid bearing and the result will be a centering true to the piercing.

Tests of Steel Hardened by the Wild-Barfield Process

An interesting report on tests recently made for the Hardness Tests Research Committee at the National Physical Laboratory (British) on steel specimens treated by the Wild-Barfield process has been published in the London *Iron and Coal Trades Review*. The process is the one used for hardening screw gages in large quantities for the Ministry of Munitions. The report states:

The steel contained 1.5 per cent carbon and 0.49 per cent manganese. Of the four specimens two (A and B) were quenched in cold water of 15 to 20 deg. C. after being heated to 10 deg. C. above the recalescent temperature before quenching, while the other two (C and D) were treated by the Wild-Barfield process. Unfortunately, specimens A and B had to be ground away in parts in preparing them for the testing machine. Consequently their worn surfaces, after removal from the testing machine, were found to consist of patches alternately highly polished and matte-like in appearance. The latter patches gave low numbers, while the former supplied high numbers in the scleroscope test, vitiating somewhat the comparisons. A truer comparison is furnished by the Brinell hardness tests which were made on specially prepared flats. The numbers were 438 and 423 respectively for A and B, and 310 and 340 for C and D, that is lower; yet the resistance to sliding abrasion was higher for C and D (560 to 710) than for A and B (420 to 560). The sliding abrasion tests were made in the special machines described in the report of the Hardness Tests Research Committee of last November.

The Colt Patent Firearms Mfg. Co., Hartford, Conn., has announced that it has recently received orders for 20,000 Browning machine guns.

Effect of Various Elements on the Strength of Cast Iron

Results of experiments by F. Wuest and his German pupils to determine the influence of carbon, silicon, manganese and phosphorus on the mechanical strength of cast iron are given in *Stahl und Eisen* by A. Stadeler. From a translated abstract in the London *Iron and Coal Trades Review* the following is taken:

Various mixtures were prepared of Swedish charcoal pig with Swedish horseshoe iron, the silicon, manganese and phosphorus contents being varied by the addition of ferroalloys. As square or rectangular test bars are liable to develop a white iron at the edges, test bars cast round and turned down were used in the experiments.

The quantity and character of the graphite appear principally to determine the mechanical properties but these are materially influenced also by the pouring and method of cooling. With gray iron containing 1.5 per cent silicon, small quantities of manganese up to 0.3 per cent increase the formation of graphite, but a further increase to 2.5 per cent has no influence. Cast irons high in phosphorus, contrary to existing ideas, may be improved by the presence of 1 per cent of manganese or more provided the rest of the ingredients have been fixed properly.

With a rise in the proportion of graphite the strength of the iron in tension and bending falls off as a rule. This is also the case with an increase in the percentage of carbon and silicon, both of which favor the formation of coarse graphite. With increase of phosphorus up to 0.3 per cent and of manganese up to about 1 per cent, the strength in tension and bending increases. Phosphorus up to 0.3 per cent and also a high graphite content enhance the bending strength, while manganese and silicon have the opposite effect.

The resistance to specific impact shows the greatest sensitiveness to silicon, manganese and phosphorus. It diminishes rapidly as the phosphorus content rises until this reaches 0.6 per cent, above which the decrease is inconsiderable. This property brings out the superiority of irons low in phosphorus in respect of resistance to impact, which the tensile and bending tests fail to reveal.

Hardness decreases with a rise in graphite content and is increased by a rise in manganese and phosphorus. It does not seem to be affected by the silicon content, but the physical properties of cast iron depend not only on the percentage but also on the character of its graphite content. An explanation of the difference in the physical properties of test pieces containing the same percentages of carbon can be readily found by an examination of their microstructure.

Women Employees in the United States

Figures as to the increasing employment of women in the United States are given as follows in a late census bulletin: There were 3,596,615 women over 16 years of age engaged in industrial occupations out of a total of 18,957,672 in 1890, the proportion being 19 per cent. In 1900 the number of those employed rose to 4,833,630 out of a total of 23,485,550, or 20.6 per cent. In 1910, on the other hand, the number of women over 16 years of age employed rose to 7,438,686, out of a total of 29,188,575, or 25.5 per cent. The proportion of the single women employed to the total number of such women grew from 43.1 per cent in 1890 to 45.9 per cent in 1900 and to 54 per cent in 1910. The percentage of the widowed and divorced advanced from 29.9 in 1890 to 32.5 in 1900, and to 34.1 in 1910. The proportion of the married women employed to the whole number of married women increased from 4.6 per cent in 1890 to 5.6 per cent in 1900, and 10.7 per cent in 1910.

The Crompton & Knowles Loom Works, Worcester, Mass., is preparing to erect the first of a series of additions. The first unit will be a storehouse 62 x 200 ft., four stories, located opposite its foundry and connected with it by a bridge.

HIGH PRESSURE GAS FURNACES*

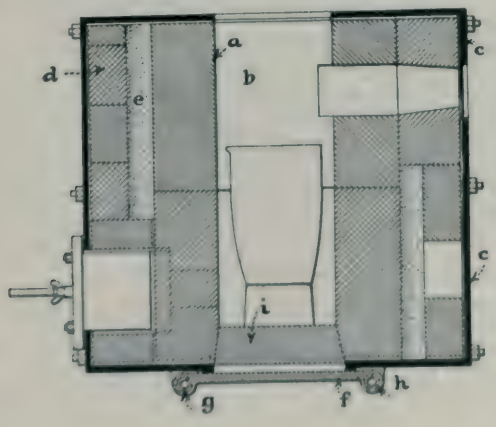
A Brass and Bronze Melting Outfit Utilizing an Atmospheric Burner

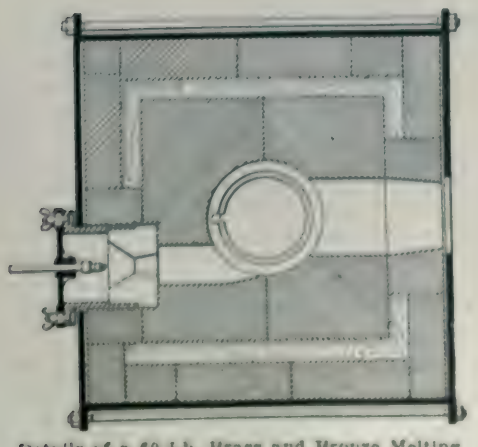
METAL melting furnaces, operated with city gas, may be classified as furnaces designed to operate at ordinary city gas pressures of 2 to 3 in. of water, and fitted with atmospheric burners, and those designed to operate with gas at city pressure and air under a positive pressure of 1 to 2 lb. per sq. in. The first are used chiefly for melting alloys not requiring a higher temperature than 1100 deg. Cent., including aluminum and gold alloys and white metals. They employ pots having a capacity up to 150 lb. of copper and furnaces employing gas at pressures considerably higher than the ordinary distribution pressures and fitted either with atmospheric burners or burners using air under a pressure of about 20 in. of water. The second group may be subdivided into pit and and tilting furnaces for melting brasses, swarf and scrap, for the production of castings, strip metals, ingots and billets, the size of crucible varying from 60 to 800 lb. capacity; furnaces for melting nickel, cupro-nickel and bronze, and furnaces for melting aluminum alloys and precious metals. Under this last head there are pit furnaces for melting brasses and bronzes for sand castings, ranging from 60 to 200 lb. capacity; pit furnaces for melting brasses, bronzes and cupro-nickel for strip and billet castings, having pots of capacities up to 200 lb.; pit furnaces for aluminum alloys having pots of capacities of from 200 to 600 lb. of copper; small furnaces for melting precious metals, and furnaces for melting brasses, bronzes, pure nickel, and for non-ferrous metals generally where extremely high temperatures and high melting speed are required.

The accompanying illustrations show the details of a 60-lb. furnace using high pressure gas in an atmospheric burner and suitable for melting brasses and bronzes for sand casting work. The brick lining *a*, built in sections, has a cylindrical core *b* of a diameter to suit the pot employed and is contained in a box of loosely bolted cast-iron plates *c*. Between the outer lining *d* of 4½-in. firebrick and the lining *a* is a space of 2 in., packed with non-conducting material *e*. The bottom plate forming a bed is supported on brick piers in the furnace pit. The circular opening in it is closed by the plate *f*, held in place by the hinge *g* and the drawbar *h*. On this is built the furnace bottom *i* consisting of about 3½ in. of well-rammed ganister and broken brick. The pot rests on a firebrick stand leaving an angular combustion space between the pot and the lining.

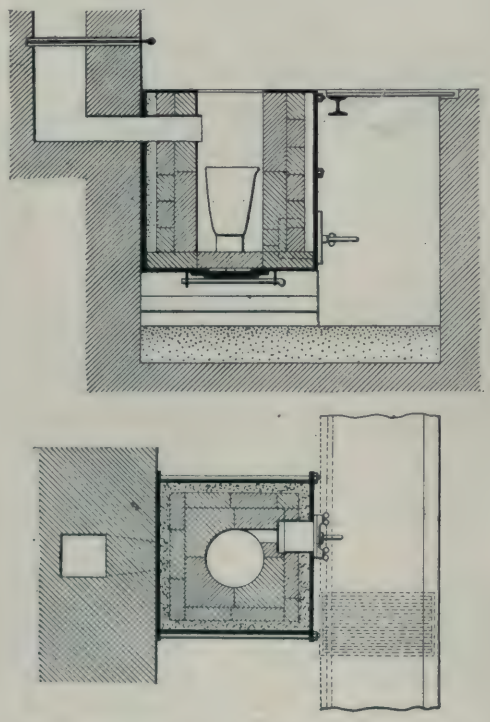
The dimensions of the combustion space are important if high temperatures and efficient working are to be obtained. Where the pots are to be removed by tongs, only sufficient clearance should be given around the pot to allow easy manipulation of the tongs. The high pressure injector burner enters the combustion space tangentially about ½ in. below the bottom of the pot and the flame forms a spiral round the pot. The flue, fitted with a nostril, enters the furnace about 2 in. above the pot rim.

*From a paper read before the Institute of Metals (Great Britain), March 22, 1917, by C. M. Walker.





Details of a 60-Lb. Brass and Bronze Melting Pot Furnace Employing High Pressure Gas in an Atmospheric Burner



General Arrangement of the Furnace Pit and Flues

Gas is supplied to the burner at a pressure of about 12 lb. per sq. in. At this pressure the requisite air for combustion can be injected and a mixture velocity of about 6000 ft. per min. obtained in the injector throat. The velocity of the mixture entering the furnace is about 5000 ft. per min. The above figures were obtained with a gas of a net calorific value of 500 B. t. u. per cu. ft., having a density of 0.52 (air equals 1) and requiring 5.5 volumes of air for complete combustion. These figures will be used in the following discussion:

At the above mixture velocity, the combustion was sufficiently concentrated and the flame temperatures high enough to meet all the usual requirements and to melt cupro-nickel. Where extremely high temperatures are required, as for melting pure nickel, the velocity of mixture entering the furnace may be increased with advantage to 9000 ft. per min.

In melting 60 : 40 brass in 50 to 60 lb. pots for sand castings with gas of 500 B. t. u. per cu. ft., 9 to 10 heats can be made in 12 hr. The first heat takes about 2 hr. and subsequent ones about 1 hr. each. The average gas consumption with a single injector burner would be about 280 cu. ft. per hr. and the gas per lb. of 60 : 40 brass melted about 5 cu. ft. If the standby losses are high due to molds not being

poured promptly, this figure will be exceeded.

The cost of a furnace of the size and type illustrated exclusive of pit work, excavation and connection to existing flues, amounts to approximately $125. A similar furnace of 160-lb. capacity should cost about $175. The cost of maintenance of a 60-lb. furnace, including relining, patching, and rebottoming each week, and one set of burner cone replacements, was approximately $41.50 for one year, during which time about 60 tons of metals were melted. The maintenance of a 160-lb. furnace for six months was $47.50 and 160 tons were melted in that period. The pot costs vary with the method of working. For 60-lb. pots a good average figure is 30 heats per pot where sand castings are made, and 8 to 10 heats per day are the maximum required. If the speed of working is increased, the number of heats per pot is also increased in about the same proportion. When melting borings or swarf requiring puddling, the pot life is reduced, owing to the mechanical wear on the pot. If the speed of melting can be increased from 8 to 12 heats per day, the pot life can be increased to about 40 heats. With strip and billet castings in 130 to 200 lb. pots, melting 10 heats per day, the average life per pot will be about 26 heats.

Sources and Amount of Metal Losses

The metal lost during the melting of brass consists of spelter volatilized and carried off with the waste gases; metal oxidized to form a dross, and metal spilled over the sides of the pot. The first two are non-recoverable and the third recoverable. To reduce the losses to a minimum, the temperature regulation should be under complete control to prevent overheating of the metal and consequent loss of spelter. Further, the atmosphere in contact with the metal should be non-oxidizing or slightly reducing to prevent the formation of dross.

Metal losses stated in terms of pounds of metal per hundredweight of castings produced are of little value for purposes of comparison. Therefore, it has been found desirable to use the loss of metal, on the basis of the weight of metal melted for a given process, including the returns. Assuming that all of the original metal is converted into billets, castings, or strip as the case may be, this figure for the loss of metal multiplied by the ratio

$$R = 1 + \frac{\text{weight of returns}}{\text{weight of castings produced}}$$

gives the approximate loss based on the work produced if the ratio is known. The ratio R really represents the number of times a given quantity of metal must be remelted to convert it into castings. The accompanying table gives values of metal losses for different classes of work when melting by high pressure gas.

Figures of Metal Loss Obtained When Melting with High Pressure Gas Furnaces.

1 Metal Melted	2 Work Produced	3	4 Loss on Metal Melted, Per Cent	5 Loss on Work Produced, Per Cent	6 Capacity of Furnace, lb.
62/38 brass	Very light cored castings	2.0	2.05	4.1	60
60/40 brass	Medium cored castings	1.5	2.20	3.3	60
60/40 brass	Medium cored castings	1.6	2.18	3.5	60
60/40 brass	Billets	1.18	1.52	1.8	130
72/28 brass	Strip	1.05	0.59	0.56	160

The percentage loss figures given in column 5 are those actually obtained from tests, and represent the loss of metal on the castings, etc., produced, while the figures given in column 4 represent the loss of metal on the metal required to be melted to produce these castings, as computed from the ratio factors given.

The 50 new coke ovens of the Wilkeson Coal & Coke Co., Wilkeson, Wash., have been completed and put in operation, giving the company 160 coke ovens in operation.

Special Firing Door for Boilers

A firing door which, it is claimed, makes it possible to use the coking method of firing, has been brought out by the Economy Furnace Appliance Co., 38 West Division Street, Chicago. Aside from eliminating the entrance of cold air when coal is being fed to the furnace, the loss of heat by radiation through the fire door is also claimed to be prevented, and the heat is utilized in driving the gas from the coal to be burned. The location of the hopper above the firing door on the front of the boiler is also relied upon to dry the coal and remove moisture that would otherwise have to be driven out of the coal in the furnace.



The Coal in Front of the Firing Door at the Left Is Pushed into the Firebox by Turning a Crank and the Gas Which It Contains Is Gradually Driven Off and Burned

The door can be used with either horizontal return tubular or firebox boilers. In either case the coal hopper is located above the door, as shown at the left of the accompanying drawing. The coal from the hopper fills the space in front of the firing door, which is pivoted at the bottom. When it is desired to add fresh fuel to the fire, the crank which is located at the side of the door is turned enough to tilt the door so that coal will fall from the hopper into the space between the coal that is being coked and the front of the door. When the crank is turned in the opposite direction, the coal is forced into the furnace as the door travels upward, this movement also breaking the coal that has been already coked. For cleaning the fires the door can be lowered to the position indicated by dotted lines.

With this door the coal is heated and becomes coke, the combustible gas being driven off. This gas passes back over the grate and, it is emphasized, is completely burned as it passes over the incandescent coke bed at the back of the fire. The coke is pushed along as successive charges of coal are introduced to maintain an incandescent coke bed at the back of the grate.

New Furnace Blown In

YOUNGSTOWN, July 31.—The new modern blast furnace of the Republic Iron & Steel Co., listed as No. 5 of the Haselton group, was put into commission Monday, July 30, and operated splendidly on its first cast. With five modern blast furnaces at Haselton, the Republic will be in better shape to take care of its metal needs required by additional open hearth furnaces and its Bessemer mill. Besides its Haselton group of smelters, the company operates the Hannah Furnace at the old Mahoning Valley works in Youngstown and the Atlantic stack in New Castle.

Stone & Webster have been awarded the contract for the grading of the new 300-acre industrial town site of the Youngstown Sheet & Tube Co. Work will be commenced this week. This plot is located at Lansingville, opposite East Youngstown, Ohio. This same construction company has the contract for grading and paving and leveling of the McDonald town site being promoted by the Carnegie Steel Co. at McDonald, located between Girard and Niles, Ohio.

Following the decision reached by the management of the Pennsylvania Railroad last spring, to open avenues of employment for women and girls, in as many lines of work as possible, more than 2000 have entered the service of the lines east of Pittsburgh and Erie, in the operating department alone. The total number of girls and women at present working in the operating department is 2360, and the greater part of these have been employed in the last two months.

WORKMEN'S LEGAL RIGHTS

Some Recent Judicial Determinations on Duties Arising Under Employment Relationships

By A. L. H. Street

Suing Employee Must Prove Negligence.—Since negligence of an employer is not to be presumed from the mere fact that a workman is injured in the course of his work, so as to make the employer liable in damages, a laborer whose toe was amputated by a falling freight elevator when caught between the edge of the car and the adjacent floor is not entitled to recover against the iron works company by which he was employed, in the absence of proof as to how the accident occurred and that the employer was negligent in some specific respect. (Louisiana Supreme Court, June 11, 1917. Franklin vs. W. K. Henderson Iron Works & Supply Co., 75 Southern Reporter, 661.)

Risks Assumed by Employees.—Where an employee, directed to move a heavy iron flange, knew its weight, through having previously carried it without any such direction, he cannot recover for injuries resulting from his attempt to carry it in obedience to instructions, on a theory that his employer was negligent in giving the instructions. The injured man is presumed to have known his own strength. (Kentucky Court of Appeals, May 29, 1917. Strong vs. Cumberland Pipe Line Co., 194 Southwestern Reporter, 1036.) That an employee assisting in carrying a boiler plate in boiler shops stumbled over a truck does not make the employer liable for resulting injury, the truck having been left in a space used promiscuously by other employees, and not in any regular passageway, and it appearing that the injured man had as full opportunity as any one else to know of the presence of the truck. (Kansas City Court of Appeals, May 21, 1917. Phipps vs. Prior, 195 Southwestern Reporter, 532.)

Injuries Sustained in Doing Unauthorized Work.—There is a rule of law that an employer is not responsible for injuries sustained by a workman while doing some act beyond the duties of his employment, especially when it appears that the workman had been previously instructed not to do that act. This rule is applied to the case of an operator of a buffing machine, to which was attached an exhaust machine designed to carry away the dust generated in the process of the work. He was distinctly instructed that if anything went wrong with the exhaust system, he should call a certain other employee whose duty it was to attend to the matter. Nevertheless, when a metal piece fell into the exhaust apparatus, he took off a cover of the apparatus and put his hand down into it to recover the piece, resulting in his hand being injured by the exhaust fan. Under such circumstances, it is held that the act causing the injury was so foreign to his employment duties as to deprive him of any right to recover an award under the Illinois workmen's compensation act. (Illinois Supreme Court, June 21, 1917. Eugene Dietzen Co. vs. Industrial Board of Illinois, 116 Northeastern Reporter.)

Employer's Duty to Safeguard Machinery.—In upholding liability of a manufacturing company for injury to a blacksmith shop employee, received through bursting of an emery wheel which he was operating in grinding iron parts, it is decided that where an employer violates the Indiana factory act, by failing to place guards upon dangerous machines when practicable, an employee cannot be deemed to have assumed the risk of consequent injury. To render the employee liable in a case of this kind, it is not necessary to show that he should have foreseen occurrence of the particular accident; it being sufficient that he should have foreseen that some injury might result from failure to install a guard which would have avoided the accident. (Indiana Appellate Court, May 11, 1917. Brown vs. Illinois Car & Mfg. Company, 116 Northeastern Reporter, 4.) And, under the Wisconsin Workmen's Compensation Act, an employer operating a traveling crane in his manufacturing plant is liable to pay an increased award for injury to or death of an employee, resulting from the failure of the employer to guard the wheels of the crane, as required by law, in the absence of proof that willful failure of the employee to exercise ordinary care for his own safety was the direct cause of the accident. (Wisconsin Supreme Court, May 15, 1917. Manitowoc Boiler Works vs. Industrial Commission of Wisconsin, 163 Northwestern Reporter, 172.) The Pennsylvania statute which requires set screws on machinery to be safeguarded applies to stationary, as well as revolving, set screws. (Pennsylvania Supreme Court, Feb. 12, 1917. Hogarth vs. William H. Grundy & Co., 100 Atlantic Reporter, 1001.)

Duty to Furnish Safe Appliances.—An employer is liable for injury sustained by an employee through breaking of a defective rope furnished him by a foreman, where the latter refused permission to use a new rope which was available. The fact that the employer had provided a new rope did not exonerate him from liability where the injured man was permitted to use it only on obtaining the consent of his foreman. (United States Circuit Court of Appeals, Eighth Circuit, April 3, 1917. Mardis vs. Miller, 241 Federal Reporter, 470.)

Workmen's Compensation Act Awards.—When it appears that since making of an award under the New Jersey workmen's compensation act in favor of an injured employee that his earning capacity has increased, the employer is entitled to have the award decreased; the basic principle of the act being indemnity against loss of earning power by reason of accidents sustained in the course of employment. (New Jersey Supreme Court, April 7, 1917. Safety Insulated Wire & Cable Co. vs. Court of Common Pleas for Hudson county, 100 Atlantic Reporter, 846.) But the fact that an injured man is able to secure new employment even more remunerative than the work in the course of which he was injured does not deprive him of the right to an award under the Kansas workmen's compensation act. (Kansas Supreme Court, May 12, 1917. Sauvain vs. Battelle, 164 Pacific Reporter, 1086.)

Strike Injunction Not Violated.—Where a foundry company operating an open shop obtained an injunction against striking employees, restraining them from doing certain things, including "addressing" the company's employees as scabs, there was no violation of the injunction by publishing a notice in a newspaper, addressed to the strikers to encourage them to refrain from returning to work, and referring to the men working for the company as scabs; it appearing that the injunction was merely intended to prevent strikers from annoying the company's employees and provoking them to breaches of the peace by calling them scabs in their presence. Nor was the newspaper notice objectionable in so far as it asked the public to remain away from the company's plant. (Illinois Supreme Court, June 21, 1917. Illinois Malleable Iron Co. vs. Michalek et al., 116 Northeastern Reporter, 714.)

Sir James Lougheed, replying to Hon. Mr. Casgrain in the Canadian Senate as to the situation regarding rails for military and other purposes, stated that the Algoma Steel Co. had been under contract since July, 1916, to roll rails for 92 miles of roads for the Hudson Bay line, but that it was doubtful whether the company could secure the steel to do so owing to the fact that the Imperial Munitions Board was taking supplies for the manufacture of munitions.

Dupont, Roy & Baudouin, Montreal, have prepared plans for a mechanical gravity filtration plant for Dorval, Que. At present there is a plant for pumping water from the St. Lawrence River. It is now proposed to construct a filtration plant which will have a capacity of 500 gallons per minute.

A plan has been filed by the American Machine Co. of Brooklyn for the construction of a 5-story concrete factory building, 185 x 100 ft. The building will cost about $250,000 and will be an addition to the main plant of the firm.

NEW TRADE PUBLICATIONS

Gage Grinding Machine.—Steel Products Engineering Co., Springfield, Ohio. Folder. Illustrations and descriptive matter explain the operation of a universal grinding machine for gages which was illustrated in THE IRON AGE Feb. 8, 1917. Among the special advantages claimed for the machine are the elimination of practically all stoning or lapping, ease of adjustment and operation and the elimination of resetting for each piece of work. The grinding wheel spindle is of a special type arranged to overcome the jerk of the driving belt and a sectional view shows how this is accomplished. A condensed table of specifications supplements the text description and the illustrations.

Sand Blast Barrel.—New Haven Sand Blast Co., New Haven, Conn. Circular. Presents a partial list of users of a self-contained sand blast barrel for gray and malleable iron and brass castings, forgings and special work. Where more than one barrel is in use at any of the plants the exact number is given.

Saws.—Henry Disston & Sons, Inc., Philadelphia. Vol. 1, No. 1, of "Disston Bits." Is a monthly house organ for distribution among the employees of the company. The new magazine will not conflict in any way with the "Disston Crucible," the trade organ which the company has issued for several years. The several departments usually found in house organs of this nature, such as editorial, sports, safety first, etc., are all represented and all of the illustrations, cartoons and editorial matter are the work of the employees themselves. The name of the new organ is significant, as the teeth of inserted saws, one of the company's products, are also called "bits."

Pipe Threading Machines.—Landis Machine Co., Waynesboro, Pa. Catalog No. 23. Calls attention to a line of pipe threading and cutting and pipe and nipple threading machines with the die heads used with each and a machine for grinding the chasers. The various heads are described at some length and specification tables and clearance diagrams and tables are included. The different machines are briefly described, a separate page being given to each. Lists of repair parts and a telegraph code are included.

All Metal Swing and Flexible Pipe Joints.—Rostern Co., Peoples' Gas Building, Chicago. Folder. Describes a new swing and flexible pipe joint suitable for steam, water, gas or oil lines in which all packing has been eliminated.

Air Compressors.—Eagle Corliss Engine Works, Erie, Pa. Bulletin No. 27. Calls attention to a line of belt and steam driven power air compressors which are built in sizes ranging from 3 to 8000 cu. ft. of air. A general description of the construction of the compressors, which is supplemented by illustrations of the different parts, is presented and this is followed by specification tables of the various sizes of compressor that can be supplied. Mention is also made of a line of air receivers and views of the different types of air compressors built are included.

High Resistance Pyrometers.—Hoskins Mfg. Co., Detroit. Bulletin No. 3-A. Illustrates and describes a line of high resistance thermo-electric pyrometers of the wall, portable and recording types. The construction of the thermocouples and the meters used in connection with the pyrometers is gone into at some length. Wiring diagrams are included and mention is made of accessories, such as protecting tubes for the thermo-couples, selective switches, inclosing cabinets, etc.

Ball Bearings.—Norma Co. of America, 1790 Broadway, New York. Folder. Points out the part being played by the company's ball bearings in the service of the Government on land, at sea and in the air, with particular reference to their use in magnetos and lighting generators. The importance of having a sure source of supply of ignition current is emphasized in every case.

Steel Wheels.—Ackerman Wheel Co., Rockefeller Building, Cleveland. Circular. Refers to a special type of metal wheel which was illustrated in THE IRON AGE, Jan. 25, 1917. The distinguishing feature of this wheel is the use of a spoke made of strip steel. These spokes are elliptical in outline and are relied upon to absorb the shocks imparted to the outer edge of the wheel. A number of views of the various forms of wheels made are included.

Nut Locks.—F. R. Blair & Co., 50 Church Street, New York. Leaflet. Deals with a nut lock which was illustrated in THE IRON AGE, Feb. 15, 1917. The essential features of the lock are a washer with a toothed surface and a plain square one that is bent up at one corner after the nut has been tightened. Illustrations showing the various portions of the lock separately and assembled are included, together with a table giving the sizes of bolts for which the lock can be supplied.

Watthour Meters.—General Electric Co., Schenectady, N. Y. Bulletin No. 46,209. Gives illustrations and a general description of two types of watthour meters for measuring direct current installations of relatively large size. One type is intended for switchboard work and the other for installations where front connections can be employed. Full information regarding the construction of the meters and their dimensions, as well as connection diagrams, is included.

Open-Hearth Charging Machine.—Edgar E. Brosius, Pittsburgh. Bulletin No. 10. Describes a single hoist charging machine for foundry cupolas and open-hearth steel furnaces and for use in the stock yard. Among the advantages claimed for the machine, which was illustrated in THE IRON AGE, May 24, 1917, are simplicity of construction and low first cost.

Vent and Leader Connections.—Barrett Co., New York. Two pamphlets. Concerned with the Holt line of vent and leader roof connections for use on any kind of flat or nearly flat roof construction or for flashing around fixtures passing through the roof. The different types of connections are illustrated and briefly described and tables of the various sizes of each that can be supplied are included.

Monel Metal.—Electrical Alloy Co., Morristown, N. J. Folder. Relates to a brand of Monel metal which is furnished in wire, ribbon, strips, rods and special shapes. The properties of the metal are briefly touched upon and mention is made of the various forms in which it can be supplied. A partial list of the uses to which the metal is put is given, together with one of the resistance materials made.

Toolroom Lathe.—Master Machine Tool Co., 110 West Fortieth Street, New York. Circular. Treats of a 12-in. lathe for toolroom and manufacturing work. The description is concise and the various parts are each given a separate paragraph with a sidehead in contrasting type. The text matter is supplemented by an illustration of the lathe and a condensed table of specifications. An illustrated description of the lathe appeared in THE IRON AGE, Feb. 15, 1917.

Speed Lathe.—Oliver Machinery Co., Grand Rapids, Mich. Circular. Treats of a 12-in. speed lathe arranged for either belt or motor drive. The construction of the lathe is gone into at some length, special emphasis being laid upon a four-step cone pulley, the use of white bronze removable ring-oiling bearings, a hand feeding carriage with compound swivel rest and a set-over tailstock. The text is supplemented by illustrations of the different parts and a brief code for ordering the lathe and the various accessories that are supplied is given. An illustrated description of the lathe appeared in THE IRON AGE, Feb. 1, 1917.

Sheet Metal Testing Device.—Pittsburgh Instrument & Machine Co., 101 Water Street, Pittsburgh. Pamphlet. Mentions a device for determining the drawing, stamping, compressive and folding qualities of sheets of iron, steel, brass, copper, gold, silver and other metals. A description of the device is presented and instructions for the making of the tests are included.

Metals.—Ellsworth Haring, 114 Liberty Street, New York. Three leaflets. Call attention to a line of high speed and tool steels, steel and brass balls and mechanical and steel specialties. These include spark plug wire, ignition metal, tungsten, German silver, zinc, phosphor bronze, brass and copper in a variety of shapes, special steel balls, etc. Brief statements indicating the extent of each line are given.

Hoisting Machinery.—Shepard Electric Crane & Hoist Co., Montour Falls, N. Y. Handbook. Presents in clear and exact form such data relative to hoisting machinery as will enable engineers and managers to consider the application of hoisting and conveying units. A brief description of the construction is presented, followed by numerous dimension diagrams and tables.

Rubber Belting.—B. F. Goodrich Co., Akron, Ohio. Pamphlet. Gives brief descriptions of the various brands of belting that can be supplied, the text being supplemented by numerous illustrations of the belts in use. Instructions on the installation and care of belts are presented, together with a number of tables of useful information.

Wire Fibrous Belting.—Wire-Fibrous Belting Corporation, Palisade Avenue, Englewood, N. J. Pamphlet. Relates to a special type of belting which is made out of spun fibrous yarn which has an untwisted steel wire center, the yarn being twisted into strands which are again woven into belting and impregnated with a dressing. An account of the development of belting from prehistoric times to the present is given, the text being supplemented by numerous illustrations. The advantages claimed for this type of belt, which include great strength, transmission of more power and freedom from stretching or contraction, are briefly touched upon.

The Role of Chrome Vanadium in Steel*

Its Position Among Alloy Steels—Wide Temperature Limits for Heat Treatment —Its Uses, Composition and Structure

BY F. J. GRIFFITHS

CHROME-VANADIUM steel holds the position virtually at the head of the commercial alloy steels and owes this prestige to the extremely wide range of physical qualities which are capable of being developed from this metal by proper methods of heat treatment. Like all alloy steels it is, as its earlier name signifies, a special steel, meaning not only that it is designed for special purposes, but also, that its preparation for the particular work it is called upon to perform must be carried out along certain lines calculated to yield in the final result, those qualities which shall represent 100 per cent efficiency in the final product. Many specifications to-day allow a variation of 1 or 2 per cent in the elongation, and restrict also the ultimate strength and yield point to extremely narrow limits. Examination of these specifications alone would serve to show the wide range of qualities of chrome-vanadium steel, and the absolute delicate accuracy with which by proper management it may be put into condition to perform its highest functions.

Its Composition and Structure

Chrome vanadium combines in such a manner with iron, that the separate constituents of the final alloy produced cannot be distinguished, regardless of the methods selected to separate them. Whether we adopt mechanical means or use the microscope under large magnification the result is the same. This phenomenon indicates a quite strong combination between the alloying elements and defines the combination unmistakably.

Until recently little investigation has been ventured to ascertain the definite properties of chrome vanadium, and the advantages secured by this alloying element were relatively unknown except to a favorite few who, through their own research work, acquired intimate knowledge of the characteristics bestowed upon iron by the addition of this alloy.

Chrome vanadium alloys with iron in all proportions and affects the properties to a marked degree, depending upon the percentage of chrome vanadium present. The qualities which become inherent are influenced also more or less proportionately by the amount of carbon contained. In this respect chrome-vanadium steel is a special steel in another sense of the word and cannot be judged by the same standard as the old carbon steels.

The point of view of the examiner of the old commercial steel is always that of the actual condition in which the metal exists as he sees it before him, and governed by the amount of carbon present. But this point of view has altered gradually until with chrome-vanadium steel the carbon range permissible to obtain specific characteristics has become narrowed. The presence of chrome vanadium in steel intensifies the effect of the carbon in all the best qualities, which it is capable of producing alone.

The property of soundness of the casting and ingots, produced by the use of chrome vanadium, induces freedom from occluded gases and greatly increases the desirable physical qualities of the forgings subsequently made from this steel, such as strength, ductility and resilience. These desirable properties are amply proved not only from the results obtained from tests, but also from the more vital trial of actual use.

Value of Special Steels

According to the old view and judging from the results of tests chrome-vanadium steel, as rolled or annealed, may appear to be a worthless product. It may have, as in examples to be given later, a percentage of elongation, reduction of area, elastic limit and ultimate strength corresponding to simple carbon steel. Stress is laid on this particularly, because there is still a large and unreasonable prejudice in certain quarters against the use of steels which have to be put in special condition, or more plainly, heat treated, before they are capable of doing their best work. Of course, as we all know, this feeling is largely giving way before the splendid performance which steels of this character are giving in service, and given sufficient time, the special steels themselves will demonstrate the unsoundness of this objection, based largely upon the limitations of the older simple carbon steels.

In order to make this more definite the subjoined tests, which are in no sense exceptional, are offered. They have been selected almost at random from records for the purpose of illustration. They cover briefly four classes of chrome-vanadium steel, as follows:

A steel with a composition of about 0.31 per cent of carbon, 0.95 per cent of chromium and 0.14 per cent of vanadium.

A steel of 0.42 to 0.49 per cent of carbon, approximately 1.10 per cent of chromium, and 0.15 per cent of vanadium.

High carbon chrome-vanadium steel of a composition of 0.98 per cent of carbon and 1.06 per cent of chromium and 0.12 per cent of vanadium, and

Low-carbon chrome-vanadium steel of an analysis suitable for most structural purposes, namely, carbon, 0.24 per cent; manganese, 0.69 per cent; chrome, 1.10 per cent, and vanadium, 0.15 per cent. It is to be regretted that while we are engaged on extensive tests of the third class of material mentioned, our experimental data are not at present available for use here. However, the extreme softness and ductility of this steel in the annealed condition may be noted from the one example given. This result is rather surprising in view of the high-carbon content present. Table 1 gives results of tests on these steels.

An examination of these results, which are concerned only with the simplest quenching and drawing treatments, shows the versatility of chrome-vanadium steel. One comment, however, based upon a practical consideration and not upon theory, may well be made here. Test results such as these just presented are valuable only in so far as they are recognized for what they are. They represent, it is true, what it is possible to do with the metal when it is in the finished state, but they do not necessarily represent what the qualities of the metal in the final product will be, if the heat treatment is carried on under exactly the same conditions as those which obtain in the tests. When it comes to question of heat treatment of the final product, the conditions must of necessity be altered somewhat, and the treatment of each class of articles then becomes a special problem. This should not be considered in the light of admission on the part of the steel manufacturer; it should be rather conceded as the principle by which he is most willing to work.

One of the principal effects produced in steel by the addition of chrome vanadium, is to raise the temperature at which the carbides dissolve in the iron, and the temperature at which they are precipitated out of solution. This elevation of the solution temperature is quite noticeable, the carbon content affecting this temperature but slightly. When chrome vanadium is added to steel, it raises the critical points on heating above the corresponding carbon-steel temperatures, but on cooling the critical point is considerably depressed, roughly in proportion to the maximum temperature from which the steel is cooled. The higher the maximum temperature reached the lower the critical range will be on cooling. This fact serves to show the slowness with which the structural changes occur in this alloy and the additional

*From a paper presented at the twentieth annual meeting of the American Society for Testing Materials at Atlantic City, June 27, 1917. The author is second vice-president and general superintendent, Central Steel Company, Massillon, Ohio.

time required for the transformation to be effected completely.

Wide Temperature Limits for Treatment

It is unnecessary to point out the practical utility in commercial practice of working with a steel, in which this slow rate of transformation can be taken advantage of by the use of higher temperatures without resulting injury to the product, and also by the fact that the steel can stand exposure at these higher temperatures without the attendant harmful effects characteristic of other steels subjected to the same conditions. In fact, chrome vanadium seems to attain its greatest combination of desirable qualities at higher treatment temperatures than would be expected from the location of its critical range, due principally to the greater length of time necessary to effect the complete transformation of its constituents into a uniform and homogeneous solid solution. This point is emphasized because certain other commercial alloy steels, although excellent in many respects, have very narrow limits of annealing and hardening temperatures, and therefore require unusual care in their treatment, a slight deviation from the correct temperatures resulting unsatisfactorily.

A single quenching and drawing treatment, as we have seen from the tests, is sufficient for general purposes to effect complete refinement and hardening of chrome-vanadium steel. This characteristic of simplicity in treatment obviously insures a high-grade product under ordinary commercial conditions, and when compared with the double and triple heat treatments required for the refinement of other alloy steels, the economy presented is obvious. These properties, possessed only by the chrome-vanadium alloy, characterize this steel as a material universally applicable for any commercial requirement. They also simplify the treating instructions necessary to successfully handle alloy steel of this chemical composition. One heat-treating specification is adaptable for any carbon analysis, whether the steel is destined for case-hardening purposes or for oil-treating for gears and cones, etc. It has been found by experience that a temperature of 775 deg. C., which is suitable for hardening a case-hardening steel and still retain desirable toughness of the core, can also be employed for hardening oil-treated parts.

The lower-carbon chrome-vanadium steels are apparently pearlitic in nature and, as such, possess the increased strength and hardness resulting from the effect of the special elements, in producing a ferrite of superior strength, subsequently resulting in a more dense and improved pearlite. With the increase in the carbon and alloy contents, this steel becomes more or less cementitic and it is probably this quality which demands the use of higher temperatures than usual in treatment in order to produce complete absorption of its component parts.

The quality of chrome-vanadium steel often described as "tough hardness" is one of its especially desirable properties, and is due probably to the somewhat finer and denser structure of the microscopic constituents, and to their more uniform distribution. This effect is obtained not only through the actual influence of the chromium and vanadium as component parts of the alloy, but also to the influence of the combination of both of these elements in producing in the molten metal a condition of purity and freedom from gases, and, therefore, subsequently forming a metal which, at the time when the structural changes occur, is in the best possible condition for these changes to take place, that is, in the highest form in which the alloy composition renders it possible.

Adaptability of Chrome-Vanadium Steel

From conclusive tests, chrome-vanadium steel can be described as a universal steel. With the carbon present in variable amounts, almost any physical property desired can be secured. It is adaptable for case hardening where the carbon should not exceed 0.20 per cent, that is, for axle shafts, etc., where nominal strength is essential; for oil-treated gears and vanadium springs, where great resilience and resistance to repeated shock is required; for dies, where surface hardness and toughness must both be present; for drills, etc., where wear-resisting qualities and lack of potential brittleness is necessary; for cones and raceways of bearings, which must possess a glass-hard surface, accompanied with proportionate toughness to prevent checking and cracking under the stresses imposed.

The adaptability of chrome-vanadium steel is general, and where strength and hardness and resistance to fatigue properties are the prerequisite, there is a chrome-vanadium steel for the purpose. When the steel is case hardened, a glass-hard surface and tough fibrous core is easily obtained. These properties are obtained without complex treatment, consisting of

Table 1.—Physical Properties of Steels of Various Chemical Compositions

Elastic Limit, lb. per sq. in.	Tensile Strength, lb. per sq. in.	Elongation in 2 in., per cent	Reduction of Area, per cent	Brinell Hardness Number	Drawing Temperature, Deg. Cent.	Remarks
0.31 per cent Carbon Chrome-Vanadium Steel						
238 000	255 000	6.5	26.0	444	200	Heated to 850° C. Cooled to 800° C., quenched in water. Reheated to 850° C. for 20 min., and cooled in air.
220 000	232 000	10.5	49.0	444	260	
178 000	193 000	11.0	50.0	444	375	
170 000	179 000	12.5	55.0	387	430	
153 000	166 000	15.0	58.0	364	485	
149 000	160 000	16.0	59.0	351	540	
130 000	146 000	17.0	60.5	340	595	
225 000	234 000	6.0	14.0	321	200	Heated to 850° C. Cooled to 800° C., quenched in oil. Reheated to 850° C. for 20 min., and cooled in air.
212 000	223 000	7.5	16.0	321	260	
206 000	212 000	8.5	41.0	321	320	
167 000	175 000	11.5	52.0	321	430	
148 000	159 000	13.0	55.0	303	485	
141 000	151 000	15.0	60.0	286	545	
130 000	144 000	16.5	62.0	269	595	
0.42 to 0.49 per cent Carbon Chrome-Vanadium Steel						
100 000	120 000	22.0	62.0	260	700	Heated to 875° C. Cooled to 825° C., quenched in oil. Reheated to 875° C. for 20 min., and cooled in air.
116 000	131 000	19.0	58.0	286	656	
155 000	170 000	15.0	45.0	387	650	
173 000	185 000	12.0	40.0	418	580	
167 000	179 000	12.0	35.0	418	540	Heated to 900° C. Cooled to 825° C., quenched in oil. Reheated to 900° C. for 20 min., and cooled in air.
182 000	188 000	11.0	32.0	444	485	
202 000	216 000	10.0	31.0	477	430	
220 000	228 000	9.5	30.0	555	375	
122 000	142 000	16.0	55.0	321	...	As rolled.
97 000	136 000	19.0	60.0	321	...	As rolled.
High-Carbon High-Chrome Steel						
43 200	92 450	32.0	64.0	170	...	Annealed.
Low-Carbon Chrome-Vanadium Steel						
194 000	209 000	12.0	51.0	444	200	Heated to 850° C. Cooled very slowly to 800° C., que'h'd in water. Reheated to 850° C. for 20 min., and cooled in air.
197 000	206 000	11.1	53.0	444	260	
182 000	198 000	10.0	53.0	444	320	
166 000	179 000	13.0	57.0	402	375	
161 000	169 000	15.0	58.0	387	430	
148 000	157 000	16.0	59.0	364	485	
144 000	155 000	18.0	60.0	340	540	
130 000	142 000	20.0	63.0	332	595	
158 000	162 000	14.0	57.0	364	430	Heated to 850° C. Cooled very slowly to 800° C., que'h'd in water. Reheated to 850° C. for 20 min., and cooled in air.
142 000	150 000	15.0	61.0	340	485	
135 000	146 000	16.0	62.0	321	540	
128 000	139 000	19.0	64.0	302	605	

Table 2.—Results of Tests on Chrome-Vanadium Steels of a Large Automobile Maker

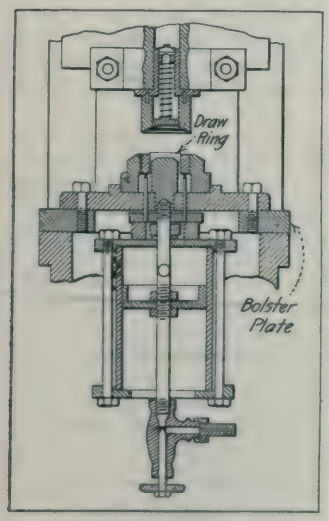
Specimen No.	Elastic Limit, lb. per sq. in.	Tensile Strength, lb. per sq. in.	Elongation in 2 in., Per Cent	Reduction of Area Per Cent	Brinell Hardness No.
1.....	162 820	172 850	14	49.7	418
2.....	160 130	172 090	14	49.5	418
3.....	160 840	172 090	15	49.9	387
4.....	159 520	171 630	14.5	46.9	375
5.....	154 480	164 760	14	52.4	364
6.....	151 000	162 240	14	55.7	364
7.....	154 570	165 160	15	52.3	364
8.....	153 920	163 590	15	54.0	351
9.....	146 590	162 790	15	55.6	340
10.....	146 700	156 360	15	55.7	340
11.....	146 080	157 790	15.5	55.3	321
12.....	148 620	158 090	15.5	55.8	332

simple quenching, with reheating and quenching. For other heat-treated parts, a simple heating, quenching and drawing give a steel, relatively so tough and strong that it is unlike any other hardening alloy steel. Chrome-vanadium steel is a universal alloy steel and stands forth unmistakably as the master alloy.

Table 2 gives results of tests made by a large automobile manufacturer using chrome-vanadium steel for principal parts. The tests given represent those made from 0.30 to 0.40 per cent carbon chrome-vanadium steel used for axle shafts, and demonstrate results that are secured from routine practice. The uniform strength exhibited supplies incontestable testimony of the dependable qualities inherent in this analysis steel when treated in commercial quantities.

A Pneumatic Die Cushion for Presses

The Strand pneumatic die cushion, a substitute for rubber bumpers or steel springs to regulate the pressure on the draw ring of stamping presses, is manufactured by the Strand Machinery Co., 825 Washington Boulevard, Chicago, to which patent claims have been allowed in full. With the device some unusual results, it is stated, have been obtained, particularly in the direction of drawing, at one operation, cylindrical or oval shapes without scratching or wrinkling, in which the depth is considerably greater than the diameter. Not only does the cushion obviate excessive or insufficient gripping by the draw ring, but it makes simple the regulation of the pressure, insures a uniform grip of the blank throughout the operation of forming, and does this despite any lack of uniformity in thickness of the metal being worked. It is fastened in position like any rubber press bumper of the ordinary type.



The Pneumatic Die Cushion Is Screwed into the Die like Any Ordinary Rubber Bumper and the Air Pressure on the Draw Plate Is Adjusted to Suit the Conditions of Each Particular Job, Although in Some Cases the Cushion Is Attached Permanently to the Bumper Plate

The air cylinder is fitted with a piston carried on a single rod, the latter having at one end a standard thread which screws into the die or bolster plate. In the ordinary type of Strand cushion the cylinder and not the piston moves, although in one design the cylinder is stationary and the piston is actuated by the air. It may be remarked that the cushion is used exactly in the same manner as a rubber bumper, or coiled spring, and that no special attachments are required. As the air is admitted to the cylinder of the cushion, its pressure is exerted on the pins of the draw ring which rest on the top of the cylinder. Therefore, as the press descends, the pins are pushed downward, causing the cylinder to recede as the air within it is forced back into the supply tank, the resistance meanwhile being uniform because of the fact that the expelled air is distributed over the larger space of the air reservoir.

The compressed air tank is fitted with blow-off and regulating valves. The reduction valve regulating the pressure for an individual machine is adjusted to meet the needs of each job, and the importance is pointed out of keeping memoranda of pressures required to save time in setting up for subsequent operations. In connecting the cushion with the pipe supplying air, either hose or gas pipe may be used. The main tank should be pumped up to the maximum pressure used in the shop, and the blow-off valve adjusted for safety.

The cylinders of the Strand cushion are made of steel tubing, bored and ground. The other parts are steel forgings. The rods are ground also. The cushions are made in various sizes up to 12 in. in diameter. On a 6-in. cushion a maximum stroke of 3½ in. is obtainable, and on a 12-in. cushion, 8½ in. On large presses it has been found advantageous to place four, or even six, cushions, and this, it is explained, can be done with certainty that the pressure will be uniform on every part of the draw plate, because all cushions are fed from one source of air supply. In several cases where the Strand cushion has been used on double-action presses it has been found feasible to eliminate the cam movement inasmuch as the cushion permits greater speed of operation. It has been definitely proved that with the device shapes can be formed at one draw that are deeper than the diameter, one such example being an oil can 2⅞ in. in diamter and 3⅜ in. in depth. Automobile headlights are made at one draw, and so successfully that buffing operations are dispensed with inasmuch as scratches on the work are eliminated.

The makers emphasize that the use of the cushion eliminates the back-kick which results from the use of rubber bumpers or steel springs due to their great compression at the end of the stroke. Not only is the back-kick a source of strain on the clutch, but it also causes a waste of power and shortens the life of the press. The well-known deterioration of rubber when in contact with oil also is pointed out.

Saw Attachment for Shaping Machines

J. A. Moller, New Rochelle, N. Y., has developed a saw attachment for shaping machines which is designed for use in connection with the manufacture of dies, gages, jigs, fixtures, tools, etc. Among the advantages claimed for the combination are the clamping of the stock positively in the vise of the shaping machine and the positive control provided for the saw when attached to the shaper ram, as well as the ability to adjust the blade in all directions.

The frame of the saw is cast in two parts, the connection between the two being made by screws which serve to tighten the blade and at the same time are relied upon to give a slight oscillating motion and thus prevent the blade from breaking. The distance from the cutting edge of the saw blade to the underside of the frame is 9 in., thus permitting stock of that dimension to be handled.

The frame is fastened to the ram by a block which enters into an oblong slot in the frame. This arrangement tends to prevent the frame from turning around



The Use of a Saw Attachment in Connection with a Shaping Machine Is Relied Upon to Facilitate the Production of Dies, Jigs and Fixtures

when tightened and the slots enable the frame to be raised or lowered 5 in. Means are provided to relieve the saw on the return stroke.

Wages of machinists, boilermakers, blacksmiths and pipe fitters at the Monon railroad shops, Lafayette, Ind., have been advanced 7c. an hour and the helpers and apprentices 5c. an hour.

An aviation school under the direction of the Aviation Section of the United States Signal Corps is expected to be established about Sept. 1 at the Johns Hopkins University, Baltimore.

Ferromanganese Supplies Are Still Diminishing

Receipts of ferromanganese from Great Britain in May and June have shown a decided falling off from previous months and the situation as to supplies is thus less reassuring. The following table presents the situation as it stands up to the present time, giving the official imports and the domestic production of the alloy from the blast furnace reports of THE IRON AGE in gross tons:

	Imports	Domestic Output	Available Supply
Average per month, 1916..	7,577	18,461	26,038
January, 1917	6,211	21,130	27,341
February	6,379	19,942	26,321
March	5,324	18,529	23,853
April	6,846	17,989	24,835
May	2,019	20,722	22,739
June	2,717	21,041	23,758

This shows that the available supply has been diminishing in the last few months, particularly in the last two. The average output of domestic alloy has been 19,892 tons per month for the first half of this year while the average imports have been only 4916 tons per month.

About two months ago the Alloy Committee of the Council of National Defense, after a thorough canvass of the situation, made the statement that the consumption of ferromanganese of the steel industry of the United States was about 28,000 tons per month. With production close to 20,000 to 21,000 tons and with imports at that time of about 6000 tons per month, the available supply seemed somewhere near being adequate. But with imports declining as decidedly as they have and bid fair to, taking into account submarine sinkings already reported, the outlook is not as promising as could be wished.

There has also been a falling off in the domestic output of spiegeleisen. The June production was only 9425 gross tons as compared with an average of 18,049 tons per month for the first five months of this year.

STEEL CORPORATION EARNINGS

Good Showing After Large Deductions for Taxes—Special Dividend

The report of the United States Steel Corporation for the second quarter of this year shows a continuation of great earnings, which would have surpassed those of any other quarter by about $30,000,000 had it not been for the deductions made for war income and excess profit taxes. The earnings, after making the usual deductions for operations, ordinary repairs and maintenance and war taxes of $53,918,872 were $90,579,204. The earnings for the past 10 quarters have been as follows:

	1917	1916	1915
First quarter	$113,121,018	$60,713,624	$12,457,809
Second quarter	90,579,204	81,126,048	27,950,055
Third quarter	.....	85,817,067	38,710,644
Fourth quarter	.....	105,968,347	51,232,788

From the $90,579,204 the usual dividends of 1¾ per cent on the preferred and 1¼ per cent on common, amounting to $12,658,700, and an extra dividend of 3 per cent on common, amounting to $15,249,075, were deducted, making a deduction of $27,907,775 for dividends and leaving a surplus for the quarter of $40,965,761. From the net surplus for the first quarter, $69,836,981, deductions for the special extra common dividend, $5,083,025 (Red Cross), and additional taxes under the bill now pending in the Senate amounting to $33,865,000 were deducted, leaving a surplus for the quarter ended March 31 of $30,888,957, and for the six months ended June 30, 1917, of $71,854,717. During the past six months ended June 30, 1917, $43,000,000 were expended on account of additions and new construction.

United States Steel Corporation Earnings for the Quarter Ending June 30th, 1917

		1917	1916
April		$28,521,091	$25,423,676
May		30,773,551	27,554,899
June		31,284,562	28,147,473
Total earnings after deducting all expenses incident to operations, comprising those for ordinary repairs and maintenance of plants, taxes (including an allowance of $53,918,872 (estimated) for war income and excess profits taxes) and also interest on bonds of the subsidiary companies		$90,579,204	$81,126,048
Less, charges and allowances for depreciation, applied as follows, viz.:			
To depreciation and extraordinary replacement funds and sinking funds on bonds of subsidiary companies	$14,347,399		$8,071,848
To sinking funds on U. S. Steel Corporation bonds	1,806,752		1,673,978
		$16,154,151	
Net income		$74,425,053	$71,380,222
Deduct: Interest for the quarter on U. S. Steel Corporation bonds outstanding	$5,326,907		$5,412,962
Premium on bonds redeemed	224,610		261,000
		5,551,517	
Balance		$68,873,536	$65,706,260
Dividends on stocks of the United States Steel Corporation, viz.:			
Preferred, 1¾ per cent	$6,304,919		$6,304,919
Common, 1¼ per cent	6,353,781		6,353,781
	$12,658,700		
Extra dividend:			
Common, 3 per cent	15,249,075		5,083,025
Balance of surplus for the quarter		27,907,775	
		$40,965,761	$47,964,535
Net surplus reported for quarter ending March 31, 1917	$69,836,981		
Less:			
Special extra common dividend, No. 51, paid July 28, 1917	$5,083,025		
Additional allowances estimated for first quarter of 1917, for war income tax and excess profits tax (per H. R. Bill 4280, reported to U. S. Senate, July 3, 1917, not yet finally adopted)	33,865,000		
	38,948,025		
Balance of surplus for quarter ending March 31, 1917		30,888,956	
Total surplus for six months ending June 30, 1917		$71,854,717	

The National Self Cooling Machine Co., Youngstown, Ohio, has organized and purchased a new foundry in addition to about 20,000 ft. of floor space. The company will purchase new equipment to the extent of $25,000, it is said.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the DAVID WILLIAMS CO., 239 West Thirty-ninth Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: Equitable Building. Philadelphia: Real Estate Trust Building. Cleveland: Guardian Building. Cincinnati: Mercantile Library Building.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year. Entered at the New York Post Office as Second-class Mail Matter.

Selective Exemption of Workers

Employers, as a whole, are just beginning to emerge from a mental haze in regard to the working of the draft plan and to appreciate the duty that rests upon them to aid the Government in preventing industrial disruption. It has been the belief of some that the Government would take the initiative to hold skilled labor in the industries essential to the war program; that there would be class exemption in some of the trades. Others thought that the Government had the power and the machinery to assign recruited and conscripted men back to industry. The truth is there is no legislation preventing the voluntary enlistment of skilled and valuable workmen nor any to return to the factories employees who are conscripted through failure to claim exemption.

In the great industrial States, employers have been busy obtaining lists of employees called out by the draft, and with very real patriotism have analyzed these lists with the purpose of appearing before the district exemption boards prepared to claim exemption only for those men whose value to the business is beyond question. There is no evidence of a general intent to ask for the release of employees whose industrial value is not clearly greater than their military value to the country. The line of demarcation between the two classes is plainly drawn. There is no true efficiency in turning a skilled workman over to months of training as a soldier if the industry from which he comes must spend the same period in training a man to take his place, and the product upon which he was working is a component of our badly needed war supplies.

The inclusion of aliens in the registration, but their exclusion from the operation of the draft law, has put a heavy burden upon the American citizens in many districts, both by reason of the exaggerated population figures credited to some cities for draft purposes, thus affecting the total number to be furnished by the city, and more particularly on account of the great preponderance of aliens in certain districts in these cities. Thus it has been predicted that in certain city districts from 1200 to 1600 men must be called for examination to secure a quota of about 250, because of excessive alien registration. The McCumber resolution, which is before a sub-committee of the Senate Foreign Relations Committee as this is written, if enacted into law will permit the conscription of aliens or their deportation upon refusal to serve. The abrogation of certain sections of existing treaties will be necessary before such a law can be passed, but it is reported that the allied countries look with favor upon this move, as at present neither the country of their nativity nor the United States can lay hold upon those aliens resident here.

In one district of Chicago, where 2923 are registered, 2108 are exempt as aliens, leaving only 815 citizens to furnish a quota of 377 soldiers. The alien population of Connecticut, the leading State in the manufacture of munitions, is 37 per cent; of Massachusetts, one of the most important producers of machine tools and mechanics' tools, 29 per cent; Michigan has 19 per cent, and Illinois 15 per cent. In view of these striking figures, some adjustment of the alien problem seems imperative before the next draft is made. Labor is already protesting against the obvious injustice of a condition which forces American workmen into the army while aliens are left free to preempt the jobs of the fighting men and to receive the high wages of industry rather than the low wages of the army.

American labor and its leaders have accepted the draft law and its obligations with a calmness that augurs well for the spirit and morale of our first National Army. The only discordant note has been that struck by an organizer of the ship workers, who made the treasonable threat that he would call a strike in the Delaware shipyards if a single union shipworker is drafted. Strikes now existing in a few places over the country are based solely upon local problems and contentions in no way connected with the draft. The huge shipbuilding program which is now being launched in earnest may call for selective conscription of workmen to fill the complements of the many projected shipyards, but it is certain that any such policy will be so fashioned by the Government and its industrial advisers as to obviate any serious dislocation of labor conditions in other trades.

Labor Conditions During War

The British, French and other missions came to the United States in order to give us the benefit of their experience in handling war problems. Beyond question it was a great advantage to us, when the new conditions of war arose, to learn how matters had been handled by the countries that entered the war three years ago. There was, however, a curious inconsistency of omission in the plans for imparting information. As a part of the British mission there was a coterie of labor representatives, who communicated information to the Committee on Labor of the Council of National Defense, but so far as we know there was no corresponding committee of British employers to impart information to the employers of the United States. In view of the admitted fact that the prosecution of war requires the speeding up of many industries it is impossible to admit that there was not as much occasion for advice to be given to employers as to employees.

That the trade unions of the United States welcomed the information offered and hope to profit by it is evidenced by the contents of the *American Federationist*. In the June number there were published the formal addresses of the British labor representatives to the Committee on Labor. In the July number there is the first portion of a record of the questions and answers that followed, and this account is to be continued in the August number.

The conference brought out the fact that during the war to date there has been a net increase of more than one million in membership in British trade unions, despite the enlistments, i.e., that the number who joined the unions exceeded the number who left the unions to go to the front by more than one million. This was the testimony of Rt. Hon. James H. Thomas, spokesman of the delegation. He is a member of Parliament and president of the Engineers' Organization of Great Britain. He testified that in the case of his own organization over 100,000 men enlisted, but that despite this loss his union was 122,000 stronger than when the war began.

We were accustomed before the war broke out to regard the United Kingdom as suffering from trade unionism and unable to progress industrially as greatly as Germany largely on that account. We are now given reason to conclude that the war is increasing the United Kingdom's handicap in this respect.

What of the United States? Our employers have not been given advice growing out of the experience of the United Kingdom. Our trade unions have been given advice on their side of the matter. It is true, of course, that early in the war the effort to push industry was overdone and men were worked too hard, it being found later according to exhaustive reports that have been made that a reduction in working time resulted in increased outputs. There is no possibility of our making any such mistake for the simple reason that labor refuses. American employers would be well content to receive a normal day's work for the greatly increased day's pay they are giving. There is no assurance, however, that the British experience will not be duplicated in some degree, that having been that many more men joined the unions than left the unions in order to fight.

There is no hope of relief in the labor situation through the operation of natural influences. The only thing that is being done is to enact, long after the proper time, the Food Control bill, for the purpose of reducing the cost of living. That is, on general principles, an excellent thing to do, but it will not increase the performance of labor. One of the difficulties in the situation has been that many men, in order to provide themselves with what they desired, did not need to work full time. If they can purchase what they need for less money they will presumably be disposed to work still less. Thus the trends in the labor situation at present appear to be three: men being called to the colors; more labor unions; less work per week. It is high time, in the circumstances, that employers take united cognizance of the situation and seek such palliation of the conditions as may be secured.

After Effects of War Economies

An important matter that concerns many if not all manufacturers is the changes in demand for manufactured products that will result from the various economies being practised as a result of the war. In the case of the railroads, for instance, the prospects of severe car shortage that were looming so threateningly have been greatly mitigated by the economies that have been introduced by heavier loadings and better handling of cars, whereby a volume of traffic is being handled to-day which a year ago would have been considered impossible with the rolling stock available. There is no reason to suppose that the old ways will be returned to after the war. Then the demand for additional cars will be less than would otherwise be the case, and there will be more funds for expansion in other directions, for more electrification, for instance.

In the agricultural field the scarcity of labor and the desire for the heaviest crops possible will cause an added demand for farm machinery, tractors in particular perhaps, with the important proviso, however, that the machinery is available at something like a reasonable price. If the use of a tractor is commenced on account of scarcity of men and horses its use will not be abandoned when men and horses become more plentiful.

In the automobile field, including both pleasure cars and trucks, the necessity for economizing gasoline will produce a trend towards the vehicles whose specialty is economy in gasoline, and as well, undoubtedly, to those which use kerosene. Necessity is the mother of invention and the inventions once introduced will remain in demand.

In times of peace conditions change as the utility of an article increases in proportion to its cost and as familiarity with the article grows. Manufacturers must constantly watch the trends in order to be provided with facilities to meet increasing demands, or gradually work out of lines for which the demand is decreasing. In wartime the speed of such trends is multiplied indefinitely, and what is frequently no easy task in times of peace becomes an extremely difficult one in times of war. It is quite clear that the economies forced by war will have very important after effects. A manufacturer who looks forward to the end of the war

with the idea that he will then resume "business at the old stand" is in danger of experiencing a rude shock. It is impossible to predict what will occur, but it is safe to assert that very few things will be the same after the war, and the trends should be studied carefully from day to day.

A corollary to this proposition is that as war demands for materials are peculiar to war, having no relation to peace demands, war produces unusual scarcities of certain materials and consumers seek substitutes. The fact that the substitution is forced does not prove that it would not have been advantageous if undertaken in the usual course of events. Return to the former material may not follow. A manufacturing consumer who finds his raw material grown scarce may not do well simply to wait until it becomes plentiful again. His competitor may be finding a substitute which he will use to advantage in future.

More Urgent Call for Manganese

Ferromanganese receipts from Great Britain are rapidly declining and the situation confronting the steel industry of the United States is not as assuring as it was. With submarine sinkings of 2000 to 3000 tons in the past two months and with an evidently more acute situation in England regarding supplies of manganese ore and metal to meet the increased demands of the steel industry there, future imports from that source are not likely soon to resume the rate needed to meet our total needs of 28,000 tons per month. The May and June available supplies were less than 23,000 and 24,000 tons respectively. The indications are that the July supplies will not be any larger than those of May and June.

In view of these facts the Alloy Committee of the Council of National Defense has just notified the steel industry that all possible conservation of the alloy must be practiced and urges a more liberal use of spiegeleisen where at all feasible.

This unexpected development again brings up the question of a way to meet the situation. It is generally accepted that metallurgically there is no complete substitute for manganese in the important rôle it plays in steel. In practice it is found that only the high percentage alloy is efficient. Both ferromanganese and spiegeleisen are high in carbon. Were lower manganese alloys available, having a low carbon content, they would probably be nearly as satisfactory and find a wide use.

A solution of the problem which holds out some hope is the conversion of our plentiful manganiferous iron ores into a low carbon manganese-iron alloy. Blast-furnace reduction does not meet the problem. The electric furnace may perhaps solve it. The suggestion of intensive and prompt research with a view to ascertaining whether such ores cannot be electrically converted into low-carbon manganese alloys might well be acted on. Such a metallurgical process, successfully carried out on a commercial scale, would be of incalculable value to the steel industry of the United States and perhaps render us independent of foreign sources for manganese. It at least deserves thorough investigation.

CORRESPONDENCE

A Manufacturer's View of the Attitude of the Government on Steel Prices

To the Editor:—Our country is now facing what may prove to be the greatest crisis in its history. Every patriotic American will be impressed by the high idealism of the recent address of President Wilson. It does not follow, however, that his conclusions as to the best method of realizing these ideals in the conduct of business are worthy of the same approval.

The war is costing at least $100,000,000 per day. If it can be shortened 30 days, $3,000,000,000 will be saved to the world. Under these conditions, why waste valuable time attempting to fix artificial prices on commodities required for war purposes?

The United States entered the war to win it, and the way to win it is to have every man in the country take off his coat with this one thought in mind—win the war in the shortest time possible. This can be accomplished only by a declaration by the Government that it is in favor of fair and even liberal prices for all commodities required in the conduct of the war.

For this purpose, steel in various forms is a vital necessity. At a time like this when every resource of the nation should be available to the Government, we find the Government officials and the steel manufacturers facing each other in an attitude of hostility and suspicion. This is an intolerable situation, and demands prompt action. In order to take such action intelligently, however, a reason should be sought for this unfortunate failure to co-operate.

At the beginning of the war the Government through Cabinet officers publicly announced the intention to demand that steel be supplied to the Government at prices which had ruled during normal conditions, absolutely ignoring the abnormally increased cost of production, which will be further increased as the war proceeds, owing to the scarcity of labor. Thus the steel manufacturers, as a matter of self-preservation, have been forced into a defensive attitude.

At various times since, similar announcements have come from Washington, and during the past week Carl Vrooman, a responsible Government official, has denounced the steel makers as "an organization of unpatriotic, selfish, sodden, steel magnates."

The steel manufacturers have made no boast of their patriotism, but they are no less patriotic than their fellow countrymen. They do, however keenly resent the attempt of Government officials, who by training have not the ability to appreciate the problems involved, to place them in a false attitude before the American public.

They do not question the right nor the propriety of the Government insisting upon preference being given to war materials over any other class of business. They do not believe, however, that the Government should attempt to fix arbitrary prices on steel products.

If an attempt is made to do this, in fairness to the manufacturers the cost of every factor entering into production must be fixed by the Government also; and, as it must be evident even to the superficial student of economics that the final cost represents the labor which has been employed on the raw material in all its stages (which, in the ultimate analysis, is estimated to constitute about 85 per cent of the cost of any finished manufactured article) this, of course, involves the fixing of wage rates.

Does the President propose to fix the price at which farmers and planters will sell their wheat, corn, cotton,

sugar and tobacco? Will he undertake to determine the wage rates to be paid workingmen in all industries supplying commodities to the Government?

It is only necessary to state this proposition to show how utterly impracticable it is; and we submit that the American people are not yet prepared for such a radical step, even if it were physically possible for the Government to undertake it.

The President says that "we must make the prices to the public the same as the prices to the Government." This means that if any business man should sell even 5 per cent of his output to the Government, the price fixed for this 5 per cent would also govern the remaining 95 per cent which he sells to the public. At the same time his neighbor may be producing a commodity none of which is required by the Government, and he can therefore sell his output at market prices, governed only by the law of supply and demand.

The attempt to fix arbitrarily the price at which any commodity shall be sold for Government use, while at the same time most of the factors entering into the cost of producing that commodity, of which labor is the most important, are not limited and in the nature of the case apparently cannot be, is bound to fail. Even the attempt, however, must have a profoundly disturbing influence on the business of the country.

There is nothing so paralyzing to industry as uncertainty.

The public interest demands that production be stimulated in every possible way, and *this cannot be accomplished by any policy of repression,* which would strangle industry and prevent earnings from which must come the revenues to carry on the war in future years.

Manufacturing plants which by reason of inferior equipment or other disadvantages cannot successfully compete under ordinary conditions must be encouraged to produce the maximum output, and this can only be accomplished by enabling them to make a fair profit over their cost. If these prices should enable more efficient plants to make higher profits, this can and should be equalized through the operation of the excess profits tax.

The fact should be emphasized that the relation of the Government to sellers is not similar to that of an ordinary purchaser, as by the exercise of the taxing power it can and will automatically recover a large percentage of the price paid for commodities.

We believe that the Government should have better prices than would be given to any other large and responsible buyer, and that there should be no difficulty in negotiating such prices if the Government officials will appreciate the problems of the manufacturers and negotiate in a spirit of fairness.

Manufacturers and business men generally should be allowed to make liberal profits, so long as their business is being conducted under fair competitive conditions; and then, after these profits have been made, the Government should take from them by taxation their fair proportion of whatever may be necessary to provide the funds for the prosecution of the war, after providing by bond issues for a more equitable share of the burden than has thus far been proposed, to be assumed by future generations, who will reap the benefit of our sacrifices.

Under such conditions, the burden of the war will be distributed fairly, business will follow the natural laws of supply and demand, and there will be no criticism among business men generally, however great the cost may be, providing it is assessed in an equitable manner.

A STEEL MANUFACTURER

New York, July 31, 1917.

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War Industries Board the New Buyer

Frank A. Scott Appointed Chairman—Decision of Priority in Delivery a Function—The Steel Cost Inquiry

WASHINGTON, July 31.—A reorganization of the purchasing system of the Government that is relied upon to bring order out of chaos was decided upon by the Council of National Defense July 28 and promptly approved by the President. A new body, known as the War Industries Board, composed of seven members working under the direction and control of the Council of National Defense and responsible through it to the President, has been created. In this body will be lodged the duty and responsibility of buying war material of all kinds and in addition the board will take over the work heretofore discharged by the general munitions board. The new body will be composed of Frank A. Scott, chairman, Lieut. Col. Palmer E. Pierce, representing the Army, Rear Admiral Frank F. Fletcher, representing the Navy, Hugh Frayne, representing labor, B. M. Baruch, Robert S. Brookings, and Robert S. Lovett.

A War Industry Clearing House

According to an official announcement made by the Council of National Defense "the board will act as a clearing house for the war industry needs of the Government, determine the most effective ways of meeting them and the best means and methods of increasing production, including the creation or extension of industries demanded by the emergency, the sequence and relative urgency of the needs of the different Government services, and consider price factors, and, in the first instance, the industrial and labor aspects of problems involved, and the general questions affecting the purchase of commodities."

Mr. Baruch has been designated to give his attention particularly to raw materials, Mr. Brookings to finished products, and Judge Lovett to matters of priority. These three members, in association with Mr. Hoover so far as foodstuffs are involved, will constitute a commission to arrange purchases in accordance with the general policy formulated and approved by the council. Concerning the status of the Advisory Commission and its numerous committees and subcommittees heretofore created the Committee on Public Information authorizes the following statement:

> The Council of National Defense and the Advisory Commission will continue unchanged and will discharge the duties imposed upon them by law. The committees heretofore created immediately subordinate to the Council of National Defense, namely, Labor, Transportation and Communication, Shipping, Medicine and Surgery, Women's Defense Work, Cooperation with State Councils, Research and Inventions, Engineering and Education, Commercial Economy, Administrations and Statistics, and Inland Transportation, will continue their activities under the direction and control of the Council. Those whose work is related to the duties of the War Industries Board will cooperate with it. The subcommittees advising on particular industries and materials, both raw and finished, heretofore created will also continue in existence, and be available to furnish assistance to the War Industries Board.
>
> The purpose of this action is to expedite the work of the Government, to furnish needed assistance to the Departments engaged in making war purchases, to devolve clearly and definitely the important tasks indicated upon direct representatives of the Government not interested in commercial and industrial activities with which they will be called upon to deal, and to make clear that there is total disassociation of the industrial committees from the actual arrangement of purchases on behalf of the Government. It will lodge responsibility for effective action as definitely as is possible under existing law. It does not minimize or dispense with the splendid service which representatives of industry and labor have so cheerfully placed at the disposal of the Government.

Board to Cooperate with Allies

The War Industries Board has not yet been clothed with any authority to make purchases for the Allies or to fix prices for them or for private consumers in this country. It is intimated, however, that a plan will soon be worked out by which the board will procure for the Allies substantial reductions in prices which, as to the leading items of supplies, will closely approximate those paid by the United States. There appears to be some uncertainty as to whether the actual work of buying for the Allies will be undertaken by the War Industries Board, and it is possible that supplies for the Allies may be purchased as heretofore, but with the cooperation of the board in securing uniformly reduced prices. In view of the importance of the work of the board in coordinating the interests engaged in turning out war material, it is the opinion of certain members of the Council of National Defense that the body should not be loaded down with the manifold details incident to purchasing for the Allies. All that is necessary can be accomplished in this direction, it is thought, by providing that the board shall cooperate with the Allies' purchasing commissions whenever necessary.

Priority Highly Important

The function of the board with respect to the dictation of priority of manufacture and shipment is of the greatest possible importance, and Judge Lovett's selection as the priority member of the board has been made with great care. He is a national figure in American railway circles, having served as president of both the Union Pacific and Southern Pacific systems for five years, and since 1913 has held the post of chairman of the executive committee of the Union Pacific System. As priority member of the board he will pass upon all cases in which there is any conflict of requisitions and will rule as to the precedence of all orders for material where the manufacturing or shipping facilities are in any way limited. His rulings will have wide scope and include purchases of material by private parties having Government contracts.

The Question of Steel Prices

The War Industries Board will probably have a more or less prominent part in the fixing of steel prices on the basis of cost of production as determined by the Federal Trade Commission. As soon as the commission is ready to report the President will summon a meeting of the Council of National Defense, which, it should be remembered, is composed exclusively of members of the Cabinet, and will determine the method to be pursued in fixing the margin of profit to be allowed to steel producers and which, presumably, will include earnings for distribution as dividends and surplus to be utilized in providing necessary extensions. Secretary Baker's official statement, given out after his recent conference with the representatives of the steel producers, pledged the Government to take both these items into account. It is assumed here that the War Industries Board will be called upon for an expression of its views as to the amount of profit to be allowed to steel producers and in view of the experience of the members of the board and the total lack of knowledge of big business problems possessed by the members of the Council of National Defense this fact has a highly important bearing on the pending problem.

It is among the possibilities that the decision of the

Government as to the cost of producing steel will not be reached without a more or less controversial exchange of views between the officials and the leading men in the steel industry. The agents of the commission are now engaged in working on the books of several large producers and some of them are in almost continuous conference with subordinate officials of the steel companies as to the proper method of arriving at costs. It is conceivable that when the commission's figures are finally made up steel men may take exception to them and seek an opportunity to present their views in detail. Whether such opportunity will be afforded before or after the findings of the commission are officially promulgated remains to be seen, but it is believed here that the President will permit the producers to be heard before any basis is adopted to which serious objection is made.

The President and Business Men

It is significant of the President's attitude toward the prominent business men who make up the committees and subcommittees of the Council of National Defense that the reorganization just effected of the Government's purchasing system does not involve the elimination of any of these subordinate bodies. It is an open secret here that the Council of National Defense, several weeks ago, recommended to the President the abolition of nearly all the subcommittees appointed by the Advisory Committee and the concentration of all authority in the hands of three boards. It is now stated that the President not only recognizes the patriotic work done by the business men who have so cheerfully put aside their own affairs and come to Washington to assist the Government, but sharply resents the unjust criticism of these men at the hands of certain Senators and Representatives. The sentiments of the President with respect to this matter are understood to be reflected in the memorandum concerning the appointment of the War Industries Board prepared by the Council of National Defense and quoted above.

Interest of Committeemen in Contracts

The bill providing for the control of food, feed and fuel, which is now in the hands of the Conference Committee, will carry a provision imposing certain restrictions upon the business men who make up the committees of the Council of National Defense. When this bill was amended by the Senate Committee on Agriculture a section was inserted making it "unlawful for any person acting either as a voluntary or paid agent or employee of the Government in any capacity, including an advisory capacity to any commission, board, or council of the Government, to procure, attempt to procure, or make any contract for the purchase of any supplies for the use of the Government either for himself, from any firm of which he is a member, or corporation of which he is an officer or stockholder, or in which he has any financial interest." It was pointed out in the Senate that the adoption of this provision would force the disbanding of practically all the subcommittees of the Council of National Defense and it was finally rejected. The subject was revived before the conference committee, which has adopted the following substitute:

> No person acting either as a voluntary or paid agent or employee of the United States in any capacity, including an advisory capacity, shall solicit, induce, or attempt to induce any person or officer authorized to execute or to direct the execution of contracts on behalf of the United States to make any contract or to give any order for the furnishing to the United States of work, labor, or services, or of materials, supplies, or other property of any kind or character, if such agent or employee has any pecuniary interest in such contract or order, or if he or any firm of which he is a member, or corporation, joint stock company, or association of which he is an officer or stockholder, or in the pecuniary profits of which he is directly or indirectly interested, shall be a party thereto. Nor shall any agent or employee make or be a member of any committee or other body which shall make or participate in making any recommendation concerning such contract or order to any council, board, or commission of the United States, or any member or subordinate thereof, without making to the best of his knowledge and belief a full and complete disclosure in writing to such persons or group of persons of any and every pecuniary interest which he may have in such contract or order and in any party thereto, nor shall he participate in making such contract or giving said order. Any willful violation of any of the provisions of this section shall be punished by a fine of not exceeding $10,000 or by imprisonment for not more than five years, or both.

At this writing the conference committee on the food, feed and fuel control bill is still wrestling with the question as to whether the so-called Smoot-Owen amendment providing for a joint committee on war expenditures shall be authorized. President Wilson has protested against the creation of such a committee on the ground that it would only serve to harass officials of the administration and would indicate a lack of confidence in the President himself. The indications are that the amendment will ultimately be rejected.

W. L. C.

SERIOUS STRIKE ENDED

Railroad Brotherhoods Compel Trainmen to Return to Work

CHICAGO, July 31 (*By wire*).—Officials of three of the Railroad Brotherhoods—Locomotive Engineers, Firemen and Conductors—forced a termination of the Switchmen's strike, which for two days seriously interfered with the movement of freight in the yards of 19 of the railroads entering Chicago. The strike was declared Saturday morning by the Brotherhood of Railway Trainmen, while the end was ordered at 5.39 o'clock Monday morning. The tie-up was by no means complete, inasmuch as the Switchmen's Union of North America did not participate in the strike. The latter body asserted that the strike was an attempt to eliminate it from the situation. It has several thousand members.

In the agreement forced upon the Brotherhood of Railway Trainmen, it was arranged that the points at issue should be left to a committee of railroad managers and brotherhood officials. The disputed points included meal hours, method of appointing yardmasters, reinstatements and employment of new men.

The leader of the striking switchmen was subjected to much criticism, both from within and without the union. The conciliatory railroad men acted because of patriotic motives and fear that the strike might bring about a compulsory arbitration law. The strike was declared by James Murdock, vice-president of the Brotherhood of Railway Trainmen, acting for W. G. Lee, president, who is ill.

Institute Meeting

The autumn meeting of the American Iron and Steel Institute will be held at Cincinnati, Friday and Saturday, Oct. 26 and 27. These dates have just been announced by Secretary James T. McCleary. The meetings will be held in the Hotel Sinton.

The labor troubles which have existed between the International Brotherhood of Boilermakers, Iron Shipbuilders and Helpers of America and the St. Louis Association of Boiler Manufacturers were adjusted July 27 at St. Louis under a two-year contract which becomes effective Aug. 2, under which union men gain an advance of 25 per cent over the present scale and will work eight hours a day. More than 350 men and 13 shops are affected. The shops of the John O'Brien Boiler Works Co., the Joseph A. Wangler Boiler & Sheetiron Works and the Heine Safety Boiler Co., where strikes are in progress, are not affected by the agreement.

Iron and Steel Markets

RAILS FOR FRENCH LINE

Our Government Buys 150,000 Tons

Heat Cuts Down Outputs—Quiet Market to Continue

Active buying of iron and steel products by the Government, in some cases with prices stipulated, but for the most part at prices to be fixed later, is in contrast with the continued abstention of private buyers from the market. There is little dissent from the view that present conditions are likely to last for some time and that if meantime some of the price peaks come off, the steel trade will not suffer.

Along with intimations that the inquiry into steel making costs will take longer than was counted on are signs of a more reasonable attitude at Washington as to the prices to be paid for steel products. But the uncertainties of the situation are enough to give concern to a good many manufacturing consumers of steel in view of exaggerated reports of the amount of the country's output the Government and its Allies are likely to require.

For the most part—there are some exceptions—steel manufacturers are quite willing to see the present check on the long continued bidding of buyers for material under the fear that they could not get enough to continue in operation.

Chief of passing developments have been the buying of 150,000 tons of rails by the Government for the building of a double track railroad from its French port to its battle front, a marked reduction in output of steel works and rolling mills due to the extreme heat in all producing districts, and the efforts of manufacturers in steel and metal working lines to have exempted from conscription enough employees to hold output of war materials where it is.

The Washington Government's railroad operations in France will be on a large scale and a vast engineering program is involved. There will also be considerable buying of light rails for portable tracks. The standard sections just bought are 80-lb. rails. Either Bessemer or open-hearth rails will be accepted, $38 per gross ton being paid for the former and $40 for the latter. For angle bars 3.25c. was paid and for track bolts and nuts 5.50c. Deliveries are to be completed by Oct. 1. The Steel Corporation took 90,000 tons of the rails and the remainder was divided between three companies.

Over against the above prices for rails, which are those at which railroads bought last year for late 1917 delivery, are current sales at 100 per cent higher. At Chicago a 700-ton sale of rails has just been made at $85. For the Government's French railroad, 300 locomotives have been placed, and there are negotiations for 17,000 cars. About 100,000 kegs of spikes are wanted.

France's plate purchases through J. P. Morgan & Co., of which 25,000 tons was reported last week, run up to about 60,000 tons, at 6c. for hull steel and 8.50c. to 9c. for boiler steel.

The holding up of certain export rollings has been the first effect of the embargo enforcement, and the effect on prices of resales of some materials for which irrevocable credit had been provided is having some consideration.

In the present situation, all price tendencies are toward easier conditions, but with mills booked so far ahead the change thus far is scarcely measurable. On sheets, offerings by jobbers in the Central West have been below the prices of some mills, or on an 8.50c. basis for black and blue annealed, and 10.50c. for No. 28 galvanized.

Export as well as domestic inquiry for plates continues heavy. No sudden increase in the percentage of plate-mill output taken by the Government is expected, and there is a very considerable tonnage available for the general market. The new plate mill of the Jones & Laughlin Steel Co. has just been started.

Next to the enormous earnings made on contract prices well below those now current, the striking facts about the Steel Corporation's statement are the setting aside of $87,000,000 for the half year against excess profits taxes, and the statement that $43,000,000 had been expended since Jan. 1 on new construction. Neither of these items would be possible on the cost-plus basis that has been proposed for Government steel contracts.

Better car supply for Connellsville coke is not adding materially to pig-iron production. In the months of acute car shortage many coke workers left for other employment, and now that there are more cars labor is not at hand for an increase in output.

The let-up in pig-iron buying has modified extremes in prices. While a large amount of iron had been sold for the first half of 1918, a good many important consumers of foundry iron have refrained from buying for that delivery, and their disposition is to wait for the clearing up of the present uncertainty. Some Central Western pig-iron producers have stopped at $55 for No. 2 foundry, as the beginning of an effort to moderate the market; but buyers show no signs of being attracted by such mild measures, with the prospect of Government regulation of prices for coal and coke.

Pittsburgh

PITTSBURGH, July 31.

The local steel market is still marking time, and it is not believed there will be any new buying of consequence until the Government defines clearly its position in regard to prices. Consumers are not buying a pound of material they can possibly avoid, and will not do so under present uncertain conditions. The mills are not embarrassed in the slightest by the falling off in new orders, as they have obligations on their books that will take all their output for a good part of the remainder of this year. Prices, under the cessation of new buying, are holding up very well, but the opinion is pretty general that the top has been reached, and later on there may be a readjustment to a lower level. Prices on pig iron in the past week have stood still, also on coke, but

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Aug. 1, 1917.	July 25, 1917.	July 3, 1917.	Aug. 2, 1916.
No. 2 X, Philadelphia...	$53.00	$53.00	$52.00	$19.75
No. 2, Valley furnace....	53.00	53.00	55.00	18.25
No. 2 Southern, Cin'ti...	49.90	49.90	49.90	16.90
No. 2, Birmingham, Ala..	47.00	47.00	47.00	14.00
No. 2, furnace, Chicago*.	55.00	55.00	55.00	19.00
Basic, del'd, eastern Pa.	50.00	50.00	50.00	19.00
Basic, Valley furnace....	52.00	52.00	52.00	18.00
Bessemer, Pittsburgh ...	55.95	55.95	57.95	21.95
Malleable, Bess., Ch'go*..	55.00	55.00	55.00	19.00
Gray forge, Pittsburgh..	46.95	46.95	47.95	18.70
L. S. charcoal, Chicago..	58.00	58.00	57.00	19.75
Rails, Billets, etc. Per Gross Ton:				
Bess. rails, heavy, at mill	38.00	38.00	38.00	33.00
O.-h. rails, heavy, at mill	40.00	40.00	40.00	35.00
Bess. billets, Pittsburgh..	100.00	100.00	100.00	43.00
O.-h. billets, Pittsburgh..	100.00	100.00	100.00	45.00
O.-h. sheet bars, P'gh....	105.00	105.00	105.00	45.00
Forging billets, base, P'gh	125.00	125.00	125.00	69.00
O.-h. billets, Phila.....	110.00	110.00	110.00	45.00
Wire rods, Pittsburgh....	95.00	95.00	95.00	55.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	4.659	4.659	4.659	2.659
Iron bars, Pittsburgh....	4.75	4.75	4.75	2.50
Iron bars, Chicago.....	4.50	4.50	4.50	2.35
Steel bars, Pittsburgh....	4.50	4.50	4.50	2.50
Steel bars, New York...	4.669	4.669	4.669	2.669
Tank plates, Pittsburgh..	9.00	9.00	9.00	3.50
Tank plates, New York..	10.169	10.169	9.169	3.669
Beams, etc., Pittsburgh..	4.50	4.50	4.50	2.50
Beams, etc., New York..	4.669	4.669	4.669	2.669
Skelp, grooved steel, P'gh	4.00	4.00	4.00	2.35
Skelp, sheared steel, P'gh	6.00	6.00	6.00	2.45
Steel hoops, Pittsburgh..	**5.75**	5.25	5.25	2.75

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire,	Aug. 1, 1917.	July 25, 1917.	July 3, 1917.	Aug. 2, 1916.
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh	8.50	8.50	8.50	2.90
Sheets, galv., No. 28, P'gh	10.00	10.00	10.00	4.25
Wire nails, Pittsburgh...	4.00	4.00	4.00	2.50
Cut nails, Pittsburgh....	4.65	4.65	4.65	2.60
Fence wire, base, P'gh..	3.95	3.95	3.95	2.45
Barb wire, galv., P'gh...	4.85	4.85	4.85	3.35
Old Material, Per Gross Ton:				
Iron rails, Chicago.....	*$40.50*	$41.50	$47.00	$18.50
Iron rails, Philadelphia..	45.00	45.00	52.00	20.00
Carwheels, Chicago.....	*30.50*	32.00	37.00	12.00
Carwheels, Philadelphia..	35.00	35.00	38.00	15.50
Heavy steel scrap, P'gh..	*33.00*	36.00	42.00	16.25
Heavy steel scrap, Phila.	32.00	32.00	40.00	14.75
Heavy steel scrap, Ch'go.	*29.00*	30.00	36.00	15.25
No. 1 cast, Pittsburgh...	**34.00**	32.00	36.00	15.00
No. 1 cast, Philadelphia.	35.00	35.00	39.00	16.00
No. 1 cast, Ch'go (net ton)	*27.00*	28.50	30.50	11.50
No. 1 RR. wrot, Phila....	*45.00*	48.00	57.00	19.50
No. 1 RR. wrot, Ch'go (net)	*33.50*	35.00	40.00	15.25
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	*$10.00*	$11.00	$15.00	$2.75
Furnace coke, future....	10.00	10.00	9.50	2.50
Foundry coke, prompt...	*12.00*	13.00	13.00	3.25
Foundry coke, future....	10.00	10.00	10.00	3.50
Metals,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.	**29.00**	26.00	31.75	26.25
Electrolytic copper, N. Y.	**29.00**	26.00	31.75	26.00
Spelter, St. Louis.....	8.50	8.50	9.00	9.25
Spelter, New York.....	8.75	8.75	9.25	9.50
Lead, St. Louis.....	**10.75**	10.25	11 25	6.00
Lead, New York.....	**10.87½**	10.25	11.37½	6.10
Tin, New York.....	**63.75**	62.50	62.00	38.00
Antimony (Asiatic), N. Y.	15.00	15.00	19.00	12.50
Tin plate, 100-lb. box, P'gh.	$12.00	$12.00	$12.00	$6.00

on scrap have further declined from $2 to $3 per ton. The extremely hot weather of the past week has curtailed output very materially, notably among blast furnaces, steel works, sheet and tin plate and pipe mills. There is also a falling off in output of coke, most of the coal miners and coke workers refusing to work more than about four days a week. The Government is steadily placing orders for pig iron, and for nearly all lines of finished steel. No announcement as to what the Government will do on prices of steel products will be made until the Federal Trade Commission has completed its investigation of costs.

Pig Iron.—There is almost an entire absence of new inquiry for pig iron, but prices are holding fairly steady. Consumers of Bessemer, basic and foundry iron are taking it in as promptly as at any time for a year or more, and in fact some consumers are insisting that shipments come forward more promptly. The melt of pig iron is as heavy as it has been at any time, but consumers are using iron bought on old contracts, and refuse to buy ahead until the situation clears. It is said that several large lots of basic iron have been offered in the past week for fairly prompt shipment, but concerns to which this iron was offered said they were not interested. We note a sale of 1000 tons of basic iron for prompt shipment at $52, Valley furnace. It is said that some Western blast furnaces will be called on to furnish about 10,000 tons of No. 2 foundry iron for Western use to be used in making castings for Government work. The resale Bessemer iron seems to have been pretty well cleared up, and none has been offered in this market in the past few days. The Shenango Furnace Co. will change over its No. 4 furnace at Sharpsville, Pa., from Bessemer to basic iron for a week or two.

We quote Bessemer iron at $55; basic, $52; malleable Bessemer, $53; No. 2 foundry, $53 to $55, and gray forge, $46 to $47, all f.o.b. at Valley furnace for delivery this year. The freight rate from Valley furnaces on pig iron to the Cleveland and Pittsburgh districts is 95c. per ton.

Billets and Sheet Bars.—We do not hear of any new sales of billets or sheet bars in the past week, nor is there any steel in the hands of dealers or others that is pressing the market for sale. Steel mills are filled up for months ahead with contracts from regular customers, on which shipments are going forward promptly, but there is an entire lack of new inquiry. This condition will likely prevail until the Government announces its policy as to prices on steel. If it should fix prices on billets and sheet bars to domestic consumers, they would probably be much under what are regarded as to-day's market prices. A sale of about 100 tons of ordinary carbon forging billets is reported at about $130, delivered.

We now quote soft Bessemer and open-hearth billets at $95 to $100 and soft Bessemer and open-hearth sheet bars at $105 to $110, maker's mill, Pittsburgh or Youngstown. We quote forging billets at $125 to $135 per ton for ordinary sizes and carbons, f.o.b. maker's mill.

Steel Rails.—As is the case on other lines of semi-finished steel, the new demand for steel rails is not so active, and probably will remain quiet until the present uncertainty as to prices has been removed. The mills that roll new light rails, and also the re-rolling rail mills, are filled up for months ahead. No new orders are being placed for standard sections. Prices on new light rails and standard sections are given on page 289.

Ferromanganese.—The new inquiry is light, consumers evidently being well covered on ferromanganese for some time ahead. Prices are ruling fairly steady, but are not as strong as some time ago. For delivery over last half of this year, we quote 80 per cent domestic ferromanganese at $350 to $375 and for first half of next year $350 or less, f.o.b. cars, maker's furnace. We quote 18 to 20 per cent spiegeleisen at $80 to $85 per gross ton at furnace.

We quote 9 per cent Bessemer ferrosilicon at $89, 10 per cent $90, 11 per cent $95, 12 per cent $100, 13 per cent $105, 14 per cent $115, 15 per cent $125, and 16 per cent $135. We now quote 7 per cent silvery iron at $84 to $89, 8 per cent $85 to $90, 9 per cent $86 to $91, 10 per cent $87 to $92, 11 and 12 per cent $88 to $93. All f.o.b. maker's furnace,

Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having a uniform freight rate of $2 per gross ton for delivery in the Pittsburgh district.

Plates.—It is said the Government will shortly place an order for about 17,000 cars for France, to be divided among four or five of the leading car builders. These will be 4-wheel, 12 metric tons capacity, flat bottom, low side gondolas. The Government will also likely place in the near future, large orders for artillery trucks for use of American troops in France. The Pressed Steel Car Co. is building 80 steel gondolas and 20 steel hoppers for the Youngstown Steel & Tube Co. No new active inquiries are in the market for steel cars, and none is expected until the situation as regards steel prices is clearly defined. The new inquiry for plates is not so active, consumers not buying a pound they can possibly avoid, but prices are holding strong. We quote ¼ in. and heavier sheared plates for delivery over the remainder of this year at 9c. to 10c. at mill while small lots from warehouse bring 12c. to 13c. and higher. The Jones & Laughlin Steel Co. has started its 128-in. plate mill installed in its Soho works, this city, and it will turn out about 15,000 tons of plates per month, when running full.

Structural Material.—The new inquiry is very light, and only small lots are being placed. Warren Moore & Co. have been notified by the Navy Department that their bid on the construction of the steel buildings to contain the projectile and armor plate plants for the Government at Charleston, W. Va., is the lowest of those received. This work will take about 2500 tons of fabricated steel. The American Bridge Co. has taken 400 tons for a new machine shop for the Auto Car Co., at Ardmore, Pa., and about 300 tons of bridge works for the Pennsylvania railroad. Prices on structural steel given on page 289.

Sheets.—The Navy Department will probably place soon, 5000 tons of steel sheets among the mills, and other direct and indirect Government orders are being placed with the mills right along. The new demand for sheets from the domestic trade is quiet, buyers holding off until more is known of the action the Government will take as to prices. As noted last week, the Government has been paying about $40 per ton less for all grades of sheets than those being charged to domestic consumers on new orders, and it is not believed that the Government, should it decide to fix prices to domestic consumers, will name prices any lower than it has been paying itself. The opinion is, however, that the Government will not take any action in regard to prices to be charged to the domestic trade for sheets. Prices are ruling fairly firm, but it is believed the crest has probably been reached. Mill prices for carloads and larger lots to the domestic trade are given on page 289.

Tin Plate.—On Tuesday, July 31, the American Sheet & Tin Plate Co. announced a new schedule of prices on terne plate, showing an advance of $2 to $2.50 per package. It is likely these prices will also be adopted by the few independent mills that are rolling terne plate. Recently the Government placed 50,000 base boxes of bright plate at $8.50, divided among the American Sheet & Tin Plate Co., which took the larger part, and the independent mills. A sale of 10,000 boxes of bright tin plate for export is reported to have been made at $57.50 per base box. Three or four mills that formerly rolled only terne plate have put in tinning pots and are now taking fairly large orders for bright plate for prompt shipment. One of these mills took the order noted above. Further Government orders are expected to be placed in a short time. It is still believed that the demand for tin plate over the next two or three years will be enormously heavy, and large additions to present capacity must be made within the next year or so to meet it. This country will likely be called on to furnish a large part of the tin plate needed by the Allies and other countries over the next two or three years. Sales of bright plate from stock have been made at as high as $14 per base box. We quote bright plate on current orders from stock at $12 to $14 per base box, f.o.b. mill, Pittsburgh. There has been a slight falling off in the new demand for tin plate from jobbers, due to the uncertainty as to the attitude to be taken by the Government in regard to fixing prices on steel. The new prices on terne plate effective from July 31, are given on page 289.

Iron and Steel Bars.—The new demand for both iron and steel bars has quieted down somewhat, but this does not worry the mills, as they have obligations on their books that will take the greater part of their output over the remainder of this year. Specifications against contracts are reported as coming in at a fair rate. One or two of the new bar mills of the Carnegie Steel Co., at McDonald, Ohio, are expected to be ready for operation within 60 days. The opinion is pretty general that prices on iron and steel bars have about reached the top. These are given in carloads and larger lots to regular domestic customers on page 289.

Hoops and Bands.—The new buying in hoops and bands is light. Most consumers are covered over the remainder of this year. Small lots of hoops for fairly prompt shipment range from 6c. to 7c. and on bands from 5.50c. to 6c. to regular customers, but some sales for both hoops and bands have been made at higher prices.

Muck Bar.—We quote best grades of muck bar, made from all pig iron at $95 to $100 per gross ton, at mill.

Wire Rods.—Mills report a continued active demand for both soft and high carbon rods, and prices are holding very firm. We note two sales of 500 tons each of soft Bessemer and open hearth rods at $95 per gross ton at maker's mill for fairly prompt shipment. Considerable exports of wire rods are still being made to Canada on contracts taken some time ago. The uncertainty as to prices on finished steel products apparently has not yet affected prices on rods, which are very strong and they are given in detail on page 289.

Wire Products.—The sub-committee on wire products placed last week 25,000 kegs of wire nails for Government use, of which about one-half will be furnished by the American Steel & Wire Co., and the remainder by independent mills. It is understood these nails are to be used largely by the Government in the permanent training camps in the South. The sub-committee on wire rope has also placed about 8000 tons among various makers, out of the 24,000 tons that the Government will eventually need. The War Department also placed 3000 to 5000 kegs of wire nails for auxiliary camps along the great lakes, this order having been taken by the American Steel & Wire Co. All the Government orders for wire nails are being furnished at the $3.20 base price. The new demand for wire nails is dull, and jobbers are anxious to work off their stocks, as much as they can, in view of possibly lower prices on wire nails when the Government definitely states its policy as to prices. So far, none of the independent wire mills has made any reduction on wire nails or wire, on account of the confusion existing in the jobbing trade by reason of the wide difference in prices on wire products of the American Steel & Wire Co., and the independent mills. The American Steel & Wire Co. is still quoting to its regular customers for indefinite delivery $3.20 base for wire nails and $3.25 for bright basic wire per 100 lb., at mill. Prices quoted on wire and wire nails by the independent mills, some of which can make fairly prompt delivery are given on page 289.

Shafting.—The Government has lately placed orders for shafting material for fuses and nose pieces for 9,000,000 3-in. shells. It is estimated that at present the Government is taking fully 40 per cent of the entire output of shafting on direct and indirect orders, and makers of shafting believe that this will be increased in the near future to probably 60 per cent, and may run to 75 per cent. New orders and specifications for shafting from the automobile and screw stock machine trades have fallen off very materially, and many automobile concerns, instead of building pleasure cars and business trucks, are getting into the manufacture of airplane motors. As yet, prices on shafting have shown no tendency toward lower values, discounts remaining firm at 10 and 5 per cent off list, depending on size of the order and the customer, while a few small sales are made at list.

Railroad Spikes and Track Bolts.—The Government has just sent out an inquiry for 100,000 kegs of stand-

ard size railroad spikes for shipment to France, and has asked for prompt delivery. It is probable that if the order is placed it will be divided among the different spike makers pro rata on their capacity. All the spike makers are filled up with orders for months ahead, and are not anxious to take on more new business. Boat spike makers are not quoting to domestic trade, desiring to conserve their entire output for Government use in shipyards, it being believed that the Government's boat building program will take practically the entire output of rivet spikes for a year or two years. Nearly all makers of spikes are quoting $7 per 100 lb. on all sizes.

Cold Rolled Strip Steel.—Makers of strip steel products are receiving large orders from the Government, direct and indirect orders from builders of airplanes in all parts of the country. It is said that fully 25 to 30 per cent of the output of the cold rolled strip steel makers is now being devoted to the Government's direct and indirect orders, and this may increase to 40 per cent in the near future. Makers are still taking orders for only 60 days ahead and 50 per cent of the specification must accompany each order, and the other 50 per cent in 30 days. Prices are firm, and the falling off in demand for finished steel products on account of the uncertainty of the Government action is not causing any weakness in prices on cold rolled strip steel.

On contracts, mills are quoting 9c. at mill, but on small current orders prices range from 10c. up to 12c. at mill. Terms are 30 days, less 2 per cent off for cash in 10 days when sold in quantities of 300 lb. or more.

Nuts and Bolts.—Makers of nuts and bolts are receiving fairly large direct and indirect orders from the Government and the quantity needed is expected to increase largely in the near future. Deliveries to domestic consumers are only fairly good, the shortage in steel and labor cutting down output of nuts and bolts to some extent. The general demand is reported fair, but not as heavy as a month or six weeks ago. Discounts adopted on April 12 last, which give prices to the large trade in carloads, over which advances are charged on small lots, are given on page 289.

Rivets.—The expected Government order for 35,000 tons of rivets has not been placed by the shipbuilders and will not be until they are called upon by the Emergency Fleet Corporation for the first allotment of ships. Fairly large direct and indirect orders for rivets are being placed by the Government, but the domestic demand is quiet, most consumers being well covered over the remainder of this year, and others are not disposed to place new orders until the Government action on prices is known.

Prices on structural rivets for delivery up to Oct. 1 only are $5.25 per 100 lb., base, and on cone head boiler rivets $5.35 base, per 100 lb., f.o.b. Pittsburgh. Terms are 30 days net, or one-half of 1 per cent off for cash in 10 days.

Wrought Pipe.—No further important orders for wrought pipe have been placed by the Government, aside from the 640,000 ft. of 6-in. and the 138,000 ft. of 4-in. noted in this report last week. It is stated, however, that further Government direct and indirect orders for pipe will come out in a short time. Mills are watching the distribution of their output very closely, desiring to conserve as much of it as possible for the expected Government demand, which will be for prompt shipment. Three or four leading pipe mills are practically out of the market on lap weld iron and steel pipe for this year delivery, but are taking care of regular customers to the best of their ability. Numerous inquiries are coming out from time to time for gas and oil lines, but no attention is paid to these, as the mills cannot handle them and make delivery. On butt weld iron and steel pipe the demand is not so urgent, and shipments can be made in eight to 12 weeks from date of order, depending on size and the quantity wanted. Discounts on steel pipe, as adopted on May 1, in effect by most of the independent mills and on iron pipe, as adopted July 1, are given on page 289.

Boiler Tubes.—Government direct and indirect orders for iron and steel boiler tubes are still getting larger, and it is now estimated that fully 40 per cent of the output of tubes is going to the Government. It is said that the leading maker of steel tubes is shipping fully 50 per cent of its output on Government direct and indirect orders. Heavy premiums over regular prices for small lots of iron and steel tubes are being paid for fairly prompt delivery, this sometimes amounting to as much as $40 per ton or more. Nominal discounts on iron and steel tubes, as adopted Nov. 1, 1916, but which show prices very much below the actual market, are given on page 289.

Coke.—The supply of cars in the coke regions up to Thursday, July 26, was 100 per cent., a much larger car supply than there was coke to load. The cars were then cut down and a shortage developed, with the result that the price of prompt blast furnace coke has held steady at $10 at oven for shipment to the valleys and further west. Eastern blast furnace coke has sold at $11 per net ton at oven. Nothing is being done in contracts, furnaces preferring to buy from day to day, while operators desire to sell their coke in that way until it is known definitely whether the Government will regulate prices on coke. We now quote best grades of blast furnace coke for spot shipment at $10 for delivery to Valley and Western blast furnaces, while for shipment East as high as $11 is being done. We quote 72-hr. foundry coke at $11.50 per net ton at oven for prompt shipment. The demand for spot furnace coke is fairly active. The Connellsville *Courier* gives the output of coke in the Upper and Lower Connellsville regions for the week ending July 21 as 362,148 tons, an increase over the previous week of 12,629 tons.

Old Material.—The local scrap market, as far as sales go, is at practically a complete standstill. Consumers will not buy material under present uncertain conditions, and dealers appreciate fully that it would be useless to try to force sales, and are not attempting to do so. Not enough scrap material is being sold in this market on which to base prices ruling, but in a general way the whole market is from $1 to $3 per ton lower than last week. A few small dealers who are not in position to hold their scrap are disposing of it at the best prices they can get, and this is having the effect of depressing the entire market. Dealers will not go short on the present market, and several report they have not closed a single transaction in the past week. Prices, therefore, are largely nominal in the absence of sales.

Dealers quote for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh delivered	$33.00 to $34.00
No. 1 foundry cast	34.00 to 35.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md., and Franklin, Pa.	40.00 to 41.00
Hydraulic compressed sheet scrap	28.00 to 29.00
Bundled sheet scrap, sides and ends, f.o.b. consumer's mill, Pittsburgh district	23.00 to 24.00
Bundled sheet stamping scrap	21.00 to 22.00
No. 1 railroad malleable stock	29.00 to 30.00
Railroad grate bars	18.00 to 19.00
Low phosphorus melting stock	46.00 to 48.00
Iron car axles	47.00 to 50.00
Steel car axles	47.00 to 50.00
Locomotive axles, steel	55.00 to 60.00
No. 1 busheling scrap	26.00 to 27.00
Machine-shop turnings	18.00 to 19.00
Cast-iron wheels	33.00 to 34.00
Rolled steel wheels	37.00 to 38.00
*Sheet bar crop ends	44.00 to 45.00
Cast-iron borings	19.00 to 20.00
No. 1 railroad wrought scrap	38.00 to 39.00
Heavy steel axle turnings	24.00 to 25.00
Heavy breakable cast scrap	27.00 to 28.00

*Shipping point

Chicago

CHICAGO, July 30.

Government orders in great volume have come to the leading interest and it is a safe assertion that it is bearing the brunt of the war demand so far developed. Some of the work which has poured in calls for material to go to France. All sorts of steel products are demanded, including shell steel and forgings for field and naval guns, the latter being of alloy steels. It is understood that this business is taken subject to a later adjustment of prices. The steel market in general is but little changed, except that new demand is lighter,

in regard to both inquiries and sales. The quiet is not displeasing. One company reports difficulty in obtaining export licenses which would enable it to fill old orders placed by Japanese interests for plates, shapes and bars. Although steel makers are quite generally of the opinion that the Government will not attempt by compulsory law to fix prices for private consumers, many of the latter seem to feel that something of the kind may happen and that they had better hold off in purchasing. That prices have reached their zenith is unquestioned. Pig iron is firm, but extremely dull. Ferromanganese is easier, delivery this year being obtainable at $375, delivered, and first half at $350. Old materials continue to decline in a quiet market. For about 350 tons of 20 per cent spiegeleisen $90 was paid. An inquiry for 1500 tons of low phosphorus iron is before some makers. For 700 tons of standard section rails wanted for industrial purposes $85 was paid in this market.

Pig Iron.—Business has been confined to occasional purchases of small lots wanted for prompt shipment, and a few transactions in resale iron, but prices remain firm. Northern No. 2 foundry, basic and malleable Bessemer quotations are unchanged at $55, furnace, delivery this side of next July. Southern iron, delivered this year, is held at $50, Birmingham, or $54, Chicago, and for the first half at $45 to $48, Birmingham. Northern makers welcome the quiet, inasmuch as they are well sold up, and the coke situation is not a pleasing one. Their efforts are concentrated in making deliveries. They were not seriously affected by the strike of switchmen in Chicago. Both foundry and charcoal resale iron have been dealt in recently, the offerings being made in one instance because of a foundry strike, and in another because the builder of a new foundry saw a way to clear several thousand dollars. The Southern furnaces, like those in the North, are chiefly engaged in making shipments, their chief trouble being the shortage of freight cars, although they are still hampered by an inadequate coke supply. In the matter of coke, the Sloss-Sheffield Steel & Iron Co. was helped out by the action of the city of Birmingham in permitting the company to resume operations at some old ovens which were within the city limits and which were condemned two or three years ago. To some extent the same company has been enabled to circumvent the car shortage by shipping in barges from two of its furnaces in Sheffield and one at Florence. It fortunately happens there is 9 ft. of water in the Tennessee river at the point where the barges can be loaded. Very little silvery iron is available, and the minimum quotation of $82.75, Chicago, still stands, although much higher is asked for some brands. In charcoal iron the inquiries are few and the makers are bending their energies to filling contracts. The base price, or that for grades Nos. 1 (foundry) to 4, is unchanged at $56, furnace, or $58, Chicago, while for grades 5 and 6, Scotch and No. 1 (soft or special) the price is $58.50, furnace, or $60.50, Chicago. For next year, $1 under these prices can be done in some directions. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b., furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 1 to 4	$58.00
Lake Superior charcoal, Nos. 5 and 6, Scotch and No. 1 soft or special	60.50
Northern coke foundry, No. 1	55.50
Northern coke foundry, No. 2	55.00
Northern coke foundry, No. 3	54.50
Northern high-phosphorus foundry	55.00
Southern coke No. 1 f'dry and 1 soft	55.00
Southern coke No. 2 f'dry and 2 soft	54.00
Malleable Bessemer	55.00
Basic	55.00
Low-phosphorus	$93.00 to 95.00
Silvery, 8 per cent	82.75

Ferroalloys.—Quotations for 80 per cent ferromanganese are lower in the face of a situation that had every appearance of strength. For the rest of this year domestic material can be had at $375, delivered, and for the first half at $350, despite the uncertainty of importations of the foreign manufactured product, or manganese ore from Brazil or elsewhere. The situation is laid at the door of a comparatively new maker of ferromanganese whose offerings have been below the market heretofore established. Small lots of ferromanganese have been lately purchased in this market at $410.

Plates.—An overwhelming business in plates could be done were the mills agreeable to accepting business. Some of them are entirely out of the market, except where the United States Government is concerned, others are said to be taking on small tonnages at prices that range from 10c. to 12c. for tank plates. Ship plates run 1c. to 1½c. higher. A large Western mill has had difficulty in obtaining licenses to ship, not only plates, but shapes and bars, to Japan, just for what reason is not clear unless it is that the Government desires to hold the material for its own use. The principal interest is selling none, except to the Government. Chicago warehouse prices are unchanged.

We quote for Chicago delivery out of jobbers' stocks, 8c.

Structural Material.—Instances multiply where building projects requiring structural shapes have been postponed indefinitely because of the scarcity and resultant high prices. One sees work stopped on the foundations of a large hotel, hears of an office-building addition being deferred and the postponement of operations in erecting a large malleable iron foundry, etc. A nominal price for shapes may be said to be 4.50c., Pittsburgh, but this means indefinite delivery. For delivery this year, an Eastern mill continues to accept a little business at 6.189c., Chicago, but there is not much demand at this level. Jobbers' quotations are unchanged. For material out of warehouse jobbers quote 5c. The American Bridge Co. has booked the following tonnages:

Steel for Fourth Street viaduct, Kansas City, Mo., 358 tons.

Morgan Street subway, Steelton, Minn., for Spirit Lake Transfer Railway Co., 347 tons.

Benzol recovery plant at Steelton, Minn., for Minnesota Steel Co., 300 tons.

Bars.—Mild steel bars are as scarce as ever. The only open quotation is 4.50c., Pittsburgh, or 4.689c., Chicago, with few seekers for them at this price. It is felt that some of the agricultural implement makers would buy if the mills would accept their orders, as not all of this industry are covered to its full desire. Most of the manufacturers, however, are inclined to go slow, especially in buying into next year. Incidentally, some of them feel that they were too slow in advancing their prices, and thereby failed adequately to protect themselves against high prices for raw materials and a possible slump with expensive material on their hands. Iron bars are in fair demand at 4.50c. to 5c., Chicago. Rail carbon bars are quoted at 4c. to 4.50c., with business not of the rushing kind, although the makers have plenty of orders on their books. The lessening of building operations is having its effect here, too. Jobbers' quotations are unchanged.

We quote prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c. to 5c.; reinforcing bars, 4.50c., base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Wire Products.—Under the restrictions imposed by the leading producer, new business is gradually growing lighter and unfilled orders fewer, this being the object sought. Specifications against contracts are active. It is asserted that consumers are getting all they need, and jobbers and retailers all they can legitimately sell. The demand for spikes such as are used in shipbuilding, lumber camps and mines is huge and beyond the capacity of the makers to fully satisfy, and for these premium prices are easily obtainable. While independent wire mills ask 4c. and upward for wire nails, the leading interest has made no change in its quotation of 3.20c., Pittsburgh, at which level it is supplying its customers. We quote on the basis of 4c., Pittsburgh, for nails, per 100 lb. to jobbers as follows:

Plain fence wire, Nos. 6 to 9, base, $4.189; wire nails, $4.189; painted barb wire, $4.339; galvanized barb wire, $5.039; polished staples, $4.389; galvanized staples, $5.039; all Chicago, carload lots.

Rails and Track Supplies.—Nothing has come to

light so far as the railroads are concerned. Their immediate wants are covered, and the mills are not disposed to go far into the future. The quotations of the leading interest, given below, are nominal, and independent makers quote higher. For standard railroad spikes, for example, they ask 5c., and for track bolts with square heads, 6c. to 6.25c.

Quotations are as follows: Standard railroad spikes, 4.25c. base; small spikes, 4.50c., base; track bolts with square nuts, 5.25c., all in carloads, Chicago; tie plates, $70 to $90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base; open hearth, $40; light rails, 25 to 45 lb., $65; 16 to 20 lb., $66; 12 lb., $67; 8 lb., $68; angle bars, 3.25c., base.

Bolts and Nuts.—Makers note a decided falling off in new business, but this is no cause of uneasiness in view of the filled-up condition of their order books. They see a general tendency on the part of large consumers to await developments. For prices and freight rates see finished iron and steel, f.o.b. Pittsburgh, page 289.

Store prices are as follows: Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to ⅞ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to ⅞ x 6 in., 40-2½; larger sizes, 30-5; hot pressed nuts, square, $3, and hexagon $3 off per 100 lb.; lag screws, 50 per cent off.

Sheets.—Manufacturers who have had difficulty in procuring export licenses for plates, shapes and bars, have encountered no such trouble in regard to sheets, and it is reported that these are a little easier. Some of the Government requirements, especially that for army field stoves, are believed to have been cared for. Local makers have booked orders for occasional carloads at 8.50c. to 9c., Pittsburgh, or 8.689c. to 9.189c., Chicago, for No. 10 blue annealed, and 8.75c. to 9c., Pittsburgh, or 8.939c. to 9.189c., Chicago, for No. 28 black. Galvanized sheets are about 10c. to 11c. Jobbers who are now disposing of material purchased at higher levels have advanced their quotations ½c.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 10c.; No. 28 black, 10c., and No. 28 galvanized, 11.50c.

Old Material.—The market continues to soften, and for a time it probably will drift in this direction, after which, in the opinion of some of those most interested, it will pick up slowly as the mills find it is necessary to become more active. At present, they are doing but little buying. The Eastern market is stronger, relatively, than that here. Average railroad offerings are made by the C., B. & Q., North Western, Pennsylvania and Soo Lines. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$40.50 to $41.50
Relaying rails	59.50 to 60.00
Old carwheels	30.50 to 31.50
Old steel rails, rerolling	40.00 to 41.00
Old steel rails, less than 3 ft.	41.00 to 43.00
Heavy melting steel scrap	29.00 to 31.00
Frogs, switches and guards, cut apart	29.00 to 31.00
Shoveling steel	27.00 to 29.00
Steel axle turnings	21.00 to 22.00

Per Net Ton

Iron angles and splice bars	$39.00 to $40.00
Iron arch bars and transoms	41.00 to 42.00
Steel angle bars	32.00 to 33.00
Iron car axles	44.00 to 45.00
Steel car axles	44.00 to 45.00
No. 1 railroad wrought	33.50 to 34.50
No. 2 railroad wrought	30.50 to 31.00
Cut forge	30.00 to 31.00
Pipes and flues	22.00 to 23.00
No. 1 busheling	25.00 to 26.00
No. 2 busheling	18.00 to 19.00
Steel knuckles and couplers	41.00 to 42.00
Steel springs	42.50 to 43.00
No. 1 boilers, cut to sheets and rings	20.50 to 21.00
Boiler punchings	34.50 to 35.00
Locomotive tires, smooth	50.00 to 50.50
Machine-shop turnings	16.50 to 17.50
Cast borings	16.50 to 17.50
No. 1 cast scrap	27.00 to 28.00
Stove plate and light cast scrap	16.50 to 17.50
Grate bars	18.00 to 19.00
Brake shoes	18.00 to 19.00
Railroad malleable	28.00 to 29.00
Agricultural malleable	23.75 to 24.75
Country mixed scrap	14.00 to 16.00

Cast-Iron Pipe.—Government purchases, several of which are outside of this territory, are notable, considerable quantities being wanted for cantonments at San Antonio and Fort Worth, Tex., and Atlanta, Ga. It also is probable that about 400 tons will be wanted for the naval training station at Great Lakes. The makers are doing a fair business in industrial lots. Whitefish Bay, Wis., is about to let 400 tons, and Lincoln, Neb., will let 300 tons, Aug. 1. Quotations are unchanged.

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., $68.50; 6 in. and larger, $65.50, with $1 extra for class A water pipe and gas pipe.

Philadelphia

PHILADELPHIA, July 30.

Business in iron and steel is marking time. Buyers are evidently waiting to see what will be done in Washington with regard to establishing prices, and the result has been an exceedingly dull week as far as new business is concerned. Export inquiry has likewise fallen off, but with mills and furnaces sold far ahead there has been no adverse effect on prices. In fact, the trade at large is rather glad of the opportunity given by the lull to take an account of stock and get some kind of a line on the future during the breathing spell. With exceptions in some special lines, there has been no heavy specification on Government account in this district during the week, but such specification as has been given has had the effect of still further hampering delivery on civilian orders. That the present slowing down in new business has had no effect on the mills may be gathered from the fact that an inquiry for upward of 6000 tons of material, intended for the repair of locomotives in England, with a 30-day time limit on delivery to the purchaser in this country, was declined here.

Pig Iron.—Trading has been light during the week, and has been non-existent among the steel-making irons, but prices are holding firm. Inquiries are for small lots in the foundry grades, and while there is more or less talk of re-sale iron and its effects, there have been transactions in eastern Pennsylvania No. 2 X on a basis of $54, furnace. In no instance have tonnages been heavy, and there does not appear to be any anxiety to sell even at the prices obtainable. As high as $55, furnace, is being asked for No. 2 X for prompt shipment, with $53 set by one interest to-day as its quotation for 1918 iron. There has been a small movement in Virginia No. 2 X at a price of $52.50, furnace, this quotation being up to the standard maintained of late despite the fact that a considerable tonnage of Virginia iron is said to be available for re-sale. This iron was bought on Swedish account and stored in Southern ports, but it is said the owners despair of getting export licenses. Gray forge has figured in no transactions, while basic is held at a nominal price of $52 and standard low phosphorus maintains its nominal price of $90. Small lots of special iron, silicon 3.50 per cent and over, have been sold at $56, furnace. Standard brands are quoted about as follows for prompt shipment, delivery in buyers' yards:

Eastern Penna. No. 2 X foundry	$53.00 to $55.75
Eastern Pennsylvania No. 2 plain	52.75 to 55.25
Virginia No. 2 X foundry	54.25 to 55.25
Virginia No. 2 plain	53.75 to 54.75
Basic	50.00 to 52.00
Standard low phosphorus	90.00

Ferroalloys.—Ferromanganese is firm at $400, a price set by transactions to-day which is the minimum for prompt shipment in this market. There have been reports of re-sale ferromanganese being held at $375, but there is no confirmation of this in the trade. Spiegeleisen seems somewhat easier, with $80, furnace, being asked for prompt and with inquiries for about 5000 tons in this market. Quotations of $225 to $250 are given on 50 per cent ferrosilicon, prompt or last quarter, with $130 for 1918 delivery.

Coke.—Spot furnace coke was quoted to-day at $10 to $11, with foundry coke a little below the figure of $13.50, at which the market closed last Saturday.

Plates.—There has been no falling off in requests for prices and deliveries in this market, and one large maker reports total orders for this month well in excess of mill capacity for the month. The market is strong, with 10.159c., Philadelphia, the minimum for tank steel. No sales of boat plates were reported for

the week, but the nominal price is still 12½c., base, mill. There have been some Government specifications on plates during the week, and some buyers have been showing interest in 1918 delivery. The way of the civilian buyers, however, remains hard. One order of considerable size was offered to a leading maker, with a fancy price stipulated for September delivery, but it was rejected. Several good lots of tank steel have been in demand, and 11c., base, Pittsburgh, delivery at mill's convenience, was offered, only to be turned down. At least some of this business would have been taken on, were it not for the demands of the Government, but Government work is having absolute right of way in the plate mills.

Structural Material.—Three of the largest makers report no business this week, but Government orders from time to time continue to complicate delivery on civilian orders long booked. Mills in this district are getting 5¼c. for such material as they have in stock, and one interest has been selling as high as 6c.

Sheets.—Considerable Western inquiry for sheets, notably from automobile makers, is reported here, with no sales during the week. Sheet capacity, like plate capacity, is giving right of way to the Government, though it is possible that an old customer might get limited consideration now and then on a basis of 8¾c., Pittsburgh, for No. 10 blue annealed.

Iron and Steel Bars.—Soft steel bars are at a minimum of 4½c., Pittsburgh, with some sales reported as high as 5c. Makers of bar iron maintain a price of 5c., Pittsburgh, with delivery at mill convenience. Expansion in shipbuilding has created a brisk demand for bars in this market.

Old Material.—Steel mills are not buying, and the market is inactive, with little change in quotations. A considerable volume of scrap is moving now as the result of previous transactions. One effect of the recent rise in the old materials market was the cleaning out of many years' accumulation in towns and villages within 150 miles of Philadelphia, the high prices making it worth while for collectors to visit remote points and gather in scrap iron and steel which would be neglected under ordinary conditions. It is safe to say that eastern Pennsylvania has been combed as never before. In contrast to conditions which prevailed a month ago, the old materials market is now in a state of watchful waiting. Prices per gross ton, delivered in eastern Pennsylvania territory, are about as follows:

No. 1 heavy melting steel	$32.00 to $33.00
Old steel rails, rerolling	45.00 to 47.00
Low phosphorus heavy melting	45.00 to 50.00
Old iron rails	45.00 to 47.50
Old carwheels	35.00 to 38.00
No. 1 railroad wrought	45.00 to 50.00
No. 1 forge fire	23.00 to 24.00
Bundled sheets	23.00 to 24.00
No. 2 busheling	16.00 to 17.00
Machine shop turnings (for blast furnace use)	19.00 to 20.00
Machine shop turnings (for rolling mill use)	22.00 to 23.00
Cast borings (for blast furnace use)	19.00 to 20.00
Cast borings (clean)	23.00 to 25.00
No. 1 cast	35.00 to 38.00
Grate bars	21.00 to 22.00
Stove plate	22.00 to 23.00
Railroad malleable	32.50 to 35.00
Wrought iron and soft steel pipe (new specifications)	34.00 to 35.00

Cincinnati

CINCINNATI, July 31—(*By Wire*).

Pig Iron.—A northern Ohio melter bought 1000 tons of Southern iron for this year's shipment at the full schedule. This is the largest sale reported in several weeks. Buying continues to be mostly for small lots of prompt foundry iron, and if the absence of inquiries indicates anything, there will be no immediate change in the present dull situation. Consumers are taking no interest at all in next year's requirements. Northern foundry, basic and malleable are stagnant, although furnace stocks of foundry iron are practically wiped out. The furnaces are quoting $55, Ironton, for first-half business, but are not making any strenuous efforts to obtain orders for that delivery. Coke troubles, together with hot weather, have curtailed production in a limited way in both the North and South. On the other hand, the foundry melt is up to capacity, with the exception of a few nearby foundries shut down on account of labor troubles. The consumption of steel-making irons was never greater. A small lot of Ohio 8 per cent silvery iron for spot shipment brought $90, but $87 can be done. Shipments of Southern iron are not moving fast enough to suit many customers, but no plants have been forced to shut down for want of iron. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, as follows:

Southern coke, No. 1 f'dry and 1 soft	$51.40 to $52.40
Southern coke, No. 2 f'dry and 2 soft	49.90 to 50.90
Southern coke, No. 3 foundry	49.40 to 50.40
Southern coke, No. 4 foundry	48.90 to 49.90
Southern gray forge	48.90 to 49.90
Ohio silvery, 8 per cent silicon	87.26 to 91.26
Southern Ohio coke, No. 1	56.26 to 57.26
Southern Ohio coke, No. 2	56.26 to 57.26
Southern Ohio coke, No. 3	55.26 to 56.26
Southern Ohio malleable Bessemer	56.26 to 57.26
Basic, Northern	56.26 to 57.26
Lake Superior charcoal	56.75 to 57.75
Southern carwheel foundry	48.90 to 49.90

(*By Mail*)

Coke.—Reports that the situation is easing up in the Connellsville field prove to be correct in only a small degree. It is true that prices quoted for prompt coke are now below last week's figures, but it is undeniably a fact that in most instances consumers are compelled to pay the maximum price in order to obtain prompt shipments. The present hot weather will have a tendency to further curtail the labor supply so that not much relief may be expected at any time soon. Some furnace coke for nearby shipment has been sold in the Buffalo district, and a few rush orders have lately been received from nearby users whose regular shipments on contracts were delayed. Connellsville 48-hr. coke for prompt shipment is around $10 to $11 per net ton at oven, but there are no authentic figures out that would indicate what the average quotation is for contract business. Foundry coke in the Connellsville district for spot shipment is now quoted at $12 to $13.50 and on contracts around $11.50 to $12. In the Pocahontas field, the car shortage is more acute, and foundry coke for nearby shipment ranges all the way from $12.50 to $14. In fact, some 72-hr. coke was sold there last week as high as $15.50. The same condition exists in the New River field, but Wise County producers are making more even prices. However, there is not very much improvement in shipments from that field.

Old Material.—Reports from all sources show prices still on the downward grade, the average reduction being close to $1 per ton on nearly all kinds of scrap. The demand for scrap is very light and dealers state that offerings are growing heavier; as a consequence, a decided weakness has developed. Some grades of scrap have been reduced as much as $10 a ton within the past few weeks, and just at the moment there is a widening difference between the cost of scrap and pig iron. The following are dealers' prices, f.o.b. at yards, southern Ohio and Cincinnati:

Per Gross Ton

Bundled sheet scrap	$19.50 to $20.00
Old iron rails	34.00 to 34.50
Relaying rails, 50 lb. and up	45.00 to 45.50
Rerolling steel rails	37.00 to 37.50
Heavy melting steel scrap	33.00 to 33.50
Steel rails for melting	33.00 to 33.50
Old carwheels	30.00 to 30.50

Per Net Ton

No. 1 railroad wrought	$32.50 to $33.00
Cast borings	13.00 to 13.50
Steel turnings	13.00 to 13.50
Railroad cast	23.00 to 23.50
No. 1 machinery cast	24.00 to 24.50
Burnt scrap	14.50 to 15.00
Iron axles	43.00 to 43.50
Locomotive tires (smooth inside)	36.00 to 36.50
Pipes and flues	17.50 to 18.00
Malleable cast	24.50 to 25.00
Railroad tank and sheet	15.50 to 16.00

Finished Material.—The mill business is slack and local representatives are devoting their time principally in aiding customers to get forward shipments on time. Specifications on old contracts are urgent in some cases, and it is frequently necessary to split up these requisitions and divide the material among different customers. The jobbers state that, considering the season of the year, they could not hope for a better business. The

local store price are unchanged as follows: Wire nails, $3.90 per keg, base; steel bars, 5c., base; twisted steel bars, 5.05c.; structural shapes, 5.25c.; ¼-in. plates and heavier, 9½c.; cold-rolled shafting, list plus 15 per cent; machine bolts, ⅜ x 4 in. and smaller, 45 per cent discount, larger and longer, 30 per cent discount; round head steel rivets, 5.05c., base; cone head rivets, 5.06c., base. The nominal mill quotation on No. 28 galvanized sheets is unchanged at 10.65c., Cincinnati or Newport, Ky., and on No. 28 black sheets, 8.65c.

Birmingham

BIRMINGHAM, ALA., July 31.—(*By Wire*).

Very little buying of pig iron is taking place and prompt sales average $50 and over with a small amount of resale under that. For limited trade, furnace interests hold 1917 iron at $50 and 1918 at $48. There is no apparent inclination to mark down on any delivery.

(*By Mail*)

The iron masters of the Birmingham district appeared to be more nearly of one opinion as to the iron market at the close of the last week in July than in some time. It was agreed that $48 was the basis for 1918 and $50 for 1917. The leading interest joined these, asking $48 for 1918, and there was nothing heard of prices under that. A customer who found himself overloaded offered lots of several hundred tons for resale. His price was $50. All furnaces, when asked for prompt iron by brokers and others, quote $50 and over. The only iron under $50 heard of is some resale metal which missed connections at ports and is available for a limited territory. Some of that, it is understood, has sold at as low as $46, while other lots brought $47 to $50. This resale metal does not represent the market and must be regarded as exceptional. Three per cent silicon has sold at $51. The leading foundry iron seller has turned out considerable high silicon metal. Very little business is transacted, but, as has already been noted, furnace interests, which are well sold from now through the first quarter of 1918, have no reason to shade prices. It is reported that a number of St. Louis territory consumers are not well provided with iron for first quarter of 1918 and are uneasy. Furnaces quote per gross ton for prompt delivery, f.o.b. Birmingham district furnaces, as follows:

No. 1 foundry and soft	$50.50 to $51.50
No. 2 foundry and soft	50.00 to 51.00
No. 3 foundry	49.50 to 50.50
No. 4 foundry	49.25 to 50.25
Gray forge	49.00 to 50.00
Basic	50.00 to 51.00
Charcoal	55.00 to 56.00

Cast-Iron Pipe.—Pipe shops divide the cantonment orders according to availability of different shops as to sizes, the army board deciding the quotas. This rush business served to postpone other manufacture, so that shops report orders ahead for about 90 days. We quote per net ton, f.o.b. pipe shop yards, as follows: 4 in., $63; 6 in., $60, with $1 added for gas pipe and special lengths.

Coal and Coke.—Miner disaffections at mines were of short duration. Government maximum prices prevail at mines, which makes big seam steam coal bring $3, f.o.b. mines. Coke movements to Texas, Mexico and the Pacific coast are going on with some regularity. Furnace coke sells at $8, and spot foundry, when obtainable, brings $14.

Old Material.—The scrap market continues its downward trend. All prices are down from $1 to $3. Consumers name terms at which deals are made. We quote per gross ton, f.o.b. dealers' yards, as follows:

Old steel axles	$50.00 to $51.00
Old steel rails	25.00 to 26.00
No. 1 wrought	28.00 to 29.00
No. 1 heavy melting steel	18.00 to 19.00
No. 1 machinery cast	22.50 to 23.00
Carwheels	25.00 to 25.50
Tram carwheels	23.00 to 23.50
Stove plate and light	16.00 to 17.00
Turnings	11.00 to 12.00

Steel Bars.—Steel bars, f.o.b. Birmingham in carlots, 4.75c. to 5.00c.; iron bars, 4.40c. to 4.60c.

St. Louis

ST. LOUIS, July 30.

Pig Iron.—While there has been comparatively little buying of pig iron during the week and almost as little inquiry, there has been no disposition on the part of furnaces, according to representatives, to lower their prices and in consequence the quotations remain as at last report so far as can be ascertained in a market in which no transactions are taking place. One sale of 600 tons of charcoal carwheel iron was reported and an inquiry for three carloads of ferromanganese constitute the chief item of interest during the week, the rest of the sales being of carload lots for special needs or purposes. One interesting development of the week, however, was a tendency on the part of some foundries which have bought in excess of actual requirements to put their surplus pig on the market, but not at prices calculated to break quotations. No. 2 Southern foundry is generally held at $49 per ton, Birmingham, or better, with no spot iron available and furnaces unwilling to commit very heavily at the price named.

Coke.—No contract coke is available in this market, the ovens having maintained their determination not to sell far in advance. Sales for spot or early delivery are being made in small lots at $12.50 to $13, Connellsville, for best selected 72-hr. coke. By-product is being sold, when transactions appear, on the same basis.

Finished Iron and Steel.—In finished products, the situation is chiefly one of urging forward deliveries on material already contracted for, but even this is decreasing, as customers realize that the Government is the cause of the further deferment of delivery and there is little use in trying to overcome the situation. The warehouses are being swept bare of the most wanted material and demand is well beyond ability to deliver needed finished material, regardless of the prices quoted. Warehouse prices follow: Soft steel bars. 4.55c.; iron bars, 4.50c.; structural material, 5.25c.; tank plates, 8.05c.; No. 10 blue annealed sheets, 10.05c.; No. 28 black sheets, cold rolled, one pass, 10.35c.; No. 28 galvanized sheets, black sheet gage, 11.75c.

Old Material.—The situation in the scrap market continues with the dealers marking time and rather inclined, considering the season of the year, to let things rest until there is a more definite readjustment of the situation and a real demand on the part of consumers for material. Lists include about 12,000 tons from the Baltimore & Ohio and 2000 tons from the Chicago, Burlington & Quincy. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton

Old iron rails	$38.00 to $38.50
Old steel rails, re-rolling	40.00 to 40.50
Old steel rails, less than 3 ft.	39.00 to 40.00
Relaying rails, standard section, subject to inspection	50.00 to 51.00
Old carwheels	30.50 to 31.00
No. 1 railroad heavy melting steel scrap	31.00 to 31.50
Heavy shoveling steel	27.00 to 27.50
Ordinary shoveling steel	26.00 to 26.50
Frogs, switches and guards cut apart	32.00 to 32.50
Ordinary bundled sheet scrap	18.50 to 19.00
Heavy axle and tire turnings	22.00 to 22.50

Per Net Ton

Iron angle bars	$35.00 to $35.50
Steel angle bars	30.00 to 30.50
Iron car axles	41.00 to 41.50
Steel car axles	40.00 to 40.50
Wrought arch bars and transoms	39.00 to 39.50
No. 1 railroad wrought	33.00 to 33.50
No. 2 railroad wrought	31.00 to 31.50
Railroad springs	30.00 to 30.50
Steel couplers and knuckles	38.00 to 39.00
Locomotive tires, smooth inside, 42 in. and over	38.00 to 39.00
No. 1 dealers forge	24.00 to 24.50
Cast iron borings	14.00 to 14.50
No. 1 busheling	24.00 to 24.50
No. 1 boilers cut to sheets and rings	20.50 to 21.00
No. 1 railroad cast scrap	20.50 to 21.00
Stove plate and light cast scrap	16.50 to 17.00
Railroad malleable	27.00 to 27.56
Agricultural malleable	22.00 to 22.50
Pipes and flues	19.50 to 20.00
Heavy railroad sheet and tank scrap	18.00 to 18.50
Railroad grate bars	17.50 to 18.00
Machine shop turnings	14.00 to 14.50
Country mixed scrap	14.00 to 15.00

Cleveland

CLEVELAND, July 31.

Iron Ore.—As a result of efforts of I. W. W. agitators, strikes have been declared at two mines on the Gogebic range. Handbills are being distributed among the miners urging them to strike for a six-hour day and $6 pay. However, the miners are reported to be generally satisfied with their present wages and mine operators apparently do not feel that the efforts of the I. W. W. to induce the men to quit work will make very much headway. The car supply at the lower Lake docks has improved somewhat, so that boats are not being delayed so long to unload cargoes as they were during the early part of the month. We quote prices as follows, delivered lower Lake ports: Old range Bessemer $5.95; Mesaba Bessemer, $5.70; old range non-Bessemer $5.20; Mesaba non-Bessemer, $5.05.

Pig Iron.—The market is still dull, although a slight improvement in the demand has sprung up as compared with the two previous weeks. This is wholly in foundry grades, no inquiry having come out for steel-making iron. One seller reports a sale of several lots, aggregating 3000 tons. In this immediate territory no sales of any grade are reported. In spite of the heavy volume of business booked for the first half of next year, some large consumers of foundry iron in this territory have not purchased any iron for that delivery, and are not expected to do so as long as the present uncertainty as to prices continues. While sellers generally are adhering to the policy of making $55 the maximum on all grades, several also hold to that as their minimum; but there have not been sufficient sales to test the market. A New York furnace that started to fill an empty order book at $50 is understood to have advanced its price to $55 for foundry iron that goes largely into the New England territory. There is no activity in Southern iron, on which prices are unchanged at $45 to $50, Birmingham. We quote, f.o.b. Cleveland, as follows:

Bessemer	$55.95
Basic	$53.30 to 55.30
Northern No. 2 foundry	55.30
Southern No. 2 foundry	49.00 to 54.00
Gray forge	50.95 to 52.95
Ohio silvery, 8 per cent silicon	88.62
Standard low phos. Valley furnace	85.00

Coke.—Producers continue to quote foundry coke at $14 per net ton at oven for standard Connellsville makes in this market for prompt shipment, and several small lot sales are reported at this price. Connellsville furnace coke for prompt shipment is quoted at $10 to $10.50. The car supply in the Connellsville region is now satisfactory but the labor shortage is curtailing production.

Finished Iron and Steel.—With the exception of material for Government work inquiry is light. Among the new Government requirements is a round tonnage of light rails for use in France for building portable tracks to connect the trenches with the standard track railroad lines the United States Government will build to carry supplies to the American army, following in general plan the French system of portable track which has taken a large tonnage of American light rails. Export as well as domestic inquiry for plates is heavy in spite of the export embargo which has unsettled the plate market. Some makers are avoiding taking export orders under present conditions, and unless licenses are issued soon for plates previously sold for export considerable of this export tonnage will probably be offered to the American trade, and this would doubtless result in some easing up in prices. In fact, the plate market is not as firm as it has been. While local mills continue to quote plates at 10c., Pittsburgh, the market seems to have settled down to a price range of 9c. to 10c. A late interpretation from Washington of the embargo is that light plates, No. 12 gage and lighter, are not covered by the embargo. There is a fair demand for small lots of structural material, mostly for factory additions for early delivery. Fabricators are securing this material almost wholly from jobbers at stock prices. Several local quotations have been made on forging billets at $125 at mill. There is a moderate demand for iron bars which are quoted at 4.75c. to 5c., Cleveland. We quote hard steel bars at 4.50c., Cleveland. Inquiry for sheets, which quieted down because of a possibility of the regulation of prices for domestic consumers, has become somewhat more active. Some inquiry has come out for first quarter contracts. Considerable tonnage has been placed for stoves for Government cantonments. Sheet prices are somewhat easier, owing to the fact that some jobbers are offering their stocks at lower prices than are being quoted by the mills, these jobbers' prices being 8.50c. for black and blue annealed, 10.50c. for galvanized. We quote mill prices at 9c. to 9.50c. for No. 28 black, 8.50c. to 9c. for No. 10 blue annealed, and 10.50c. to 11c. for No. 28 galvanized. Warehouse prices are 5c. for steel bars, 5.25c. for structural material, 9c. for plates and 8.50c. to 9c. for blue annealed sheets.

Bolts, Nuts and Rivets.—There is a heavy demand for bolts and nuts, an increasing volume of business coming out from manufacturers having Government orders. The hot weather is seriously curtailing the output, as many men are refusing to work. The demand for rivets is quiet, both in specifications and new orders. We quote rivets at 5.25c., Pittsburgh, for structural, and 5.35c. for boiler rivets. Bolt and nut discounts are as follows, round lot buyers being allowed 5 to 10 per cent discount from these prices:

Common carriage bolts, ⅝ x 6 in., smaller or shorter, rolled thread, 35 off; cut thread, 30 and 5, larger or longer, 20. Machine bolts, with h. p. nuts, ⅝ x 4 in., smaller or shorter, rolled thread, 40; cut thread, 35; larger and longer, 25. Lag bolts, cone point, 40. Square h. p. nuts, blank, $1.90 off list; tapped, $1.70 off list. Hexagon, h. p. nuts, blank, $1.70 off; tapped, $1.50 off. C. p. c. and t. hexagon nuts, all sizes blank, $1.25 off; tapped, $1 off. Cold pressed semi-finished hexagon nuts, 50 and 5 off.

Old Material.—The market is inactive, but a slightly firmer tone has developed. Prices are lower on some forms of scrap that did not move down as rapidly as the more active grades during the recent sharp decline, but for the most part quotations of a week ago are maintained. None of the mills is actively in the market for scrap, practically all the transactions being between dealers. In some cases there is a wide range in prices. Sales of heavy melting steel are reported all the way from $30 to $35. Considerable irregularity exists in prices of busheling scrap. A 200-ton lot brought $28.25 per net ton in a transaction between dealers in this market last week. Other sales were made at $26 and higher, and one Cleveland dealer is now offering $28 for this grade to cover short sales made at considerably higher prices. Dealers claim that, owing to the scarcity of labor, considerable scrap usually sheared up into busheling is either sold as heavy melting steel or the lighter material goes to the mills as bundled sheet scrap. Cast scrap is very dull and weak. Dealers are looking for some recovery in prices when the market again becomes active but do not expect that they will reach the recent high levels. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton	
Steel rails	$31.00 to $32.00
Steel rails, rerolling	45.00 to 46.00
Steel rails, under 3 ft.	39.00 to 40.00
Iron rails	43.00 to 44.00
Steel car axles	50.00 to 52.00
Heavy melting steel	32.00 to 33.00
Carwheels	32.00 to 33.00
Relaying rails, 50 lb. and over	50.00 to 55.00
Agricultural malleable	24.00 to 25.00
Railroad malleable	31.00 to 32.00
Light bundled sheet scrap	24.00 to 25.00
Per Net Ton	
Iron car axles	$47.00 to $49.00
Cast borings	17.50 to 18.00
Iron and steel turnings and drillings	17.00 to 17.50
No. 1 busheling	25.00 to 26.00
No. 1 railroad wrought	42.00 to 43.00
No. 1 cast	29.00 to 30.00
Railroad grate bars	21.50 to 22.00
Stove plate	20.00 to 21.00

The American Steel & Wire Co. is to erect two new buildings and two additions at its works at Fair Haven, Conn. The largest building will be a rope mill 88 x 363 ft., one story. The other building will be a hemp storage 48 x 100 ft., one story. An addition to an existing building will be 50 x 125 ft., one story, and an additional story will be added to another building 60 x 223 ft. The extensions will be used for work formerly done at the Worcester plants of the company.

Buffalo

BUFFALO, July 31.

Pig Iron.—The market continues very quiet with only a small total of orders amounting to not more than 1000 tons for the district for the week. Inquiry is at low ebb, buyers maintaining a waiting attitude. Producers welcome the cessation in inquiry and buying, as furnace capacity is practically all taken for months ahead and because of averseness to binding themselves to far future commitments at present owing to uncertainties regarding coming costs of raw materials and the question of ability to produce 100 per cent of capacity. Prices remain unchanged, and the limited sales made during the week have been made on the basis of $55, furnace, for average foundry grades, and $57 to $58 for the higher silicon grades, mostly for this year's delivery. For 1918, first quarter and half, we quote as follows, f.o.b. furnace, Buffalo:

High silicon irons	$55.00 to $56.00
No. 1 foundry	54.00 to 55.00
No. 2 X foundry	53.00 to 55.00
No. 2 plain	52.00 to 54.00
No. 2 foundry	51.00 to 53.00
Gray forge	51.00 to 53.00
Malleable	54.00 to 55.00
Basic	54.00 to 55.00
Lake Superior charcoal, f.o.b. Buffalo	55.00 to 60.00

Finished Iron and Steel.—Liberal shipments are being made against tonnage on mill books. In many instances, shipments represent orders that were placed in 1915 and early 1916. This specially applies to plate tonnages. Mills continue to make more effort to ship material than to book new business. In fact, the general policy of mills and agencies continues—as has been reported for the past couple of weeks—to be that of refraining from encouraging the placing of additional business; and buyers, as well as sellers, are pursuing this "sit tight" policy. The prevailing open market prices on such business as is consummated on bars, shapes and plates are: For bars and shapes, 4½c., and for plates, 8½c. For cold finished steel the current price is 5 per cent off the list for carload lots; and for tin plate, "stock accumulations"—which is the only tin plate moving—$11.50 to $12 per base box. Bids are being received for structural steel for the new plant for the Curtiss Aeroplane & Motor Corporation, Buffalo, for which ground has just been broken, and which will require about 4000 tons.

Old Material.—The market is simply riding along, exhibiting about the same conditions as were in evidence last week, except that the situation has been further restricted and complicated by additional embargoes placed in effect in the Pittsburgh and Valley districts. A considerable number of the commodities of the list show a further decline in price, heavy melting steel having dropped $1 per ton, low phosphorus and No. 1 railroad wrought $3, iron and steel axles $5, old carwheels $1 to $2, with similar recessions in some other grades. Dealers are still engaged principally in completing back orders as far as possible. A number of cancellations have been reported recently, on high-priced orders, by reason of the fact that time delivery had expired. This is turning the tables on dealers who are in the "slackers" class—most of them having contracts at the old, and lower figures—on which they were not making deliveries. There is a coincidence of opinion by most dealers that the market is likely to drag along in its present condition for some time, as there are no indications of a buying movement setting in or an increase in prices in the immediate future. We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$33.00 to $34.00
Low phosphorus	45.00 to 48.00
No. 1 railroad wrought	43.00 to 45.00
No. 1 railroad and machinery cast	30.00 to 31.00
Iron axles	45.00 to 50.00
Steel axles	45.00 to 50.00
Carwheels	33.00 to 36.00
Railroad malleable	30.00 to 31.00
Machine shop turnings	18.00 to 19.00
Heavy axle turnings	26.00 to 27.00
Clean cast borings	20.00 to 21.00
Iron rails	43.00 to 44.00
Locomotive grate bars	20.00 to 21.00
Stove plate	20.50 to 21.00
Wrought pipe	30.00 to 31.00
No. 1 busheling scrap	29.00 to 30.00
No. 2 busheling scrap	20.00 to 21.00
Bundled sheet stamping scrap	21.00 to 21.50

New York

NEW YORK, Aug. 1.

Pig Iron.—While the pig iron market is extremely quiet, a better feeling exists than prevailed during the preceding two weeks. Prices are showing some tendency to recede, but for the most part are well maintained. Very little Alabama iron is to be had and the car situation shows little change. Some buyers of iron in Alabama have not been able to obtain deliveries, which are now three, four and even more months in arrears. Pennsylvania irons are somewhat easier. There is very little active inquiry, the principal one being from a Brooklyn foundry for 500 tons for the first half of next year and the same tonnage for the last half. For Pennsylvania No. 2 X, $52, furnace, can be done, but $53 is more frequently asked. Heavy tonnages still are pending for export. Some new foreign inquiries have appeared. Licenses for export are being issued very slowly, and are limited to 60 days, so that no sales are being made for delivery after that period. We quote tidewater for prompt delivery as follows:

No. 1 foundry	$53.25 to $54.25
No. 2 X	52.75 to 53.75
No. 2 plain	52.50 to 53.50
Southern No. 1 foundry	52.75 to 53.75
Southern No. 2 foundry and soft	52.25 to 53.25

Ferroalloys.—The market is inactive, despite the fact that the prospect for adequate supplies, due to dwindling imports, is not as good as it has been. Some little concern is beginning to be apparent here and there, but there is not much inquiry either for this year's or next year's delivery. It is reported that licenses are growing increasingly difficult to obtain, and it is already evident that receipts in July have been no better than those for May and June, or less than 3,000 tons for the month. Because of the recommendation of the Alloy Committee of the Council of National Defense referred to eleswhere, that ferromanganese supplies be conserved as much as possible, and that the more liberal use of spiegeleisen be resorted to, rather large inquiries for spiegeleisen have appeared within the last week. One consumer is asking for 2000 to 2500 tons for delivery this year, and two other consumers are seeking 1000 tons each for the same delivery, while another is a prospective buyer of 1000 tons, making a total of 3000 to 3500 tons actually before the market. For delivery this year $85 furnace is the quotation and the market is strong. Ferrosilicon, 50 per cent, is reported to be scarce for delivery this year at $200 per ton, the quotation for delivery next year still standing at $130. One British representative of a maker of ferromanganese who has made some sales recently reports that his principal is not anxious to take further orders.

Structural Material.—Government contracts and plant extensions made necessary by Government munitions and other work continue to be the only business that is attracting any attention, with the possible exception of mandatory railroad bridge and other construction. The total is not large and the market is quiet. The 12,000 tons required for the Federal Shipbuilding Co.'s plant, to be built for the Steel Corporation near Newark, N. J., will be furnished by the American Bridge Co. The Ingersoll-Rand Co. has awarded 150 tons for a plant extension and the Milliken works will furnish 600 tons for an extension to the Chile Copper Works in South America on an order taken by the Downey Shipbuilding Corporation. The Auto Car Co. has awarded 400 tons to Morris Wheeler, Philadelphia, for a machine shop at Ardmore, Pa. The Downey Shipbuilding Corporation will require 4000 tons for shipways and buildings. The lowest bidder for 600 tons for bridge work for the Pennsylvania Railroad is the Phoenix Bridge Co., and the same buyer is in the market for about 500 tons for bridges. The Boston & Albany is inquiring for 200 tons for two bridges and the Boston Elevated Railroad has awarded 125 tons for a car house at Sullivan Square. Various companies are reported as making tentative inquiries for plant extensions. We quote plain material from mill at 4.669 to 5.169c., New York, the lower price in three to four months and the higher for small lots in earlier deliveries. Shipments from warehouses are 5c. to 5.25c. per pound, New York, according to sizes desired.

Rails and Track Supplies.—For the purpose of building a comprehensive railroad system back of the battle lines in France for the support of the American army which will soon be in the field, the United States Government has placed orders for 150,000 tons of 80-lb. steel rails and correspondingly large tonnages of angle bars, bolts, etc. The rail order has been divided among the four leading producers, the largest interest, it is understood, taking about two-thirds. The Government apportioned the order according to the rail-producing capacity of the plants and the price was fixed at $40 per ton for open hearth and $38 for Bessemer rails, the mills being given the option as to which kind they shall furnish. Angle bar orders were placed at 3.25c. and bolts at 5.50c. In addition several large orders were placed with manufacturers of frogs and switches and the rails required for the turnouts were in addition to the 150,000 tons. Preference is to be given to these orders by the mills, as the Government requires prompt delivery. There is said to be a prospect that a leading producer will take on all or a part of an order for 130,000 tons of rails for the Russian Government. This inquiry has been in the market for three or four months and difficulty has been experienced in finding a mill that would accept it.

Plates.—July was a very active month in all finished steel, especially for export, and plates easily took the lead in tonnages placed in this market. New business has now dropped off practically to nothing, although the Japanese are still anxious to buy. A few orders have been accepted for Japanese shipment during the past week, but the majority of the mills prefer not to place any more of this business on their books until the export license situation has been cleared up. There are at present thousands of tons of plates and shapes awaiting shipment and with the exception of the release of a few small lots, none of this has been moved even to seaboard since the embargo went into effect. Various lots of plates for England, France, Italy and Russia have gone forward without objection. There are indications that a strong effort will be made, when the Japanese Commission arrives, to secure the transfer of some Japanese vessels to the Atlantic. All of the plates for France, about 50,000 to 60,000 tons, have been placed, and first shipments have already been made. As mentioned last week, 6c. was paid for hull steel, but orders for boiler plates were placed at two prices, 8.50c. and 9c., the 8.50c. price being that fixed for the larger producers. France has bought a considerable quantity of shapes out of stock and was apparently glad to get them, its needs being urgent. Car business shows more activity. It is understood that the United States Government is inquiring for cars for shipment to France as a part of its general railroad program for the war. The South Buffalo Railway is reported to have ordered 300 steel hopper cars from the American Car & Foundry Co. and the Bessemer & Lake Erie Railroad is reported to have ordered 1500 70-ton hopper cars from the Ralston Steel Car Co. The Semet-Solvay Co., Syracuse, N. Y., wants 100 hopper cars, the New York, New Haven & Hartford Railroad is said to be inquiring for 50 refrigerator cars and the Long Island Railroad may buy 25 passenger and baggage cars and 40 coaches. Sellers' views on plates are firm on the basis of 10c., Pittsburgh, for tank quality and 12c. to 12.50c. for plates rolled to Lloyds specifications, although little business is being done. On mill shipments we quote tank plates at 10.169c., New York, and ship plates, 12.169c., New York. Plates out of store at 8c. to 9c. for tank quality and 8.50c. to 9.50c. for ship steel.

Iron and Steel Bars.—Some of the smaller mills are said to be willing to take on business in steel bars for delivery in three to six months at 4.50c., though 5c. is being asked in most instances for fairly prompt shipment. Deliveries of bar iron are also a little easier, although a leading producer cannot do better than late in the fourth quarter of this year or the first quarter of 1918, its price for such delivery being 4.75c., Pittsburgh. We learn, however, of an offer of about 1000 tons of bar iron for delivery beginning in 30 days at 4.50c., Pittsburgh. Some producers are asking up to 5c., the latter figure seeming to represent the views of most sellers. We continue to quote steel bars in mill shipments at 4.669c. to 5.669c., New York, and bar iron at 4.919c. to 5.169c., New York. From New York district warehouses steel bars are sold at 5c. and bar iron at 5c. to 5.50c.

Old Material.—With the exception of cast borings, which have advanced about $2 and are now quoted at from $20 to $21, the old material market is weak, although quotations on foundry material are being well maintained. An extraordinary number of rejections are reported. There is some buying of heavy smelting steel at Steubenville, Ohio, and Midland, Pa., but very little is being taken by eastern Pennsylvania mills. Brokers quote buying prices as follows to local producers and dealers per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$28.00 to $29.00
Old steel rails (short lengths) or equivalent heavy steel scrap	28.00 to 29.00
Relaying rails	65.00 to 70.00
Rerolling rails	39.00 to 40.00
Iron and steel car axles	42.00 to 43.00
No. 1 railroad wrought	41.00 to 42.00
Wrought-iron track scrap	32.00 to 33.00
No. 1 yard wrought long	32.00 to 33.00
Light iron	10.00 to 12.00
Cast borings (clean)	20.00 to 21.00
Machine-shop turnings	18.00 to 19.00
Mixed borings and turnings	16.50 to 17.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long)	31.00 to 32.00

Cast-iron scrap continues to hold its own remarkably well, but there is considerable variation in reports as to sales of No. 1 machinery cast, some dealers asserting that as low as $32 has been accepted, while others are quoting from $34 to $35, and in some cases even higher. Dealers in New York City and Brooklyn are quoting as follows to local foundries per gross ton:

No. 1 machinery cast	$34.00 to $35.00
No. 1 heavy cast (column, building material, etc.)	29.00 to 30.00
No. 2 cast (radiators, cast boilers, etc.)	28.00 to 29.00
Stove plate	20.00 to 21.00
Locomotive grate bars	20.00 to 21.00
Old carwheels	33.00 to 34.00
Malleable cast (railroad)	33.00 to 34.00

Cast Iron Pipe.—The City of New York is in the market for 1227 tons of 6-in., 8-in. and 12-in. pipe for the Department of Water Supply, Gas & Electricity, and bids will be received Aug. 6. The city will also receive bids Aug. 7 on 145 tons for the Department of Charities. Carloads of 6-in., 8-in. and heavier are quoted $65.50 per net ton tidewater and 4-in. at $68.50.

Will Finance Manufacturers

WASHINGTON, July 31.—The War Department is preparing to finance manufacturers of airplanes who are not in position to supply funds for the purchase of materials, equipment, etc., for the execution of large contracts. The aviation bill, passed by the House and signed by the President a few days ago, makes no provision for advances to manufacturers, and Section 3648 Revised Statutes specifically forbids such payments except under certain prescribed conditions which do not apply to this emergency. Many manufacturers of aircraft have valuable patents and have been building airplanes on a small scale, but lack the necessary capital to enlarge their operations and take an active part in the building program, which is counted upon to produce more than 20,000 fliers within the coming year.

To meet this emergency Representative Hulbert of New York has introduced a bill to remove the restrictions on advance payments imposed by Section 3648 Revised Statutes as they apply to the expenditure of appropriations contained in the aviation act. Quick action on this measure is looked for, and as soon as the bill is passed the War Department will be in position to place a large number of contracts which manufacturers with moderate facilities now hesitate to undertake.

The American Steel Export Company, New York, has appointed Woodburn's, Ltd., Montreal, Canada, as its exclusive agents for the provinces of Ontario and Quebec.

The Combination Lighting Unit Co., Pittsburgh, has been organized with a capital of $350,000 to manufacture and sell all kinds of lighting fixtures.

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin.	Lead		Spelter	
		Electro-	New	New	St.	New	St.
July	Lake	lytic	York	York	Louis	York	Louis
25	26.50	26.50	62.50	10.50	10.37½	8.75	8.50
26	28.50	28.50	62.75	10.50	10.37½	8.75	8.50
27	28.50	28.50	63.00	10.75	10.62½	8.75	8.50
28	28.50	28.50	....	10.75	10.62½	8.75	8.50
30	29.00	29.00	63.75	10.75	10.62½	8.75	8.50
31	29.00	29.00	63.75	10.87½	10.75	8.75	8.50

NEW YORK, Aug. 1.

The markets continue dull and more or less nominal, pending some decision as to Government price regulation and purchases. Copper is firmer and nominally higher. Tin is quiet and a little stronger. Lead is firm with a tendency upward. Spelter is inactive and nominal but steady. Antimony is dull and unchanged.

New York

Copper.—After two weeks of a continuous decline the copper market late last week took a decided turn upward and has been more or less strong ever since. This bulge in prices was due to two causes: The withdrawal of resale lots and an idea that large consumers were about to purchase. As a whole the market has been more or less nominal and narrow and drifting with few actual transactions recorded. The higher quotations have really not been based on actual purchases and have been ruled not so much by supply and demand as by sentimental reasons. The quotations yesterday for both Lake and electrolytic was 29c., New York. The quotation for last quarter is generally regarded as 27.50c. to 28c., New York. The lower prices reported last week in the London market are unchanged at £137 for spot electrolytic and £133 for futures.

Copper Averages.—The average price for both Lake and electrolytic copper for the month of July, based on daily quotations in THE IRON AGE, was 28.78c.

Tin.—General business is of a halting and ragged nature and scant in volume. In the middle of last week there was a fair inquiry for far future delivery and some good business is reported to have been done for delivery in the last quarter with smaller quantities sold for early London shipment. There was but little inquiry for spot tin, however, and some price cutting was in evidence, sales of Straits tin being made as low as 62.50c. on July 25, with 62c. quoted. On July 27 buying died down and considerably less interest was shown although sales for the period made a respectable showing. Yesterday and Monday, July 30 and 31, the market was entirely uninteresting and very slow with hardly enough business reported to establish price levels. A liberal estimate of the sales on those two days was 150 tons. The quotation for spot Straits yesterday in New York was 63.75c., the market having continually advanced in the last week. The London market has shown decided strength and continued to rise last week until yesterday the quotation for spot Straits was £248, an advance of nearly £9 per ton. The arrivals up to July 31 were 2390 tons, with 3450 tons reported afloat.

Lead.—The intimation last week of a possible turn for the better in the market has been borne out. The market has continued to advance until yesterday the quotation at New York was 10.87½c., with the price at St. Louis, 10.75c., an advance of over ¾c. in the week. One of the principal reasons for this situation is that the outside market has either been bought up or such lots withdrawn, easing the pressure and creating a better tone. While the leading interest as well as some large producers continue to quote 11c., New York, and while outside lots are difficult now to locate, some business has been done at 10.75c., New York, but this is the exception rather than the rule. General demand is at a minimum and the market is dull. Another cause for the general situation mentioned are reports of more or less serious labor troubles in four important localities, affecting lead production and shipments.

Spelter.—The market continues inactive and lifeless. There has been more interest displayed and this has resulted in some small buying, but its effect has been of no consequence. Until the expected large foreign buying materializes the stagnant condition will probably continue, accentuated by the waiting attitude which has been so prevalent, caused by the uncertainty as to the Government's needs and purchase of prime Western spelter. The feature of the past week has been the purchase by the Government of 8,250,000 of grade A spelter and 15,000,000 lb. of grade B at 13.50c. and 13c. per pound, St. Louis, respectively. This is an advance of 2c. per lb. over the purchase made in May. No prime Western was included in the order. While the extra price paid for these grades is encouraging it has not affected the grade C market, though the fact is of a bullish nature rather than otherwise. The market is nominal at 8.50c., St. Louis, or 8.75c., New York, for delivery up to October inclusive, though some is reported as sold to January at that price. It is believed that all material available at 8.37½c., St. Louis, has been disposed of.

Antimony.—Chinese and Japanese grades are obtainable at 15c. to 15.50c., New York, duty paid, but demand is very light and the market is quiet.

Aluminum.—No. 1 virgin metal, 98 to 99 per cent pure, is again lower and is obtainable at 50c. to 52c., New York, for early delivery. It is reported that 100 tons were offered yesterday at 51c., New York.

Old Metals.—The market is very unsettled. Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible	26.50 to 28.00
Copper, heavy and wire	25.50 to 27.00
Copper, light and bottoms	24.00 to 24.50
Brass, heavy	18.00 to 19.00
Brass, light	13.50 to 13.75
Heavy machine composition	24.00 to 25.00
No. 1 yellow rod brass turnings	17.50
No. 1 red brass or composition turnings	19.00 to 21.00
Lead, heavy	9.25 to 9.375
Lead, tea	7.75
Zinc	6.75

Chicago

CHICAGO, July 30.—The market is relatively quiet, but the bottom was touched in the week and some recovery is shown by every metal, except spelter and antimony. The greater strength is reflected in old metals, and the outlook is considered better by the trade in both new and old. Some attempt has been made to purchase lead, but the offers did not induce holders to sell. Tin is firmly held. Spelter is called "dead." We quote as follows: Casting copper, 27c.; Lake, 30c.; electrolytic, 28.50c.; tin, carloads, 64c.; small lots, 66c. to 67c.; lead, 10.75c.; spelter, 8.50c.; sheet zinc, 19c.; Oriental antimony, 17c. to 18.50c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 22.50c.; copper clips, 22c.; copper bottoms, 21c.; red brass, 21c.; yellow brass, 15c.; lead pipe, 8c.; zinc, 6c.; pewter, No. 1, 35c.; tinfoil, 40c.; block tin, 45c.

St. Louis

ST. LOUIS, July 30.—The week has been rather quiet on the non-ferrous metals market with the close to-day, in car load lots, for lead at 10.75c. and firm and spelter at 8.37½c. In less than car load lots the quotations were: Lead, 11c.; spelter, 9.50c.; tin, 67c.; lake copper, 31c.; electrolytic copper, 30.50c.; Asiatic antimony, 18c. In the Joplin ore district the price of lead, basis of 80 per cent metal, fell off $5 per ton to $110 per ton at which price the district output averaged. Zinc blende showed quiet strength at $65 to $75 per ton, basis of 60 per cent metal, with the average for the district for the week at $70 per ton. The production is maintained at a high level despite the fact that the sheet ground operations have decreased, being unprofitable at present prices. Calamine ranged from $35 to $42 per ton basis of 40 per cent metal, with the average for the week for the district at $38 per ton. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 10.50c.; heavy yellow brass, 13c.; heavy red brass and light copper, 18c.; heavy copper and copper wire, 21.50c.; pewter, 25c.; tinfoil, 42c.; zinc, 6c.; lead, 7c.; tea lead, 6c.

IRON AND INDUSTRIAL STOCKS

Market Generally Inactive, but Good Demand for Short Time Notes

The stock market during the past week was characterized by decided inactivity on the whole, but a quickening in the demand for note securities of high yield was a favorable feature of the situation. Notes of this kind have been sold recently by a number of railroad and industrial corporations, and last week the Canadian Government came into the market for $100,000,000 of two year 5 per cent notes, which are being sold so as to yield slightly more than 6 per cent. Money is easier again and banks last week were liberal with their offerings of funds. The rate fell to 2½ per cent and lower for call loans at the stock exchange. Estimates of greatly enlarged expenditures for the war by the Government have caused some feeling of caution, but it is believed that the money market will not be seriously affected by future demands of the Government. The feeling as to price fixing by the Government is one of decreased anxiety, as there is a growing hope that a spirit of fairness will prevail.

Among the industrial stocks that registered gains during the past week were the following: American Car & Foundry, ¼; American Locomotive, ¼; Baldwin Locomotive, 3; Colorado Fuel & Iron, 1⅞; International Harvester, 2½; National Enameling & Stamping, 3¼. Among the stocks that made losses during the week were the following: Allis-Chalmers, ¼; American Can, 1; Bethlehem Steel, 2¾; Bethlehem Steel, Class B, 2 1/3 Crucible Steel, 1½; Lackawanna Steel, 1¼; Midvale Steel, ¾; Pressed Steel Car, 2¼; Republic Iron & Steel, ¾; United States Steel, 1/3; United States Steel, Preferred, ¼. American Steel Foundries remained the same at the end of the week as at the beginning, being 68¾.

The range of prices on active iron and steel stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com..	28½- 30	Int. Har. Corp., com.	72
Allis-Chal., pref..	83¼- 84	Lackawanna Stl.	90½- 93½
Am. Can, com...	48 - 49	Lake Sup. Corp..	15½- 17⅝
Am. Can, pref.....	107⅞	Midvale Steel....	57 - 59¾
Am. Car & Fdry., com.	74⅛- 76⅞	Nat.-Acme	34 - 34½
Am. Car & Fdry., pref.	116	Nat. Enam. & Stm., com.	43⅜- 45½
Am. Loco., com.	70⅛- 73¾	Nat. Enam. & Stm., pref.	99¾
Am. Loco., pref.....	103	N. Y. Air Brake..	131¾-132
Am. Rad., com..	283 -293	Nova Scotia Stl..	97 - 98½
Am. Rad., pref.....	133	Pressed Stl., com.	72½- 73⅞
Am. Ship, com..	82½- 90½	Ry. Steel Spring, com.	51⅛- 52
Am. Ship, pref.....	94	Ry. Steel Spring, pref.	98
Am. Steel Fdries.	67⅝- 69	Republic, com. ..	89 - 92⅝
Bald. Loco., com.	68¾- 75⅝	Republic, pref. ..	102 -103½
Bald. Loco., pref.....	100	Sloss, com.	51⅞- 54½
Beth. Steel, com.	126½-132	Sup. Steel	44¼- 45⅝
Beth. Steel, Class B	123¾-128⅞	Superior Steel, 1st pref.	102½
Case (J. I.), pref.....	84	Transue-Williams	41¼- 42⅝
Charcoal Iron, com....	8⅝	Un. Alloy Steel..	43 - 45
Charcoal Iron, pref....	6½	U. S. Pipe, com..	21 - 22½
Colo. Fuel	48 - 51⅞	U. S. Steel, com.	119⅞-125¼
Cruc. Steel, com..	78⅝- 83¼	U. S. Steel, pref.	117⅞-119
Cruc. Steel, pref.	102⅝-103¾	Va. I. C. & Coke	68 - 68½
Gen. Electric....	154 -155	Westing. Elec....	48 - 49⅝
Gt. No. Ore Cert.	32½- 33¾		
Gulf S. Steel....	118½-119		
Int. Har. of N. J., com.	113 -115½		

Industrial Finances

All the outstanding $573,000 first mortgage 5 per cent sinking fund gold bonds of the Phillips Sheet & Tin Plate Co., Weirton, W. Va., have been called by the Fidelity Title & Trust Co., Pittsburgh, trustee. The bonds, dated Feb. 1, 1912, will be redeemed on and after Aug. 1, 1917, at the rate of $1,025 per bond and accrued interest. The bonds were not due until Feb. 1, 1922.

It is said that last week the Westinghouse Electric & Mfg. Co., East Pittsburgh, received $9,000,000 in cash from the British Government on account of munitions and $3,000,000 more, balance of the $12,000,000 due, will be received next week. These payments are those which were referred to by Chairman Tripp in the annual report recently issued when he said, "In addition to current collections item of accounts receivable will be reduced by a cash payment of over $11,000,000 from the British Government on account of munitions."

The Fulton Pit Car & Mfg. Co., Canal Fulton, Ohio, has increased its capital stock from $150,000 to $400,000. In order to complete a merger of that company with the Kenova Mine Car Co., Kenova, W. Va., no plans have been made as yet to erect new buildings or to purchase additional equipment.

The plant and business of the Keystone Farm Machine Co., North Beaver Street, York, Pa., manufacturer of agricultural implements and machinery, have been acquired at a receiver's sale by Henry C. Niles for a consideration of about $100,000.

William Holland, Sibley Machine Co., South Bend, has been appointed receiver of the Perkins Windmill Co., one of the oldest manufacturing concerns of Mishawaka, Ind. The liabilities are placed at $150,000 and assets at $400,000.

Richard M. Coleman has been appointed receiver for the Meridian Mfg. Co., Indianapolis, maker of automobile bodies. Insufficient working capital is given as cause of the trouble.

Regular and excess subscriptions to the $2,000,000 preferred stock issue of the Trumbull Steel Co., Warren, Ohio, were more than double the amount of the issue. The $350,000 common stock offered was also more than oversubscribed. Subscriptions to the common stock must be paid in full Oct. 1, and preferred in four equal installments, the first of which is due Oct. 1. Preferred payments may be anticipated after Aug. 10 by payment of par and accrued dividends to date of payment.

Within a short time an official statement will be made regarding the transfer of the Republic Rubber Co., of Youngstown, Ohio, to the Knight Tire & Rubber Co., of Canton, Ohio, to a new corporation, with a capital of $20,000,000 which is to take over both companies. It is said officials of the new corporation will be the same as the present officials of the Republic Rubber Co. as follows: T. L. Robinson, chairman of the board of directors; Guy E. Norwood, president; C. F. Garrison, secretary, and Myron I. Arms, II., treasurer.

On Aug. 1 the Republic Rubber Co. paid a quarterly dividend of 2 per cent, which will likely be the last dividend to be paid by the present company, as the merger is expected to be completed before the next dividend period.

Will Issue Preferred Stock

YOUNGSTOWN, July 31.—Edward F. Clark, president of the Liberty Steel Co., which is to be built at Leavittsburg, two miles west of Warren, Ohio, announces that $250,000 of preferred stock will be issued at once. This will give the company a total capitalization of $750,000. The new preferred issue is to be made payable in two installments, Oct. 1 and Jan. 1. It will be offered to holders of common in proportion to their holdings at par. The corporation has $500,000 in common stock authorized and outstanding.

The foundations for the new sheet mills are now about completed. A new brick office is to be erected in connection with the plant. J. L. Decker of Niles is the architect. The Hunter Construction Co., Youngstown, will erect the mill buildings.

Dividends

The Canada Foundry & Forgings Co., quarterly, 3 per cent on the common and 1¾ per cent on the preferred, both payable Aug. 15.

The International Harvester Co. of New Jersey, quarterly, 1¾ per cent on the preferred, payable Sept. 1.

The International Harvester Corporation, quarterly, 1¾ per cent on the preferred, payable Sept. 1.

The Pressed Steel Car Co., quarterly, 1¾ per cent on the common, payable Sept. 5, and 1¾ per cent on the preferred, payable Aug. 22.

The Scovill Mfg. Co., 15 per cent, payable Aug. 1.

The Standard Mfg. Co., quarterly, 1½ per cent, on the preferred, payable Aug. 31.

The Standard Sanitary Mfg. Co., quarterly, 1½ per cent on the common and 1¾ per cent on the preferred, both payable Aug. 10.

The Superior Steel Corporation, 2 per cent on the first and second preferred, payable Aug. 15.

Bessemer and Basic Averages for July

PITTSBURGH, Aug. 1—(*By Wire*).—W. P. Snyder & Co. report that the average price in July on Bessemer iron was $56.50 and on basic $52.848 on sales of 1000 tons or more, both in gross tons at Valley furnace. These prices show an advance in Bessemer in July over June of $3.24 and of basic $3.698, about one-half the advances in prices shown in June over May.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c. Denver pipe, 76.1c., minimum carload, 46,000 lb.; structural steel and steel bars, 76.1c., minimum carload, 40,000 lb. Pacific coast (by rail only), pipe, 65c.; structural steel and steel bars, 75c., minimum carload, 60,000 lb. No freight rates are being published via the Panama Canal, as the boats are being used in transatlantic trade.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 4.50c.

Wire Products

Wire nails, $4 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire is $4.05 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.95; galvanized wire, $4.65; galvanized barb wire and fence staples, $4.85; painted barb wire, $4.15; polished fence staples, $4.15; cement-coated nails, $3.90 base, these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 43 per cent off list for carload lots, 42 per cent off for 1000-rod lots, and 41 per cent off for small lots, f.o.b. Pittsburgh.

Nuts and Bolts

Discounts in effect for large buyers are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days.

Carriage bolts, small, rolled thread, 40 per cent, small cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent; with c. p. nuts, 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq. blank, $2.10 off list, and tapped, $1.90 off; hex., blank, $1.90 off, and tapped, $1.70 off; nuts, c. p. c. and t. sq. blank, $1.70 off, and tapped, $1.50 off; hex. blank, $1.60 off, and tapped, $1.40 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Wire Rods

Soft Bessemer and open-hearth rods to domestic consumers at $95 to $100; high-carbon rods made from ordinary open-hearth steel, $100 to $110, and special steel rods with carbons running from 0.40 to 0.60, $100 to $110 at mill; above 0.60 carbon, $115 to $120.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $7.00 base; ⅝ in., 7/16 in. and ½ in., $7.00. Boat spikes are occasionally quoted $7.00 to $8.00, all per 100 lb. f.o.b. Pittsburgh, but some makers are quoting higher. Track bolts with square nuts, 7c. to 7.50c. to railroads, and 8c. to 8.50c., in small lots, for fairly prompt shipment.

Steel Rails

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails, and on carload and smaller lots, 4c. to 4.25c. at mill. Light rails: 25 to 45 lb., $75 to $80; 16 to 20 lb., $80 to $81; 12 and 14 lb., $82 to $83; 8 and 10 lb., $83 to $84; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard Bessemer rails, $38; open-hearth, $40, per gross ton, Pittsburgh.

Tin Plate

Effective July 31, prices on all sizes of terne plate were advanced from $2 to $2.50 per package. Prices quoted by leading makers are now as follows: 8-lb. coating, 200 lb., $16 per package; 8-lb. coating, I. C., $16.30; 12-lb. coating, I. C., $17.50; 15-lb. coating, I. C., $18.25; 20-lb. coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 4.50c. to 5c. for delivery late this year, and 5c. and higher from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c.; railroad test bars, 5.25c. in carload lots and larger lots f.o.b. mill.

Wrought Pipe

The following discounts in steel are to jobbers for carloads on the Pittsburgh basing card in effect from May 1, 1917, all full weight, except for LaBelle Iron Works and Wheeling Steel & Iron Co., which quote higher prices, and National Tube, which adheres to card of April 1.

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛, ¼ and ⅜	42	15½	⅛ and ¼	23	+4
½	46	31½	⅜	24	+3
¾ to 3	49	35½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	42	29½	2	26	12
2½ to 6	45	32½	2½ to 6	28	15
7 to 12	42	28½	7 to 12	25	12
13 and 14	32½	..			
15	30	..			

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	38	20½	⅛, ¼ and ⅜	22	5
½	43	30½	½	27	14
¾ to 1½	47	34½	¾ to 1½	33	18
2 to 3	48	35½			

Lap Weld, extra strong, plain ends

2	40	28½	2	27	14
2½ to 4	43	31½	2½ to 4	29	17
4 to 6	42	30½	4½ to 6	28	16
7 to 8	38	24½	7 to 8	20	8
9 to 12	33	19½	9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

Nominal discounts on less than carloads, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes, and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in.	28	1¾ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3¼ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in.	No quotations
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths. Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net, or 2 per cent discount in 10 days.

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer

	Cents per lb.
Nos. 3 to 8	8.00 to 8.50
Nos. 9 and 10	8.25 to 8.50
Nos. 11 and 12	8.50 to 8.75
Nos. 13 and 14	8.75 to 9.00
Nos. 15 and 16	9.00 to 9.25

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	8.30 to 8.80
Nos. 22 and 24	8.35 to 8.85
Nos. 25 and 26	8.40 to 8.90
No. 27	8.45 to 8.95
No. 28	8.50 to 9.00
No. 29	8.55 to 9.05
No. 30	8.65 to 9.15

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11	9.00 to 9.50
Nos. 12 and 14	9.10 to 9.60
Nos. 15 and 16	9.25 to 9.75
Nos. 17 to 21	9.40 to 9.90
Nos. 22 and 24	9.55 to 10.05
Nos. 25 and 26	9.70 to 10.20
No. 27	9.85 to 10.35
No. 28	10.00 to 10.50
No. 29	10.25 to 10.75
No. 30	10.50 to 11.00

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	7.80 to 8.30
Nos. 17 to 21	7.85 to 8.35
Nos. 22 to 24	7.90 to 8.40
Nos. 25 to 27	7.95 to 8.45
No. 28	8.00 to 8.50
No. 29	8.05 to 8.55
No. 30	8.05 to 8.55
Nos. 30½ and 31	8.10 to 8.60

The Shipping Outlook More Encouraging

Remarkable Foreign Trade Showing in June—Figures on New Vessels and Submarine Losses Unfavorable to Germany

WASHINGTON, July 31.—In the midst of conflicting reports regarding the effectiveness of the German submarine campaign reliable figures have become available here which shed much light on the situation with respect to the ocean-borne trade of the United States and the Allies and which are full of encouragement. The Department of Commerce announced to-day that in spite of the activity of the undersea boats our imports for the month of June broke all records by a large margin, and our exports exceeded those of any month except last January, while both imports and exports for the fiscal year just ended were carried to a high level never dreamed of before the war. Coincidently with the publication of these statistics comes the information that the U boats, during the past six months, have sunk only a fraction of the tonnage predicted by the German experts when the campaign of frightfulness was launched; that the undersea fleet has suffered heavy losses so that to-day less than 200 U-boats are available for service; that Great Britain and the United States in 1917 will turn out a merchant vessel tonnage in excess of that destroyed in the year, and that during the calendar year 1918 British and American shipyards will probably build no less than 8,000,000 tons of standardized cargo-carrying vessels.

Record-Breaking Trade Totals in June

The foreign trade of the United States in June exceeded the most sanguine expectations of Government officials. The imports, amounting to $306,000,000 in round numbers, exceeded those of June, 1916, by $60,000,000, or nearly 20 per cent, and surpassed those of the next largest month, May, 1917, by $36,000,000. Our exports for the month aggregated $575,000,000, a gain as compared with the corresponding month of 1916, of more than $111,000,000, or nearly 20 per cent. In only one month, January, 1917, have these exports been exceeded. The fiscal year figures dwarf all previous records. Imports aggregated $2,659,000,000, as compared with $2,197,000,000 in 1916, the largest previous total. Exports for the fiscal year rose to the huge figure of $6,294,000,000, as compared with $4,333,000,000 in 1916, which was an increase of nearly 50 per cent over 1915. It is conclusively shown by these figures that our imports have not been materially interfered with by the submarines, as the official statistics represent goods actually landed in this country, and, while the merchandise reported as exported does not necessarily reach its destination in order to be included in these figures, the cargoes sunk by the submarines are known to have embraced a very small number of American origin.

Encouraging Shipping Situation

According to the carefully compiled figures of the London *Times*, something less than 2,000,000 tons of British shipping have been destroyed by submarine and mine since Feb. 1. These figures agree closely with tables prepared here by experienced official observers. The number of vessels of other nationalities sunk by U-boats has steadily dwindled of late and according to reliable British data the oversea traffic of Allies and neutrals alike is suffering much less than formerly. An interesting item in this connection is the report that the number of ships of all nationalities entering French ports increased from an average of 842 in the four weeks of March to 1014 for four weeks in June and to 1067 for the same period in July. Departures are in keeping with arrivals. Returns from official Italian sources are equally encouraging.

On July 1, 1916, the British merchant marine included approximately 18,000,000 tons of seaworthy ships of all kinds. During the past year, it is estimated, about 3,000,000 tons have been lost on account of submarines, mines, accidents and general deterioration. The output of the British shipyards during the same period, however, though not officially announced, is estimated at approximately 2,000,000 tons, and while this shows a net decrease in total tonnage, it must be remembered that the sinkings and other losses represent the destruction of vessels of all types and in various stages of seaworthiness, while the new ships are nearly all standard cargo-carrying vessels of superior speed to those destroyed. Shipbuilding experts are disposed to calculate that in point of efficiency one ton of the new ships is equal to nearly two tons of those destroyed.

New 1917 Vessels Put at 1,500,000 Tons

While the official figures showing merchant construction in the United States have not been made public since early in the present calendar year, there is reason to believe that the total output of the American yards, including work done for the United States Shipping Board, will amount to nearly 1,500,000 tons by Dec. 31 next. It is therefore apparent that the merchant shipbuilding of England and the United States together has exceeded the losses inflicted by the undersea campaign, this calculation taking no account of the superior efficiency of the new vessels built as compared with those destroyed.

The British shipyards, according to Lloyd George, will turn out during the calendar year 1918 no less than 4,000,000 tons of merchant shipping. During the same period it is estimated that the Emergency Fleet Corporation will secure in American shipyards the construction of not less than 3,000,000 tons, and if Congress provides the additional appropriation of $500,000,000 requested by the United States Shipping Board, this figure will be substantially increased. In any event it is believed there will be a very substantial output of merchant vessels for private account and the total production in American yards of not less than 4,000,000 tons is confidently expected.

Heavy Submarine Losses

Very definite reports, though lacking in detail, have recently reached Washington to the effect that the German undersea fleet has encountered heavy losses during the past three months. Following a policy adopted early in the present year, the British Government publishes no data concerning submarines captured or destroyed, but the American Government has received numerous reports, from which it is conservatively deduced that Germany now has less than 200 submarines in serviceable condition. The former German Ambassador, Count Von Bernstorff, in a statement made here last February, predicted that the German Admiralty would have more than 300 U-boats in the waters around the British Isles by April 1 and that these would be sufficient to starve England within a month.

Summarizing the data above presented it would appear that the plans of the German Government have fallen far short of expectations and that there is no danger that England will be starved into submission by the undersea campaign. Officials here, in fact, feel no further anxiety with regard to their ability to transport adequate food supplies to Great Britain. Their chief concern is in obtaining the supplies, while at the same time keeping up the great work of transporting to France a large army with the equipment necessary to enable it to carry on effective operations.

W. L. C.

Pittsburgh and Nearby Districts

The Jones & Laughlin Steel Co., Pittsburgh, has given a contract to the Thompson-Starrett Co., of New York, for the building of 100 additional houses at Woodlawn, which is the town located near its blast furnaces and steel works at Aliquippa. These houses are to cost about $350,000 and work is to start at once.

The American Sheet & Tin Plate Co., Pittsburgh, has made plans for the building of a hotel and club house for use of employees in its Sharon, Pa., works, to cost about $75,000.

The Jones & Laughlin Steel Co., Pittsburgh, recently purchased the property of the D. O. Cunningham Glass Co., on the Southside, near its works, for the price of $130,000. Part of the ground will be used by the Jones & Laughlin Steel Co., as a site for its new spike plant, which will be removed from its Soho Works in Pittsburgh, to make room for a new large plate mill being installed.

The American Sheet & Tin Plate Co., Pittsburgh, has advanced wages of its hot tin mill employees 14½ per cent, and hot sheet mill hands about 11 per cent. Wages now being paid by this company are slightly more than those paid by the union sheet and tin plate mills, working under the wage scale of the Amalgamated Association of Iron, Steel and Tin Workers. This company will erect a new hotel and build 100 homes for use of employees at its Farrell, Pa., works.

The Petroleum Iron Works Co., Sharon, Pa., has just completed a steel stack at the works of the Youngstown Sheet & Tube Co., which is 160 ft. high. This makes a total of 76 steel stacks fabricated by this company for the Youngstown Sheet & Tube Co.

The National Tube Co., Pittsburgh, paid taxes last week for its blast furnaces, steel plants and tube mills in McKeesport, Pa., amounting to $57,999.14. The above amount was for McKeesport city taxes, and the school taxes of the company in McKeesport, payable shortly, will be a larger amount. The National Tube Co. is by far the largest single taxpayer in McKeesport.

The H. Koppers Co., Union Arcade Bldg., Pittsburgh, is building for the Dominion Steel Corporation, Sydney, Nova Scotia, two batteries of 60 Koppers by-product ovens each. The first battery is expected to be in operation about March 15, 1918, and the second battery about Aug. 15, 1918. These ovens will have an estimated annual output of 1,800,000 tons of coke. The Indiana Steel Co. is also building 120 Koppers by-product coke ovens at Gary, doing the work itself. On Monday, July 30, coal was fired in the 110 by-product coke ovens built by the Seaboard By-Products Co., a subsidiary interest of the H. Koppers Co., at Hackensack Meadows, near Jersey City, N. J. These ovens have been under way for about a year, and the output of blast furnace coke will be sold partly to the Wharton Steel Co. and the remainder to other Eastern blast furnaces. The foundry coke will be sold to Eastern foundries, while the water gas coke will be sold to the Consolidated Gas Co., to be used in making water gas for illuminating purposes. Formerly this company used anthracite coal in making water gas, but it will be replaced as a fuel by by-product coke. The illuminating gas made at the Seaboard By-Product Co.'s plant will be sold to the Public Service Corporation of New Jersey, which furnishes illuminating gas to Newark and other nearby cities; in fact, this plant was built primarily for this purpose.

The Pittsburgh Steel Products Co., Frick Bldg., Pittsburgh, has adopted the plan of having its office employees report for duty at 8 a. m. and stop at 4 p. m., with one hour for luncheon. The company believes that by having its office employees report one-half hour earlier in the morning and stop at 4 p. m., it will get better results, while they will have more time for recreation. This plan will continue in force until Sept. 15 next.

The Keystone Wire Goods Co., Greensburg, Pa., has been organized with a capital of $40,000 to manufacture articles made from wire, such as garment hangers, etc.

A purchase of 85,000 acres of iron ore land in Wayne County, Missouri, was completed in St. Louis July 28 by the transfer of the land from the Concrete Investment Co. to the Midvale Steel & Ordnance Co.

Awards Contract for Plant

MILWAUKEE, WIS., July 31.—The Wisconsin Gun Co., Milwaukee, incorporated recently with a capital stock of $100,000 by five of the leading metal working industries of the city to manufacture 3-in. field ordnance for the Government, has awarded contracts for the construction of a complete plant, to be located on Orchard Street, between Thirty-fifth and Thirty-seventh Avenues, in West Milwaukee. It is designed by Herman J. Esser, architect, Camp Building, Milwaukee, and will be 130 x 300 ft., with sawtooth roof, creosoted block floors, and fireproof construction throughout. The general contract is in charge of the Worden-Allen Co., Milwaukee. Henry J. Wiegand, superintendent, Cutler-Hammer Mfg. Co., is in general charge of the erection, equipment and management of the plant, having been given leave of absence for this purpose. The company will employ between 350 and 400 highly skilled workmen and will manufacture 1000 of the 1916 model 3-in. gun at the rate of three each working day. As soon as practicable, the Government will take over the entire plant, the capital to build which was furnished by the Kearney & Trecker Co., milling machines; Cutler-Hammer Mfg. Co., electric controlling devices; Bucyrus Co., South Milwaukee, steam shovels; Northwestern Malleable Iron Co., founder, and Power & Mining Machinery Co., Cudahy, Wis., machinery and pumps. Frederick L. Sivyer, Northwestern Malleable Iron Co., is secretary. The project was noted in the July 19 issue of THE IRON AGE, p. 137.

Large Locomotive Orders

Orders for locomotives in the past two weeks call for 319. The United States Government has ordered 300 consolidation locomotives, 80 tons each, equally divided between the American Locomotive Co. and the Baldwin Locomotive Works. It is understood that these locomotives are for the service of the American forces in France and will receive prior consideration to all orders in their execution. The Norfolk & Western is building 10 Mallet locomotives in its own shops and the Toronto, Hamilton & Buffalo Railway has ordered six switching locomotives from the Canadian Locomotive Co. The Chicago & Alton is in the market for five additional Mikado locomotives and the Chicago, Milwaukee & St. Paul and the Boston & Maine are also about to make purchases.

Jones & Laughlin Plate Mill Starts

Last week the Jones & Laughlin Steel Co. started up the 128-in. 3-high plate mill, which the company bought late last year from the Dominion Iron & Steel Co., Ltd., Sydney, N. S. This mill will roll sheared plates up to 120 in. wide, and will have a capacity of 15,000 to 18,000 tons of plates per month. During last year, and early this year, the Jones & Laughlin Steel Co. installed and now has in operation six new 50-ton open-hearth furnaces, which will furnish the steel for this plate mill. The company is furnishing large quantities of plates right along for Government use, and with the starting of this new plate mill the quantity of plates it is furnishing to the Government will likely be largely increased.

New Company to Sell Electric Furnaces

The Seneca Electric Furnace Corporation of Albany, N. Y., has been incorporated for the purpose of manufacturing and selling electric furnaces for steel making and other purposes. Thornton W. Price is vice-president and general manager and Edwin Corning is treasurer. The New York office of the company is located in the Woolworth Building.

The Auto Car Co., Pittsburgh, is building a large machine shop at Ardmore, Pa., where its plant is located, and considerable equipment will be needed, part of which has been purchased. The American Bridge Co. will erect a steel building for this shop, which will take about 400 tons of fabricated steel.

PERSONAL



Newman Ebersole of the purchasing department of the American Rolling Mill Co., Middletown, Ohio, will head a party of "Armco" employees, numbering 14, who have formed an ambulance unit for service in France. The unit will be maintained by contributions from the organization of the company.

John T. Wilkin has been elected president of the Connersville Blower Co., Connersville, Ind., in addition to his duties as engineer. Mr. Wilkin was one of the organizers of the company in 1892. The president, C. W. Ansted, died some time ago.

George Looms, who has been assistant purchasing agent for B. F. Avery & Sons, Louisville, Ky., has become purchasing agent for the Cyclops Steel Co., Titusville, Pa.

Edward J. Kearney, secretary-treasurer Kearney & Trecker Co., Milwaukee, maker of milling machines, has been appointed member of the Wisconsin State Board of Vocational Education, created by the last legislature. He is one of three representatives of the employers of Wisconsin.

J. B. McComber, Green Bay, Wis., has withdrawn from the Fox River Cornice & Corrugating Co., Green Bay, of which he was secretary-treasurer since February, 1910.

Donald Fraser, second vice-president and superintendent, Chain Belt Co., Milwaukee, has received word that his son, Donald K. Fraser, formerly assistant superintendent, who enlisted in the Nineteenth Canadian regiment, was wounded in the battle of Vimy Ridge and is recuperating in a London hospital.

Arthur C. Pletz, general manager Morris Machine Tool Co., Cincinnati, has returned from a three weeks' vacation spent in Canada and at Eastern summer resorts.

William C. Aldrich, formerly superintendent of the Penn Steel & Iron Co., Lancaster, has been made assistant to the general manager. J. O. B. Dellet has been made secretary to succeed J. Hale Steinman, now in the Federal service, and W. F. Barry has been made superintendent. Mr. Aldrich is a native of Harrisburg, Pa., and went to Lancaster from the Portland Rolling Mill Co., Portland, Me.

O. B. Newton has been appointed general sales agent of the Virginia Iron, Coal & Coke Co., Roanoke, Va., effective Aug. 1, vice C. W. Owen, resigned, to engage in other business.

The Pangborn Corporation, Hagerstown, Md., has extended its sales organization by the addition of Alfred L. Holmes and C. M. Goldman, who will act in the capacity of district sales agents. Mr. Holmes' headquarters will be at Cleveland and Mr. Goldman's at Philadelphia. Mr. Holmes was formerly with the Pangborn Corporation, in the same capacity for about six years, and Mr. Goldman has been representing the Obermayer Co. in the Philadelphia territory for some years.

J. H. Jowett, general sales manager of the Ingersoll-Rand Co., New York, has been elected by the board of directors vice-president of the company, and L. D. Albin, formerly assistant general sales manager, has been appointed general sales manager. Mr. Jowett and Mr. Albin will continue to make the offices at 11 Broadway their headquarters.

B. F. Brompton has been appointed comptroller of the Canadian Car & Foundry Co., Montreal. He was associated with Price, Waterhouse & Co., in New York, for over 10 years, and subsequently held the position of general auditor to the Dominion Steel Corporation, Sydney, N. S., for several years.

James E. Wilson, traffic manager of the Youngstown Chamber of Commerce, has resigned to become traffic manager of the Larkin Co., Buffalo. He will be succeeded by Harry Rhodehouse of Pittsburgh, at present traveling freight agent for the New York Central Railroad.

The Connellsville coke region has been given further representation on the Coke Committee of the Committee on Coal Production of the Council of National Defense. Roy A. Rainey has been appointed chairman, Vice-President E. L. Pierce of the Semet-Solvay Co., Syracuse, N. Y., resigned, and Scott Stewart, general manager of the W. J. Rainey interests, has been appointed a member and secretary of the committee. Mr. Rainey has also been made a member of the Committee on Coal Production.

C. F. Williams, who has been the Pittsburgh representative of the *Iron Trade Review* for five years, has resigned, to become identified with the Allen S. Davison Co., Oliver Building, Pittsburgh, which owns and operates Bessie furnace at New Straightsville, Ohio, making ferrosilicon, and also Sharpsville furnace at Sharpsville, Pa., operating on Bessemer iron. The company controls the Basic Products Co., manufacturer of dead burned dolomite syndolag. Mr. Williams will have the best wishes of his many friends in his new business. He will be succeeded by L. W. Moffett, Washington, D. C., correspondent for four years of the *Iron Trade Review*.

Louis G. Henes, Pacific Coast representative for Manning, Maxwell & Moore for the past eight years, has resigned to act as direct factory representative of Steinle Turret Machine Co.; Foster Machine Co.; Newton Machine Tool Works; New Britain Machine Co.; Houston, Stanwood & Gamble Co. His office is at Room 1037, Monadnock Building, San Francisco.

T. J. Ray, assistant manager of the Cleveland plant of the Peck, Stow & Wilcox Co., Southington, Conn., has been elected a director of the company succeeding W. R. Walkley, who has resigned because of poor health.

A. B. Marble, district sales manager of the Boston office of the Jones & Laughlin Steel Co., Pittsburgh, has been transferred temporarily to the general offices of the company in the Jones & Laughlin Building, Pittsburgh. Mr. Marble is filling the duties of J. L. Haines as assistant to Vice-President Willis L. King, Mr. Haines having been absent in Massachusetts for several months, recuperating his health, which is steadily improving.

F. K. Bennett, rolling mill superintendent of the Tata Iron & Steel Co., Sakchi, India, is in this country on a leave of absence, after three years' service at the Tata works.

M. A. Neeland, who went to Russia early this year to make investigations in iron and steel lines for the American International Corporation, returned to New York last week.

J. V. McCartney, formerly of the office of Perin & Marshall, New York, is en route to India with a party of open-hearth furnace men who have engaged with the Tata Iron & Steel Co., Sakchi, Bengal, India. Mr. McCartney and L. V. Workman, also of the office of Perin & Marshall, will be engaged on mechanical work at Sakchi.

Stanley W. Hull, 3729 Prospect Avenue, Cleveland, has organized a new mechanical drafting service company for inventors and manufacturers known as S. W. Hull & Co. For the past ten years he has had experience in the engineering departments of plants of the General Electric Co., Westinghouse Church Kerr & Co. and Brown Hoisting Machinery Co., particularly in connection with limit systems for the production of interchangeable parts. He will specialize also in the design of mechanical and electrical devices.

W. T. Collins, who has been with the Scullin Steel Co., St. Louis, for some years, has been appointed vice-consul at Tien-Tsin, China. He is a native of Kentucky, having been born at Covington, but has lived in St. Louis since 1889. He leaves for his new post Aug. 6.

H. L. Shepler, who recently resigned his position as vice-president, in charge of production, of the Willys-Overland Co., Toledo, Ohio, will become associated with the Aircraft Production Board in Washington. It is understood that Mr. Shepler's new position will give him full supervision of the construction of airplanes for the United States Government.

SOME PERPLEXING QUESTIONS

Important Points Connected with Claims for Exemption

WASHINGTON, July 31.—No little anxiety has been aroused among manufacturers of munitions and others having Government contracts lest the rigid enforcement of President Wilson's executive order, issued July 28, warning all Government officials and private employers to exercise the "greatest care" in issuing exemption affidavits to employees, may result in denying exemption to a large number of mechanics and others in private establishments, whose retention in their present jobs has heretofore been confidently counted upon. Many inquiries are being received here as to the exact scope of the President's order and the construction to be put upon certain passages therein.

While the President's order is mandatory upon none but Government employees, it lays down a general rule for private establishments as well, emphasizing the high national importance of carrying out "the spirit of the selective act and of securing its fullest effectiveness by holding to military service all drafted men who are not absolutely indispensable," and it has been followed up by an announcement by Provost Marshal General Crowder that the employees of no special class of industrial concerns will be allowed exemptions because of the character of their employment. In his proclamation the President urges that exemptions should be reduced to "the minimum number consistent with the maintenance of vital national interests during the emergency of war," and that while the order is addressed to Federal department officials "it is earnestly hoped that all citizens who may be called upon as employers, under section 44 of the regulations, to make affidavits for securing the discharge of persons deemed to be indi pensable to national industrial interests during the emergency, will exercise the same conscientiousness and scrupulous caution, to the end that there will appear to be no favored or exempted class among the citizens called by law to the national defense."

Soon after the issuance of the President's proclamation the Coal Production Committee of the Council of National Defense inquired of General Crowder as to whether, in view of the importance of their employment, coal miners would be relieved from military service. The reply of the Provost Marshal General has been incorporated in a bulletin given out by the Committee on Public Information in part as follows:

> The Coal Production Committee of the Council of National Defense was definitely informed yesterday by Provost Marshal General Crowder that miners as a class will not be exempted from the selective draft. No class exemptions will be made, as is definitely set forth under Section 44 of the Exemption Regulations, which states that any claims for discharge on the part of persons engaged in industries, including agriculture, must be filed with the district board on a form provided by the Provost Marshal General and supplied by district and local boards for that purpose.
>
> General Crowder's office has been deluged with mail, hundreds of letters coming from the heads of large industrial concerns and pleading for special exemptions in the case of men doing specialized work. Appeals of this kind can accomplish nothing, as the Provost Marshal General cannot show any favoritism. The question of whether or not a man is more useful to his country in a peaceful pursuit than in military service is a matter to be taken up with the district board and for that board to determine in the light of the circumstances surrounding each individual case.

The apparent intention of the President and the officials of the Provost Marshal General's office to draw the line as tightly as possible has raised the question as to the proper definition of the term "absolutely indispensable" as applied to munitions workers and other skilled laborers. Persons making inquiries here on this score are referred to the so-called presidential regulations governing exemptions among employees of Government manufacturing establishments. The most pertinent of these regulations is as follows:

> (d) Artificers and workmen employed in the armories, arsenals and navy yards of the United States. Any artificer or workman employed in any armory, arsenal, or navy yard of the United States, upon presentation to such local board, at any time within 10 days after the filing of a claim of discharge by or in respect of such person, of an affidavit signed by the commandant or officer having command of the armory, arsenal, or navy yard of the United States in which such person is employed, stating that such person is, in his opinion, necessary to the efficient and adequate operation of such armory, arsenal, or navy yard of the United States and cannot be replaced by another person without substantial material loss of efficiency in the effective and adequate operation of such armory, arsenal or navy yard of the United States.

It has heretofore been assumed that all employees of private munitions plants would be exempted on the ground that their service is absolutely essential to the successful prosecution of the war. It is pointed out, however, by managers of private establishments who have looked into the matter that the provision (d) above quoted would permit the drafting of any thoroughly skilled mechanic working in a munitions plant, provided another mechanic of reasonable skill could be supplied in his place so that the operations of the plant might proceed "without substantial material loss of efficiency." This would mean, it is contended, that large numbers of men might be drafted from munitions plants so long as their places could be filled by men fairly skilled in the same trade. The fact that new men could not, under any circumstances, maintain the plant at exactly the same standard of efficiency cannot be taken into account if the regulations are to be literally construed, for it goes without saying that some decrease in efficiency, however slight, must follow the replacing of a skilled mechanic by another who has not recently worked at exactly the same job and under the same conditions.

Seaman-Sleeth Co. Sale Completed

At Pittsburgh, on Monday, July 30, final details were closed and the purchase price of $2,000,000 was paid over, by which the plant and assets of the Seaman-Sleeth Co., owner of the Phoenix Roll Works in that city, have been transferred to the Pittsburgh Rolls Corporation. A detailed account of the proposed transfer of this property to the new owners was printed on page 218 of THE IRON AGE of July 26. The Pittsburgh Rolls Corporation has a capital stock of $2,000,000, of which $1,500,000 is 7 per cent cumulative preferred stock and $1,500,000 common stock. There are also $1,000,000—20 year 6 per cent first mortgage bonds. For over 60 years, this plant has been engaged in the manufacture of rolls, the plant being equipped with four 30-ton, one 18-ton and one 10-ton air furnaces, one 60-in. and two 48-in. cupolas. Recently adjoining property was acquired for the erection of a 25-ton open hearth furnace, which is now in course of construction. The principal products are sand rolls and Phoenix steel rolls, which the Seaman-Sleeth Co. has for many years been furnishing to many of the steel companies in the United States, Mexico, Canada and Japan. It is understood the new owners have contracts to re-equip a number of English steel plants. The new open hearth furnace will double the plant's capacity. Other improvements just made or under course of construction include an industrial railway with electric locomotives, the installation of an electric plant to drive the machinery by electricity instead of steam, and an emergency gas engine.

At an organization meeting held after the deal was closed, Jos. S. Seaman, who has been the active head of the Seaman-Sleeth Co. for more than 50 years, was elected chairman of the board of directors; David L. Eynon, formerly general manager, was elected president; Henry Meckley, secretary, and Harry R. Warfield, vice-persident and treasurer. The management of the former Seaman-Sleeth Co. will remain identically the same with the Pittsburgh Rolls Corporation, and the same service and high-class products furnished to the trade for so many years will continue. The only change made is the entrance of Harry R. Warfield as an active official of the company.

Machinery Markets and News of the Works

CONTROL BY GOVERNMENT

Several Plants Under U. S. Supervision

Big War Orders May Require Virtual Commandeering of Machinery and Machine-Tool Works—Business Very Active

Just how far the Government will go in taking over the output of machinery and machine-tool plants is problematical, but the fact that several large plants are at present virtually under federal control leads many to believe that Government necessities may make further action along this line necessary.

The air is filled with reports of big projects having to do with war preparations, in all of which the machinery trade must be reckoned upon to furnish large quantities of equipment. Among these is a proposed plant which the Government has asked the Bullard Machine Tool Co., Bridgeport, Conn., to build at an estimated cost of from $5,000,000 to $10,000,000 for making heavy artillery. Congress is being asked for upwards of $2,000,000,000 for the manufacture of big guns, and the plan of Secretary Daniels for a $7,500,000 plant at Washington will tax the builders of machine tools. New war contracts include one taken by the Ingersoll-Rand Co. for shells and guns.

Our Government is asking for bids and will close soon for about $2,000,000 worth of machine tools for the railways of France, and the Pennsylvania Railroad Co., acting in behalf of the United States Government, is asking for bids on seven vertical boring and turning mills, two vertical turret lathes, one horizontal boring and drilling machine and a car wheel boring mill, which are required for the use of a regiment of railway men enlisted as U. S. Army Engineers, who are going to France to assist in the rehabilitation of the railways of that country and to build a new railroad for the American army.

The shipbuilding program is about in the same position as a week ago, but it is expected that contracts for ships will be awarded soon by the Emergency Fleet Corporation, and then a great deal of business will be offered to machinery and machine-tool concerns. The Federal Shipbuilding Co., which is a subsidiary of the United States Steel Corporation, is in the market for a large quantity of equipment for its shipbuilding plant on the Newark meadows. The Kelly-Atkinson Construction Co. of Chicago has taken a Government contract for 20 steel cargo steamers and will construct a shipbuilding plant somewhere on the Atlantic seaboard. The Downey Shipbuilding Corporation is making inquiries for equipment for its yard on Staten Island. It is understood that this concern has plans for several shop buildings and will require considerable new equipment.

Export business from New York continues active. The Tata Iron & Steel Co., Ltd., Sakchi, India, has made purchases during the past week running into very high figures. Large orders for Russia and Italy have recently been placed.

In the New England territory there have been sizable orders for tools, particularly grinding machines, from concerns which are engaging in the manufacture of airplane engines and motor trucks, among these being the Packard Motor Car Co., the Nash Motors Co. and the Leland interests. The Delaware, Lackawanna & Western Railroad has sent out a list of tools required. The General Electric Co. has been doing considerable buying.

Chicago reports activity on war work. The new Wisconsin Gun Co., Milwaukee, which will make three-inch field pieces, has placed large orders for tools. The Nash Motors Co., Kenosha, which has a Government contract for motor truck chassis, has been buying tools and the Harley-Davidson Motorcycle Co., Milwaukee, which has a Government motorcycle contract, is expected to come into the market. The British Government will give orders in the Chicago territory for tractors of the caterpillar type. One order, it is said, will approximate $1,250,000.

In Cleveland there has been a heavy but widely scattered demand for machinery and tools, mostly for Government work. The Platt Iron Works, Dayton, Ohio, wants 20 lathes of from 30 to 36 in. Boring mills and planers are in great demand for Government work. The Baltimore & Ohio Railroad has bought two 26-in. turret lathes for the Newark, Ohio, car shops. The American Brake Shoe & Foundry Co., Erie, Pa., is placing orders on its list recently sent out.

The ordering of munitions for the Government is under way in Detroit and vicinity and there is considerable activity on airplanes. One body factory is ordering material to build 150 airplanes, exclusive of motors, a day. Large motor truck orders placed in Detroit and nearby have brought out a demand for tools.

New York

NEW YORK, July 31.

The Government is taking a stronger hand in the machine-tool situation. All of the plants of the Niles-Bement-Pond Co. are virtually under Government control, and it is said that other large plants may be commandeered soon in order to provide the necessary tools for urgent war work.

Big Government work is absorbing the attention of the trade. Such projects as the manufacture of heavy artillery guns, for which an appropriation exceeding $2,000,000,000 is now being asked, and the similar work which is being provided for at the navy yards and arsenals, including the $7,500,000 plant at Washington, will tax the facilities of all of the largest machine-tool plants. Last week the Government placed orders for $1,500,000 worth of big tools for navy yards and arsenals. The Bullard Machine Tool Co., Bridgeport, Conn., has been asked by the War Department to build a plant at Bridgeport, costing from $5,000,000 to $10,000,000, for making big guns, and if this plan goes through, it is understood that the Bullard company will make many of the tools for equipping the plant.

The Ingersoll-Rand Co. has taken a Government contract for shells and guns, and is said to be anxious to locate a concern able to make 8-ft. guns with 4-in. bore to take a sub-contract. The American Car & Foundry Co., which has recently been adding to its equipment, will make 740,000 shells in its Berwick (Pa.) plant and 10,000 10-in. projectiles in its Detroit plant. The Consolidated Car Heating Co. has completed equipment of a new plant at Albany and is starting work on a large shell contract. The plant of the Worthington Pump & Machinery Corporation at Hazleton, Pa., is

said to be nearly ready for similar work. The Maxim Munitions Corporation is working on a contract for 260,000,000 cartridges at its plants at Watertown, N. Y., and Derby, Conn.

As a part of the program for the rehabilitation of France's railways under the supervision of a regiment of railway men organized as U. S. Army Engineers, this Government is receiving bids and will soon buy about $2,000,000 worth of machine tools and machinery needed for railroad repair shops in France. The Pennsylvania Railroad Co., acting in behalf of the U. S. Government, has sent out a list asking for bids by Aug. 2 on tools urgently needed, and which, it is understood, will be shipped on the transports which carry the railroad men to France. This list is as follows:

1 vertical boring and turning mill, 100 in. in diameter.
1 vertical boring and turning mill, 84 in. in diameter.
1 vertical boring and turning mill, 52 in. in diameter.
4 vertical boring and turning mills, 42 in. in diameter.
2 vertical turret lathes, 34 in. in diameter.
1 horizontal boring and drilling machine, 24 x 6 ft., No. 1 or 50 in.
1 car wheel boring mill.

These tools are subject to the commandeer process, if necessary, and must be scheduled for prompt delivery, as a patriotic duty. Prices are asked f.o.b. New York, Philadelphia and Newport News.

Intimations from Washington are that the shipbuilding program will not be materially changed, but that it will be enlarged wherever possible, as both wooden and steel ships will be constructed in as large numbers as the facilities of the country will permit. Two concerns, the Lake Torpedo Boat Co., Bridgeport, Conn., and the American U-Boats Co., 21 Park Row, New York, are said to be ready to undertake the building of submarine cargo boats, if the Emergency Fleet Corporation gives the word. Concrete ships have also been talked of, but there is nothing official to indicate that they will actually be built. The United States Steel Corporation is asking for bids on cranes, hoists and machinery needed for its Federal Shipbuilding Co. plant near Newark. Twenty-eight hoists will be bought for the plate and angle shop and considerable other equipment will be needed for this and other shops. The Sun Shipbuilding Co., Chester, Pa., the Chester Shipbuilding Co., Chester and Bristol, Pa., and the Pennsylvania Shipbuilding Co. (including the New Jersey Shipbuilding Co. and Pusey & Jones) are all buying equipment of various kinds. All of these companies have recently placed orders for electric hoists. One concern has about 100 hoists on order for shipbuilding plants. The Newburgh Shipyards, Inc., which is equipping a new plant for steel and wooden ships at Newburgh, N. Y., has bought second-hand cranes in order to get quick deliveries, and is in the market for punching and shearing machinery and other shop equipment. The Downey Shipbuilding Corporation, 120 Broadway, is making inquiries for miscellaneous tools.

The Kelly-Atkinson Construction Co., Chicago, will construct a shipyard on the Atlantic seaboard, having taken a contract for 20 steel cargo steamers for the Emergency Fleet Corporation.

There are expectations that contracts for ships will be placed in Washington this week. Some of the concerns which are said to be looking for contracts are as follows: American International Corporation, Submarine Boat Corporation and Lackawanna Bridge Co., Whittlesey & Whittlesey, Sun Shipbuilding Co., Chester Shipbuilding Co., the Pennsylvania Shipbuilding Co., the New Jersey Shipbuilding Co., the Groton Iron Works, the Newburgh Shipyards, Inc., the George A. Fuller Co., H. C. Raynes & Co., James Stewart & Co. Inc., Standard Shipbuilding Corporation, the Staten Island Shipbuilding Co., the Fort Mifflin Shipbuilding Co., the Delta Shipbuilding Co., and the Merchants' Shipbuilding Corporation. This is only a partial list of those which have submitted propositions to the Emergency Fleet Corporation. Some are possibly doomed to disappointment because of the difficulties they will have in convincing the Government of their ability to equip plants.

The Newport News Shipbuilding & Dry Dock Co. still has some crane orders to be placed, in addition to several recently awarded to the Shaw Electric Crane Co. and Heyl & Patterson, Inc., the latter taking an order for eight 15-ton and two 75-ton overhead electric cranes. Several of the large crane-building plants are sold up until next March, April or May and are not disposed to take on any more business unless it is virtually forced upon them because of Government necessities. Some concerns have put up their prices so high that general business is being discouraged. Shipyards are active buyers, but new inquiries are fewer. The New Jersey Foundry & Machine Co. has taken an order for 15 2-ton cranes wanted by the contractors who are erecting mine-storage buildings for the Government. The T. H. Symington Co., Rochester, N. Y., has bought 11 7½-ton cranes from the Chesapeake Iron Works, Baltimore. The Bullard Machine Tool Co. has bought a 5-ton crane. The Chile Exploration Co. and affiliated companies have not concluded their extensive purchases of cranes. There is an unusually heavy demand for steam hammers and builders are sold up for many months ahead.

Prices of machinery and machine tools continue to advance. Makers of punching and shearing machinery, who recently withdrew all prices, will advance 10 to 15 per cent. No single line of machinery or machine tools can, however, be singled out as being higher in prices, as the advances are general, and further rises are looked for Aug. 1. The labor situation is disturbing to some builders. Manufacturers who have Government contracts on a "cost plus" basis are offering such high prices for labor that it is difficult for concerns doing work on a contract-price basis to compete with them in the labor market.

Although the necessity for export licenses has greatly disturbed general export business, the sales of machinery and machine tools for abroad continue on a large scale. The Tata Iron & Steel Co., Ltd., Sakchi, India, which is erecting a $20,000,000 plant, has made purchases of equipment in the past week running into very large figures. On the other hand machinery concerns have declined to quote on some business for export because of the certainty that it will be needed at home. A shipbuilding concern in England wanted a complete equipment for shipment one year from now, but several builders to whom the inquiry was referred said they could not tell what a year might bring forth, and preferred to sell their output for our own Government work. Large orders for Russia and Italy have recently been placed.

The Morse Dry Dock & Repair Co., 17 Battery Place, New York, will build a two-story, reinforced-concrete and brick machine shop, about 100 x 200 ft., at First Avenue and Fifty-sixth Street, Brooklyn. Contract for the erection has been awarded.

The Loening Aeronautical Engineering Corporation, New York, has been incorporated with a capital of $25,000 to manufacture aircraft. G. C. and R. R. Loening and T. C. Curtis, 44 Wall Street, are the incorporators.

J. R. Wood & Sons, 1325 Atlantic Avenue, Brooklyn, N. Y., manufacturing jewelers, will build a new five-story plant, about 80 x 134 ft., on Atlantic Avenue, to cost $75,000.

The American Machine & Foundry Co., Fifty-sixth Street and Second Avenue, Brooklyn, N. Y., will make alterations and improvements in its plant to cost about $20,000.

The Shipbuilders Iron Works, Inc., Brooklyn, N. Y., has been incorporated with a capital of $10,000 to manufacture iron and steel fittings for ships and boats. C. J. N. Poyer, A. A. Sawman and W. A. Hall, 648 East Tenth Street, are the incorporators.

The Jacob Brothers Co., 539 West Thirty-ninth Street, New York, will build a three-story brick extension, 23 x 50 ft., to its piano factory at Walton Avenue and 138th Street.

Joseph A. Atwell, Inc., New York, has been organized with a capital of $50,000 to manufacture engines and kindred products. C. A. Slocum, W. W. Westall and M. F. Tilman, 62 Wall Street, are the incorporators.

The Progressive Smelting & Metal Corporation, 543 West Twenty-fifth Street, New York, will make extensions to its two-story brick foundry to cost about $5,000.

The Hydrograft Co., New York, has been incorporated with a capital of $30,000 to manufacture hydroplanes and other aircraft. L. W. E. Coleman, C. L. Andrews and H. P. Keane, 378 Central Park West, are the incorporators.

Abraham, J. R., and Wallace MacDougall, and Edward L. Hearn, New York, have incorporated in Delaware the American File Restoration Co., with capital of $100,000 to operate a file works.

The Astoria Casket Co., 16 Chestnut Street, Long Island City, N. Y., has had plans prepared for alterations and improvements in its plant on Fourth Avenue to cost about $10,000.

Ward E. Pearson, Edward F. Oats and Edwin L. Russell, New York, have incorporated in Delaware the Silent Valve Motor Corporation, with capital of $3,500,000 to manufacture motors, engines and allied products.

The Nation Wire Wheel Co., Geneva, N. Y., has awarded a contract for the construction of a two-story plant, 110 x 110 ft., for the manufacture of wire wheels for automobiles. H. P. Sickles, Rochester, N. Y., is the contractor.

The Catchpole Boiler, Foundry & Machine Co., 23 Jackson Street, Geneva, N. Y., will build an extension to its plant.

The St. Lawrence Metal Products Corporation, Ogdensburg, N. Y., has been incorporated with a capital of $200,000 to manufacture metal specialties. E. J. Turley, P. H. Fitzgibbons and J. E. Fell, Ogdensburg, are the incorporators.

The Oswego Machine Works, West First and Schuyler streets, Oswego, N. Y., manufacturer of cutting machines, will build a one-story addition, about 60 x 100 ft. The Austin Co., Cleveland, has the contract.

The Morris Machine Works, 31 Genesee Street, Baldwinsville, N. Y., manufacturer of pumping machinery, is building an extension, 50 x 60 ft., to the erection shops.

The Huguenot Motor & Supply Co., New Rochelle, N. Y., has been incorporated with a nominal capital of $5,500 to manufacture motors, engines, etc. A. B. Gilkes, J. F. Phillips and P. Jenness, New Rochelle, are the incorporators.

The Sealright Co., Fulton, N. Y., has been incorporated with a capital of $30,000 to manufacture machinery and tools. E. W. Skinner, W. L. Wright and J. T. Bond, Fulton, are the incorporators.

The Onondaga Steel Co., East Water Street, Syracuse, N. Y., will build three new factory buildings in the Park Hill section, East Syracuse.

The Security Tire & Rubber Co. of Central New York, Syracuse, N. Y., has been incorporated with a capital of $100,000 to manufacture automobile tires and tubes. Frederick D. Burchill, Jordan, N. Y.; George J. Quay, Cleveland, and Joseph A. Gloger, Syracuse, are the incorporators.

The Atlas Steel Casting Co., 1963 Elmwood Avenue, Buffalo, will build a one-story extension to its pattern shop, to provide about 3300 sq. ft. additional floor space.

Edward Gaskins, Frank P. Ranahan and Jacob Cobersheimer, Buffalo, have incorporated in Delaware the Lake Shipbuilding & Construction Co. of Buffalo, with capital of $25,000, to operate a local shipbuilding plant.

The Board of Education, 1401 New York Telephone Building, Buffalo, will receive bids until 12 noon, Aug. 8, for vocational school equipment, including metal-working machinery, power equipment, manual training benches and woodworking equipment, in accordance with specifications on file. James Storere is secretary.

The Shephard Crane & Hoist Co., Montour Falls, N. Y., has awarded a contract for the construction of its proposed new brick and steel pattern shop, one-story, 90 x 200 ft., to the Lowman Construction Co., Elmira, N. Y., at a cost of $75,000.

The Vulcan Detinning Co., Sewaren, N. J., will build a one-story addition to its plant, about 30 x 40 ft.

The American Mine & Torpedo Co., East Orange, N. J., has been incorporated with a capital of $100,000 to manufacture mines and allied specialties. Gordan Grand, Harry H. Picking and L. Matthews, East Orange, are the incorporators.

The Samuel L. Moore & Sons Corporation, Front Street, Elizabeth, N. J., machinists and iron founders, is having preliminary plans prepared for the erection of an addition to its plant. Ring & Gray, 280 North Broad Street, Elizabeth, are architects.

The Public Light Service Co., Bayonne, N. J., has been incorporated with a capital of $25,000 to manufacture lighting fixtures. Edward Sweeney, Louis Lehr and Murray Bell, Bayonne, are the incorporators.

The Tisch Tool Works, 454 Spring Street, Elizabeth, N. J., will build a new one-story extension, 22 x 40 ft. Contract for erection has been awarded.

The Eagle Mfg. Co., Jersey City, N. J., has been organized to operate a plant at 18 Morris Street, for the manufacture of automobile horns. E. T. Monteleone, 73 Claremont Avenue, heads the company.

The Erie Railroad, Jersey City, N. J., has awarded contracts for the construction of a new machine shop, 30 x 150 ft., and office building at Cleveland, to cost about $40,000.

The Federal Shipbuilding Co., Hoboken, N. J., has been incorporated with a capital of $3,000,000 to build a shipyard on the Kearny meadows, near Newark. The company is a subsidiary of the United States Steel Corporation, and has acquired a tract of about 80 acres for the proposed plant, which will comprise an initial installation of six ways. The incorporators are Edward F. Briggs, 51 Newark Street, Hoboken, and William W. Corlett and Kenneth B. Halstead 51 Broadway, New York.

The Star Electric Motor Co., Newark, N. J., has been incorporated with a capital of $100,000 to manufacture motors. Carl M. and Hilmer P. Peterson and Emil Hollander are the incorporators.

The Eclipse Phonograph Co., Newark, has been incorporated with a capital of $1,000,000 to manufacture phonographs. J. T. Sibley, Newark; Charles A. Isileb, Paterson, and A. R. Winans, Brooklyn, N. Y., are the incorporators.

S. D. Layman, Newark, operating a plant at 620 Twenty-first Street, Irvington, for the manufacture of metal lasts for shoes, has filed articles of incorporation under the name of the S. D. Layman Co., with capital of $50,000 and office at 603 Second Street, Irvington. Stephen D. Layman, J. H. Borman and George C. Lever are the incorporators.

The Diehl Mfg. Co., Elizabeth, N. J., is planning extensions to its factory, but definite arrangements have not yet been made. It manufactures electrical apparatus and has a New York office in the Singer Building.

New England

BOSTON, July 30.

The current demand for machine tools maintains unabated the high record of sales, although it is a little more spotty. On certain sizes of machines the builders have been able to make a little gain on deliveries, but a flood of Government business is expected before long that will push deliveries for private industry further into the future than ever before. There has been a livelier demand for grinding machines of the precision type the past week, the companies that are to enter into aeroplane engine manfacture having placed several orders. Delivery on the smaller sizes of cylindrical grinding machines is now about November and on the larger sizes about January.

The Savage Arms Co. is reported in the market for 40-in. and 60-in. planers and for 36 to 42-in. lathes for its plant extensions at Sharon, Pa. The General Electric Co. has also been a large purchaser. New England will fill part of a list issued by the Delaware, Lackawanna & Western Railroad. The Newport Torpedo Station, Newport, R. I., is asking bids on a list of eight lathes.

The Bay State Insulated Wire & Cable Co., Boston, has been incorporated with authorized capital stock of $300,000 The directors are John H. H. McNamee, Hyde Park, president and treasurer; Daniel T. O'Connell and M. J. Cashman.

The Crowninshield-Swasey Shipbuilding Co., Boston, has been incorporated with authorized capital stock of $300,000. The directors are Bowdoin B. Crowninshield, president; Clarence T. Birkett, 540 West 122d Street, New York City, treasurer; and H. W. Krogman.

The Connecticut Electric Steel Co., Hartford, Conn., has taken a contract to make 1,200,000 lb. of steel castings for the New Britain Machine Co., New Britain, Conn., to be used in building anti-aircraft gun mounts. The Connecticut Electric Steel Co. will issue $25,000 of 8 per cent preferred stock which the New Britain Machine Co. will buy at par. The latter company will advance the money to double the capacity of the plant of the steel casting company, the advance to be paid out of future profits.

The Hendee Mfg. Co., Springfield, Mass., participates with the Harley-Davidson Co., Milwaukee, Wis., in a Government contract for 5000 motorcycles at $250 each. About 200 of the cycles will be equipped with side cars for mounting machine guns.

The Springfield Blower Co., Springfield, has been incorporated with authorized capital stock of $3,000. The directors are Herman C. Kline, Hartford, Conn., president and treasurer; F. G. Wooden and M. A. Kline.

The Smith & Wesson Associates, Springfield, have received a contract from the Government for 100,000 revolvers for army officers. The company is extending its plant to take care of the contract.

The Gorton Pew Fisheries Co., Gloucester, Mass., has awarded a contract for a machine shop, 50 x 100 ft., one-story.

The Standard Brass & Copper Tube Co., New London, Conn., has bought in 503 shares of outstanding stock and issued $45,000 of additional shares. The company is controlled by the Bridgeport Brass Co., Bridgeport.

The West & Dodge Co., Boston, has been incorporated with authorized capital stock of $75,000 to manufacture tools, hardware, metal patterns and models. The incorporators are Herbert F. Dodge, president; William F. Dodge, 167 Oliver Street, treasurer; R. M. Smith and A. J. Law.

The Rodney Hunt Machine Co., Orange, Mass., has been reorganized. Carl C. Harris has bought the interest of W. O. Harris, Boston, who, with Raymond Harris, has retired from the company. Carl C. Harris becomes treasurer, continuing also as superintendent.

The Wallace Barnes Co., Bristol, Conn., is to build a five-story addition, 60 x 107 ft., with an ell, 40 x 149 ft. The company manufactures springs.

The North & Judd Co., New Britain, Conn., has purchased additional land adjoining its plant to provide for future expansion.

The Stamford Iron & Brass Co., Stamford, Conn., has been incorporated with authorized capital stock of $10,000, to deal in steel and iron, by Paul V. Hoyler and Albert C. Smith, both of New York City, and George G. Hammill.

The Atlantic Coast Co., a new Maine corporation capitalized at $2,000,000, has bought the shipyard of the Townsend Marine Railway & Construction Co., Boothbay Harbor, Me. The company also leases a yard at Thomaston, Me., where four ships are under construction.

Philadelphia

PHILADELPHIA, July 30.

The American Ice Co., Sixth and Arch streets, Philadelphia, is planning for the erection of a two-story addition, 50 x 160 ft., to its wagon manufacturing works to cost about $10,000.

The Keystone Emery Mills, 4329 Paul Street, Philadelphia, manufacturer of emery and other abrasive wheels, is taking bids for the construction of a two-story, brick and steel addition to its plant, about 36 x 100 ft.

The American Metal Works, 314 Armat Street, Philadelphia, has commenced the erection of a two-story stamping, plating and finishing shop, 60 x 320 ft., on Stenton Avenue, to cost in the neighborhood of $100,000.

The Beacon Light Co., Chester, Pa., is building a machine shop, about 40 x 70 ft., at its new electric power station now being erected at a cost of over $2,000,000. It is a subsidiary of the Philadelphia Electric Co., Chestnut Street, Philadelphia.

The American Steel & Wire Co., Hamilton Avenue, Trenton, N. J., has taken bids for the erection of a one-story addition to its machine shop, about 48 x 68 ft., and an extension to its wire rope works, about 175 x 310 ft.

The Department of Public Safety, Camden, N. J., will soon call for bids for a two-story municipal machine shop, to be erected on Fifth Street at a cost of about $10,000. James H. Forsythe is chairman of the building committee.

The United States Collapsible Metallic Casket Co., Camden, N. J., has been incorporated with a capital of $125,000 to manufacture metallic caskets. Charles H. Gandar, I. P. Perrott and George W. Litzenberg, Camden, and Albert Bradbury, Woodbury, N. J., are the incorporators.

W. H. Nicholson & Co., 12 Oregon Street, Wilkes-Barre, Pa., manufacturers of machine tools, steam fittings, etc., have taken bids for the construction of a new one-story machine shop, 53 x 175 ft., at South Wilkes-Barre.

The Bethlehem Steel Co., Bethlehem, Pa., has awarded a contract for the erection of a one-story addition, 42 x 120 ft., to be used as a centrifugal compressor shop.

The Edgemont Iron Works, Edgemont, Pa., has awarded a contract for the construction of a two-story, reinforced-concrete and brick addition, 32 x 80 ft., to cost $20,000. E. E. Hollenback, Inc., 1804 Brandywine Street, Philadelphia, is the contractor.

The Keystone Wire Goods Co., Greensburg, Pa., has been incorporated in Delaware with a capital of $40,000 to manufacture wire specialties. Vincent D. and Robert Edwards, and Charles J. McKnight, Greensburg, are the incorporators.

The Light Cycle Co., Pottstown, Pa., manufacturer of castings, automobile parts, etc., is having plans prepared for extensions and improvements in its plant. A. A. Heilman, Reading, is architect.

The Temple Malleable Iron & Steel Co., Temple, Pa., is taking bids for the construction of a series of 10 new foundry buildings, each one-story, brick and concrete. F. D. Case, Peoples Gas Building, Chicago, is the architect.

The Maccar Truck Co., Scranton, Pa., manufacturer of automobile trucks and parts, has completed plans for a one-story brick and concrete addition to its plant, 40 x 65 ft.

Fire, July 23, destroyed a portion of the plant of the Williamsport Iron & Nail Co., Williamsport, Pa., manufacturer of nails, spikes, etc., with loss estimated at $100,000.

The Fisk Rubber Co., Chicopee Falls, Mass., has acquired the plant and business of the Gibney Tire & Rubber Co., Eighth Avenue and Harry Street, Conshohocken, Pa. The new owner will continue the operation of the works and is reported to be planning to increase the capacity for the manufacture of tires.

The Federal Machine Shop, Harrisburg, Pa., has commenced the operation of a new machine and general repair shop at Court and Cranberry streets.

The Autocar Co., Ardmore, Pa., has plans prepared for enlarging its plant. A five-story machine shop will be built adjoining the present factory and a sales and service building will soon be erected in Brooklyn, N. Y. J. H. Goulding, Ardmore, is the purchasing agent.

F. H. Keiser & Co., Pottstown, Pa., have the contract for the erection of the new plant of the Pottstown Steel Plate Products Co. of that city.

The Combination Lighting Unit Co., Pittsburgh, Pa., has been incorporated in Delaware with a capital of $350,000 to manufacture lighting fixtures. W. S. Wells, S. V. Reed and David Evans, Pittsburgh, are the incorporators.

Baltimore

BALTIMORE, MD., July 30.

The Baltimore Dry Dock & Shipbuilding Co., Baltimore, has plans for additional buildings, including a one-story brick and concrete power house, 70 x 90 ft.

The Poole Engineering & Machine Co., Woodberry, Md., is understood to be planning the construction of airplanes for the Government.

The Baltimore Tube Co., Wicomico and Ostend streets, Baltimore, have acquired two lots near its present plant, which it is understood will be used for additions.

The Symington-Anderson Co., Baltimore, has been formed with $1,000,000 capital, to build guns for the Government. It is planned to build a plant at Rochester, N. Y., where the T. H. Symington Co. and the Symington Machine Corporation are located. T. H. Symington, who is connected with these two companies, will be president of the Symington-Anderson Co., and has an office at 1005 Maryland Trust Building, Baltimore. M. H. Anderson, formerly connected with the Bethlehem Steel Co., will be vice-president.

The Tucker Mills, Baltimore, Md., are remodeling and improving property, recently acquired, for the establishment of a plant for the manufacture of automobile tires.

The Howard E. Crook Co., 28 Light Street, Baltimore, manufacturer of boilers, etc., has recently increased its capital from $120,000 to $250,000.

The Bureau of Yards and Docks, Washington, D. C., has received low bids from Warren, Moore & Co., Colonial Trust Building, Philadelphia, for the construction of four new buildings at Charlestown, W. Va., as follows: One-story machine shop, 111 x 402 ft.; one-story foundry and forge shop, 135 x 562 ft.; one-story heat treatment plant, 92 x 153 ft.; and lavatory and locker rooms, 75 x 110 ft.

The District Commissioners, Washington, D. C., will build a foundry addition to the McKinley Manual Training School, Rhode Island Avenue and Seventh Street.

The De Loyd Thompson School of Flying, Washington, D. C., has been incorporated in Delaware wtih capital of $100,000, to manufacture airplanes in connection with a school of instruction. George R. Collins, N. B. McCanless, Charles N. Riker and Fred S. Swindell, Washington, are the incorporators.

Chicago

CHICAGO, July 30.

Some attractive business growing out of war needs has been placed in this city, and the majority of dealers report a satisfactory volume of orders, with small buying a trifle lighter.

Large orders have been placed by the Wisconsin Gun Co., Milwaukee, Wis., a new organization, which is to manufacture 3-in. field pieces for the Government. The guns are to be made of heat-treated alloy steel forgings, delivered to the company rough bored. Milwaukee capital is behind the enterprise. Deliveries will be given precedence over orders from the industrial field.

The Nash Motor Co., Kenosha, Wis., which has a Government contract for 3000 truck chassis, has been in the market for a considerable number of tools, and the Harley-Davidson Motor Co., Milwaukee, which received a large order for motor cycles, is expected to become a factor in buying, although not to a great extent, inasmuch as it has a complete equipment. A large machine-tool manufacturer in Wisconsin is reported to have Government orders, to which fact is attributed the recent purchase of several machine tools by the company in question.

A Michigan machine-tool builder is busy making machines for the Government which greatly facilitates breech work on large guns, inasmuch as it obviates the necessity of moving the heavy pieces and permits work to be done on a number of guns in a comparatively small space.

Salesmen are finding it more difficult to get over their territories because of the number of passenger trains which the railroads have discontinued. It is especially difficult to cover the smaller towns, and more day travel is found necessary. Even interurban electric lines have cut down their service in some instances.

Orders for tractors of the caterpillar type, valued at several millions of dollars, have been practically placed with Illinois manufacturers by the British Government, but builders do not want to give any specific information concerning the orders until transactions are completely closed. The value of one order will approximate $1,250,000. Additions to shop equipment will be a probable result. The orders were divided among four companies. The Moline Plow Co. has been buying for its tractor department.

It is quite generally conceded that buying for the Rock Island Arsenal will be done in the East.

The railroads are practically out of the market. The Santa Fe wants a double-head bolt cutter of ⅝ to 2¼-in. capacity. Punches and shears are exceedingly difficult to procure because of the absorption of those machines by shipyards. One maker cannot promise deliveries earlier than the first quarter of 1918. A leading maker of grinding machines has advanced his prices 10 per cent.

The Superior Steel Castings Co., Benton Harbor, Mich., is working night and day on a Government order for castings to be used in the manufacture of guns of 4-in. caliber.

A factory, 100 x 160 ft., to cost $150,000, is being built at Fullerton and Racine Avenues, Chicago, for the Standard Cap & Seal Co. O. N. Tevander is president. Davidson & Weiss are the architects.

McCord & Co., Chicago, manufacturers of railroad equipment, have purchased from the Illinois Central Railroad a tract of 3½ acres, in West Pullman, part of which is improved with large buildings, one of which the purchasers have occupied for the manufacture of journal boxes.

Plans will soon be completed for a three-story reinforced concrete factory, 51 x 112 ft., in Twenty-seventh Street, near La Salle Street, Chicago, for Adolph C. Ehman, president, Vail Rubber Co. and the Ehman Tire & Rubber Co., to cost about $30,000.

Bids are being taken by S. N. Crowen, 30 North La Salle Street, Chicago, for a one and two-story mill construction factory at Argo, Ill., for the Elgin Motor Car Corporation.

The Chicago Fuse Mfg. Co., Chicago and New York, is having plans made by a New York architect for a factory at Morgan & Congress Streets, Chicago. The site is 119 x 125 ft.

The Belden Mfg. Co., 2300 South Western Avenue, Chicago, manufacturer of insulated wires, has awarded the general contract for a one-story factory, 92 x 127 ft., in West Van Buren Street. This is the initial building of a plant to cost $250,000.

The Alexander Railroad Crossing Co., Clinton, Ill., has purchased a site at Chicago Heights, Ill., where it will manufacture railroad crossings and other railroad specialties.

Bids have been taken for the general work on an industrial school, Twenty-second Street and Harlem Avenue, Riverside, Ill., for the Chicago and Cook County School for boys. The cost was estimated at $250,000, but all bids exceeded the appropriation, and it is probable that a part of the work will be postponed.

Frank D. Chase, architect and industrial engineer, 122 South Michigan Avenue, Chicago, has been retained to prepare plans for a malleable iron foundry at Temple, Pa., to cost between $300,000 and $400,000. The plant probably will comprise five buildings of brick, steel and concrete construction.

The Peoria Malleable Castings Co., Peoria, Ill., has purchased 16½ acres for its new malleable iron plant. Plans have been prepared for two main buildings, 120 x 200 ft. and 100 x 220 ft., respectively, as well as for several smaller buildings. H. Hemmingway, Beloit, Wis., is vice-president and general manager.

The Moore Motor Vehicle Co., Danville, Ill., has been incorporated with a capital stock of $100,000. It is established in a plant at Danville, and is assembling 100 machines, parts for which were made in Minneapolis. George L. Moore is president.

The Calumet Machine & Casting Co., Chicago, Ill., has been incorporated in Delaware with a capital of $250,000, to operate a foundry and manufacture machinery. Samuel C. Rowland and Harry Lewis, Chicago, are the incorporators.

Milwaukee

MILWAUKEE, WIS., July 30.

The demand upon machine tool builders is largely confined to metal-working shops which hold Government contracts. Orders come from every part of the country and consist mainly of single tools or small lots, covering the entire list of types and sizes. No large inquiries have appeared, but it is intimated that several of considerable volume are in prospect. No purchases have as yet been made directly on Government account, so far as can be learned, nor have local tool builders experienced any signs of Federal control of their works up to this time. The closest scrutiny is being given every order so that machines required for Government contract work may receive the proper attention. Requirements of buyers are checked up officially by the makers, who keep in close touch with the War Munitions Board. A considerable number of bookings made in recent days indicate that users are anticipating their requirements. During the last week or more buyers who placed orders some time ago have become more and more urgent and all shops in this district are subjected to strong pressure for deliveries.

Stanley F. Kadow, architect, 988 Kinnickinnic Avenue, Milwaukee, has been engaged to prepare plans for a foundry and machine shop, to be erected in or near Milwaukee by a new concern, the name of which is withheld for the present. The main building is to be ell-shaped, 80 x 163 and 30 x 163 ft., and an office building, 26 x 50 ft., will also be erected.

The B-V Milking Machine Co., Milwaukee, has been organized with a capital stock of $150,000 to establish a plant for the manufacture of automatic milking machines, barn and dairy equipment. The incorporators are H. F. Bodecker, Charles E. Somers and A. G. Langlois. An architect will be selected soon.

The Wisconsin Duplex Auto Co., Clintonville, Wis., organized recently, with capital stock of $500,000, to manufacture a quadruple drive chassis for passenger cars and trucks, is completing the first models in a Milwaukee machine shop under the direction of William A. Besserdich, president and general manager, who designed the transmission system. Contracts for the erection of the first unit of a new plant at Clintonville will be awarded within a few weeks. Mr. Besserdich was one of the original designers of the Four Wheel Drive truck, and with W. S. Zachow organized the Four Wheel Drive Auto Co., Clintonville, Wis., now capitalized at $1,000,000. He withdrew recently to engage on his own account in the manufacture of a new design.

The Simple Gas Engine Co., Ashland, Wis., manufacturer of light gas and oil engines of the stationary and portable type, has completed the removal of its works and offices to Menasha, Wis., and has resumed operations in its new quarters. The articles of incorporation have been amended to change the official headquarters from Ashland to Menasha.

The Fitzsimmons Steel Products Co., 530-580 Park Street, Milwaukee, has awarded contracts for the construction of a one-story foundry and warehouse addition, 75 x 150 ft., of steel and brick.

The Gilson Mfg. Co., Port Washington, Wis., founder and machinist, has taken a contract for manufacturing 5000 light type garden tractors for the Beeman Garden Tractor Co., Minneapolis, Minn., delivery to begin Sept. 1.

The Appleton Auto Body Co., Appleton, Wis., organized in February to manufacture open and closed automobile bodies, truck bodies, etc., has increased its capital stock from $10,000 to $25,000 in preparation for the erection of a two-story plant, consisting of metal, sheet metal and wood-working shops, costing about $20,000. Work will begin shortly after Aug. 1 and the plant is to be ready Oct. 1. C. Gustave Seeger is general manager.

Joseph Wulff, machinist and blacksmith, Mondovi, Wis., will enlarge his shop and install a new electric motor and a number of machine-tools.

The T. & M. Mfg. Co., Oshkosh, Wis., which is the reorganization of the Termaat & Monahan Co., Oshkosh, maker of marine and stationary engines, lathes, etc., reopened the works the past week under the direction of Myron C. Kline, formerly of the Jacobson Machine Co., Warren, Pa., who has been appointed works manager. A force of 65 men is working full time.

Joseph Weasler, Campbellsport, Wis., is organizing a company to manufacture a metal scaffold for use in the construction of silos, smokestacks, water towers, elevators and other high structures, and a hoist for general construction purposes.

The Goodrich Transit Co., Chicago and Milwaukee, probably will continue to make Manitowoc, Wis., the headquarters of its repair yards, winter storage and machine-shops, the local Chamber of Commerce practically having concluded negotiations for a new site in the inner harbor. The present yards are leased from the Manitowoc Shipbuilding Co., which is building new shops and docks to increase the capacity about 100 per cent to adequately handle Government contracts. The Goodrich company will expend between $50,000 and $100,000 in establishing a new plant.

The Silent Washer Co., Clintonville, Wis., has amended its articles to provide for an increase in its capital stock from $15,000 to $25,000, and changing its location from Appleton, Wis., to Clintonville, where a new factory will be erected at once.

The J. I. Case Threshing Machine Co., Racine, Wis., is building a $15,000 addition to its South works in Lakeside, at the southern limits of Racine.

The Wasson Trolley & Mfg. Co., Milwaukee, has been incorporated with a capital stock of $50,000 by Frank A. Wasson, Charles Pfeiffer and D. R. Moore. Mr. Wasson is general manager of the Wasson Engineering & Supply Co., 216 West Water Street.

The Lasure Friction Clutch Co., Watertown, Wis., formerly the Lasure Clutch Co., Madison, Wis., has completed its

reorganization incident to the removal of the plant and headquarters from Madison to Watertown, and elected the following officers: President, R. L. Richardson; vice-president, A. D. Platz; secretary-treasurer, B. M. Parsons; directors, Edward L. Schempf and A. M. Peltier. The company resumed operations in its new plant July 28, having equipped the former Dornfeld Iron Works shop on Fifth and Market streets, Watertown.

The Edgerton Barn Equipment Co., Edgerton, Wis., has completed its organization by the election of the following officers: President, H. C. Schmeling; vice-president, E. M. Ladd; secretary, H. H. Drew; treasurer, T. A. Ellingson. The company takes over the business of the Drew Barn Equipment Co., but will establish a new plant as soon as possible.

The Charles Skidd Mfg. Co., Kenosha, Wis., is completing the removal of its works and offices to Janesville, Wis., where it is occupying one of the larger buildings of the former Wisconsin Carriage Co., now the Janesville Products Co. Operations will be resumed in the new plant Aug. 1. The Skidd company manufactures dairy machinery, pasteurizers, coolers, etc.

The Independent Foundry Co., West Allis, Milwaukee, will select an architect to design its proposed new $20,000 gray iron shop about Aug. 1. It is hoped to start construction work about Aug. 15 or Sept. 1. August M. Fons is secretary.

The Kahlenberg Co., Two Rivers, Wis., manufacturer of gasoline and kerosene engines for marine and stationary duty, is now building crude oil engines designed by William R. Kahlenberg, chief engineer, embodying a new igniter tube.

The Federal Tractor Co., Inc., Minneapolis, Minn., has recently been organized and is temporarily occupying a factory building in St. Paul for the manufacture of "Tom Thumb" farm tractors. It is said the company plans to build two plants, one in the Southwest and one near St. Paul or Minneapolis, the exact site not having yet been selected. This tractor is of the caterpillar type. Albert A. Robbins is secretary and treasurer of the company.

Detroit

DETROIT, July 30.

The machine tool market continues to show improvement. A large number of fair-sized orders were placed last week, and numerous inquiries were received. Manufacturers in this section, especially brass, copper, steel and aluminum companies, are operating at capacity. Shipyards have orders for months ahead, and have increased their production to the utmost. Iron miners in the northern part of the State are causing trouble. On one large range, all miners have stopped work until wages are raised. State officials have taken a hand, and it is probable the trouble will be adjusted within a short time.

The ordering of munitions for the Government is under way. One large body factory is now ordering material which will enable it to turn out bodies for 150 airplanes a day, exclusive of engines. The Packard Motor Co. has received orders for 2000 trucks for war purposes. Three other truck companies in Detroit are expecting war orders for 1000 trucks each. The manufacture of airplane engines will begin on a large scale within a short time.

The Grand Trunk Railway has issued an order for an additional freight car repair shed at Port Huron, Mich., to be 150 x 360 ft. It will employ more than 800 men, and is expected to be completed about Oct. 1.

The Edward F. Lyon Co., Detroit, has been equipped to manufacture axle shafts for automobiles.

The Perlman Rim Co., formerly of New York, is installing machinery in its factory at Jackson, Mich., which will be the headquarters of the company. The Jackson factory will be enlarged.

The Alamo Mfg. Co., Hillside, Mich., has been reincorporated under the name of the Almo Engine Co., with capital stock of $300,000.

The Lloyd Mfg. Co., Menominee, Mich., manufacturer of furniture, will shortly begin additions to its plant.

The National Engineering Co., Saginaw, Mich., manufacturer of automobile accessories, has increased its capitalization from $30,000 to $200,000. T. Monte Carpenter is resident manager.

The Hagaman-Storrs Co., Bay City, Mich., manufacturer of tools, jigs and automobile parts, will shortly move into larger buildings.

The Pierce-Budd Motor Co., Bay City, Mich., has been reorganized and the business will be expanded. It manufactures boat engines, and expects to develop an aeroplane engine.

The Grand Rapids School Equipment Co., Grand Rapids, Mich., has secured a Government contract for 6000 auto truck bodies, to be finished within seven months. The contract amounts to more than $1,000,000, and means the employment of several hundred additional men.

The Electric Power & Equipment Co., Grand Rapids, Mich., will be incorporated shortly to manufacture motors and do a general electrical business. Joseph Brown is president.

The Universal Auto Top Co., Grand Rapids, Mich., has been incorporated with a capital stock of $25,000 to manufacture the Universal top. The incorporators are William E. Pugsley, Leon S. Carrel, Clyde Vandenburg and Robert Luce.

The Manistee Iron Works Co., Manistee, Mich., is erecting an addition to its plant, and will employ 200 additional men.

The American Fork & Hoe Co., Jackson, Mich., is erecting a three-story factory to cost $24,000, to be completed Oct. 1.

The Parker Mfg. Co., 410 Ker Building, Detroit, has been organized to manufacture machined products. The capital stock is $75,000, all paid in.

The St. Louis Foundry Co., St. Louis, Mich., has been taken over by J. I. McCormick, Orville Allen and C. L. Graham, Alma, Mich., who will reorganize it under the name of the Gratiot Foundry Co.

The Maxwell Motor Co., Detroit, will build a branch plant at Windsor, Ont., to cost $150,000.

Plans are being completed for a factory, 70 x 236 ft., for the Triangle Motor Truck Co., St. Johns, Mich. It is expected that the building will be completed about Sept. 1. F. Von Thurn, Fildew Building, Walker Street, St. Johns, is general manager.

It is reported that the Chicago Stove & Range Co. is to locate at Benton Harbor, Mich. A 10-acre site has been secured, and several brick buildings will be erected.

Cleveland

CLEVELAND, July 30.

The volume of machine tool business has been fairly heavy the past week in spite of an absence of round-lot orders. Business has come from widely scattered sources, although a fair share is being placed by companies that have taken sub-contracts for airplane parts. Makers of tools, jigs, and dies are also buying freely. There is a very active inquiry for heavy machinery for Government work. The Platt Iron Works, Dayton, Ohio, is inquiring for 20 30 to 36-in. lathes for rough turning 3-in. guns. A number of other inquiries, so far of a rather indefinite nature, came out the past week for pending Government work. A heavy demand is noted for boring mills and planers for the Government, but some lines, including power presses and turret lathes, have so far not been stimulated to any great extent by Government orders. Some railroad business has come out, among which were two 26-in. turret lathes, purchased by the Baltimore & Ohio Railroad for its Newark, Ohio, shops. The American Brake Shoe & Foundry Co., Erie, Pa., is understood to have purchased a large amount of machinery the past few days. This company came into the market recently for about 240 machines for shell work. A round lot of machinery equipment was also placed during the week by the Cleveland Pneumatic Tool Co., which is building a new plant.

The Ohio Blower Co., Cleveland, will erect a plant in Orville, Ohio, where it will manufacture its present line of steam specialties and add some new products. A one-story foundry, 100 x 100 ft., and a machine shop, 60 x 200 ft., will be erected. Some new equipment will be required.

The Grant Motor Car Co., Cleveland, will begin the erection of a one-story concrete addition, 60 x 260 ft., to be used as a machine shop, painting and enameling department. Plans have been prepared by the W. S. Ferguson Co., architect, Cleveland. The company has under consideration the erection of five additional buildings, which may be started later this year.

The Guide Motor Lamp Co., Cleveland, has acquired a 5½-acre site on Mandalay Avenue, Northeast, near the Nickel Plate Railroad and East 152d Street, on which it contemplates the erection of a new plant shortly, having outgrown its present quarters at 11400 Madison Avenue.

The Defiance Machine Works, Defiance, Ohio, has increased its capital stock from $600,000 to $1,200,000, and has acquired adjoining property on which it will erect additional two-story brick and concrete buildings, in addition to enlarging its machine shop. Special metal-working machinery will be added to its present line of wood-working machinery. Some changes in the organization have re-

cently been made; R. P. Kettenring is vice-president, and George A. Ensign and W. F. McCarty, works manager and chief engineer, respectively.

The Fulton Pit Car & Mfg. Co., Canal Fulton, Ohio, which recently increased its capital stock from $150,000 to $400,000, states that the increase was made to complete the recently announced merger of that company with the Kenova Mine Car Co., Kenova, W. Va.

The Rex File Co., Newcomerstown, Ohio, has been incorporated with a capital stock of $200,000, and will succeed the company of the same name which was in business in Newcomerstown until recently, when its plant was destroyed by fire.

The Banner Machine Co., Columbiana, Ohio, has abandoned its plan to move its plant to East Palestine, Ohio, and will build a foundry and machine shop in Columbiana.

The Sunbury Mfg. Co., Sunbury, Ohio, has acquired a new site on which it will build a plant, 70 x 120 ft., for the manufacture of car loading and unloading equipment.

The O'Neil Tire & Rubber Co., Akron, Ohio, will build a new plant, providing 20,000 sq. ft. of floor space.

The Fulton Foundry & Machine Co., Cleveland, has taken over all of the assets and good will of the Fulton Foundry Co.

Indianapolis

INDIANAPOLIS, July 30.

The Nordyke & Marmon Co., Indianapolis, manufacturer of milling machinery and automobiles, is enlarging its plant to engage in the manufacture of motors for aeroplanes. It is expected the company will become one of the largest builders of aircraft motors. Howard Harmon is Government supervisor of motor construction.

The Hammond Optical Machine Mfg. Co., Vincennes, Ind., has increased its capital stock from $15,000 to $30,000.

The Standard Electric Mfg. Co., Indianapolis, has increased its capital stock from $100,000 to $300,000.

The Gary Co-operative Association, Gary, Ind., has been incorporated with $10,000 capital stock, to deal in machinery, tools, etc. The directors are Andrew Schoppel, Vasil Vangeloff and John Kraft.

The Peru Foundry Co., Peru, Ind., has been incorporated with $60,000 capital stock, to conduct a general foundry business. The directors are M. F. Gartland, J. H. Schaumleffel, John C. Haswell, John P. Whalen and Frank X. Gartland.

A plant for the manufacture of motors and dynamos is planned for South Bend, Ind., as a subsidiary of the Marble Arms & Mfg. Co. John F. Card, Three Rivers, Mich., is the head of the enterprise.

A one-story foundry, 65 x 132 ft., will be built by the Fulton Brass Foundry Co., 1508 South William Street, South Bend, Ind.

The Beatty Mfg. Co., recently incorporated at Indianapolis, Ind., has purchased a 4-acre tract at Hammond, Ind., and has let the contract for a factory to cost about $50,000. The company will manufacture heavy machinery, including a bulldozer for forge work. W. R. Beattty is president.

The Columbus Machine Works, Columbus, Ind., recently incorporated, will manufacture the Columbus portable pipe machine.

Cincinnati

CINCINNATI, July 30.

A heavy demand exists for large machine tools, including radial drilling machines, lathes, from 24 in. up, and planers. Shaping machines are the only small machine tools wanted, and firms making these have enough work ahead to keep them busy for some time to come. Shipbuilding companies are quietly buying more machines than heretofore, and it is not often that an inquiry is sent broadcast when a large machine tool is needed. The question of delivery is one of the most important ones. Auto-truck manufacturers are also buying on the same basis, and much work is in hand, or under negotiation. The slack demand for small lathes is due, to an extent, to the absence of buying on the part of repair shops and small manufacturers.

The local labor situation is satisfactory, but frequent reports from foundries in Hamilton, Ohio, are somewhat disconcerting. Some molders who were out returned to work on Monday of last week, but struck again the following Thursday. The demands made are ostensibly for a formal recognition of the union.

The L. Schreiber & Sons Co., Cincinnati, has contract for an addition to the plant of the Springfield Light, Heat & Power Co., Springfield, Ohio.

It is reported that the plant of the former Cincinnati Equipment Co., Sedamsville, Cincinnati, will resume operations at an early date. Ernest W. Volz is interested in a new company formed to remodel the plant.

The Dayton Electrical Mfg. Co., Dayton, Ohio, is removing its plant to a building on Fourth Street, and intends to increase its capacity.

The Gondolo Mfg. Co., Springfield, Ohio, has been incorporated with $10,000 capital stock by H. E. Stimmel and others to make special machinery. Nothing is known as to its machinery requirements.

Plans are under way for an addition to the plant of the C. A. S. Products Co., Columbus, Ohio, manufacturer of motor truck parts.

The Capitol Milling Co., Columbus, Ohio, has been incorporated with $150,000 capital stock, and will increase the capacity of its plant on West Mound Street. L. C. Titus is president.

The American Tool & Mfg. Co., Urbana, Ohio, has acquired a site near its plant on which it will erect a building to augment its output of automobile specialties.

It has been definitely announced that the Elgin Tractor Co., Elgin, Ill., will remove its plant to Piqua, Ohio, and will occupy the former building of the Piqua Rolling Mill Co. It is the intention to more than triple the present output of farm tractors.

The Kenney-McGreevy Foundry Co., Mansfield, Ohio, has been incorporated with $20,000 capital stock by H. D. Kenney and others.

The Mid-West Box Co., Anderson, Ind., is making a one-story addition to its plant, 32 x 64 ft. Part of this will be used as a machine shop.

The Central South

LOUISVILLE, KY., July 30.

High prices are tending to slow up general machinery business in this territory, although Government contracts are supplementing the volume handled. There is a strong demand for second-hand equipment. Coal and oil development operations continue to create considerable demand for equipment and supplies.

The Continental Car Co., Louisville, has been awarded a Government contract to make 2000 motor truck bodies. A. B. McKinley is general manager.

The Southern Machine Exchange, Somerset, Ky., is in the market for a 50-hp., alternating current, 220-volt electric motor and a 50-hp. oil or kerosene engine.

The Hercules Buggy Co., Evansville, Ind., has contracted with the Government to furnish 4500 motor truck bodies.

The John G. Duncan Co., Knoxville, Tenn., is asking for dealers' prices on a 75-hp. direct current motor, in first-class condition, for immediate delivery.

Birmingham

BIRMINGHAM, ALA., July 28.

Dealers report a good machinery market. The demand from the Alabama graphite field, especially for electric apparatus, is continuous, owing to the building of new mills in that rapidly developing industry. The sawmill demand is also good, and pumps and gasoline engines are selling actively.

The Aluminum Co. of America, Badin, N. C., will build a second dam at Yadkin Falls and a power house containing three 10,000-hp. units.

The Fernandina Shipbuilding & Dry Dock Co., Fernandina, Fla., capital stock $1,000,000, has been organized, and has purchased land on the water front. It proposes to construct a shipbuilding plant.

The Tampa Shipbuilding & Engineering Co., Tampa, Fla., contemplates the erection of a third machine shop, a pipe-bending shop, a joiner shop and a sawmill.

The Dierke-Blodgett Co., Pascagoula, Miss., will build a shipyard on the Pascagoula River.

St. Louis

ST. LOUIS, July 30.

Industries engaged in the production of various supplies for Government use are constantly in the market for additions to their equipment. All dealers are sold up to capacity to deliver and far ahead. New business is limited by buying opportunities rather than by any other feature.

The Mueck Auto Body Co., St. Louis, has been incorporated with capital stock of $80,000 by Frank J. Mueck, Henry J. Happel and William Happel to manufacture vehicle bodies and is in the market for equipment.

The Auto Traffic Signal & Mfg. Co., St. Louis, has been incorporated with capital stock of $25,000, by Alfred A. Krause, Walter G. Krause and Arno D. Krause, to manufacture tools, machinery, auto parts, etc.

The Girtanner Mfg. & Sales Co., St. Louis, has been incorporated with capital stock of $20,000 by Fred Girtanner, Herman Mueller and L. L. Kraft, to manufacture powerhouse supplies and accessory equipment.

The St. Louis Washing Machine Co., Red Bud, Ill., has been incorporated with capital stock of $25,000, by L. I. Zimblemann, Herman Eggerding and F. W. Buch, to manufacture machinery.

The Four States Lumber Co., Texarkana, Ark., L. W. Krouse, manager, is in the market for boilers and other power plant equipment.

The Drexel Oil & Gas Co., Pawhuska, Okla., H. P. White, manager, is in the market for oil pumping power plants.

The Traders Oil & Refining Co., Baltimore Building, Oklahoma City, Okla., is in the market for equipment for an oil refining plant, boiler, steam still, tanks, pumps, etc.

The Triangle Mines Co., Miami, Okla., J. D. Bomford, manager, is in the market for mill machinery, power plant, oil engines, etc.

The Henryetta Public Service Co., Henryetta, Okla., has been incorporated with capital stock of $200,000, by J. R. Watson, A. W. Anderson and Harlan Reed, all of Okmulgee, Okla., and will equip an electric plant.

The Hine-Hodge Lumber Co., Hodge, La., will equip a shipbuilding plant at Moss Point, Miss., where a site has been acquired.

The Jonesville Lumber & Veneer Co., Jonesville, La., A. W. Stewart, president, is in the market for boilers and other power plant equipment, including two engines, etc.

The Forschler Motor Truck Mfg. Co., New Orleans, La., will erect a building, 147 x 220 ft., for the manufacture of motor trucks.

The Ged Iron Works, Ged, La., recently incorporated, was first organized with $7,500 capital stock, which later was raised to $10,000.

Texas

AUSTIN, TEX., July 30.

The machinery and tool trades continue unusually active despite the intense heat. The demand for cotton gin machinery is showing an increase and a number of cotton gins will probably be built before the cotton harvest is fairly open.

The Westminster Gin & Development Co., Westminster, will build a cotton gin to cost about $8,000. W. W. Eubanks, Westminster, is a stockholder.

The Texas & Pacific Coal Co., which has developed a natural gas supply amounting to more than 50,000,000 cu. ft. per day from 28 wells, near Thurber, will lay a pipe line to Fort Worth and Dallas. Edward L. Marston, a banker of New York, is president of the company.

The Dayton-Goose Creek Railway Co., Dayton, has been incorporated to construct a railroad between Dayton and Goose Creek, a distance of about 30 miles. The cost of building and equipping the road will be about $400,000. R. S. Sterling, W. S. Parrish, W. W. Pondren and R. L. Blaffler, all of Houston, are among the incorporators.

The Memphis Cotton Oil Co., Memphis, which has increased its capital stock from $75,000 to $200,000, all paid in, will spend about $125,000 in enlarging its plant. A new building will be erected and machinery installed.

There are now in active operation five shipbuilding plants at Orange, Tex. These include International Shipbuilding Co., the Orange Maritime Co., the Southern Dry Dock & Shipbuilding Co., the Sabine-Neches Shipbuilding & Navigation Co., and the National Shipbuilding Co. With the exception of the International Shipbuilding Co., all of these companies are backed by Orange capital. It is said that they have, in all, contracts for 54 vessels, including a large number for the Emergency Fleet Corporation.

California

LOS ANGELES, July 24.

The Crellin Machine Co., 121 Railroad Street, Los Angeles, manufacturer of tools, has filed plans for a new one-story machine shop, 32 x 100 ft., at 123 North Railroad Street. C. W. Crellin is head.

The Warman Steel Casting Co., Los Angeles, specializing in the production of electric and crucible steel castings, has completed the erection of a new foundry at Boyle and Slauson avenues.

The California Sprayer Co., Los Angeles, has been incorporated with a capital of $45,000 to manufacture spraying equipment. John S. Davis, 6029 Pasadena Avenue, is the principal incorporator.

The United States Spring Co., 1120-22 South Los Angeles Street, Los Angeles, has leased property adjoining its plant for the erection of an addition. Plans have been prepared for a one-story building, about 50 x 150 ft., for the different operating departments. The present building will be used exclusively for manufacturing, specializing in the production of springs for automobiles and automobile trucks. It is said that new machinery will be installed to increase the capacity, including six new furnaces.

The Baker Iron Works, 950 North Broadway, Los Angeles, specializing in structural steel, sheet steel and foundry work, has recently completed an addition.

The American Aircraft Co., Los Angeles, has been incorporated with a capital of $10,000 to manufacture different types of aircraft. The incorporators are Joseph Mattingly, 540 Indiana Avenue, Venice; Roy Bower, Quincy, and H. King, 4501 Marmion Way, Los Angeles.

E. A. and George White, Oakland, are negotiating with the city officials at Redondo Beach, near Los Angeles, for the establishment of a shipbuilding plant to cost about $300,000.

The Pacific Electric Railway Co., Pacific Electric Building, Los Angeles, has awarded contract for the construction of a one-story car repair shop, 163 x 163 ft., at Echandia Junction, to cost about $10,000.

The California Automatic Sprinkler Co., Los Angeles, has been incorporated with a capital of $10,000 to manufacture automatic sprinklers for agricultural purposes. M. J. and J. R. Spencer and A. A. Sturges are the incorporators.

The Pacific Northwest

SEATTLE, WASH., July 24.

With few exceptions, notably that of the lumber industry, every manufacturing plant in the Northwest is busy, with many operating two and three shifts daily. The increase is particularly noticeable in the machine shops, and the larger plants have booked orders that will keep them busy for months to come. It is stated that foreign orders booked with Seattle plants run as far ahead as 1919. The problem of obtaining raw materials is likely to become a serious one, but the shortage has not been extreme as yet.

Seattle's water-borne commerce for the first six months of this year aggregated $250,237,362, or a gain of more than $55,000,000 over the same period of 1916. The bulk of the increase was in foreign trade, with domestic commerce recording a vigorous gain.

The Thomas Pulp & Paper Co., Portland, Ore., capitalized at $500,000, has selected Aberdeen as the site for a pulp and paper plant to be erected at once. A power plant is also included in the plans. R. Thomas heads the company.

The Lumbar Products, Ltd., New Westminster, B. C., which has taken over the Iowa Lumber Co.'s plant and properties, will make improvements and additions, including the installation of a new saw mill. It will operate a box factory, and has purchased the North Vancouver toy factory, which will be enlarged and brought to New Westminster.

The plant of the Tacoma Fir Door Co., Tacoma, Wash., was completely destroyed by fire recently, with a loss of $150,000.

The Ship Lumber Co., Tacoma, Wash., recently incorporated, has purchased a site on the waterfront, and will erect a lumber mill, with a daily capacity of 50,000 ft.

The Allen Shipbuilding Co., Seattle, has been incorporated by C. J. Smith, Frank P. Allen, N. Paschall, Robert P. Greer and F. K. Smith, and has acquired a site on Salmon Bay, on which will be established a wooden shipbuilding plant. Four ways will be installed.

S. Matheson, Vancouver, B. C., has opened an office at 517 Rogers Building, for the Vancouver Shipyards & Engine Works, Ltd., composed of Eastern capital of $750,000. It is reported a deal is pending for a shipbuilding site where wooden vessels will be constructed.

The National Home Building Co., Vancouver, Wash., manufacturer of knockdown houses and boxes, will double the capacity of its plant and install new machinery, with individual motors.

Kruse & Banks, Marshfield, Ore., will install new machinery at their shipbuilding plant, including a large electric crane.

The W. E. Boeing Airplane Co., Hoge Building, Seattle, contemplates extensions and improvements to its factory on

Lake Union. The plans include a two-story machine shop, 84 x 88 ft., office building, and concrete vault.

It is reported that the Victoria Machinery Depot, Victoria, B. C., has received contracts for the construction of all the boilers required for the wooden steamers that will shortly be under way for the British Government. The company will make a specialty of boiler construction.

The Port of Portland, Portland, has completed plans for the erection of bunkers and the installation of coal handling machinery, and for the construction of a number of ocean going barges with a capacity of 800 tons each.

The Pacific Lifeboat Co., Portland, has been organized and will equip a three-story factory on East Water Street, with rail and water communication. V. A. Crum is president and H. F. Gallimore secretary-treasurer.

The Supple-Ballin Shipbuilding Co., Portland, has been incorporated with a capital stock of $300,000 by Joseph Supple, Fred A. Ballin and Arthur Languth.

The Gray & Barash Co., Seattle, has secured a site, covering an entire block of waterfront property, on which will be erected a plant for manufacturing electrical and nautical machinery.

The Pacific Northwest Mfg. Co., Seattle, Wash., has been incorporated with a capital stock of $100,000 by W. L. Specklemier, F. T. Coulter and D. B. Thompson, to manufacture furniture.

The Griswold-O'Donnell Co., Portland, has leased a site at Vancouver, Wash., with 1500 ft. of river frontage on which a shipbuilding plant will be erected. Four shipways for wooden vessels will be put in at once, and a saw mill will be added later. E. A. Griswold is president; M. J. O'Donnell, vice-president, and Clarence M. Eubanks, secretary.

The Tregoning Boat Co., Seattle, Frank C. Tregoning, president, will install a shipbuilding plant at Portland.

The Ames Shipbuilding & Dry Dock Co., Seattle, which has three steamers of 8800 tons capacity on the ways, and nine others to follow, is in the market for additional machinery, and for large and small wood-working tools.

The Oregon Shipbuilding Co. and the Motor Ship Construction Co., Portland, have been consolidated.

Canada

TORONTO, July 30.

The Eastern Machinery Co. of Montreal, Montreal, has increased its capital stock from $45,000 to $95,000.

Armstrong, Whitworth of Canada, Ltd., Montreal, shipbuilders and iron and steel manufacturers, have been granted a license to do business in the province of Ontario with a capital stock of $40,000. Elias T. Malone, Bay and Melinda streets, Toronto, is the attorney.

The Watson Specialties, Ltd., Brantford, Ont., has been incorporated with capital stock of $150,000 by Alexander Greig, John M. Sparrow of Toronto, Frank Kent of Meaford, Ont., and others, to manufacture screens, metal frames, wardrobes, office furniture, etc.

H. W. Petrie, Ltd., Toronto, is in the market for motors, 60-cycle, three-phase, 550 volts, in sizes up to 75 hp.; also a lighting outfit, 50 or 60 hp., high-speed engine, direct connected to 110-volt generator.

The Packard Electric Co., St. Catherines, Ont., is in the market for a power squaring shear to cut No. 10 gage steel up to 24 in. wide.

The directors of the Canada Malleable & Steel Range Co., Oshawa, Ont., have decided to dispose of their plant.

Bids have been called by the Canadian Shovel & Tool Co., Imperial Street, Hamilton, Ont., for the erection of an addition to cost $30,000.

Work has been started in transforming the old customs building at Cobourg, Ont., into a factory for the Bird-Archer Co., manufacturer of boiler supplies, etc.

The Muskoka Foundry Co., Bracebridge, Ont., will make an extension to its foundry at a cost of $15,000.

The Brantford Computing Scale Co., Brantford, Ont., has purchased a site adjoining its factory, and it is reported extensive additions will be made, including the erection of a foundry.

The Cameron-Genoa Mills Shipbuilders, Victoria, B. C., which recently received contracts from the Imperial Munitions Board, Ottawa, for the erection of four ships, will enlarge its plant.

The Cotton Co., Ltd., Vancouver, B. C., will erect a shipbuilding plant at False Creek, Vancouver, B. C.

A. F. Bernstein, Vancouver, B. C., is contemplating the establishing of a smelter and steel works at Port Coquitlam, B. C., estimated to cost $500,000.

John A. Moody, London, Ont., is in the market for a Crown wheel, 2 ft. in diameter; also a Fitzgibbon marine boiler, anchor, chains and cables, etc.

The Frederick Thompson Co., electrical engineer, will erect a four-story factory, 60 x 104 ft., at 7-11 St. Genevieve Street, Montreal, to cost $30,000.

The John Morrow Screw & Nut Co. has started the erection of an addition to its plant at Ingersoll, Ont., to cost $30,000.

Engineer Calder, Swift Current, Sask., has recommended the purchase of a 75 hp. auxiliary induction motor, at a cost of $2,000; and also repair parts for pumps, etc. The recommendations were adopted by the council.

A group of Western men, headed by James Playfair of the Quebec Shipbuilding Co., Quebec, proposes to establish a steel shipbuilding plant on the St. Charles River.

The Canadian Ford Motor Co., Windsor, Ont., has purchased additional land near its plant, and is contemplating extensive additions.

The Canadian Brass Co., St. Catharines, Ont., will build an addition to its plant, at a cost of $15,000, for the manufacture of plumbers' supplies, brass fittings, etc.

Van Sycle & Macdonald, Vancouver, B. C., propose to establish a shipbuilding plant at New Westminster, B. C., at a cost of $50,000.

The Canadian Fasteners, Ltd., Hamilton, Ont., recently incorporated to manufacture fasteners, hooks, etc., will shortly call for tenders for the erection of a concrete and brick factory to cost $20,000.

The Northern Bolt & Screw Co., Seventeenth Street East, Owen Sound, Ont., is contemplating the erection of a factory to cost $300,000.

The Willys-Overland, Ltd., Weston Road, Toronto, manufacturer of automobiles, etc., have had plans prepared for the erection of a brick and concrete factory.

The Maloney Electric Co., Mercer Street, Windsor, Ont., is erecting a reinforced concrete and brick addition to its plant at a cost of $12,000. William Kerr is manager.

Contracts have been awarded for the erection of a machine shop to cost $15,000 for the Canadian Ingersoll-Rand Co., Sherbrooke, Que.

Joliette, Que., will shortly be in the market for new electrical equipment for its power plant. Alfred L. Marsolais is secretary-treasurer.

The John Inglis Co., 14 Strachan Avenue, Toronto, Ont., will build a concrete and brick power station to cost $5,000.

The Canada Screw Co., 334 Wellington Street West, Hamilton, Ont., is completing arrangements for the erection of an addition to its plant to cost $100,000.

The Herbert Morris Crane & Hoist Co., Ltd., Toronto, which is building a plant at Niagara Falls, Ont., awarded a contract to the Dominion Bridge Co. for the structural steel only, and not for the erection of the plant, as was erroneously stated. M. R. Malcolm is general manager.

Effect of Time of Heating and of Fuel on Malleable Castings

In order to ascertain the influence of the time of heating and of the fuel used on the properties of malleable castings, F. Wuest and E. Luenenberger, in a recent issue of *Ferrum*, a German technical paper, published the results of some of these experiments. The conclusions as given by a translator in the London *Iron and Coal Trades Review* are as follows:

Material cast from an oil furnace, owing to low sulphur content, is much superior to that from a cupola in elongation, contraction and tensile strength.

With increase in time of heating, the tensile strength decreases at first slowly and then rapidly, with the elongation and contraction correspondingly increased.

With increased time the toughness and resistance to shock are considerably increased.

Hardness decreases with increased time of heating.

With heating the specific gravity decreases but the time has little influence. Increased silicon content lowers the specific gravity considerably.

The Cohoes Rolling Mill Co., Cohoes, N. Y., is rebuilding its plant which was destroyed by fire a few months ago.

THE IRON AGE

New York, August 9, 1917

ESTABLISHED 1855 VOL. 100: No. 6

Electric Steel for Roller Bearings

New Type of Ingot-Handling Machine in the Plant of the Timken Roller Bearing Co.—Furnaces Located in Pits

AN electric steel plant of large capacity, designed for quality production of alloy steels, that are used for the most part in its own plant in the manufacture of roller bearings, has recently been built by the Timken Roller Bearing Co., Canton, Ohio. The plant also supplies steel for its allied interest, the Timken-Detroit Axle Co., and manufactures special electric and alloy steels for the trade. The plant was laid out primarily, however, with a view to providing a steel works to make steel to meet the company's requirements.

Recent additions to the Timken plant in Canton include a tube-mill department equipped with an electrically driven piercing mill for rolling seamless-steel tubing. This plant was described in THE IRON AGE, April 27, 1916. With the completion of the steel plant the company has combined in one unit all the manufacturing processes, from making the steel itself to the production of a highly finished product.

The steel plant is equipped with four 6-ton Heroult electric furnaces. The combined capacity of the furnaces is 125 tons of ingots in 24 hours. The ingots are broken down in a hydraulically operated 600-ton forging press. An unusually interesting feature of the plant is an electrically operated manipulator that handles the ingots while they are being broken down, taking the place of a jib crane and porter bar. This manipulator is a new type of equipment for use in a steel plant, and in general design and operation largely resembles an open-hearth charging machine.

The steel plant is located in a modern type of mill building, 284 ft. long and 80 ft. wide. At right angles to this, and connected at the lower end, is a rolling-mill building, 266 ft. long and 110 ft. wide. Adjoining the lower end of this, parallel to the building housing the melting department, is the tube-mill building. With this arrangement the product passes from the steel plant through the finishing-mill department and on to the lower end of the latter, adjoining which is the charging end of the heating surface of the tube mill.

A large scrap storage space is provided on the floor at the upper end of the furnace building. Scrap is brought in on standard railroad cars over a track that traverses this section of the plant, and the cars are unloaded with an electric traveling crane and electric magnet. The melting department is equipped with two 15-ton and one 5-ton cranes that perform the handling service in the building for handling scrap, molten metal, ingots and billets.

The electric furnaces are located along one side of the building, and at the lower end at this side is the reheating furnace. Opposite the electric furnace on the other side of the building, adjoining the side wall, is a pouring platform, 7 ft. wide, 60 ft. long and 4 ft. high. Further down on the same side are the soaking pits, forging press and manipulator.



The Four Electric Furnaces Are Located in Pits, Making Them Convenient for Charging from the Floor Level

The furnaces are placed in pits 10 ft. deep, making them conveniently located for charging in the doors on each side from the floor level, and pit space is provided in front for the ladle when tapping. They have basic bottoms, the side walls and roofs are lined with silica brick,

and the bottoms are of magnesite. The transformers back of the furnaces are elevated 10 ft. above the floor level.

Two grades of steel are produced for the company's use, one running from 0.15 to 0.20 per cent carbon for seamless-tube stock, which is used for cups and cones for roller bearings, and the other has the same percentage of carbon, but 0.80 to 1.25 per cent of chromium, the latter being added for steel which is rolled into small round bars, 9/16 in. in diameter and under, which is cold-drawn and manufactured into rollers used in bearings.

A typical furnace charge is 3000 lb. of tube-mill scrap, 2000 lb. of roller-bearing scrap (these being produced in the company's adjoining manufacturing plants), and 9000 lb. of shrapnel turnings. The product in both grades runs about 0.40 to 0.60 per cent manganese, 0.10 to 0.15 per cent silicon, and 0.03 and under in sulphur and phosphorus, the only difference in the two grades being the presence of chromium in one of them.

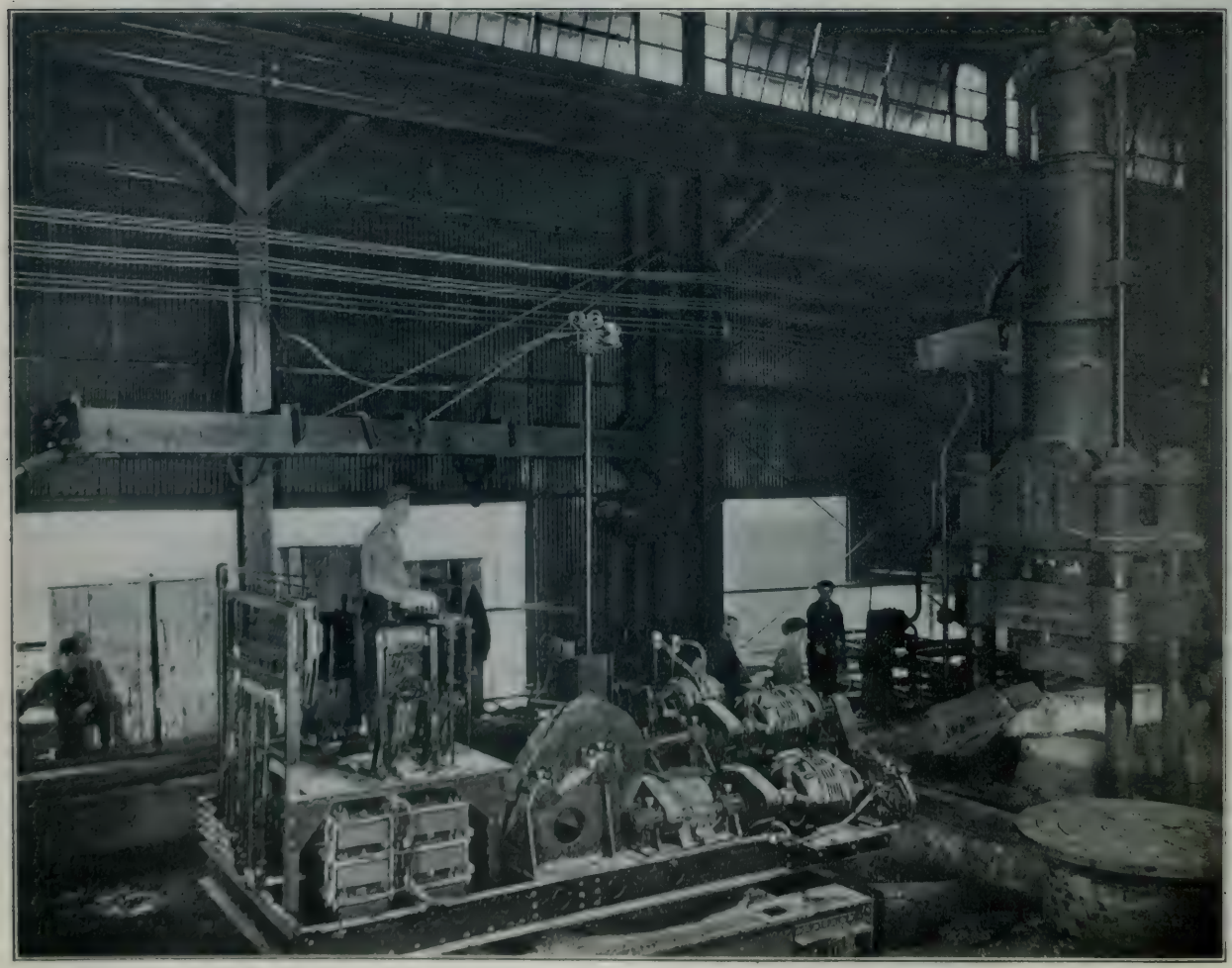
The furnace charge, which is all shovel scrap, is placed in charging boxes by means of the cranes and magnet and charged by hand from these to the furnaces. The average time of a heat is 4½ hr.

Electricity, which is purchased from the Central Power Co., is supplied to the plant in 3-phase, 60-cycle, 11,000-volt alternating current. This will be supplied later at 22,000 volts. It is delivered to the furnaces at 110 volts, by three 400-kva. oil-insulated, air-cooled Westinghouse transformers for each furnace. The electrodes are handled by the Thury system of control. Each electrode is raised and lowered by a 3-hp., 200-volt, direct-current motor, there being three motors for each furnace.

The direct current is furnished by a motor-generator set of 9-kw. capacity, a separate set being provided for each furnace, which is tilted by a 35-hp. motor in the pit, geared to the tilting mechanism. In melting down the full capacity of the transformers 1200 kw. is used at the start, and after the charge becomes molten it is cut down to 600-kw. capacity. The current consumption is about 3900-kw. hr. per heat of 6 tons. The power factor on the furnace averages 88 to 90.

The steel is poured in 6-ton ladles and is cast in ordinary molds of one size, 16 in. square. The stripped ingots are heated in two 6-ingot hole gas or oil-fired soaking pits, 9 ft. long, 6 ft. wide, and 7 ft. deep, having a capacity to heat 150 tons of ingots in 24 hr.

The ingots are usually reduced on the forging press to 7 x 8-in. blooms, although they can be broken down to a 4 x 4-in. section. The manipulator, in the powerful jaws of which the ingots are held while being forged, has five movements, each provided by separate motors, and is controlled by one man, stationed on the machine. The machine itself is located on a 6-ft. gage track and has a forward and backward movement of 18 ft. Above the truck section is a revolving table, upon which the remainder of the machine is mounted, and permitting the mechanism to rotate. The jaw operating arm, about 12 in. in diameter, with jaws 3 ft. long at the end, revolves and also has an up-and-down motion like an elbow. The fifth movement is the grip of the jaws. The manipulator is provided with



A Manipulator Somewhat Resembling an Open Hearth Charging Machine, the First of This Type to Be Built, Takes the Place of a Jib Crane and Porter Bar for Handling Ingots While Being Broken Down in the Forging Press, Resulting in the Saving of Six Workmen



One of the Mill Stands and Tilting Tables in the Plant of the Timken Roller Bearing Co.

two 11-hp. and three 15-hp. motors for driving its operating mechanism.

The machine has a capacity for handling a 3000-lb. ingot, and the manipulator and press have a capacity for handling the maximum daily output of the electric furnaces. Three men on the press and one man for the manipulator are required to operate this unit, a saving of six men for a 12-hr. shift, as compared with the operation of the press when handling ingots with the jib crane or porter bar, before the machine was placed in operation.

Hydraulic power for the press is supplied by a pump with a capacity of 100 gal. per min. and 3000 lb. of water pressure per square inch. This is driven by a 200-hp. motor with 2300-volt, 60-cycle, 3-phase current.

After being broken down, the blooms are placed on a truck that operates on a track that runs to one side of the building, to a stock yard adjoining where they are chipped. In this stock yard is also handled steel brought into the plant to be rolled for other consumers. The stock yard is served by a 25-ton locomotive crane equipped with a 48-ft. boom.

The heating furnace of the rolling mill is a standard horizontal, continuous-discharge furnace, with a heating chamber 45 ft. 6 in. long and 10 ft. 8 in. wide, and with a capacity for taking blooms up to 9 x 10 in. and 8 ft. long, and having a rated capacity of 250 tons per 24 hr. The furnace is equipped with a combination of oil and gas burner, the oil supply being controlled with a needle valve in the burner, so that either oil or gas can be used, or both can be used at the same time. When the gas supply is plentiful the oil is not used, but during the past winter, when the gas supply was low, the combination fuel was used both in the reheating furnace and in the soaking pits where similar burners are provided. Oil is supplied at 20-lb. pressure and gas at 8-oz. pressure.

The steel is discharged from the furnace by a push bar electrically operated by a winch and two 35-hp. motors upon a roller table 12 ft. long, that adjoins the front tilting table to the mill.

The rolling mill consists of four stands of 3-high 22-in. mill. The first two stands are used for rolling 3½ to 6½-in. round bars for the tube mill and for rolling merchant bars, and the last two stands roll from 1½ to 3 15/16-in. rounds and square and flat bars. Two of the mill stands are roughing stands and two are finishing stands. The first roughing stand operates in connection with the first finishing stand, and in the case of 90 per cent of the product the second roughing stand operates with two finishing stands, in this respect differing from the usual practice. In the remaining 10 per cent of the production, when rolling sections that require a larger billet than can be rolled on the second roughing stand, the billets are given the roughing pass on the first roughing stand. The first roughing pass is a box and edging pass. With the practice of producing square sections in the roughing rolls the necessity of an intermediate stand of rolls is eliminated. In the roughing stands are various passes for rolling round sections. The finishing stand has a leader or octagon pass at the top, and the steel goes from the upper pass to a round pass in the bottom for finishing. The mill is provided with two traveling tilting tables 29 ft. long.

The mill is driven by 1000-hp., 2300-volt, 60-cycle, 3-phase induction motor through a Dodge rope drive to a 20-ton flywheel. A Nuttall flexible coupling is provided between the rope and motor sheave. The motor is connected with a permanent slip resistance so proportioned that it will not be overloaded. On a heavy load the motor slows down and allows the flywheel to deliver its stored energy. The normal speed of the mill is 65 r.p.m. Each tilting table is driven by one 50 and two 30-hp. motors.

Two runout tables, each 110 ft. long, extend from the back tilting table to the end of the hot bed, one on each side. One table handles steel of the first roughing and finishing stands, and the second table the product of the other two stands. The hot bed, which is of the standard rolling type, is 80 ft. long and 30 ft. wide. Each runout table is driven by a 30-hp. motor.

At the side of the hot bed is an inspection floor, where the bars are laid out, inspected and marked. They are sheared at the lower end of the mill building, near the charging end of the continuous furnace of the tube mill, on vertical shears having a capacity up to 6 in. in diameter. According to present plans the hot bed will be made longer and a hot saw installed.

The mill building is served by a 10-ton crane, which is used in changing rolls and in handling the finished steel. With the exception of the direct-current motors that raise and lower the electrodes, alternating-current motors are used exclusively throughout the plant for operating the cranes and for other service.

The mill stands were built by the Standard Engineering Co., Ellwood, Pa., and Wheeling Mold & Foundry Co., Wheeling, W. Va., each furnishing one roughing and one finishing stand. The former company supplied the tilting tables and the latter company the runout tables. The reheating furnaces and the soaking pits were furnished by the W. R. Miller Co., Pittsburgh. The forging press and the hydraulic pump were supplied by the William Tod Co., Youngstown, Ohio, and the manipulator by the Alliance Machine Co., Alliance Ohio. The cranes were supplied by the Whiting Foundry Equipment Co. All motor equipment was supplied by the Westinghouse Electric & Mfg. Co. The stock yard locomotive crane was furnished by the McMyler-Interstate Co., Cleveland. The mill and melting shop buildings were erected by the Canton Bridge Co.

Modern Economies in Pickling Steel*

Equipment to Facilitate the Process — The Cleaning Solutions, Their Proper Strength and Temperature—Application to Drop Forgings

BY J. H. SNYDER

DURING the last five years, and more especially the last two years, on account of the rapid rise in the cost of labor and acid, practically all the larger plants and many of the smaller ones have made efficient changes in their pickling department to reduce labor and acid consumption, increase output and get a more uniformly pickled product. Experiments have been made with solutions of potash, Wyandotte cleaner, etc., to eliminate oils and grease preparatory to the acid bath, thereby saving a large percentage of acid.

Employment of Machinery

Conveying machinery, trucks, cars, cranes, etc., have recently been installed to increase output. Wire is now frequently sent from the mills to the cleaning departments on an endless chain conveyor, with hooks spaced at suitable intervals for holding the wire coils. Ordinary factory trucks are often used to transfer sheets, tin plate, forgings, pipe, castings, etc. Sometimes, where conditions are suitable, tracks are laid throughout the plant with switches and turntables and cars convey the material over these tracks to the different departments. In large plants electric cranes are used for carrying material to and from the cleaning department. Devices are attached to the crane hooks for carrying each particular product, thereby effecting an efficient means of transfer.

Electric hoists, air hoists and jib cranes assist the men to place and remove material being cleaned in the vats, and also to shift this material in the acid solution to obtain better results in cleaning. In many cases large electric cranes, used in the transfer of the production from one department to another, are used for this purpose. This method, used in several plants with more or less favor, has the following objections: The acid fumes constantly rise and come in contact with the electrical apparatus, causing increased maintenance cost and delays in operation; the objects lie motionless nearly all the time in the acid solution, which, on account of little or no agitation, is of varying density from bottom to top, so that certain portions of the objects are overpickled and other portions contain unpickled spots.

Many companies have installed pickling machines to take the place of electric cranes and reduce the labor. These machines are to a great extent acid proof, simple in design and fool prof in operation. The surging or plunger type, which has been in use a number of years, forces the acid up through the material being pickled by means of a plunger. This keeps the density of the acid throughout the vat constant. The machine is installed where an extremely large tonnage is desired and seems a great improvement over former methods, but since the material is not agitated the greatest economy is not reached.

A machine made by the Mesta Machine Co. agitates the material as well as the acid by moving the load up and down through the different solutions and is being used for almost every kind of product that is being pickled or cleaned. The machine is operated by steam or air from a central plunger carrying horizontal arms from which are suspended acid proof crates. The number of arms is governed by the number of baths required.

Pickling, rinsing and loading are all done simultaneously. Sudden admission of steam or air in the cylinder at the end of the down stroke of the plunger causes a snap which tends to separate and shift the material so as to remove the scale or sand, scour the material and mechanically aid the chemical action of the acid. The advantages of this machine are: Crane service can be eliminated; labor can be materially reduced; acid required per ton pickled can be reduced; it is simple in design and fool-proof in operation; exhaust steam can be used for heating the vats; maintenance cost is low, and small floor space is required.

Sulphuric Acid and Pickling Compounds

To have ideal pickling the scale and oxides should be removed without any chemical action on the metal directly beneath them and great care should be exercised in the choice and strength of acids so a maximum cleaning action may be obtained with a minimum solvent action on the metal.

Acids used for pickling are sulphuric, muriatic or hydrochloric and hydrofluoric. Various compounds are also used. Sulphuric acid 60 deg. and 66 deg. Baumé is most generally used in this country. It is generally admitted that sulphuric acid solutions clean metal as well as other acid solutions if made strong enough to remove all scale with sufficient rapidity not to allow any part of the material to become overpickled, or combined carbon to precipitate and form a graphitic coat on the surface.

The proper percentage of sulphuric acid necessary is governed by experience and is controlled by the character of the material to be pickled. According to Comey (Dictionary of Chemical Solubilities) the rate of corrosion increases with concentration of acid up to a certain point, after which the rate of corrosion decreases. This variation is sometimes very irregular with different materials. The action of acids also increases by raising the temperature. Most men mixing solutions guess the amount of acid necessary; some test with the hydrometer, others tell by taste the strength of a solution.

Many companies change the sulphuric acid solution every 24 hr. When work is begun in the morning a solution of about 8 per cent sulphuric acid by volume is put into the vat and the proper amount of water is mixed with the acid. Throughout the day sufficient acid to keep the necessary strength is added. The vat which contains scale and ferrous salts is cleaned out completely and a new solution made for the next 24 hr. This is done where large tonnages are pickled. In most of the plants acid is added for two or three days, or even much longer than this, and from time to time the scale is cleaned out and some of the weakened acid solution drawn off.

Where the material to be pickled is covered with oil or grease potash solutions are used to clean the surfaces. Potash is very expensive and a substitute known as Wyandotte Cleanser is used. It is claimed that 50 per cent sulphuric acid is saved by proper cleaning of material preparatory to the acid bath.

Some substitutes used in place of sulphuric acid and in connection with it are Edis Compound, Kleanrite, Nitre Cake, etc. Edis Compound is manufactured in dry cakes which are soluble in water. The temperature of the solution is kept about the same as with acid. Kleanrite is a powdered compound, and is ordinarily used in a solution made up of 1 lb. of Kleanrite to 4 or 5 lb. of water. This solution may be varied to suit the character of the material. Nitre Cake is also used in a similar way. About 1 lb. is used per gal. of water. The substitutes have met with favor in some plants and it is said that they do not emit disagreeable fumes, such as is the case when pickling with sulphuric acid.

*From a paper presented at the annual meeting of the American Drop Forge Association at Cleveland, June 14-16, 1917. The author is with the Mesta Machine Co., Pittsburgh.

The amount of sulphuric acid per ton of steel pickled varies with the character of material and with the chemical analysis of the acid. It ranges from 60 lb. to 200 lb. per ton of steel. Arsenic is very detrimental in sulphuric acid, and if one-tenth of one per cent is contained in the acid, pickling is hindered to a considerable extent. A great deal more acid is required with 60 deg. than 66 deg. Baumé sulphuric acid and there is a tendency to more arsenic in the former than in the latter. However, some companies are pickling with 60 deg. Baumé acid. Considering the low cost of this acid, they claim to pickle as fast and for the same cost per ton as with 66 deg. acid.

Proper Pickling Temperatures

The temperature of the sulphuric acid solution should be kept as near the boiling point as possible. In various plants the temperature varies from 75 deg. Fahr. to 212 deg. Fahr. For hand pickling the temperature is generally preferred low on account of the danger of having a hot open acid vat into which workmen may fall. Usually where this method is used ventilation is very poor and laborers cannot work efficiently because of the steam. The temperature of the bath frequently is obtained by connecting a steam pipe to the vats from the low pressure boiler used for heating the office buildings, shop offices, etc. This necessitates long steam lines and the vats usually get what is left when all other requirements are provided for.

The usual practice in plants of ordinary size is to pipe live steam into the acid solution. In this case a great saving can be effected when pickling with a steam-operated machine by piping the exhaust steam through an oil separator into the vats. In some cases, especially in smaller plants, anti-acid coils are used to which steam is admitted, and in this way the solution of acid is not weakened by condensation of steam.

High temperature has a remarkable effect on the efficiency of the chemical action of the acid and it is extremely detrimental to good work, as well as extravagant in acid consumption, to use a luke-warm solution of sulphuric acid. On the other hand, it is claimed that when the bath is kept too hot a large amount of finely divided acid is carried up in the vapor which corrodes the structural steel of the building and, in time, may cause serious trouble.

The temperature of water in the vats is a problem which everyone must work out for himself, being governed entirely by the kind of material to be washed. Certain materials require cold water, while others require it as hot as possible. For instance, enameled ware is immersed in cold water, while sheets in heavy gages are rinsed in very hot water and allowed to dry from the heat thus absorbed. But lighter gage sheets must be put through a drying furnace to prevent rusting.

The following table shows the varying amounts of sulphuric acid by volume and the time necessary for successful pickling, together with the method used as a basis for the figures given:

Kind of Material	Per Cent of Acid by Volume	Average Pickling Time in Minutes	Method
Tin plate	2-10	6-10	Machine
Tin plate	10-20	10-20	Hand
Sheets	4-10	8-12	Machine
Sheets	10-18	10-20	Hand
Wire	6-12	15-30	Machine
Wire	10-20	25-50	Hand
Pipe	6- 8	10-15	Machine
Pipe	8-20	20-25	Hand
Cold rolled steel	8-10	12-15	Machine
Cold rolled steel	10-15	20-25	Hand
Stampings	8-12	15-18	Machine
Forgings	8-10	15-18	Machine
Forgings	15-20	20-30	Hand
Enameled ware	10-15	15-20	Machine
Brass	10-15	5- 8	Hand
Alloy Forgings	8-10	20-30	Machine
Alloy forgings	8-10	30-45	Hand

After the material is properly pickled it is transferred to the water bath, where the acids and ferrous salts are completely washed off.

A Well Constructed Wooden Vat

Vats used for pickling solutions are made of white pine, cypress, California fir, birch, concrete, anti-acid tile brick and other material.

The most preferable material at present is No. 1 white pine, although it is somewhat expensive and difficult to get. When a vat is properly constructed from this material an average life of from two to four years is obtained. There are companies using concrete vats lead lined, wooden vats lead lined, and anti-acid tile brick with success. However, the cost of a vat made in this way is more than that of the ordinary wooden vat, and it is a question whether the added life justifies the extra cost.

A good construction of a wooden vat is to use 6 x 6's or 6 x 8's or 8 x 8's, painted with thick white lead and rabbeted together with copper bolts put down through the center. A false lining on the walls and the bottom of the inside of the vat is made of 1-in. match white pine. Guards made of 2 x 4's or 2 x 6's are placed up and down in the vat at different points to protect the lining. This lining is the only part of the vat that must be removed and repaired.

In the use of concrete tanks it is best to lead line them to keep the acid from being continually in contact with the concrete. Also, concrete chips very easily when struck by the crates while handling the material.

Ventilating the Pickling Room

An important factor in the pickling department is proper ventilation of the pickling room. The suggestion usually made is to construct a high building with a ventilator on top containing a double row of windows. This, however, is not the best method. When volumes of vapor rise in winter weather they are met with a strong current of air from the windows above, since cold air rushes into the room instead of allowing the warm vapor to wend its way out.

A well ventilated pickling room, not over 15 ft. high, has a single row of windows on one side of the building, slightly higher than the top of the vats. A small fan placed in the window opposite each acid vat induces a continuous volume of vapor and acid fumes, coming directly from the surface of the acid vat, to pass through it. Thus practically no vapors or fumes are left in the pickling room. The temperature of the room is about 60 deg. Fahr and it is important to keep it at least this high. It is customary in many plants to provide little heat to the pickling room and in winter workmen are forced to grope about amid clouds of vapor at almost a freezing temperature.

Another excellent method of ventilation is to take in cold air through a series of hot steam pipes and then force it up into a large horizontal pipe which runs along the pickling room about 15 ft. above floor level. In this horizontal pipe are several down comers, through which the hot air passes. The temperature is maintained at from 60 deg. to 70 deg. to prevent the formation of vapor. The fumes are forced up by the warm air and pass out of the building through a single row of windows at the top.

Another system forces air up through pipes placed near the floor level at an angle of about 45 deg. on the opposite side of the room from the vats. By this method, not only is the room heated in winter and cooled in summer, but the rising fumes are caught, taken up by the blast of air and carried out of the ventilator.

When a pickling department must be laid out in a large building containing machinery, a very good method is to build semi-circular brick walls around the vats, which tend to carry the fumes up 20 or 30 ft. A fan placed in a ventilator above will conduct them out with comparatively little damage.

Pickling Versus Sand Blasting

In the drop forge industry, pickling, tumbling and sand blasting are the three principal methods used in the cleaning department. Pickling is preferable if the acids and salts are thoroughly washed from the surfaces of the forgings.

Information received from one of the largest companies in the country shows there is no favorable comparison between pickling and sand blasting. In the former method all surfaces are cleaned thoroughly

from oxides or foreign substances which are detrimental to the machining operation, while in the method of tumbling and sand blasting, small forgings, tumbling together, hammer fine sand into their surfaces. The resulting cost of machining is 300 to 400 per cent more than that of pickled forgings. Furthermore, drop forgings containing small bores or indentations are not cleaned properly by sand blasting. The same authorities claim that all companies in the drop forging business eventually would pickle their product, as the additional cost is more than offset in machining.

In this connection the reclamation of waste acids for the manufacture of copperas is important. In one instance a company allowed waste acid to flow down the river for years and later reclaimed it with a net profit of $60 per day. Comparatively few companies are doing this at present and these only experimentally. Within the next decade this by-product will be generally made throughout the country.

BRITISH WIRE-DRAWING

Steps in the Cleaning Process—Alloy Steels for Draw Plates

Wire drawing in its various stages was discussed recently by A. T. Adam before the Edinburgh Section of the Society of Chemical Industry (British). After briefly outlining the history of wire, he explained that it was difficult to define clearly a wire rod, because plants are now in operation which are drawing or rolling cold bars in round, square or hexagon, etc., up to 2½ in. in diameter at least, probably more. In speaking of a wire rod, however, one generally means material which has been rolled hot to about ½ in. diameter and under. Before the rods can be drawn through a die they must be freed entirely from scale of oxide, otherwise the hole through which the wire is drawn will be torn out. The rods are therefore pickled in sulphuric or hydrochloric acid. When the coils are dipped in the pickling tank, it is usual to have a solution, containing anything from 2 to 8 per cent or free acid, in which case the operation of cleaning takes about two hours. Slow cleaning is almost essential when the gage of the wire is small. A strong solution can be used when the gage is large or when the wire is drawn through the bath continuously instead of being dipped in the form of a coil.

The process of pickling may be hastened by using a hot bath. The acid bath works best when it has been in operation a few days, or when the specific gravity has been increased by sulphate or chloride of iron. If the specific gravity be too high, however, the cleaning action will cease unless heat is used. Mr. Adam has found the percentage of free acid in a spent tank as high as in a freshly made up tank. The specific gravity of the former was 1.28 and of the latter 1.03. Mechanical means have been tried to assist the acid in cleaning the higher class wires, but without much success. This is unfortunate because acid is apt to make the wire brittle unless great care is taken to remove it completely.

When all the scale has been removed from the wire it is thoroughly washed with water from a hose. The cheaper qualties of wire are then dipped in hot lime and dried, but with the higher grade wires, which have to receive several passes through the draw plate without annealing, it is necessary to give them a water coat. This is done by keeping the coils continually under a spray of water until a brown rust is formed. During this operation they must not be allowed to become dry. The wire is limed to neutralize any acid remaining and to prevent corrosion. The coil is dried in a blueing oven at 100 deg. C., where the last traces of acid should be driven off. The wire is then ready for cold drawing. The cleaning operation has to be performed not only on the raw wire rod, but also on the drawn wire, each time it has been annealed to facilitate further drawing. In drawing, the reduction effected at each pass through the die varies from 5 per cent to 20 per cent of the diameter according to the nature of the material. The draw plates are made from self-hardening steels.

Some of the alloy steels are used nowadays for draw plates of special make; for example, one well-known make contains 14 per cent chronium and 3 per cent carbon. These elements form a very hard double carbide with the iron. The hole in the draw plate through which the wire passes is first punched hot, then sized and shaped correctly, when cold, with hardened and tempered tapered punches. Very fine wires are drawn through jeweled dies, diamonds and rubies being chiefly used. Before the wire enters the die it passes through tallow or olive oil soap which acts as a lubricant.

Some wires are drawn wet, in which case a liquid lubricant is used. Various secret lubricants are in vogue for the wet process, sour beer being a favorite ingredient of most of them. When the wire is to be drawn wet it is polished to give a bright metallic surface and is then coated with copper by immersion in a bath of copper sulphate. The copper being softer than the steel forms a kind of cushion between it and the die. It is drawn into the wire and gives it a yellow color. The process of drawing is repeated until the wire is finished or too hard to be drawn further without heat treatment.

A Small Diesel Engine

What is believed to be the smallest internal combustion engine of the pure Diesel type has recently been completed by the Fulton Mfg. Co., Erie, Pa. It is a 90-hp. six-cylinder unit and was installed in a boat that will be used by the Government in the vicinity of Wilmington, N. C. A two-stage air compressor located on the forward end of the crankcase supplies the air pressure for starting and for fuel injection. From the compressor the air is led to three steel bottles, one of which is employed to supply the injection air that is led to the injectors located on the top of each cylinder. The surplus air is stored in the other two steel bottles for starting. Individual fuel pumps are provided for each cylinder. In this way if anything should happen to cripple one of the cylinders or the pumps it would be possible for the cylinder affected to be cut out and the engine run on the remaining cylinders. The flywheel is located at the after end of the engine instead of forward, this arrangement, it is pointed out, taking all unnecessary strain off the flywheel. In a test made of the engine it developed 100 b. hp. at a speed of 400 r.p.m. instead of the 90 b. hp. guaranteed. The consumption of fuel oil per brake horsepower per hour at the rated speed of 400 r.p.m. was 0.53 lb. instead of 0.55 lb.

Ashland Steel Output Increasing

The Ashland Iron & Mining Co., Ashland, Ky., expects to blow out its No. 1 furnace, which has been making silvery iron and ferrosilicon, before the middle of the present month. It is the intention of the company to put in a new hearth and tuyere jackets and at the same time arrangements will be made for running basic iron direct into the ladles for transportation to the company's open-hearth steel department. The company has in operation three open-hearth furnaces and will have three additional furnaces ready by Sept. 1. At present billets and slabs are being rolled for the market and sheet bars for the company's sheet mill department. Future plans include the erection of a plate mill and a universal mill.

The San Francisco Shipbuilding Co., San Francisco, Cal., has been organized to build concrete ships. An experimental hull is to be constructed and towed to Hawaii. If the test is successful the hull will be brought back, it is said, and fitted with engines. W. L. Comyn is named as president of the company and Alan MacDonald, chief of construction.

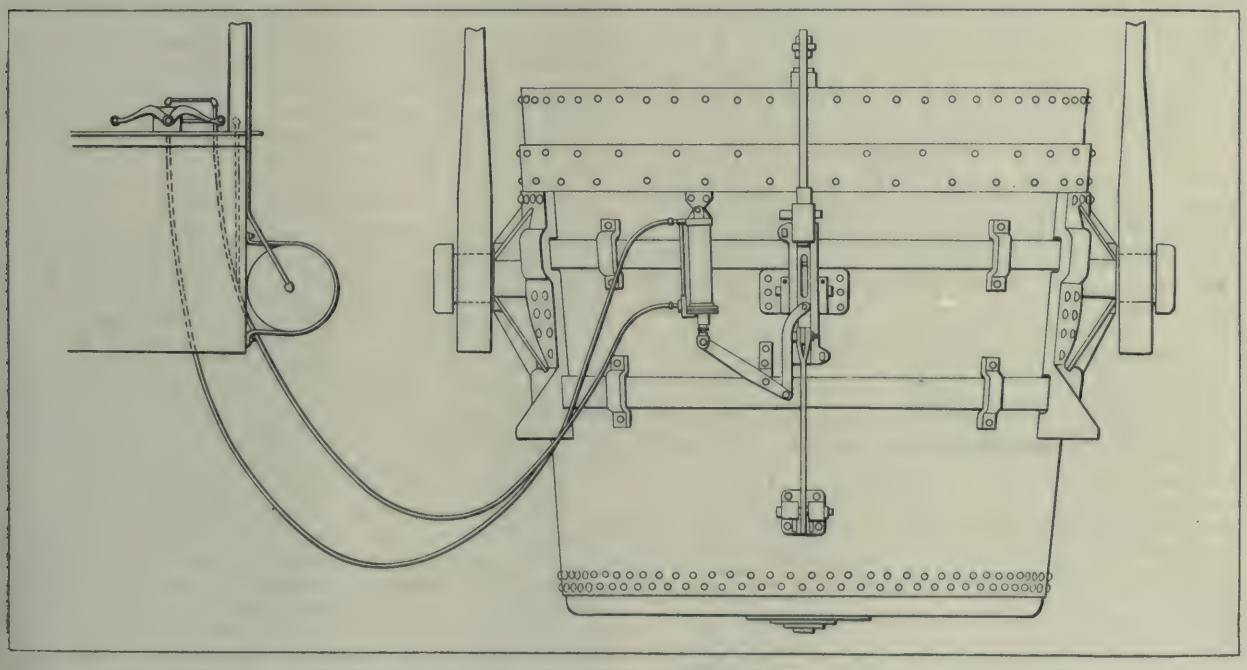
Officials of the Carpenter Steel Co., Reading, Pa., have purchased a controlling interest in the McHose & Co., Inc., Reading Firebrick Works, from William McHose Boyer, president, and Wilson V. McHose, treasurer.

A Mechanically Operated Ladle Stopper

The disadvantages of operating a ladle stopper in the usual manner in present practice are numerous, owing to the extreme heat of the molten metal, its liability to scatter over the operators and other causes. It is apparent that the ladleman and his helper standing on the platform adjacent the molds, occupy dangerous positions, because the gases escaping from the metal while the mold is filling keep the metal in motion and eruption, frequently causing some to fall on the operators. Again, the operators are sometimes fatally burned by the metal escaping from a ladle overturning when a rope, chain, hook or other part of the hoisting mechanism breaks, which is liable to occur at any time. It also occasionally happens after partly emptying the ladle, that the metal violently reacts, the escaping gas throwing the liquid metal to the roof of the building and rendering it extremely dangerous for the operators.

A further serious objection is that not infrequently the stopper will only partially close the nozzle opening, due to imperfect construction, thereby allowing a stream of metal to escape when the nozzle is supposed to have been closed. The nozzle also occasionally breaks, owing to sudden expansion when the hot metal strikes it, causing a leak, so that while the ladle is being conveyed from mold to mold, the metal from a leaky nozzle striking the top edges of the molds, splashes upon the operators and frequently burns them seriously.

To overcome these objections and obviate the necessity of employing ladlemen, George A. Wettengel has devised an improved stopper operating mechanism in which the operation of the stopper is entirely under the control of the craneman or the pusher, who is always a sufficient distance away to insure his safety.



Arrangement of the Pneumatic Apparatus for Mechanically Operating the Ladle Stopper in Pouring Steel

According to U. S. patent No. 1,207,251, it consists of a mechanical means of raising and lowering the ladle stopper. Secured to the ladle and to one side of the usual stopper mechanism is an air cylinder, as shown by the illustration, the piston rod of which is connected to the sliding plate by means of a link and lever. Mounted in the crane cage is an air valve similar to those used on pneumatic hoists having flexible tube connections to the cylinder and to the air tank. The ends of the tubes have quick detachable hose connections. A tank is attached to the crane and is supplied with air from a motor driven compressor. The operation of the device is as follows:

After the ladle full of molten metal is in place over a mold, the craneman raises the lever of the air valve admitting air under pressure to the cylinder which raises the stopper thus admitting the metal to flow through the nozzle into the mold. When the mold is full the lever is lowered so as to admit air into the opposite end of the cylinder, which lowers the stopper and stops the flow of metal. This is not only a safety device, but it is also a labor saver, no ladleman being required.

Scrap Congestion at Pittsburgh

At a recent meeting in Pittsburgh, called by the Pittsburgh district committee on car service, appointed to consider and decide upon a method of controlling scrap material, representatives were present from the mills, railroads and scrap iron dealers and it developed that a very serious congestion exists in the Pittsburgh district, due largely to uncontrolled shipments of scrap. This condition has become so bad that drastic action at Washington will be necessary, unless the shippers of scrap assist materially.

Eli Joseph, New York, chairman of the Sub-Committee on Scrap Iron and Steel of the American Iron and Steel Institute, has issued a letter calling attention to the conditions at Pittsburgh and adding:

> We would therefore ask that you notify all members of the trade through your columns, impressing them with the necessity—first for loading cars to the maximum capacity of the car, or in case of light material, to its visual capacity; second, to ship scrap directly to the consignees, not shipping to themselves or to dealers; third, eliminating the use of order bills of lading in every way possible; fourth, to absolutely discontinue the practice of shipping to intermediate points with a view to reconsigning to some other point when embargoes are lifted or conditions favorable to the shipper arise; fifth, to load scrap carefully to avoid rejections, to ascertain carefully the specifications of the mills to which they are shipping and to conform strictly to those specifications, as every reshipment and reconsignment works a great hardship on the railroads.

Mr. Joseph also points out that if the suggestions are not carried out, the railroads will discontinue the practice of reconsigning and their remedy in case of constant rejections and reconsignment will probably be to return the material to points of shipment, if not unloaded in the time allowed.

Col. W. S. Peirce, commandant Springfield Armory, has instituted new methods to stimulate the production and increase the loyalty of employees. Huge wooden clocks have been placed at the entrances of the two plants, the hands of which will mark the daily actual production and the tentative daily production program. Operatives working on piece work will receive medals for increased output.

New Steel Embargo Aimed at Plates

Designed to Bring Japanese Vessels Into Atlantic Trade for War Purposes— Shipping Board Takes Over 700 Vessels

WASHINGTON, Aug. 7.—The halting by Presidential order of exports of iron and steel plates, steel billets, pig iron and iron and steel scrap, pending arrangements intended to force Japan to send merchant ships to the Atlantic to help in the work of supplying the Allies, was the salient feature of the past week's war developments. Closely co-ordinated with this project in the program of the United States Shipping Board to beat the submarines is the action of the Emergency Fleet Corporation which on Aug. 3 took over, at a cost to the Government of about $150,000,000, approximately 700 vessels, aggregating nearly 2,000,000 gross tons, now building in the shipyards of the country for private account. Steps to increase the total number of wooden ships ordered by the Fleet Corporation to not less than 300 have also been taken by Chairman Hurley and Admiral Capps. Altogether the gigantic task of the Shipping Board has received the most powerful impetus given it since its initial program was launched.

Iron and Steel Embargo Aug. 15

A distinct sensation in the diplomatic corps at Washington was caused by the announcement of the instructions given by the President to the Secretary of Commerce for the guidance of the Division of Export Licenses concerning future shipments of iron and steel and explosives, amounting in effect to a hard and fast embargo taking effect Aug. 15. The new rules governing iron and steel shipments, which supersede all previous regulations, are as follows:

First. That all shipments to those nations associated with the United States in the war are, until further instructions, to be licensed freely, without reservations and without restriction, except iron and steel plates, pig iron, iron and steel scrap, and steel billets, for which licenses shall be granted only in case said articles are destined for actual war purposes or will directly contribute thereto.

Second. Licenses which may be properly issued will be granted for shipments of all iron and steel plates and structural shapes and other articles properly included under these general headings under the following conditions only:

(1) The application for such license must be received by the Department of Commerce, Division of Export Licenses, Washington, D. C., on or before Aug. 10, 1917.

(2) Such articles shall be completely made up and manufactured on or before Aug. 10, 1917.

(3) Such license shall be valid, and shall indicate that it is valid, only in case such shipments are covered by railroad or ocean bill of lading dated on or before Aug. 15, 1917.

With respect to the general term "explosives," used in the proclamation of the President on July 9, 1917, the following chemicals are included in its meaning: Ether, alcohol, sulphur, sulphuric acid and its salts, acetone, nitric acid and its salts, derivatives of benzol, phenol (carbolic acid) and its derivatives of toluol, mercury and its salts, ammonia and its salts, glycerine, potash and its salts, all cyanides.

Japanese Vessels Wanted in the Atlantic

While the new regulations with respect to iron and steel products covered by the President's proclamation positively prohibit exportations of these articles after Aug. 15, no secret is made here of the fact that negotiations are now on foot which are expected to result in the relaxation of the new restrictions as soon as a satisfactory agreement can be reached with the Japanese Government. For many months large quantities of structural steel and plates have been exported to Japan for use in shipbuilding, an industry that has had an amazing revival in that country during the past two years. The effect of this activity on the part of Japan promised to be two-fold: First, to absorb a large tonnage of steel shipbuilding materials sorely needed in the United States and, second, to enable Japan to dominate the carrying trade of the Pacific after the war and ultimately to give it a powerful influence in the trade of the Atlantic.

To meet this situation, diplomatic negotiations were undertaken to induce Japan to send a large tonnage of merchant vessels to the Atlantic to aid in transporting food and war material to the Allies. As these negotiations made but slow progress, the President and his advisers decided on drastic action, cutting off all steel supplies from Japanese ship builders. In order that the action taken by the United States might not present the appearance of a direct discrimination against Japan, the embargo on steel was made broad enough to cover all exports of shipbuilding material, while permitting war munitions free movement as heretofore.

In construing the term "war purposes," used in the President's order, it is authoritatively stated that this designation is not limited to the construction of war ships or the manufacture of any form of war material. The American Government regards it as of vast importance in the conduct of the war that there should be ample transportation facilities available for carrying food and war supplies to England and France; hence, if Japan will furnish a reasonable number of merchant vessels for this purpose, the President will be willing to lift the embargo on steel shipbuilding materials. As a collateral provision, however, the Japanese merchant ships sent to the Atlantic must be furnished under an agreement that the freight rates to be charged by their owners shall be reasonable and on a practical parity with the rates which the Shipping Board intends to enforce in the near future.

Norway Affected Also

The new rules regarding exports of iron and steel will also have an important effect upon the commerce of Norway. That country also has experienced an important revival of ship building since the beginning of the war and, in addition, has been engaged in furnishing large quantities of iron ore, pig iron and other metal products, as well as food, to Germany. The submarine campaign has cut heavily into Norway's trade with the Allies and neutral countries and to-day her merchant marine is said to consist of but 2,000,000 tons of which about 1,000,000 tons is tied up owing to the undersea menace. The American Government now threatens Norway with an absolute embargo on food as well as iron and steel commodities and has pointed out that the only condition under which certain limited amounts of the particular kinds of food needed by the Norwegian people and the very moderate quantity of iron and steel can be secured is that satisfactory pledges shall be given, not only that none of these things shall find their way to Germany, but that they shall not be substituted for Norwegian products exported to the Teutonic allies. In addition, Norway must release for the transatlantic trade all merchant ships now tied up and must guarantee a reasonable scale of freight rates. The Norwegian government has already indicated unofficially its intention to comply with the demands of the United States, the people of Norway facing starvation should this Government place an absolute embargo on food products.

Orders for 700 Ships Taken Over

The action of the Emergency Fleet Corporation in taking over all cargo vessels above 2500 tons capacity now being constructed in American shipyards was foreshadowed by an announcement made by General Goethals some time before his resignation as general manager of the Corporation was tendered to the President. While the Bureau of Navigation has published no figures since Feb. 1 of vessels under construction

in American yards, it is understood that a memorandum supplied to the Shipping Board by the Department of Commerce shows nearly 700 ships in excess of 2500 tons each. The average contract price of these vessels was about $150 per ton, and as they are on the average about one-half completed the Government will be called upon to pay upon the 2,000,000 gross tons about $150,000,000. Under the terms of the act creating the Shipping Board the Government will fix the price to be paid, and in the event that it is unsatisfactory the owners will be at liberty to accept 75 per cent of the amount tendered and to bring suit in the United States Court of Claims for the remainder alleged to be due.

Admiral Capps' order does not make it clear whether the Government intends to pay indemnities in any amount for contracts requisitioned upon which no work has been done, but it is probable that claims of this kind will be presented. It is a well-known fact that bare options on deliveries 18 months hence of vessels the keels of which have not yet been laid have recently been sold at handsome advances over the contract price. Hereafter the Government will rule upon every large ship contract for private account, even for repairs, and the entire shipbuilding industry of the country will be directed by the Shipping Board to the one end of speeding up new tonnage for the commerce of the Atlantic and to defeat the object of the submarine campaign.

It is understood that a corps of experts will at once begin a revision of the plans of the ships now under construction which have been taken over under Admiral Capps' order, the purpose being to eliminate all luxurious features and in many cases to remodel passenger vessels so as to make them more available for the carrying of cargos. In addition, the work of construction will be speeded up by doubling or trebling labor shifts and by working overtime where possible. Construction will also be expedited through the work of the Priority Officer of the War Industries Board, who will see that steel and other materials are promptly supplied to the various yards by the most conveniently located plants.

Merchant Ships To Be Taken

It is intimated that within ten days or two weeks the Shipping Board will issue another order, taking over every large merchant ship flying the American flag. Many of these vessels are now in the coastwise trade and will be transferred to the foreign service and operated chiefly between the United States and England and France. Many of them will be used as troop transports and for the conveyance of food and war supplies for the American army on the western front.

A decided impulse has been given to the building of wooden ships as the result of a conference between Chairman Hurley and Admiral Capps and a delegation representing the lumber interests of the country and especially the mill owners of the Pacific Coast and the so-called Southern Pine Association. There will be a substantial increase in the number of these vessels to be built—probably to 300—but it is nevertheless probable that 75 per cent of the big fleet of cargo carriers will be of steel.

Foreign Ships In Coastwise Trade

Administration officials are confidently counting upon an early report on the resolution recently introduced in the House by Representative Alexander at the instance of the Shipping Board authorizing the President to permit vessels of foreign registry to engage in the coastwise trade. Secretary of Commerce Redfield is in receipt of many inquiries concerning the status of the present laws with regard to the privileges of foreign vessels in the American coastwise trade and for the purpose of clearing up all doubtful points in reference thereto has authorized a statement saying that the chief purpose of the resolution is to allow Canadian vessels on the Great Lakes to do coastwise business between American ports.

The Canadian Government very handsomely acted on the matter some time since as concerns us, allowing the coastwise privilege to American vessels in Canadian ports. There is urgent necessity for the employment of all possible tonnage on the Great Lakes in the coal and iron ore hauling.

We need greater freedom in coastwise trade. Suppose for instance a British vessel discharged cargo at Norfolk and was ordered to Galveston for a cargo of cotton. Suppose also that there was need of coal at Galveston and this vessel could carry a considerable amount and had cargo offered. It could not take that cargo without subjecting itself to heavy penalties as matters now stand. As badly as coal is needed in New England for stocks the vessel could not proceed from Philadelphia to Boston with coal. It could not take lumber for shipyards, or anything else.

The passage of the Alexander resolution will be expedited by its introduction in the Senate before the House has acted, and it is confidently believed the measure will become a law within the next thirty days.

W. L. C.

French National Laboratories for Scientific Research

After a study of the question of the need of national laboratories in France, the special commission appointed for the purpose has made its report. After reviewing what private initiative has done in France and what the government and private enterprise have accomplished in other countries, notably in Great Britain, the United States and Germany, the commission concludes that there is an urgent need in France for the establishment of a national laboratory for scientific research. Such an institution could be placed under the control of the French Academy of Sciences in the same way as the National Physical Laboratory in London is placed under that of the Royal Society.

After hearing the report, the Academy of Sciences has passed a resolution to the effect that the establishment of a National Laboratory for Physical Science and Mechanics is highly desirable, and that it should be specially entrusted with the work of scientific research for the purpose of promoting industry. The resolution contains some hints as to the status, organization and administration of such a laboratory, further details of which are elaborated in the commission's report. As regards financial support for the new institution, the report states that in France it would be useless to wait for the large industrial firms to combine and take the initiative, as they did in Great Britain, and to try to start the laboratory without a Government grant. To ensure a successful start for the institution, about £20,000 would be required, apportioned among the central institution and its branches.

The Chandler & Farquhar Co. of Boston, a well-known hardware concern, celebrated its thirty-fifth anniversary the evening of Aug. 2. Certificates of insurance were given to employees under the group policy plan of the Massachusetts Savings Bank Life Insurance. The certificates range from $250 to $1,000, according to the length of service. A prominent feature of the anniversary was an address on "Women in Business," by Miss Alice H. Grady, financial secretary of the Massachusetts Savings Insurance League.

The American Steel Export Co., Woolworth Building, New York, has issued a 20-page booklet entitled "Export Engineering and Contracting." It describes the facilities which the company has for handling the export problems of American manufacturers. Brief descriptions of the work which the company is prepared to undertake in the construction of industrial plants of all kinds, as well as the exporting of machinery, is touched upon.

The Allentown Standard Mfg. Co., Allentown, Pa., which is building a new factory, has revised its plans so that a three story structure will be erected instead of a two story. The estimated cost will be $40,000. The company will manufacture sheet specialties and will employ about 400 men. The building will be ready for occupancy about October 15.

It is reported from Winnipeg that deposits of manganese dioxide have been discovered in the Cypress Hills, in southeast Alberta. Already 800,000 tons, worth approximately $54,000,000, have been blocked out. The product, it is stated, is being sold to the British war office at $68 per ton.

The Use and Abuse of Steel for Aircraft*

Troubles of British Aeroplane Makers in Obtaining Proper Material—Lack of Heat-Treating Skill—Electric and Crucible Steel—Value of Impact Tests

BY R. K. BAGNALL-WILD AND E. W. BIRCH

WHERE weight-saving is essential, the designer is constantly keeping in mind the necessity for strength combined with lightness and durability; it follows, therefore, taking a typical example, that the quality of steel used in aeroplane and aeroplane engine construction must necessarily receive very close attention. In the earlier days the Royal Aircraft Factory rendered the greatest of services in instituting detailed specifications for aircraft steels. Prior to this date the complete range of alloy steels had not been fully used for parts requiring great strength with a minimum of weight.

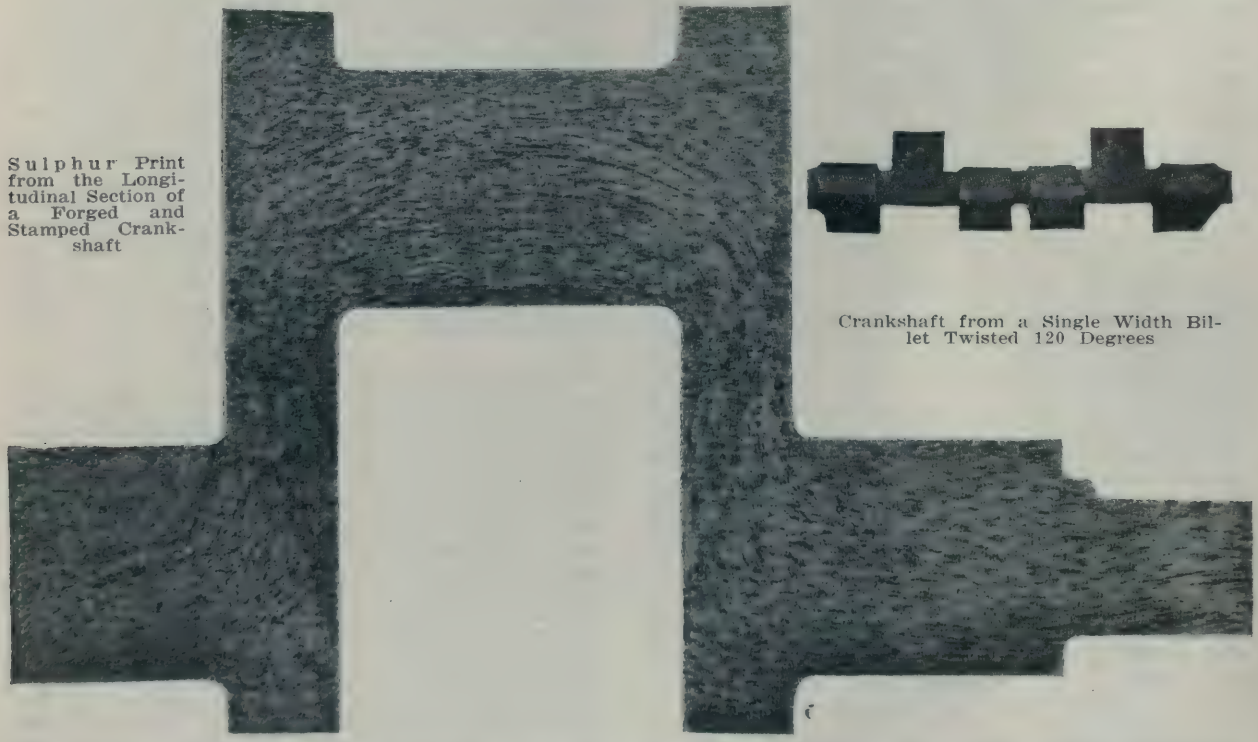
In many cases, firms engaged in the construction of aeronautical components had practically no knowledge of the treatment of special alloy steel. As matters progressed it was found from experience that some of the conditions required by the Royal Aircraft Factory specifications had to be altered and improved. Such progress was inevitable with the great increase of output in the earlier stages of the war.

The progress of the various manufacturers was made to give the same physical test results. Again, it is not generally realized that an alloy steel can be made to give physical tests covering a wide range by variation of heat-treatment.

One question in the choice of a steel by composition is its resistance to abrasive wear. Experience has shown that a relatively high nickel steel does not resist abrasion as well as a low nickel steel with low chromium. On the other hand, the very low nickel, high chromium steel is objectionable owing to its liability to defects in the form of cracks.

Importance of Heat Treatment

Close touch between the steel maker and the steel user is essential, and lack of this co-operation has led to many costly mistakes. A few degrees in temperature one way or the other may spoil a good steel. It is not sufficient to install a heat-treating plant with the latest type of pyrometer and then sit down and allow a semi-skilled man to do the rest. For instance, a firm recently expressed pride in its heat-treating



Sulphur Print from the Longitudinal Section of a Forged and Stamped Crankshaft

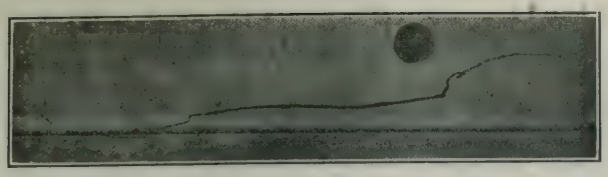
Crankshaft from a Single Width Billet Twisted 120 Degrees

very carefully watched, and every endeavor was made to assist them to promote and encourage developments. The object of this paper is to place on record some of the troubles experienced in the earlier days, and to a certain extent to-day.

A year or so ago very few firms, excepting in the Sheffield district, possessed heat-treating appliances of their own. Many plants have since been built, and this is specially the case in the Birmingham and Coventry districts. It is not, however, sufficient to build a heat-treating plant; it is essential to be able to use it correctly. But it is almost impossible to obtain men with the requisite knowledge. When steels are classified according to their mechanical properties, independent of chemical compositions, each composition requires a different heat treatment: Two steels differing widely in composition may, by different heat treatments, be plant and pyrometric installation, whereas observation of the interior of the furnace during a heat showed that the temperature was obviously considerably in excess of that recorded by the pyrometer. On examination the pyrometer was found to be incapable of reading higher than 440 deg. C., although the scale extended to over 1000 deg. In pre-war days it was the custom in a number of cases for firms who are now producing aeronautical components, to leave any process which required the steel to be heated in the hands of a foreman blacksmith.

A great deal of delay in production, waste of material and financial loss is undoubtedly caused by want of metallurgical knowledge on the part of some designers. Losses in time and money have also occurred owing to manufacturers not realizing that alloy steels require more careful handling than a carbon steel. For example, the machining of some crankshafts, rough machined prior to heat treatment, was in one instance

*From a paper presented before the Institution of Automobile Engineers (British).



Developed Surface of a Crankpin Showing Fracture and Hair Cracks

very rough and left many jagged edges and sharp corners. On heat treatment, these crankshafts developed serious cracks at 45 deg. to the angle of the web and the axis of the pin. At first the steel was blamed, next the heat treatment, but finally, after a considerable loss in cranks had occurred, the real truth was found out. During heat treatment the cracks started from the rough and jagged edges at the corners of the web and the pin.

Another great source of danger is the design. Designers naturally endeavor to curtail the dimensions of an engine. In one or two cases of engines of the 12-cylinder Vee type, this was effected by the substitution of roller bearings for the ordinary plain bearings.

The cranks were to be made from billets twisted through 120 deg., and the main journal where the twists had to be made was approximately 7/16 in. in length between the webs. It was anticipated that serious damage to the steel would result, since in order to twist the shaft, it had to be raised locally to so high a temperature that subsequent heat treatment could not restore the steel to such a structure as is required to give the physical properties demanded by the specification and desirable for the safety and life of the crank. A number of tests were made on these cranks after final heat treatment, with the following results:



Enlarged View of Hair Crack, 100 Diameters

It was next suggested that the cranks should be made from a double width billet so that the twist would not exceed 60 deg. This certainly improved matters, but did not entirely obviate the doubtful structure obtained in the twisted journals.

Various other methods were then tried; cranks were cut from the round, and they were also forged into trifoliate section; the latter is thought to be promising. If it is possible in the design to have, from the steel maker's point of view, a reasonable distance between the webs, it is obvious that some form of pressing from a bar billet gives the most suitable structure in the shaft. The flow of the metal is then continued through the journals, up the webs, along the pins, and so throughout the shaft, as shown by one of the illustrations, but such a form of combined stamping and forging is not possible with the very short main bearing.

	Yield Stress, Tons per Sq. In.	Max. Stress, Tons per Sq. In.	Elongation on 1.5 In., Per Cent	Reduction of Area, Per Cent
Straight portion of crank.	56.8	62.8	15.3	42.3
	51.3	56.8	20.7	56.2
Twisted portion of crank.	...	53.5	1.33	0.28
	...	52.5	1.67	0.25

A reluctance to heat-treat alloy steels after working used to be prevalent, and the necessity for heat treating after bending, welding or stamping, etc., was not fully recognized. Many firms were quite content to receive stampings as stamped; in some cases they normalized them, but such a process as quenching and tempering was regarded as a luxury or a fad.

Another drawback to progress was the fact that a number of steels were known by certain trade names, and were in fact proprietary articles. They were ordered as such, and no mention of any physical test was made on the order.

A big difficulty had to be overcome where a small steel maker produced a comparatively large output of crucible steel, which as produced was as near perfect as possible. Firms such as this greatly enlarged their plant, introduced the electric furnace, and other modern improvements, but in some cases the increased output was not as satisfactory as the previous small supply; in other words, they had to learn and adopt new methods under difficult conditions.

There is another point which makes steel production difficult in that the raw materials now available are variable. Pig iron (known by trade classification), instead of being uniform in composition as before the war, now may vary within very wide limits. As a result each charge becomes a separate metallurgical problem, and it is only by great skill that a relatively high degree of perfection has been maintained in the high grade alloy steels. Many of the troubles experienced from "hair cracks" are undoubtedly traceable not only back to the ingot, but to the steel making.

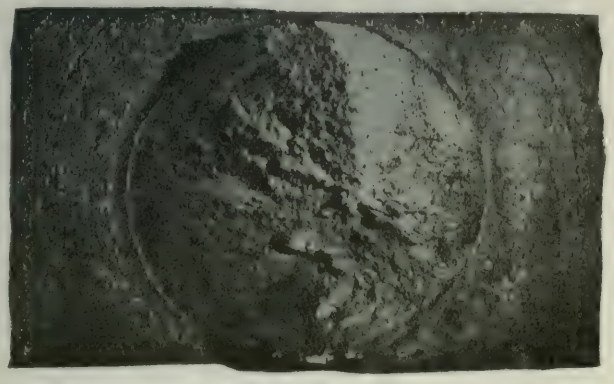
Hair Cracks and the Life of Shafts

Some interesting experiments have recently been carried out with a view to ascertain if crankshafts with hair cracks are dangerous as regards their life.

Assuming in the first place that a crankshaft has only a certain life, it was thought that minor hair cracks, scarcely visible to the eye, should not cause the rejection of a shaft, if it could be proved that such cracks do not develop before the shaft has become worn out, due to stress reversal. With this in view, an engine was tested with a crankshaft which showed certain cracks; it was proposed to run the engine for 100 hours, but the crankshaft broke at 78 hours.

It is certain that hair cracks, although longitudinal, are undesirable, as they form a starting point for circumferential fractures. In many cases the cracks can be traced from end to end of the shaft. There is no definite proof that they open out during a short period of running, but there is evidence that after 50 or 100 hours' work they show signs of developing and in some cases cause fracture of the shafts. Such cracks on a pin running in a white metal bearing must have a disturbing influence on the surface of the white metal. All evidence goes to show that these hair cracks are derived from defects in the ingot.

It is not economical to lay down a definite crop for every type of ingot, or even perhaps individual ingots. Some ingots undoubtedly require more than others. The difficulties may possibly be overcome by insisting on the cranks being forged down from ingots split either into two or four, preferably the latter. The amount of crop necessary, and even the desirability of using the particular ingot, could then be more readily judged. It is noted that the practice of turning blooms all over before cogging down is becoming more



Fracture of a Crankshaft Pin During Straightening Operation

prevalent. This undoubtedly saves wastage at a later date, and eliminates to a great extent surface defects.

The authors are strongly of the opinion that in addition to physical tests, analysis within reasonably wide limits should be specified. There is no doubt that the designer, especially the engine designer, is finding that some steels are more suitable for certain purposes than others. Many steels may satisfy the specification, but differ in chemical composition.

Value of Impact Tests

When the Royal Aircraft Factory introduced an impact test for aircraft steel, very considerable opposition was experienced. Records of tests show that in the earlier days impact test figures were very variable, and this was used as a basis for argument that the impact test as carried out did not give a true representation of the general properties of the steel.

To-day the impact test figures are far more regular, and in steels of a similar composition and tensile figures, from the same firm, the impact results are higher than they were two years ago. A number of experiments have been carried out in the Test House of the Aeronautical Inspection Department and elsewhere, with reference to the introduction of a round Izod test specimen. The results so far obtained have been extremely regular, but this may be argued not to be a sure indication of possible instability in the steel. At the present moment, however, even with the insufficient data available, it is thought that this form of test piece may be accepted in lieu of the square specimen.

The round test piece is suggested as the better, in that it eliminates the difficulty of machining to the standard form now in use. Inaccuracies in the "V" notch are thought to produce variations in the result obtained, but this is not altogether borne out in practice.

It is proposed not only to endeavor to introduce the round Izod test piece, but to allow it to be used with varying diameters. The amount of machining then required would be comparatively small.

A most important point at the moment is output. The steel maker is using every endeavor to produce steel free from roaks, flaws and cracks, but it is a fact that in spite of care, a quantity of faulty steel is delivered to the machine shop, and sometimes a large amount of work is done on it before the defects are found. Detailed inspection can do a great deal to prevent such steel leaving the steel maker; numbers of examples, however, can be put forward showing that much labor in this country is at present being wasted in machining faulty steel.

Steel High in Sulphur and Phosphorus

With regard to bolts required in mild steel, or rather what is so termed in aeronautical manufacture (35 tons ultimate), very great trouble has been experienced in certain directions. A large quantity of steel exists in this country which has a sulphur and phosphorus content in excess of 0.1 per cent. Such steel is well beloved by the screw maker, it cuts like cheese, does not wear out the dies, and allows a well-cut thread to be produced; on the other hand, it is absolutely dangerous for aeronautical purposes (it is not intended to criticize it for other uses). It is possible to keep down the sulphur and phosphorus content in crank steel to 0.03 per cent, though steel makers have asked a little latitude in this direction, which has been granted, but which it is very gratifying to note, is seldom if ever required. On the other hand, with the milder steels, a latitude for war production purposes of sulphur and phosphorus up to 0.06 per cent has been allowed.

Military specifications for the milder steels formerly did not include an analysis, neither did they include an impact test. It has now been found necessary to include either one or the other. It is obvious that a limit on the chemical content of sulphur and phosphorus will eliminate the dangers attending the use of steel high in these constituents. It is also interesting to note that an impact test of even 15 ft.-lb. on the Izod machine will have the effect of keeping these constituents low. With a percentage in excess of 0.06 practically no impact figure is obtained with this steel as used commercially.

The use of alloy steels for drop stampings has led to many disastrous results. These steels are delicate and require most careful manipulation. The stamper, when using mild steel, ran very little risk of burning it, and experienced no difficulty in making it fill the dies. The chief cause of failure with stampings in alloy steel has been due to the over-heating of the steel. In some cases this can be rectified by heat treatment, but in the majority of cases the stamping is spoiled. Too little attention is given by the stampers to the metallurgical side of the problem.

There is no doubt that in the average engine and aeroplane of to-day—and, the authors think, of to-morrow—air-hardening steel is not as essential as designers imagine. A steel which will give some 70 tons ultimate, with about 17 per cent elongation, will fulfill requirements, provided the designer uses discrimination. A medium nickel alloy steel with moderate chromium, provided the carbon is kept about 0.3 per cent, will satisfy the majority of requirements.

A considerable diversity of opinion exists as to the steel required for gear wheels. There is no doubt that the design of a suitable gear reduction, so as to allow an engine which runs at 2000 r.p.m. to drive an air-screw at 1200 or 1500 r.p.m., presents serious difficulties. Experience has shown so far that the air-hardened gear wheel is liable to pitting and subsequent disintegration, whereas the case-hardened gear does not show these defects. It must be borne in mind that these gears are not running under ordinary conditions. An aero engine must necessarily be of light construction, and therefore nothing is rigid, the crankshaft whips, the crankcase whips, and the whole engine is alive.



An Airplane Engine Cylinder Showing the Tearing of Fins During Machining

The evidence available tends to show that a case-hardened gear wheel is more suitable than the air-hardened one under these special conditions. A very large number of gear wheels have been examined, and although perfectly truly aligned and centered, the wear is not equally distributed along the tooth surface. There is evidence that periodic spot contact instead of line contact takes place.

Another example of trouble is illustrated by one of the illustrations, which shows the fins of an air-cooled aero engine cylinder which have been torn during machining. At one time this resulted in a considerable loss of output, and after careful investigation, the cause of the trouble was found to be due to the manganese content of the steel, which was a straight carbon, being too low. On increasing the manganese no further difficulty was experienced.

Discussion

There was a long and interesting discussion, the steel maker, the steel user and the stamper all being represented. The twist on the crankshaft received some attention, J. H. S. Dickenson quoting experiments in which he had twisted a shaft 120 deg. with 5/16 in. gap as against the 7/16 in. mentioned in the paper. At the same time, narrow gaps were not generally advocated. Dr. Rosenhain favored strengthening steel specifications in the direction of specifying the chemical analysis.

Dr. Hatfield, referring to some sulphur prints exhibited, said that the shape of the ingot was not everything. From the prints one might assume that if the ingot were made slightly broader at the top instead of broader at the bottom, and a refractory head was put on, all difficulties would be overcome. That was not so, and the art of steel making was not by any means as simple as that. Questions to be taken into consideration were the speed with which the steel was poured into the mold, and the casting temperature, *i.e.*, the heat of the metal when it was poured into the mold. Lastly, there was the composition; the amount of silicon, manganese and aluminum. These factors influenced greatly the soundness of the ingots. He pointed them out to show that there was no simple form of specification which would ensure freedom from trouble by the adoption of a certain weight of ingot or a certain amount of cropping.

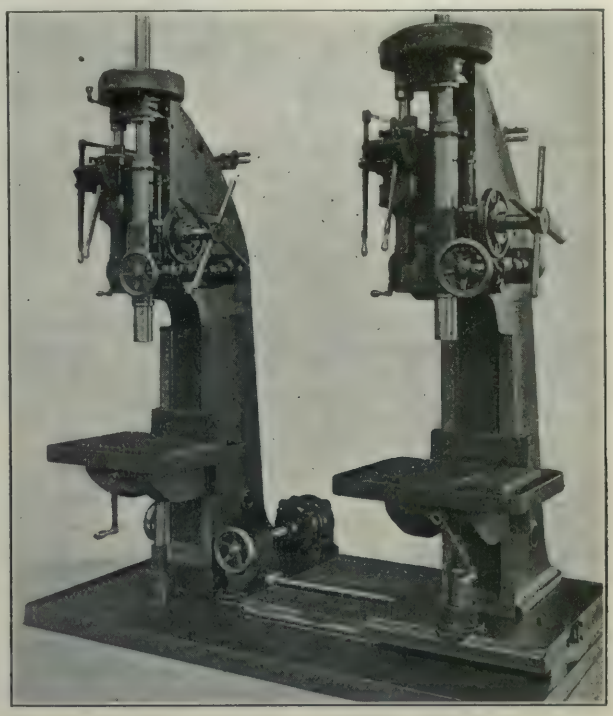
J. H. Brearley was opposed to "analyses within reasonably wide limits" being imposed in the specification. A heat-treatment department could not be expected to produce uniform properties in articles which had been machined from steels of variable and unknown composition. The manager of such a department could produce the best results only if he was able to formulate a treatment and stick to it, and if he had no voice in the matter it was quite time that those who had should bear this important consideration in mind when making their purchases. The easiest and safest of all steels for handling in the heat treatment department were the air-hardening steels, but they were correspondingly difficult for the steel maker and the stamper.

A. E. Berriman referred to an American system of twisting crankshafts in which all the twist came on the pin. He asked for information of the mechanics of the strain that went on during the process of twisting. T. Clarkson asked if the Whitworth process of fluid compression could be applied not only to the ingot but to the casting of the shaft. In that way a good deal of the subsequent work upon it would be avoided. He threw it out as a suggestion for solving one of the difficulties in connection with latent flaws.

The Charles A. Schieren Co., New York, has completed additions to its tannery at Bristol, Tenn., and work will be begun immediately to increase the company's output of leather belting. A working force sufficient to produce 24,000 lineal ft. of belting daily will be employed at the start and added to as rapidly as skilled help can be found until the full capacity of the plant, 50,000 ft. daily, is reached. This plant has been built to take care of a growing trade in the South.

A Double Spindle Axle Drilling Machine

A two spindle axle drilling machine, designed for the simultaneous drilling of both ends of the front axles of automobiles, has been brought out by Baker



Both Ends of a Front Automobile Axle Are Drilled Simultaneously, the Machine at the Right Having an Adjustment of 25 In. to Take Care of Variations in the Length

Bros., Toledo, Ohio. This machine consists of two units of the firm's No. 314 standard single spindle high speed drill mounted on a longer bed than the single spindle machine.

One machine is stationary on the bed, and the other adjustable unit at the right is held on a gibbed way and its movement is controlled by a square threaded screw that turns in a stationary nut, the screw being driven through a worm and worm gear from the armature shaft of a 1½-hp. motor located at the side of the stationary machine, as shown in the illustration.

The right hand machine moves 25 in. on its ways and the two drill spindles can be placed on a range of 35 to 60 in. centers. Each unit is driven independently from an overhead countershaft. The machine is designed to drive a 3-in. high speed drill to capacity. It has six speed changes and 12 feed changes. The distance from the center of the spindle to the face of the frame is 12¼ in.

Considering Price Control

The Merchants and Manufacturers' Association, Baltimore, Md., Robert J. Beacham, secretary, is expected to take action in the matter of Government control of prices of raw materials. The association has asked its members to express their opinion as to whether it should act on the question and what position it should take. "Should it openly advocate Government price control of all the primary elements of raw materials which enter into American manufactures, or should it advocate only the limitation of that control to such activities as will cut out the fictitious values due directly and exclusively to speculation?" it asks.

The association also wants to know how far the policy of price-fixing by the Government should be permitted to interfere with a seller's right to dispose of any commodities of raw material at a premium, if such sale involves a sale of special value or advantage to the buyer for which he is willing to pay.

The American Machine & Mfg. Co., Atlanta, Ga., announces that it will begin operating its new steel foundry with a capacity of 10 tons of finished steel castings per day on Sept. 1.

Role of Silicon in Steel Making*

Its General Effect an Indirect One —Influence on Mechanical Properties — Silicon Magnetic Steel

BY W. E. RUDER

FOR many years after Mushet found that quartz sand, when added to molten iron, produced a product that was hard and brittle, the presence of silicon in steel was looked upon with suspicion and distrust. Even to-day there are undoubtedly many metallurgists who would be very slow to specify even small percentages of this element for most grades of steel.

Less than 30 years ago, however, the researches of Barrett, Brown and Hadfield gave to silicon a place as a useful alloying element with iron, which has not since been usurped or even approached by any other element. It is true that in this country, some years before this, small percentages of silicon had been found useful to reduce magnetic aging of mild steels used in the construction of magnetic circuits, but the percentage was so small that it could scarcely be classed as an alloy steel.

The effect of small percentages of silicon, such as are met with in carefully made steel from any process, upon the mechanical properties has been carefully investigated by many authorities and it is the general concert of opinion that its effect is negligible. Where it has been found in proportions exceeding 0.1 per cent and poor results obtained, such results are usually traceable to accident or lack of care in manipulation during the process of manufacture.

Silicon and Mechanical Properties

In most of the investigations carried on by prominent investigators, the effect of silicon, particularly in amounts less than 1 per cent, have been masked or modified by the presence of varying percentages of manganese and carbon. In a recent paper Yensen has re-examined the series of forgeable silicon alloys, using as a base pure electrolytic iron and giving us a more exact idea of the effect of silicon alone. Although his figures differ in some cases from those found by previous investigators the general trend of his curves is the same.

Silicon increases the tensile strength of pure iron from 38,000 to about 90,000 lb. per sq. in. at 4 per cent in annealed samples. Beyond this point the value rapidly falls off. The elastic limit is likewise steadily increased up to 4 per cent silicon. The ultimate elongation and reduction of area are practically unaffected until 2.5 per cent of silicon is reached. From this point the drop is rapid.

It is interesting to note that whereas Yensen's values for elastic limit and ultimate strength are generally lower than those of previous investigators, his values for reduction of area and ultimate elongation are in general higher, particularly for silicon content below 2.5 per cent. This would indicate that silicon in itself does not cause brittleness when below 2.5 per cent, and that the presence of small percentages of carbon increase the strength at some sacrifice of ductility. The decrease in ductility is about coincident with the beginning of the marked tendency for large grain growth which silicon imparts to mild steel and with the beginning of the precipitation of graphite.

Although the limit of forgeability is given as about 7 per cent of silicon, the practical limit for sheet rolling is something under 5 per cent.

An interesting new development in the study of iron-silicon alloys is noted in Yensen's work in which he appears to have established a heretofore unnoticed critical point at which there is a sudden drop in all mechanical values at about 2.5 per cent of silicon. The phenomenon was first noticed from the fact that two ingots in this range broke up in forging. A further examination showed that there was a sharp drop in all values at 2.5 per cent and an equally sharp recovery at 2.7 per cent of silicon. The formation of a compound $Fe_{19}Si$ is suggested as an explanation but seems hardly adequate. However, no satisfactory explanation has yet been arrived at.

Silicon and the Critical Points

Gumlich has shown that the second magnetic transition point is steadily lowered with increased silicon content until it reaches a value of about 660 deg. C. for 8.35 per cent silicon, while the first (pearlitic) point steadily rises, the two coinciding at 2.2 per cent silicon, and becomes practically extinct at 2.5 per cent silicon. In an exhaustive study Charpy and Cornu-Thenard later confirmed this observation and definitely connected the disappearance of the A_1 point with the precipitation of graphite.

Silicon forms a solid solution with iron in all proportions up to about 20 per cent of silicon and since this is far beyond the region of present usefulness it is unnecessary to discuss, at this time, the iron-silicon diagram.

Silicon and Magnetic Properties

Just as tungsten, chromium, nickel and manganese have found their specific uses when alloyed with iron, so also silicon quickly found its place as an alloy for magnetic circuit for alternating fields. Although carbon steels containing from 0.2 to 0.4 per cent of silicon are made for tires and automobile springs, and certain tool and gun steels are reported to have from 0.3 to 0.6 per cent of silicon, the almost exclusive use of silicon alloys is for magnetic circuits. Something over 100,000 tons of silicon alloy sheets were used in this country alone during the past year.

Silicon raises the resistivity of mild steels about 10 microhms per cubic centimeter for each per cent added, so that a silicon steel containing 4.5 per cent of silicon has a resistivity of 59 microhms per cubic centimeter. This has an important effect in reducing the eddy current losses.

Gumlich found that the coercive force was very greatly improved by the addition of 0.06 per cent of silicon in both rods and sheets. This improvement continued in the sheets, reaching its lowest value at 0.4 per cent of silicon and thereafter rising. In rods, however, there is an immediate rise up to 1 per cent of silicon, and then a gradual falling off.

Yensen, on the other hand, working with very pure alloys in the shape of rods only, finds two minimum points of equal value, one at 0.15 per cent silicon and one at about 4 per cent. In maximum permeability there is fair agreement as to the shape of the curve, that is, each shows two maximum values at about 0.2 and 3.5 per cent respectively, although their numerical values differ very greatly. In this case, however, we are comparing Yensen's rods with Gumlich's sheets. From his rods the latter gets widely different and unexplained results.

The explanation of the wide difference which Gumlich finds between sheets and rods and the agreement in the shape of his curves for sheets with those of Yensen's rods probably lies in the fact that the former's sample contained from 0.18 to 0.34 per cent of carbon. This carbon remained in the combined form for the rods under 2 per cent silicon, while in the sheets it precipitated out as graphite, this graphitization being aided in this case by the freer access of oxygen during

*From a paper presented at the Twentieth Annual Meeting of the American Society for Testing Materials, Atlantic City, N. J., June 27, 1917. The author is in the research department of the General Electric Co., Schenectady, N. Y.

the annealing and possibly by the fact that it had more severe mechanical working.

Effect of Silicon an Indirect One

The effect of silicon, therefore, seems to be, unlike that of the ferromagnetic metal cobalt, an indirect one. Its first effect is to act as a deoxidizer, its presence in small percentages indicating its excess over the amount of removable oxygen originally present, and therefore explaining the first peak in permeability curve and depression in hysteresis value. From this point on to about 2 to 2.5 per cent, the silicon merely acts as a diluent causing a steady drop in saturation value and permeability and an increase in coercive force. At about 2 per cent, however, its influence as a grain growth stimulator becomes evident (Hadfield) and there is a consequent rise in permeability and decrease in coercive force. This effect reaches a maximum and from this point onward any added silicon again acts as a mere diluent.

In some recent unfinished experiments I have gathered some evidence that hydrogen appears to form an alloy with iron producing much the same effect on the maximum permeability and saturation value. This alloy, however, appears to be stable only at low temperatures.

The increased solvent power for gases imparted by the silicon and the decreased solvent power for carbon are also undoubtedly large factors where these are present. In commercial silicon steel these properties are of the utmost importance. Charpy and Cornu-Thenard have shown that a 3.9 per cent silicon steel containing 0.14 per cent of carbon had its carbon completely separated out as graphite after an annealing of three hours at 800 deg. C. This graphitization accounts in part for the second maximum point, particularly in alloys containing over 0.1 per cent of carbon.

Effect of Grain Size

The effect of grain size on the two components of total watt loss, namely, hysteresis and eddy currents, and upon the permeability, is interesting and the reason is not altogether clear. Increased grain size causes a decrease in hysteresis and an increase in permeability at medium and low densities. The eddy current losses increase with the grain size but apparently not in as direct a ratio as the decrease in hysteresis. From recent data, this increased permeability seems to be due to a higher permeability in the direction of crystal orientation and the high eddy loss to a consequent non-uniform permeability in the cross-section tested.

Heretofore it has been considered that the resistivity of the material and the thickness of laminations was the sole factor governing the eddy current losses, but I have found many cases where the eddy current losses have been doubled with increased grain size without change in resistivity or thickness in lamination.

Increased grain size in the direction of rolling also accounts for the increased permeability and decrease in watt loss of silicon steel when tested in sheets cut parallel to the direction of rolling when compared with those cut across.

Other elements as tin and arsenic have been shown (Burgess & Aston) to have similar effects upon magnetic properties of iron, but none of them combines all of the beneficial effects of deoxidation, graphitization, increased grain size, increased electrical resistance and solvent power imparted by silicon.

Newman Erb, president of the British Columbia Copper Co., 42 Broadway, New York, has begun suit against the Bettendorf Co., Bettendorf, Iowa, manufacturer of cars and railroad equipment, for $2,681,480, alleged to be due to him on a contract with the Russian Government. Mr. Erb sets forth in his bill of complaint that he obtained a contract from a commission known as the Direction of Railways of the Imperial Russian Government for 4000 gondola cars of 40 tons each, and subsequently made a contract, he claims, with the Bettendorf Co. to build these at $1,436.30 each. It is charged that the defendant failed to carry out the contract.

GUNS FOR ARMY

Surmise in Regard to Large Appropriations Asked by Secretary McAdoo

WASHINGTON, Aug. 6. — The largest item in the latest estimates submitted by Secretary McAdoo and referred to in THE IRON AGE of Aug. 2, calls for $2,468,613,000 for "armament of fortifications." This demand came upon Congress like lightning from a clear sky. The amount is more than has been spent upon coast and harbor fortifications in the past 20 years and the fact is being emphasized here that the Chief of Engineers of the Army in his annual report, submitted to Congress last December, stated that our seacoast fortifications were satisfactory so far as attack from the sea was concerned and only needed protection against aerial attacks or assaults from the rear. It is well known that the Ordnance Bureau has contemplated the strengthening of the fortifications with 17-in. guns at a few points along the coast, but it has been the freely expressed opinion of ordnance experts that no advance in marine gunnery has been made that would render our coast defenses vulnerable. It will be surmised in well informed quarters that a large part of this appropriation will be utilized in providing artillery for the new national army. Under a rule of the House, ordnance items to be considered by the Committee on Appropriations are usually classified as "armament of fortifications" for the reason that the committee originates the annual fortifications bill while other ordnance items are handled by the Committee on Military Affairs. The form in which these estimates are presented encourages the belief that the Congressional leaders are now prepared to relax many of the restrictions heretofore imposed on the expenditure of appropriations for war material.

Sharon Steel Hoop Co. Extensions

The Sharon Steel Hoop Co., Sharon, Pa., as noted briefly on page 222 of THE IRON AGE of July 26, will make some large extensions to its Youngstown Iron & Steel Co. plant. Severn P. Ker, president, states that the extensions consist of the addition of two new 75-ton basic open-hearth furnaces, these being exact duplicates of the four furnaces now in operation at that plant, also one 4-hole soaking pit, duplicating its present three 4-hole soaking pits, and also the addition to the electrical power equipment of a reversing motor and motor generator set to drive what is now a three-high universal slabbing mill, but after installation of the new power, will be changed to a two-high universal slabbing mill. The electrical equipment to be added is a typical reversing set with motor generator fly wheel set, and the contract for all the electrical equipment has been given to the Westinghouse Electric & Mfg. Co., but so far no other contracts have been placed. No additions to the finishing mill capacity in the Youngstown Iron & Steel Co. mills are included in this program, or contemplated in the near future.

A New Grinding Wheel for Munitions Plants

A grinding wheel in which the grains of the abrasive are welded together has been brought out by the White Heat Products Co., Frazer, Pa. Among the advantages claimed for the wheel are a faster cutting speed and a longer life, together with the generation of less heat when cutting tool steel. The wheels are made by a secret process from bauxite. It is stated that wheels can be made from the raw material to the finished product in 48 hr., a feature which enables deliveries to be made quickly on orders for special wheels.

The American Ship Building Co., Cleveland, will launch a new freighter, building for M. A. Hanna Co., from its Lorain, Ohio, yards, Aug. 11. The vessel will be named the Carmi A. Thompson, after the former Secretary of State of Ohio who is now identified with the Great Northern ore properties.

Light versus Heavy Reductions in Cold Working Brass*

In a paper entitled "An Investigation Leading to Specifications for Brass Condenser Tubes," by Prof. A. E. White, delivered at the last annual meeting of this society, the statement was made that: "It is likewise more desirable to reduce the thickness of the tube by many light drafts than by a few heavy drafts. Such procedure guarantees more thorough and uniform kneading and interlocking of the tube grains."

In the discussion the writer called attention to the fact that no evidence was presented in support of this statement, and that it was contrary to established practice. The proper degree of reduction is later defined by Professor White as one "which should only be just heavy enough to work the metal all the way through" without defining any method of determining what constitutes that degree. It is quite certain that experienced brass workers could not make such a determination. It is felt by the writer that if there was a difference in results obtained by a series of relatively light passes as compared with one heavy pass effecting the same total reduction, the fact could readily be determined. In order to obtain some data on the subject, the following experiments were performed.

A sample of cartridge metal was rolled down to approximately 0.200 in. thick and very carefully annealed. This sample was then cut into two pieces. Sample No. 1 was rolled to 0.098 in. thick in one pass, while sample No. 2 was rolled to precisely the same thickness in six passes. From each piece three test samples were cut and submitted to physical test with the results shown in Table 1. A microscopic examination was also made. It is evident from both the physical tests and microscopic examination that the only difference between the material which was given six passes and that which was given but one pass is that the latter has a higher tensile strength and slightly lower elongation.

TABLE 1—TESTS OF ROLLED CARTRIDGE METAL

Sample No.	Tensile Strength, Lb. per Sq. In.	Elongation in 4 In., Per Cent
1 (One pass)	79,130	5.0
	79,760	4.25
	77,770	5.0
Average	78,890	4.75
2 (Six passes)	77,420	4.75
	77,870	5.25
	78,340	4.75
Average	77,880	4.92

As a further check on this experiment a sample of high brass rod containing a small percentage of lead was drawn to ½ in., carefully annealed and treated precisely as in the preceding case, except that a reduction of 50 per cent was effected in one sample by one draft through a die, while a similar reduction was effected on the other rod by five successive passes. The results of physical tests are shown in Table 2.

It is certain that nothing indicates that any superiority is possessed by the samples from material reduced in several passes, over that reduced in one pass.

Upon examination of the ends of the rods after drawing it was found that those passing last through the die were cupped because of the greater flow of metal near the surface, and that the cup in the rod having five passes was much deeper than in the other case. It is this uneven flow which produces the internal strains which cause season cracking. It was therefore decided to investigate this phenomenon further. A rod of high brass, free from lead, was extruded and drawn to 1 15/16 in. diameter and carefully annealed. One portion of it was drawn to 1.415 in. in diameter in one pass and an adjacent portion to the same diameter in five passes. Prior to drawing, the ends of the rods were accurately squared up in the lathe.

TABLE 2—TESTS OF DRAWN BRASS ROD

Sample No.	Tensile Strength, Lb. per Sq. In.	Elongation in 4 In., Per Cent
1 (One pass)	94,450	4.25
	94,300	4.25
Average	94,380	4.25
2 (Five passes)	93,700	4.25
	93,450	4.25
Average	93,580	4.25

It is planned to investigate the relative intensity of the internal strains in these two rods and report the results obtained later. A careful microscopic examination was made of each rod but no differences could be detected.

While these experiments cannot be considered as conclusively demonstrating the falsity of the statement quoted at the opening of this paper, at the same time they are better evidence than any evidence that has been presented in support of its truth. It is therefore felt that it is not yet necessary to abandon the existing methods of working brass in favor of that recommended by Professor White.

*From a paper presented at the twentieth annual meeting of the American Society for Testing Materials, Atlantic City, June 26 to 29, 1917. The author, W. Reuben Webster, is general superintendent, Bridgeport Brass Co., Bridgeport, Conn.

Cement Joints for Cast-Iron Water Mains

At Long Beach, N. Y., there are 60 miles of cast-iron water mains, varying from 4 to 24 in. in diameter, and laid with cement joints. They are all under pressures ranging from 40 to 80 lb. per sq. in. Charles H. Shaw, in a recent paper before the American Society of Civil Engineers, described the method of making these joints.

The author recommends the use of dry jute, free from oil or grease, instead of oakum for the foundation ring. The Portland cement is to be placed dry on a piece of canvas (a torn sack) under the joint and to be moistened and mixed to such a consistency that when gripped firmly in the hand the paste should retain its form but crumble if dropped from a height of 12 in. The paste is then to be hand-packed into the joint and to be hand-rammed with a caulking tool until the socket is half full. The joint is then to be filled and caulked with an iron tool and heavy blows with a hand hammer, until the cement is thoroughly packed, and the packing to be continued till the joint is nearly full. A small bead of neat cement in plastic condition is then put on, using the caulking tool for smoothing like a trowel. After the cement has set the joint is to be covered with earth so as to protect it from the air and sun. The back filling of the excavated material is to be settled with water. About 20 per cent of the cement is generally wasted. The joint is allowed to stand 48 hours before the pressure is turned on.

It is stated that such cement joints will stand a great deal of rough treatment and that settlements to the extent of 3 in. and more have occurred without destroying the seal. As regards cost, according to the written communication of another member, a cement joint is cheaper than a lead joint but more expensive than one made up with "leadite."

Steam Turbine for Boiler Feed Pumps

For driving boiler feed and circulating pumps, fans and blowers the General Electric Co., Schenectady, N. Y., has developed a steam turbine of the impulse type. A wide range of capacities is covered, the number of stages and rows of buckets being dependent upon the capacity of the unit. The wheel casing is of the split type and is lagged with planished iron. In this way, it is pointed out, the buckets which are of bronze, dovetailed into the rim of the wheel, can be readily inspected. A constant running speed is maintained by a governor mounted directly on the shaft and controlling a double balance piston valve type throttle. A handwheel adjustment provides for changes in speed while the turbine is in operation. The rigid frame of the turbine is supported by three feet which are relied upon to keep the bearings in line at all times, and the main shaft carrying the turbine and governor runs on babbitted bearings with a renewable lining.

Molybdenum is found in the Siamese Malay States and at Chantaburi, on the east coast of the mainland of Siam.

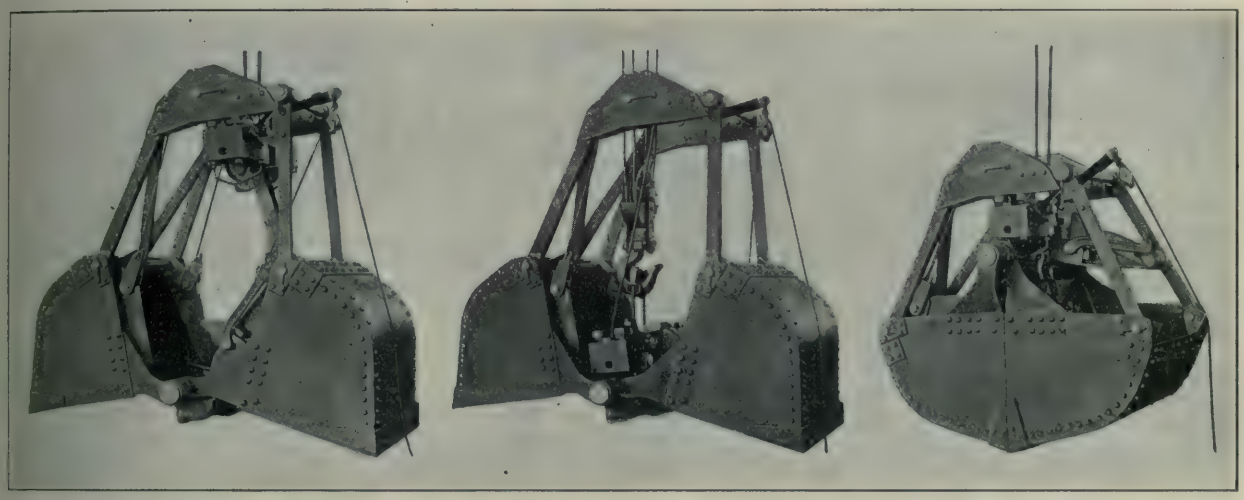
New York Interests Buy Bon Air Plant

The Bon Air Coal & Iron Corporation will be organized with a capital of $10,000,000 to take over the Bon Air Coal & Iron Co.'s properties at Allen's Creek, Eastland, Bon Air and Ravenscroft, Tenn., which have been in receivers' hands for seven years. The new company will improve the two stacks and six Gordon hot-blast stoves which the old company operated at Allen's Creek and will add two more stoves, increasing the output to 200 tons a day. At Eastland the company had 200 beehive ovens which produced 80,000 tons of coke a year. The coal mines of the corporation are located at Bon Air, Ravenscroft and Eastland, and it is the purpose of the new owners to increase the output of coal to 10,000 tons a day. Included in the purchase are 27,000 acres of timber land in Wayne County, Tenn., and this property is reported to contain rich iron deposits which will be developed later. The officers of the Bon Air Coal & Iron Corporation are Alex. R. Peacock, New York, president; W. J. Cummins, Nashville, vice-president; A. J. Moreland, Pittsburgh, secretary and general manager; John McE. Bowman, New York, treasurer and chairman. Mr. Peacock was formerly vice-president and sales manager of the Carnegie Steel Co., and Mr. Moreland was once connected with the same company. Mr. Bowman is a leading New York hotel man, interested in the Biltmore, Manhattan and Commodore hotels.

A Single Hoist Type of Grab Bucket

As a substitute for the double hoist or two-line grab bucket, Edgar E. Brosius, Pittsburgh, has brought out an automatic single hoist type. The bucket is designed for use in iron and steel foundries, rolling mills and industrial plants. Among the advantages claimed for the bucket are that it can be attached to any crane or hoist by simply throwing the hook block of the bucket over the hook of the crane, operates in limited headroom and trips by hand line from the operator's cage or ground without any shock to the crane or bucket.

In the open position the hook block is lowered until the cross-head of the bucket comes all the way down and allows the latch to engage. The hook is then hoisted until the bucket is closed, and the load raised. When it is desired to dump the bucket the hand line is pulled either from the operator's cage or the ground. This releases the latch which holds the two sections of the bucket together, thus permitting the bottom scoops to fall open again. The shock of opening is absorbed by causing the bucket to climb its own hoisting cable, an arrangement which is relied upon to permit the bucket to drop open easily without jar either to itself or the crane.



The Movement of the Hook Block Controls the Opening and Closing of a Single Hoist Grab Bucket

The bucket is used in rolling mills for removing roll scale from the pit, as well as handling miscellaneous material around the plant. In industrial plants the bucket has been installed on locomotive cranes for handling stock material at irregular intervals. When used for this purpose it is pointed out that it is not necessary to change from the fall block to the ordinary two-line bucket which keeps the crane out of commission from 1 to 3 hr. every time the change is made.

Large Lake Ore Shipments in July

Shipments of iron ore from the Lake Superior region in July this year broke the record for the same month last year by 5.04 per cent or 491,476 gross tons. The total was 10,241,633 tons against 9,750,157 tons in July, 1916, the record month at that time. The totals by ports, with season shipments and a comparison with 1916, are given below:

Port	July, 1917	July, 1916	To Aug. 1, 1917	To Aug. 1, 1916
Escanaba	932,274	1,044,368	3,137,571	3,647,192
Marquette	643,887	680,779	1,269,636	1,334,919
Ashland	1,238,326	1,302,682	3,147,794	3,506,945
Superior	2,231,502	1,986,631	5,757,584	5,865,546
Duluth	3,543,873	3,012,492	8,672,767	9,338,482
Two Harbors	1,651,771	1,723,205	4,391,416	5,172,640
Total	10,241,633	9,750,157	26,376,768	29,365,724
1917 increase	491,476	.....	.....	.....
1917 decrease	.....	.....	2,988,956	.....

The season's shipments to Aug. 1 are less than those for last year by 10.17 per cent. The Duluth percentage of this total is 32.88 per cent against 31.80 per cent last year, while that for the Great Northern also reveals an increase of 18.09 per cent this year against 17.50 per cent last year.

The Alexander Milburn Co., Baltimore, Md., manufacturer of lighting and welding apparatus for industrial plants, has opened a New York office at 51 East Forty-second Street in charge of W. F. Barnwell.

Natural Gas Prices Advance

The Pittsburgh and West Virginia Gas Co., supplying towns in Harrison, Lewis, Marion, Monongahela, Taylor, Tyler and Wetzell counties, has made application to the public service commission for permission to increase its rates on natural gas supplied to industrial concerns. The company now charges 22c. per 1000 cu. ft. for 150,000 ft., 17c. for the second 150,000 and 11c. a thousand for all over 300,000. The application is to establish a rate of 22c. per 1000 for all gas up to 500,000 cu. ft. and 16c. per 1000 for all over that quantity. It would also raise the rate to schools, public buildings, hospitals and churches from 16c. to 19c. per 1000 ft. The present rate of 23c. per 1000 for domestic use would stand.

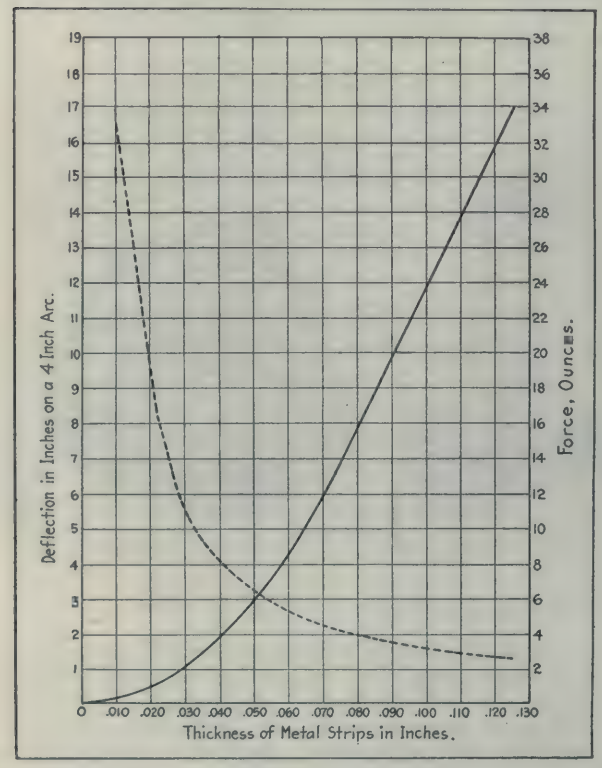
C. W. Leavitt & Co., 30 Church Street, New York, as buying agents for foreign clients, will be interested to receive catalogs and quotations for export on oil and tar heater furnaces for tempering and annealing steel as well as on furnaces for hardening tools of high-speed steel, on pyrometers and other apparatus useful in producing high-grade steel.

A NEW THERMOSTATIC METAL

Curves or Regains Its Straightness as the Temperature Rises or Falls

A NEW metal, known as G-E Thermostatic Metal, which takes a curve or regains its original straightness in accordance with well defined laws as the temperature rises or falls, has recently appeared. It is the product of the General Electric Co., Schenectady, N. Y. As a result of this responsiveness to temperature change and the mechanical force developed, this metal is used to actuate various mechanisms which tend to neutralize either the temperature change or its effect upon devices.

The new metal consists of two strong non-corrosive metals possessing a wide difference in coefficients of expansion, the widest difference possible for any known stable combination of metals. These two metals are firmly attached to each other throughout their entire length so that there is no slip of the one upon the other.



The Dotted Curve Shows That the Deflection per Degree of Temperature Is a Constant for Any Definite Piece of the Thermostatic Metal. The other curve shows that a piece of the metal, 1/10 in. thick by 5/16 in. wide by 4 in. long, on being restrained from binding when subjected to a temperature change of 100 deg. Fahr. will exert a force of 24 oz. or 1½ lb.

Thermostatic metal can be cut, stamped or pressed into practically any desired shape and when annealed will have all its original inherent qualities. It will not deteriorate nor take permanent set under applications of heat or force within definite practical limits, according to the claims of its originators. The metal is manufactured in various standard thicknesses ranging from 0.25 to 0.015 in. with a maximum width of 4 in. and a maximum length of 36 in.

As an indicator this metal is regarded as remarkable in that it can be used for temperatures as high as 500 deg. Fahr. The deflection per degree of temperature change, besides being quite considerable, as shown by the dotted curve in the illustration, is a constant for any definite piece of the metal. Since a definite and considerable opposing force is necessary to cause the metal to take permanent set, the metal can be depended upon when used in devices where extreme accuracy is required.

If the curving of this thermostatic metal on heating or cooling is opposed, the metal will produce a mechanical force, which is limited only by the force required to produce permanent set. For example, the pull line curve, in the illustration, shows that a piece of thermostatic metal 1/10 in. thick, 5/16 in. wide and 4 in. long will exert a force of 24 oz. (1½ lb.) on being restrained from bending when subjected to a temperature change of 100 deg. Fahr. This curve illustrates the laws that the force exerted by this metal varies as the square of the thickness, directly as the width and as the square of the temperature.

The deflection for any given temperature change varies directly as the square of the length of the piece of thermostatic metal and inversely as the thickness of the piece. As previously pointed out the deflection of any piece of metal varies directly as the temperature change.

G-E thermostatic metal is used in the products of many different industries owing to the fact that it can be successfully worked into different shapes and forms. In some of its applications it is used to actuate mechanism directly by means of the force developed within itself when its tendency toward assuming a curved shape is restrained. In other applications it is used to close and open the contacts of electrical circuits by means of which various devices are operated.

It has possibilities in carbureter manufacture, in automatically controlling the richness of the mixture as the temperature changes; in scales, balances and other scientific instruments in compensating for errors due to temperature changes; in furnaces, incubators and refrigerators for controlling the temperature. In these latter applications the non-corrosive characteristics of the metal are to its advantage.

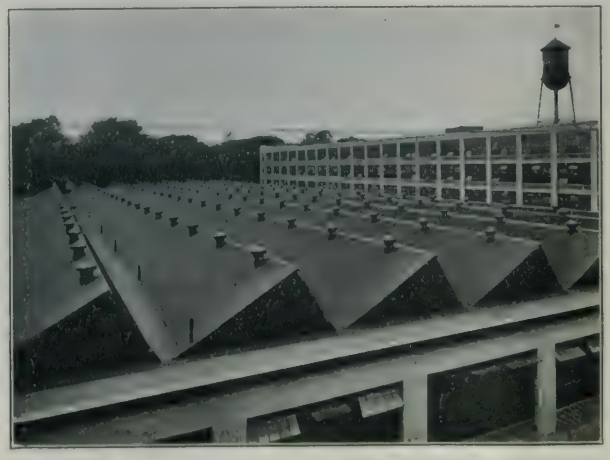
The reliability of this metal has merited its use in thermometers and has gained consideration for it as a compensating device in watch balances, and it is but a step forward to see it used in the proverbially accurate ship's chronometer.

Thermostatic metal is a product of the Fort Wayne, Ind., Works of the General Electric Company where the desirability of a metal with its characteristics arose from necessities in the construction of certain types of electric meters. This metal met the requirements so fully that manufacturers who had thermostatic and heat compensation problems adopted it as a matter of course.

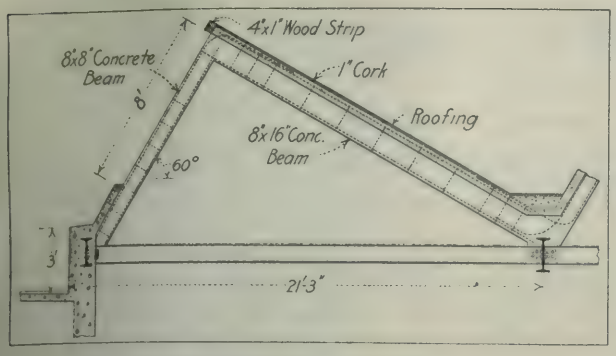
Sawtooth Roof for Firearms Plant

A one-story addition to the plant of the Colt's Patent Fire Arms Co. has recently been completed by the Aberthaw Construction Co., Boston. A four-story factory was built last fall, but the increase in orders for army revolvers has made necessary the addition of nearly 3 acres of floor space.

The addition is covered by a sawtooth roof running lengthwise of the building so that the glass area is exposed to a north light. The framing is structural steel supported on round steel columns, the bay spacings being about 21 ft. each way. The outside columns and the floor are of reinforced concrete and heavy reinforcement was necessary in the latter on account of bad ground conditions. Some 260 tons of structural



Sawtooth Roof Covering a Recent Addition to the Colt Fire Arms Plant Which Is Protected by a High Woven Wire Fence and Barb Wire



A Typical Section of the Roof

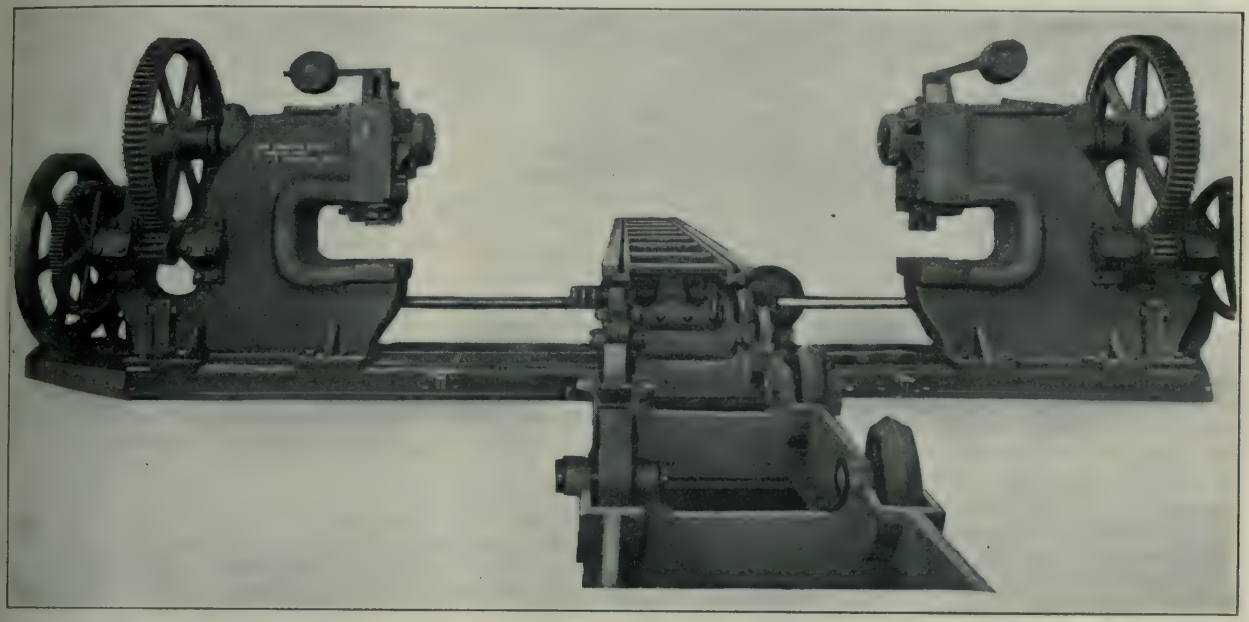
steel and 350 tons of reinforcing steel were employed. The sidewalls of the building are equipped with steel sash of the Fenestra type, over 10,000 sq. ft. being installed.

Large Double Plate Punching Machine

The Ironton Punch & Shear Co., Ironton, Ohio, has just completed for the Jones & Laughlin Steel Co. a large double punching machine. It has some features which are said by the manufacturers to be different from anything of the kind heretofore built. The machine in reality is a double punching machine, each one arranged to punch in unison a 1⅜-in. hole through 1⅜-in. soft steel plates.

Each machine is mounted on a bedplate and can be adjusted so that centers ranging from 5 to 14 ft. can be obtained. The shaft shown in the center drives both machines through gears and its revolutions automatically space the work to be punched. Power for the shaft is supplied by a 20-hp. motor through rawhide spur gears and motor pinion.

The spacing table is 3 ft. wide and long enough to accommodate a 30-ft. plate. The rollers upon which the spacing table operates are 12 in. in diameter. They are 3 in. wide and are flat on one side of the table and V-shaped on the other.



Holes 1⅜ In. in Diameter Are Simultaneously Punched Through Opposite Edges of a 1⅜-In. Steel Plate

As will be noticed from the exterior view, the plant is surrounded by a high woven wire fence, and as an additional protection against trespassers a number of strands of barb wire are placed at the top.

Opens Washington Office

The Jones & Laughlin Steel Co., Pittsburgh, has opened a district sales office on the fourth floor of the Woodward Building, Washington, D. C., in charge of H. F. Holloway, who is district sales manager of the New York office of the company, and he will also hold the same title in the new Washington office. Mr. Holloway will be assisted by Ralph T. Rowles, who was formerly connected with the Philadelphia office, and covered the Washington, D. C., field. Mr. Rowles will now have his headquarters in the Washington office.

The Banner Machine Co., Columbiana, Ohio, will not move its plant to East Palestine, Ohio, as it had planned, but will remain in Columbiana, and is now making some large extensions, for which some new equipment will be needed. This includes the building of a machine shop, 90 x 105 ft., with the addition of a power plant, also a new foundry, 90 x 75 ft. and a new office building. Foundations for these buildings are in and bricklaying will start at once. A cupola which had been shipped to East Palestine for a proposed new foundry there was returned to Columbiana, and will be installed in a new foundry at that place. The Banner Machine Co. manufactures rubber molds, cores, and dies of all kinds, special rubber machinery, general machinery repair work, and special machinery.

More Motor Truck Contracts Placed

In addition to the $23,000,000 worth of motor trucks recently ordered for the War Department, orders have been placed for 5750 vehicles at an aggregate cost of $21,000,000, making about $44,000,000 worth of Army motor trucks now under contract. The quartermaster's depot in Chicago has also been advised to buy 192 light trucks of large chassis and Babcock delivery bodies for the Army cantonments, 12 to be issued to each place, the cost being $750 each.

The Packard Motor Car Co., Detroit, received a contract for 3000 trucks of 3-tons capacity, of which 1200 will cost $3,197.39 each, and 1800 will cost $3,836.87 each. The Locomobile Co. of America, Bridgeport, Conn., received a contract for 1250 trucks at $4,071.38 each and the Pierce-Arrow Motor Car Co., Buffalo, 1500 trucks at $3,500 each, all of 1½ tons capacity.

The Bethlehem Steel Corporation has put into operation six of the 12 tin plate mills at Sparrows Point, Md., which are being constructed at a cost said to approximate $2,000,000. The works are operated wholly by electricity. J. M. Jones, manager of the plant, was for years vice-president and general manager of the Massillon Rolling Mill Co., Massillon, Ohio.

The British Board of Trade advises all British exporters, shipping to neutral European countries, of the desirability of concluding all contracts on a f.o.b. instead of a c.i.f. basis.

Government Control of Coal and Coke

A Broad Commandeering Provision to Become a Law This Week—Price Fixing and Complete Regulation of Fuel

WASHINGTON, Aug. 7.—Although the conference committee in charge of the Lever food control bill has eliminated from its provisions iron and steel, copper, lead and other metals, yet in the draft of the bill as finally agreed to it has incorporated an important category of articles of much interest to iron and steel producers. The conference agreement has been reached after prolonged discussion and it is expected that the measure will receive the President's signature during the present week.

The provision of the bill authorizing the President, through such agency as he may select, to control the distribution of products subject to the act enumerates "foods, feeds, fuel, including fuel oil and natural gas, and fertilizer and fertilizer ingredients, tools, utensils, implements, machinery and equipment required for the actual production of foods, feeds and fuel." These articles are classified in the bill as "necessaries" and it is to "assure an adequate supply and equitable distribution thereof" that the law is to be placed on the statute books.

President May Control All Fuel

The practical effect of the measure, therefore, will be to place under the supervision of the officer designated by the President to execute the provisions of the law all coal, coke, fuel oil and natural gas, machinery employed for the mining of coal, the drilling of oil wells, the manufacture of flour and all other food products, and all tools, utensils, implements, etc., used in these numerous lines of industry. While the language employed in this section is vague, it certainly does not lack comprehensiveness and as the President or the agent appointed by him will be the sole judge of the scope of the law it is evident that ordinary rules of statutory construction are not to be relied upon. The President is specifically authorized "to make such regulations and to issue such orders as are essential effectively to carry out the provisions of this act" and no appeals will lie from either regulations or orders.

A series of criminal offenses is created by section 4 of the bill as agreed to, this provision amounting in effect to the suspension of the Sherman act and other antitrust statutes with respect to the articles coming within the purview of the proposed law. These offenses include hoarding or monopolizing any of the articles mentioned, the making of "any unjust or unreasonable rate of charge in handling or dealing in" any of the "necessaries" mentioned, or conspiring, combining, agreeing or arranging to limit the facilities for transporting, manufacturing, or dealing in any of them, or the exacting of excessive prices therefor. Any person who violates any of these provisions is liable to a fine of $10,000 or imprisonment not exceeding two years or both.

Licenses May Be Required

Whenever in the judgment of the President it shall become necessary, he is authorized to license the importation, manufacture, storage, mining or distribution of any of the articles under supervision and thereafter it is made unlawful for any person without such license to produce, store or distribute any of the articles referred to. The President is authorized to prescribe regulations for the issuance of licenses and requirements for systems of accounts and auditing of accounts to be kept by licensees and the entry and inspection by duly authorized agents of the places of business of licensees.

One of the most comprehensive features of the bill as agreed to provides that whenever the President shall find it is necessary to secure an adequate supply of any of the commodities mentioned for the support of the Army or the maintenance of the Navy "or for any other public use connected with the common defense" he is authorized to requisition and take over for use or operation by the Government any factory, oil-pipe line, mine, or other plant and to operate the same. The compensation for such commandeering is to be determined by the President and in the event that the sum offered is not satisfactory the owner of the commandeered facilities will be entitled to receive 75 per cent of the amount determined by the President and may sue the Government for the remainder in the United States Court of Claims.

Federal Trade Commission the Medium

Contrary to the general impression, this extraordinary measure is not limited in respect to price fixing to food products. Section 24 provides specifically that the President, whenever in his judgment it is necessary for the efficient prosecution of the war, "may fix the price of coal and coke, wherever and whenever sold, either by producer or dealer, to establish rules for the regulation of and to regulate the method of production, sale, shipment, distribution, apportionment, or storage thereof among dealers and consumers, domestic or foreign; said authority and power may be exercised by him in each case through the agency of the Federal Trade Commission, during the war or for such part of said time as in his judgment may be necessary." No commandeering statute heretofore considered is broader in scope than this provision which authorizes the President whenever any "producer or dealer fails or neglects to conform to such prices or regulations, or to conduct his business efficiently under the regulations and control of the President as aforesaid, or conducts it in a manner prejudicial to the public interest" to requisition and take over the "plant, business, and all appurtenances thereof belonging to such producer or dealer as a going concern, and to operate or cause the same to be operated in such manner and through such agency as he may direct during the period of the war or for such part of said time as in his judgment may be necessary."

Cost of Coal and Coke Left in Doubt

While the President is thus authorized to fix the price of coal and coke, both for the Government and for private consumers, the bill goes further and provides that if the prices so fixed are not satisfactory to the producers or dealers payment may be made to the extent of 75 per cent of the prices fixed by the Government and the producers or dealers may sue in the Court of Claims for any amount claimed to be due in the same manner as is provided for the owners of plants taken over by the President's order. Obviously this provision introduce a complication, for even should the President fix the price of coal and coke by public announcement no consumer supplied under this arrangement will be able to figure accurately the price he may ultimately be obliged to pay should the producer or dealer be dissatisfied with that fixed by the President.

An alternative provision is included in the bill to the effect that if the President shall be of the opinion that he can better provide for the common defense and the efficient prosecution of the war, "then he is hereby authorized and empowered to require any and all producers of coal and coke, either in any special area or in any special coal fields or in the entire United States, to sell their products only to the United States through an agency to be designated by the President, such agency to regulate the resale of such coal and coke and the prices thereof and to establish rules for the regulation of and to regulate the methods of production, ship-

ment, distribution, apportionment, or storage thereof among dealers and consumers, domestic or foreign, and to make payment of the purchase price thereof to the producers thereof or to the person or persons legally entitled to said payment."

Cost Plus "Fair and Just Profit"

A feature of this important measure which bears upon the broad question of the factors which are to be taken into account in the fixing of prices by the Government is a provision stipulating the method by which the Federal Trade Commission shall fix the prices to be paid for coal and coke. These prices, it is provided, "shall be based upon a fair and just profit over and above the cost of production, including proper maintenance and depletion charges." As this is a mining proposition Congress has not thought it necessary to provide that the price shall include a profit that will take care of extension which, presumably, will be taken into account by the Federal Trade Commission in the fixing of prices for the output of manufacturing concerns.

It would be idle to speculate on the conditions under which the Government may take over the product of the coal mines or the coke ovens. The significant fact is that the Lever bill furnishes all the necessary authority to enable the President to commandeer mines, ovens and output. It may fairly be assumed that with the Lever bill on the statute books the Government will be able in most cases to negotiate satisfactory terms for both official and private supplies without resorting to the expedient of commandeering. W. L. C.

British Trade Union Rules After the War

The interim report on joint standing industrial councils, made by the British Reconstruction Committee's sub-committee on relations between employers and employed was issued recently. The report recommends that the Government should propose without delay to the various associations of employers and employed the formation of joint standing industrial councils in the several industries where they do not already exist, composed of representatives of employers and employed, regard being paid to the various sections of the industry and the various classes of labor engaged. As to the guarantees for the restoration of trade union rules and customs, the report says that while this does not mean that all the lessons learned during the war should be ignored, it does mean that the definite co-operation and acquiescence of both employers and employed must be a condition of any setting aside of these guarantees or undertakings. The report suggests that the following proposals should be laid before the national industrial councils:

First, district councils representing trade unions and employers' associations to be created or developed out of the existing machinery; second, works committees representing management and workers to be instituted in particular plants to act in close co-operation with the district and national machinery.

The report suggests a number of questions to be dealt with, including technical training, industrial research, legislation affecting the special industry, security of earning and unemployment and conditions of employment.

The Old Dominion Iron & Nail Works Co., whose business was founded in 1836, discontinued the manufacture of cut nails some years ago, and having recently embarked in the manufacture of steel by the electric process, found it desirable to change the title of the company to the Old Dominion Iron & Steel Corporation, and this was done on July 12. Under the new title the company will continue to devote its attention to the manufacture of puddled iron bars, electric steel bars and horse and mule shoes.

From 40 to 60 tons of tungsten ore, containing from 60 to 72 per cent of WO_3, is mined each month in the Siamese Malay States, according to a local mining engineer of the Bangkok district.

To Build Composite Ships Near Mobile

The contract of the Kelly-Atkinson Construction Co., Chicago, with the United States Emergency Fleet Corporation for 18 cargo-carrying steamers covers delivery of complete ships, including propelling machinery, deck and cabin equipment, etc. They are to be composite or so-called McClelland ships with all-steel frames and wood plating. Each ship will require 800 tons of steel and 400,000 board ft. of timber. More regular structural shapes will be used than is usual in ship construction. The ships are to be 286 ft. long, 46 ft. beam and 24 ft. draft.

The company has purchased 16 acres on the Mobile River, Mobile, Ala., known as the Hieronymous tract, and will have a deep channel in fresh water free of ship worms or barnacles. Work has been started on the yard, which will contain six berths 52 by 535 ft. The plant will employ from 1000 to 1200 men. Officers of the company follow: W. L. Kelly, president; M. R. Fife, secretary and treasurer; Frank McLaughlin, chief engineer. Mr. McLaughlin was formerly contracting manager of the Federal Bridge & Structural Co., Waukesha, Wis.

New Proving Ground in Illinois

WASHINGTON, Aug. 7.—The War Department to-day issued orders for the clearing of 12,500 acres of land near Savannah, Ill., for use as a proving ground for large guns manufactured at Government arsenals. The work of preparing the ground and the construction of the necessary buildings will proceed under the direction of Col. George W. Burr, commandant of the Rock Island Arsenal, and it is understood that the testing field will be ready for the actual proof of large field pieces by Sept. 1.

The Ordnance Bureau announces that practically all the guns manufactured for the Army will be tested at the Savannah plant. Those manufactured at the Watervliet Arsenal will be sent to Rock Island, where carriages and caissons are manufactured and will be taken thence overland to the testing ground.

Ordnance Company Organized

CLEVELAND, Aug. 8—(*By Wire*).—The Inland Ordnance Co. has been incorporated with $500,000 capital by interests identified with the McMyler Interstate Co. here and will manufacture medium sized ordnance in a portion of the McMyler plant at Bedford, Ohio, taken over for the purpose. The officers are: President, Frank H. Ginn; vice-presidents, R. W. Kaltenbach and Justin Griess; treasurer, H. H. Hammond, and secretary, W. Lovell.

The company has placed an order with the Carnegie Steel Co. for 6000 tons of nickel steel for forgings for 3 and 4-in. guns awarded it by Federal Government. It also has inquired for 4000 to 6000 tons of shapes for further extension of the McMyler plant, which it plans to have ready for occupancy in 60 days.

The Lau Iron Works, Youngstown, Ohio, with an authorized capital of $350,000, $100,000 preferred and $250,000 common, has been incorporated by A. W. Lau, E. E. Swartswelter, John R. Rowland, John T. Harrington and H. E. Grosshans. The new company will take over the business which heretofore had been conducted under the same name with A. W. Lau as proprietor. The corporation was formed to bring new capital and provide for extension. Of the authorized capital none of the preferred will be issued at this time, and only about half of the common. A 4½-acre plant site in the Brier Hill district was acquired some time ago at a cost of $16,000. The company will fabricate structural and decorative iron and steel.

The Standard Tin Plate Co., Canonsburg, Pa., has advanced labor not affected by the Amalgamated Association scale, about 12½ per cent, now paying common labor 31c. per hour for 10 hours a day. The company also recently signed the Amalgamated Association scale for tin mills for the first time in some years.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the DAVID WILLIAMS CO., 239 West Thirty-ninth Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: Equitable Building. Philadelphia: Real Estate Trust Building. Cleveland: Guardian Building. Cincinnati: Mercantile Library Building.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year. Entered at the New York Post Office as Second-class Mail Matter.

The Draft in Munitions Centers

There is general approval of the thoroughness and care with which the draft is being put into effect. Employers are seeing, however, with increasing clearness that the population estimates on which the draft quotas have been made up throw a most inequitable burden on the centers of production of war supplies.

Two factors have brought about this injustice —the presence of a large floating population of men of the draft age and the very high percentage of aliens in both the permanent and temporary populations. Bridgeport, Conn., is an example. Its actual population probably does not much exceed 185,000; its population estimate furnished by the Census Bureau for draft purposes is 278,000, based upon a registration of over 26,000. A majority of the registrants are aliens. The minority citizen element is composed largely of young men in training to be the skilled machinists, tool and gage makers, forgers and brass workers, from whom must be drawn the directing forces of production in the coming years, perhaps in a single year if war necessities demand the continued rapid expansion of Bridgeport's industries such as has marked the past two years.

While it is true that the provision for exemption of industrial workers opens a way to hold many valuable men in industry, employers are none too eager to appear before the Federal district exemption boards and ask for the retention of large groups of employees. They appreciate that under Bridgeport's conditions the wholesale exemption of factory workers on top of the heavy exemption of aliens and those with dependents will impose the entire burden of military conscription upon a comparatively small class of clerical, mercantile and public service employees and the younger men of the professions. As the names of those asking exemption are to be published, an employer requesting any considerable number of exemptions may find himself subject to much deserved or undeserved criticism. It would help matters if the full extent of the Government's future demands on industry were known; without this knowledge and without experience to dictate the relative value of many of his employees in military or industrial activity, the way of the manufacturer is beset with thorns.

The Connecticut Council of Defense has sent to Provost Marshal General Crowder an urgent plea for a change in the rule of apportionment, as applied to Connecticut, before the next levy and that some credit be given then for the excessive quota of the State in the first levy. The council's analysis of the situation will apply with nearly equal force in other States. It points out the obvious injustice of inflated population figures, stating that of the total registration of 159,890, 34,276 are men with dependents and 58,000 are friendly or neutral aliens. These 58,000 aliens, it is claimed, are almost wholly unmarried laborers who represent themselves alone but, in the population figures employed for draft purposes, furnish the basis for an increment of 500,000 in population. The council believes that the exemption of such aliens will act as a bar to further naturalization, as they will be desirous of maintaining their present status so long as it enables them to earn the high wages of the war period and avoid military obligations.

The deduction is drawn from a State census made this year of all males over 15 years of age that with all classes of exemptions less than 50 per cent of the Connecticut registration of 159,890 will be actually liable for military service. The council claims that the quota demanded is fully 4000 in excess of a fair allotment and that the census estimate of 1,719,623 population for the State is at least 400,000, or 30 per cent, greater than the actual population. Under the operation of the draft system, the presence of the great factories which are expected to furnish more than 50 per cent of the nation's supply of arms and munitions augments the number of registrants but decreases the available supply of men for military service. The council contends that the so-called estimates of population have caused a violation both in spirit and letter of the apportionment section (section 4) of the law creating the new army.

One effect of the draft and the previous enlistment of workers in industrial centers has been the temporary raising of the maximum age limit or the

abrogation of age limits as previously imposed by employment departments. An employer in Worcester recently advertised for a group of machinists, 60 years of age or older. His company was not wholly influenced by the need of more machinists; it had reached the conclusion that in highly skilled work experience is more valuable than mere activity. It has demonstrated to its own satisfaction that the older men can maintain both production and quality, are more settled and stable in their habits and are little influenced by labor agitators or other disturbing elements of industry. Other manufacturers, including Government arsenals, have opened the doors to their pensioners and have had a prompt response from those still capable of manual labor. Women workers have gradually invaded many departments of industry and their capacity has opened the eyes of many an employer, so much so that their future place in the factories seems assured. From the ranks of older men and deft and sturdy women will come much of the labor to replace drafted workmen.

Commandeering Machinery for War

Government direction of industry, which is all but authorized in coal mining and distribution, is making a start in machinery and machine tools, where something akin to federal supervision is now in effect. One of the largest machine-tool companies, operating several plants, is placing practically all of its output as the Government directs, and this policy is likely to extend to other plants as the Government necessities become more urgent.

A severe tax has been placed on many machine-tool plants by the Government war program. With calls from munition works, airplane factories and shipyards, in addition to the normal demand from a diversity of industries, the builders of metal working machinery have gradually been obliged to cancel or postpone delivery of many orders for private consumers not engaged on Government work and turn their output over to concerns which the Washington authorities have designated as entitled to prior consideration.

Fortunately for the country, many companies which have been engaged in making munitions for the Allies have their plants well equipped and their recent needs have been confined chiefly to a comparatively few machines to replace those which had become worn out or defective. New munitions plants have been or are being equipped, and the rapidity with which machine tools have been furnished to them is highly creditable.

The problem of the new shipyards is much more formidable and it seems quite unlikely that many of the projected yards can be completely equipped before the opening of the new year even if work is started very promptly. The delays in getting the shipbuilding program under way have led some machine-tool concerns to accept attractive offers for equipment from other sources, particularly for export. However, as such contracts contain a protection clause there will be no hardship to the sellers if the Government decides later to take over the machines for war work.

The good progress the country is making in providing the main implements of war—munitions, airplanes and ships—has been largely possible through the loyal co-operation of the machinery and metal working tool manufacturers. The latter, in fact, in some instances, have kept ahead of the Government, and some impatience has cropped out because delays at Washington have foiled well laid plans for speeding up plant to meet emergencies.

Excess Profits Taxes on Steel

In reporting earnings for the second quarter of the year the United States Steel Corporation deducted an allowance for the prospective excess profits tax, while in the statement for the first quarter such allowance could not be made. The allowance has since been made as a deduction from the half year's surplus. Making the statement in similar form for the two quarters, the profits without allowance for the tax were $113,121,018 in the first quarter and $144,498,076 in the second quarter. With allowance for the tax the remaining earnings were $79,256,018 for the first quarter and $90,579,204 for the second quarter.

The reported earnings for June were $31,284,562 and the estimated excess profits tax for the month would be about $18,700,000, making approximately $50,000,000 for the total profits in the month. The shipments were about 1,250,000 gross tons, so that the total profits were about $40 per ton, and the amount set aside for excess profits tax was about $15 per gross ton.

In 1916 the production of finished rolled steel in the United States was 30,500,000 gross tons, and an output of say 31,500,000 tons may perhaps be expected for this year. At $15 per ton the revenue from the steel industry alone, using the Steel Corporation's experience as a rough basis for comparison, would be about $465,000,000, quite a tidy sum for the Government to collect from an industry which is expected to aid it in the furnishing of materials as well as in the paying of taxes. It is to be observed, too, that the prices realized upon the Steel Corporation's shipments in June were much lower than the prices quoted as the market during the past few months, the orders having been taken largely before the beginning of this year.

Labor Leaders Stop a Strike

Recent strikes by labor unions to force recognition when war necessity compelled plant operation have been little less than treasonable. And now the switchmen's strike in Chicago has come and gone. It lasted but two days and did little harm, but it would have had the gravest consequences had it taken the course prescribed for it by the head of the Brotherhood of Railway Trainmen. Not only would lives have been menaced by a shortage of ice and other necessaries, but military supplies awaiting shipment to Atlantic coast ports would have been seriously delayed.

Credit for the termination of the strike belongs to the brotherhods embracing the locomotive engineers, firemen and conductors. At the same time their action did not proceed from unalloyed patriotism or a sense of what was ethically demanded; rather, they foresaw, in the event of the continuance of the strike, the possibility that Con-

gress might enact a law for compulsory arbitration of strikes—one of the last things organized labor wants to see. Moreover, they were not slow to see that no such strike can win a particle of public sympathy at this time. There was also the fact that the strike was not unanimous, as the members of the Switchmen's Union of North America, a powerful organization, did not leave their work on the 19 roads affected. The leaders of this union declared that one purpose of the strike was to eliminate it from the field, and the fact that the Brotherhood of Railway Trainmen sought preferential treatment for its members in the employment of new switchmen gave color to this contention. The point was lost. It was virtually a demand for the closed shop. Other matters at issue, including the question of meal hours, appointment of yardmasters and the employment of new men, are to be settled by a joint board of the railroad managers and labor leaders.

Whatever motives were uppermost in causing the three brotherhoods to force an end of the strike, they did well. This is no time for such demands. Railroad workers least of all want the military control of transportation for which the Chicago strike was plainly headed.

Japan's Ship Plate Orders

Steel plate shipments to Japan have been an outstanding feature of our phenomenal war exports. Quick to perceive the profit to be made out of merchant vessels in the face of a wholesale destruction of shipping, the Japanese have been concentrating every energy on shipbuilding. No matter what the cost, they have seen that a good return on the investment was certain; that the earning power of a steel vessel for several years after the war would far more than compensate for its present high cost. Paying as high as 11c. and 12c. per pound for American plates delivered in Japan, their absorption of this material has been the outstanding feature of the plate market.

An analysis of our steel plate exports reveals the extent of this striking movement toward Japan. By leaps and bounds the outgo to that country has increased from only 7250 gross tons in 1913 and 3275 tons in 1914 to 89,458 tons in 1916. For the ten months ended April 30, 1917, Japan's share of plate exports was 138,565 tons, or nearly 50 per cent of the total. The movement is a striking example of Japanese business acumen.

It is too early to measure the effect of the steel embargo, but it is hardly to be supposed that Japan will bring her shipbuilding program to a standstill by failing to make a reasonable contribution of vessel tonnage to the urgent needs of the Allies in Atlantic transport.

The Nagle Steel Co., Pottstown, Pa., has acquired property consisting of about 170 acres in the Brooke district, near Pottstown. It is said that the company is planning for the erection of a new steel works to include open-hearth furnaces and plate and slabbing mills.

The Johnson & Barry Steel Co., Birmingham, Ala., which was recently incorporated, is doing a structural steel and steel jobbing business and is a fabricator of plate and structural work.

FRANCE'S AID IN AVIATION

To Keep 5000 Planes in Service Means Building 18,000 in Nine Months

WASHINGTON, Aug. 7.—The passage last week of the aviation bill appropriating $640,000,000 for aeroplanes, engines, and all the necessary equipment for the organization of a huge corps of fliers has been followed by the rapid development of the War Department's plans to execute the law. In this work the department is receiving the co-operation of the French aviation corps which has detailed Captain de la Grange to act as technical advisor. In a statement given out by this expert through the Committee on Public Information some of the manufacturing problems to be encountered are pointed out and the steps taken to meet them are described.

2000 Planes and 4000 Motors Per Month

"If the Government wishes to, before April 1, 1918, it can have a tremendous aero fleet," says Captain de la Grange. "Suppose it decided to have only 5000 planes and 10,000 motors. In order to keep that number of aeroplanes always at the front, it will be necessary to build 2000 planes and 4000 motors per month, viz., 18,000 planes and 36,000 motors during the next nine months. This means a great effort on the part of the American factories. They can make this effort, as they have already the buildings, the workmen and part of the machinery needed. They have also a large number of the best scientists and technicians. The size of the orders given them will insure obtaining the money necessary to organize the plants for their construction.

"Two difficulties will be met at once; the first, that of skilled labor. The American industry, as far as possible, has replaced manual labor by machines. The following motto is written in one of the American factories: 'Manual labor must be abolished whenever a machine can take its place.' In constructing airplanes machines are not sufficient; very good fitters are needed, and a great number of them also; they must be taught the methods used in French and English factories.

"The necessary steps should be taken to recruit these men as soon as possible, and in view of this the board of production is sending a commission composed of skilled workmen to France so that they may study the methods used in the factories there. When finished, they will return to the United States, they will supply all they have learned and will be able to train the workmen as well.

"The second difficulty is that of manufacturing quickly enough machines and tools necessary for building such a large supply of planes and motors. Although the best American engineers are giving all their attention to this, it will be impossible, I am afraid, to build these machines fast enough so that at Jan. 1, 1918, each factory will be able to produce, not 10 motors per month but 20 and 30.

Work Must Go On Night and Day

"In my opinion, there is only one way in which this difficulty can be surmounted. It is to realize that the work must go on night and day, and to organize night shifts so that the machines will never be idle. The French workmen, when they understood how important it was to turn out for the front planes and motors in great numbers and as rapidly as possible, did not hesitate to adopt night work, because they knew that their work at the factories would save the lives of their comrades who during this time were fighting in the trenches."

In the opinion of this expert it will not be practicable to transport to France the bodies of the flying machines because of their great bulk which would necessitate a large amount of cargo space. He therefore suggests that the motors be manufactured in this country and shipped abroad at the rate of approximately 4000 per month, and that factories be established in France to build the bodies. In this way a large corps of American aviators fully equipped with airplanes would be ready

next spring. The Allies acquired and still control the supremacy of the air, but they cannot develop their aviation to any further point. The American contingent would make it possible to overwhelm the foe, to hasten the final victory and to save thousands of lives.

GISHOLT CO. TO MAKE GUNS

Madison, Wis., Machine-Tool Concern Organizes New Company at Request of Government

The Northwestern Ordnance Co., Madison, Wis., has been incorporated with a capital stock of $100,000 by representatives of several large metal-working interests at Madison, at the request of the Government, for the specific purpose of manufacturing field pieces of the 4.7-in. type for the United States Army. The organization is similar to the Wisconsin Gun Co., organized recently at Milwaukee, as previously noted, by representatives of five large metal-working corporations, to build 3-in. field pieces of the 1916 model.

The new Madison company is largely financed by C. A. Johnson, president, and H. S. Johnson, vice-president of the Gisholt Machine Co. It will undertake immediately the erection of a machine-shop on land leased from the Gisholt company. The general contract for the work has been awarded to the Worden-Allen Co., Milwaukee, which also is building the new shop of the Wisconsin Gun Co. at Milwaukee. The two shops will be similar in size and construction, being about 130 x 300 ft., of steel and brick, with concrete foundations and floors, affording about 40,000 sq. ft. of floor space.

As in the case of the Milwaukee company, the Northwestern company will do only the machine-work and assembling of the ordnance, the rough forgings being furnished by the Government. The two plants will each employ about 400 highly skilled machinists. The projects are financed by Madison, Wis., capital without the hope of fee or reward or profit, the Government having informally stated that as soon as practicable it will take over the works and reimburse the financiers.

As mentioned in THE IRON AGE of Aug. 2, the Bullard Machine Tool Co., Bridgeport, Conn., is considering the request of the Government to build a plant similar to that which will be conducted by the Gisholt Machine Co. interests. THE IRON AGE also learns that the Otis Elevator Co. and the Niles-Bement-Pond Co. have also been asked by the War Department to build or equip gun-making plants of the same type.

Expansion of the Stavanger Electro-Steel Works

A new rolling mill will be added to the plant of the Stavanger Electro-Steel Works, Stavanger, Norway, and an American expert has been employed to design it. Since Jan. 1, 1917, the company, established in 1913, has increased its capital from $300,000 to over $1,000,000. Most of the product sold so far has been raw steel. The plan is to double the output by installing electricity and to turn out a finished rolling mill product.

The American expert has advised that work be pushed on the project as soon as possible in spite of the increased cost of materials and wages. It is thought that countries previously supplying the world with much of its steel will, after the war, be first employed in replacing and renewing their own supply. This should give the Norwegian plant a chance.

That the company may be quite independent of imported fuel, it has taken over a power company located near it, whose plant when fully developed can deliver 12,000 to 14,000 hp. Of this, 1600 hp. is already in use and 5600 hp. is under completion for the steel works.

The Berwick plant of the American Car & Foundry Co. has received an order for 42,000 galvanized smokestacks for the Government cantonment camps; 6000 iron collars will also be made. The company plans to ship four carloads daily of finished product.

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PIG-IRON OUTPUT FALLS

Coke Still the Limiting Factor

Production of 3,342,438 Tons, or 107,820 Tons per Day, in July

The rate of pig-iron production fell off further in July, the output for the month being 3,342,438 tons, or 107,820 tons per day, as against 3,270,055 tons in the 30 days of June or 109,002 tons per day. Coke scarcity caused bankings of furnaces in various districts and output was cut down further by heat and humidity. Various furnaces were blown in in July and others went out, leaving the number of active furnaces on Aug. 1 at 351, or the same as on July 1. The active capacity Aug. 1 is estimated at 109,248 tons per day against 111,755 tons per day on July 1.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from July, 1916, is as follows:

Daily Rate of Pig-Iron Production by Months—Gross Tons

	Steel Works	Merchant	Total
July, 1916	74,397	29,620	104,017
August	74,617	28,729	103,346
September	76,990	29,755	106,745
October	81,639	31,550	113,189
November	80,141	30,253	110,394
December	74,264	28,273	102,537
January, 1917	72,394	29,249	101,643
February	65,280	29,193	94,473
March	73,731	31,132	104,863
April	79,031	32,134	111,165
May	77,561	32,677	110,238
June	76,805	32,197	109,002
July	76,440	31,380	107,820

Capacity in Blast Aug. 1 and July 1

The following table shows the daily capacity in gross tons of furnaces in blast Aug. 1 and July 1 by districts:

Coke and Anthracite Furnaces in Blast

Location of furnaces	Total number of stacks	Aug. 1—Number in blast	Aug. 1—Capacity per day	July 1—Number in blast	July 1—Capacity per day
New York:					
Buffalo	18	17	5,705	18	5,985
Ferro	1	1	50	1	60
Other New York	5	3	665	2	475
New Jersey	4	3	605	3	640
Ferro	1	0	0	1	50
Pennsylvania:					
Lehigh Valley	21	14	3,542	14	3,695
Spiegel	2	2	214	2	220
Schuylkill Val.	12	10	2,960	11	3,175
Spiegel	1	1	95	0	0
Lower Susquehanna	7	6	1,577	6	1,610
Lebanon Valley	8	8	1,055	8	1,060
Ferro and Spiegel	3	2	105	1	45
Pittsburgh Dist.	53	48	22,020	47	22,150
Ferro and Spiegel	4	4	555	4	450
Shenango Val.	19	18	5,645	19	6,105
Western Pennsylvania	25	23	6,885	22	6,954
Ferro and Spiegel	3	1	84	2	210
Maryland	3	3	952	3	1,355
Ferro	1	1	95	1	100
Wheeling District	14	12	4,183	12	4,147
Ohio:					
Mahoning Val.	25	25	10,392	25	10,450
Central and Northern	26	25	9,661	25	9,355
Hocking Val., Hang. Rk. and S. W. Ohio	15	15	1,858	14	2,042
Illinois and Ind.	37	33	16,145	33	16,304
Ferro	2	1	66	1	72
Michigan, Wis. & Minn.	12	10	2,472	11	2,748
Colorado & Missouri	5	4	1,084	4	1,110
Ferro	2	1	86	1	50
The South:					
Virginia	18	12	1,376	12	1,515
Kentucky	5	4	558	4	610
Alabama	37	31	7,410	31	7,648
Ferro	1	1	68	1	75
Tenn. and Ga.	16	12	1,080	12	1,290
Total	406	351	109,248	351	111,755

Among furnaces blown in in July were Northern in eastern New York, one Steelton in the Susquehanna Valley, Lebanon Valley and one Bird Coleman in the Lebanon Valley, one Edgar Thomson, one Isabella and Neville Island in the Pittsburgh district, one Cambria in western Pennsylvania, Star in Hanging Rock district, and one Gary in the Chicago district.

The list of furnaces blown out last month includes one Susquehanna in the Buffalo district, one Wharton in New Jersey, one Steelton in the Susquehanna Valley, one Eliza and one Monongahela in the Pittsburgh district, Atlantic in the Shenango Valley, one South Chicago in the Chicago district and one Bay View in Wisconsin.

Production of Steel Companies

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies show the following totals of steel-making iron month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons

	Pig, total production 1915	1916	1917	Spiegeleisen and ferromanganese 1915	1916	1917
Jan.	1,115,944	2,251,035	2,244,203	18,041	24,866	38,792
Feb.	1,237,380	2,183,845	1,829,846	13,319	23,877	32,137
Mar.	1,551,082	2,365,116	2,285,430	12,274	29,388	36,563
Apr.	1,584,111	2,316,768	2,370,937	12,337	31,862	39,595
May	1,694,290	2,408,890	2,404,380	13,440	35,844	37,701
June	1,770,657	2,295,784	2,304,155	19,200	38,597	30,829
July	1,949,750	2,306,303	2,369,630	17,854	31,353	43,884
Aug.	2,101,818	2,313,122	.....	27,463	33,338	.....
Sept.	2,129,322	2,309,710	.....	23,159	29,451	.....
Oct.	2,281,456	2,530,806	.....	23,992	34,566	.....
Nov.	2,198,459	2,404,210	.....	28,741	44,975	.....
Dec.	2,283,047	2,294,620	.....	25,094	43,470	.....

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces in July and the three months preceding:

Monthly Pig-Iron Production—Gross Tons

	Apr. (30 days)	May (31 days)	June (30 days)	July (31 days)
New York	188,547	198,111	193,198	194,255
New Jersey	6,863	9,485	14,340	18,990
Lehigh Valley	119,962	117,584	114,465	116,432
Schuylkill Valley	86,416	100,531	94,097	94,578
Lower Susquehanna and Lebanon Valley	80,673	83,985	79,989	84,540
Pittsburgh district	705,992	690,919	651,768	664,456
Shenango Valley	183,288	176,200	171,074	174,614
Western Pennsylvania	202,733	211,621	202,145	215,192
Maryland, Virginia and Kentucky	94,754	106,768	99,238	89,603
Wheeling district	129,569	129,169	125,403	129,689
Mahoning Valley	323,683	335,797	307,829	322,165
Central and Northern Ohio	283,067	276,712	278,396	299,458
Hock. Val., Hang. Rk. & S. W. Ohio	56,556	55,544	60,866	55,186
Chicago district	470,338	506,297	489,780	503,946
Mich., Minn., Mo., Wis. and Col.	124,088	122,312	118,109	114,952
Alabama	246,164	260,969	234,259	231,738
Tennessee and Ga.	32,267	35,336	35,099	32,644
Total	3,334,960	3,417,340	3,270,055	3,342,438

The Record of Production

Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1913—Gross Tons

	1913	1914	1915	1916	1917
Jan.	2,795,331	1,885,054	1,601,421	3,185,121	3,150,938
Feb.	2,586,337	1,888,670	1,674,771	3,087,212	2,645,247
Mar.	2,763,563	2,347,867	2,063,834	3,337,691	3,251,352
Apr.	2,752,761	2,269,655	2,116,494	3,227,768	3,334,960
May	2,822,217	2,092,686	2,263,470	3,361,073	3,417,340
June	2,628,565	1,917,783	2,380,827	3,211,588	3,270,055
July	2,560,646	1,957,645	2,563,420	3,224,513	3,342,438
7 mo.	18,909,420	14,359,360	14,664,237	22,634,966	22,412,330
Aug.	2,545,763	1,995,261	2,779,647	3,203,713	.....
Sept.	2,505,927	1,882,577	2,852,561	3,202,366	.....
Oct.	2,546,261	1,778,186	3,125,491	3,508,849	.....
Nov.	2,233,123	1,518,316	3,037,308	3,311,811	.....
Dec.	1,983,607	1,515,752	3,203,322	3,178,651	.....
Total, yr.	30,724,101	23,049,752	29,662,566	39,039,356	.....

The figures for daily average production, beginning January, 1910, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1910 Gross Tons

	1910	1911	1912	1913	1914	1915	1916	1917
Jan.	84,148	56,752	66,384	90,172	60,808	51,659	102,746	101,643
Feb.	85,616	64,090	72,442	92,369	67,453	59,813	106,456	94,473
Mar.	84,459	70,036	77,591	89,147	75,738	66,575	107,667	104,882
Apr.	82,792	68,836	79,181	91,759	75,665	70,550	107,592	111,165
May	77,102	61,079	81,051	91,039	67,506	73,015	108,422	110,238
June	75,516	59,585	81,358	87,619	63,916	79,361	107,053	109,002
July	69,305	57,841	77,738	82,601	63,150	82,691	104,017	107,820
Aug.	67,963	62,150	81,046	82,057	64,363	89,666	103,346	.....
Sept.	68,476	65,903	82,128	83,531	62,753	95,085	106,745	.....
Oct.	67,520	67,811	86,722	82,133	57,361	100,822	113,189	.....
Nov.	63,659	66,648	87,697	74,453	50,611	101,244	110,394	.....
Dec.	57,349	65,912	89,766	63,987	48,896	103,333	102,537	.....

Diagram of Pig-Iron Production and Prices

The fluctuations in pig-iron production from January, 1909, to the present time are shown in the accompanying chart. The figures represented by the heavy lines are those of daily average production by months of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron at furnace at Chicago. They are based on the weekly market quotations of THE IRON AGE.

Blast Furnace Notes

Final payment was made last week by Harrison W. Matthews in the purchase from the receivers of the property of the Dayton Coal & Iron Co., Dayton, Tenn., reported several weeks ago. The cash payment amounted to $50,000 and notes were given for $450,000 to representatives of the holders of the furnace company's bonds. Preparations have been made for the early blowing in of the Dayton furnaces. Mr. Matthews is president of the Matthews Iron & Mining Co., now operating a blast furnace at Rome, Ga.

The Minnesota Steel Co., Duluth, Minn., will blow out one of its furnaces in August for relining.

The West End furnace at Roanoke, Va., operated by the Old Dominion Pig Iron Corporation, is now known as the Old Dominion furnace.

The Juniata Furnace & Foundry Company, Newport, Pa., expects to blow in its Marshall furnace on ferromanganese early in August.

Scarcity of material and labor has delayed the blowing in of Lochiel furnace at Harrisburg, Pa., scheduled for Aug. 1. It will probably start within the coming week.

The furnace of the Oriskany Ore & Iron Corporation, Lynchburg, Va., was blown out Aug. 2 for relining.

Neville Island furnace of the Carnegie Steel Company, which has been idle for several years, was blown in July 16.

Iron Rolling Mill at Riverdale, Ill., Sold

E. B. Lanman, H. A. Lanman and C. O. Lanman of the E. B. Lanman Co., East Chicago, have purchased the Riverdale, Ill., rolling mill built in 1908 by the Riverdale Iron & Steel Co., which has been closed down since December, 1911, and which was purchased by Armour Steel Co. in 1914. The plant has a bar mill with a capacity of about 30 tons of bar iron per day. The new owners expect to install another furnace and will start the mill on bars, squares and flats and possibly special shapes. To handle the property the Riverdale Rolling Mill Co. has been formed. The new organization is separate from the E. B. Lanman Co., although interests are the same. Latter company makes bolts, nuts and washers.

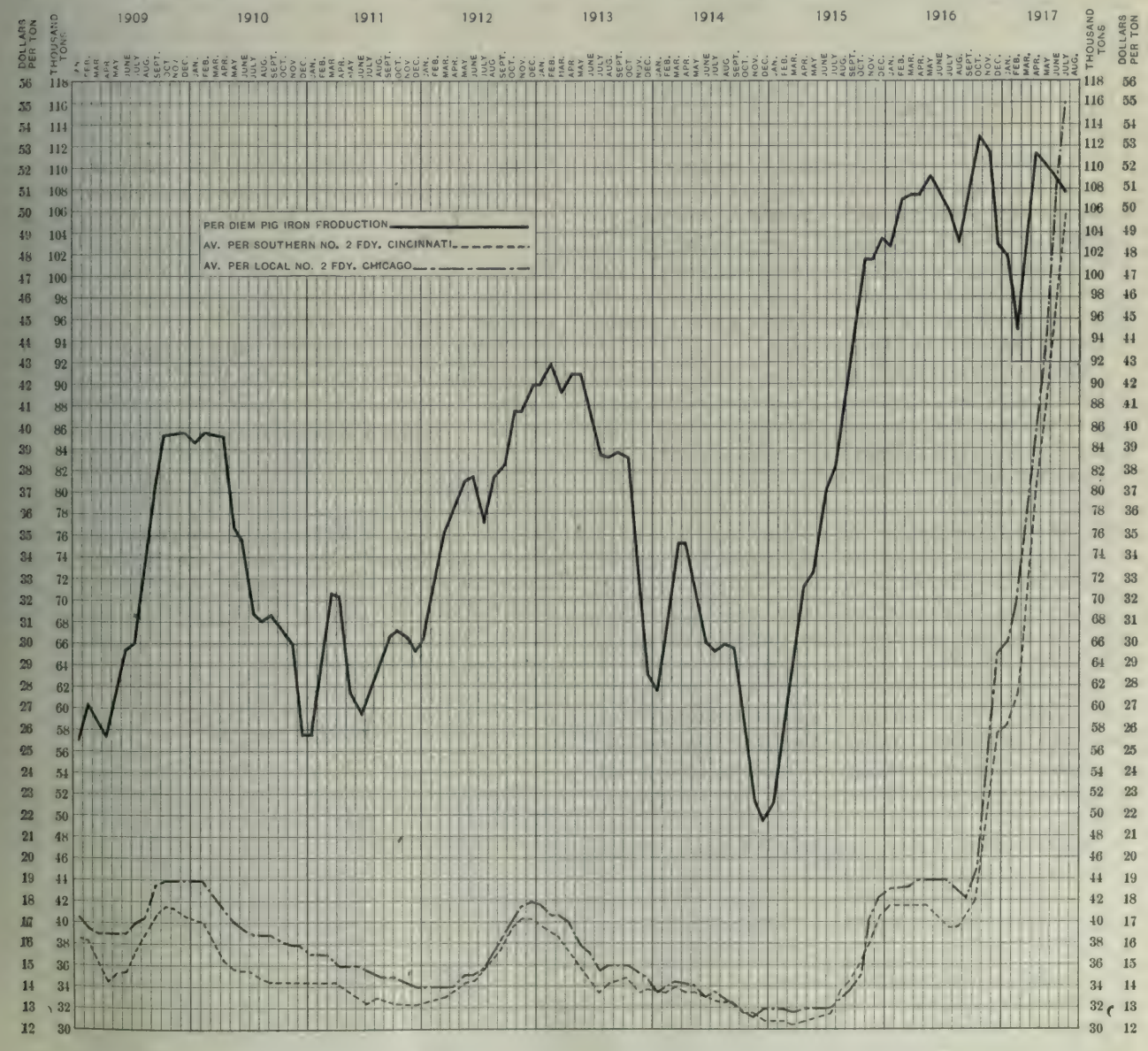


Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from Jan. 1, 1908, to Aug. 1, 1917; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron at Chicago District Furnace

Iron and Steel Markets

DECLINE IN SHEET BARS

Freer Offerings of Semi-Finished Steel

Buying for the Allies Held Up—Some Resales of Export Material

Repeated outgivings from Washington of sweeping action intended in the Government's dealings with steel makers and the reiteration of the President's call for "one price for all" have only added to the uncertainty that is holding back all iron and steel markets. Price changes have been narrow, apart from semi-finished steel, in which offerings have been made at $10 to $15 a ton below the recent high level of $100 for billets and $105 for sheet bars.

It is known that buying for the Allies is held up by the steel cost inquiry and that more time will be necessary for the latter than was counted on. Meanwhile official statements of steps that will be taken in the handling of steel prices are not assuring. In all of it there is no hint of regulation in the products of those manufacturers who buy finished iron and steel. Moreover, consumers of pig iron, of which Government buying is negligible, are not convinced that regulation in that market on the "one-price-for-all" principle will effect any marked readjustment. The suggested commandeering of plants charging more to private consumers than to the Government might not be easily applied to 400 blast furnaces, only a few of which by any chance would be sellers to the Government.

Though Government control of coal and coke output and prices is practically assured in the passing of the food bill, there is still the problem of insufficient labor to increase the coke output. The withdrawal of cars from the coke districts in view of labor scarcity there was overdone this week and spot coke advanced $3 to $4 a ton or to $13 and $14.

That pig iron output fell off further in July was chiefly due to coke shortage, with heat and humidity added. The decrease from June was 1200 tons a day, which was also the June decline from May. The July total was 3,342,438 tons, or 107,820 tons a day, against 3,270,055 tons in June, or 109,002 tons a day. Furnaces blowing out balanced those going in, so that 351 were active Aug. 1 as on July 1, with estimated capacity of 109,248 tons a day, compared with 111,755 tons a day one month previous.

The offering of sheet bars in the Central West at $90 per ton and the sale of slabs at that price for August delivery, representing a decline of $15, may indicate that the great increase in open-hearth steel capacity is beginning to tell—though this must be chiefly through larger use of scrap, as pig iron supply does not increase. Also the cutting down of finishing mill output because of hot weather has caused billets and sheet bars to accumulate, and some of the freer supply came from the holding up of rollings by the export embargo.

The limiting of export licenses for plates and various other products to material for war purposes will result in some resale transactions, though there has been no great amount so far. Japan has taken 50 per cent of plate exports in recent months and has large orders on the books of the plate mills, on some of which rollings may be held up indefinitely.

Four weeks of restricted buying has developed a policy on the part of some jobbing interests, of working down stocks on hand against possible readjustments of prices, and there are evidences of a similar policy on the part of manufacturing consumers, some of whom have for months specified freely against contracts.

The early rolling of the 150,000 tons of rails for the Government's line in France will mean that domestic roads must wait for rails which were to be delivered in August and September.

There is a call from consumers of bars and other products for some assurance of stability in prices that will enable them to make their plans for the later months of the year. Implement makers are among the number. Concern over ability to get enough steel for full operations has subsided somewhat, apart from plates, but the possibility of price readjustments is a first consideration in every line of consumption. To a very considerable extent implement bar contracts on which shipments will be made in the remainder of the year were at prices ranging from 2.75c. to 2.90c.

Foreign inquiry for tin plate continues to come from India, Japan and South America. On 30,000 boxes for Japan as high as $18.40 was offered, but supplies are being husbanded for domestic use.

Production of ferromanganese and spiegeleisen in July increased notably, going to 43,884 tons as against 30,829 tons in June and 37,701 tons in May. The situation as to British ferromanganese is tightening and domestic producers are holding more firmly for $375 for the last quarter of this year and $350 for the first half of 1918, while for early delivery $400 is paid. Recent sales of ores from India have been at $1.15 per unit.

Pittsburgh

PITTSBURGH, Aug. 7.

It is said that in July the railroads of the country eliminated about 1200 passenger trains representing about 16,000,000 train miles per year. The saving of fuel, lubricants and labor is expected to result in quicker movement of freight. There is no doubt that the movement of raw materials to, and finished materials from the blast furnaces and steel works is better now than it has been for some months. A shortage in cars developed last week in the Connellsville coke region, but there had been an oversupply of cars for which coke could not be found and the railroad diverted more cars from the coke regions than should have been done. The local steel market shows no new features. There is

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Aug. 8, 1917.	Aug. 1, 1917.	July 3, 1917.	Aug. 2, 1916.
No. 2 X, Philadelphia...	$53.00	$53.00	$52.00	$19.75
No. 2, Valley furnace....	53.00	53.00	55.00	18.25
No. 2 Southern, Cin'ti...	49.90	49.90	49.90	16.90
No. 2, Birmingham, Ala.	47.00	47.00	47.00	14.00
No. 2, furnace, Chicago*	55.00	55.00	55.00	19.00
Basic, del'd, eastern Pa..	50.00	50.00	50.00	19.00
Basic, Valley furnace...	52.00	52.00	52.00	18.00
Bessemer, Pittsburgh ...	55.95	55.95	57.95	21.95
Malleable Bess., Ch'go*..	55.00	55.00	55.00	19.00
Gray forge, Pittsburgh..	46.95	46.95	47.95	18.70
L. S. charcoal, Chicago..	58.00	58.00	57.00	19.75
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	38.00	38.00	38.00	33.00
O.-h. rails, heavy, at mill	40.00	40.00	40.00	35.00
Bess. billets, Pittsburgh.	*90.00*	100.00	100.00	43.00
O.-h. billets, Pittsburgh..	*90.00*	100.00	100.00	45.00
O.-h. sheet bars, P'gh...	*90.00*	105.00	105.00	45.00
Forging billets, base, P'gh	125.00	125.00	125.00	69.00
O.-h. billets, Phila.....	*100.00*	110.00	110.00	45.00
Wire rods, Pittsburgh....	95.00	95.00	95.00	55.00
Finished Iron and Steel				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	4.659	4.659	4.659	2.659
Iron bars, Pittsburgh....	4.75	4.75	4.75	2.50
Iron bars, Chicago.....	4.50	4.50	4.50	2.35
Steel bars, Pittsburgh....	4.50	4.50	4.50	2.50
Steel bars, New York....	4.669	4.669	4.669	2.669
Tank plates, Pittsburgh..	9.00	9.00	9.00	3.50
Tank plates, New York..	10.169	10.169	9.169	3.669
Beams, etc., Pittsburgh..	4.50	4.50	4.50	2.50
Beams, etc., New York..	4.669	4.669	4.669	2.669
Skelp, grooved steel, P'gh	4.00	4.00	4.00	2.35
Skelp, sheared steel, P'gh	6.00	6.00	6.00	2.45
Steel hoops, Pittsburgh..	5.75	5.75	5.25	2.75

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire,	Aug. 8, 1917.	Aug. 1, 1917.	July 3, 1917.	Aug. 2, 1916.
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh	8.50	8.50	8.50	2.90
Sheets, galv., No. 28, P'gh	10.00	10.00	10.00	4.25
Wire nails, Pittsburgh...	4.00	4.00	4.00	2.50
Cut nails, Pittsburgh....	4.65	4.65	4.65	2.60
Fence wire, base, P'gh...	3.95	3.95	3.95	2.45
Barb wire, galv., P'gh...	4.85	4.85	4.85	3.35
Old Material, Per Gross Ton:				
Iron rails, Chicago.....	$40.50	$40.50	$47.00	$18.50
Iron rails, Philadelphia.	45.00	45.00	52.00	20.00
Carwheels, Chicago	30.50	30.50	37.00	12.00
Carwheels, Philadelphia.	35.00	35.00	38.00	15.50
Heavy steel scrap, P'gh..	33.00	33.00	42.00	16.25
Heavy steel scrap, Phila.	*31.00*	32.00	40.00	14.75
Heavy steel scrap, Ch'go	29.00	29.00	36.00	15.25
No. 1 cast, Pittsburgh...	34.00	34.00	36.00	15.00
No. 1 cast, Philadelphia.	*34.00*	35.00	39.00	16.00
No. 1 cast, Ch'go (net ton)	*23.00*	27.00	30.50	11.50
No. 1 RR. wrot, Phila....	45.00	45.00	57.00	19.50
No. 1 RR. wrot, Ch'go (net)	33.50	33.50	40.00	15.25
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	**$13.00**	$10.00	$15.00	$2.75
Furnace coke, future....	10.00	10.00	9.50	2.50
Foundry coke, prompt...	**14.00**	12.00	13.00	3.25
Foundry coke, future....	10.00	10.00	10.00	3.50
Metals,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.	*28.00*	29.00	31.75	26.25
Electrolytic copper, N. Y.	*28.00*	29.00	31.75	26.00
Spelter, St. Louis.....	8.50	8.50	9.00	9.25
Spelter, New York.....	8.75	8.75	9.25	9.50
Lead, St. Louis.....	10.75	10.75	11.25	6.00
Lead, New York.....	10.87½	10.87½	11.37½	6.10
Tin, New York.....	*63.62½*	68.75	62.00	38.00
Antimony (Asiatic), N. Y.	15.00	15.00	19.00	12.50
Tin plate, 100-lb. box, P'gh	$12.00	$12.00	$12.00	$6.00

almost an entire absence of the wonderful activity in buying that prevailed until a month ago. Consumers evidently are not buying a pound of material they can possibly avoid, and manufacturers as well as consumers fully believe the apex in prices has been reached and that there may be severe declines in the near future, once the Government has announced its definite policy as to prices for finished steel products. There were no marked declines in prices in the past week, except on semi-finished steel, the market on billets and sheet bars showing a decidedly weaker tendency with prices off about $10 per ton as compared with the highest market reached on these commodities. Pig iron held fairly steady, also scrap, but prompt blast furnace coke, due to shortage in cars and labor, has moved up $3 to $4 per ton. The report of the Federal Trade Commission on its investigations into steel costs is looked for at any time, and much interest is being shown as to just what cost figures will be given.

Pig Iron.—The local market is in very peculiar condition. No sales are being made by furnaces direct to consumers, but there is some resale iron that was loaded on the docks in New York for export shipment and had been turned back on account of not being able to get ships. One sale of this kind, involving about 2000 tons of Bessemer, was made at $50, f.o.b. New York, equal to $52.50, Pittsburgh. Possibly some Bessemer iron to come from one furnace outside the Valley district could be had at $52 at furnace, equal to $53.70, Pittsburgh, but the amount would be relatively small. On resales of Bessemer iron that have been made since the Government embargo was declared, prices have ranged from $53 to $55, Pittsburgh, but it is not believed that over 7000 to 8000 tons have been thus sold. These were also practically forced sales, and the prices ruling are not considered as the ruling market on Bessemer iron. None of the furnaces making Bessemer will sell at less than $55, Valley, and one leading maker is holding Bessemer at $57, Valley furnace. Nothing is doing in basic, which is firm at $52 to $53 at furnace. Predictions are that after the hot weather is over, and finishing mills again are making normal output, there will be a decided shortage in the supply of pig iron, and that prices in 60 days from now may be higher than they are now.

Billets and Sheet Bars.—The great increase in new capacity for making open-hearth steel that is now in operation is commencing to tell, and in the past two weeks there has been a decided increase in the quantity of semi-finished steel available for the open market, in the forms of billets, sheet bars and slabs. New inquiry for steel is dull, but offerings of steel from sellers are coming out nearly every day, and for quick shipment. This week, several consumers of sheet bars that have regular sources of supply and are getting all the steel they can handle, have been offered sheet bars from other sources at $90 per gross ton, f.o.b Pittsburgh, and the steel was declined. This week a sale of 1500 tons of slabs for August and September delivery was made at $90 per gross ton, f.o.b. Pittsburgh. Export shipments have been cut off. Output of steel has increased at least 2,000,000 tons per year since Jan. 1, and with steel mills making better deliveries to customers, the drop in prices of billets and sheet bars is readily explained. During the excessively hot weather of the past two weeks, the output of finishing mills was very materially cut down, and they have larger stocks of steel billets and sheet bars piled up in their yards than for a long time.

We now quote soft Bessemer and open-hearth billets at $90 to $95 and soft Bessemer and open-hearth sheet bars at $90 to $95, maker's mill, Pittsburgh or Youngstown. We quote forging billets at $125 per ton for ordinary sizes and carbons, f.o.b. maker's mill.

Steel Rails.—New demand for new and rerolled light rails is not so active as three or four weeks ago, but prices are holding firm. The new light rail mills, and also the rerolling rail mills, are filled up for six to nine months ahead on all the rails they can possibly

turn out. No new orders are being placed for standard sections, aside from the Government contracts for the Allies. Prices on new light rails and standard sections are given on page 343.

Ferroalloys.—Demand for ferromanganese in the past week for prompt shipment was decidedly more active, and prices are firm. We note sales of 200 to 250 tons of 80 per cent domestic ferromanganese for prompt shipment, and 300 to 400 tons for delivery over remainder of this year at $400 per gross ton, f.o.b. Pittsburgh. We quote 80 per cent domestic ferromanganese for prompt shipment at $400; for delivery over remainder of this year, $375 to $400, and for first half of 1918, about $375, at furnace. We continue to quote 18 to 20 per cent spiegeleisen at $80 to $85 per gross ton at furnace. Nearly all consumers of ferrosilicon are covered over the remainder of this year, and new buying is light. However, we note a sale of 700 tons of 10 per cent Bessemer ferrosilicon for delivery for first half in 1918 at $95 per gross ton at furnace.

We quote 9 per cent Bessemer ferrosilicon at $89, 10 per cent $90, 11 per cent $95, 12 per cent $100, 13 per cent $105, 14 per cent $115, 15 per cent $125, and 16 per cent $135. We now quote 7 per cent silvery iron at $84 to $89, 8 per cent $85 to $90, 9 per cent $86 to $91, 10 per cent $87 to $92, 11 and 12 per cent $88 to $93. All f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having a uniform freight rate of $2 per gross ton for delivery in the Pittsburgh district.

Structural Material.—The new inquiry has been very light for some weeks, and not much new work is in sight. The McClintic Marshall Co. has taken 4000 tons for steel buildings for the new seamless-tube plant of the Pittsburgh Steel Products Company at Allenport, Pa. It is now estimated that about 8000 tons of steel will be needed for the proposed shipyards of the Federal Shipbuilding Co., in Hackensack Meadows, N. J. The plain material will be furnished by the Carnegie Steel Co., and will be fabricated by the American Bridge Co. Prices on structural material are given on page 343.

Plates.—No new orders for steel cars are coming out, except from the Government, which is said to have practically placed 17,000 cars for France. About 85,000 to 100,000 tons of plates and shapes will be needed. Domestic railroads are not ordering cars, knowing it would be months before they could get them, as the Government work will take preference. Steel car builders are getting only 40 to 50 per cent of the regular requirements of plates, and the outlook is that when the Government starts to place orders for ships the quantity of plates available for car plants will be less than now. The Chilean State Railways are reported in the market for 400 stock cars and 600 box cars. Prices on plates are holding strong, but new inquiry is not so active. We quote ¼-in. and heavier sheared plates for delivery over remainder of this year at 8c. to 9c. at mill, while small lots from warehouse bring 12 to 13c. Pittsburgh.

Sheets.—Additional fair-sized orders for blue annealed, galvanized and Bessemer black sheets are being placed by the Government for prompt shipment. Tin plate and sheet mills through the sub-committee on sheets have furnished promptly all the sheets called for and expect to do so on future orders. New demand from the domestic trade is quiet, the general opinion being that the crest has been reached in prices, and that the market may be lower before long. It is true sheet mills are well sold up over remainder of this year, some having no sheets to offer before next year, but there has been a large increase in capacity in the past year, and this is able to take care of the demand. Prices are firm, but are not expected to be any higher. Mill prices for carload and larger lots to the domestic trade are given on page 343.

Tin Plate.—An annoying error crept into this report last week when it was stated that 10,000 boxes of bright tin plate for export had been sold at $57.50 per base box; the correct price was $17.50. On 30,000 boxes of tin plate for Japan, as high as $18.40 per base box at maker's mill has been offered and refused by several mills, which state they could not possibly spare the plate in spite of the very attractive price. Foreign inquiry is still very heavy, coming from the Orient, India and South America. Several leading mills explain that obligations on their books now will take their entire output of tin plate up to April of next year. It is likely large additions to capacity for making tin plate will be made over the next year or 18 months to meet the expected heavy export demand, to come not only during the war but for several years afterward. Sales of bright plates from stock are being made at $13 to $14 per base box. New demand from jobbers is not so active as it was a month or more ago. We quote bright plate from stock on current orders from $12 to $14 per base box, f.o.b. mill. New prices on terne plate, effective July 31, are given on page 343.

Iron and Steel Bars.—It is claimed that implement makers and other large consumers of steel bars are now fully covered over the remainder of this year. It is stated that prices range from 2.75c. to 2.90c. at mill, but in the Chicago district, lower figures were made. New demand for iron and steel bars is only fair, most consumers being covered, and specifications are quite active. The Government is buying moderate quantities of steel and reinforcing bars. It is not believed that prices on iron and steel bars will be any higher. Mill prices on carloads and larger lots to domestic customers are given on page 343.

Hoops and Bands.—New buying is slow, as consumers are covered over the remainder of this year, and at prices very much lower than are quoted on small lots for fairly prompt shipment. We quote hoops in small lots for prompt shipment at 6c. to 7c. and bands 5.50c. to 6c., extras on the latter as per the steel bar card.

Muck Bar.—There is no new inquiry, but prices on high grade muck bar made from all pig iron are ruling at about $95 per ton at mill.

Wire Rods.—Export and domestic demand for rods is still quite heavy. Small lots of soft Bessemer and open hearth rods for export are being sold regularly at about $100 per gross ton, at mill. To domestic consumers, soft rods are held at about $95, and high carbon rods made from special steels bring as high as $120. Prices on rods are given in detail on page 343.

Wire Products.—The recent order for 42,000 kegs of wire nails from the Government has been filled, and the order has been duplicated, about one-half going to the leading interest, and the remainder divided pro rata among the independent mills. New demand for wire nails and wire is quiet, and it is believed that the bulk of the new business being placed is going to the leading interest, as its prices are $16 per ton less than are being quoted by the independent mills. So far none of the independent mills has reduced prices on account of the falling off in new business, and they say they will not do so. This is always the dull season in the wire trade, and the mills believe that late in September or early October there will be more active buying. Jobbers are not inclined to carry heavier stocks of nails than they need to fill their current orders. Independent mills have pretty well cleaned up all orders on their books taken at the $3.20 price for wire nails, and $3.25 for bright basic wire, and are now shipping out on contracts taken at the $3.50 price for nails and $3.55 for wire. The American Steel & Wire Co. prices on wire nails remains at $3.20 base, and $3.25 for bright basic wire per 100 lb. at mill. Prices quoted on wire and wire nails by the independent mills, but at which only a comparatively small amount of business has been placed, are given on page 343.

Shafting.—Very large quantities of shafting will be needed for the time fuses and the detonators for the 9,000,000 of 3-in. shells placed lately by the Government. In each of these time fuses, one piece of shafting measuring 1⅝ in. to 1 11/16 in. is used, each piece weighing about 7 lb. Other heavy direct and indirect Government orders are being placed, and the output of the makers is well sold up over the remainder of this year. Specifications from the automobile trade have fallen off very much in volume, but from the screw stock machine trade are still quite active. Builders of aeroplane motors will be heavy users of shafting, and have already placed considerable orders. Discounts remain firm at 10 and 5 per cent off list,

depending on the order, while a few small lots are being sold at list.

Railroad Spikes and Track Bolts.—New demand for railroad spikes for the past several weeks has been very dull, and specifications are quiet. So far no part of the order for 100,000 kegs of standard spikes for the Government railroad in France has been placed. All the makers of spikes have their output well sold up for this year, and prices are ruling firm. As noted last week, makers of boat spikes, as a rule, are not quoting to the domestic trade, desiring to conserve practically their entire output over the next year to meet the Government boat building program. Track bolts are in only fairly heavy demand and local makers are sold up for this year. Prices on railroad spikes and track bolts are given in detail on page 343.

Cold Rolled Strip Steel.—It is estimated that the Government is taking 15 to 20 per cent of the output, both in hot rolled and cold rolled products. New demand from the domestic trade is not so active, consumers being pretty well covered over the next 60 to 90 days, and the belief is that the crest in prices has probably been reached.

On contracts, mills are quoting 9c. at mill, but on small current orders prices range from 10c. up to 12c. at mill. Terms are 30 days, less 2 per cent off for cash in 10 days when sold in quantities of 300 lb. or more.

Nuts and Bolts.—Makers are well sold up over remainder of this year. Jobbers are not anxious to carry large stocks, believing that prices will not be any higher. The hot weather and the shortage of labor is cutting down output to some extent, but deliveries of steel are better than for a long time. Discounts adopted on April 12, which give prices to the large trade in carloads, advances being charged for small lots, are given on page 343.

Wrought Pipe.—The sub-committee on tubular products has been able to distribute and get prompt delivery for all the wrought steel pipe so far required for the different Government cantonments. The committee recently received Government specifications for about 4300 tons of pipe for steam heating for the cantonments. This has been distributed pro-rata among the different manufacturers, and it will be shipped as fast as required. About 500,000 ft. of 6-in. pipe has already left the mills, together with a smaller quantity of other sizes. Pipe manufacturers have all given these orders preference, though difficult at times to secure the steel. There will be no trouble about the Government securing pipe as fast as needed, on account of the large capacity of the pipe mills of this country. The current demand for lap-weld iron and steel pipe is not so active as it has been, business from jobbers and from consumers showing a falling off, due largely to the uncertainty of Government regulation of prices. However, the mills are sold up on lap-weld iron and steel pipe over the remainder of this year, and some have large orders for 1918 delivery. New demand for butt-weld iron and steel pipe is quiet, partly due to the large falling off in building operations all over the country, on account of the high prices ruling for material and labor. Mills can fill new orders for butt-weld pipe in six to eight weeks from date of order. Discounts on steel pipe, as adopted on May 1, in effect by most of the independent mills, and on iron pipe as adopted on July 1, are given on page 343.

Boiler Tubes.—Some difficulty will likely be encountered by the Government in securing promptly boiler tubes to be required later on for the merchant marines and other ships. Tube mill order books are filled up for a year to 18 months, and while they will give preference to Government orders, capacity is not relatively so large as for making pipe. Several large makers of steel tubes have been furnishing close to 50 per cent of their output to the Government for some time. This also applies to seamless steel tubing, the National Tube Co. and the Pittsburgh Seamless Tube Co., both having been furnishing large quantities for some months. These two concerns have their output of seamless steel tubes sold up for more than a year ahead. The Pittsburgh Steel Products Co. has started work on a new seamless tube plant at Allenport, Pa., facing the Monongahela River, which will be larger than its present Monessen plant, which has an annual capacity of 60,000 tons of seamless steel tubes, ranging from 1-in. to 6-in. in diameter. Heavy premiums are being paid for fairly prompt deliveries of iron and steel tubes, consumers willing to pay practically any prices. Nominal discounts on iron and steel tubes, adopted Nov. 1, but which show prices very much below the actual market, are given on page 343.

Old Material.—The local scrap market shows no change. There is still almost an entire absence of new buying, and the market keeps marking time. Prices held steady in the past week, and are no lower. The only concern buying heavy melting steel scrap is an open-hearth steel plant in Central Ohio; in the past week or two, this has bought probably 35,000 tons of heavy steel melting scrap at $34 to $35, delivered, the freight rate from the Pittsburgh district being $1.20 per gross ton. Sometime ago there was a heavy demand in this district for borings and turnings for blast furnace use, but this has also stopped. The same is true of low phosphorus melting stock, this material having been in very active demand until about two weeks ago. Dealers report they are not yet trying to force sales of scrap under present conditions, taking the stand that it would be useless to do so, as consumers are not in a buying mood. Dealers are afraid to go short, feeling that an upward turn in prices may come at any time. They claim that prices of scrap today are cheap, and as soon as demand starts up again, the market will be higher. Several large dealers in this district report they have not made a large sale in the past week. Dealers quote for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh delivered	$33.00 to $34.00
No. 1 foundry cast	34.00 to 35.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md., and Franklin, Pa.	40.00 to 41.00
Hydraulic compressed sheet scrap	28.00 to 29.00
Bundled sheet scrap, sides and ends, f.o.b. consumer's mill, Pittsburgh district	23.00 to 24.00
Bundled sheet stamping scrap	21.00 to 22.00
No. 1 railroad malleable stock	29.00 to 30.00
Railroad grate bars	18.00 to 19.00
Low phosphorus melting stock	46.00 to 48.00
Iron car axles	47.00 to 50.00
Steel car axles	47.00 to 50.00
Locomotive axles, steel	55.00 to 60.00
No. 1 busheling scrap	26.00 to 27.00
Machine-shop turnings	18.00 to 19.00
Cast-iron wheels	33.00 to 34.00
Rolled steel wheels	37.00 to 38.00
*Sheet bar crop ends	44.00 to 45.00
Cast-iron borings	19.00 to 20.00
No. 1 railroad wrought scrap	38.00 to 39.00
Heavy steel axle turnings	24.00 to 25.00
Heavy breakable cast scrap	27.00 to 28.00

*Shipping point.

Coke.—The supply of cars all last week was very short, averaging only about 45 per cent. On one day it was only 10 per cent, but on other days ran up to 65 and 70 per cent. This served to hold up prices on prompt furnace coke, but the fact that during the hot weather coke workers worked only two or three days on the average, probably had more to do with putting up prices than the failure of the car supply. Early last week spot furnace coke sold at $10 per ton at oven, but this was the low mark, and prices steadily went up in the remainder of the week, and also in the first part of this week. Best grades of prompt furnace coke are now held at $13 to $14 per net ton at oven for shipment to the two Valleys, while coke for Eastern blast furnaces, loaded on Pennsylvania Railroad cars, is held as high as $15 per net ton at oven. Nothing is doing in contracts, coke operators still believing that the Government will regulate prices on both coal and coke. Furnaces are content to buy whatever surplus coke they need over regular contracts at prices ruling from day to day. The demand for prompt blast furnace coke is active, shipments not being heavy enough to give the furnaces all they need. The supply of labor, particularly coke drawers, is short, and operators who have hand-drawn ovens are often unable to get their coke drawn promptly. We now quote best grades of blast furnace coke for prompt

shipment to Valley furnaces at $13 to $14, and to Eastern furnaces shipped over the Pennsylvania Railroad at $14 to $15 per net ton at oven. We quote best grades of 72-hr. foundry coke for prompt shipment at $13 to $14 per net ton at oven. A meeting of coal and coke operators is to be held at Deer Park, Md., on Friday and Saturday of this week, to talk over the situation as to prices. The Connellsville *Courier* gives the output of coke in the upper and lower Connellsville regions for the week ended July 28 as 367,355 tons, an increase over the previous week of 5207 tons.

Chicago

CHICAGO, Aug. 6.

Interest is centered to a large degree in the consequences which will follow compliance by the Division of Export Licenses of instructions to grant no export licenses for plates, shapes, iron and steel bars, pig iron, scrap, etc., except where it is shown they are to be used for war purposes. Export companies have placed a great deal of business which cannot be handled despite confirmed credits. The order has resulted, in one mill, at least, in what is termed a "nasty mess," inasmuch as it is undesirable to roll what cannot be shipped. Neither is it desirable to let the material accumulate when domestic demand is so heavy. In the opinion of some the market for the products so restricted may be rendered easier as the result of the greater availability of material. The leading interest continues to take orders from the Government only, and other producers are taking but little or no new business. An order for 5000 kegs of spikes for France, presumably in connection with the recent order for 150,000 tons of rails, has been taken by a Western mill. Government orders are coming out heavily, but little is being said of them. Consumers of bars and other products are anxious for some assurance of stability in prices which would enable them to enter the future with greater certainty. The president of a large agricultural implement company believes this the most pressing question before manufacturers. Not a single letting for fabricated steel is announced this week. Sheets appear to have recovered from their recent weakness, and to have grown stronger, a sale of 300 tons of block sheets at 10.50c. being recorded. Pig iron is unchanged, but several grades of scrap show further declines. Dealers are of the opinion, however, that the bottom has been reached. Consumers are not buying here, but some strength is imparted to the market by the activity in the East where dealers appear to be buying to cover commitments.

Ferroalloys.—Eighty per cent ferromanganese for delivery in the first half of 1918 can be had at $350, delivered, and for the latter part of this year at $375. Strictly prompt is held at around $400.

Plates.—Narrow plates for domestic consumption can be had at 10c. to 11c., tank plate quality, delivery in sixty to ninety days. Practically all of the makers are out of the market in wide plates. It is not unlikely that the stricter ruling of the Government with regard to export licenses may bring about some ease in the market by making plates more available for domestic use. The principal effect so far is to create more or less confusion at the mills, inasmuch as in some instances exporters who placed orders have not yet obtained licenses and may not be able to do so, their orders not being predicated on war needs. Where licenses have not been obtained ,the railroads are not willing to carry material to the seaboard. Even the slowness of the Government in issuing licenses, prior to the last drastic order, caused one mill to accumulate 5000 tons. Jobbers to-day advanced their quotation.

For Chicago delivery out of stocks, jobbers quote 10c.

Pig Iron.—From every point of view the market is quiet and devoid of feature. As was the situation a week ago, the chief concern of the iron trade lies in making deliveries against contracts on its books. The Northern producers quote $55, furnace, for No. 2 foundry, basic and malleable Bessemer, any delivery this side of next July. Southern makers quote $50, Birmingham, for this year, and $45 to $48, for the first half. The few lots of prompt iron which have come on the market have brought full prices when they have been taken. Charcoal iron is unchanged. Copper-bearing low phosphorus is about $90, Chicago, and there is practically no activity to report, an inquiry for 1500 tons having been withdrawn. It is regarded as not improbable that the action of the Government in refusing export licenses except where iron is destined for war consumption may later have some effect in easing the market, but no influence has yet been felt, on the contrary, there now appears to be none too much iron for domestic consumption. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 1 to 4	$58.00
Lake Superior charcoal, Nos. 5 and 6, Scotch and No. 1 soft or special	60.50
Northern coke foundry, No. 1	55.50
Northern coke foundry, No. 2	55.00
Northern coke foundry, No. 3	54.50
Northern high-phosphorus foundry	55.00
Southern coke No. 1 f'dry and 1 soft	55.00
Southern coke No. 2 f'dry and 2 soft	54.00
Malleable Bessemer	55.00
Basic	55.00
Low-phosphorus	$90.00 to 93.00
Silvery, 8 per cent	82.75

Structural Material.—Again a week has passed without a single structural letting to be announced, although in miscellaneous lots one maker reports a fair business. Delivery this year commands 6.189c., Chicago, although it is likely this figure might be shaded a little. No car orders are reported. The largest producers of shapes are entirely out of the market.

For material out of warehouse jobbers quote 5c.

Bars.—Large consumers of bars, and of other products, are uncertain as to their future buying because of the uncertainty which confronts them. If the agricultural implement makers, for instance, were convinced that the market would pursue a reasonably stable course some of them would place orders. Mild steel bars are unchanged at 4.689c., Chicago. Rail carbon bars, quoted at 4.50c., Chicago, have been a little more active in the last two or three days. Iron bars range from 4.50c. to 5c., Chicago.

We quote prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c. to 5c.; reinforcing bars, 4.50c., base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Wire Products.—No change from a week ago can be reported. The leading interest continues to fill specifications at its 3.20c., Pittsburgh base, while independents ask 4c. and over. We quote on the basis of 4c., Pittsburgh, for nails, per 100 lb., to jobbers, as follows:

Plain fence wire, Nos. 6 to 9, base, $4.189; wire nails, $4.189; painted barb wire, $4.339; galvanized barb wire, $5.039; polished staples, $4.339; galvanized staples, $5.039; all Chicago, carload lots.

Sheets.—The slightly easier tendency which was apparent in sheets a few days ago seems to have disappeared, one indication of which lies in the action of an Ohio maker in withdrawing all quotations last Saturday, requesting its representatives to submit all inquiries to the mill. Prices have stiffened a little, several makers now asking 9.189c. for both No. 10 blue annealed and No. 28 black. Galvanized are nominally 10.50c. to 11c., Pittsburgh, or 10.689c. to 11.189c., Chicago. A lot of 300 tons, delivery in 60 to 90 days, was purchased at 10.50c., but this price is over the general market. Jobbers' quotations are unchanged.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 10c.; No. 28 black, 10c., and No. 28 galvanized, 11.50c.

Rails and Track Supplies.—A Western mill has received an order for 5000 kegs of spikes for export to France, presumably in connection with the Government purchase of 150,000 tons of rails reported a week ago. The price is not announced, but it is presumed to be in line with those to be paid by the Government for other track materials. Specifications for splice bars have

been fair. The quotations for spikes and track bolts show considerable variance, the leading interest holding down its prices, although at the same time it is not taking any but Government business.

Quotations are as follows: Standard railroad spikes, 4.25c. base; small spikes, 4.50c., base; track bolts with square nuts, 5.25c., all in carloads, Chicago; tie plates, $70 to $90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base; open hearth, $40; light rails, 25 to 45 lb., $65; 16 to 20 lb., $66; 12 lb., $67; 8 lb., $68; angle bars, 3.25c., base.

Bolts and Nuts.—Quiet in new business is pronounced, but the makers have more than enough in hand to keep them busy. For prices and freight rates see finished iron and steel prices, f.o.b. Pittsburgh, page 343.

Store prices are as follows: Structural rivets, 5.50c.; boiler rivets, 5.60c; machine bolts up to ⅞ x 4 in, 40-10; larger sizes, 35-5; carriage bolts up to ⅞ x 6 in, 40-2½; larger sizes, 30-5; hot pressed nuts, square, $3, and hexagon $3 off per 100 lb.; lag screws, 50 per cent off.

Cast-Iron Pipe.—Akron, Ohio, it is expected, will to-day place 2500 tons. The Whitefish Bay, Wis., requirement of 400 tons went to a contractor. The Government continues to buy in liberal quantities. In addition to previous purchases, it has taken 2000 tons for Fort Riley, Kan. Quotations are unchanged.

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., $68.50; 6 in. and larger, $65.50, with $1 extra for class A water pipe and gas pipe.

Old Material.—In this market there is no active buying on the part of consumers, but prices are supported, to some extent, by the strength of the Eastern market, where there appears to be considerable effort on the part of dealers to cover their commitments. Local dealers believe that quotations are near the bottom, partly because of their policy of not pressing material for sale. The Illinois Central Railroad refuses to let its coal cars leave the Chicago switching district, and it is understood other lines will follow this example. A fair list has been issued by the Union Pacific, and small ones by the C. & E. I., Illinois Central, Pere Marquette and Big Four. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$40.50 to $41.50
Relaying rails	50.00 to 55.00
Old carwheels	30.50 to 31.50
Old steel rails, rerolling	39.00 to 40.00
Old steel rails, less than 3 ft.	39.00 to 40.00
Heavy melting steel scrap	29.00 to 30.00
Frogs, switches and guards, cut apart	29.00 to 30.00
Shoveling steel	26.00 to 27.00
Steel axle turnings	21.00 to 22.00

Per Net Ton

Iron angles and splice bars	$38.00 to $39.00
Iron arch bars and transoms	41.00 to 42.00
Steel angle bars	30.00 to 31.00
Iron car axles	40.00 to 41.00
Steel car axles	40.00 to 41.00
No. 1 railroad wrought	33.50 to 34.50
No. 2 railroad wrought	30.50 to 31.00
Cut forge	30.00 to 31.00
Pipes and flues	21.00 to 22.00
No. 1 busheling	25.00 to 26.00
No. 2 busheling	18.00 to 19.00
Steel knuckles and couplers	41.00 to 42.00
Steel springs	42.50 to 43.00
No. 1 boilers, cut to sheets and rings	20.50 to 21.00
Boiler punchings	31.00 to 32.00
Locomotive tires, smooth	40.00 to 41.00
Machine-shop turnings	16.00 to 17.00
Cast borings	16.50 to 17.50
No. 1 cast scrap	23.00 to 24.00
Stove plate and light cast scrap	17.50 to 18.00
Grate bars	17.50 to 18.50
Brake shoes	17.50 to 18.50
Railroad malleable	29.00 to 30.00
Agricultural malleable	23.75 to 24.75
Country mixed scrap	16.00 to 16.50

Philadelphia

PHILADELPHIA, Aug. 6.

Pressure for deliveries is stronger, if anything, in all lines of iron and steel, but new business is slow except for plates, where the most congestion exists. There is a growing feeling here that there will be no drastic Government action with regard to price fixing in civilian business, but no increase of orders is accompanying that conviction. There is certainly no worry over the lack of new business; mills and furnaces are sold so far ahead that the opportunity to take a breathing spell and to get a clearer view of the whole situation is being welcomed. The President's embargo on steel and iron exports has had an effect in some lines, but the actual amount of resale material available in this market as a result of the export embargo is apparently small and certainly has had no effect on prices.

Pig Iron.—Firm conditions prevail, despite the light inquiry and the comparatively trifling sales. One large house reports that for the last two weeks transactions have not been 25 per cent of the average. There is no apparent disposition on the part of buyers to place orders running into the third quarter of 1918, and as many furnaces are sold up for virtually all of the first half of 1918, it is likely that business will lag for the remainder of August. The call for prompt shipment of iron against contract is insistent, while actual furnace stocks are at their minimum. Some small lots of Eastern Pennsylvania No. 2 X have sold in the week at $53 to $55 furnace. Other small transactions in Southern No. 2, first-half delivery, are reported on a basis of $49, Birmingham. Virginia iron has been inactive and in the standard grades maintains last week's quotations as the nominal prices, though some Virginia iron of high silicon content has changed hands at the equivalent of $57.50 Philadelphia. Steel-making irons are quiescent, with standard low phosphorus nominal at $90 and basic nominal at $50 to $52. For prompt shipment, delivery in buyers' yards, standard brands are quoted as follows:

Eastern Pa. No. 2 X foundry	$53.00 to $55.75
Eastern Pa. No. 2 plain	52.75 to 55.25
Virginia No. 2 X foundry	54.25 to 55.25
Virginia No. 2 plain	53.75 to 54.75
Basic	50.00 to 52.00
Standard low phosphorus	90.00

Coke.—Foundry coke is quoted to-day at $13 to $14, with furnace coke ranging from $10.25 to $11 for spot fuel.

Ferroalloys.—Ferromanganese maintains its level of $400 for prompt delivery, with makers apparently inclining toward stiffer prices and with some mention of $420 as their idea. While no sales have been recorded higher than $400 there has been none reported below that figure, though for last quarter delivery it is possible to buy at $375, with $350 asked for 1918. Spiegeleisen is none too strong at $80 furnace, with $82.50 asked for small lots. Fifty per cent ferrosilicon is somewhat easier at $225 for prompt and $125 to $130 for first quarter.

Billets.—Resale billets have been offered in this market by an exporting house, which has been quoted $90 on about 2000 tons of open-hearth billets, 6 x 6 in., carbon 0.10 to 0.15 per cent. It is reported here that the Pennsylvania Railroad has purchased upward of 1500 tons of forging billets, 1918 delivery, at $125.

Sheets.—Mill capacity continues to be more or less taken up with Government work, but civilian business which can be accommodated is taken on a basis of 8½c. to 8¾c. for blue annealed; 8c. for black and 10¾c. to 11c. for galvanized.

Iron and Steel Bars.—Moderate inquiry is reported in concrete bars, which are being held by makers at 4¾c., while soft steel bars are quoted at 5c. to 5½c., Pittsburgh, according to tonnage. Makers of bar iron report extra heavy inquiry as a result of the Government's shipbuilding program, and inquiries of approximately 20,000 tons are reported on wooden ships. Mills are holding bar iron at 5c. to 5¾c., Pittsburgh, shipment at mill convenience.

Structural Material.—Additional Government specifications are reported by mills which have not yet reached the maximum of their allotments, and the path of the civilian with orders on the books is getting thornier. New work is conspicuous by its absence in this territory, and prices on available shapes run anywhere from 5¼c. to 6c. The chief interest in the structural field just now is the possibility of renewed work on the Broad Street subway, the three pending contracts on that enterprise, covering six sections, calling for about 25,000 tons of steel. As the bids were presented nearly six months ago, when prices were much lower than they are now, the general contractors have requested concessions from the city, and a meeting with

the Mayor is expected this week. Four of the six sections, according to the original design, were to have been fabricated by the McClintic-Marshall Co., and it is understood that the bulk of the steel was to have been rolled by the Bethlehem Steel Co. The remaining steel work, for two sections, was to go to the American Bridge Co. Pending the conference with the general contractors and the city solicitor, the mayor, it is understood, will not sign the awards.

Plates.—Specifications have been very heavy. It is said that including Government specifications for plates, such as might be used on destroyers or similar light craft, the total was several hundred per cent of the full capacity of the mills for the week. Car, locomotive and ship plates were included, as well as an inquiry for 1000 tons of tank plates for export which was turned down with other export inquiries. New business placed aggregated about 4000 tons, while the business, both export and domestic, which was rejected, ran into many thousands of tons. Government orders, which are very heavy, continue to get preference, which means virtually no promise of shipments to ordinary purchasers under ten or twelve months, with the likelihood of a longer delay if Government interests require it. There is considerable bridge work in the market and bridge companies are using 10.159c., base Philadelphia, or its equivalent, in making estimates, with several orders placed on this basis. Minimum quotations on plates remain unchanged, 10.159c., Philadelphia, for tank and 12½c. mill for ship steel.

Old Material.—Mills which were thought to be showing interest in scrap metal when the export embargo was announced have relapsed into their old waiting attitude and the market is decidedly quiet. Though trading is almost at a standstill there seems to be a general desire of short interests to cover, while holders of actual material are not inclined to sell. Somewhat softer prices are quoted in a number of lines, but in the absence of real transactions the figures are largely nominal. For material delivered in Eastern Pennsylvania, the prices per gross ton are:

No. 1 heavy melting steel	$31.00 to $32.00
Steel rails, rerolling	43.00 to 45.00
Low phosphorus, heavy melting	45.00 to 50.00
Old iron rails	45.00 to 47.50
Old carwheels	35.00 to 38.00
No. 1 railroad wrought	45.00 to 50.00
No. 1 forge fire	22.00 to 23.00
Bundled sheets	22.00 to 23.00
No. 2 busheling	16.00 to 17.00
Machine shop turnings (for blast furnace use)	19.00 to 20.00
Machine shop turnings (for rolling mill use)	22.00 to 23.00
Cast borings (for blast furnace use)	19.00 to 20.00
Cast borings, clean	23.00 to 25.00
No. 1 cast	34.00 to 37.00
Grate bars	21.00 to 22.00
Stove plate	22.00 to 23.00
Railroad malleable	32.50 to 35.00
Wrought iron and soft steel pipe (new specifications)	31.00 to 33.00

Cleveland

CLEVELAND, Aug. 7.

Iron Ore.—Lake ore shipments in July amounted to 10,241,633 gross tons, setting a new record. The previous high mark was in August, 1916, when the ore fleet moved 9,850,140 tons. Shipments for July a year ago were 9,750,157 tons. Shipments to Aug. 1 were 26,376,768 tons, or 2,988,956 tons less than in the corresponding period a year ago, the falling off being due to the light movement early in the season resulting from the late opening of navigation caused by ice conditions. The July movement was surprisingly large, considering the long delays caused to boats at lower Lake ports while waiting for cars. It is expected that another new record will be established in August. Information gathered during the past few weeks and presented at a meeting of the pig iron, ore and coal committees of the advisory commission of the Council of National Defense held in Cleveland, Aug. 1, which was presided over by Chairman H. G. Dalton, indicates that the Lake Superior iron ore requirements of the inland blast furnaces for the year will be 34,000,000 tons, that the Eastern blast furnaces will require 4,000,000 tons of Lake ore, and the Lake front furnaces will require 20,000,000 tons. It is possible that the inland furnaces will be allowed 2,000,000 tons additional, making the probable requirements from 58,000,000 to 60,000,000 tons. Shipments by water in 1916 were 64,734,198 gross tons. However, it was predicted early in the season that the 1916 record would not be reached this year, one of the reasons for this being that there were not such large stock piles of ore at the mines at the beginning of the season of navigation as there were early last year. The figures showing the probable ore requirements for this year indicate that there is not cause for the fear of an ore shortage that has been expressed in some quarters. The problem that confronts the iron and steel industry and the various committees is one of car supply rather than a scarcity of ore or lack of sufficient vessel capacity to move it. Because of this situation it is stated that the committees will make no attempt to curtail the amount of ore shipped to Lake front furnaces unless conditions later should warrant some restrictions in the amount of ore going to Lake front consumers in order to speed up the Lake movement of coal shipped to the Northwest. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, $5.95; Mesaba Bessemer, $5.70; old range non-Bessemer, $5.20; Mesaba non-Bessemer, $5.05.

Pig Iron.—While some small lots of No. 2 foundry and malleable pig iron are being sold by Cleveland furnace interests, the total tonnage booked in the past week has been unimportant. One large interest took on only a total of 5000 tons of both grades in the past seven-day period. These sales, which were made at $55, furnace, involved largely deliveries for this year, buyers seemingly having lost some of their former apprehension over ability to secure iron for delivery next year. Steel-making irons have not been active here for several weeks, but Cleveland furnaces are not inclined to accept $52, Valley, as the prevailing basic iron price, two of them declaring they will not sell under $54. The low-phosphorus iron market is quiet, with no inquiry now active, and the quotation prevails at $82 to $85, Pittsburgh. All melters of iron in northern Ohio are anxious to secure regular shipments of metal, and so far the car service has been fairly satisfactory. We quote, f.o.b. Cleveland, as follows:

Bessemer	$55.95
Basic	$53.30 to 55.30
Northern No. 2 foundry	55.30
Southern No. 2 foundry	49.00 to 54.00
Gray forge	50.95 to 52.95
Ohio silvery, 8 per cent silicon	88.62
Standard low phos. Valley furnace	85.00

Coke.—The rapid advance in the Connellsville prompt furnace coke price since Friday has been somewhat of a surprise to Cleveland consuming interests. They had previously been offered furnace fuel for August delivery at $10 and $10.50 per net ton at ovens, but had shown no anxiety to cover. Now the quotation has jumped $2 a ton, and the lowest quotation heard to-day was $12, ranging up to $12.50, ovens. Some sales have been made in small lots of several carloads to-day at $12.50, ovens. Foundry coke has been hard to get, that is, standard quality coke, and as high as $14, ovens, has been paid. The car supply again is causing anxiety, and this week it has become much tighter than usual. Whether the new high price will be more than temporary is a question, but since extraordinary efforts are being made to bring in more lake cargo coal, it is suspected the coke pinch here may continue for some days.

Finished Iron and Steel.—Sales have been of small proportions the past week, largely for odds and ends. Some northern Ohio implement makers have sought to buy additional steel bars for next year, but have not been encouraged. Steel bars are being sold at 4c. by one mill for delivery in the fourth quarter of this year, but only to old customers. Shapes are being sold at 4½c. by the same mill, also to old customers. But the shape trade has dwindled to small proportions. A Canton, Ohio, manufacturer, using cold rolled material has been unable to secure additional tonnage, except at prices it considered prohibitive, and has withdrawn from the market to prod up mills previously

slow in making deliveries to it. Bar iron is selling in odd lots from time to time around 4.75c. to 5c. Steel sheet inquiry for first quarter of next year has not been satisfied as yet. Local jobbers have again advanced quotations to the mill basis.

Semi-Finished Steel.—While some northern Ohio sheet mills have been trying to sound out the market for sheet bars for fourth-quarter delivery, manufacturers have put aside such inquiry with the declaration that it is too soon to figure. Sheet mills in this district appear to be so well covered for the present that they may be able to carry over into the fourth quarter fairly good tonnages of sheet bars, in some cases. Intimation has been given by sheet bar makers that fourth quarter prices may be around the third quarter price, which averaged $105 to $110, mill.

Old Materials.—No more activity has developed here the past week in iron and steel scrap than has been apparent in the previous two weeks. Sales have been infrequent, and confined largely to dealings between brokers. No changes in quotations have been made, and we quote, f.o.b. Cleveland, as follows:

Per Gross Ton

Steel rails	$31.00 to $32.00
Steel rails, rerolling	45.00 to 46.00
Steel rails, under 3 ft.	39.00 to 40.00
Iron rails	43.00 to 44.00
Steel car axles	50.00 to 52.00
Heavy melting steel	32.00 to 33.00
Carwheels	32.00 to 33.00
Relaying rails, 50 lb. and over	50.00 to 55.00
Agricultural malleable	24.00 to 25.00
Railroad malleable	31.00 to 32.00
Light bundled sheet scrap	24.00 to 25.00

Per Net Ton

Iron car axles	$47.00 to $49.00
Cast borings	17.50 to 18.00
Iron and steel turnings and drillings	17.00 to 17.50
No. 1 busheling	25.00 to 26.00
No. 1 railroad wrought	42.00 to 43.00
No. 1 cast	29.00 to 30.00
Railroad grate bars	21.50 to 22.00
Stove plate	20.00 to 21.00

Buffalo

BUFFALO, Aug. 7.

Pig Iron.—The furnaces of the district almost without exception report a very quiet market with an exceedingly limited amount of business transacted either for current or forward deliveries. The reason given is that there is no current or immediate future product available, with the one exception of the Burden stack at Troy, controlled by Buffalo interests, and now being put in repair for operation. This continues to contract for considerable business for delivery over the remainder of the year and forepart of 1918. This interest reports the sale of about 10,000 tons during the week at current prices. The initial price of $50 per ton, quoted for the purpose of obtaining a backlog of orders, was withdrawn about two weeks ago. One producer reports quite a large call for prompt and last quarter shipment of malleable iron, because of accumulated demand which furnaces have been unable to supply. Some car shortage is being experienced, causing delay in some instances in the forwarding of furnace shipments. Prices remain at about the same level as last week, the range for 1918 first half delivery being as follows, f.o.b. furnace, Buffalo:

High silicon irons	$55.00 to $56.00
No. 1 foundry	54.00 to 55.00
No. 2 X foundry	53.00 to 55.00
No. 2 plain	52.00 to 54.00
No. 2 foundry	51.00 to 53.00
Gray forge	51.00 to 53.00
Malleable	54.00 to 55.00
Basic	54.00 to 55.00
Lake Superior charcoal, f.o.b. Buffalo	55.00 to 60.00

Finished Iron and Steel.—Shipment of finished products for July fell off considerably as compared with June, due to some extent to the extremely hot weather. Interest now centers in Government specifications, which are beginning to come through in larger volume. Local sales offices are finding it difficult, they state, to convince their regular trade that Government preference is a reality. A good many users of steel products of various kinds apparently feel that it is a term that is being employed to cover delays in shipments on their contracts. The demand for tin plate is heavier than ever, and it is understood that the minimum price on tin plate "accumulations" has advanced to $12 per base box. Specifications for standard railroad spikes are coming in freely. Larkin & Sangster, Buffalo, have the general contract for the Galveston Causeway, Galveston, Tex., requiring 2700 tons of reinforcing bars to be supplied by the Jones & Laughlin Steel Co. with the Diamond bars. The F. N. Burt Co., manufacturers of paper boxes, Buffalo, will require 200 tons of reinforcing bars and a small tonnage of structural steel. Austin & Co., Cleveland, for the Curtiss Aeroplane & Motor Corporation, has sublet the 4000 tons of structural steel work to the Buffalo Structural Steel Co., the Hamilton Bridge Co., Hamilton, Ont., and the Blaw-Knox Co., Pittsburgh. The steel for the Buffalo Structural Steel Co.'s portion will be furnished by the Lackawanna Steel Co. The King Bridge Co., Cleveland, has the contract for the Symington gun works, Rochester.

Old Material.—Heavy sales of carwheels have been made during the past week, for Pittsburgh delivery, on the basis of $36, Buffalo. A considerable tonnage of heavy melting scrap has also been under inquiry by a local user in the latter part of the week, for delivery over the next three months. Railroad malleable scrap has been in better demand and the price has advanced to $33 to $34 per ton. In other commodities there has been no special trading, with no change in the price list. The embargoes in the Pittsburgh and Valley districts, mentioned last week, remain in effect and are holding back shipments for these points. We quote dealers' asking prices, per gross ton, f.o.b., Buffalo, as follows:

Heavy melting steel	$33.00 to $34.00
Low phosphorus	45.00 to 48.00
No. 1 railroad wrought	43.00 to 45.00
No. 1 railroad and machinery cast	30.00 to 31.00
Iron axles	45.00 to 50.00
Steel axles	45.00 to 50.00
Carwheels	35.00 to 36.00
Railroad malleable	33.00 to 34.00
Machine shop turnings	18.00 to 19.00
Heavy axle turnings	26.00 to 27.00
Clean cast borings	20.00 to 21.00
Iron rails	43.00 to 44.00
Locomotive grate bars	20.00 to 21.00
Stove plate	20.50 to 21.00
Wrought pipe	30.00 to 31.00
No. 1 busheling scrap	29.00 to 30.00
No. 2 busheling scrap	20.00 to 21.00
Bundled sheet stamping scrap	21.00 to 21.50

Cincinnati

CINCINNATI, Aug. 8—(*By Wire*).

Pig Iron.—Comparison with conditions as existing in the first week of August last year made by different pig-iron houses shows that the unfilled tonnage on books Aug. 1 this year will average fully 20 per cent above last year's record. This includes iron to be shipped in the remainder of the present year and in the first half of 1918. Little if any iron has been bought for shipment in the last half of next year. With order books so comfortably filled, sellers are inclined to hold back and allow consumers to take the initiative to cover for the balance of their first-half requirements. Last year a large tonnage of iron was booked for shipment in the first half of this year in the months of May and June. This year orders commenced to flow in early in April for that delivery. The second buying movement in 1916 commenced early in September and it is generally expected that no activity of note will be recorded this year before that date. Sales now are confined principally to spot iron that in some cases brings the full schedule and in others small reductions have been made on consignment orders that had to be disposed of quickly. On the other hand, where a particular brand of iron was wanted a slight premium was obtained. Practically all transactions now cover resale and not furnace iron. Conditions in the Hanging Rock district are unchanged with $55, Ironton, representing the furnace price on No. 2 foundry, malleable and basic. It is rumored that production in both the North and the South has been cut off on account of the growing acute shortage of furnace coke. A few furnaces in both districts will blow out at an earlier date than expected for repairs on account of the coke situation. Based on freight rates of $2.90 from Birmingham and $1.26 from

Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, as follows:

Southern coke, No. 1 f'dry and 1 soft.	$51.40 to $52.40
Southern coke, No. 2 f'dry and 2 soft.	49.90 to 50.90
Southern coke, No. 3 foundry	49.40 to 50.40
Southern coke, No. 4 foundry	48.90 to 49.90
Southern gray forge	48.90 to 49.90
Ohio silvery, 8 per cent silicon	87.26 to 91.26
Southern Ohio coke, No. 1	56.26 to 57.26
Southern Ohio coke, No. 2	56.26 to 57.26
Southern Ohio coke, No. 3	55.26 to 56.26
Southern Ohio malleable Bessemer	56.26 to 57.26
Basic, Northern	56.26 to 57.26
Lake Superior charcoal	56.75 to 57.75
Southern carwheel foundry	48.90 to 49.90

(*By Mail*)

Finished Material.—Warehouses are now able to make very good deliveries on most everything ordered with the exception of some sizes of structural shapes and sheets. The mills are evidently making progress on shipments. The demand for nearly all finished products, however, has been curtailed lately, due in a measure to the proposed Government regulation of prices, and also to the extreme hot weather that has been prevalent over the Central West in the past week. The nearby rolling mills are not soliciting any new business on either black or galvanized sheets and are only taking care of their old customers, in which endeavor they have been fairly successful. We quote No. 28 galvanized sheets around 8.65c., Cincinnati or Newport, Ky., and No. 28 galvanized at 10.65c.; iron and steel bars from jobbers' stocks are unchanged at 5c., and twisted steel bars 5.05c.; structural shapes, 5.25c., and plates ¼ in. and heavier 9.50c. The discount on machine bolts ⅜ x 4 in. and smaller is now 40 per cent; larger and longer, 30 per cent. Cold rolled shafting is quoted at 15 per cent plus list. The mill supply business is still slow.

Coke.—Nothing of interest has developed with the exception of reports that the output in all fields had been very much curtailed within the past 10 days. It is extremely difficult to get sufficient labor in hot weather to keep the ovens in operation, and as a consequence there has been some inconvenience experienced both by furnace and foundry coke consumers. Prices for spot coke have climbed back to the previous high record, and some foundry coke has brought $16, Connellsville, for prompt shipment. Contract figures range from $12 to $13 per net ton at oven. There are no stable prices for contract furnace coke, but desirable business would probably be accepted between $9 and $10 at oven. The same conditions exist in the Wise County, Pocahontas and New River fields.

Old Material.—Heavy melting steel scrap has been reduced to $32 per gross ton and other reductions have been made that average about $1 a ton. No. 1 railroad wrought is quoted to-day at $31.50 per net ton, and is weak at that figure. Cast borings and steel turnings are also weak, but only a slight reduction was made in regular quotations on these two grades. Offerings are heavier and outbound shipments are slower. The following are dealers' prices, f.o.b. at yards, southern Ohio and Cincinnati:

Per Gross Ton

Bundled sheet scrap	$19.50 to $20.00
Old iron rails	33.00 to 33.50
Relaying rails, 50 lb. and up	45.00 to 45.50
Rerolling steel rails	36.00 to 36.50
Heavy melting steel scrap	32.00 to 32.50
Steel rails for melting	32.00 to 32.50
Old carwheels	29.00 to 29.50

Per Net Ton

No 1 railroad wrought	$31.50 to $32.00
Cast borings	12.50 to 13.00
Steel turnings	12.50 to 13.00
Railroad cast	23.00 to 23.50
No. 1 machinery cast	24.00 to 24.50
Burnt scrap	14.50 to 15.00
Iron axles	43.00 to 43.50
Locomotive tires (smooth inside)	36.00 to 36.50
Pipes and flues	17.50 to 18.00
Malleable cast	24.50 to 25.00
Railroad tank and sheet	15.50 to 16.00

Birmingham

BIRMINGHAM, ALA., Aug. 7 (*By Wire*).

Consumers show no disposition to purchase until Washington uncertainty is over with. There is practically no iron for 1917 delivery. Makers offer no concessions. Fifty dollars for 1917 and $48 for 1918 is the uniform quotation, with prompt metal at $50 and higher.

BIRMINGHAM, ALA., Aug. 4 (*By Mail*).

Pig Iron.—Buying is almost nil, but there have been no price recessions. Operators quote a uniform level of $50 for 1917 and one of $48 for 1918. A regular customer of a large interest was quoted $50 on iron deliverable in November and December. A prominent broker paid $50 for a carlot to the furnace company, adding his commissions on this prompt shipment order. No orders for prompt shipment under $50 have been noted; frequently more is charged. Most of the metal left over at ports belongs to Great Britain, and is not available for the market. To reach consuming territory, loading charges and freight rates back to Birmingham must be added. These conditions keep that business confined in a small area and to small movements. Furnace operators pay no attention to resale metal, as it does not affect their well-filled order books. One large concern is behind 30,000 tons in deliveries. Movements attained a high record for June, the Alabama Demurrage Association reporting 92,000 freight cars handled compared with 75,000 in June of 1916. The Trussville stack is expected to blow in by Sept. 1. With this the Vanderbilt furnaces of the Woodward and the Shelby stack active, Alabama production will attain new high levels. We quote per gross ton for prompt delivery, f.o.b. Birmingham district furnaces, as follows:

No. 1 foundry and soft	$50.50 to $51.50
No. 2 foundry and soft	50.00 to 51.00
No. 3 foundry	49.50 to 50.50
No. 4 foundry	49.25 to 50.25
Gray forge	49.00 to 50.00
Basic	50.00 to 51.00
Charcoal	55.00 to 56.00

Cast-Iron Pipe.—Pipe shops have another month's work on cantonment pipe. Municipalities are ordering scattering lots for fill-in purposes. Prices are unchanged. We quote per net ton, f.o.b. yards, as follows: 4 in., $63; 6-in. and upward, $60.

Coal and Coke.—Coal operators are exerting every effort for a maximum production in expectancy of the threatened walkout of the newly organized miners fixed for Aug. 20, unless the operators meanwhile come to terms, which the operators flatly decline. Coke has softened $1 to $2 per ton in sympathy with reductions in Virginia and other sections. Spot is now quoted at $12.50 per net ton, but very little is to be had, most makers being behind on deliveries.

Old Material.—Scrap is still weaker. Quotations are not changed for the week, but the consumers have the situation in control and frequently make terms below the market prices. We quote per gross ton, f.o.b. dealers' yards, as follows:

Old steel axles	$50.00 to $51.00
Old steel rails	25.00 to 26.00
No. 1 wrought	28.00 to 29.00
No. 1 heavy melting steel	18.00 to 19.00
No. 1 machinery cast	22.50 to 23.00
Carwheels	25.00 to 25.50
Tram carwheels	23.00 to 23.50
Stove plate and light	16.00 to 17.00
Turnings	11.00 to 12.00

Bars.—Steel bars in car lots, f.o.b. Birmingham, are quoted at 4.75c. to 5c.; iron bars, 4.30c. to 4.50c.

The plant of the Southern Manganese Co. at Anniston, allied with the Anniston Ordnance Works and the electrical steel furnaces at Anniston, has been completed and one furnace is in operation.

San Francisco

SAN FRANCISCO, Aug. 2.

Uncertainty as to the Government's program of requisitioning products of the steel mills has not tended towards instilling confidence in the minds of those engaged in the steel industry or in large operations dependent on steel products. The suspense has caused cessation of many activities, the majority of which, perhaps, are of comparatively minor importance, yet in the aggregate forms a considerable obstacle to satisfactory business progress. About July 10 there was an incipient

strike at the Alameda plant of the Union Iron Works. Nearly 1000 riveters and other skilled workmen walked out, the riveters demanding substantial raises in their wage scale. There was only a temporary dislocation of operations at the plant, and the men returned to their posts in a few days. The presence of half a company of soldiers, always on guard at the works, no doubt had a salutary effect on the situation. Newspaper accounts of a large steel plant about to be established on the Coast, with the investment of $20,000,000, have excited no little interest among steel men, but the project appears to be indefinite, as yet, and premature in announcement.

Bars.—There is still a lively demand for steel bars with insufficient means of satisfying it. Twisted steel bars are being called for eagerly by builders and local dealers are kept busy in supplying their needs. Local mills quote steel bars unchanged at a base range of 4.25c. to 4.75c. in carload lots. Jobbers offer twisted steel bars at a base price of 6c.; steel bars at 6c., or 5.50c. in carload lots.

Structural Materials.—A fair amount of public work in the interior of the State has been in progress for some time, but the buildings are nearing completion. Pending the Government's decision as to the exact amount of steel that will be held from the market, dealers and customers alike are in a quandary. New plans are being reconsidered and projects laid aside until the situation clears. Most of the construction going on in San Francisco, both public and private, is nearly finished and the continued high prices of material, with no signs of relief, have driven the capitalists out of the building field. Quotations from local mills vary from 5c. to 5.85c., being considerably under jobbers' figures, in smaller than carload lots.

Plates.—Every effort is being made by Eastern mills to keep the shipyards of the Coast supplied with sufficient ship plates, but the task is a difficult one and is made more complex by the entry of new shipbuilding aggregations into the field. Besides the great building program of the Union Iron Works, other concerns have secured heavy contracts, as, for instance, the newly organized Moore shipyard, which is under contract for the building of 10 large steamers. These new demands complicate the already congested demands for more material. Jobbers and representatives of Eastern mills continue to quote base prices of 12c. for ship plates and 10c. for tank plates, but there is no assurance of any early delivery, or of a firm quotation except on day of shipment.

Sheets.—Military needs and other Government requirements have considerably shortened the visible supply of sheets, as well as that of other material. The new prices announced by jobbers three weeks ago have not been changed on blue and galvanized sheets, which are quoted at, for No. 10 blue annealed sheets, 10.50c., and for galvanized sheets, 12.74c.

Wrought Pipe.—The lack of supply of wrought pipe continues to be a serious problem to solve. Requirements of the oil fields are insistent, with only a limited amount of exploitation work in progress. Jobbers' quotations have not advanced and 2-in. black pipe is quoted at $27.65 per 100 ft.; 2-in. galvanized pipe, $35.40.

Cast-Iron Pipe.—Few public works demanding the use of cast-iron pipe are now in contemplation. Orders, even of small caliber, are infrequent. A contract has been awarded in Los Angeles for 600 tons of 6-in. and 8-in. pipe, at prices of $71.60 to $74.60.

Pig Iron.—There is no Chinese pig iron in this market to-day, nor has there been any for some time. The high freight rates, averaging $40 a ton from the Orient, prevent shipments, and the only supplies arriving are in fulfillment of old contracts, very few in number. No. 1 foundry, f.o.b. Birmingham, is quoted here at $50, but with no guarantees of delivery.

Coke.—Good Eastern coke is extremely scarce in this market and is quoted at figures of $20 to $23, with no specified delivery. Contracts can hardly be made for coke in needed amounts. Some dealers offer spot coke at $27.50 from stocks in hand which had been supplied from old contracts made at cheaper prices.

Old Materials.—Stocks of both heavy and light scrap have been very scarce and high for some time past. As high as $40 a ton has been paid for small lots of heavy melting. Dealers are procuring supplies from the valleys of the interior, farm scrap being shipped down the Sacramento River by water carriage. Last week, 450 tons of heavy scrap were shipped here from Mexican ports, part of which was mining machinery from abandoned mines and part the results of the wreckage of war. Stories of vast piles of old material lying ready for shipment at various assembling points in Mexico, supplemented by the arrival of a shipment, have caused the market here to ease off, and quotations have dropped under $35 for No. 1 machinery scrap with light scrap at $22 to $24. These prices may be augmented if the exportation of scrap to Japan is continued under Government license.

British Steel Market

Pig Iron Active and Strong—Tin-Plate Demand Exceeds Supply

(*By Cable*)

LONDON, ENGLAND, Aug. 8.

The pig-iron market is active and the general demand remains strong. Tin plates are firm with demand exceeding supply and prices unrestricted only for stock free from permits until Aug. 31. American wire rods have been sold for the last quarter at £28 and a lot of Bessemer rods has just been shipped at £29, c.i.f. Liverpool. Ferromanganese is nominally strong.

Benzol is quoted at 13d. and toluol and ammonium sulphate are unchanged. We quote as follows:

Tin plates, coke 14 x 20; 112 sheets, 108 lb., f.o.b. Wales, maximum, 30s.
Black sheets, £21 5s.
Ferromanganese, £45 nominal.
Ferrosilicon, 50 per cent, c.i.f., £35 upward.
On other products control prices are as quoted in THE IRON AGE of July 19, p. 171.

Ferromanganese Market Very Tight—New Maximum Prices for Pig Iron

LONDON, ENGLAND, July 17, 1917.—The price control shows no sign of being relaxed. The rise in prices of uncontrolled products has been gradual and of no great importance except in tin plates and black sheets, while only few alterations have taken place in controlled prices. There was an advance of 5s. a ton in South Staffordshire part mine forge and foundry iron to £5 and £5 2s. 6d., respectively. A new order fixes the maximum price of Cleveland as well as South Staffordshire, Shropshire and Worcestershire basic iron at £4 17s. 6d. Maximum prices have also been fixed for special brands of hematite iron (malleable), such as refined cupola cast varying from £8 to £8 5s., and cast direct from blast furnaces varying from £6 17s. 6d. to £7 10s.

The third quarter so far has disclosed no alteration in general conditions, but government work continues predominant. Merchant business is negligible.

No Pig Iron to Neutrals

Pig iron is unchanged and underlying conditions are firm. No iron is now allowed to go to neutrals, and it is inferred that the business in American iron, which heretofore was handled through merchants under British permits, will cease, in view of the American embargo. A further advance in wages has been made to Cleveland blast furnacemen and miners based on the ascertained selling price of No. 3 pig iron for the last quarter at 94s. 4.91d. against 89s. 8.76d. for the first quarter. Deliveries to home consumers of hematite iron seem more satisfactory, although an extension of output is needed, as larger allocations may shortly have to be made subject to an official revision of prices. Foreign ore deliveries have improved but demand is intense.

Since Government needs absorb nearly all of the semi-finished steel output, other requirements remain unrelieved and shell discards are in keen demand. The possibility of securing American billets is as remote as

ever, although odd quantities of wire rods are still obtainable with some business passing at about £28, c.i.f. Liverpool, for the third quarter, but terms vary up to £30 for near at hand parcels. There are plenty of buyers, but very few sellers.

In finished steel war needs predominate. The mills are heavily booked ahead, while considerable arrears have yet to be made good against old orders. The speeding up of the shipbuilding program keeps plate makers going at full pressure and the demand exceeds the supply. Demand for bar iron is incessant, especially the higher grades, at full prices. Since the restrictions were enforced on finished steel prices, makers' costs have increased, but the representations made to secure a revision of maximum rates do not carry much weight with the authorities.

New Steel Plant and Shipyard

An important engineers' scheme is contemplated on the Teeside that will involve an expenditure of £3,000,000. At a meeting of the Tees Conservancy Commissioners, the transfer was approved of 21 acres of land at Portrack abutting on the river to the East Coast Steel Corporation, which is a new company being formed to erect blast-furnaces, steel works and an extensive shipyard on the site. The scheme is to be taken in hand this year. A syndicate of northern ironmasters are the promotors of the undertaking.

Tin-plate prices have strengthened further. Makers are in some cases overbooked against their steel allocations. Demand is in excess of supply. Quotations vary from 35s. to 36s. per basis, f.o.b. against war work, and very few makers are quoting, while the drain on merchants' stocks proceeds unchecked, chiefly because of the big orders placed recently to cover urgent French requirements. Stockplates are very scarce, odd lots free from permit restrictions commanding a big premium, at fully 44s. basis.

Manganese Ore High and Scarce

The position in ferromanganese is as tight as it can be. Sellers are extremely rare and business has been done up to £80, f.o.b. for forward shipment to a continental port subject to permit being granted. The last transaction reported on North American account was at 400 c.i.f. for shipment in the third quarter. Makers are virtually out of the market and prices for export are nominal. Business in Indian manganese ores has been more difficult because of tonnage scarcity, and the price is nominally about 3s. 6d. per unit c.i.f. United Kingdom ports.

New York

NEW YORK, Aug. 8.

Pig Iron.—It is true of the market as it was true last week that while it is exceedingly quiet there is a little more inquiry than was seen in the greater part of July. A New Jersey open-hearth steel works is inquiring for 5000 tons of basic iron for the last quarter of this year. There is an inquiry for 800 tons of foundry iron from a New Jersey foundry for first quarter of 1918, and several inquiries are up for 400 and 500-ton lots. Buffalo iron figures very little in the Eastern market at present and transactions in eastern New York and New England in recent weeks have been in part due to backlog sales for the furnace that is soon to start at Troy, N. Y. An inquiry for foundry in the New York district for 500 to 1000 tons for 1918 delivery has apparently become inactive. The company had presumably covered for most of the first half of next year and this inquiry was in view of additional work it was taking. Export iron is coming on the market in a few cases. For the most part prices show no change. We quote for tidewater delivery in the near future as follows:

No. 1 foundry	$53.25 to $54.25
No. 2 X	52.75 to 53.75
No. 2 plain	52.50 to 53.50
Southern No. 1 foundry	52.75 to 53.75
Southern No. 2 foundry and soft	52.25 to 53.25

Ferroalloys.—The ferromanganese market is quiet and steady, with quotations practically unchanged from those prevailing for the last month. Domestic ferromanganese can be obtained at $400 for early delivery, at $375 for the last quarter and at $350 for the first half of next year. A little more interest is being taken in the market, but the only sales reported are those of small lots for nearly all deliveries. British ferromanganese is practically unobtainable for any position, even into next year. With receipts from Great Britain at a low mark in July and with the prospect of their being at a still lower mark in August, the general situation is viewed with some anxiety in some quarters. The only reassuring fact on the horizon is the increasing output of the domestic alloy, the blast furnace reports of THE IRON AGE for July indicating a production of not less than 23,500 gross tons, which is a record for any month in the history of the industry. It is a fact, however, that a large part of this production is for companies which consume the greater part of the output themselves. The spiegeleisen market is active, inquiries for over 5000 tons having appeared, including those mentioned last week, but no sales have yet been reported. The quotation is still $85, furnace. Imports of Indian manganese ore are reported as fairly liberal recently, and as high as $1.15 per unit has been paid for manganese ore from that and other sources, such as Cuba. Ferrosilicon, 50 per cent, is unchanged at about $200 per ton for delivery this year, with $130 asked for delivery in 1918.

Structural Material.—An indication of the present state of the building trade in New York is afforded by the statement of one of the largest interests furnishing such material for office buildings, apartments and lofts that the month of July was the worst in the history of the company. The same situation prevails in nearly all other branches of this market and even Government orders, which had been the mainstay for some time, have nearly disappeared, at least temporarily. An interesting statement is to the effect that the armor plate plant for the Government involving 25,000 tons has been revived, at least politically. The two largest contracts which have recently been reported are 1000 tons for a new pump station for the Worthington Pump & Machinery Corporation, Harrison, N. J., taken by the National Bridge Co., and 1200 tons for the extension to the Park Avenue viaduct, by Terry & Tench. Other contracts recently awarded are the following: American Bridge Co. has taken 300 tons for an addition to the Stanley Works at New Britain, Conn.; the Hedden Iron Works, 250 tons for a boiler shop for the Staten Island Shipbuilding Co.; the McClintic Marshall Co., 160 tons for two bridges for the Philadelphia & Reading; the Boston Bridge Works, 100 tons for two bridges for the Baltimore & Ohio and the American Bridge Co., 100 tons for a bridge for the Philadelphia & Reading. The Central Railroad of New Jersey has awarded 200 tons for a coal pier and the Pennsylvania Railroad is inquiring for 200 tons for two or three bridges and the New York, New Haven & Hartford for 100 tons for a bridge at South Boston. For an extension to its plant at Trenton, N. J., the American Steel & Wire Co. has placed 300 tons with the American Bridge Co. The Chesapeake & Ohio is asking for about 200 tons for several bridges and the Interborough Rapid Transit Co. for 500 tons for additions to car sheds in New York. We quote plain material from mill at 4.669 to 5.169c., New York, the lower price in three to four months and the higher for small lots in earlier deliveries. Shipments from warehouses are 5c. to 5.25c. per pound, New York, according to sizes desired.

Plates.—The past week has been uneventful. There remains some demand for export, but domestic business, except for scattered lots of small tonnages for urgent requirements, is exceedingly quiet. The mills relish the opportunity for a breathing spell to catch up to some extent on their orders. Considerable confusion has been caused since the promulgation of the President's new embargo on export shipments by the scramble of exporters to obtain earlier rolling of their plate orders than had been specified. Exporters who had not been promised delivery until some time this fall have been appealing to the mills to give their orders preference before Aug. 10, in order that they might ship before the ruling becomes effective that

nothing but plates for actual war needs shall leave the country. There have been no new developments regarding the shipment of plates and shapes to Japanese shipbuilding concerns, and none is expected until the arrival of the special Japanese commission, now on its way to Washington. It is expected that the full tonnage contracted for will go forward as per schedule as soon as the matter is threshed out. This confidence in the outcome of the situation seems to extend to the Japanese interests, also, for an order was placed Aug. 7 at 10.75c. for less than 100 tons of tank plates, and it is claimed that large amounts would be closed if mills were willing to take on the business. We learn of a mill asking 12c. for fabricating plates for fairly prompt shipment. We quote without change tank plates for mill shipment at 10.169c., New York, and ship plates at 12.169c., New York. Plates out of store are 8c. to 9c. for tank quality and 8.50c. to 9.50c. for ship plates.

Iron and Steel Bars.—New inquiry is infrequent, buyers generally awaiting the outcome of present Government consideration of material prices, while the mills find issues so clouded as to leave doubt about what they really have to sell. The one activity is a continued inflow of specifications on contracts. In the absence of sales of importance, we continue to quote steel bars in mill shipments at 4.669c. to 5.669c., New York. Good buying marks the iron bar market, with most of the business at 5c., Pittsburgh basis, though large lots, one, for example, of 500 tons, go at as low as 4½c. per pound. We quote mill shipments of bar iron at 4.919c. to 5.169c., New York. From New York district warehouses steel and iron bars are sold at 5c. to 5.50c.

Cast-Iron Pipe.—For the two lots of pipe work for the Department of Water Supply, Gas and Electricity, New York, R. D. Wood & Co. will supply the 1227 tons involved. No other public lettings are noted, but there is more private buying. Carloads of 6-in., 8-in. and heavier are quoted at $65.50 per net ton, tidewater, and 4-in. at $68.50.

Old Material.—What little business has been done shows strength in prices rather than weakness. Dealers express a belief in a decided betterment almost any time and emphasize that no further weakness, even considering the embargoes against consumers' yards, need be considered in view of the immeasurable demands on the steel mills. Brokers quote buying prices as follows to local producers and dealers per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$29.50 to $30.50
Old steel rails (short lengths) or equivalent heavy steel scrap	29.50 to 30.50
Relaying rails	65.00 to 70 00
Rerolling rails	39.00 to 40.00
Iron and steel car axles	42.00 to 43.00
No. 1 railroad wrought	41.00 to 42.00
Wrought-iron track scrap	32.00 to 33.00
No. 1 yard wrought long	32.00 to 33.00
Light iron	10.00 to 12 00
Cast borings (clean)	21.00 to 21.50
Machine-shop turnings	18.00 to 19.00
Mixed borings and turnings	16.50 to 17.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long)	30.00 to 31.00

For cast-iron scrap dealers in New York City and Brooklyn are quoting as follows to local foundries per gross ton:

No. 1 machinery cast	$34.00 to $35.00
No. 1 heavy cast (column, building material, etc.)	29.00 to 30.00
No. 2 cast (radiators, cast boilers, etc.)	28.00 to 29.00
Stove plate	20.00 to 21.00
Locomotive grate bars	20.00 to 21.00
Old carwheels	33.00 to 34.00
Malleable cast (railroad)	32.00 to 33.00

St. Louis

ST. LOUIS, Aug. 6.

Pig Iron.—While the selling of small lots of pig iron at high prices continues, chiefly because of immediate urgent needs, no transactions of individual moment are appearing because of the general uncertainty which hangs over the market, particularly as to future prices and also supplies. In fact, quick shipment business at fancy prices dominates the situation, and naturally the quantities handled are not large. On No. 2 Southern, $50 Birmingham is being paid, but prices run down to $48, these two figures constituting the range. No. 2 X, Chicago, is commanding $55 per ton, and No. 2 Northern $55 per ton, Ironton, while Lake Superior charcoal iron is selling as high as $60 per ton. All interests seem to be awaiting a settlement of the general situation, both buyers and sellers, and the former seem for the most part to have enough iron contracted for or in the yards to make them feel measurably safe.

Coke.—Small lots of coke are selling for spot or near future delivery, but there is no deferred contract business in the market. Spot coke is selling at $13 Connellsville in small lots for best selected 72-hr. foundry grades, while furnace coke is held at $11.50 to $12.50. By-product coke is not figuring much in the market at the present time.

Finished Iron and Steel.—No new business is being accepted, and the chief interest in finished products seems to be in getting deliveries on material already contracted for, the pressure being particularly strong and becoming more accentuated. Movement out of warehouse is maintained up to the ability to deliver. For stock out of warehouse, we quote as follows: Soft steel bars, 4.55c.; iron bars, 4.50c.; structural material, 5.05c.; tank plates, 8.05c.; No. 10 blue annealed sheets, 10.05c.; No. 28 black, cold rolled, one pass, 10.35c.; No. 28 galvanized, black sheet gage, 11.75c.

Old Material.—The scrap market, because of the lack of business, shows a weaker tendency, though it is not quotably lower, there having been no transactions on which to base a revision of prices. There is no demand at present from the steel mills, rolling mills or foundries, and practically all the little business being done is on material to ship East. About the only sign of life shown in the market to-day was in borings, and not much in that. Lists out include one for 1500 tons from the Union Pacific, and one for 1250 tons from the Big Four. None of the roads with St. Louis headquarters has put out any material so far this month, and little is expected. We quote dealers' prices f.o.b. St. Louis industrial district, at customers' works, as follows:

Per Gross Ton	
Old iron rails	$38.00 to $38.50
Old steel rails, re-rolling	40.00 to 40.50
Old steel rails, less than 3 ft.	39.00 to 40.00
Relaying rails, standard section, subject to inspection	50.00 to 51.00
Old carwheels	30.50 to 31.00
No. 1 railroad heavy melting steel scrap	31.00 to 31.50
Heavy shoveling steel	27.00 to 27.50
Ordinary shoveling steel	26.00 to 26.50
Frogs, switches and guards, cut apart	32.00 to 32.50
Ordinary bundled sheet scrap	18.50 to 19.00
Heavy axle and tire turnings	22.00 to 22.50
Per Net Ton	
Iron angle bars	$35.00 to $35.50
Steel angle bars	30.00 to 30.50
Iron car axles	41.00 to 41.50
Steel car axles	40.00 to 40.50
Wrought arch bars and transoms	39.00 to 39.50
No. 1 railroad wrought	33.00 to 33.50
No. 2 railroad wrought	31.00 to 31.50
Railroad springs	30.00 to 30.50
Steel couplers and knuckles	38.00 to 39.00
Locomotive tires, smooth inside, 42 in. and over	38.00 to 39.00
No. 1 dealers forge	24.00 to 24.50
Cast iron borings	14.50 to 15.00
No. 1 busheling	22.00 to 22.50
No. 1 boilers cut to sheets and rings	20.50 to 21.00
No. 1 railroad cast scrap	20.50 to 21.00
Stove plate and light cast scrap	16.50 to 17.00
Railroad malleable	27.00 to 27.50
Agricultural malleable	22.00 to 22.50
Pipes and flues	19.50 to 20.00
Heavy railroad sheet and tank scrap	18.00 to 18.50
Railroad grate bars	17.50 to 18.00
Machine shop turnings	14.50 to 15.00
Country mixed scrap	14.00 to 15.00

Sale of Kewanee Works Completed

On Aug. 1 the Kewanee plant of the National Tube Co. at Kewanee, Ill., was sold to the Walworth Mfg. Co., Boston, and on that date the National Tube Co. retired from the manufacture of pipe fittings. Mention was made in THE IRON AGE of July 12 of the negotiations for this sale, and in that connection it was stated that the product of the Kewanee plant, chiefly pipe fittings and valves, the output being 28,000 tons of gray iron and malleable castings per year and 2600 tons of brass castings, has complemented to a considerable extent that of the Walworth Mfg. Co.

IRON AND INDUSTRIAL STOCKS

Market Inactive and Professional, with No Definite Price Changes or Trends

Mid-summer dullness and inactivity has dominated in the stock market in the past week. Added to this, has been the period of excessive heat which interfered decidedly with speculative operations and was finally so potent that the governers of the exchange closed the market on Saturday of last week. The market as a whole has had very little trend one way or the other and has been entirely in the hands of professional traders, the total transactions any one day amounting to not more than 300,000 to 400,000 shares. Price changes have been very small in most cases. The steel stocks have been fairly strong with the general trend upward rather than downward, excepting the Bethlehem Steel stocks, which have receded on expectations of new financing.

The range of prices on active iron and steel stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com..	29¼- 31⅜	Int. Har. of N. J., com.	112¾-113½
Allis-Chal., pref..	83¾- 86¼	Lacka. Steel.....	92⅜- 94
Am. Can, com....	48¼- 49¼	Lake Sup. Corp..	17 - 17½
Am. Can, pref...	108 -108⅝	Midvale Steel....	58⅝- 59¾
Am. Car & Fdry., com.	76 - 77½	Nat.-Acme	34⅞- 35
Am. Car & Fdry., pref.	115½	Nat. En. & Stm., com.	43½- 44¾
Am. Loco., com.	72¾- 73⅞	Nat. En. & Stm., pref.	99
Am. Loco., pref..	103 -103¾	Nova Scotia Steel	98 -104½
Am. Rad., pref....	291¾	Pitts. Steel, pref.....	100
Am. Ship, com...	91 - 92	Pressed Stl., com.	73 - 74
Am. Steel Fdries.	68 - 70⅞	Pressed Stl., pref.....	102
Bald. Loco., com.	73¼- 75⅝	Ry. Steel Spring, com.	52½- 53
Beth. Steel, com....	127½	Republic, com. ..	91⅛- 93¼
Beth. Steel, class B	123¾-128½	Republic, pref...	103½-104
Cambria Steel.....	155	Sloss, com.	54 - 56
Central Fdry., pref.	52 - 53	Superior Steel...	46 - 48
Colo. Fuel	50¼- 51⅞	Transue-Williams.	42 - 43
Cruc. Steel., com.	81¼- 85⅝	Un. Alloy Steel..	44¼- 44½
Cruc. Steel, pref.	102 -103	U. S. Pipe, com...	21¼- 22
Deere & Co., pref.....	100½	U. S. Pipe, pref..	55 - 55½
Gen. Electric....	154⅛-155½	U. S. Steel, com.	123⅝-127⅞
Gt. No. Ore. Cert.	33¾- 35½	U. S. Steel, pref.	117½-119⅝
Gulf States Stl...	117 -119	Va. I. C. & Coke	69½- 71
		Westing. Elec....	48¾- 49¾

Dividends

American Brass Co., extra, 11 per cent; and quarterly, 1½ per cent, both payable Aug. 15.

Eastern Steel Co., 2½ per cent on the common and an extra, 5 per cent, on the common, both payable Sept. 1; quarterly 1¾ per cent on preferred, payable Sept. 15.

Harbison-Walker Refractories Co., extra, 6 per cent on common, payable Aug. 15; quarterly, 1½ per cent on common, payable Sept. 1; quarterly, 1½ per cent on preferred, payable Oct. 20.

American Steel Foundries Report

Net earnings of the American Steel Foundries in the six months ended June 30 last were three and a half times greater than those in the same period of 1916. The report just issued shows net earnings of $3,948,187, compared with $1,314,226. Surplus after charges amounted to $3,684,780, against $1,022,815 last year. These earnings are at the rate of $4.45 a share for the six months period, against $6 a share earned in the same period of 1916.

Announcement was made by the company last Thursday that the directors had voted to retire the $1,300,000 first mortgage 6 per cent bonds on the next interest date, Oct. 1. The company has already paid off its note issue of $1,200,000, making the only outstanding obligation an issue of $2,000,000 4 per cent debentures.

Earnings in the first half of 1914 amounted to only $242,162. The company is booked to capacity well into 1918. It has a cash surplus of $1,750,000 and a working capital of about $11,000,000.

Midvale Steel Earnings

After setting aside $4,619,524 as reserve for Federal taxes, the surplus earned for the capital stock of the Midvale Steel & Ordnance Co. in the quarter ended June 30 was $12,224,302, equivalent to $6.11 a share on the 2,000,000 shares outstanding. This was at the rate of $24.44 a year.

Net earnings for the quarter were $18,966,135, compared with $15,859,738 in the preceding period. The appropriation for Federal taxes was $2,982,769 larger than the amount deducted for that purpose in the initial quarter of the current year. There was charged off to depreciation $1,305,788, compared with $1,381,840 in the preceding three months.

Receivers Appointed

John F. Anderson and C. H. Hafford of Butler, and Grover Higgins of Clearfield, have been appointed temporary receivers for the Pittsburgh-Hickson Co., Butler, Pa., following the filing of a petition by creditors of the company and holders of preferred stock. Permanent receivers will be appointed Aug. 18. The Pittsburgh-Hickson Co. engaged in the manufacture of brass and metal beds in East Butler, is capitalized at $1,500,000 and employs about 300 persons. The temporary receivers are empowered to operate the plant.

Industrial Finances

The plant of the Carbon Iron & Steel Co., Parryville, Pa., has been sold to Albert Broden, representing the Central Railroad of New Jersey, for $200,000. The railroad held a mortgage of $350,000. The furnace will continue to operate as heretofore. It has an annual production of about 40,000 tons of pig iron.

A financial statement issued by the Savage Arms Corporation shows earnings for the quarter ended June 30, 1917, of $462,105 and for six months ended that date of $2,493,963. The stockholders were prepared for the statement showing a decline in earnings, because President Borie some time ago explained the necessity of adjusting the machinery of the Utica plant, where the Lewis machine guns are made, to make American caliber guns instead of the British type which the plant had been manufacturing. The corporation has closed orders for the United States Army, Navy, Marine Corps and Aviation Corps for between 20,000 and 25,000 machine guns involving more than $30,000,000.

The National Acme Co., Cleveland, manufacturer of automatic screw machines, earned $2,510,000 net in the six months ended June 30, last. This is equal to $5 a share on the 500,000 shares of stock, par value $50, and an annual rate of $10 a share or 20 per cent.

Reviewing the position of the Canadian Car & Foundry Co. at the annual meeting, at Montreal, Senator Curry, the president, said that orders on the books of the company now amounted to over $35,000,000. The execution of this business, much of it in regular lines of manufacture, he said, required so much floating capital that payments on the preferred stock would be held in abeyance until the assets of the company are in a more liquid position.

Pittsburgh and Nearby Districts

It is probable that a very large number of foundrymen from the Pittsburgh district will attend the annual meeting of the American Foundrymen's Association, to be held in Boston, Sept. 24-29. Arrangements for the trip from Pittsburgh are in the hands of F. H. Zimmers, secretary of the Pittsburgh Foundrymen's Association, and he reports that already a large number of Pittsburgh foundrymen have notified him they intend to go to the convention.

On Aug. 1 the Carnegie Steel Co., Pittsburgh, had 48 blast furnaces in operation and 11 were idle. Of these five stacks are banked for lack of coke, these being 2 Edgar Thomson, 1 Mingo Junction and two Ohio stacks. The other idle stacks are Steubenville, 1 Bellaire, Zanesville, 1 Edgar Thomson, 1 Clairton and Edith. Neville Island stack in Pittsburgh, which was idle for many months, blew in on July 14.

The first steel at the Valley Mold & Iron Co. was poured July 26 at its new ingot mold foundry at West Middlesex. Work of building the plant was started four months ago, and it was completed in record time.

The contract for coal that has existed for some years between the Pittsburgh Coal Co. and the United States Steel Corporation is being readjusted. This is being done on account of the very high advance in the price of coal, which made the contract, as at first executed, unprofitable to the Pittsburgh Coal Co.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c.; Denver pipe, 76.1c., minimum carload, 46,000 lb.; structural steel and steel bars, 76.1c., minimum carload, 40,000 lb.; Pacific coast (by rail only), pipe, 65c.; structural steel and steel bars, 75c., minimum carload, 60,000 lb. No freight rates are being published via the Panama Canal, as the boats are being used in transatlantic trade.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 4.50c.

Wire Products

Wire nails, $4 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire, $4.05 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.95; galvanized wire, $4.65; galvanized barb wire and fence staples, $4.85; painted barb wire, $4.15; polished fence staples, $4.15; cement-coated nails, $3.90 base, these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 43 per cent off list for carload lots, 42 per cent off for 1000-rod lots, and 41 per cent off for small lots, f.o.b. Pittsburgh.

Nuts and Bolts

Discounts in effect for large buyers are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days.

Carriage bolts, small, rolled thread, 40 per cent, small cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent; with c. p. nuts, 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq. blank, $2.10 off list, and tapped, $1.90 off; hex., blank, $1.90 off, and tapped, $1.70 off; nuts, c. p. c. and t. sq. blank, $1.70 off, and tapped, $1.50 off; hex. blank, $1.60 off, and tapped, $1.40 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Wire Rods

Soft Bessemer and open-hearth rods to domestic consumers at $95 to $100; high-carbon rods made from ordinary open-hearth steel, $100 to $110, and special steel rods with carbons running from 0.40 to 0.60, $100 to $110 at mill; above 0.60 carbon, $115 to $120.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $7.00 base; ⅝ in., 7/16 in. and ½ in., $7.00. Boat spikes are occasionally quoted $7.00 to $8.00, all per 100 lb. f.o.b. Pittsburgh, but some makers are quoting higher. Track bolts with square nuts, 7c. to 7.50c. to railroads, and 8c. to 8.50c., in small lots, for fairly prompt shipment.

Steel Rails

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails, and on carload and smaller lots, 4c. to 4.25c. at mill. Light rails: 25 to 45 lb., $75 to $80; 16 to 20 lb., $80 to $81; 12 and 14 lb., $82 to $83; 8 and 10 lb., $83 to $84; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard Bessemer rails, $38; open-hearth, $40, per gross ton, Pittsburgh.

Tin Plate

Effective July 31, prices on all sizes of terne plate were advanced from $2 to $2.50 per package. Prices quoted by leading makers are now as follows: 8-lb. coating, 200 lb., $16 per package; 8-lb. coating, I. C., $16.30; 12-lb. coating, I. C., $17.50; 15-lb. coating, I.C., $18.25; 20-lb. coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 4.50c. to 5c. for delivery late this year, and 5c. and higher from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c.; railroad test bars, 5.25c. in carload and larger lots f.o.b. mill.

Wrought Pipe

The following discounts on steel are to jobbers for carload lots on the Pittsburgh basing card in effect from May 1, 1917, all full weight, except for LaBelle Iron Works and Wheeling Steel & Iron Co., which quote higher prices, and National Tube Co., which adheres to card of April 1.

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛, ¼ and ⅜	42	15½	⅛ and ¼	23	+4
½	46	31½	⅜	24	+3
¾ to 3	49	35½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	42	29½	2	26	12
2½ to 6	45	32½	2½ to 6	28	15
7 to 12	42	28½	7 to 12	25	12
13 and 14	32½	..			
15	30	..			

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	38	20½	⅛, ¼ and ⅜	22	5
½	43	30½	½	27	14
¾ to 1½	47	34½	¾ to 1½	33	18
2 to 3	48	35½			

Lap Weld, extra strong, plain ends

2	40	28½	2	27	14
2½ to 4	43	31½	2½ to 4	29	17
4 to 6	42	30½	4½ to 6	28	16
7 to 8	38	24½	7 to 8	20	8
9 to 12	33	19½	9 to 12	15	8

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

Nominal discounts on less than carload lots, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes, and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap-Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in.	28	1¾ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3¼ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in.—No quotations	
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths. Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net, or 2 per cent discount in 10 days.

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer

	Cents per lb.
Nos. 3 to 8	8.00 to 8.50
Nos. 9 and 10	8.25 to 8.50
Nos. 11 and 12	8.50 to 8.75
Nos. 13 and 14	8.75 to 9.00
Nos. 15 and 16	9.00 to 9.25

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	8.30 to 8.80
Nos. 22 and 24	8.35 to 8.85
Nos. 25 and 26	8.40 to 8.90
No. 27	8.45 to 8.95
No. 28	8.50 to 9.00
No. 29	8.55 to 9.05
No. 30	8.65 to 9.15

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11	9.00 to 9.50
Nos. 12 and 14	9.10 to 9.60
Nos. 15 and 16	9.25 to 9.75
Nos. 17 to 21	9.40 to 9.90
Nos. 22 and 24	9.55 to 10.05
Nos. 25 and 26	9.70 to 10.20
No. 27	9.85 to 10.35
No. 28	10.00 to 10.50
No. 29	10.25 to 10.75
No. 30	10.50 to 11.00

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	7.80 to 8.30
Nos. 17 to 21	7.85 to 8.35
Nos. 22 to 24	7.90 to 8.40
Nos. 25 to 27	7.95 to 8.45
No. 28	8.00 to 8.50
No. 29	8.05 to 8.55
No. 30	8.05 to 8.55
Nos. 30½ and 31	8.10 to 8.60

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin.	Lead		Spelter	
Aug.	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
1	29.00	29.00	63.87½	10.87½	10.75	8.75	8.50
2	29.00	29.00	63.87½	10.75	10.62½	8.75	8.50
3	29.00	29.00	63.62½	10.75	10.62½	8.75	8.50
4	29.00	29.00	....	10.75	10.62½	8.75	8.50
6	28.50	28.50	63.75	10.87½	10.75	8.75	8.50
7	28.00	28.00	63.62½	10.87½	10.75	8.75	8.50

NEW YORK, Aug. 8.

The metals are nearly all nominal with business at a decidedly low ebb, still caused by uncertainties as to the Government's attitude. Copper is nominally lower but strong. Tin is dull and inactive. Lead is quiet but firm in an almost nominal market. Spelter is nominally unchanged with business almost at a standstill. Antimony is quiet and unchanged.

New York

Copper.—After a brief period last week of advancing prices the copper market has receded again to lower levels until yesterday the quotation for both Lake and electrolytic was 28c. per lb., New York. The market is peculiar in that fundamental conditions are strong despite continued dullness, which is the outstanding feature. No one appears anxious to buy under present conditions. The air is full of rumors regarding the price which both the Government and its Allies are to pay for copper, the latest speculation fixing it at 22c. to 23c. per lb., but no definite idea of the probable action of the Government is obtainable from any source and the result of the investigation as to the cost of copper production is not likely to be known for two or three weeks. Under these conditions, there is no reason for purchases except those absolutely necessary. Re-sale lots, the withdrawal of which was the cause of the upward trend in the market last week, were offered again on Aug. 3 at 29c., New York, but were not sold. Efforts to drum up business in most cases met with no response. One of the surprising incidents of the week has been the report that exports for June were only 28,198 tons as compared with an average of 38,512 tons per month for the previous five months. London quotations yesterday were unchanged at £137 for spot electrolytic and £133 for futures.

Tin.—It appears, from the revenue bill reported to the Senate on Monday, that there will be no duty on tin and the trade generally expects that this will be the case. At least one cause of uncertainty seems in a fair way to be removed by this action. The market as a whole for the entire week has been quiet and sales have been of small volume. On Aug. 3, about 100 tons of futures changed hands and earlier than that substantial quantities of off-grade brands were sold for prompt delivery but business in Straits tin was small. Early this week the market appeared quiet on the surface and was largely inactive although one seller reported the disposition of 100 tons of future which, outside of some activity in shipments from the East, was the only sale reported. The quotation yesterday for spot Straits was 63.62½c., New York. Arrivals of tin to Aug. 7 were 505 tons, but there has been no official report as to the quantity afloat so far this month, indicating the possibility that this data has been withheld from the public. In London yesterday, the quotation for spot Straits was £247, a decline of £1 from that of last week.

Lead.—Some believe that the Government has already made a purchase of 8000 tons of lead at 8c. per lb. St. Louis, to cover its August requirements, but that no official announcement has been or will be made. The future of the lead market is full of uncertainty, and depends entirely upon Government demands. If these are of sufficient volume to take up the ordinary slack in the market, production will be kept up at full pace, and the market will continue strong. At 8000 tons per month the Government would use about one-fourth of the country's yearly output. The market is now extremely dull, but firm and almost nominal. Labor troubles which were prominent last week seem to have been settled in many cases. The extent to which transportation and labor troubles may interfere with output in the future is receiving some consideration. Quotations have been practically unchanged the entire week at 10.75c. St. Louis, and 10.87½ New York, with a slight recession on Aug. 2, 3 and 4.

Spelter.—The market continues in its stagnant and lifeless condition. A few dealers report a little more activity, but it is not widespread. Prime Western is obtainable for early delivery at 8.50c., St. Louis, or 8.75c., New York, which means as far ahead as September, beyond which time some are unwilling to quote while others demand as high as 8.67½c. to 8.75c., St. Louis, or 8.87½c. to 9c., New York. The interesting feature of the week has been the inquiry put out by the Government for bids on 11,500,000 lb. of Grade C spelter, which is nearly the same as prime Western, though of a little better quality as to impurities. It has been a surprise to the entire trade that this procedure was followed instead of a price being fixed as in the buying of Grades A and B, referred to last week. Bids will be opened on Friday of this week. The question of ascertaining a cost price still goes slowly on, and the market continues deadlocked.

Antimony.—Demand is at a low ebb, and the market is dull, with Chinese and Japanese grades quoted at 15c. to 15.50c. per lb. New York, duty paid.

Aluminum.—The market is inactive and unchanged at 50c. to 52c. per lb., New York, for No. 1 virgin metal, 98 to 99 per cent pure.

Old Metals.—The market is a little higher. Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible	27.00 to 28.00
Copper, heavy and wire	26.00 to 27.00
Copper, light and bottoms	24.00 to 24.50
Brass, heavy	18.50 to 19.50
Brass, light	14.00 to 14.75
Heavy machine composition	24.75 to 25.25
No. 1 yellow rod brass turnings	17.50
No. 1 red brass or composition turnings	19.00 to 21.00
Lead, heavy	9.25 to 9.375
Lead, tea	7.75
Zinc	6.75

Chicago

The metal market continues to show a quiet trend. Copper is firmly held. Interest in tin has been of the routine sort. Lead is fairly strong, though inactive. Spelter continues lifeless; antimony likewise. We quote as follows: Casting copper, 28.50c.; Lake, 30c.; electrolytic, 29c.; tin, carloads, 64c., small lots, 66c. to 67c.; lead, 10.75c.; spelter, 8.37c. to 8.50c.; sheet zinc, 19c.; antimony, 17c. to 18.50c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 23c.; copper clips, 22c.; copper bottoms, 21c.; red brass, 22c.; yellow brass, 15c.; lead pipe, 8c.; zinc, 6c.; pewter, No. 1, 35c.; tinfoil, 40c.; block tin, 45c.

St. Louis

AUGUST 6.—Non-ferrous metals have been quiet and in some cases a little firmer during the week, though this latter does not apply to the Missouri product. The close to-day on car load lots was: Lead, 10.92½c.; spelter, 8.37½c. to 8.50c. In less than car load lots, the quotations were: Lead, 11.25c.; spelter, 9.50c.; tin, 68c.; lake copper, 31.50c.; electrolytic copper, 31c.; Asiatic antimony, 18c. In the Joplin district there was a better demand for the high-grade zinc ores, but the price range remained at $65 to $75 per ton, basis of 60 per cent metal, the average for the week being $69 per ton for the district. Calamine ranged from $35 to $42 per ton, basis of 40 per cent metal, with the average for the district at $38 per ton. The output from the Oklahoma section of the field is increasing, but elsewhere there is a reduction because of the prices prevailing. Lead ore was steady at $110 per ton, basis of 80 per cent metal. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 10.50c.; heavy yellow brass, 13c.; heavy red brass and light copper, 15c.; heavy copper and copper wire, 20c.; pewter, 25c.; tinfoil, 42c.; lead, 7c.; zinc, 6c.; tea lead, 4c.

ANOTHER BIG SHIP PLANT

United States Steel Corporation Acquires Site Near Mobile, Ala.

The United States Steel Corporation will build a steel shipbuilding plant near Mobile, Ala., according to an announcement made this week by President George G. Crawford of the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. Beyond officially announcing the purchase of land for the shipbuilding plant, President Crawford makes no statement now, but it is understood that the proposed plant will be one of the largest in the United States, will cost about $30,000,000 and take two years to construct. The presumption is that the construction of the new shipbuilding plant and the 110-in. plate mill at Fairfield, Ala., announcement of which was recently made, will proceed simultaneously.

The Tennessee Coal, Iron & Railroad Co. is expected to extend the Birmingham Southern Railroad seven miles to the south, reaching navigable water on the Warrior River, where a river terminal will be built, and steel carried thence by water to Mobile.

This shipbuilding plant, with that of the Federal Shipbuilding Co., will make the Steel Corporation one of the largest shipbuilders of the country. The Federal Shipbuilding Co., which was recently incorporated, has been organized and officers have been elected. An office and engineering department have been located on two floors of the building at 54 Dey Street, New York, and plans are being carried out rapidly for erecting the plant on Newark Bay. Judge Gary is president of the Federal Shipbuilding Co. Robert MacGregor is vice-president and general manager. Other directors and officers are Joshua A. Hatfield, president American Bridge Co. of New Jersey; Richard Trimble, secretary and treasurer of the Steel Corporation, and William J. Filbert, comptroller of the Steel Corporation.

Of the $6,000,000 appropriated by the Steel Corporation for the Federal plant about $2,000,000 has been spent for the site, and the remainder will be divided about equally between buildings and equipment. Some of the machinery will be built by the American Bridge Co. It is expected that the first keel will be laid in December.

Steel Rail Exports

Exports of steel rails continue at a high rate. From Government data the following table has been prepared:

1917	Gross Tons
January	76,493
February	46,153
March	52,469
April	38,410
May	49,260
Total	262,785
Calendar year 1913	460,553
Calendar year 1914	174,680
Calendar year 1915	391,379
Calendar year 1916	540,349

The rate in the first five months of this year is greater than it was in 1916 and considerably larger than in 1913 when rail exports reached their height under normal conditions.

Of 513,076 tons exported in the 10 months to May 1, 1917, the amount taken by Russia is the largest—101,097 tons. The West Indies and Bermuda are credited with 77,559 tons, Canada with 61,727 tons, South America with 21,520 tons and Japan with 9359 tons.

The Provincial Hydro Electric Commission of Ontario has taken over the plant of the Ontario Power Co., at Niagara Falls, Ont. The plant was recently purchased by the Commission at $22,000,000 $13,000,000 of which is represented in bonded indebtedness to the company, and it is understood, will form an important link in the Chippawa Creek-Queenston Heights development scheme, the ultimate capacity of which will be 900,000 hp. The Ontario Development Co. has a franchise development of 180,000 hp.

WAR BUYING COMMISSION

Purchases May Be Made for Allies Also—The Steel Cost Inquiry

WASHINGTON, Aug. 7.—Plans for detailing members of the War Industries Board to serve as purchasing commissioners for the American Government and for the Allies were discussed at a meeting of the board held at the White House yesterday and participated in by President Wilson. All the members of the board were present and by the President's invitation Secretary Daniels also attended the conference. At the request of the board President Wilson outlined his views with respect to the advantages that should be given the Allies in buying war materials in this country, taking the ground that substantially the same price concessions obtained by this Government should be accorded all the European nations allied with the United States in the war on Germany. The President did not express himself as to purchases for private foreign interests and it was understood that the War Industries Board will consider only the buying of material intended strictly for the prosecution of the war.

While the plans of the board with respect to buying material have not yet been worked out in detail it is understood that a purchasing commission for the American Government will be organized with Bernard M. Baruch as chairman and including Robert S. Brookings and Herbert Hoover, the latter to serve as buyer of food products. As chairman of this commission Mr. Baruch will not only buy raw materials for the American Government and exercise a general supervision of other purchases but it is understood he will ultimately be designated to make all purchases for the Allies. This arrangement will leave Chairman Scott of the War Industries Board free to devote himself to the technical problems of procuring war material and standardizing the requirements of the Government and the equipment of private manufacturers.

To avoid duplication of work and to take advantage of the organizations already in existence in the War and Navy Departments the purchasing commission of the War Industries Board will leave the actual making of contracts in the hands of the purchasing bureaus of the departments, Army contracts being signed by Colonel Palmer E. Pierce and those for the Navy by Rear Admiral Frank F. Fletcher, both of these officers being members of the War Industries Board.

No information has been made public during the past week with regard to the progress of the Federal Trade Commission in fixing the basis for steel prices. This is somewhat significant in view of the fact that the commission to-day gave out a brief bulletin promising to lay before the President within two weeks its report upon the cost of producing copper. This bulletin is as follows:

> The Federal Trade Commission's investigation into the cost of producing copper, under supervision of Commissioner Colver, is progressing favorably. Dr. L. H. Haney is in direct charge of the details of this phase of the commission's investigation of metal costs. The field reports are now coming in rapidly and the Commission hopes to have all reports in and results ready for submittal to the President within two weeks. None of these figures will be given out at the commission. If given out at all they will be made public at the White House.

None of the investigations undertaken by the commission to determine the cost of producing the various metals, coal, petroleum, etc., presents anything like the complicated aspect of the inquiry into the cost of making steel. While no conclusions are yet in sight, a large staff of the commission's experts are working with great energy and it is promised that the figures will be laid before the President at the earliest possible moment.

PERSONAL

Thomas E. Durban, for 25 years general manager Erie City Iron Works, Erie, Pa., has resigned and will hereafter devote his time to his position as commissioner representing boiler manufacturers of the country in behalf of the American Society of Mechanical Engineers Uniform Boiler Code, with offices in the Commerce Building, Erie.

Peter Blackwood has severed his connection with the Blackwood Steel Foundry Co., Springfield, Ohio. He has not yet announced his future plans.

Henry M. Wood has resigned from the Lodge & Shipley Machine Tool Co., Cincinnati, to become associated with Axel Malm in the Malm & Wood Machine Co., Dayton, Ohio, manufacturing rotary presses and dies. The company heretofore operated under the name of the Malm Machine Co. Mr. Malm is president and mechanical engineer of the new firm and Mr. Wood vice-president and general manager.

Harry T. Streaker, Lancaster, Pa., has become superintendent of the local foundry of the Champion Blower & Forge Co.

Charles H. Purdy, superintendent Dalton Machine Co., 1911 Park Avenue, New York, has resigned, to design and construct special machinery, with office at 103 East One Hundred and Twenty-fifth Street.

William H. Ellis, Chicago, has bought an interest in and been elected general manager of the Two Rivers, Wis., Plating & Mfg. Co., which recently erected a large factory addition. He formerly was associated with the International Harvester Corporation.

S. J. Williams, for the last year deputy of the Industrial Commission of Wisconsin, in charge of building inspection, has been advanced to the position of engineer, in charge of safety and sanitation work. He fills the vacancy caused by the resignation, a year ago, of C. W. Price, who became associated with the National Safety Council.

F. O. Ebeling, general superintendent DePere Mfg. Co., DePere, Wis., formerly the Lyons Boiler Works, and now controlled by the Joliet Bridge & Iron Works, has resigned to accept a position with Gage Bros. Mfg. Co., Chicago. He is succeeded by Ward Clark.

Harold H. Hamilton, for twelve years president Whiting Mfg. Co., Bridgeport, Conn., has resigned to devote his entire time to the new organization of Hamilton & DeLoss, Inc. He was presented with a watch by the department heads of the Whiting Mfg. Co.

H. E. Harris, president and general manager H. E. Harris Engineering Co., Bridgeport, Conn., has been elected chairman of the Bridgeport section of the American Society of Mechanical Engineers, formed July 31. F. R. Pleasanton, chief engineer Remington Arms-U. M. C. Co., Inc., is vice-chairman. R. W. Ellingham, assistant superintendent, Remington Arms & Ammunition Co., is treasurer; E. Leslie Fletcher, Fletcher-Thompson, Inc., Bridgeport, is secretary, and Charles M. Burgess, New Britain, Conn., is chairman of the membership committee.

W. J. Longmore, purchasing agent at East Pittsburgh for the Westinghouse Electric & Mfg. Co., has been promoted to general purchasing agent at the Pittsburgh offices. Other changes are the promotion of Charles G. Taylor from assistant purchasing agent to purchasing agent of the East Pittsburgh, Shadyside, Cleveland and Newark plants, and the promotion of A. W. Fullerton from purchasing agent of the machine works to purchasing agent of the East Pittsburgh, Trafford and Essington machine works.

Frank B. Ward, representing the Elwell-Parker Electric Co., Cleveland, maker of electric storage battery trucks and tractors; the J. D. Fate Co., Plymouth, Ohio, builder of gasoline locomotives; the Nazel Engineering & Machine Works, Philadelphia, pneumatic forging hammers; the Vulcan Iron Works, Wilkes-Barre, Pa., locomotives, and other manufacturers, has taken offices at 501 Park Building, Pittsburgh.

Morris Lee Sternberger, Jr., president, and Samuel Edward Sternberger, vice-president and general manager, Wellston Iron Furnace Co., Jackson, Ohio, announce that by court decision their names have been changed to Morris Lee Stephenson and Samuel Edward Stephenson, respectively.

George Giffault, formerly with Fitz, Dana & Brown, metals, has become associated with the Baltimore Copper Smelting & Rolling Co., at New York. The New York office for the sheet copper department has been moved to 128-130 Fourth Avenue, near Union Square, and a stock of the products of the American Smelting & Refining Co. is carried, including ingot copper, pig tin, lead and spelter. W. C. Dickey is New York manager.

William A. Greaves, one of the founders of the Greaves-Klusman Machine Tool Co., Cincinnati, has sold out his interest in that firm to the remaining directors. William B. Dickson has been appointed general manager.

S. M. Hershey, formerly with the Hyatt Roller Bearing Co., Newark, N. J., and the Norton Co., Worcester, Mass., has been placed in charge of an office opened by the Heald Machine Co., Worcester, Mass., manufacturer of grinding machines in the Commonwealth Building, Philadelphia.

W. C. Rowley, for some time a member of the board of directors of the Federal Motor Truck Co., has been elected vice-president in charge of sales, succeeding J. F. Bowman, resigned. He was with the Michigan Central Railroad for 32 years, becoming general freight agent at Detroit.

W. J. Ogden has resigned as superintendent of the forge department of William Wharton, Jr., & Co., Easton, Pa., to engage in the forging business at Perkasie, Pa. In conjunction with H. Boyd he has formed the Perkasie Forge & Machine Company.

Thomas B. Jones has been appointed a member of the Exports Administrative Board at Washington representing the Department of Commerce and succeeding Edward N. Hurley, recently transferred to the chairmanship of the United States Shipping Board. Mr. Jones was nominated by the President for membership on the Federal Reserve Board when that body was originally organized, but was rejected by the Senate after a protracted contest. Confirmation by the Senate of members of the Exports Administrative Board is not required. Mr. Jones is a well-known business man and capitalist of Chicago and has had much experience calculated to fit him for service in his new post.

De Courcy Browne, metallurgical engineer, Goldschmidt Thermit Co., 120 Broadway, has been commissioned a second lieutenant in the ordnance department of the U. S. Army, and is connected with the second training company, Coast Artillery Corps, Fortress Monroe, Va.

John Duncan, vice-president Wheeling Steel & Iron Co., Wheeling, W. Va., who had a major operation on July 21 at a hospital in Pittsburgh, is making satisfactory progress toward recovery.

H. L. Kaufman, Cleveland representative for years of E. N. Breitung & Co., Marquette, Mich., ore miners and shippers, has withdrawn from the firm and returned to Marquette. It is understood he will enter the banking business in New York City.

Edward Worcester, first vice-president and general manager of sales of National Tube Co., Pittsburgh, has gone to Maine on a month's vacation.

George A. Mason, in charge of sales of the wire and wire nail departments of Jones & Laughlin Steel Co., Pittsburgh, has gone to Canada on his annual vacation.

J. W. Kelly, for eight years purchasing agent of the Riter-Conley Mfg. Co., Leetsdale, Pa., has resigned and opened offices in the Second National Bank Building, Pittsburgh, as manufacturer's agent. He is representing the Mahoning Foundry Co., Punxsutawney, Pa., producer of gray iron, brass and bronze castings.

Fred G. Lange, formerly chief accident agent of the Youngstown Sheet & Tube Co., Youngstown, Ohio, has

been appointed deputy safety inspector of the Ohio Industrial Commission. In his new capacity he will serve both as inspector and as instructor of deputies. He will be stationed at Columbus.

George F. Alderdice, vice-president of Brier Hill Steel Co., Youngstown, Ohio, has recovered from an operation for appendicitis performed recently.

Fred Corll, formerly superintendent of the open-hearth department of the Farrell, Pa., works of the Carnegie Steel Co., has resigned to accept a similar position with the Cambria Steel Co., Johnstown, Pa. Norman S. Powell, superintendent of the North Works open hearth, will succeed Mr. Corll at Farrell. Mr. Powell will be succeeded by Joseph Cooper.

OBITUARY

ALBERT F. GANZ, professor of electrical engineering at Stevens Institute of Technology and a well-known consulting engineer, died July 28 at his home in Hoboken, N. J. He was born in Germany, April 25, 1872, came to this country with his parents in 1881 and graduated from Stevens in 1895. He was appointed professor of electrical engineering in 1902. Professor Ganz was a fellow of the American Institute of Engineers and the American Association for the Advancement of Science. He was a member of the American Society of Mechanical Engineers and other engineering societies.

HORACE BROCK, Mt. Lebanon, Pa., died early Aug. 4 at the Orthopedic Hospital, Philadelphia, of infectious pneumonia. He was 64 years old, and a son of the late John Penn Brock. He was formerly active in the affairs of the North Lebanon furnaces and the American Iron & Steel Co., of which he was treasurer for many years. He is survived by a widow and two children, John Penn Brock, manager of the American Iron & Steel plant at Lebanon, and Mrs. Quincy Bent, wife of the general manager of the Bethlehem Steel Co. plant at Steelton.

WILLIAM I. BABCOCK, head of the firm of Babcock & Penton, naval architects, 120 Broadway, New York, and son of the late Capt. David S. Babcock, died Aug. 7 at his home in New York in his sixtieth year. Mr. Babcock was connected with the Chicago Shipbuilding Co. a number of years ago, and later became associated with Henry Penton, who was then with the same company and is now a resident of Cleveland. Mr. Babcock was a member of the Engineers' Club and other engineering societies.

OTTO P. STEHN, general sales manager of the Hydraulic Pressed Steel Co., Cleveland, died Aug. 5 in Baltimore, Md., where he had been spending some time for medical treatment. He was about forty years of age and had been connected with the Hydraulic Pressed Steel Co. for six years. Before becoming associated with that company he was for some time Cleveland sales manager of Manning, Maxwell & Moore, Inc.

JACOB FISCHER, aged 69, president Indiana Stove Works, Evansville, Ind., died July 28, at his home in that city. He was born in Germany and had lived in Indiana from his boyhood.

ISAAC G. HAAS, president of the Empire Plow Co., Cleveland, died Aug. 1, after an illness lasting several months.

JOHN W. SHANAHAN, superintendent Bissell Carpet Sweeper Co., Grand Rapids, Mich., died July 13.

Blast Furnace Sold

CHICAGO, Aug. 8—(*By Wire*).—The Stephenson Charcoal Iron Co. has sold its furnace at Wells, near Escanaba, Mich., to the Delta Chemical Co. The latter is owned largely by Eastern capital.

Tin exported from Siam for the fiscal year ended March, 1916, was 20,156,667 lb., valued at $7,807,703.

AIRCRAFT MAKERS ORGANIZE

Association of Manufacturers Will Put an End to Troublesome Patent Litigation

Organization of the Manufacturers' Aircraft Association will, it is believed, end the litigation over airplane patents, chiefly between the Curtiss and Wright interests. The association has opened offices at 501 Fifth Avenue. Membership is open to "any responsible manufacturer of aircraft, or any one who intends to become a bona fide producer, or any manufacturer to whom the United States Government has given a contract for the construction of ten or more airplanes, or any person, firm or corporation owning or controlling United States patents relating to airplanes."

Fay L. Faurot, chairman of the publicity committee of the association, has made an official statement in part as follows:

By the terms of their agreement the various patents owned by the individual members are to be taken over and so cross-licensed that their use may be made universal to all engaged in the industry. This action comes as a result of a number of conferences held in Washington by the members of the National Advisory Committee for Aeronautics and the officials of the Army and Navy and the Manufacturers Aircraft Association.

The directors of the association are: Frank H. Russell, of the Burgess Co., Marblehead, Mass.; Albert H. Flint, L. W. F. Engineering Co.; John P. Tarbox, Curtiss Aeroplane & Motors Corporation; Harry Bowers Mingle, Standard Aero Corporation; B. S. Foss, Sturtevant Aeroplane Co.; George H. Houston, Wright-Martin Aircraft Corporation, and H. E. Talbor, Jr., Dayton-Wright Aeroplane Co.

The officers of the association are: Frank H. Russell, Burgess Co., president; Albert H. Flint, L. W. F. Engineering Co., vice-president; Harry B. Mingle, Standard Aero Corporation, treasurer, and Benjamin S. Foss, Sturtevant Aeroplane Co., secretary, and Benjamin L. Williams, assistant secretary.

By the terms of the cross-licensing agreement any responsible manufacturer of aircraft, or one who intends to become a bona fide producer of same, or any manufacturer to whom the United States Government has given a contract for the construction of ten or more airplanes, or any person, firm, or corporation owning or controlling United States patents relating to airplanes may become a party to the voting trust agreement, provided for in the by-laws, and can qualify as a member.

It is the purpose of the association not to curtail, but to open up the industry in order that the Government officials and airplane manufacturers may not at this time be under any improper or unfair restraint. All patent litigation relating to airplanes between members of the association ceases automatically, and the airplane industry is therefore left free to expand to any limits desired or required by the unusual demands of the war.

Secretary of the Navy Daniels has announced that the Government will build an aircraft factory for the navy at a cost of about $1,000,000 for buildings and machinery. The plant will be located at the League Island Navy Yard, Philadelphia.

Pittsburgh Steel Product Co.'s New Plant

Property amounting to about 300 acres recently purchased by the Pittsburgh Steel Products Co., Pittsburgh, and located between the boroughs of Allenport and Stackdale, Washington county, Pa., facing the Monongahela River, will be used for extending the operations of the company in the manufacture of seamless steel tubes. This company for some years has operated at Monessen, Pa., a large plant in the manufacture of seamless steel tubing from 1 in. diameter up to 6 in., the annual capacity being about 60,000 tons. Its property at Monessen does not permit of future extensions, and the company decided to erect its new tube mills at Allenport. Plans so far decided upon and work on which construction has already started include the erection of tube mill buildings similar to those at Monessen, the building of a sea wall along the Monongahela River as a protection against floods, the construction of a pumping station, also a large power plant, including electrical equipment. All mills in the new plant will be motor driven.

CORRESPONDENCE

Welded Cast Steel Ship Sections

To the Editor: The comments of Mr. Sandor I. Oesterreicher in your July 26 issue and his deep interest in advancing the arts of welding and casting for ship building purposes to meet the submarine menace are welcomed as valuable contributions throwing new and unexpected lights upon the subject.

His idea that welding cast-steel ship sections will be the death of electric welding might well be elucidated by giving his reasons. When so doing the experience of the Wilson welding system in ships during the last few months should be given consideration.

Mr. Oesterreicher "guesses" that the Wilson system uses a constant potential, multiple arc system. His guess is correct. He quotes a statement from a Wilson patent to the effect that the unsteadiness of an operator's hand and the wide ampere variations resulting caused a porous weld. This statement referred to the problem that Mr. Wilson solved. His solenoid and carbon pile eliminate porosity, so that the weld is dense and tough,—in fact the joint is filled with steel containing manganese capable of scientific predetermination as to quantity, to produce the degree of tensile strength and ductility desired.

The speed of welding depends on many factors,—the thickness of the plates to be welded, the size of the welding electrode, and the amount of current used.

Mr. Oesterreicher appears to be entertained at the idea of one hundred 5000-ton ships from each of ten ship yards per month. And justly so. Through some error somewhere "ten" was printed in the daily press as "one hundred."

It is planned to build ships of about 9100 tons d.w.c. and a total of as many as can be built. Fifty-five ships per month require 2,000,000 tons of steel more or less, and furnaces to reduce the ore and purify it for casting are the chief problems. Two blast furnaces have just been completed within 57 days. A dozen might be necessary,—perhaps more. And open-hearth furnaces to match. It is a big undertaking. The highest order of engineering is required. Casting has reached such a satisfactory stage and now welding has just equalled it, that the casting and welding of ships, while new and revolutionary to the naval architect, may be said fairly to have been brought within the realms of straight engineering.

MYRON F. HILL.

New York, Aug. 6.

The Unfairness of the Senate Bill Tax on Excess Profits

To the Editor: Two conditions should be met in the special tax legislation now before the Senate at Washington. They are especially important because of the enormous sums involved. If these two conditions are met, the taxes will be raised and paid with patriotic cheerfulness:

1. Incidence of the tax should be fair and just to all.
2. The tax must not be beyond the ability of the taxpayer to pay.

As to the first, I feel that the method provided in the Senate bill is essentially unjust and unfair. Let me illustrate. Assume two corporations each having $500,000 invested as capital Jan. 1, 1917, and each during 1917 earning net 35 per cent, or $175,000. A had normal earnings in 1911, 1912 and 1913 of 20 per cent, or $100,000; B normal earnings during 1911, 1912 and 1913 of less than 6 per cent, which by Senate bill allows them to assume 6 per cent earnings, or $30,000 normal earnings. By Senate bill A pays no excess profits tax up to $100,000. A pays excess profits tax as follows:

A has earnings of $175,000, less $100,000 normal income, or $75,000 on which excess tax is collected, and will pay as follow:

12 per cent on first 15 per cent of $100,000, or	$1,800.00
16 per cent on succeeding 10 per cent (15-25 per cent) of $100,000	1,600.00
20 per cent on succeeding 25 per cent (25-50 per cent) of $100,000	5,000.00
25 per cent on succeeding 25 per cent (50-75 per cent) of $100,000	6,250.00

This completes A's excess profits payment, making a total of $75,000 on which excess profits is laid, which with the normal earnings of $100,000 equals the total earnings of $175,000. The total of the excess profits tax which A pays would be $14,650.

Corporation B pays on excess profits above $30,000, or on $145,000. B pays 12 per cent on $4,500, 16 per cent on $3,000, 20 per cent on $7,500, 25 per cent on $75,000, 30 per cent on $7,500, 35 per cent on $15,000, 40 per cent on $15,000, 45 per cent on $15,000 and 50 per cent on $70,000. B thus pays $59,625 on the same capital and same earnings on which A pays but $14,650.

Surely this does not seem fair. If what A pays is right, then B is certainly paying too much, and vice versa. The unfortunate working out of this is that corporation B with failure staring it in the face in 1911, 1912 and 1913—for no commercial corporation can endure on a 6 per cent or less earning capacity—is compelled in 1917 and thereafter not only to compete with its much more successful rival of 1911, 1912 and 1913 and its larger earnings, but is severely penalized in the matter of taxation, thus further handicapping it in a competitive race. It is penalized first because its excess profits taxation is on a much larger amount, and further because by reason of the percentage applying to a smaller initial amount, corporation A finds 25 per cent the extreme limit it is compelled to pay on any portion of its excess profits, while corporation B is compelled to pay from 30 to 50 per cent on more than 80 per cent of its excess profits.

Surely any principle which produces such inequitable results is essentially wrong. The question what caused the prosperity of corporation B in 1917, in contrast with 1911, 1912 and 1913, really is not a matter which ought to control with B any more than with A. Corporation B in any event needed the prosperity a good deal worse than corporation A, is less able to pay the tax, and certainly should not be taxed in excess of A.

Two brief suggestions: One is that a large part of both A's and B's profits in 1917 arise out of appreciation of raw materials, and this profit later on will gradually appear in the loss column as materials go down.

The other: The idea of the normal year's earnings, as I understand, is copied after England's law. It should be remembered, however, that during the period prior to the war and roughly covered by 1911, 1912 and 1913 the industries in England were generally earning a large rate of return on their investment, so that a normal income might be for the general run of English concerns as much as 20 per cent, and excess profits began beyond that percentage. If this be true, English corporations are in much better condition to stand a heavy excess profits tax than many of our American corporations.

Another idea I would like to present as briefly as possible is that too heavy a tax will bring about failure on the part of a number of our commercial corporations. Increasing business and increasing sales have called for increasing capital. This is not usually in the smaller corporations secured by sales of stock. A very large proportion of moderate sized corporations, at least, rely upon their banking facilities largely for aid in extending their business and for the supplying of capital.

Take corporation B with $500,000 of capital Jan. 1, 1917. Likely we shall find, even in a good wholesome corporation, this condition of affairs approximately to exist:

Accounts payable	$25,000
Bills payable to bank	100,000

To support this bank and current indebtedness, sound banking usually calls for approximately twice the indebtedness in liquid assets on the part of the borrowing corporation. Thus such a corporation would

need to have clear $200,000 to $250,000 of liquid assets to sustain its indebtedness of $125,000, of which $100,000 is bank indebtedness. These liquid assets consist mainly of book accounts, raw, semi-finished and full-finished material or merchandise, and not, as is many times supposed, of money in bank. Money in bank is usually with most corporations the smallest item of their assets.

Practically, what is a corporation then to do, if the burden of taxation is piled on, as is indicated in the case of corporation B? What will be its situation? It can scarcely go to the banks for a great portion of the money it will need to pay the Government next year, for the total resources of all the banks will not probably permit of the banks financing a large proportion of the income tax payments of various sorts, all of which have to be paid approximately at the same time. Either the corporation will be unable to make the payment called for, in which event it is ruined, or it must at an early date set about retrenching instead of extending, at a time when extension in many industries is needed badly. It will have to set about reducing its bank indebtedness. To do that it will need to restrict its trade, reduce its stock and absolutely abandon all thoughts of expansion of its business. In that event, even the very effort to take in sail, to provide funds to meet taxation on excess profits, will destroy the possibility of profit and thereby defeat the Government's own purpose.

My plea, therefore, is as to these two points only: First, make the tax so that it will bear equally and fairly on all on whom it falls and not favor the ultra prosperous ones at the expense of those who have barely escaped substantial failure during the depressing years which preceded the war. Second, let the tax not exceed in amount such percentage of profits as will still leave it possible to the taxpayer to make payment of taxes and continue to exist.

In addition to the excess profits tax, of course, there is the heavy normal tax to be paid as well. Practically, how and where are many of these corporations to get the money with which to pay these taxes?

J. E. DURHAM,
President Bonney Vise & Tool Works, Inc.
Allentown, Pa., Aug. 3, 1917.

Orders for Nine Heroult Electric Furnaces

Licenses for the installation of the following Heroult electric steel furnaces have been issued by the United States Steel Corporation:

The General Electric Co., West Lynn, Mass., will install one 6-ton furnace for making steel castings.

The Taylor-Wharton Iron & Steel Co., High Bridge, N. J., will install one 6-ton furnace for making steel castings. This is in addition to one 3-ton recently ordered.

The Crucible Steel Co. of America will install one 6-ton furnace at its Park Works, Pittsburgh, for making special steels. This supplements several furnaces of the same types already operating or ordered.

The Pennsylvania Engineering Works, New Castle, Pa., will install one 6-ton furnace for making steel castings.

George C. Warner, Fulton, N. Y., will install one 1-ton furnace for making steel castings under the name of a company still to be formed.

The United States Government, as previously forecasted in THE IRON AGE, has placed an order with the Corporation for three 6-ton furnaces to be installed in its new projectile plant at Charleston, W. Va., and also one 6-ton furnace for making steel castings at the Naval Gun factory, Washington, D. C.

The installation of these nine furnaces brings the total number of this type operating or contracted for in the United States and Canada to 134.

Appraisement of the properties of the Sloss-Sheffield Steel & Iron Co. in Alabama is being made by W. L. Klutts, general manager Sheffield Coal & Iron Co., Warner Shook, former manager Central Coal & Iron Co.'s furnace, and H. S. Geismer. This is being done for the information of the directors of the company as a basis for future developments, a large by-product plant being considered among other things.

Japan's Large Share in Exports of Steel Plates

Unprecedented exports of steel plates have been made and are being made from the United States. The total for the first five months of this year of 209,197 gross tons nearly equals the exports in 1913 of 223,814 tons and those of the entire year 1915 when they were 222,472 tons. The proportion going to Japan is significant. The following table gives the official Government exports of steel plates over certain periods and also gives the total of steel plates and sheets sent to Japan in the corresponding periods, in gross tons:

1917	Plate Exports	Plates and Sheets to Japan
January	38,903	19,177
February	26,395	12,680
March	41,439	20,932
April	47,611	29,595
May	54,849	.....
	209,197	.....
10 months ended Apr. 30, 1915.	85,747	6,058
10 months ended Apr. 30, 1916.	229,938	53,189
10 months ended Apr. 30, 1917.	306,305	138,565
Calendar year 1913	223,814	7,250
Calendar year 1914	111,552	3,275
Calendar year 1915	222,472	37,119
Calendar year 1916	276,034	89,458

It will be seen that steel plate exports for the 10 months ended April 30, 1917, which were 306,305 tons, not only exceeded the record of 276,034 tons in the full year 1916 but were over one-third more in 10 months than in the pre-war record year of 1913. The increase has also been progressive from January to May this year excepting the decrease in February, due possibly to submarine warfare.

Striking too is Japan's proportion of these exports. From about 50 per cent of the total plates in January, February and March, the proportion in April was still larger. This trend is more evident in the relation between the ratio for the 10 months ended April 30, 1917, and for the calendar year 1916.

Armor Plate Plant Not to Be Built

WASHINGTON, Aug. 7.—Reports published in the daily press during the past week to the effect that the Government is about to award contracts for 25,000 tons of structural steel for the armor plant for which a site has been provided at Charleston, W. Va., are pronounced by officials of the Navy Department to be entirely without foundation. Some months ago the requirements of the plant were carefully figured and tabulated in connection with the steel required for the projectile plant and for all other buildings which the Navy Department has had in view for war purposes and for the permanent naval establishment. From time to time inquiries have been made concerning the availability of this steel and orders have been given for various lots, the delivery of which in the near future was desired. So far as the armor plant is concerned, however, Secretary Daniels recently made the official announcement that as this establishment could not be completed in time for its product to be of use in winning the war, its construction had been postponed. There has been no change in the status of the matter. As heretofore stated in this correspondence, the impression is strong that the proposed armor plate plant will not be built but that all armor needed by the Navy will be purchased from private establishments on the basis of prices to be fixed by the Federal Trade Commission or by the President on cost data gathered by the commission.

Has Not Purchased Interest in Mine

THE IRON AGE is advised by W. A. Thomas, president of the Brier Hill Steel Co., Youngstown, Ohio, that the report that his company had purchased a half interest in the Dunwoody ore mine on the Mesaba range, Minnesota, is untrue.

EXEMPTIONS OF EMPLOYEES

Plant Managers in War Industries Need to Take Energetic Action

WASHINGTON, Aug. 7.—The serious question of preventing inroads upon the organizations of munition makers and other manufacturers having Government contracts by the war draft has been put squarely up to the employers. Only courageous and vigorous action can prevent well-meaning but over-zealous officials from depleting the labor forces of many establishments, and industrial managers should not hesitate to act with energy in view of their knowledge of the effect upon the interests of the Government itself of any breaking down of manufacturing efficiency in the crisis now confronting the country.

The President's proclamation calling upon private establishments to refrain from assisting in procuring exemptions for employees except where they are "absolutely indispensable" was outlined in THE IRON AGE last week, together with certain rulings promulgated under the authority of Provost Marshal General Crowder. During the last few days the situation has become much more acute, however, due to a variety of causes. A very large proportion of drafted men who have been found physically fit have indicated their intention to seek exemption, the majority of the claims being based apparently on the alleged dependence of families or relatives. A very large number of young men have contracted marriages apparently for the sole purpose of securing exemption from the draft. To meet these conditions the War Department officials are preparing to pursue a drastic course, and machinery is being set in motion designed to reduce exemptions to a minimum. While the aim of the authorities is legitimate and proper, there is reason to believe that the strong measures being taken will result in embarrassing certain industries highly important to the Government rather than in reaching the particular "slackers" at which they are aimed.

No Exemptions by Industries

The instructions originally issued by the President and the Provost Marshal General were addressed to local exemption boards. These were followed up by a ruling forwarded to the Coal Production Committee of the Council of National Defense holding that the War Department will not recognize exemptions by industries and that the indispensable relation of each workmen to his employment can alone be considered. General Crowder has now issued a new and comprehensive order addressed to district boards to which appeals from local boards lie, and the War Department has appointed an official challenger for every local board, thereby guaranteeing the taking of an appeal on behalf of the Government against practically every ruling of the local boards granting exemption except in the case of physical disability. In issuing this order General Crowder declares that the interest of the nation solely must be subserved and that "consequently industrial exemptions should be granted only to men absolutely essential to the conduct of a business which itself is essential to the proper prosecution of the war." The question in an individual case, he says, is always two-fold:

1. Is the industry in question necessary to the maintenance of the military establishment or the effective operation of the military forces or the maintenance of the national interest during the emergency?

2. Does the person by or in respect of whom the discharge is claimed occupy such a status in respect of such a necessary industry that his place could not be filled by another without direct substantial material loss and detriment to the adequate and effective operation of the particular enterprise?

There may be many cases, General Crowder asserts, where discharges will be claimed on circumstances "that raise a question of private loss or hardship rather than of national necessity," but such cases, he asserts, "are without the power of district boards to relieve." Wherever local boards have sought to grant such exemptions the official challenger is directed to step in and take an appeal to the district board on behalf of the Government.

The Question of Indispensability

Strong representations are being made here by manufacturers having Government contracts that the practical effect of these regulations is to break up working organizations, and appeals are being made to modify the instructions to local and district boards and to challengers. It is pointed out that in a munition plant, for example, the greatest possible difficulty in securing adequate forces of skilled men has been experienced for many months, but that, nevertheless, foremen and managers hesitate to say under oath that any particular employee is "absolutely indispensable" to the efficient operation of the plant. The real question in the mind of the foreman or manager is as to the skill and productivity of the workman who is to be substituted for the drafted man, and in most cases this cannot be determined until too late to claim exemption for the employee who has been called for military service. Furthermore, according to some of the complaints received here, the serious problem which the employer must consider is not the indispensable character of the individual employee, but the effect upon the organization of the loss of a considerable number of employees called upon to quit work at the same time. Individually no one of these employees may be said to be indispensable, but the efficiency of any given plant would be seriously reduced should any considerable number of workmen be drafted. There are no rules for drawing lines in such cases, and just at this juncture, when the Government appears to be far more concerned in getting soldiers than in protecting manufacturing establishments producing goods for the Army and Navy, many employers find themselves in a very serious quandary.

It is evident, from the present disposition of the authorities in this particular emergency, that manufacturers must adopt a firm course and protect their Government contracts at all costs, assuming, of course, that those contracts relate to the prosecution of the war. Foremen, managers and others should not hesitate to supply their workmen with the necessary affidavits as to the indispensable character of their service where any substantial decrease in plant efficiency is threatened, and the fact should be borne in mind that an adequate army can certainly be secured without taking men engaged in the manufacture of war materials, whereas no war can successfully be waged unless the Government is assured of the prompt delivery of adequate supplies of war material of all kinds.

Pilling & Crane Partnership Dissolved

Announcement is made of the dissolution on Aug. 1 of the partnership of Pilling & Crane which for many years has been one of the most prominent Eastern houses doing business in iron ore, pig iron and coal, having main offices in Philadelphia and an office in New York. T. I. Crane withdraws from the firm and will devote himself to various interests including those of the Northern Ore Co. which operates a zinc property in northern New York and more recently acquired the Island Park blast furnace near Easton, Pa. W. S. Pilling will continue the business under the name of Pilling & Crane.

Machinery Markets and News of the Works

NEARLY ALL WAR BUYING

Private Business Almost Stopped

Machine-Tool Concerns to Aid in Ordnance Work—Gisholt Machine Co. Organizes New Concern to Build Guns

The Government is looking to machine-tool builders to render valuable aid in ordnance work. In addition to the Wisconsin Gun Co., which was recently organized by five leading metal-working concerns of Milwaukee, Wisconsin will have a gun plant at Madison, the Northwestern Ordnance Co. having been organized by officials of the Gisholt Machine Co. and the contract for a building similar to the one being erected by the Wisconsin Gun Co. has been let. There appears to be reason to believe also that the Niles-Bement-Pond Co. may build a similar plant near Kearny, N. J., although no definite information to this effect is obtainable, and the Otis Elevator Co. will probably utilize one of its manufacturing buildings for a gun plant. THE IRON AGE mentioned last week that the Bullard Machine Tool Co., Bridgeport, Conn., had been asked to erect a similar factory. The initiative in the establishment of these plants is said to have come from the Government, which has selected the concerns which were thought to be in the best position to assist materially in the equipment of the United States Army with artillery.

A majority of metal working machinery and machine tool plants is now about 75 to 90 per cent engaged on work directly or indirectly associated with the war program, and with the necessities of the Government still unsatisfied, it will not be many weeks before work for private manufacturers who are taking no part in the great war preparations will have been entirely put into the discard. The process of requisitioning machinery and tools for Government work, which has been going on for many weeks, has almost completely absorbed all the available equipment, and further action along this line will make it necessary for Washington officials to determine whether one class of war work is of more importance than another.

An illustration of this condition is to be found in the efforts made last week by the American Locomotive Co. and the Baldwin Locomotive Works to locate several cranes up to 25-tons capacity, which could be used in building locomotives for the Government railroad in France. Many such cranes are being built, but most of them are for other Government work, and the crane builders were not willing to decide the question of priority.

Government contracts include additional orders for motor trucks aggregating $21,000,000, making $44,000,000 worth now contracted for. The new contracts went to the Packard Motor Car Co., the Locomobile Co. of America and the Pierce-Arrow Motor Car Co. Shell orders are reported to have been placed with the American Car & Foundry Co., the Consolidated Mfg. Co., the American & British Mfg. Co. and the Harrisburg Pipe & Pipe Bending Co. The Colt's Patent Firearms Mfg. Co. is said to have received a large order for machine guns.

Airplane buying will not reach as large a volume as was expected, machine-tool dealers say. Automobile plants will be utilized to a great extent in engine building. However, the Curtiss Aeroplane & Motors Corporation and the Wright-Martin Aircraft Corporation have made some purchases in New York, while Henry M. Leland has bought in the Cleveland market.

The Pennsylvania Railroad Co. has issued another list of tools to be bought for the United States Army engineers going to France to build a railroad system. Westinghouse Church Kerr & Co. have been buying tools in New York for the Rock Island Arsenal, Rock Island, Ill.

The Groton Iron Works, which is building a $2,000,000 steel shipbuilding plant at New London, Conn., has placed equipment orders aggregating several hundred thousand dollars. The Bath Iron Works, Bath, Me., is expected to buy some equipment for an addition. The Newburgh Shipyards, Inc., Newburgh, N. Y., and the Bayles Shipyards, Inc., Port Jefferson, N. Y., are also in the market for equipment. The Federal Shipbuilding Co. has organized and taken offices at 54 Dey Street, New York, and will soon make substantial purchases.

Foreign business is active. Australia is buying in this market, showing the trend of that country toward manufacturing.

The Pennsylvania Lines West (Panhandle Route) have made appropriations for new machine, tank and boiler shops in Columbus, Ohio, and new tools will be needed, lists for which are expected soon. The Pittsburgh Steel Products Co. will be in the market in a short time for equipment for a seamless tube mill at Allenport, opposite Fayette City, Pa.

Chicago reports that the new Northwestern Ordnance Co. of Madison and the Wisconsin Gun Co. of Milwaukee are placing orders there. The Whitman Agricultural Co. will build a new plant in St. Louis for the manufacture of farm tractors and will need equipment.

Good-sized orders have been placed in Detroit for machine tools. The Packard Motor Car Co. now has Government truck orders aggregating $16,000,000. In Cleveland the Forest City Machine & Forge Co. has placed orders for 30 screw machines, it having taken a Government contract for detonators. San Francisco reports that the establishment of new shipyards there and the expansion of old ones has greatly stimulated demand for machinery and tools.

New York

NEW YORK, Aug. 7.

It now develops that the United States Government has been negotiating with three machine-tool concerns to build or equip big plants for the manufacture of heavy artillery. The Bullard Machine Tool Co., Bridgeport, Conn., was mentioned in this connection last week, and it is now learned that the Gisholt Machine Co., Madison, Wis., and the Niles-Bement-Pond Co., New York, are included in the same program. The Otis Elevator Co., New York, is also considering a similar proposition. In case this plan goes through, the Bullard, Gisholt and Niles-Bement-Pond concerns will probably build new plants. The Niles-Bement-Pond Co. is understood to have taken an option on property near Kearny, N. J., on which to erect such a plant. The Bullard Machine Tool Co. will, of course, build at Bridgeport and the Gisholt Machine Co. at Madison, the latter company having organized the Northwestern Ordnance Co. and let contracts for a new plant and equipment. The Otis Elevator Co. will use one of its present manufacturing buildings, but will require some change of equipment. Negotiations for these plants have been conducted quietly, and although a number of meetings have taken place in Washington, THE IRON AGE last week published the first intimation that such a plan was being considered.

Government work is becoming almost the sole factor in the machinery and machine-tool trade. It is estimated by various dealers that the metal-working machinery and machine-tool plants of the country are now engaged to the extent of 75 to 90 per cent on work which is directly or indirectly associated with the war program. Crane builders are sold up for nearly a year and are so largely on Government work that it has been very difficult for the Baldwin Locomotive Works and the American Locomotive Co. to locate several cranes up to 25-ton capacity which could be commandeered by the Government to assist in the work of building 300 locomotives for use in France. There are, of course, many such cranes on order in the various plants, but most of them are for other Government work, which was regarded as equally important. Shipbuilders are finding it almost impossible to get delivery of cranes in the time they require them, and they are substituting other methods for conveying material.

Munitions contracts are being given out at Washington, a substantial order for 3 and 4 in. shells having been divided recently among the American Car & Foundry Co., the Consolidated Mfg. Co., Toledo, Ohio, the American & British Mfg. Co., Bridgeport, Conn., and the Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa. The American & British Mfg. Co. has recently been adding to its equipment, but the Harrisburg Pipe & Pipe Bending Co. is understood to be already well equipped for shell work. The Colts Patent Firearms Mfg. Co., Hartford, Conn., is reported to have obtained a contract for 20,000 Browning machine guns. The Savage Arms Co. has received large additional orders, it is said, for Lewis machine guns.

Machine-tool dealers say that the demand for tools from the airplane industry will not be as large as was expected, it being the policy of the airplane companies to utilize the automobile factories as much as possible rather than await the delivery of new machines. Many automobile plants are exceptionally well equipped, having before the declaration of war purchased additional tools in anticipation of increasing manufacturing output. The Curtiss Aeroplane & Motors Corporation will purchase some tools for its Buffalo and Hammondsport plants and the Simplex plant at New Brunswick, N. J., has bought a few grinding machines for work being done for the Wright-Martin Aircraft Corporation, but the aggregate of such airplane buying, it is said, is not large.

Additional motor truck contracts have been awarded by the Government, aggregating $21,000,000. These, with the contracts previously given out, make a total of about $44,000,000 worth of motor trucks now being built for army use. The new contracts call for 3000 Packards, 1250 Locomobiles and 1500 Pierce-Arrows. The quartermaster's depot at Chicago has also been advised to buy 142 light trucks of large chassis and equipped with Babcock delivery bodies for use at the army cantonments, 12 being issued to each place.

The Pennsylvania Railroad Co. has issued another list of additional tools required for the United States Army engineers who will build the new railroad system in France. Westinghouse, Church, Kerr & Co. have been placing orders for machine tools required for the shell-loading plant of the Government at the Rock Island Arsenal, Rock Island, Ill. A large part of the equipment for that plant consists, however, of woodworking machinery.

The Groton Iron Works, headed by C. W. Morse, has placed equipment orders aggregating several hundred thousand dollars for its steel shipbuilding plant at New London, Conn. A complete fabricating shop equipment order was awarded to the Hilles & Jones Co., Wilmington, Del.; five tower cranes of 5-ton capacity each were ordered from the Edward F. Terry Mfg. Co., and three locomotive cranes from the McMyler-Interstate Co., Cleveland. Orders will soon be placed for bridge cranes for shops and yard gantry cranes. The Federal Shipbuilding Co. has taken two floors at 54 Dey Street, New York, for offices and engineering department and has a force of engineers at work on plans for its plant on the Newark Meadows. It is understood that 14 buildings will be erected, and complete equipment will soon be purchased. Some of the machine tools are being built by the American Bridge Co. The Bath Iron Works, Bath, Me., is said to be building an addition to its plant, for which additional equipment may be needed. The Newburgh Shipyards, Inc., 31 Nassau Street, New York, with plant at Newburgh, N. Y., is buying punching and shearing machinery and other shop equipment. The Bayles Shipyards, Inc., Port Jefferson, N. Y., with office at 115 Broadway, New York, is in the market for equipment for a plate and angle shop and cranes. This concern is preparing to build composite ships.

Inquiries for cranes are frequent, but evoke little enthusiasm because of the sold-up condition of plants. The Southern Pacific Railroad is inquiring for a 120-ton and a 15-ton overhead crane. The Crocker-Wheeler Co., Ampere, N. J., wants two 2-ton cranes. There have been inquiries from abroad as well as for domestic trade.

Foreign business, especially for France, continues active. Australia has been in the market for machine tools, indicating the trend of that country toward manufacturing. It is said that some machine tools are now being made in Australia, and its future as a market for American machine tool builders is said to be excellent.

J. Curthew Sanders, managing director of Stewart Sanders & Co., Ltd., Johannesburg, South Africa, manufacturer of bolts, nuts, rivets, forgings, etc., is buying bolt and forging machinery in this country. His New York headquarters is at 6 Cliff Street.

The Cary Safe Co., Buffalo, has purchased a site 150 x 360 ft., at Elmwood and Hertel avenues, with Erie Railroad switch, on which it will erect a factory, 100 x 300 ft.

The Sizer Forge Co., Buffalo, is erecting at its plant at Larkin Street, Erie, and Lake Shore Railroads, an electric furnace building, a steel and brick coal house and a covered scrap iron yard, to cost with equipment, $110,000.

The Curtiss Aeroplane & Motors Corporation, Buffalo, has commenced work on erection of factory building No. 3 at its new plant on Elmwood Avenue, Erie, and Delaware, Lackawanna & Western Railroads. This building will be 700 x 900 ft. and will cost $400,000.

The International Railway Co., Buffalo, has let a contract for erection of a sub-power-station, 75 x 90 ft., at North Division and Oak streets.

Plans are being prepared for an addition to be made to the plant of the Ludlum Steel Co., Watervliet, N. Y.

The H. G. Trout Iron Works Co., Buffalo, is having plans drawn for a foundry and blacksmith shop to be erected at its plant at Ohio and Mackinaw streets.

The Waterloo Mfg. Co., Waterloo, N. Y., has let the general contract for the rebuilding of its factory to cost $50,000.

The Hammond Steel Co., Syracuse, N. Y., has awarded the contract for the erection of a transformer building, a melting scrap bin building and other buildings, at its plant on Milton Avenue.

Libby, McNeil & Libby of Chicago are building a two and three-story condensary building addition at Adams Centre, N. Y.

The Staten Island Shipbuilding Co., Richmond, Staten Island, which will build a new machine shop, blacksmith shop and boiler works at its Mariners Harbor plant, has awarded the contract to John Milnes & Co., Port Richmond, S. I.

The L. W. F. Engineering Corporation, New York, manufacturer of airplanes, has leased the plant of the Peerless Unit Ventilating Corporation, Sixth Avenue and Tenth Street, College Point, L. I., for the establishment of a works for the manufacture of aircraft.

The Fifth Avenue Coach Co., 10 East One Hundred and Second Street, New York, has completed plans for the erection of a new four-story plant at Broadway and One Hundred and Thirty-second Street for the manufacture of motor buses. R. A. Meade, president.

Thomas F. Meehan's Son & Co., Brooklyn, N. Y., operating a shipworks on Van Brunt Street, have filed articles of incorporation under the name of Thomas F. Meehan & Son, with capital of $230,000, to engage as shipwrights, specializing in caulking, joining, ceiling and other kindred operations in connection with shipbuilding.

The Hoffay Talking Machine Co., 3 West Twenty-ninth Street, New York, has increased its capital from $1,000,000 to $2,000,000.

The Delmore Mfg. Co., New York, has been incorporated with a capital of $500,000 to manufacture automobiles and accessories. E. C. Landergren, E. V. Van Voorheis and R. Henry, Jr., 165 East One Hundred and Fifth Street, are the incorporators.

The R. B. V. Motor Sales Co., New York, has been incorporated with a capital of $5,000 to manufacture motors and engines. J. J. Brady, Jr., F. X. Riley and D. L. Brady, 1403 Grand Concourse, Bronx, are the incorporators.

Charles Ross & Son Co., 148 Classon Avenue, Brooklyn, N. Y., machinists, has had plans prepared for a new one-story shop, 50 x 85 ft., on Emerson Place, to cost about $8,000.

The Longuemare Motor Devices Co., New York, has been incorporated with an active capital of $25,000 to manufacture motors, carburetors and kindred products. B. Happ, P. D. Saxe and I. Mosson, 3 Broome Street, are the incorporators.

A. W. Britton and S. B. Howard, New York, have incorporated in Delaware the International Steel & Ordnance Co., with capital of $2,000,000, to manufacture machinery, tools and brass and iron hardware.

Oscar E. Jackson of Duncan, Jackson & Duncan, 79 Wall Street, New York, has organized a shipbuilding company to build and operate a plant on Staten Island. Property has been purchased on Arthur Kill Road, Tottenville, fronting on the Staten Island Sound, for the proposed works, which will be equipped to specialize in the production of open and covered vessels of barge type.

Charles T. Stork & Co., New York, have been incorporated with a capital of $20,000 to manufacture airplanes and motor cycles. S. Newborg, L. L. Callan and B. Bag, 2 Rector Street, are the incorporators.

The Warren-Nash Motor Corporation, New York, has been incorporated with an active capital of $78,750 to manufacture motor vehicles of different kinds. A. F. Skinner, C. B. Warren and J. J. Jansen, Jr., 37 Wall Street, are the incorporators.

The New York, New Haven & Hartford Railroad is having plans prepared for a new one-story roundhouse, 95 x 360 ft., at New Haven, Conn.

Lincoln Krueger, Morris Grossman and Harry G. Hecht, all of New York, have incorporated in Delaware the Decalmo Machine Co., Inc., with a capital of $100,000, to manufacture machinery.

The United Steel & Metal Corporation, New York, has been incorporated with a capital of $100,000 to manufacture iron, steel and metal products. The incorporators are F. Viethardt, A. Heller and M. Sternberg, 906 Broadway.

The General Optical Co., 583 First Avenue, New York, has awarded a contract for the construction of a three-story brick addition, about 75 x 275 ft., at First Avenue and Washington Street, Mt. Vernon, N. Y. A. Barbaresi, 48 South Fourth Avenue, Mt. Vernon, is the contractor.

Burdick & Son, Albany, N. Y., operating a sheet metal works at Hamilton and Mosher Streets, are having plans prepared for a new four-story addition to cost $50,000. B. W. Burdick is president.

The Tolhurst Machine Works, Sixth Avenue and Fulton Street, Troy, N. Y., manufacturer of machinery, is taking bids for the erection of a new one-story plant, about 40 x 60 ft., at Green Island, near Troy. C. H. Foster, president.

The General Electric Co., Schenectady, N. Y., will build a new one-story foundry, about 100 x 110 ft., at its Pittsfield, Mass., works. Contract has been awarded.

The Continental Can Co., Crouse Avenue, Syracuse, N. Y., will build a new three-story addition, about 55 x 250 ft., at its East Water Street plant to cost $200,000 Frederick P. Ashman is vice-president and treasurer.

The Pullman Co., 1770 Broadway, Buffalo, has commenced the erection of a new one-story carshop, about 235 x 540 ft., at its car construction and repair works, to cost about $175,000. The shop will be equipped for car repair work, with capacity of about 50 cars. A new power house and electrical plant, 60 x 110 ft., will also be constructed.

The Foster Specialty Corporation, Buffalo, has been incorporated with a capital of $300,000 to manufacture hardware specialties. Kimball A. Conant, George Walter and Walter C. Lambert, 4-6-8 Eighteenth Street, Buffalo, are the incorporators.

The H. G. Trout Co., 226 Ohio Street, Buffalo, specializing in the production of iron and brass castings, will build a new addition to its foundry, about 52 x 83 ft., to cost $14,000. A new one-story blacksmith shop, 40 x 50 ft., to cost about $4,000, will also be erected.

The Transcontinental Motor Truck Corporation, Buffalo, has been incorporated with a capital of $1,250,000 to manufacture automobiles and motor trucks, engines and kindred specialties. The incorporators are E. S. Stengel, R. A. Schmidt and P. J. Bloxham, all of Buffalo.

James F. Herron, Bordentown, N. J., and associates, have incorporated in Delaware the Atlas Aircraft Corporation with a capital of $500,000, to manufacture aircrafts of various kinds. John J. Inglesby, Merchantville, N. J., and Frank Amon, Philadelphia, are also interested in the company.

The United States Naval Department has commenced the erection of a new airplane station and auxiliary buildings on the south side of Cape May Harbor, Cape May, N. J.

The American Mine & Torpedo Co., East Orange, N. J., has filed articles of incorporation with a capital of $100,000 to manufacture mines and other munitions. Gordon Grand, Harry H. Picking and L. Matthews, all of East Orange, are the incorporators.

The American Smelting & Refining Co., Maurer, N. J., has awarded a contract for the construction of a new four-story steel pulverizing mill, 55 x 60 ft., to H. D. Best & Co., 52 Vanderbilt Avenue, New York. Headquarters of the company are at 120 Broadway, New York.

The Des Lauries Aircraft Co., Jersey City, N. J., has been incorporated with a capital of $500,000 to manufacture aeroplanes and other aircraft. The incorporators are Harry A. Dahlen, Jersey City; DeJohn De Wary, Newark, and R. R. Kelly, Plainfield.

The Driver-Harris Co., Middlesex Street, Harrison, N. J., manufacturer of wire, will build a new one-story foundry, 75 x 200 ft., to cost $25,000.

The Asher Mfg. Co., Willimantic, Conn., manufacturer of laundry machinery, has acquired property, about 175 x 220 ft., on Colt Street, Newark, N. J., for the erection of a new plant to cost about $30,000.

The Coit Machine & Engineering Co., 146 Coit Street, Irvington, Newark, N. J., will build a new two-story concrete addition to its plant at 154 Coit Street, 50 x 100 ft., to cost about $17,000.

The Simmons Pipe Bending Works, 40 Mechanic Street, Newark, N. J., manufacturer of pipe bends and coils, will build a one-story addition to its plant at Avenue D and Murray Street, 45 x 46 ft., to cost about $3,000.

The New Devices Co., Newark, N. J., has been incorporated with a capital of $10,000 to manufacture vacuum cleaners, etc. The incorporators are B. N. Bishop and Richard Deubich, Newark, and Louis Caper, Plainfield.

The Bayonne Steel Casting Co., Oak Street, Bayonne, N. J., has filed plans for the construction of a one-story brick addition to its foundry to cost about $10,000.

New England

BOSTON, Aug. 6.

If New England machine-tool builders were dependent upon local markets for an outlet for their products, their present great activity would have ceased some time ago. While there is some plant expansion and machine replacement going on to-day, it is indeed small in volume in comparison with 12 and 18 months ago. There is a decided lull in the business of the machinery dealers and such business as they are now getting is in many instances for plants in other sections of the country.

The local factories are virtually all running to capacity and are playing a large part in equipping the country's industries that are engaged in some portion of the war supply program. Outside of Bridgeport almost nothing is heard of labor troubles and in that city recent troubles have been of short duration with the exception of a polishers' strike at the Remington Bridgeport Works. One peculiarity of the military draft is becoming more marked each day, and that is that the small shops will be affected much more seriously than the large ones. One of the largest of the metal working industries will lose not more than 300 men and may lose as few as 100. It does not expect to ask for exemption on more than 12 or 15 men, and its employment department reports a supply of candidates for employment considerably in excess of its requirements.

The New York, New Haven & Hartford Railroad Co. has had plans drawn for a machine shop addition, 40 x 70 ft., one story, at New Haven, Conn.

The Palmer Foundry & Machine Co., Palmer, Mass., has been incorporated with authorized capital stock of $15,000. The incorporators are Michael A. Heneberry, president; William A. Scollen, Worcester, treasurer, and S. G. Nash.

The American Hardware Corporation, New Britain, Conn., is expected to begin soon the erection of a foundry to replace the buildings known as the Corbin Annex, recently destroyed by fire.

The American Mfg. Co., Meriden, Conn., has been incorporated with authorized capital of $50,000 to manufacture metal products.

The New Haven Clock Co., New Haven, Conn., has voted to increase its capital stock from $1000,000 to $1,750,000.

The Globe Iron Works, Boston, has been incorporated with capital stock of $10,000 by Otto E. Kuehl, president; Charles A. Swenson, Medford, treasurer, and H. A. Kuehl.

The William H. Haskell Mfg. Co., Pawtucket, R. I., contemplates an addition to its bolt factory.

The Sawyer Shipyard Corporation, Augusta, Me., has been incorporated with authorized capital stock of $800,000 by I. S. Kearney, president and treasurer, and E. Maynard Thompson.

The American Cement Ship Co., Boston, has been incorporated with authorized capital stock of $99,000. The directors are H. W. Loker, president; Warner V. Taylor, Wakefield, treasurer, and G. A. Clarke.

The Clark Brothers Bolt & Nut Co., Southington, Conn., contemplates building an addition to its plant.

The Wilcox-Crittenden Co., Middletown, Conn., has awarded a contract for a foundry, 40 x 90 ft., one story.

The Penn Seaboard Steel Corporation, New Haven, Conn., has awarded a contract for an addition to its local steel plant to cost $25,000.

The Rockwell-Drake division of the Marlin-Rockwell Corporation, Plainville, Conn., expects to double the capacity of its plant and work on the new structures will begin at once.

The Stamford Rolling Mills Co., Stamford, Conn., has begun the erection of an addition, 60 x 70 ft., one story.

J. H. Hamlen & Son, Masonic Building, Portland, Me., have had plans drawn for a shipyard at South Portland.

The Fafnir Bearing Co., New Britain, Conn., has awarded a contract for an addition, 50 x 80 ft., one story.

The Holland Machine Co., Water Street, Norwalk, Conn., has awarded a contract for an addition, 25 x 50 ft. and 12 x 17 ft., one story.

The Magnus Co., brass founders, 248 Cedar Street, New Haven, have begun the erection of a foundry, 85 x 140 ft., one story, on Eddy Street.

The Cheney-Bigelow Wire Works, Springfield, Mass., has purchased a tract of land on Liberty Street to provide for future plant expansion. The company has no immediate plans for improvements.

The American Emery Wheel Works, 325 Waterman Street, Providence, R. I., will build an addition, 40 x 75 ft., one story.

Philadelphia

PHILADELPHIA, Aug. 6.

The Lanston Monotype Machine Co., Twenty-fourth and Locust Streets, Philadelphia, will build a new 5-story and basement brick and concrete plant addition, about 50 x 125 ft. William Steele & Sons Co., 34 South Fifteenth Street, has the contract.

S. A. Ashman & Son Co., 2300 East Tioga Street, Philadelphia, manufacturer of iron and steel forgings, has filed plans for the erection of a shop addition.

The Machine Composition Co., Philadelphia, has been incorporated with a capital of $18,000 to manufacture type. B. F. Banes is the principal incorporator.

The Pennsylvania Railroad Co., Broad Street Station, Philadelphia, will build a new one-story shop building, 50 x 90 ft., at its Girard Point works. The company is also taking bids up to Aug. 14 for the construction of a new one-story concrete power house, 30 x 50 ft., at Girard Point.

The Electric Service Supplies Co., Seventeenth and Cambria Streets, Philadelphia, manufacturer of electrical specialties, has awarded a contract for the erection of a three-story brick and concrete plant addition. John L. Gill & Co., Otis Building, are the contractors.

The All-Steel Wheel Co., Philadelphia, has been incorporated in Delaware with a capital of $200,000 to manufacture steel wheels. F. R. Hansell, Philadelphia; J. Vernon Pimm and S. C. Seymour, Camden, N. J., are the incorporators.

The Richter Machine Co., Philadelphia, will build an addition to its shop in the Wissinoming section.

The E. B. Friel Co., Philadelphia, has been incorporated with a capital of $5,000 to manufacture metal lathing and kindred specialties. H. K. Armstrong is the principal incorporator.

The Trenton Malleable Iron Co., New York Avenue, Trenton, N. J., is having plans prepared for a new two-story pattern shop, about 28 x 130 ft. R. A. Schumann, 932 Lamberton Street, is architect.

The proposed new plant of the Temple Malleable Iron & Steel Co., Temple, Pa., will consist of a one-story malleable foundry, 136 x 288 ft.; hard iron mill, 32 x 170 ft.; soft iron mill and annealing works, 95 x 260 ft.; one-story pattern shop, 36 x 90 ft.; core house, 50 x 70 ft.; and power plant for operation, 65 x 80 ft. The structures will be brick, steel, and reinforced concrete; with equipment, the plant is estimated to cost $500,000. Frank D. Case, People's Gas Building, Chicago, is architect.

The Clarksburg Motor Co., Clarksburg, Pa., has been incorporated with a capital of $10,000 to manufacture motors. J. E. Ashbaugh is the principal incorporator.

The Commercial Box & Envelope Co., Chester, Pa., has acquired property at Manayunk for a new manufacturing plant, and will remove its present works to the new location. The present Chester plant has been acquired by the Chester Shipbuilding Co. for extensions to its shipbuilding plant.

The Landis Tool Co., Waynesboro, Pa., manufacturer of machine tools, is building a new one-story foundry addition, about 60 x 100 ft.

The Hamburg Foundry Co., Hamburg, Pa., has been incorporated with a capital of $50,000 to operate a local plant. D. H. Redmond, Philadelphia, heads the company.

The Troy Engine & Machine Co., Railroad Avenue, Troy, Pa., manufacturer of stationary engines, is planning for the erection of a new one-story foundry addition to its plant, about 45 x 45 ft.

The Conestoga Motor Truck Co., Lancaster, Pa., has acquired about 15 acres of property with 1200 ft. frontage on the Pennsylvania Railroad, for the construction of a new plant.

The Craley Mfg. Co., Mt. Joy, Pa., has been incorporated with a capital of $10,000 to manufacture tools. Jacob D. Flory, Lancaster, heads the company.

The Gross Mfg. Co., West Hazleton, Pa., operating machine repair shops, has commenced the erection of a new pattern shop. The company will also enlarge its foundry.

The Reading Steel Casting Co., Reading, Pa., will build a new foundry and make extensions at its plant to cost about $100,000. A new 10-ton open-hearth steel furnace will be installed. The company has recently received an order from the Government for mountings for four-inch aircraft guns.

The Keystone Machine Co., York, Pa., has been incorporated with a capital of $5,000 to operate a local plant. M. S. Niles is the principal incorporator.

Baltimore

BALTIMORE, Aug. 6.

Land for shipbuilding sites is still being sought in this section. It is understood that the Chesapeake Shipbuilding Co., Inc., which was incorporated here recently by Cleveland interests, is planning to take over a large tract of land in the vicinity of Curtis Bay, Md., where a large number of plants are located. It also is understood that the plant when constructed will turn out vessels for the Government. The tract is of about 75 acres. The Chesapeake Shipbuilding Co. was incorporated with $100,000 capital by Sheldon H. Tolle, Kernold Gill, James H. Foster and Roger C. Hyatt, all of Cleveland.

The Consolidated Power Co. of Baltimore, York Road near Chesapeake Avenue, Towson, Md., has been incorporated with $1,300,000 capital stock to carry on electric light, power and gas light business. The incorporators are Herbert A. Wagner, Charles M. Cohn and William Schmidt, Jr., all of the Consolidated Gas, Electric Light & Power Co., Baltimore.

The Lincoln Brass Foundry Co., Fifth and Jeffrey streets, Chester, Pa., a new industry, is ready for operation. The new building has been fully equipped. The company is headed by J. A. Worrell, Chester, and W. Frank Mathues, Media, Pa.

The Baltimore Gas Appliance & Mfg. Co., Bayard and Hamburg Streets, Baltimore, Md., is taking bids for the construction of a new one-story foundry, 137 x 370 ft., to cost about $50,000.

The Consolidated Gas, Electric Light & Power Co., Baltimore, Md., is planning for the erection of a new electric power station, with initial capacity of about 50,000 h.p. It is expected to have the plant in operation in about 18 months.

The Maryland Meter Works, Baltimore, Md., will build a new six-story plant, about 50 x 90 ft., at Holliday and Saratoga streets, to cost $30,000. Deverill Spencer, Garrett Building, is the contractor.

Henry Smith & Sons Co., German and Light Streets, Baltimore, Md., has acquired property consisting of about 10

acres on Curtis Creek, and plans for the construction of a shipbuilding plant.

The National Tractor Co., Georgetown, Del., has been incorporated with a capital of $2,500,000, to manufacture tractors and tractor parts. The incorporators are Woodburn Martin, Charles W. Cullen and Albert Worth, all of Georgetown.

The Bureau of Yards and Docks, Washington, D. C., will build a new one and two-story repair shop addition to the naval observatory, about 40 x 50 ft., to cost about $20,000.

The American Shipbuilding & Dock Corporation, Beaufort, S. C., recently incorporated with a capital of $320,000, has acquired a site on the Beaufort River, near Beaufort, and plans for the erection of a shipbuilding plant, including machine, riveting, and erecting shops. Two shipbuilding berths will be constructed, each about 350 ft. R. C. Horne, Jr., and W. E. Richardson, both of Beaufort, are president and treasurer, respectively.

Howard Bruce, president of the Bartlett-Hayward Co., Baltimore, has denied the press statement that his company has a large contract for the manufacture of guns for the Government. It has been reported that if the company takes such a contract it will build a large plant in the vicinity of its munitions operations at Turner's Station, Md.

The Maryland Metals Spraying & Welding Co., 2620 North Charles Street, Baltimore, has been incorporated with $75,000 capital stock to deal in metal coating machines, welding machines and other machinery. The incorporators are William R. Seth, Thomas Benson and Jacob H. Nicholson.

Pittsburgh

PITTSBURGH, Aug. 6.

Machinery builders and dealers in this district continue to report conditions as quiet. There has been a general halt in the buying of new tools, and in some cases plans that were under way for extensions to existing plants have been put aside until the situation as to the future clears up. No new machine lists have come out in the past week. Machine tool builders here do not look for any material decline in prices. They point out that they are filled up with orders for a year to 18 months on nearly all kinds, and the army draft is going to take hundreds of men now employed in machine building shops, though to some extent the men will have to be replaced by female labor.

The scarcity of skilled mechanics is interfering seriously with the completion of tools on shop floors. The Westinghouse interests are especially short of men at all of their shops, and are advertising for men in the daily papers in nearly all of the large cities.

The Pennsylvania Lines West (Panhandle Route) have made an appropriation for the building of new machine, tank and boiler shops at Columbus, Ohio, and a large quantity of new machinery and tools will be needed, for which the lists are expected soon.

Within a short time it is expected the Pittsburgh Steel Products Co., Frick Annex, Pittsburgh, which is making plans for building a large seamless tube mill plant at Allenport, opposite Fayette City, Pa., will be in the market for an extensive line of equipment. This will consist of cranes, shears and seamless tube mill machinery.

The Keystone Pipe & Supply Co., 237 East Cunningham Street, Butler, Pa., manufacturer of oil well supplies, is planning for the installation of a new four-inch pipe machine, steam engine, air compressor, and other equipment.

The McKeesport Enameling Co., McKeesport, Pa., has been incorporated in Delaware with a capital of $50,000. James W. Nesbitt, A. Clifford Wiltshire and J. R. Woreley, all of McKeesport, are the incorporators.

The Pittsburgh Mining Machine Co., Pittsburgh, has been incorporated with a capital of $100,000 to manufacture mining machinery. T. H. Edelblute is the principal incorporator.

The Aluminum Co. of America, Pittsburgh, will build a new hydroelectric power plant at Badin, N. C. The initial installation will consist of three 10,000 horsepower generating units and auxiliary equipment.

Chicago

CHICAGO, Aug. 6.

Business which owes its inception to Government action is making itself felt in the Chicago territory. Most of the activity is in tools required in the manufacture of guns and tractors, large orders for both having been placed with Western firms. The Wisconsin Gun Co., Milwaukee, continues to buy, and orders are being placed also by the Northwestern Ordnance Co., Madison, Wis. As reported heretofore two truck companies have placed substantial orders, also a company manufacturing motors for tractors.

In Minneapolis and St. Paul there is considerable activity. The Toro Motor Co., St. Paul, has sold equipment and manufacturing rights to the Whitman Agricultural Co., St. Louis. The latter company also has purchased the Bull Tractor Co., Minneapolis, and will erect a factory at St. Louis, Mo., for the manufacture of tractors. The Toro Motor Co. will equip a new shop at Minneapolis, and continue the manufacture of motors. The Twin City Four Wheel Co., Minneapolis, Minn., tractor makers, is buying also.

The Buda Co., Harvey, Ill., is about to close on a number of tools. No recent shell business is reported, but the general run of small orders is keeping up in a satisfactory way. Building operations in Chicago continue at low ebb. In July, permits were taken out for 321 buildings, involving a total cost of $4,104,100, as against 844 buildings, representing $8,076,800 for the corresponding month a year ago.

Ottenheimer, Stern & Reichert, 220 South State Street, Chicago, architects and engineers, have let several contracts for the construction of a five-story factory, 60 x 150 ft., for the Monarch Leather Co., Division and North Branch streets. The cost is estimated at $150,000.

The general contract for a two-story tannery, 130 x 166 ft., 1257 and 1265 Elston Avenue, Chicago, for the Chicago Rawhide Co., has been awarded to F. H. Pitkin, 30 North Michigan Avenue. The structure will cost $20,000.

The American Sugar Refining Co. and the National Biscuit Co. have purchased 145,003 sq. ft. of land in the southwestern part of Chicago, on which they will eventually build large warehouses.

Libby, McNeil & Libby, packers, have purchased 22 acres in Western Avenue, at the intersection of the Baltimore & Ohio Railroad, on which they will construct a six-story reinforced concrete building to cost $500,000.

The King & Hamilton Co., Ottawa, Ill., maker of agricultural implements, has added to its plant a building 60 x 160 ft., to be used as a forge and sheet metal shop.

The Cable Lumber Co., Chicago, has leased land at Western Avenue and Kinzie Street, 185 x 267 ft., on which it will erect a planing mill and other buildings.

Work has been begun at Peoria, Ill., on repair shops for the P. & P. U. Railway.

The Carnation Milk Co., which operates a large condensing plant near Oconomowoc, Wis., is contemplating the erection of a can factory, 120 x 150 ft., to cost about $250,000.

The Simple Gas Engine Co. has been organized at Menasha, Wis., with a capital stock of $10,000 to manufacture gas engines. John G. Walter is president. The company was formerly located at Superior.

The Morton Mfg. Co., Muskegon Heights, Mich., is contemplating the addition of a foundry to its plant. It recently completed a four-story addition to its shops. The company has begun negotiations for land on which to erect the foundry, the cost of which is estimated at $100,000.

The Michigan Hearse & Motor Co., Grand Rapids, Mich., has bought land to provide for an addition to its factory, which will double its output. The company manufactures army ambulances in addition to other types.

The J. Knape Machinery Co., Grand Rapids, Mich., has begun the building of a one-story plant addition, 30 x 74 ft., to cost about $2,500.

The Olds Motor Works, Lansing, Mich., is adding to its large plant a two-story structure, 80 x 400 ft. The lower floor will be used for the storage of materials, and the upper for the inspection and care of new cars.

The Peru Foundry Co., Peru, Ind., has been incorporated with a capital stock of $60,000, to do a general foundry business. Among the directors are M. F. Gartland, J. H. Schaumleffel and John C. Haswell.

The Moline Forging & Mfg. Co., Moline, Ill., will build a new one-story forge shop, about 110 x 265 ft., to cost $75,000. H. Ainsworth is president.

Milwaukee

MILWAUKEE, WIS., Aug. 6.

High-pressure conditions continue to be further accentuated by an ever-increasing number of orders from a wide variety of sources, and shops are getting further and further behind on deliveries, which now are eight to nine months forward. The bulk of the new business comes from metal-working shops which are working on Government business and these requirements are being given preference according to the degree of urgency of each case in its relation to the scheme of national defense. A feature of the past week's activities is the large number of new corporations organized to engage in one or another field of the metal-working industry. New organization slackened at the beginning of the war to an appreciable extent, but a sharp revival has now set in.

Another large ordnance manufacturer, the Northwestern

Ordnance Co. of Madison, in which the Gisholt Machine Co. is largely interested, has entered the field at the request of the Government, making two shops in Wisconsin devoted exclusively to the production of field pieces, the Wisconsin Gun Co., Milwaukee, having been previously noted. They have been responsible for two lots of comparatively large size placed with tool-builders in recent days. Business in prime movers also shows a revival, the past week's bookings including a 1500 kw. installation by the Allis-Chalmers interests. The intense heat during the past week reduced production to some extent throughout the industry in Wisconsin. For humanitarian reasons nearly all plants closed on two or three afternoons. Contrary to the popular idea, it is stated that the stringency in the labor situation is not pressing, although the men who are available demand places on day forces, making it somewhat difficult to keep night forces up to the desired quota.

The Wisconsin Engine & Dynamo Co., Milwaukee, has been incorporated with a capital stock of $200,000 to establish a plant for the manufacture of electrical machinery and equipment. The moving spirit in the project is John I. Beggs, Milwaukee, a large owner of public utilities in Wisconsin and elsewhere. Win H. Cameron and Chester B. Pierce are associated with Mr. Beggs. While no definite announcement has been made relative to the plans of the new concern, it is understood that a plant will be leased or erected in Milwaukee or suburbs, and the equipment is now being contracted for. Offices have been opened in the First National Bank Building, Milwaukee.

The L. J. Mueller Furnace Co., 197 Reed Street, Milwaukee, maker of hot air, hot water and steam heating plants, has taken a contract to furnish hot air heaters to the Government for the equipment of the various cantonments for the new national army. The contract calls for about 1000 units and is valued at $100,000.

The Ton-A-Ford-Trux Co., Racine, Wis., has been organized by Fred and Louis Boldig, Herman R. Swanke and George Beardsley to engage in the manufacture of commercial car attachments to Ford chasses. The capital stock is $200,000.

The Lawson Aircraft Corporation, Green Bay, Wis., has been incorporated with a capital stock of $200,000 to take over the airplane manufacturing business established recently in that city by the Lawson Aircraft Co., capital stock $50,000. Alfred Lawson, formerly of Detroit, is general manager of the plant, which occupies a number of buildings of the former American Woodworking Machinery Co., Green Bay. John Carisi, formerly of Brooklyn, N. Y., is factory superintendent and Lawrence Allison is chief engineer. Green Bay capital is financing the project.

The American Auto Body Co., Milwaukee, has been incorporated with a capital stock of $40,000 to manufacture passenger and commercial automobile bodies. The incorporators are David J. Borun, L. L. Gridley and Henry E. Bradley.

The Milwaukee Heat Treating Co., 651-653 South Pierce Street, Milwaukee, has changed its corporate style to Wesley Steel Treating Co. The company operates a large plant devoted to carbonizing, case-hardening, tempering and annealing processes. Charles Wesley is general manager.

The Green Bay & Eastern Railway Co., Manitowoc, Wis., organized a year ago with $50,000 capital, has been authorized by the Railroad Commission of Wisconsin to increase its capital stock to $3,000,000. The company will build a line from Manitowoc to Green Bay, Wis., and from Manitowoc to Sheboygan, Wis. W. M. Willinger is president and Rudolph Stockinger is secretary.

Stanley, Wis., business men are negotiating with the promoters of a foundry and furnace manufacturing company, the name of which is not divulged, with a view to locating its plant in that city. The company purposes to manufacture heating devices capable of utilizing low-grade western lignite coal. J. B. Halverson is representing Stanley business men.

The New Way Machine Co., Eau Claire, Wis., organized recently with a capital stock of $60,000 by Ernest Wege, A. J. Hintz and O. A. King, will engage in the manufacture of farm tillage tools and machinery.

The Simple Gas Engine Co., Menasha, Wis., has completed the removal of its shop from Ashland, Wis., to Menasha, and resumed operations in the former plant of the Menasha Cooperage Co. The new officers are: President, John Walter; vice-president and superintendent, A. L. Priemesberger; secretary-treasurer, John Hrubecky; general manager, F. J. Oberweiser.

The Wisconsin Interurban Co., Madison, Wis., organized several years ago to build an electric railroad system of 250 miles, radiating from Madison, has filed a trust deed of $9,000,000, with the Chicago Title & Trust Co., Chicago, as trustee, and will resume work immediately. The Railroad Commission has authorized the first installment of bonds, amounting to $600,000. The general contract for the construction of the road has been awarded to John T. Adams, Columbus, Ohio.

The Oshkosh Foundry Co., Oshkosh, Wis., which has been incorporated with $10,000 capital, is the formal organization of the commercial foundry business established in a plant on Marion Street, Oshkosh, within the last three months by Joseph W. Radl, Frank T. Turner and Hugo M. Steuck.

The Racine Motor Truck Co., Racine, Wis., organized about four months ago to build commercial vehicles, and now occupying temporary quarters at 1109 Sixth Street, is contemplating the erection of a complete new plant during the coming year. It will then also engage in the manufacture of internal spur gear drive axles on a commercial basis. Charles H. Piggins is vice-president and chief engineer.

The Wisconsin Valley Electric Co., Wausau, Wis., has contracted with the Allis-Chalmers Mfg. Co., Milwaukee, for the erection and equipment of a new auxiliary steam generating plant of 1500 kw. capacity, estimated to cost between $90,000 and $100,000. The plant will include a steam turbine, Heine boilers and Westinghouse automatic stokers. Delivery will be made during September.

The Goodrich Transit Co., Chicago, has accepted the offer of the Chamber of Commerce, Manitowoc, Wis., of four lots on the Manitowoc River in the inner harbor for its proposed new repair yard and winter quarters, made necessary by the fact that its present quarters are required by the Manitowoc Shipbuilding Co. to handle Government business. W. A. Cochrane is superintendent.

Detroit

DETROIT, Aug. 6.

The machine tool market continues to show improvement, due to excellent business conditions and the large number of firms recently incorporated to enter the manufacturing field. Several good sized orders were placed last week and numerous inquiries are being received. Deliveries on standard machines remain very slow and on special machines quotations are made for 1918.

Labor conditions in the district are excellent and wages high. The trouble with the miners in the northern part of the State has practically been settled, as the backbone of the strike for higher wages has been broken after the expelling of I. W. W. agitators.

The greatest difficulty is obtaining prompt delivery of steel and copper, which is handicapping the automobile concerns and accessory plants. Transportation facilities have been greatly improved during the last several weeks and deliveries are expected more regularly.

The Packard Motor Car Co., Detroit, has received an order for 3000 3-ton chainless trucks. This is the second quantity order placed by the Government with the Packard within the last two weeks, and brings the total up to 4800 trucks, representing a money value of more than $16,000,000.

During the fiscal year of the Ford Motor Co., Detroit, ended July 31, 735,000 automobiles were produced. Orders at present are 80,000 in excess of production. Last year's production was 200,000 more than the previous year at the Detroit plant and 50,000 more at the branch plants. During the month of May, 1917, 83,706 cars were completed.

The Great Lakes Engineering Co., Detroit, is being considered by the Government as a producing plant for its boats.

The Pioneer Trailer Corporation, Detroit, has been organized with a capital of $30,000.

The Triangle Truck Co., St. Johns, Mich., will have its new plant in operation about Nov. 1. The concern, which was recently organized, will make 1½-ton vehicles.

The One Wheel Truck Co., St. Louis, Mich., has recently been incorporated to build a tractor with one wheel in the center surrounded by a platform for the motor and driver's seat.

The Saxon Motor Car Corporation, Detroit, has taken a lease on the plant formerly occupied by the Abbott Motor Corporation. The plant has 60,000 sq. ft. of floor space.

The Fisher Body Corporation, Detroit, is reported to have received an order for airplane bodies amounting to more than $5,000,000.

The Young High Velocity Carburetor Co. has engaged in business at 1211-15 Woodward Avenue, Detroit, to manufacture high velocity carburetors. The authorized capital is $250,000, all of which has been paid in in cash.

The Chicago Stove & Range Co. will erect a factory at Benton Harbor, Mich.

The William E. Hill Co., Kalamazoo, Mich., manufacturer of machinery, castings and similar products, has re-incorporated with a capital stock of $150,000, all of which has been paid in.

The Mott Wheel Works, Jackson, Mich., an enterprise recently obtained by that city, is installing machinery, stock and other equipment in its new plant.

The Saginaw Shipbuilding Co., Saginaw, Mich., has filed articles of incorporation with a capital stock of $350,000.

The Wilson Body Co., Bay City, Mich., has completed its new plant and is ready for the installation of machinery. The main plant has a floor space of 90,000 sq. ft. and with smaller buildings totals 114,500 sq. ft.

The Bay City Auto Body Co., Bay City, Mich., formerly the Kelly Body Co., has moved from the west side to the east side and is rapidly expanding its business.

The Harrah Wire Cloth Co., Niles, Mich., plans an addition to its factory. W. F. Harrah is president.

The Michigan Chandelier Co., Detroit, has been incorporated with a capital stock of $50,000 by Nathan and Regina Silberstein and S. Groosfoeld.

The Manistique Pulp & Paper Co., Manistique, Mich., has been incorporated with capital stock of $500,000.

Announcement is made of the formation of the Ecorse Foundry & Machine Co., Ecorse, Mich., which is completing a new plant. The company will manufacture gray iron castings and sufficient equipment is being installed to melt 100 tons per day. B. F. Everitt is president and A. J. Kinnucan is treasurer and general manager.

The Lake Shore Engine Works, Marquette, Mich., has increased its capital stock from $200,000 to $350,000.

The Hayes Motor Truck Wheel Co., St. Johns, Mich., has increased its capital stock from $100,000 to $500,000.

The Underhood Motor Heater Corporation, Detroit, has been incorporated by Stephen Kaladzie, Samuel V. Kowrack and James B. Gierm. Capital stock, $65,000.

The Victor Wire Wheel Co., Kalamazoo, Mich., has been incorporated for $500,000.

The Duplex Truck Co. is rushing work on the construction of its new plant at Lansing, Mich. It is expected the plant will be in operation Dec. 30. H. M. Lee is president.

The Tower Motor Truck Co., Grennville, Mich., has increased its capital stock from $50,000 to $100,000.

Cleveland

CLEVELAND, Aug. 7.

Machine tool builders are getting a good volume of orders for machines for Government work, largely in connection with airplanes and shells. The Forest City Machine & Forge Co., Cleveland, has taken a large Government order for detonators, and has purchased 30 screw machines. Orders for a number of machines for airplane work were placed during the week by Henry Leland, Detroit. The shortage of labor in machine shops is having an effect on the market, some plant managers announcing that they would like to purchase additional equipment were they able to secure men to operate it. A number of factory additions designed for war work or for increasing the capacity in lines stimulated by the war are under way or being planned in this territory, and this will require considerable additional machinery equipment. Trade has quieted down somewhat with local machinery dealers. Scattered small lot sales are reported, but outside of machinery requirements for Government work the market is quiet.

The Cleveland Tractor Co., Cleveland, will enlarge its plant by the erection of a one-story factory addition, 60 x 477 ft., and a hardening room, 80 x 90 ft. Plans are being prepared by George S. Rider & Co., engineers, Cleveland.

The Federal Nut, Bolt & Machine Co., Cleveland, has recently been organized and has a new plant nearly ready for operation on Collamer Avenue, near the Nickel Plate Railroad. The new building is one story, 40 x 120 ft. The company is composed of the same interests that control the Cuyahoga Stamping & Machine Co., and has taken over the screw machine products department of that company. H. A. Tremaine is president.

The Parish & Bingham Co., Cleveland, maker of automobile frames and other sheet metal parts, is planning the erection of a machine shop addition, 150 x 200 ft., with a saw-tooth roof. Bids have been taken by Ernest McGeorge, engineer, Leader-News Building.

The H. J. Walker Co., Cleveland, has under construction a $30,000 plant addition to be used for machine shop purposes.

The Austin Co., Cleveland, has taken a contract for two factory buildings for the Dayton Metal Products Co., Dayton, Ohio. One will be 60 x 115 ft. and the other 100 x 360 ft.

The Crowell-Lundoff-Little Co., Cleveland, has taken the general contract for a large plant addition to be erected for the T. H. Symington Co., Rochester, N. Y. This will be a one-story structure, 225 x 700 ft., and will be used in the manufacture of 3-in. guns. The structural steel contract has been placed with the King Bridge Co., Cleveland. It will require 800 tons of structural steel.

The Lang Auto Body Co., Cleveland, has acquired a 5-acre site on Lorain Avenue, on which it plans the erection of a large plant for the manufacture of bodies for motor trucks and pleasure cars. Plans are being prepared by Paul Schmitt. Charles E. J. Lang of the Baker R. & L. Co., is president, and Elmer Lang is vice-president and general manager.

The Union Tool Co., Cleveland, has been incorporated with a capital stock of $100,000 by S. L. Drake, G. I. Gardner, A. E. Gillard and others.

The Aultman-Taylor Co., Mansfield, Ohio, will enlarge its plant by the erection of a two-story machine shop addition to provide greater capacity for the manufacture of gas tractors.

The Kenney-McGreevy Foundry Co., Mansfield, Ohio, has been incorporated with a capital stock of $20,000 by W. D. Kenney, Hugh McGreevy and others.

The Jaxon Co., Toledo, Ohio, has been incorporated with a capital stock of $10,000 by Frederick E. LaFrance, G. E. Smith, Frank L. Lucas and others to manufacture tools and dies.

Indianapolis

INDIANAPOLIS, IND., Aug. 6.

The Commercial Club of Richmond, Ind., announces that the Jenkins Vulcan Spring Co. of St. Louis will move its plant to Richmond. The company is to be reorganized with $300,000 capital stock.

The Spearhead Lawnmower Co. has been organized at Indianapolis and incorporated with $50,000 capital stock, to manufacture machines and tools. The directors are J. E. Harting, J. H. Pearson and C. E. Phillips.

The Coldstream Corporation has been incorporated at Evansville, Ind., with $60,000 capital stock, to manufacture apparatus for cooling water. The directors are William Scherfflus, Jr., William J. Mann and Hayward Flickner.

The Red-Devil-Speed Hammer Co. has been incorporated at Gary, Ind., with $50,000 capital stock, to manufacture machinery. The directors are Julius Cayo, Samuel Mitchell, George P. Rose, Don Van Lieu and P. T. Burke.

The Parsons & Posey Construction Co. has been incorporated at Evansville, Ind., with $10,000 capital stock, to construct railroads, highways, etc. The directors are Charles H. Parsons, George M. Posey and Phelps F. Darby.

Craig-Hunt, Inc., has been incorporated at Indianapolis, with $10,000 capital stock, to manufacture automobiles. The directors are John R. Craig, Wilbert L. Hunt and William C. McNabb.

The Juniata Sweeper Mfg. Co. has been incorporated at Indianapolis, with $25,000 capital stock, to manufacture street sweeping and cleaning equipment. The directors are Martin P. Brumbaugh, Clayton A. McKinney, Juniata, Pa; Daniel S. Brumbaugh, Altoona, Pa.

Cincinnati

CINCINNATI, Aug. 6.

Munition makers and shipbuilding firms have lately bought a number of large lathes, planing machines and boring mills. Small lathes now seem to be the only kind of machine tools that are not in demand, but orders already in hand enable different firms to keep running on full time. A very encouraging feature of the present situation is the comparative absence of any labor troubles. The bonus systems adopted by different local firms seem to operate successfully and both skilled and unskilled labor is now earning more than at any previous time. The labor situation at Hamilton, Ohio, as far as the foundries are concerned, changes almost daily. The latest reports show the resumption of work at all except two foundries. There is no likelihood of the present strike there being extended to include the machinists.

The Cisco Machine Tool Co., Cincinnati, has awarded contract to Wm. Lang & Sons Co. for a large addition to its plant at Southside. The equipment to be installed will be mostly of the company's own manufacture.

Work on the new plant of the Champion Tool Works Co., Cincinnati, has progressed so rapidly that the company expects to have it in full operation early in the fall season.

The Dayton Handle Co., Dayton, Ohio, has secured permit for the erection of a two-story brick and concrete plant estimated to cost $14,000. Work will commence at an early date.

The Superior Tool Co., Dayton, Ohio, has been incorporated with $10,000 capital stock, and has taken over the business of the Progressive Tool & Die Co. W. H. Williams is president and W. E. Watson secretary and treasurer.

J. A. Poss, contractor, Springfield, Ohio, has been awarded contract for remodeling a building at Urbana, Ohio, that will be the new home of the American Tool & Mfg. Co. of that city.

The city of Springfield, Ohio, is in the market for an 18-in. x 10-ft. engine lathe. Bids will be opened Aug. 14. Charles E. Ashburner is city manager.

The Troy Wagon Works Co., Troy, Ohio, is contemplating making an addition to its plant. The company recently received a large order from the French Government for automobile and auto-truck trailers.

The municipality of Lucasville, Ohio, will establish an electric lighting plant. Alonzo Purdy heads a committee appointed to purchase the necessary machinery.

Additional details received confirm the report that the Elgin Tractor Co., Elgin, Ill., will remove its plant to Piqua, Ohio. Work has already commenced in remodeling a building to house the plant.

The Remy Electric Co., Anderson, Ind., has broken ground for a three-story addition to its plant, of concrete and steel construction.

The Central South

LOUISVILLE, KY., Aug. 6.

Inquiries for motors of various sizes have been a feature of the week in this market, high prices of coal and uncertainty of supplies favoring changing of factories to electric drive. Occasional inquiries for ice-making machinery and cold storage plant equipment are beginning to be received. High prices are tending to discourage buying in most lines and the most active demands are those from the coal and oil development interests. The Louisville Industrial Foundation is negotiating with several prospects who consider locating a malleable iron foundry in Louisville.

The Southern Machinery Exchange, Somerset, Ky., is in the market for a s. h. oil well drilling machine; one self-contained, side-crank steam engine, 40 to 60-hp., and manual training equipment consisting of one surfacer, one College lathe, three smaller lathes and a 5 hp. a. c. motor, 220-volt.

The John G. Duncan Co., Knoxville, Tenn., has issued the following inquiries: Jobbers' prices, for immediate delivery, on a second-hand circular or band resaw, to saw boards 12 in. wide, in first-class running condition; self-feed gang rip saw to rip veneers ¼ in. thick and 1 in. wide, with capacity for eight such strips or wider; jobbers' prices on first-class-second-hand broom handle lathe, paint and polishing machine, and combination mattress packer for quick delivery; dealers' prices on a complete crushing and pulverizer outfit for turning out 75 to 100 tons of agricultural limestone in 10 hours.

California

LOS ANGELES, July 31.

The Riverside Aircraft Co., Riverside, Cal., recently incorporated, has been granted permission by the State commissioner to issue stock for $50,000 to provide for the installation of a plant for the manufacture of airplanes and other aircraft. The company has acquired the former Miller planing mill on Fifth Street for its initial works. R. C. Bowman and E. T. Ford head the company.

The Forschler Dual Frame Truck Co., Los Angeles, has been incorporated with a capital of $100,000 to manufacture trucks of special type. J. F. Manning, H. W. Wyatt and L. W. Van Dyke, all of Los Angeles, are the incorporators.

The Board of Supervisors, Los Angeles, is having plans prepared for a new one-story, reinforced-concrete power plant, 80 x 100 ft., to be erected at the county hospital. William Davidson, chief mechanical engineer, Hall of Records, is in charge.

The Lilly-Fletcher Co., Los Angeles, has filed application with the City Harbor Commission for a lease of property consisting of about five acres on the Wilmington Basin, Los Angeles Harbor, for the construction of a shipbuilding works.

The National Pump Co., Los Angeles, has been incorporated with a capital of $100,000 to manufacture pumping machinery. G. A. Howk, Los Angeles, F. M. and J. H. Townsend, San Gabriel, and A. J. Gutzler, South Pasadena, are the incorporators.

The A. J. Savage Munitions Co., San Diego, Cal., is arranging for a site on Broadway, including tideland property, for the erection of its proposed firearms manufacturing plant. The initial structures will consist of two one-story buildings, each about 60 x 300 ft., with woodworking plant, to cost about $45,000; the machinery and equipment is estimated to cost $225,000, including the electric operation of the plant in all departments. The company will specialize in the manufacture of sporting rifles, repeating shotguns, automatic pistols and a new automatic machine gun. About 250 hands will be employed.

The Merchants Marine Construction Co., Los Angeles, has acquired property consisting of about 10 acres on the main channel of Long Beach inner harbor, Long Beach, and plans for the construction of a new shipbuilding plant to cost about $500,000.

The Satisfaction Heating Co., Los Angeles, has been incorporated with a capital of $10,000 to manufacture heating specialties. Charles D. Wharton and S. M. Campbell, Los Angeles, and Wilson H. Teale, Pasadena, are the incorporators.

The Southern Pacific Railroad Co., Los Angeles, is planning for the construction of a new roundhouse at Fresno, Cal., as an addition to its present shop, to provide for an increased capacity of 30 locomotives.

The Seventh Street Co., Union Oil Building, Los Angeles, has had plans prepared for a reinforced-concrete power plant, about 40 x 90 ft., to be erected in the rear of 715 Olive Street, at a cost of about $14,000.

San Francisco

SAN FRANCISCO, July 31.

The establishment of new shipyards on San Francisco Bay, the enlargement of others, and expansion of manufacturing plants of various kinds, have stimulated the machinery market in this territory to an unusual degree. All lines of machine tools, both heavy and light, are moving easily under pressure of the insistent demand from industrial plants. Many large orders for heavy machinery have been placed by shipyards, both those in existence and in course of construction. There is a very active demand for sugar mill machinery, especially, from the beet sugar mills. Electric transmission machinery commands the special attention of local factories and Eastern representatives. Exploitation of new mines and the reopening of old ones calls for the heavier lines of machinery equipment. Lack of material is the most serious problem that machinery houses, on this side of the country, have to contend with.

Construction work is under way on the Hetch Hetchy project for supplying San Francisco with pure water. Attempts to secure bids on three locomotives for a connecting railroad, with a six-months delivery, failed.

The Byron Jackson Iron Works, West Berkeley, Cal., is adding another machine shop, 275 x 100 ft. The total cost, including equipment, will approximate $100,000.

A fire protection plant is being installed at the Stockton (Cal.) works of the Holt Mfg. Co., at a cost of $50,000. The system is dominated by a tower supporting a tank containing 100,000 gal. of water, the base of which is 125 ft. from the ground. Although the factory is within the Stockton city limits an independent pipe system has been installed.

The Fay Shipbuilding Co., Eureka, Cal., will at once erect shops and other buildings on the site of its proposed shipyard.

The extensions to the machine shop at the United States Navy Yard, Mare Island, Cal., include a 40-ton and a 10-ton crane.

The Llewellyn Iron Works, Los Angeles, Cal., has applied for a lease on waterfront property on which to erect works for manufacturing and assembling boilers, tanks, engines, etc., for outfitting ships.

The San Diego & Arizona Railroad Co., San Diego, Cal., will erect a 4-stall engine house costing $27,000. Considerable trackage and the installation of machinery will be involved.

The Tracy Shipbuilding Co., National City, Cal., has renewed its option on bay front property.

The Savage Corporation has applied for a lease on tide lands at San Diego, Cal., on which to erect two factory buildings and a wood-working shop. The cost of the buildings is placed at $45,000 and of the equipment at $225,000.

The Riverside Aircraft Co., Riverside, Cal., has taken over the Miller planing mill at that place and announces plans to enlarge the plant and install new machinery.

The California-Hawaiian Sugar Co., Crockett, Cal., has let contracts for extensive additions to its sugar refining plant to cost, according to report, approximately a million and a half dollars.

The Union Construction Co., Oakland, Cal., has secured a lease of a 25-acre shipbuilding site on the Oakland waterfront.

J. C. Stanley, Oakland, Cal., has completed plans for a one-story brick shop building to be erected at the Hollywood shipyards, Canal Street.

The Consolidated Mfg. Co., Oakland, Cal., has bought the plant of the East Bay Foundry Co. and will enlarge the works and add new equipment. General offices are at 512 Syndicate Building.

The San Francisco Shipbuilding Co. of San Francisco has been incorporated with a capital stock of $500,000 to engage in the shipbuilding business. Subscribers and directors are John Lawson, George U. Hind, John H. Baxter, M. E. Harrison and W. L. Comyn.

A large administration building, a roundhouse and a machine shop, 100 x 200 ft., in dimensions are to be erected immediately for the Nevada-California,Oregon Railroad at Alturas, Cal., at a cost of $100,000.

The Barnes & Tibbets Shipbuilding Co. is expending $40,000 in piling and preparing the ground at its Alameda site, preparatory to erecting buildings for its shipyard.

The Commercial Iron Works has entered the field in San Francisco, at 497 Fifth Street, intending to specialize in box mailing machinery.

At a directors' meeting of the Loughhead Aircraft Mfg. Co. at Santa Barbara, Cal., the following officers were elected: B. R. Rodman, president; Allan H. Loughhead, vice-president; Malcolm Loughhead, secretary, and Alfred Edwards, treasurer.

Contracts have been let for the construction of a number of concrete buildings costing $50,000 for the Pacific Electric Metals Co. at Bay Point, Cal.

The Pacific Scale & Show Case Co., Spokane, Wash., states that the report that it had sold its plant to C. J. Reed of that city is entirely without foundation.

The Pacific Northwest

SEATTLE, July 31.

The strike that has tied up the greater part of the lumber mills and logging camps in the State of Washington seems to be no nearer settlement than for several weeks past, despite the efforts of both sides, and the work of Federal officials to bring about a peacable settlement. It has been persistently rumored that unless a way is found to immediately end the strike, the Government may take over and operate the mills as an assurance that the shipbuilding program will not be held up. A few of the mills have agreed to the 8-hour demand, particularly several plants in Tacoma, which are furnishing lumber for the big army cantonment near that city, and the camp is reported to be receiving all the lumber needed. The threatened strike of 15,000 metal trades workers, which would result in closing the shipyards in Seattle, is not likely to materialize, according to union officials in the city. The question of boycotting the products of the Washington Iron Works, one of the reasons for the threatened strike, has been satisfactorily adjusted, as well as other questions of wages and shorter hours.

It is announced by Northwest representatives at Washington, D. C., that 95 per cent of all the spruce to be purchased by the United States Government for airplane construction will come from Oregon and Washington. It is understood that the aggregate amount for which contracts soon will be closed will probably exceed 75,000,000 ft.

Machine shops and manufacturing plants continue rushed with orders. A large number of the plants are operating continuously to keep up with the demand for equipment.

The George H. Gallagher Co., Spokane, manufacturer of farming machinery, plans to greatly increase the capacity of its plant.

Construction work at the Todd Shipbuilding Corporation's shipyards in Tacoma, Wash., is being rushed, and it is expected laying of keels for the four 7500-ton steel ships under contract will be ready by Sept. 1 The main buildings are nearing completion, and the 90 x 110 ft. power house will be erected shortly. Steel shed and mold loft will be 250 x 324 ft., two stories, with pile and concrete foundations.

The Foundation Co. of New York has leased a large site on the water front in Portland, on which will be built 10 sets of ways, the company holding contracts to build wooden steamers for the French Government. Charles F. Swigert, Portland, manager of the company.

The Coos Bay Shipbuilding Co., Marshfield, Ore., plans to immediately proceed with installation of the proposed shipyards in that city. Wooden vessels, 285 ft. long and 43 ft. beam, will be built.

George F. Rodgers, Astoria, Ore., recently leased a site in that city and has started work on construction of a shipbuilding plant. He has contracts for a number of wooden vessels.

The Kuhn Tractor Truck Co., Seattle, organized months ago for the building of trucks and other vehicles, plans early construction of a plant in Seattle. Several sites are now under consideration. William O. Kuhn, president, Gus Ehrenberg, vice-president and general manager.

The Kilbourne & Clark Mfg. Co., Seattle, manufacturer of wireless plants, will shortly move into its new home on the Seattle waterfront, where it will have one of the largest plants of the kind in the world. The company holds $1,200,000 in contracts for the United States Government, and $400,000 in contracts from private interests. The plant will be operated 24 hours a day, employing 400 persons. The main building of the new plant is a 2-story structure, 180 x 120 ft., with one-story frame extension in the rear at each side, 60 ft. sq. Electric power will be employed throughout the plant.

The plant of the Ballard Marine Railway Co. in Seattle is to be converted into a shipbuilding plant by the construction of new buildings and building of several ways.

The Granby Consolidated Mining, Smelting & Power Co., Anyox, B. C., plans to increase the capacity of its smelter from 2500 to 3000 tons daily, according to Jay P. Graves. A furnace, two large converters and other apparatus will be installed.

Steps have been taken toward the organization of the Columbia River shipbuilding concerns, near Portland, Ore., and Vancouver, Wash., for mutual benefit and to assist the government in speeding construction of vessels in that section. Twenty-five men, whose yards have contracts for millions of dollars' worth of steel and wooden vessels, attended a recent meeting at the Multnomah Hotel in Portland. The Columbia River Shipbuilders' Association was formed, with the following board of managers: H. E. Pennell of the Coast Shipbuilding Co.; Max Houser, McEachern yards, Astoria; William Cornfoot, Albina Engine & Machine Works; Joseph Bowles, Northwest Steel Co.; Fred Ballin, Supple & Ballin; F. C. Knapp, Peninsula Shipbuilding Co.

British Columbia machinery plants are considering the possibility of undertaking the manufacture of main engines for the Government steamers, although no contracts have as yet been placed with them. In figuring on the engines, the firms are faced with the prospect of having to install additional costly machinery, with contracts at a fixed price, and containing penalty clauses for late delivery, with no protection against strikes.

Birmingham

BIRMINGHAM, ALA., Aug. 4.

In addition to a steady demand for sawmill and mining machinery of all sorts, cotton gins and apparatus for cotton seed and peanut oil mills are quite active. Second-hand equipment is eagerly sought, but very little is to be obtained.

Hine-Hodge Lumber Co., Hodge, Miss., will build a shipbuilding plant on a 40-acre site.

Florida Marine Construction Co., Jacksonville, Fla., has been organized with a capital stock of $100,000 to construct wooden vessels for the Government.

Poag & Co., Tampa, Fla., have secured a site for a shipbuilding plant to build schooners up to 600 tons capacity.

American Shipbuilding Corporation, Beaufort, S. C., has been incorporated with a capital stock of $320 000. R. C. Horne, Jr., and W. E. Richardson are among the incorporators.

Universal By-products Co., Pittsburgh, Pa., proposes to establish a $300,000 factory at Fernandina, Fla., to make a leather from shark skins.

McLain-Quick Lightning Switch Co., Anniston, Ala., has been incorporated to manufacture switches and switch appliances.

Kelly-Atkinson Construction Co., Chicago, has taken over the Hieronymous docks property at Mobile, Ala., to build 18 steam and wooden vessels for the Government.

Canada

TORONTO, ONT., Aug. 4.

Lieut. T. Harbon, purchasing agent, Military Hospitals Commission, "D" Unit, 1 Queen's Park, Toronto, Ont., will purchase the following workshop equipment to be delivered to Hart House, University Buildings, Toronto, during the week of Aug. 24 to 31: 1 Brown & Sharpe (or Cincinnati) universal miller, No. 1 (with improved spiral dividing head and swivel vise); 1 McKenzie engine lathe, 14 in. x 6 ft., with 8-in. 4-jaw independent chuck; 1 Barnes drill press, 15-in. with chuck and arbor; 1 3-hp. motor 110 d.c. compound wound (1200 to 1700 r.p.m.), Westinghouse or General Electric; 1 No. 2 American bench gas forge; 1 No. 3

Root's Acme blower; 1 No. 2 "perfect" power hack saw; set stock and dies, ¼ in. to ¾ in. (Little Giant); set stocks and dies, 1-64 in. to 14 in. (Little Giant); 1 Preston dimension saw, No. 125; 1 20-in. Sidney band saw; 1 Blount speed lathe, 11 in. x 5 ft.; 1 bench emery stand, 8 in. diameter x 1 in. wheel; 1 Universal grinder, No. 1, with automatic feed (Le Blonde); 36 ft. of 1 7/16 in. shafting; 1 pair couplings, 5 16-in. hangers.

Tender forms, specifications and drawings have been received from D. H. Ross, Canadian trade commissioner, Melbourne, Australia, for the supply and delivery of pumping plant and equipment for the Commonwealth naval dock yard, Cockatoo Island, Sydney, N. S. W., and are open for inspection at the Department of Trade and Commerce, Ottawa, Ont. (refer to file No. A-1901). Tenders addressed to either the director of naval contracts, care Commonwealth navy dockyard, Cockatoo Island, Sydney, N. S. W., close on Oct. 10, 1917. The particulars are as follows: 2 main dock pumps with vertical spindle motors and control equipment; 1 vertical spindle motor and control equipment. 4 sluice valves, with 4 motors and control equipment; 2 drainage pumps with motors and control equipment; 2 exhaust pumps with motors and equipment; 1 inclosed motor and equipment for dock caisson.

Tender forms and specifications have been received from D. H. Ross, Canadian trade commissioner, Melbourne, for supply and delivery of auxiliary machinery for the Flinders naval base, via Melbourne, Victoria, and are open for inspection at the Department of Trade and Commerce, Ottawa, Canada (refer to file No. A-1901). Tenders addressed to the Director of Navy Contracts, Navy Office, Melbourne, close Oct. 24, 1917. The equipment required is as follows: 2 electrical driven air pumps, with complete set of spare parts; 1 steam driven air pump, with complete set of spare parts; 2 small circulating pumps; 1 large circulating pump; 1 large feed pump, with complete set of spare parts; 1 small feed pump, with complete set of spare parts, and 1 oil fuel pump, complete with spare parts.

The first carload of machinery for the shipbuilding plant now in course of construction on Poplar Island, New Westminster, B. C., by the New Westminster Construction & Engineering Co., has arrived on the site and the installation will be begun at an early date. The company has a contract for building four vessels for the Imperial Munitions Board.

The British American Shipbuilding Co., Ltd., Toronto, Ont., has been incorporated with a capital stock of $1,000,000 by Francis H. Keefer of Thorold, Ont.; Andrew A. Kinghorn, Amy W. Crysler and others of Toronto, to build ships, boats, drydocks, etc.

The Gaylord Engineering & Construction Co., Inc., of New York has been granted permission to carry on business of designing, building, etc., power plants, steam transmitting lines, heating and ventilating systems, etc., in Ontario with a capital stock of $40,000, and has appointed William J. Elliott of Toronto attorney.

The Richmond Mfg. Co., Ltd., Toronto, Ont., has been incorporated with a capital stock of $200,000 by Wilbert W. McKnight, Noubar Courian, Abraham Cohen and others of Toronto to manufacture munitions machinery, including chucks, gages, reamers, taps, cutters, etc.

The Pedlar People Ltd., Oshawa, Ont., is in the market for 6-ft. power squaring shears, with capacity to cut 16 gage sheets or lighter.

The Maxwell Motor Co., of Detroit will build a plant at Windsor, Ont., to cost $150,000. R. Westcott has been awarded the contract. The building will be two stories, 100 ft. frontage and 300 ft. in depth. Automobiles for the Canadian and British Empire trade will be manufactured.

The American Can Co., Hamilton, Ont., proposes to build a large addition to its factory at a cost of $125,000.

James, Loudon & Hertzberg, Ltd., Toronto, Ont., are preparing plans for a brass foundry to be constructed of brick and steel for the Mueller Mfg. Co., Sarnia, Ont., at a cost of $100,000.

The Vancouver Shipyards & Engine Works, Ltd., Vancouver, B. C., proposes to build shipyards and shipbuilding plant at Vancouver. Manager S. Matheson, 517 Rogers Building.

Wells & Gray, Confederation Life Building, Toronto, have been awarded the contract for the erection of $40,000 addition to the plant of the Nicholson File Co., Port Hope, Ont.

Evidence of the revival of shipbuilding in Toronto was strikingly manifest by the launching of three new boats. One of these was a 4300-ton freighter, the largest vessel yet built in the city; the other two were fishery protective vessels, which are being constructed for the Government. The freighter which has been named the "Orleans," was launched at the yards of the Thor Iron Co. and has been acquired by the Oriental Navigation Co., Nantes, France. She is 261 ft. long, 43 ft. beam and 28 ft. 3 in. of molded depth and is equipped with triple engines of 1400 hp. The other two boats, named the St. Eloi and Festubert, were launched from the yards of the Polson Iron Works, and will form part of the fleet of six boats built for fisheries protection work. They are 140 ft. long, 23 ft. 6 in. beam and 13 ft. 6 in. molded depth. They will be equipped with compound surface condensing engines of 500 hp. and Howden water tube boilers, with down draught and working at 180 lb. steam pressure. They are the first of this type of boiler to be constructed in Canada, although they have been generally adopted in the British yards. The vessels are fitted with electric light, steam heated and have evaporating equipment. Every detail of the machinery and equipment is ready for installation, and it is expected to have the two vessels ready for delivery this month.

The ratepayers of London, Ont., will vote on a proposal to guarantee the bonds of the Ajax Rubber Co. to the extent of $450,000. The company agrees to build and equip with machinery and manufacturing accessories a plant to cost at least $300,000, in which it will manufacture 900 tires daily and employ 250 hands.

Strathroy, Ont., is asking for bids for a direct-connected motor driven turbine pump, 80 imperial gallons capacity, against a head of 20 ft. Apply Public Utilities Board, Strathroy, Ont.

Plans have been placed in the hands of the Ontario Hydro Commission, Toronto, for its endorsement in connection with the erection of a hydro station at Galt, Ont. As soon as the indorsation has been completed bids will be called for the construction of the plant.

The Laurin & Leitch Construction Co., Montreal, Que., has been awarded the general contract for the erection of a pumping and filtration plant at St. John's, Que.

An appropriation of $55,000 has been made for harbor work at Goderich, Ont., in connection with the establishing of a shipbuilding plant there by the Goderich Shipbuilding Co. The work includes the construction of slips, etc.

The Eureka Shipbuilding Co., Ltd., North Head, N. B., has been incorporated with a capital stock of $32,000 by F. Ingersoll, J. E. Gaskill, F. L. Lakeman and others to build ships, boats, etc.

Government Purchases

WASHINGTON, Aug. 6.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until Sept. 4, schedule 1379, for one motor-driven centrifugal pump for Pearl Harbor, T. H.; schedule 1387, opening date unassigned, for one open-side surface-grinding machine, for South Charleston, W. Va.; schedule 1388, opening date unassigned, for two heavy-duty milling machines and two back-geared turret screw machines for Philadelphia; schedule 1389, opening date unassigned, for one 100-in. vertical boring and turning mill for Boston; schedule 1395, opening date unassigned, for one 15-ton locomotive crane for Charleston, W. Va.; schedule 1396, opening date unassigned, for one motor-driven radial drill for Mare Island; schedule 1397, opening date unassigned, for one motor-driven centrifugal pump for Norfolk, Va.; schedule 1400, opening date unassigned, for two motor-driven lathes for Fort Miffin.

Bids will be received by the Bureau of Yards and Docks, Washington, until Aug. 13, for furnishing and installing eight electric mono-rail hoists, mono-rail track, supports, switches, turntables and trolley rails in the new foundry at the navy yard, Norfolk, Va., specification No. 2481.

Bids were received by the Bureau of Yards and Docks, Navy Department, Washington, specification No. 2464, for furnishing cranes for the smithery addition at the Philadelphia navy yard.

Item 1, for the work complete; 2, one 80-ton crane complete with spare parts; 3, one 15-ton, two 5-ton bridge and four 5-ton wall cranes with spare parts; 4, one additional 15-ton crane complete; 5, price per foot installed for runway circuit consisting of two No. 2-0 B. & S. gage, bare copper wires; 6, price per foot installed for runway circuit of two No. 4-0 B. & S. gage copper wires.

Chesapeake Wire Works, Westport, Md., item 3, $68,335, 120 to 270 days; 4, $16.475, 160 days; 5, $1, 120 days.

Niles-Bement-Pond Co., 111 Broadway, New York, item 1, $108,610, 420 days; 2, $43,750, 420 days; 3, $64.860, 390 days; 4, $14,400 each, 390 days; 5, $1 per ft. of buildings; 6, $1.50.

Morgan Engineering Co., Alliance, Ohio, item 1, $52,125; 2, $18,475; 3, $23,780; 4, $54,780; time, 240 to 270 days.

Bids were received July 30 by the Bureau of Yards and Docks, Navy Department, Washington, under specification No. 2443 for furnishing electric traveling cranes for extension to machine shop at the navy yard, Mare Island, Cal.:

Item 1, price and time of delivery for one 40-ton and one 15-ton crane, complete, with spare parts; 2, for one 40-ton crane, complete, with spare parts; 3, one 15-ton crane, complete, with spare parts; 4, one additional 15-ton crane, complete; 5, price per foot for runway circuit consisting of two No. 2-0 B. & S. gage, hard-drawn, bare copper main collector wires, insulating brackets, and take-ups; 6, price per foot for a runway circuit consisting of two No. 4-0 B & S. gage, hard-drawn, bare copper main collector wires, insulating brackets and take-ups.

Chesapeake Iron Works, Westport, Md., item 3, $23.520, 155 days; 4, $22,320, 165 days; 5, 90c., 155 days.

Niles-Bement-Pond Co., 111 Broadway, New York City, item 1, $47,000; 390 days; 2, $28,300, 390 days; 3. $18,700, 390 days; 4, $17,320, 390 days; 5, 75c. per ft. per building; 6, $1.25.

Morgan Engineering Co., Alliance, O., item 1, $38,950; 2, $25,175, 270 days.

THE IRON AGE

New York, August 16, 1917

ESTABLISHED 1855 VOL. 100: No. 7

New Plant of Pyle-National Company

Manufacturer of Locomotive Headlights, Turbo Generators and Valve Gear Housed in Notable Buildings — Low Insurance Cost — Testing Apparatus

ANOTHER example of the present-day tendency to construct manufacturing plants which in every detail may be compared to a completely equipped and well-finished machine, presenting something good to look at, as well as affording maximum utility, is embodied in the entirely new factory of The Pyle-National Co., 1337 and 1357 North Kostner Street, Chicago, manufacturer of turbo generators and headlights for locomotives and locomotive valve gear. The group of buildings consists of a two-story, fireproof office building, 46 x 124 ft.; a machine shop, 122 x 300 ft., of steel frame and mill roof construction; forge shop, 48 x 94 ft.; foundry, 79 x 204 ft.; power house, 57 x 76 ft., and a one-story warehouse, 94 x 168 ft. It was designed by Davidson & Weiss, architects, and the mechanical details were supervised by Patterson & Davidson, engineers, Monadnock Block, Chicago.

The machine shop, a view of which is given in Fig. 1 has a mezzanine floor 32 ft. in width on either side, with narrower connections at the ends. Most of the machine tools at present in use are under the mezzanine floor, the lathes being staggered to economize in space. The general construction of the shop is well shown in the illustration. To the right of the picture is the toolroom. More machine tools are to be placed in the shop, but the major portion of the central part of the floor will be reserved for the assembly of valve gear. All of the large tools, some of which can be seen in the background of the half-tone, are motor-driven, the smaller tools being group-driven. The machine shop and, in fact, every building in the group, even the forge shop, is equipped with sprinklers. As a result of this protection, together with the character of construction and the general care that is exercised against fire, the insurance cost is less than 4½c. per $100. The fire equipment includes a 60,000-gal. gravity tank and



Fig. 1—Machine Shop of Pyle-National Co., Chicago. Mezzanine floor on sides of building is 32 ft. wide. Most of the machine tools are under the balcony, the center of the floor being reserved for assembly. Traveling crane is controlled from the floor

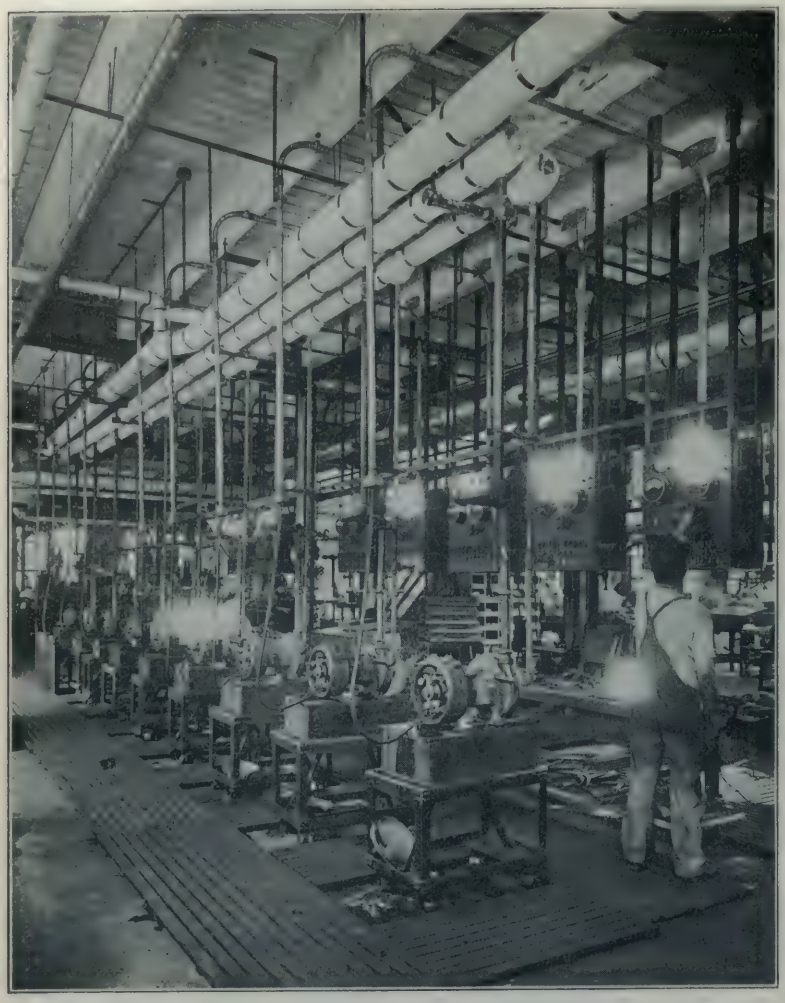


Fig. 2—Testing Turbo Generators for Locomotive Headlight and Train Lighting in Plant of Pyle-National Co. The machines are assembled, tested, painted and packed on the steel trucks. Bank of panels is double. Main steam line carries 225 lb. pressure

a 1200-gal. Fairbanks-Morse fire pump. The flooring is of factory maple laid on concrete.

The machine shop is served by a 7½-ton traveling crane controlled from the main floor. The mezzanine floor is served by a 6000-ton elevator. On this floor are located winding, nickel-plating, pattern-making and small machine departments. Conspicuous in the photograph are the heating and ventilating pipes, the machine shop being 50 per cent direct and 50 per cent indirect heated. The foundry heating is entirely indirect. Artificial light is provided by Westinghouse nitrogen lamps with reflectors.

RUNNING TEST FOR TURBO GENERATORS

An interesting feature is the equipment for testing turbo generators by an actual running test, shown in Fig. 2. This department is located under the balcony and consists of 20 test racks, each with its own panel. The steam pressure carried in the pipe-line overhead is 225 lb. From the main line, opposite each panel, drops a pipe to which the turbo generators are connected by a flexible coupling. The exhaust steam is carried back to the power house, and is available for heating and other purposes. The current generated is conducted by cable, the upper part of which is encased in pipe, to the test panel which is fitted with incandescent lamps, switches and the necessary meters for registering the performance of the generator. The steel trucks on which the turbo generators are tested, as shown in Fig 2, are removed and replaced by others when a test is completed. The machines are assembled on the trucks, and rest on them while being tested, painted and packed for shipment. Incidentally, it may be stated that the turbo generators are built in capacities ranging from 350 watts to 3 kw., the larger sizes being for train lighting.

The construction of the gray-iron foundry building, Fig. 3, is much the same as that of the machine shop. It is served by a 5-ton Whiting traveling crane, also operated from the floor. Production is confined almost entirely to standard duplicate work and is largely done on molding machines. The cupola is located at the side near the end of the building. Adjoining the foundry is the core-room, containing two ovens large enough to accommodate trucks, and an oven of the drawer type, all of Whiting design. The company also has a brass foundry containing six furnaces.

The forge shop, shown in Fig. 4, is notable because of the high ceiling, ample space and good light it possesses, all of which afford a decided contrast with the old-time shop of its kind. It contains Buffalo down-draft forges and a Buffalo furnace, a No. 4 double Brown & Sharpe case-hardening and annealing furnace and a 1200-lb. Massillon steam hammer. It has Buffalo forge blowers direct connected to induction motors.

A view of the boiler room, Fig. 5, shows an interesting alignment of equipment. It contains two 200-hp. and one 75-hp. Page & Burton water-tube boilers, which carry a working pressure of 225 lb. The boilers are equipped with Cox-Fulton stokers, and the ash is handled by a Brady siphon ash conveyor. To permit of convenient storage of six carloads of coal the boiler room is depressed 5 ft. below the engine room floor. The latter will contain a 385-kva. Westinghouse turbine generator set, and a 750-cu.-ft. Ingersoll-Rand air compressor. The power plant has a 150-ft. brick stack erected by the Heine Chimney Co. sufficient for 800 hp.

The Potter Title & Trust Co. has been appointed temporary receiver of the Pennsy Motors Co., Pittsburgh, builder of automobiles and motor trucks.



Fig. 3—Foundry Is Light and Airy. Work is principally standard duplicate castings, and molding machines are successfully used. Five-ton Whiting crane is controlled from the floor

The Copper Trade in 1917

The mystery in the copper trade during the year has been the gigantic increase in exports, says a member of the Bureau of Copper Statistics. The monthly average for the first six months is 45,000 tons as compared with the average of 27,276 tons in 1916, 23,029 tons in 1915 and 31,091 tons in 1913 (known as the Central Powers' war preparation year, German consumption representing fully 70 per cent of the entire amount) and against a 10-year average of 26,117 tons. Of additional interest is the fact that the exported metal is presumably for munition needs by the Allies and for 1918 consumption. Copper contained in exported brass amounted to 166,000,000 pounds additional.

Domestic consumption has declined probably as a result of this increase in exports or because of increased munition manufacture in England and France. In the six months' period it probably has been 70,000,000 lb. less than in the same period of last year.

Copper costs per pound for 47 companies increased to an average of 12½c. compared with 10.5c. for 1916. The Anaconda Co.'s production reports would indicate an increase from 10.2c. to 16c., but these items are sometimes a matter of expert bookkeeping. Certainly high wages will be exacted during the year, and this may mean average production costs per pound of 13½c. to 14c.

Total dividends paid during the six months by 47 companies amounted to $93,000,000, as compared with $66,000,000 for the same period last year. Total net profits for these companies were in excess of $173,000,000. Total stockholders in the producing copper companies of this country, Canada, Mexico, and South America amount to nearly 600,000.

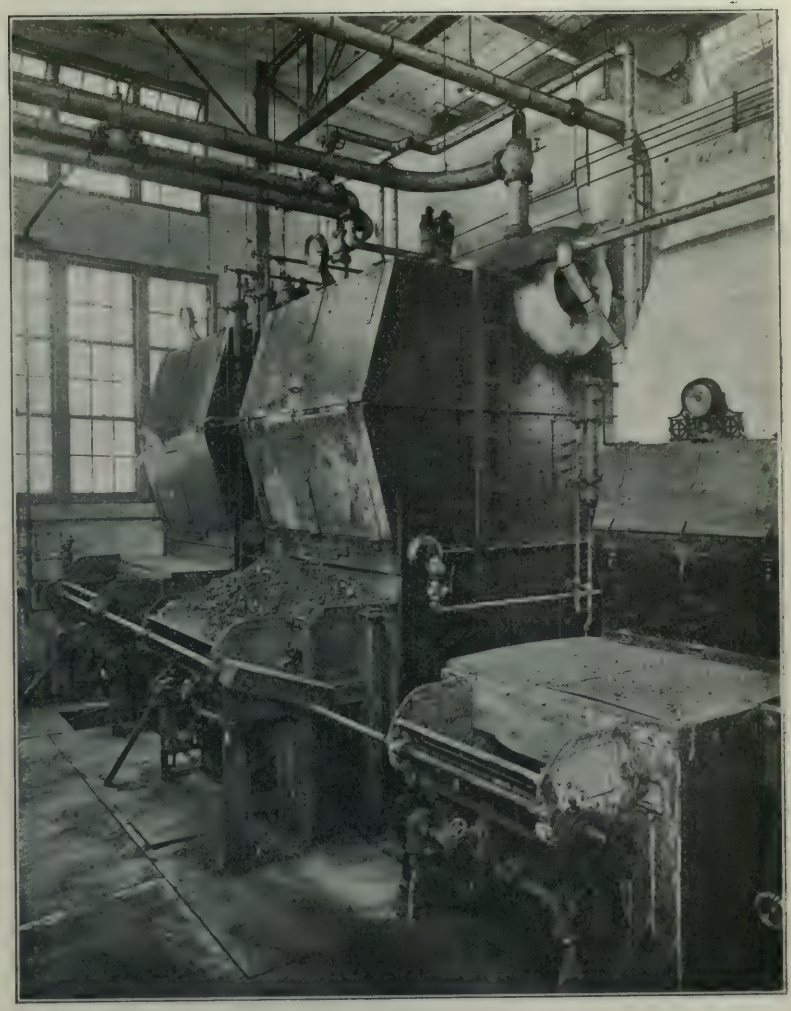


Fig. 5—A Modern Boiler Room Containing Two 200-Hp. and One 75-Hp. Boilers with Automatic Stokers and Syphon Ash Removers. The floor is 5 ft. below the engine room floor, enabling the storage of 6 carloads of coal. A working steam pressure of 225 lb. is carried

New Plant of Union Smelting & Refining Co.

Following an expansion which antedates even the present abnormal activity in the metal trades and industries, the Union Smelting & Refining Co. is now building a thoroughly modern plant in Newark, N. J. The company now operates plants for the production of white metal alloys at Nineteenth Street, and at Fourteenth Street, New York; and also operates a large plant in Baltimore. The growth of the business led to the acquirement of 11 acres in Newark. The tract is triangular and is bounded on its three sides by three railroads, the Pennsylvania, the Central of New Jersey and the Lehigh Valley Railroad. Utilizing these excellent transportation facilities, the new plant has an extensive switch yard of its own, with loading tracks, track scales, etc., to accommodate 25 cars.

The main building is of steel and brick modern fireproof factory construction 110 x 450 ft. Details provide for the maximum of light and air and the equipment is designed for economy of time and labor. All material within the plant proper is handled by traveling cranes. The receipt and disposal of raw material and the quick handling of the finished product is thus assured.

The planning of the plant has included such choice of sites for the present buildings as will permit future expansion which will not interfere with the full use of existing facilities. This administration building, which will house all the offices, is unique in many respects. Living rooms are provided for caretakers; a kitchen and dining room serve to supply meals to the staff, and the officers have private rooms with bath and shower. Like the main building, the construction of the office unit is of steel and brick and of pleasing architectural design.

The architects are Fletcher-Thompson, Inc., Bridgeport, Conn. L. D. Waixel, president of the company, says the entire plant will be in full operation by the end of the present year.



Fig. 4—In Marked and Pleasant Contrast Is This Forge Shop with Those of Earlier Days. The ceiling is high, there is plenty of light. The forges are down-draft

The Youngstown Foundry & Machine Co., Youngstown, Ohio, is building an 8-in. and a 10-in. mill for the Denner Steel Co., Buffalo, the mills being designed by the purchaser. The Youngstown company also has large contracts for roll lathes, large shears and spike machines that will keep it busy for some time to come. It will make shipment this month of two large roll lathes to the Whitaker-Glessner Co., Wheeling, W. Va.

War Board Proposes "Reasonable Profits"

Same Price for Government and Allies, but There Can Be No Commandeering for Other Nations

WASHINGTON, Aug. 14.—Prices liberal enough to include "reasonable profits" but much below the levels representing "the extortion now exacted for many commodities of prime necessity" will be fixed by the War Industries Board for all war material purchased for the United States or for the Allies. For the present the board will not undertake to control the prices of materials purchased for the general consuming public, but the Government will speedily exercise its control over the country's output of coal and coke, as authorized by the Lever act, and, should circumstances warrant, consideration will be given to the propriety of fixing the prices of other commodities in the interest of the private consumer. This program has been outlined during the past week in official and semi-official statements and will be put into force as soon as its details have been worked out. Meanwhile Senator Pomerene has introduced in the Senate a comprehensive bill, described elsewhere in this issue, authorizing the President to fix the price and regulate the sale of all products of the iron and steel industry, whether purchased by the American Government, the Allies or by private consumers.

A Great Buying Machine

As the result of numerous conferences participated in by many high officials of the Government, a carefully co-ordinated project for controlling the cost of all war material has been worked out and a big machine developed on a scale that is confidently counted upon to meet any emergency. The most important feature of this machine will be the War Industries Board with its purchasing commission, but working in close co-operation and in perfect harmony will be the Federal Trade Commission, the Food Administration, just created by the enactment of the Lever bill, the United States Shipping Board, an important function of which will be the regulation of ocean freight rates, and the Exports Council which, through the authority of the President to impose embargoes, will be able to conserve supplies of war material and food products and direct their distribution in the most economical and efficient manner.

The plans of the purchasing commission of the War Industries Board were formulated after several conferences with President Wilson and with members of the Federal Trade Commission. It has been the intention of the members of the board from the outset to insist that the Allies shall be able to purchase war material at the same prices paid by the American Government conditioned only upon a reciprocal agreement on the part of the Allies that the United States may buy in the factories of the allied countries at the same prices as those paid by their respective governments. Both the President and the members of the board have regarded it as desirable that private consumers should be able to secure the same prices as the Government and the President has heretofore expressed his views on this point in very plain terms. He has been apprehensive lest the action of the Government in forcing down the price of iron and steel and other important commodities when purchased for war purposes might result in an increase in the cost of those articles to the private consumer, intended by the manufacturer to offset the curtailment of his profits.

Same Prices for Allies

After careful deliberation, however, both the President and the members of the War Industries Board have reached the conclusion that there is now no authority in law to permit the Executive to fix the price for private consumers of any commodity not specifically included in the category of the Lever act, which has just received the President's signature. Under the terms of this act the President may regulate the operations of the industries engaged in producing coal and coke and fix the prices of those products. He may also within certain limitations regulate the supply and distribution of "foods, feeds, fuel, including fuel oil and natural gas, and fertilizer and fertilizer ingredients, tools, utensils, implements, machinery, and equipment required for the actual production of foods, feeds and fuel." Beyond this, however, it is doubtful that the powers of the Chief Executive extend. Having reached this conclusion the War Industries Board made public the following official statement:

"It is the purpose of the War Industries Board to carry out the policy recently announced by the President, and with which the members of the Board are in complete accord, that in the purchase of war materials in this country, our Allies shall be charged no more than our own Government has to pay. Guns and ammunition employed against our enemy are for our benefit as much when used by our Allies as when used by our own men; and it is obviously unjust to require our Allies when fighting our battle to pay our own people more than our own Government pays for the materials necessary to carry on the war. A mere statement of the proposition seems enough; and we are confident that our manufacturers, who have so patriotically responded thus far to the calls of our Government in this emergency, will readily accept this policy.

"But this policy has two important limitations. First: It is to be reciprocal. The Allies must henceforth apply the same principle in dealing with their own producers and in selling to us and in selling to each other. Second: the arrangement must be limited to war materials, in order to protect our own industry. We must not allow raw materials sold by our producers at prices patriotically conceded to our Government and its Allies for war purposes to be diverted to industry and trade abroad which may come in competition with our own manufacturers and producers. Measures will be taken by the Board for the best possible assurance that materials sold at a concession in prices for war purposes shall be applied only to war purposes.

"In fixing the prices to be paid by the Governments, we shall allow a reasonable profit, but shall deny the extortion now exacted for many commodities of prime necessity. We shall pay the just price so admirably defined by the President in his public statement of July 12th, as follows:

" 'By a just price I mean a price which will sustain the industries concerned in a high state of efficiency, provide a living for those who conduct them, enable them to pay good wages, and make possible expansions of their enterprises which will from time to time become necessary as the stupendous undertakings of this great war develop.'

"The War Industries Board has not yet had and may not have occasion to deal with the question of prices to be charged the public, but it seems proper in this connection to direct attention again to the following from the statement of the President on that subject:

" 'We must make the prices to the public the same as the prices to the Government. Prices mean the same thing everywhere now; they mean the efficiency of the Nation whether it is the Government that pays them or not. They mean victory or defeat.'

"The war makes enormous drafts upon many raw materials absolutely necessary to the industrial life of the Nation and to the ordinary existence of the people. This has resulted in the bidding up of prices for what is left of many materials of prime necessity in manufacture to a point obviously out of all relation to the cost of production, and involving unconscionable profits on our national resources, and the consequence

is that the cost to the public of all the articles in the manufacture of which such materials enter has reached a level never before known."

Judge Lovett, of the War Industries Board, who was delegated to give this statement to the press, amplified it somewhat in reply to questions as to the course to be pursued in the event that difficulty was experienced in inducing manufacturers to dispose of their products at reasonable prices. This possibility, he said, had been considered and he intimated that the board was fully prepared to meet any such contingency, although it was the unanimous opinion of its members that very few such occasions would arise. He also said that he believed authority could be found to enable the Government to secure reasonable prices for private consumers, but repeated the board's official statement that "it has not yet had and may not have occasion to deal" with this question.

Cannot Commandeer Except for United States

Notwithstanding the apparent confidence of the members of the War Industries Board that, under existing laws, manufacturers can be compelled to supply the Allies at the same prices fixed by the President to be paid by the American Government, the law departments of several large corporations have advised the managing officials thereof that the President has no power to commandeer supplies except for the United States. On steel wanted for Italy it is understood some steel companies have refused to book orders, leaving the price to be fixed after the Trade Commission's inquiry ends. It is privately admitted that the question of the Government's authority in such cases has been made an issue. That Government officials are doubtful of their authority in the premises is evidenced by the fact that they are calling attention to the provisions of the priority of shipment act, which they say would enable the President to deny manufacturers the use of the railroads for transporting their goods should they refuse to sell to the Allies at prices to be fixed by the President. Altogether it is quite evident that all the points involved in the purchasing program of the War Industries Board have not been finally settled.

The actual fixing of steel prices is still waiting on the report of the Federal Trade Commission as to cost of production. The President is extremely anxious that this report should soon be forthcoming as he regards it as important that there should be a full understanding between the purchasing agents of the War Industries Board and the trade before any further orders are placed. While considerable steel has been ordered pending the determination of the price, the Government's requirements are being quite generally held in abeyance in order that officials in charge of various classes of work may be able to estimate in advance the cost of their undertakings. At the Federal Trade Commission the only information available concerning the steel investigation is that it is being prosecuted with the utmost vigor but has proved a much more complicated inquiry than was anticipated at the outset.

Price-Fixing in Coal and Coke

It is now altogether probable that the first actual price-fixing to be done by the President will determine the cost of coal, both bituminous and anthracite, to the Government and to the public. There can be no doubt of the power of the President to fix the price of coal and coke, as authority is specifically conferred upon him by the Lever bill in the following language:

> That the President of the United States shall be, and he is hereby authorized and empowered whenever and wherever in his judgment necessary for efficient prosecution of the war, to fix the price of coal and coke, wherever and whenever sold, either by the producer or dealer, to establish rules for the regulation and to regulate the method of production, sale, shipment, distribution, apportionment, or storage thereof among dealers and consumers, domestic or foreign; said authority and power may be exercised by him in each case through the agency of the Federal Trade Commission during the war or for such part of said time as in his judgment may be necessary.

When Secretaries Baker and Daniels, some weeks ago, repudiated the agreement with the coal producers made by Secretary of the Interior Lane, Trade Commissioner Fort and Chairman Peabody of the Committee on Coal Production of the Council of National Defense, under the terms of which bituminous coal was to be supplied to all consumers at $3 per ton with a reduction of 50 cents per ton to the Government, the President directed the Trade Commission to report as soon as possible upon the cost of producing both bituminous and anthracite coal. A preliminary report upon an inquiry previously begun in answer to a congressional resolution has already been made and the final report giving the desired figures is looked for daily. In the matter of coal the Commission will probably recommend a price, although in the steel investigation its work will be limited to ascertaining the cost of production. It is already intimated that the Commission will hold that $3 per ton for bituminous coal f.o.b. the mine is too high and it is expected that the price to the consuming public will be fixed at not to exceed $2.50 a ton, possibly with a further reduction for Government purchases.

While the Federal Government is thus seeking to bring about a reduction in the coal prices, steps are being taken looking to State regulation by a co-operative agreement. The Governors of all the States have been invited to attend a conference to be held in Chicago on the 16th instant for the purpose of bringing about a uniform regulation of the price of coal and a majority have already accepted the invitation. Many large coal operators will attend the conference and several have indicated their willingness to permit the Government to fix a price at the mines and to direct the distribution of the product.

W. L. C.

Steel Corporation's Orders Again Decrease

The United States Steel Corporation's monthly statement shows unfilled orders on the books on July 31 of 10,844,164 tons, a decrease of 539,123 tons from those reported June 30. It was the third consecutive month in which the unfilled tonnage of the corporation has shown a decrease. The total of unfilled tonnage is now the smallest since last October.

The following table gives the unfilled tonnage of the United States Steel Corporation at the close of each month since January, 1914:

	1917	1916	1915	1914
January	11,474,054	7,922,767	4,248,571	4,613,680
February	11,576,697	8,568,966	4,345,371	5,026,440
March	11,711,644	9,331,001	4,255,749	4,653,825
April	12,183,083	9,829,551	4,162,244	4,277,068
May	11,886,591	9,937,798	4,264,598	3,998,160
June	11,383,287	9,640,458	4,678,196	4,032,857
July	10,844,164	9,593,592	4,928,540	4,158,589
August		9,660,357	4,908,445	4,213,331
September		9,522,584	5,317,618	2,787,667
October		10,015,260	6,165,452	3,461,097
November		11,058,542	7,189,489	3,324,592
December		11,547,286	7,806,220	3,836,643

German Metallurgical Research

The question of establishing an institute for undertaking iron and steel research work in Germany, referred to in THE IRON AGE, July 26, in the article on "War Tasks of the German Steel Industry" has now been followed up by the holding at Düsseldorf of a conference of representatives of the iron and steel industries from all parts of Germany, at the instance of the association of German steel makers. It was urged that it was necessary to extend the system of metallurgical research in order to be equipped in every respect for the inevitable economic contest after the war. It was decided to form the proposed institute in association with the Kaiser Wilhelm Gesellschaft and to raise the necessary funds almost entirely in the iron and steel trades.

The production of spelter in the first six months of 1917 was 364,000 net tons, according to returns of the United States Geological Survey, Department of the Interior, compared with 351,000 net tons in the last half of 1916. Stocks on hand are estimated at 33,000 tons as compared with 17,600 at the beginning of the year. A large number of retorts, about 35,000, including 14 complete plants, were reported idle June 30, in addition to the retorts engaged in refining prime Western metal and in redistilling zinc ashes.

FACTORY AID ASSOCIATION

Last Few Years Workings of an Organization Twenty-eight Years Old

BY H. A. RUSSELL*

In 1889 twenty-seven workmen and foremen held a meeting at York, Pa., to discuss plans whereby an association could be formed, which would have for its object the payment of a weekly sum to members in good standing who might become sick for a period exceeding one week. Payment of benefits were to be paid for the first week, providing the member was incapacitated through sickness or accident for at least that period of time. The weekly benefits also were to continue at a certain specified amount for 26 consecutive weeks and at a smaller amount, thereafter, as long as the member was physically unable to resume his normal or other wage-earning occupation. It was also proposed to make the dues high enough so that something could be paid at a member's death. It was further proposed to pay one-half of the amount of the death benefit at the death of a member's wife.

After several meetings, the beneficial association was formed and the remainder of the employees were asked to join, under certain restrictions. The original plan called for weekly dues of 10 cents from each member and assessments as might become necessary. It might be well to state here that the original charter members did not have any particular knowledge regarding insurance or an association of this nature. It was therefore necessary to provide a method whereby the members, whether sick or well, would be protected. Furthermore, it was not an easy matter to secure information which would assist them in fixing a weekly dues rate, which would, under ordinary circumstances, keep the organization solvent. It was therefore decided to make the membership payments on the basis stated.

The constitution and by-laws were drawn up and printed in the form of a booklet. A brief summary follows:

The association known as P. A. W. Beneficial Association No. 1 shall be composed of white male employees of the Pennsylvania Agricultural Works (A. B. Farquhar Co., Ltd., York, Pa.) at the time of becoming members. (The name was later changed to the Farquhar Beneficial Association.) Applicants for membership must be recommended by a member in good standing and must be employed in the works at least six months previous to the date of the application.

Article 2 stated that the regular meetings should be held on Monday evening of each week. Also that special meetings should be held, at any time, at the written request of seven members in good standing, but that no other business could be transacted at the special meeting other than that named in the call. All members, within a reasonable distance, were to attend at least four regular meetings each year; a quorum to consist of at least seven members in good standing.

Article 3 referred to the duties and election of officers, and article 4 outlined the duties of the relief, auditing and delinquent committees.

Article 5 specified that an applicant must be between the ages of 16 and 50 years, of sound mind and body and good health and possess a good moral character. That the proposing member must know the applicant at least one year and that a committee of three members must report in writing the result of their investigation as to the health, character and fitness of the applicant to become a member. That at the next meeting a ballot on the candidate must be taken and if one or more black ballots appear, the application must be referred back to the same committee, and members casting the black ballots must give reasons to the committee. In the event that at a later meeting, a second ballot is taken, and three or more black ballots appear against the applicant, he shall be rejected.

The fees for membership, covered in article 6, were as follows: For ages of 16 to 34, inclusive, $1; for each additional year up to and including 44, 10c.; for each additional year up to and including 49, 25c.

The membership dues are now 14 cents per week. The first plan, which was in effect up to 1904, was to collect 10 cents per week and when necessary assess the members. With a membership of slightly over 300 at the present time, the 14 cents per week per capita seems to be holding the cash reserve stationary. The recorder receives $50 per year and the assistant recorder $20 for the same period. The treasurer receives $1 per annum. The recorder, treasurer and chairman of the trustees are all under bond of $100 to $500.

The benefits are paid as follows: Every member of the association, who through sickness or personal disability, is unable to follow his usual business or some other occupation, is entitled to $4 per week for the first 26 weeks and $2 per week thereafter, as long as the relief committee reports him as being entitled to benefits. At the death of a member in good standing, his widow or other legal heirs are entitled to $150, payable within 60 days. In the event of the death of a member's wife, prior to the death of the member, the member receives $75, payable within 60 days, and he also remains in full membership, providing, of course, that dues are paid regularly, and his heirs are entitled to receive $150 at his death.

The average number of members in 1914, 1915 and 1916 was 306, 305 and 303, respectively. The number of members who received weekly benefits during the following years was as follows:

Average Number Receiving Weekly Benefits

	1914	1915	1916		1914	1915	1916
January ...	18	17	25	July	14	11	16
February ..	15	16	18	August	18	18	17
March	21	23	16	September .	18	21	16
April	19	26	15	October	14	18	9
May	17	19	19	November .	12	14	11
June	15	13	16	December ..	16	19	14

There are four members who have been receiving benefits for two years or longer. There is one member who has received benefits for over 15 years. During the three years for which the summary has been worked out, the total number of days for which benefits were paid was as follows: 1914, 4319 days; 1915, 4704 days, and 1916, 4004 days.

The majority of the weekly benefits paid are at the $4 rate, as it is the exception for a member to be sick or disabled for more than 26 weeks.

In these days of constantly shifting labor, it is not so easy as formerly to secure new members, and unless a certain proportion of new members are added from time to time, the association would pass out of existence. However, the membership has remained at about the same figure for some years past, and as this membership is sufficient to keep up the reserve, the only requirement has been that the membership committee had to hustle a little harder.

Some of the members like to keep their dues paid up a long time in advance while others just keep inside the danger line. Both of these methods simply indicate phases of human nature, with which we are all familiar. Since the first aid department was started in this factory, the length of time that a member might be on the sick, or rather disabled, list has been reduced considerably, we believe. This is rather hard to determine accurately because there is always the possibility that the member would have returned to work just as soon, with or without the first aid treatment, because some men, whose blood is in better condition than others, will throw off the possibility of infection in a cut or bruise. Again we have the help of the safety committees in reducing the number of accidents.

Once a member, always a member, as long as the dues are paid regularly. By this is meant that a man, once he has joined the association, may leave the employ of this company and work elsewhere without losing membership. This may or may not be the wise method because the next employment may be considerably more hazardous than that in which the member was engaged when he joined the association.

The National Castings Co., Marietta, Pa., announces the beginning of operations at its new foundry, Aug. 13, for the production of gray iron and semi-steel castings. The plant has a daily capacity of 50 tons.

*York, Pa.

United States Pig Iron Production—First Half of 1917

The American Iron and Steel Institute, 61 Broadway, New York, has issued its special statistical bulletin No. 5 (1917) which gives the production of pig iron in this country in the first six months of the present year. For the third time, in a six-month period, the production has exceeded 19,000,000 tons, the figures being as follows: First half of 1916, 19,619,522; second half of 1916, 19,815,275; and first half of 1917, 19,258,235. The production of charcoal pig iron for the six months was 180,235, or 180 tons less than for the last half of 1916. The details of the last half year's output are as follows:

HALF-YEARLY OUTPUT OF PIG IRON BY STATES.

HALF-YEARLY PRODUCTION OF ALL KINDS OF PIG IRON.

States	Blast furnaces. In blast Dec.31, 1916.	Blast furnaces. June 30, 1917. In.	Out.	Total.	Production—Gross tons. (Includes spiegeleisen, ferro-mang., ferro-silicon, ferro-phosphorus, etc.) First half of 1916.	Second half of 1916.	First half of 1917.
Massachusetts	1	1	1	2	4,700	1,019	4,305
Connecticut	1	2	1	3			
New York	18	21	6	27	1,214,037	1,138,498	1,118,482
New Jersey	1	4	1	5			
Pennsylvania	127	136	25	161	8,286,076	8,220,208	7,790,514
Maryland	4	4	1	5	243,895	257,557	234,589
Virginia	9	12	8	20	202,777	197,108	231,937
Georgia	0	0	4	4			
Texas	0	0	2	2			
Alabama	29	34	14	48	1,366,728	1,396,157	1,494,479
West Virginia	4	4	0	4			
Kentucky	4	4	3	7	268,859	285,731	282,548
Mississippi	0	0	1	1			
Tennessee	11	12	6	18	162,009	193,365	201,296
Ohio	65	72	5	77	4,250,790	4,352,105	4,269,708
Illinois	24	22	2	24	1,938,152	1,984,360	1,810,137
Indiana	10	12	0	12	1,073,768	1,147,940	1,200,122
Michigan	12	12	2	14			
Wisconsin	5	6	2	8	417,542	393,783	392,864
Minnesota	3	3	0	3			
Missouri	2	2	0	2			
Iowa	0	0	0	0			
Colorado	3	4	2	6	190,189	247,444	227,254
Oregon	0	0	1	1			
Washington	0	0	1	1			
California	0	0	0	0			
Total	333	367	88	455	19,619,522	19,815,275	19,258,235

HALF-YEARLY PRODUCTION OF COKE PIG IRON.*

New York	18	21	2	23	1,214,037	1,138,498	1,117,918
New Jersey	1	3	1	4			
Pennsylvania	112	122	16	138	8,205,199	8,080,729	7,586,452
Maryland	4	4	0	4	243,895	257,557	234,589
Virginia	6	12	6	18			
Georgia	0	0	2	2	202,777	197,108	231,937
Texas	0	0	1	1			
Alabama	28	32	13	45	1,346,460	1,377,223	1,475,063
West Virginia	4	4	0	4			
Kentucky	4	4	3	7	268,859	285,731	282,548
Tennessee	10	11	6	17	161,128	191,944	200,874
Ohio	65	72	5	77	4,250,790	4,351,438	4,269,708
Illinois	24	22	2	24	1,938,152	1,984,360	1,810,137
Indiana	10	12	0	12			
Michigan	3	3	0	3	1,150,364	1,202,824	1,263,426
Wisconsin	4	5	1	6			
Minnesota	3	3	0	3			
Missouri	1	1	0	1			
Iowa	0	0	0	0			
Colorado	3	4	2	6	366,274	429,251	402,028
Washington	0	0	1	1			
Oregon	0	0	1	1			
California	0	0	0	0			
Total	303	335	62	397	19,347,935	19,496,663	18,874,680

*Includes ferro-alloys made with electricity.

ANTHRACITE AND MIXED ANTHRACITE AND COKE PIG IRON.

New York	0	0	3	3			
New Jersey	0	1	0	1	79,591	138,197	203,320
Pennsylvania	12	12	6	18			
Total	12	13	9	22	79,591	138,197	203,320

HALF-YEARLY PRODUCTION OF CHARCOAL PIG IRON.

Massachusetts	1	1	1	2	4,700	1,019	4,305
Connecticut	1	2	1	3			
New York	0	0	1	1	1,286	1,282	1,306
Pennsylvania	3	2	3	5			
Maryland	0	0	1	1			
Virginia	0	0	2	2			
Alabama	1	2	1	3	20,268	18,934	19,416
Georgia	0	0	2	2			
Texas	0	0	1	1			
Tennessee	1	1	0	1	881	2,088	422
Mississippi	0	0	1	1			
Ohio	0	0	0	0			
Michigan	9	9	2	11	132,637	127,986	124,618
Wisconsin	1	1	1	2			
Missouri	1	1	0	1	32,224	29,106	30,168
Total	18	19	17	36	191,996	180,415	180,235

TOTAL PRODUCTION OF PIG IRON ACCORDING TO FUEL USED.

Coke*	303	335	62	397	19,347,935	19,496,663	18,874,680
Anthracite†	12	13	9	22	79,591	138,197	203,320
Charcoal	18	19	17	36	191,996	180,415	180,235
Total	333	367	88	455	19,619,522	19,815,275	19,258,235

*Includes ferro-alloys made with electricity
†Includes mixed anthracite and coke pig iron.

HALF-YEARLY OUTPUT OF PIG IRON BY GRADES.

HALF-YEARLY PRODUCTION OF BASIC PIG IRON.

States.	First half of 1916.	Second half of 1916.	First half of 1917.
New York, New Jersey	573,244	632,596	535,286
Pennsylvania—Allegheny County	2,309,777	2,167,298	1,797,309
" —Other counties	2,578,396	2,328,799	2,330,237
Virginia, Alabama, Kentucky	501,225	686,685	770,667
Ohio	1,199,267	1,257,609	1,412,324
Indiana, Illinois	1,416,246	1,451,455	1,466,677
Michigan, Wis., Minn., Missouri, Colorado	251,930	329,560	308,104
Total	8,830,085	8,854,002	8,620,604

HALF-YEARLY PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS.

New York, New Jersey	223,456	229,564	224,345
Pennsylvania	2,566,539	2,966,468	2,943,071
Maryland	227,652	241,343	214,652
West Virginia, Kentucky, Tenn., Ala	236,182	260,406	240,427
Ohio	2,377,073	2,556,158	2,235,910
Illinois, Wisconsin, Minnesota, Colorado	1,208,275	1,329,341	1,173,421
Total	6,839,177	7,583,280	7,041,426

HALF-YEARLY PRODUCTION OF FOUNDRY PIG IRON AND FERRO-SILICON.

Massachusetts, Connecticut	4,700	1,019	4,305
New York, New Jersey	331,651	193,951	271,555
Pennsylvania	559,767	427,447	417,088
Maryland, Virginia, West Virginia	192,454	196,764	236,549
Kentucky	43,151	40,929	29,617
Tennessee	132,264	172,983	187,068
Alabama	824,867	668,506	701,886
Ohio	465,106	322,091	330,402
Indiana, Illinois	91,742	60,296	58,844
Michigan	199,600	180,397	176,142
Wisconsin	165,155	146,292	143,258
Minnesota, Missouri, Iowa, Col., Wash.	75,953	56,559	45,734
Total	3,086,410	2,467,234	2,602,448

HALF-YEARLY PRODUCTION OF MALLEABLE PIG IRON.

New York	74,298	76,011	77,806
Pennsylvania	58,415	52,989	38,176
Kentucky, Ohio	139,682	146,498	205,098
Indiana, Illinois, Michigan, Wis., Mo.	188,444	185,149	188,902
Total	460,839	460,647	509,982

HALF-YEARLY PRODUCTION OF FORGE PIG IRON.

New York, New Jersey	6,780	3,112	3,607
Pennsylvania	54,807	91,081	98,910
Virginia	16,103	*4,364	2,147
Tennessee, Kentucky	1,366	1,588	1,643
Alabama	19,570	15,380	17,156
Ohio	70,680	72,241	75,451
Total	169,306	179,038	198,914

*Credit. Due to change in grade.

HALF-YEARLY PRODUCTION OF SPIEGELEISEN AND FERRO-MANGANESE.

N. Y., N. J., Pa., Md., Ala., Ill., Col., Wash. Cal.	189, 46	226,488	210,432*
Total	189,046	226,488	210,432*

*130,965 gross tons ferro-manganese and 79,467 tons spiegeleisen.

HALF-YEARLY PRODUCTION OF OTHER GRADES.

New York, New Jersey	2,108	3,264	3,388
Pennsylvania	8,586	11,639	8,803
Md., Virginia, West Va., Tenn., Alabama	27,984	23,353	13,164
Ohio	5,006	4,261	10,523
Indiana, Ill., Mich., Wis., Minn., Missouri, Col., Wash., California	975	2,069	38,551
Total	44,659	44,586	74,429

PIG IRON MADE FOR SALE OR FOR USE OF MAKERS IN THE FIRST HALF OF 1917.

Grades.	For sale.	For maker's use.	Total Gross tons.
Basic	1,312,529	7,308,075	8,620,604
Bessemer and low phosphorus	1,103,327	5,938,099	7,041,426
Foundry, including ferro-silicon	2,548,789	53,659	2,602,448
Malleable	509,946	36	509,982
Forge or mill	58,154	140,760	198,914
Ferro-Manganese	46,802	84,163	130,965
Spiegeleisen	53,229	26,238	79,467
All other grades	52,013	22,416	74,429
Total	5,684,789	13,573,446	19,258,235

Government Plan to Prevent Strikes

Council of National Defense Organizes Commission Which Will Arbitrate Disputes—Serious Trouble Has Been Threatened at Various Places

WASHINGTON, Aug. 14.—A comprehensive plan to prevent the halting of work on war contracts by labor disputes has been evolved by the Council of National Defense. The steps taken have been made necessary by a series of strikes which, beginning in the Eastern shipyards, have spread to several of the big cantonment projects and now include a considerable number of isolated plants working on rush orders for much needed war material. The council's plan will enable the Government to enforce the arbitration of all labor disputes by including in all contracts made hereafter an agreement on the part of the contractor to submit any controversies to Government mediation and to make the employment by him of workmen conditional upon their pledge to accept mediation and abide by the decisions of the mediators.

It has been evident for some time that, whatever the good intentions of the leaders of organized labor may be, they have not been able to prevent strikes nor to settle them when called. A factor in the situation has been the feeling expressed by subordinate officials of labor organizations that the officers of the American Federation of Labor have not shown a proper amount of zeal in utilizing the present emergency to secure advantages for labor, but have permitted themselves to be flattered by Government officials into pledging the support of labor regardless of the conditions of employment that might arise.

The members of the Council of National Defense have anticipated this development and propose to meet it by securing the pledges of the workers themselves to refrain from embarrassing the Government by holding up work on war contracts. The necessity for this action has been acute during the past week as the result of threats that a nation-wide strike on Government work would be called unless the demands of the carpenters' unions in the New York jurisdiction for a closed shop on Federal contracts were met. It was estimated by union leaders that this would mean the calling out of no less than 50,000 men and would bring to a dead stop the work on 30 army cantonments, several aviation camps, two port terminals, an important project in the extension of the New York Navy Yard and a dozen or more private shipyards doing work for the Navy Department and for the United States Shipping Board. The striking carpenters made but a single demand, namely, full recognition of the union, involving, of course, a closed shop and the discharge of all non-union men. That the union issue and not any substantial grievance was at stake is fully evidenced by the fact that the union officials agreed to call off the strike if all non-union carpenters employed on Government work would at once join the union, the additional promise being made that initiation fees would be remitted in this instance. When the contractors acceded to the closed shop demand, the strike was called off.

Representatives of both War and Navy Departments conferred with the local labor leaders and President Gompers of the American Federation of Labor is said to have used his good offices to induce the men to refrain from striking, pointing out that organized labor was morally bound to support the Government in the war crisis and especially to avoid strikes to enforce the closed shop or any other formal recognition of the union. Early in June, an informal agreement was reached between the American Federation of Labor and the Secretary of War under which labor disputes were to be referred to a committee of three representing the Department, the workmen and the public, but thus far this agreement has not been utilized in the settlement of labor disputes, as until quite recently no controversies of importance have arisen under the jurisdiction of the War Department.

Sporadic labor troubles in the plants of contractors doing war work have emphasized the necessity of prompt action by the authorities. The War Department was advised a few days ago that a large number of workmen engaged in Utica, N. Y., factories in making steel helmets for the new national army walked out because of the refusal of the employing contractors to unionize their shops. It has been charged that these strikes are part of a widespread plot of pro-German conspirators to embarrass the Government. The contractors give little weight to this charge and have refused to accept Federal mediation, declaring that the strike is simply an attempt on the part of the workmen to take advantage of a critical situation to compel recognition of the union.

The details of the plan of the Council of National Defense to enforce the arbitration of labor disputes affecting Government contracts are set forth in a statement issued by the Committee on Public Information. A Labor Adjustment Commission has been created to be composed of nine members, three representing the Government, three acting for the employers, and three speaking for labor. The commission is given jurisdiction over all disputes concerning wages or conditions of employment in all establishments having contracts for the Government in accordance with the eight-hour laws of June 19, 1912, and March 3, 1913, and shall hear and determine all labor controversies in which more than 1000 workers are directly affected and may in its discretion hear and determine disputes affecting a smaller number. It is also authorized to appoint from time to time labor adjustment committees to hear and determine such disputes as may be assigned to them by the commission where less than 1000 workers are directly affected, such committees to be representative of the same elements as the commission. The awards of the Labor Adjustment Commission, or of the committees appointed by it, shall be made in each case not more than 30 days after the case has been submitted to the commission and shall be binding upon the employers and the employees in the plants affected for such period as may be expressed in the award, but not longer than 60 days after the close of the war. In all hearings before the commission or its committees, the employers and employees affected are given the right to be represented in the presentation of their respective cases by such persons as they may select under rules to be prescribed by the commission.

W. L. C.

Revised Demurrage Rules in Canada

A revised code of car demurrage rules has been issued in Canada. The free time allowance is as follows: 24 hr. after notice of arrival for clearing customs, reconsignment or reshipment in the same car, stopoffs, etc., and 48 hr. free time for the unloading of all commodities; 24 hr. are also allowed to give orders for special placement in the case of consignees not served by private sidings or industrial interchange tracks. The old rule allowed an additional 24 hr. for unloading coal, coke, lime in bulk and for loading and unloading certain kinds of lumber. For bulk shipments that arrive frozen additional free time will be allowed. Demurrage for the third day is put at $1; for the fourth day, $2; for the fifth day, $3; for the sixth day, $4, and for the seventh day and each day thereafter a charge of $5 per day.

For the increased production of its monorail electric hoists, the Link-Belt Co. has practically completed an additional building at its Philadelphia plant. The hoists have lifting capacities ranging from 1000 to 6000 lb.

WAGE DISPENSING SCHEME

Arrangement Made to Expedite Payments and to Minimize Fraud

BY FREDERIC MERON*

The newly engaged manager of a European factory employing about 500 men coming unexpectedly into one of the departments where about a hundred men were employed, saw an employee standing in the middle of the shop with a tray full of envelopes containing the wages of the workmen in the department. He called them one by one to receive their money. The manager by making himself as inconspicuous as possible was able to watch and observe the true attitude of the workmen of the entire force. Not one was working whether they were paid by day or by piece work rate; it made no difference. Besides this, the machine tools either were stopped or turned idle. Some of the workmen watched their comrades to see how much they were getting; others were making plans for spending their money, or crowded around the pay clerk talking among themselves. In short, they were all taking time off. Even when the pay clerk left the department, order was not at once restored. In looking over the time sheets, one could also observe that the output of the pay-day was deficient.

One may admit that every workman loses at least two hours on account of such a system of paying wages. If one multiplies the number of workmen in a factory by two, and if he will not forget that the same rule applies to all machines and devices, he will have an idea of the value of the losses sustained by the company and thus of the importance of the question.

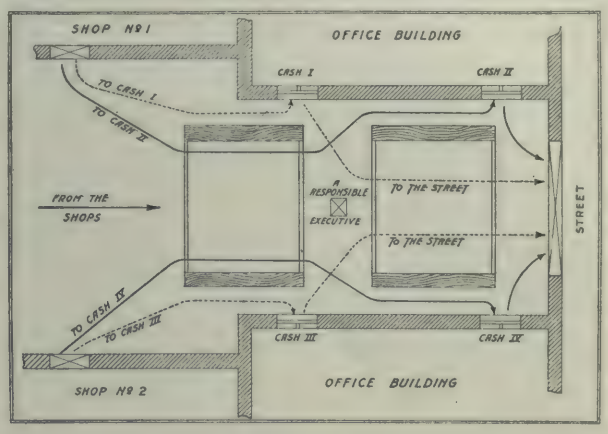
A simple and original system made it possible to pay off the entire force of the works in about 8 min. This was at the end of the day after the whistle had blown. That the reader may understand the reasons for taking some of the special steps of the system I find it necessary to explain that some dishonest employees of the company invented a trick to steal the company's money, and had done so for a long period of years.

The pay list contained fictitious names or the names of workmen who had left the company some time before. The total sum indicated as representing the total amount of the payroll was exaggerated, and the difference was pocketed by the employees partners to the scheme. Nobody seemed to compare the actual number of workmen in the factory with the number of workmen mentioned in the list, nor had any one apparently thought to verify the pay-roll additions and the company used no special counting machines.

The accompanying drawing shows the arrangement adopted. Advantage was taken of an entrance passage in where there were four doors. In each doorway was fastened to the wall, with hinge and hooks, two boards. Whenever they were needed, these boards were let down to form folding desks. Inside the passage was placed a movable wooden barrier composed of parts fastened together, which took only a few minutes to put up or take down. These were intended to guide the workmen, as shown by the arrows. Signs with the numbers of the cash desks were placed in the proper places. Each pay card that the workman received gave the number of the cash desk where it was to be presented.

At about 11.30 a.m. each workman received a card, with the information necessary as to the amount due him, the number of hours he had worked, unit prices, fines, bonus, etc. He had therefore the entire lunch hour to check up all these figures. If he had any complaint to make, he was instructed to make it at the end of the lunch hour. Thus there was plenty of time for everybody to see whether his claims were just and to arrange matters if necessary. When the workman was satisfied he signed the card and he was not obliged to sign his name in a hurry while receiving his money from the clerk, nor to lose time for others while making his complaint. In Europe workmen are obliged to leave a receipt when receiving wages.

Just before work stopped a list was made out, naming eight employees, usually four clerks and four foremen, who were to attend to payments. These eight employees were to come to the office, where they received for each desk envelopes containing the workmen's wages. They were to be in place at the desks with these envelopes a few minutes before closing time.



Portable Barriers Placed at the Entrance to a Factory Facilitate the Grouping of Employees Thus to Expedite Wage Paying

At the same time the foreman who had charge of placing the wooden barriers in the passage, posted himself between them in the position indicated to see that there was no crowding before the desks and also that the workmen came out with as little disorder as possible. When the whistle blew the men went directly to their respective cash desks, each holding his card in his hand, signed in advance. At each desk were the two men, namely, the clerk and a foreman. To the latter, who stood in front of the desk, each workman handed his card. The foreman showed it to the clerk posted behind the desk, and the latter gave the workman his money. The card was then dropped into a slot in a locked box, the keys being kept in the office, where the payments were later checked.

By calling each time different persons to make the payments, the same ones were seldom together at the desks. This was necessary to prevent thefts of funds such as previously occurred. As the number of employees taking part in this work was about 20, and they were changed about without any apparent system, there was little danger of their conspiring among themselves for dishonest purposes.

*Management engineer.

Aviation Supply Depot at Middletown, Pa.

Laborers have started getting the 21-acre plot of the Keystone State Fair grounds near Middletown, Pa., into shape for the construction of a building 364 x 901 ft., to be used as an aviation supply depot. A 40-ft. runway will surround the entire building. Gannett, Seelye & Fleming, Harrisburg, Pa., engineers, in charge, estimate the cost of the work between $400,000 and $500,000. The first building to be erected will be used as a supply depot for the assembling and distribution of air and water craft, wireless apparatus and machine gun parts. This will be followed by the erection of an aeroplane and hydroplane factory on adjacent ground.

Supervising employees of the Lebanon plant of the Bethlehem Steel Co. last Friday evening gave a banquet to W. L. Wolfe, the retiring superintendent of the Donaghmore plant, which includes the Cornwall, North Cornwall, Colebrook and North Lebanon furnaces. E. T. Entswile, his successor, acted as toastmaster.

The Nazareth Foundry & Machine Co., Nazareth, Pa., has been sold to New York parties, who will conduct the business as heretofore.

Canada's Import Trade with United States

Value of Metals, Minerals and Manufactures Was Largest on Record—Some Unusually Interesting Features of the Year Just Closed

BY WILLIAM LEWIS EDMONDS

Canada's import trade with the United States in metals, minerals and manufactures thereof during the fiscal year ending July 1, 1917, was in several respects of a more than usually interesting character.

In value the trade was the largest on record, being represented by the sum of $156,333,801. This is $10,273,138 in excess of the boom year 1913, when the total was $146,060,663. It is, however, when we compare these figures with those for 1915 and 1916 that the most striking results are obtained.

Nineteen fifteen was the year which saw Canada's import trade, as a result of the general business depression obtaining, recede to the lowest point it had touched for some years, the total value of the imports of metals, minerals and manufactures thereof from the United States being but $71,567,725, a decline of 51 per cent from the high record of 1913. Nineteen sixteen, however, saw a decided turn in the tide, largely the result of the substantial orders for munitions which were obtained by the manufacturers of Canada from the Imperial Government. Consequently, when the fiscal year 1916 closed, the imports under this classification from the United States had reached the sum of $96,216,802. And now for 1917, as already pointed out, we have a new record established.

The increase in 1917 was 62.48 per cent. over 1916, 118.44 per cent over 1915 and 7.02 per cent over 1913, the year in which the previous high record was reached.

A Summary of the Trade of 1917

	From U. S.	Total All Countries	Ratio from U. S.
Iron and steel and mfrs. of.	$119,754,265	$125,614,714	95.33
Machinery	33,154,265	33,859,689	97.91
Copper and manufactures of	8,567,018	8,599,764	99.62
Brass and manufactures of.	5,725,213	5,885,731	97.29
Tin and manufactures of...	8,865,045	10,317,431	85.92
Zinc and manufactures of..	2,118,756	2,119,342	99.95
Aluminum and aluminia....	1,666,359	1,670,248	99.76
Lead and manufactures of..	1,074,539	1,266,922	84.83
Ores, except iron.....	2,416,067	2,416,067	100.00
Other minerals and mfrs. of	2,313,097	3,025,923	76.46

But there is still another feature in connection with Canada's import trade in metals, minerals and manufactures thereof with the United States which is worthy of note, and that is the proportion it bears to the total imports from all countries. In the previous record year 1913, this proportion was 85.18 per cent. It receded slightly in 1915, being 84.83 per cent; but it rose to 93.04 per cent in 1916. During the last fiscal year, it did even better than that, namely, 94.50 per cent, which is a new record. It will, therefore, be noticed that in both value and proportion to total imports from all countries, a new record has been established in favor of American products.

Under the classification of iron, steel and manufactures thereof, Canada imported $119,754,265 worth from the United States during the fiscal year 1917. This was not a new record, but it was only approximately one-half of one per cent below the high-water mark of 1913, for which year the aggregate import value was $120,568,284. Could all the material wanted have been obtained, a new record would undoubtedly have been established. Over 1916 there was an increase of 39.66 per cent and over 1915 an increase of 116 per cent.

As the total imports of iron and steel and manufactures thereof from all countries during 1917 had a value of $125,614,714 it will be seen that 95.33 per cent of the whole came from the United States. This was a new record, for in 1916 the proportion was 93.58 per cent; in 1915, 85.58 per cent, and in 1913, 86.97 per cent.

In the machinery imported during the fiscal year 1917 there was a decline of 7.42 per cent in the value as compared with 1913, when the high-water mark was reached, but there was an increase of 68.75 per cent over 1916 and of 123.65 per cent over 1915. And here again, could delivery have been obtained, the gain would have been greater.

The aggregate value of all kinds of machinery imported by Canada from the United States during the fiscal year 1917 was $33,154,265, compared with $19,645,894 in 1916, $14,824,159 in 1915 and $35,815,369 in 1913.

Although in value the imports of machinery from the United States did not reach the figures of 1913, yet, in proportion to the total imported from all countries, it was the largest in history, being 97.91 per cent of the whole compared with 96.61 per cent in 1916; 90.49 in 1915 and 91.61 per cent in 1913.

As the larger part of the machinery imported into Canada is placed under the classification "machinery not otherwise specified," it is not possible, even were it desirable, to enter fully into details. Under the "not otherwise specified" classification, the value of the imports during the last fiscal year was $18,538,275. This was nearly six millions larger than in 1916 and a little over half a million dollars in excess of 1913. Under the definitely classified, portable engines with boilers rank first in value. Of these $3,258,958 worth were imported from the United States in 1917. This was a little more than double the importations in 1916, but short of the figures for 1913 by nearly 50 per cent.

Paper and pulp machinery is beginning to figure prominently in the Canadian import figures. Four years ago, it did not appear at all in the returns, being hidden away under one of the general classifications. In 1916 the import value of this description of machinery of American production was $319,247. Last year, however, it crossed the million dollar mark. Threshing machine separators increased from $624,544 in 1916 to $1,284,715 in 1917. But the latter was short of the figures for 1913 by over $800,000. Imports of carding and weaving machinery from the United States were valued at $1,488,820, which exceeded the figures for both 1916 and 1913 by over half a million dollars. Ore crushing machinery, which was $413,924 in 1913 and $328,939 in 1916, was $601,825 last year. Neither rolling mill nor saw mill machinery was classified in the returns for 1913, but in those for 1917 the former figured for $223,994 and the latter for $186,897. In 1916 the figures were $179,687 and $133,506 respectively. Printing presses imported from the United States were valued at $775,479, compared with $380,184 and $1,132,235 for 1916 and 1913 respectively. Typesetting and type-casting machinery imported was valued at $660,659, compared with $316,107 in 1916 and $435,541 in 1913. Bookbinding machinery was $311,525 compared with $158,086 in 1916 and $353,807 in 1913.

Enlarged Share of the Cutlery Trade

Notwithstanding that Canada's total import trade in cutlery is considerably smaller than it was before the outbreak of the war, owing to the difficulty of getting an adequate supply, the imports from the United States are in value more than double that which they were in any previous year, being $609,073, compared with $300,925 in 1916, $202,533 in 1915, and $288,354 in 1913. The increase in the year was 102.40 per cent. Compared with 1915 it was 196 per cent and with 1913, 111.22 per cent. The proportion which these imports from the United States bear to the total from all countries has also increased in a striking manner. Four years ago, when Canada imported $1,389,122 worth of cutlery, the

Principal Canadian Imports from United States in 1916 and 1917 and Total from All Countries in 1917

	From U. S., 1916	From U. S., 1917	All Countries, 1917
Electric motors, generators	$863,128	$1,397,483	$1,400,436
Agricultural implements	1,656,641	3,221,898	3,239,335
Axles and axle parts	1,049,951	1,966,423	1,966,423
Bar iron or steel	2,502,357	4,005,215	4,012,135
Canada plates, Russia iron, etc.	524,330	852,130	852,130
Castings, iron or steel	1,090,128	1,127,740	1,128,818
Cast iron pipe	65,927	133,491	133,491
Chains	171,302	272,953	274,137
Locomotives	190,617	912,380	912,380
Engines, gasoline and gas	3,376,288	4,788,804	4,788,880
Engines, steam	94,933	274,741	274,741
Boilers and parts of	186,450	326,482	479,202
Fittings for iron or steel pipe	452,208	718,694	729,786
Spiegeleisen and ferromanganese	90,513	372,670	504,212
Forgings	759,344	1,155,775	1,166,374
Builders' hardware	494,828	679,304	702,176
Iron or steel billets	845,552	497,710	499,307
Iron or steel ingots	375,319	466,191	466,371
Pig iron	726,150	1,306,244	1,321,023
Iron ore	1,735,322	3,342,171	4,332,657
Locks of all kinds	200,026	324,145	327,339
Cranes and derricks	275,625	450,572	450,572
Ore crushers, air compressors, etc.	328,939	601,825	631,047
Portable engines	1,166,967	3,258,958	3,259,671
Threshing machine separators, parts	287,637	452,595	452,595
Threshing machine separators	624,554	1,284,715	1,285,393
Sewing machines	307,998	364,242	381,044
Adding machines	145,815	358,624	358,934
Typewriting machines	377,024	692,718	692,800
Machines for bookbinders and printers	158,086	311,525	313,280
Printing and lithographic presses	380,184	755,245	758,402
Paper and pulpmill machinery	397,132	1,084,030	1,133,131
Rolling mill machinery	179,687	223,994	223,994
Saw mill machinery	133,506	186,897	188,810
Carding, weaving and spinning machinery	979,009	1,488,820	1,683,699
Machinery not specified	12,140,216	18,538,275	18,895,761
Washing machines	71,750	159,377	159,377
Wire nails	36,485	273,930	273,964
Pumps, hand	133,947	169,757	170,045
Pumps, power and parts	618,198	934,918	954,589
Steel rails	308,188	463,633	463,655
Railway fishplates	49,611	108,171	108,687
Angles, channels, beams, etc.	3,181,020	6,674,891	6,675,383
Boiler plate	184,536	608,606	608,606
Rolled iron or steel of greater value than 3½c. lb.	585,576	1,175,920	1,175,920
Iron tubing for bed mfrs	177,309	233,234	234,276
Sheets, plates, angles, etc., for ships	388,332	1,837,365	1,865,353
Galvanized sheets, flat	1,161,156	950,823	986,264
Locomotive and car wheel tires in the rough	319,322	963,102	1,023,575
Typecasting and typesetting machines	316,107	660,659	660,942
Machinery for beet sugar factories	39,679	414,571	414,829
Tin plates and sheets	3,256,156	6,334,732	6,479,653
Galvanized sheets, flat	1,161,156	950,823	986,264
Skelp for making iron or steel pipe	2,394,305	3,234,429	3,394,429
Wire rods	1,904,705	2,925,711	2,925,711
Barb wire	1,020,639	1,543,376	1,543,376
Boiler tubes for marine boilers	358,518	1,110,697	1,119,222
Wire, galvanized, No. 9, 12, 13 gage	1,636,960	1,173,957	1,173,957
Wire for rope making	71,650	109,805	201,363
Stoves of all kinds	220,482	399,194	399,713
Rolled iron or steel, hoop, band, scroll or strip, 14 gage and thinner	575,573	1,311,406	1,314,029
Rolled iron or steel sheets or plates, sheared or unsheared	558,518	1,531,831	1,531,912
Rolled plates not less 30 in. wide and not less ¼ in. thick	907,793	1,577,480	1,579,405
Rolled sheets, 14 gage and thinner	2,095,689	3,597,193	3,598,218
Screws	71,941	209,173	209,175
Scales	79,708	139,941	140,709
Shafting	87,132	325,945	339,922
Switches, frogs, crossings and intersections	44,208	117,804	118,604
Wrought tubing	343,176	742,324	744,104
Granite or enamelled ware	125,918	185,195	186,840
Ware, n. o. p.	92,480	145,394	150,456
Wire cloth and netting	146,554	215,895	216,777
Wire, crucible cast, valued not less 6c. lb.	65,879	110,328	110,414
Wire, covered	159,524	187,656	212,758
Wire of iron and steel, n. o. p.	176,225	339,392	341,368
Wire rope, n. o. p.	136,383	188,586	424,407
Nuts, rivets, bolts, hinges	184,923	544,507	549,931
Cutlery of all kinds	301,925	609,073	780,387
Guns, rifles and revolvers	486,259	642,551	665,268
Needles	101,020	137,158	234,211
Steel plate for bridges and structural work	896,074	1,409,191	1,409,191
Bars or sheets for shovel making	56,850	111,401	111,503
Rolled iron or steel and cast steel in bars, bands, hoops, etc., greater value 3½c. lb.	1,822,810	4,880,266	4,891,744
Hand tools	754,885	1,258,937	1,300,788
Manufacturers of iron and steel n. o p.	5,346,884	8,666,620	8,935,950
Electric insulators, sockets, telephone and telegraph instruments	3,366,861	4,173,816	4,290,516
Nickel plated ware	716,418	1,113,383	1,160,931
Gunpowder and other explosives	798,586	863,059	997,407

proportion obtained from the United States was 20.75 per cent, while last year it touched 78.47 per cent.

Marked Development in Imports of Tin Plate

For some years tin plate of American manufacture has been gradually supplanting the British product in the Canadian market. Last year it practically monopolized the market, securing 98.07 per cent of the total imports, the value of the imports from the United States being $6,334,732, compared with $6,479,653 from all countries. In 1913, when Canada imported $4,178,323 worth of tin plate from all countries the proportion credited to the United States was 86 per cent, but it dropped to 82 per cent in 1915, when the imports were the smallest for some years. With the revival in business in 1916, when a total of $3,415,306 worth was imported, 95.34 per cent of the whole came from the United States. Compared with 1916 the tin plate of American production imported in 1917 showed an increase of 94.53 per cent, while the increase over 1915 was 145.40 per cent and over 1913 it was 76.23 per cent.

In total imports from the United States in tin and manufactures thereof, a new record was established, the value being $8,865,045, compared with $5,236,072 in 1913, the previous high-water mark. This was an increase of 69.30 per cent.

Copper and Its Products

While under the general classification of copper and manufactures thereof Canada's imports from the United States in 1917 were in proportion about the same as for some years past, namely, over 99 per cent, the value was the largest on record, being $8,567,018, compared with $7,279,695 in 1913, when the previous highest point was touched.

Outlook for the Current Year

What the current year's trade will be, time alone will determine. That the outlook is promising there can be no doubt, and the extent of Canada's imports of iron and steel and manufactures thereof will largely be determined by the ability of United States manufacturers to satisfy the demand. Generally speaking, the crops are much more promising than they were a year ago, while the fact that the Dominion has just successfully floated a loan for $100,000,000 in New York will naturally tend to increase the volume of her imports from the Republic.

Will Build Wilputte Ovens

Announcement is made that the Wilputte Coke Oven Corporation, 6 Church Street, New York, has taken over the organization formerly operated by the Otto Coking Co., Inc., and will build the Wilputte regenerative by-product coke oven. The new company is financed entirely by American capital. Louis Wilputte, coke oven engineer, is president and general manager. A contract for 80 Wilputte ovens has just been awarded to the Wilputte Oven Corporation by the Steel Co. of Canada, Hamilton, Ont., and the new plant will be complete with by-product plant and coal and coke handling apparatus by December, 1918.

The Wilputte regenerative by-product coke oven has been installed or is under construction at the following plants: Mitsubishi Goshi Kaisha, Kenjiho, Japan, 50 ovens; Coal Products Mfg. Co., Joliet, Ill., 18 ovens; Tata Iron & Steel Co., Sakchi, India, 200 ovens; Woodward Iron Co., Woodward, Ala., 60 ovens.

The company will also build benzol apparatus, and plants of its construction are now in operation at Lackawanna Steel Co., Lackawanna, N. Y.; Republic Iron & Steel Co., Youngstown, Ohio; Citizens' Gas Co., Indianapolis, and Laclede Gas Light Company, St. Louis.

The fall meeting of the American Electric Chemical Society will be held at Pittsburgh on Oct. 2 to 5, at the William Penn Hotel. Social features are planned for the first day. In the morning of Oct. 3 and 4 papers will be read and discussed and on Oct. 5 industrial plants will be visited.

The Illiterate Worker in War Time

Progress Depends on Education—Some Suggestions in Regard to Teaching English—Bad Results Due to Ignorance—Obstacles in the Way

BY WINTHROP TALBOT, M.D.*

"WHAT possible difference does it make whether my men in the yard, shoveling or loading cars, or digging, can read or write? Can a man shovel faster, load more barrels, or do more rough work in a day because he can read? I don't want my men to be scholars. Workmen don't need educational frills."

This kind of commentary becomes less general among managers so fast as study of production cost becomes more general. Probably the "Safety First" campaign has been one effective means of showing the fallacy of such reasoning, because the unlettered yard-hand who cannot read the danger sign may become through his ignorance a cause of greater money loss by avoidable accident than it would cost to teach reading and writing to every illiterate workman in the plant. A reason for eliminating illiteracy which is even more important than the cost of avoidable accident is the fact that in these days information, opportunity and advancement all depend on ability to read.

What is to be done about the teaching of English? The night schools start out bravely each year with a promising attendance, although they attract only hundreds where thousands are in need of instruction. At the end of two weeks, about one-third of those who attend have ceased attendance, and at the end of a few weeks the classes are small and often end prematurely. Some of the charitable organizations present notable figures of work accomplished in teaching foreigners the American language, but in spite of all efforts the number of non-English speaking people has steadily increased since 1880 and notably within the 15 years prior to the diminution of immigration in 1914 at the opening of the war.

Effects of Ignorance

The barrier set up by the absence of a common language becomes stronger, more threatening, misunderstandings occur, suspicion, race friction, waste and inefficiency interfere with normal industrial production, a state of things to be deplored in times of peace, but scarcely to be tolerated in war time. Is it not of the utmost importance to the nation entering now upon a struggle which already is drawing enormously upon even our huge resources, to remove all needless sources of misunderstanding and friction in industrial establishments? A few alert-minded managers have undertaken to require the use of English on the part of all operatives and employees. Some of the mills employing large numbers of French Canadians have been highly successful in this regard, and a number of automobile factories have regularly organized classes in English. But after all if we regard the whole industrial field, these may be considered as exceptional rather than as typical. The thousands of garment factories employing scores of thousands of Yiddish-speaking employees, and the mines, factories, mills, refineries and meat-packing establishments as yet have not given their attention to teaching English to their alien workers. They are apparently oblivious to the economic value of this important aspect of industrial management.

Probably the best example shown by the records of the past three years as illustrating good method in handling this problem is in an undermuslin factory in New York City, which has co-operated each year with the public schools in carrying on daily classes in its workrooms during work hours without loss of wage for its illiterate and non-English speaking women employees.

The following outline shows what has been accomplished each year for really Americanizing its Italian and Yiddish-speaking workers.

There are many difficulties technical in nature which prevent teaching of English from being effective. Many of these difficulties have not been studied at first hand in the places of employment, and as a result the school people have not successfully analyzed the reasons for the downward attendance curve in the night schools. As it is the purpose here to deal with the teaching of English from the point of view of the manager rather than from that of the teacher, no attempt will be made to enter into school methods or the details of school technic. It is important, however, to emphasize the fact that on the shoulders of industrial management rests the major share of responsibility for the alien's disabilities, not only industrial but also social and political, for it is clear that unless industrial economic pressure is brought to bear and men and women are led to realize that their jobs and advancement are affected to their loss by ignorance of English, it is hard to overcome the inertia and lack of initiative which keep them ignorant of the language.

A Bit of Experience

Tony Machetie, two years out from Sicily, grins pleasantly and shakes his curly black head when asked to come to school. He is earning good money and likes to play ball in spare time. Tony cannot speak English, but why should Tony worry? He can earn as much without English as with it. But if his big boss in the office made it quite clear to him that the works were really American and that American was the language which had to be mastered, probably Tony would be apt to agree and would buckle to the task. It would be poor policy perhaps to make hard and fast requirements of an arbitrary sort and attempt to force workers unwillingly; on the other hand, it is perfectly possible to set inducements which would make the learning of American not only natural but practically inevitable.

Changing of shifts is an interruption to classwork at night school and probably accounts for many who start and leave at the end of two weeks or four weeks. If a man is on a day shift for two weeks and then changes to night shift, of course attendance in a scheduled class becomes impossible, and when he is able to attend again, the class has progressed so far beyond him that he cannot make up the work and so falls out.

Shift work affects the attendance of women also on night classes because they have to be at home when their men folks are at home. Therefore in such cases the class work must be arranged to meet the convenience and needs of workers in this respect.

Another obstacle found in teaching English to aliens lies in the fact that their need of English is largely a matter of dollars and cents. Unless they know that the pay envelope will be better filled as a result of learning the language, there is difficulty in arousing interest. Interest in learning English being exceedingly limited especially among illiterates, in order to increase it there must be a close link between their industrial work and their classroom work. This, however, seldom is the case. Even the textbooks employed for the purpose of teaching English to aliens are almost always lacking in this regard; and speaking of textbooks, we find that many of the first principles requisite to arouse interest are lacking in nearly all of them. They seem to be based on the idea that the alien adult is a mere child with only the child's background of experience, but when a man has had the courage, ambition and initiative to leave his native land for a 5000-mile journey to a strange country, dependent wholly on his own strength, health and skill to earn a living; when,

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for instance, he has landed at Galveston and worked at Fort Worth on a farm, at Kansas City and Chicago in the stockyards, at Gary and Kenosha in steel processes, in New York in the subways, and Bayonne in oil refining, that man is no child in experience. The fact that he speaks Russian, Polish, Lithuanian, does not help him much in understanding American, and he may seem awkward, slow, and even stupid in the mistakes he makes, but his mind is often more keen than that of the foreman or the teacher if they were only alert enough to know it. He is not interested in Mary's thimble or the account of Fido wagging his tail, even though such be thrilling to the last degree for the enraptured schoolchild. Perhaps this sort of thing doesn't really interest even the little child. Fortunately we can now obtain something of more practical use than the conventional textbook for teaching English.

The Wrong Emphasis

Another fault in many classrooms is the emphasis laid on trying to teach English by repetition of phrases which would never be used in ordinary human intercourse and by the neglect to link up English words with their equivalents in other languages. It is perhaps unwise for the teacher to use the foreign language in teaching English, but it is of importance not to waste time and put a premium upon inaccuracy by failing to give the foreign equivalent of the words used in the lesson. Every lesson should be made plain and effective by the use of the balopticon, the stereopticon, the graphophone, and the telephone receiver; moreover, the work may be objectified to the greatest advantage by having at hand and in daily classroom use a full equipment of all the ordinary tools, utensils and materials commonly talked about, with the technical names of tools clearly shown and with appropriate descriptive labels attached.

Perhaps enough has been said in this brief article to indicate some of the difficulties, some of the advantages and some of the methods which should be taken into consideration by the industrial manager in dealing with the non-English speaking alien. Certain it is that it cannot be considered a waste of time in any plant, however rushed with wartime production, to take the comparatively few hours requisite to transform the uncomprehending alien into a worker able to understand ordinary English.

Will Discuss Labor Problems

The Civic and Industrial Bureau of the Merchants' & Manufacturers' Association, Baltimore, Md., has taken up the labor problem and A. S. Goldsborough, director of the bureau is hard at work on it.

Through the efforts of the organization 28 employment managers of large manufacturing concerns held a conference recently at which the various problems were discussed. W. C. Robinson, of the Manufactures Committee of the association, presided. The conference considered the establishment of a Labor Clearing House by the bureau; certain advertising which is causing a curtailment of Baltimore's labor supply and producing restiveness among laborers, and the organization under the supervision of the bureau of a circle composed of employment managers which will meet at regular intervals for the discussion of labor problems for the purpose of bringing about closer co-operative action among the employment industries, thereby leading to a removal of some of the labor problems.

The Labor Clearing House plan was indorsed and strong resolutions were passed requesting the Baltimore press to refuse any out-of-town advertisements which seek to induce labor to leave Baltimore. The Employment Managers' Circle also was indorsed and Director Goldsborough authorized to proceed at once with the development of the plan.

The Cayuga Steel Co., Ltd., Auburn, N. Y., has completed the main buildings of its new plant for making crucible and electric furnace steel, and is about to begin operations with two 28-pot crucible melting furnaces and two electric furnaces, a hammer plant and rolling mills. A brief description of the equipment which is to produce straight carbon and alloy steels was given in THE IRON AGE of April 5, 1917.

New Water Route for Shipping Pig Iron

With a view of aiding the Government plan of conserving railroad rolling stock and using water transportation for freight wherever it is possible to do so, the Keystone Steel & Wire Co., Peoria, Ill., of which W. H. Sommer is president, has successfully concluded an interesting experiment, moving 1200 tons of pig iron over 681 miles from Sheffield, Ala., to Peoria almost entirely by water. The movement was over four rivers, the Tennessee, Ohio, Mississippi and Illinois, and from an operating standpoint was a complete success, though the trip was marked by a few minor mishaps. Whether or not the expense of the trip exceeds the present rail



Transporting Pig Iron by River

cost the company has not yet been able to determine, and may not be able to do so until a few more trips have been made. It is believed by the company that this is the longest inland movement of pig iron made by water by any single manufacturer.

The pig iron was conveyed by three barges towed by a tug, obtained from the Pittsburgh Coal Co. The pig iron was made at Birmingham and shipped by rail in 35 cars to Sheffield, 156 miles away. There were no adequate facilities available for loading the iron and the Government finally loaned the company machinery. The War Department took an interest in the Keystone company's experiment and sent a representative, Capt. W. S. Winn, to report on its success. At Peoria the iron was easily unloaded with the aid of an electric magnet.

If it is found feasible to make this waterway route a permanent one for the transportation of pig iron from Alabama to points in the Central West, there is said to be a possibility that a loading wharf may be equipped at Riverton, Ala., 40 miles below Sheffield, where machinery for quick loading would be provided. The Government's interest in the experiment seems to indicate that some action along this line may be taken.

Spain's New Iron and Steel Plant

A new iron and steel plant to be erected at Seville, Spain, is to have an initial capacity of 50,000 tons of pig iron and a like amount of shapes and ship plates per year. The iron ores will be mostly Spanish, coking coal will be obtained from the county of Durham in England and the gas coal for the basic open-hearth furnaces will come from Cordoba. The scheme includes a by-product coke plant with an annual consumption of 75,000 tons of coking coal, the waste gases being used in reheating furnaces. The slag is to be used for making cement.

The Parker Mfg. Co., Detroit, has elected the following officers: President and treasurer, Gorham C. Parker; vice-president, David J. Rice; secretary, Howard K. Chambers. The directors are the officers and Charles D. Bennett and Kenneth P. Albridge. The company, which had been operating since October, 1916, was incorporated in July with an authorized capital of $75,000. It is manufacturing drill chucks and arbors.

The New England Machinery Co., New Haven, Conn., builder of machinery for electrically heating and driving rivets, has opened a sales office at 50 Church Street, New York.

Wonderful Record of Steel Exports

Very Heavy Movement in June Carries Total for 1917 Far Above Other Years—Machinery Exports Also Make a New Record

WASHINGTON, Aug. 14.—All records for exports of iron and steel by values fell before the huge totals shipped in June, which carried the aggregate of the fiscal year 1917 no less than 82 per cent above the level of 1916, exceeding that of any previous fiscal twelve-month by nearly 150 per cent. Tonnage commodities in June came within a hair's breadth of the record figures of last September, while for the fiscal year 1917 they scored a phenomenal gain over 1916. Machinery exports made a new record in June and for the fiscal year far surpassed the shipments of 1916. Obviously the submarine has had no influence whatever upon these unprecedented shipments, which are of special interest at this time in view of the establishment on July 15 of embargo regulations, which are counted upon to cause substantial reductions in our exports of certain important items of iron and steel.

Exports of iron and steel by values during June gained 56 per cent over the corresponding month of 1916 and 7.2 per cent over the high record of March, 1917. Commodities reported by tonnage gained 20 per cent in June over the same month a year ago and fell less than 2 per cent short of the high water-mark reached last September. For the fiscal year, the exports of tonnage iron and steel rose 40 per cent above the total for 1916, which far exceeded the record of any previous fiscal year. Shipments of machinery in June received a new impetus, breaking all previous records, gaining 3.6 per cent as compared with the corresponding month of 1916 and surpassing the high water-mark of last August by 1.4 per cent. For the fiscal year, these exports showed a gain of 43 per cent over 1916. While machine tools gained 1.4 per cent in June as compared with the corresponding month of 1916, they were 13 per cent below the record figures for May of last year when many large British and French munitions factories were in process of equipment. For the fiscal year, however, machine tools showed a gain of 38 per cent over 1916.

The value of all shipments of iron and steel products in June, 1917, was $119,141,836 as compared with $76,257,884 for the same month of 1916 and $111,164,876 for March of this year, the highest previous record. For the fiscal year 1917, the total was $1,129,341,616 as compared with $621,209,453 for 1916 and $251,480,677 in 1914, the highest level reached in any preceding fiscal year. Exports of machinery in June were valued at $27,946,036 as compared with $20,541,139 for the same month of 1916. For the fiscal year 1917, the total was $262,241,278 as against $182,677,065 for 1916. The best previous record, that of 1914, was $115,658,814. Shipments of metal-working machinery aggregated $8,587,248 in June, 1917, as compared with $8,465,985 for the same month of 1916. For the fiscal year 1917, these exports totaled $84,935,410 as against $61,315,032 in 1916 and $28,162,968 in 1915. Details of the exports of machinery in June, 1916 and 1917, and for the two fiscal years are given in the accompanying table.

Exports of Iron and Steel (Gross Tons)

	June		Fiscal Year	
	1916	1917	1916	1917
Pig iron	48,770	81,999	286,399	833,523
Scrap	15,867	9,692	154,709	237,801
Bar iron	6,056	5,952	70,519	64,682
Wire rods	18,045	17,128	171,528	147,258
Steel bars	61,017	52,258	625,138	749,998
Billets, ingots and blooms, n.e.s.	116,425	192,133	962,229	1,936,252
Bolts and nuts	2,156	2,798	30,844	29,546
Hoops and bands	4,007	5,876	41,256	48,089
Horseshoes	1,369	256	13,126	4,278
Cut nails	372	359	4,420	4,610
Railroad spikes	2,099	2,278	26,405	19,106
Wire nails	17,187	9,824	128,762	124,681
All other nails, including tacks	1,067	2,934	9,634	19,447
Wrought pipes and fittings	12,161	16,072	125,628	169,472
Cast-iron pipes and fittings	5,879	6,915	52,617	75,385
Radiators and cast-iron house heating boilers	193	1,014	2,263	4,901
Steel rails	49,772	42,078	541,810	602,065
Galvanized iron sheets and plates	4,048	7,735	42,631	52,586
All other iron sheets and plates	4,058	7,735	42,631	52,586
Steel plates	18,662	61,197	271,280	422,396
Steel sheets	9,969	20,316	98,546	127,964
Structural iron and steel	25,034	19,506	276,866	339,480
Tin and terne plates	29,751	25,460	230,473	232,949
Barb wire	37,499	17,369	364,244	303,203
All other wire	30,333	21,919	251,518	242,229
Total	527,542	631,712	4,862,154	6,885,543

Exports of iron and steel for which quantities are given aggregated 641,712 gross tons in June, 1917, as compared with 527,542 tons in the same month of 1916. The record for exports of these commodities is still held by September, 1916, with a total of 643,763 gross tons.

Exports of Machinery

	June		Fiscal Year	
	1916	1917	1916	1917
Adding machines	$117,972	$210,584	$1,074,299	$1,846,802
Air-compressing machinery	84,354	109,396	574,396	1,135,661
Brewers' machinery	106	7,586	28,726	65,365
Cash registers	129,676	102,728	1,444,350	1,387,258
Parts of	9,777	3,073	118,545	114,126
Cotton gins	3,876	12,796	65,721	115,005
Cream separators	32,636	60,467	488,984	499,034
Elevators and elevator machinery	127,054	260,232	1,494,411	2,220,689
Electric locomotives	17,681	18,227	454,544	527,034
Gas engines, stationary	21,214	80,909	352,299	718,101
Gasoline engines	1,565,383	2,769,473	11,888,531	18,954,667
Steam engines	836,727	3,538,825	13,499,320	20,760,625
All other engines	664,716	390,292	3,463,036	4,890,149
Parts of	866,222	1,886,004	7,273,523	18,996,186
Laundry machinery, power	35,070	78,584	295,018	392,559
All other	13,460	31,936	252,723	314,380
Lawn mowers	26,341	35,722	201,258	199,715
Metal-working machinery (including metal-working tools)	8,465,985	8,587,248	61,315,032	84,935,410
Meters, gas and water	32,045	68,325	290,499	429,659
Milling machinery (flour and grist)	323,919	90,768	2,749,734	1,132,834
Mining machinery, oil well	148,456	180,279	1,332,246	1,922,305
All other	518,593	1,115,107	6,241,333	10,124,013
Paper-mill machinery	36,601	124,549	858,234	1,839,570
Printing presses	206,955	209,289	1,647,998	1,899,786
Pumps and pumping machinery	494,104	537,319	4,718,185	6,134,611
Refrigerating and ice-making machinery	31,591	113,829	686,918	904,033
Sewing machines	426,481	806,561	5,422,182	6,536,862
Shoe machinery	83,713	139,161	1,266,221	1,365,364
Sugar-mill machinery	397,801	710,398	5,987,491	11,026,767
Textile machinery	369,676	353,475	2,705,827	3,548,278
Typesetting machines	77,714	149,593	884,021	1,161,873
Typewriting machines	1,114,025	1,062,004	9,104,189	11,162,423
Windmills	105,888	51,100	1,087,964	895,223
Wood-working machinery, saw mill	31,135	34,359	360,688	458,877
All other	56,649	72,704	1,076,845	985,998
All other machinery and parts of	3,068,543	1,943,134	31,971,774	42,640,036
	$20,541,139	$27,946,036	$182,677,065	$262,241,278

Imports of Iron and Steel (Gross Tons)

	June		Fiscal Year	
	1916	1917	1916	1917
Ferromanganese	....	3,817	....	73,741
Ferrosilicon	536	869	5,469	8,715
All other pig iron	13,360	1,798	112,718	35,795
Scrap	3,868	15,598	96,012	223,834
Bar iron	1,251	142	8,241	4,383
Structural iron and steel	279	94	1,581	1,020
Hoops and bands	....	2	1	26
Steel billets without alloys	254	4,345	11,325	16,920
All other steel billets	1,953	624	12,630	11,097
Steel rails	4,711	970	53,944	14,067
Sheets and plates	91	139	1,709	1,866
Tin and terne plates	91	2	802	612
Wire rods	494	21	4,619	2,085
Total	26,888	28,421	309,051	395,161

For the fiscal year 1917, these shipments aggregated 6,885,543 gross tons as compared with 4,862,154 tons for the same period of 1916. The accompanying table shows the exports for June and for the fiscal year ended June, 1917, as compared with 1916.

Imports of tonnage iron and steel continue to show small totals. Declines in the receipts of ferromanganese and steel rails have more than offset increased imports of scrap. The importations for the month, however, are slightly in advance of those for June, 1916, aggregating 28,421 gross tons as compared with 26,888 tons. The imports for the fiscal year 1917 were 395,161 gross tons as compared with 309,051 tons for 1916. The accompanying table shows the imports of tonnage commodities for June and for the fiscal year 1917 as compared with 1916.

Chester Shipbuilding Co. Reorganized

A reorganization of the Chester Shipbuilding Co., Inc., Philadelphia, has been announced. Hereafter the Chester Shipbuilding Co. will control only the shipbuilding plant at Chester, Pa., and the plant recently acquired at Bristol, Pa., will be under the control of the Merchants' Shipbuilding Corporation, which was recently incorporated by Arthur P. McKinstry, a lawyer. 60 Wall Street. Officers for the Merchants' Shipbuilding Corporation and the Chester Shipbuilding Co. are the same and have elected as follows: Chairman of board of directors, W. A. Harriman; president, R. H. M. Robinson; vice-president and comptroller, C. B. Seger, all of 165 Broadway, New York; vice-president, Carl W. Hamilton; secretary and treasurer, William M. Simpson, both of 50 Broad Street, New York; general manager, W. T. Smith; consulting engineer, C. P. M. Jack; engineering manager, Max Willemstyn, all of Finance Building, Philadelphia.

The Merchants' Shipbuilding Corporation has obtained a contract from the Emergency Fleet Corporation to build 20 or more steel cargo-carrying steamers. The Chester Shipbuilding Co. is reported to have received a similar contract. These contracts are based upon a tentative contract price, but the Government agrees to reimburse the companies in case of any loss, and will pay a substantial bonus for quick delivery of ships and the saving of costs of construction.

Permits were recently granted by the Commissioner of Navigation of the Delaware River for the construction of 12 steel shipways at the Bristol plant and four at the Chester plant. The Chester plant already has six berths.

Munition Steel Output in India

In the financial year 1915-1916 the Indian Government took 85 per cent of the output of the Tata Iron & Steel Co., Ltd., for munitions. India's production of iron and steel is now sufficient to supply the requirements of the country, according to a report in the London *Ironmonger*, and to send a fairly large tonnage to Australia and the Far East, where Indian brands are beginning to be well known. The principal customer is Japan.

THE IRON AGE has an inquiry from Norway for the names of manufacturers of machinery for converting sawdust into marketable products; also for the names of manufacturers of presses for making briquettes of sawdust. Replies addressed to this office will be forwarded.

WILL BUILD HEAVY GUNS

Tacony Steel Co. Organizes Tacony Ordnance Corporation and Will Erect $1,500,000 Plant

The Tacony Ordnance Corporation has been organized by the Tacony Steel Co., Tacony, Pa., and will construct a large plant for the forging of 6-in. howitzers for the United States Government. The company has a capital stock of $100,000, but will expend about $1,500,000 for buildings and equipment. Purchases of equipment will be made through the War Department.

J. B. Warren, general manager and secretary of the Tacony Steel Co., which was formerly the Philadelphia Steel & Forge Co., is president of the new concern; W. C. Pearson is vice-president and O. W. Bird, Jr., treasurer. These three constitute the board of directors.

A site for the new plant has been acquired at Tacony, Pa., consisting of about eight acres. Several buildings, including a forge shop and machine shop, will be built at once. The machining of the big guns will be done at one of the Government arsenals.

It is understood that the Bullard Machine Tool Co., Bridgeport, Conn., will proceed with its plans to construct a plant for Government gun work, though no definite announcement has been made.

The Government's efforts to add to the ordnance plants of the country has borne fruit with remarkable rapidity, the plants of the Wisconsin Gun Co., Milwaukee, the Northwestern Ordnance Co., Madison, Wis., the Inland Ordnance Co., Bedford, Ohio, the Symington-Anderson Co., Rochester, N. Y., and the American Brake Shoe & Foundry Co., Erie, Pa., being already under way, while plans now under consideration for similar plants are said to involve the Otis Elevator Co., the Niles-Bement-Pond Co. and other concerns.

A Blast Furnace in Siberia

A Siberian blast-furnace plant, the Abakansk Iron Works, has been purchased by a Swedish financial group. The plant, located on the Yenesei River, had been abandoned owing to lack of transport, but is to be enlarged and re-equipped and started up for the manufacture of agricultural implements and machines on a large scale. The Atchinsk-Minussinsk Railway, which is now nearing completion, passes close to the works. The Abakan deposits, from which the iron ore will be obtained, have been worked in a desultory way since 1885. They are said to contain 12,000,000 tons of ore. The ores are magnetic and yield as high as 66 per cent of iron. The Abakan River affords excellent facilities for the transport of the ores and coking coal is close at hand. Coal from the Kuznetsk basin can also be utilized. In addition to above development another company is planning the establishment of a large metallurgical and coke plant near Kuznetsk. Hitherto the supplies of iron required for western and central Siberia have been obtained for the most part from the Ural district or South Russia. The development of the two undertakings, however, should result in the production locally of many of the iron products that are required in the territory such as agricultural implements, rails, mining machinery, iron roofing sheets, etc.

Tests of pipe coil and cast-iron heaters for warming air, as in forced blast systems, were made under the direction of Prof. John R. Allen, while professor of mechanical engineering, University of Michigan (now of University of Minnesota), and the report of the tests has been reprinted from the Journal of the American Society of Heating and Ventilating Engineers. It can perhaps be had on application to the American Radiator Co., 816 South Michigan Avenue, Chicago.

The American Sheet & Tin Plate Co., Sharon, Pa., is now employing women in its cold-roll department at the Farrell mills. Applications for positions have been received from about 50 additional women to take the places of men called into military service.

STANDARD TIN PLATE PLANT

Powdered Coal Equipment Has Been Installed—Gas Shortage Expected

The Standard Tin Plate Co., whose plant is located at Canonsburg, Pa., 23 miles from Pittsburgh, on the Panhandle route, Pennsylvania Lines West, has more than doubled the size of its plant in the past year, and now has one of the largest and most modern independent tin plate mills in the country. It was originally started in 1904, with four hot tin mills, but in 1906 six more were added. In the past year 13 additional hot tin mills have been built, so that the plant now contains a total of 23 hot tin mills, 23 sheet and 23 pair furnaces, and there are 18 24-in. cold mills serving the hot mills. The tinning department contains 46 jumbo tinning pots, of which 40 are for bright plate and six for terne plate. The sheet bar building is equipped with two 25-ton Morgan cranes. The bars are unloaded by these cranes. After being weighed, they go directly to the heating furnaces, and after being reheated, follow the usual processes of making bright and terne plate. The black pickling department is equipped with two 4-arm Mesta pickling machines, with a capacity for pickling about 1840 tons of plate per week. The white pickling department has one 4-arm pickling machine.

The plant has a monthly capacity of about 150,000 base boxes, about 95 per cent of which is bright plate, and the remainder terne plate. The Continental Can Co. has its Canonsburg plant just adjacent to the works of the Standard Tin Plate Co.

Main additions recently made by the Standard Tin Plate Co. are to the power house and the installation of modern powdered coal equipment, the latter having been built by the Bonnot Co., Canton, Ohio. It is probable there will be a shortage of natural gas the coming winter, and the company installed the powdered coal equipment, both from the standpoint of economy in cost, and also to be prepared against the expected shortage of natural gas.

Powdered coal is now used for fuel with very satisfactory results in firing the sheet and pair furnaces, while two of the nine annealing furnaces are also fired with this fuel, and seven are heated with natural gas, but these will also be changed to powdered coal as soon as new equipment now being installed has been completed, which will be about Oct. 1. The power house is contained in a brick building, and is equipped with two 300 hp. Crocker-Wheeler generators, power being obtained from the lines of the West Penn Power Co., which also furnishes power to all the cranes, also for electric lighting in all departments of the plant, and to the small motors in the tinning house. Of the 23 hot tin mills, 16 are now driven by two 1200-hp. Crocker-Wheeler motors, equipped with Mesta gears, eight mills being driven by each motor. The other seven mills will be driven by a third Crocker-Wheeler 1200 hp. motor, to be installed within a short time. Of the 18 cold mills, 14 are driven by a Crocker-Wheeler 1200 hp. motor. When the additional motor is installed, all the hot mills will be electrically driven. The nine annealing furnaces in the plant are served by two 25-ton Shaw electric cranes. Of the 46 jumbo tinning stacks in the tinning departments, one is being fired with powdered coal, and the others will be changed to this fuel later.

Probably the most important addition made to the plant is the powdered coal equipment. The coal is secured from the Canonsburg Gas & Coal Co., which has coal mines nearby. The powdered coal plant is being materially enlarged, and when additions have been completed this coal will be used entirely for fuel in the plant. The company has also made various other additions, these including a general machine shop for repair work, equipped with lathes, planers, etc., a new grease house for storing grease for the hot mills, a new millwright shop, and a new hot mill office. There are also being installed two hydraulic sheet scrap bundlers. built by C. Logeman Brothers, Milwaukee. These will have a capacity for handling 27 bundles of sheet scrap per hour, each bundle weighing 450 lbs. The company has about 20 acres of ground, nearly all of which is taken up by mill buildings, the hot mill building being 1000 ft. long by 100 ft. wide, with lean-tos on either side of the same dimensions.

The Standard Tin Plate Co. was originally organized in 1903 by Louis Follet and others, Mr. Follet having been connected for some years with the Gas City, Ind., plant of the American Sheet & Tin Plate Co. Mr. Follet is president, B. W. Bennett is vice-president and treasurer, W. J. Reese secretary, and W. J. Lynch, for some years with the National Enameling & Stamping Co., Granite City, Ill., is general works manager.

Big Gun Plant Going Up in Rochester

Work has been started on the new plant for the Symington-Anderson Co., Rochester, N. Y., which has received a Government contract for 3000 3-in. guns, with a possibility that the order may later be increased to 4000. The Crowell-Lundoff-Little Co., Cleveland, has the contract for the building, which will be of steel frame and brick, 650 ft. long, 227 ft. wide and 30 ft. high.

The Symington-Anderson Co. was recently incorporated with capital stock of $1,000,000, having been requested by the Government to undertake the building of guns. T. H. Symington, of the T. H. Symington Co., Rochester, maker of railway equipment, and the Symington Machine Corporation, is president of the new company, and M. H. Anderson, formerly of the Bethlehem Steel Co., is vice-president.

It is said that the contract which the Symington-Anderson Co. has received is one of the largest which has been let in Washington. The guns will cost between $8,000 and $10,000 each, it is reported, thus aggregating in the millions. The building will be constructed as quickly as possible, as it is to be a temporary one.

New Shipyard at City Island, N. Y.

The American U-Boat & Arms Corporation, 21 Park Row, New York, has recently acquired the ship repair yard of Hawkins & Miller at City Island, N. Y., and is rebuilding and equipping it. Four new shipways will be constructed, each 60 x 400 ft. and wooden, steel or composite cargo-carrying steamers of 3500 to 4000 tons will be built for the Emergency Fleet Corporation. The corporation has not received a formal contract from the Government, but expects one soon. Later on, a plan for building cargo-carrying submarine vessels will be submitted to the Government, delay in this matter being caused by controversy over submarine patents. Present plans contemplate the completion of six vessels a year. A two-story building, 60 x 380 ft., has been erected and contains plate shop, sawmill and carpenter shop, mold loft, etc. A machine shop, 70 x 100 ft., is being built and plans provide for a blacksmiths' shop, power house and administration building. A. J. Hyman is president of the concern and S. Wiebe is chief engineer.

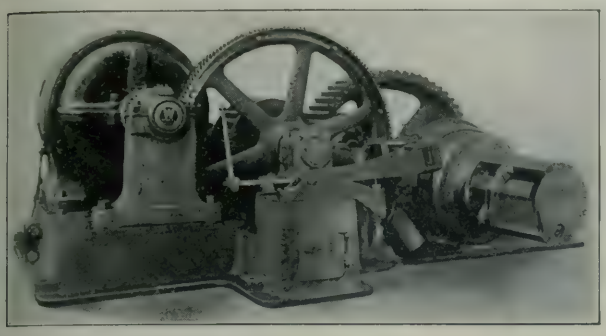
Afternoon Rest Period Instituted

A "seventh inning stretch" has been instituted at the Brooklyn plant of the Syracuse Smelting Works. At 3.15 each afternoon, the telephone operator sounds a long ring and for fifteen minutes there is a cessation of work. Among other innovations are a lunch-room and shower-baths for the men at the furnaces.

Coal production statistics compiled by C. E. Lesher, United States Geological Survey, show that in 1916 about 820 tons of coal were produced per employee, while in 1915 the production per employee averaged 725 tons. The total production in 1916 was about 590,000,000 tons, or about 11 per cent more than in 1915, while the number of employees was 721,000, or about 2 per cent less than the number in 1915. The average number of days worked in 1916 was 235 and in 1915 209.

Motor-Driven Wire Drawing Machines

Two types of machines for use in wire drawing shops have been further developed by the Morgan Construction Co., Worcester, Mass. One is a two-block



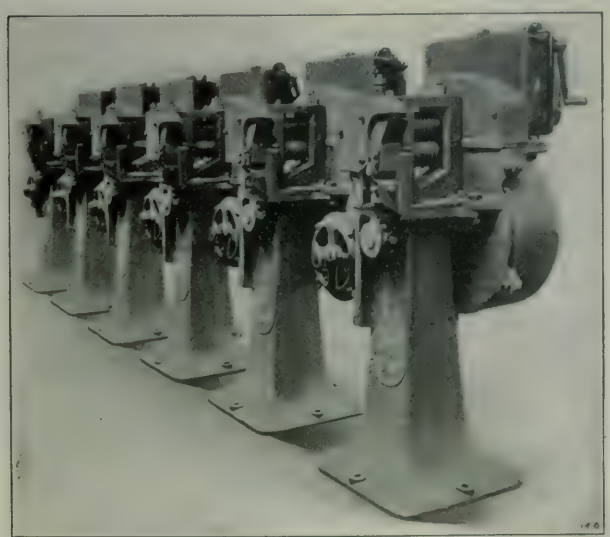
The Pull Is Close to the Main Bearing and the Coiled Wire Moves Out to the End of the Block Which Can Be Instantly Stopped by Operating an Internal Friction Clutch

horizontal spindle bull frame for drawing wire ranging from 7/16 to 1 in. in diameter, while the other is a wire pointing roll arranged with the driving motor mounted on the frame.

The special feature of the bull frame is the winding block. This is arranged so that while the pull, which ranges from 10,000 to 20,000 lb. at the die, is always close to the main bearing, the coiled wire moves out to the end of the block in a regular helix without bunching or crowding. The individual drive, it is pointed out, provides quick stopping and safety, and in addition a friction clutch is located in each block to instantly disengage it from the driving mechanism. In this way, it is pointed out, the drawing may be stopped at any time regardless of the strain on the block.

Square, hexagonal and round sections are handled by the machine which is intended for heavy work at high speeds. The machine illustrated is driven by a 150-hp. type CS Westinghouse induction motor, and other sizes driven by motors down to 50 hp. are built.

The wire pointing rolls are intended for shops that prefer individual drive, and among the advantages claimed for the arrangement of mounting the motor on the frame is a compact unit since the external apparatus and overhead connections have been eliminated. The machine consists of a pair of rolls revolving so as to feed material toward the operator, a number of grooves being provided to take care of various sizes of wire. The cross-section of these grooves diminishes around the circumference, so that the end of a wire placed in the open part of the groove is pushed back by the rolls and the end tapered. The pointed end is then threaded through the die in which the wire is to be drawn. These machines are driven by a 3-hp. CS Westinghouse induction motor operating at a speed of 1700 r.p.m. The motor is started and stopped by a conveniently located starting box.



The Mounting of Electric Motors on the Frames of Wire Pointing Rolls Provides a Compact Unit

Reversing Alternating Current Switch

An oil switch suitable for use in starting alternating current motors up to 10 hp. by connecting them directly to the supply circuit has been developed by the Crocker-Wheeler Co., Ampere, N. J. The switches are also arranged for reversing operations and are characterized by simple and rugged construction. The switch consists of one set of moving and three sets of stationary contacts, an arrangement which gives a large break on two points for each pole.

The moving contacts are mounted on a fiber-insulated rod and are free to turn on their axis. This arrangement, it is emphasized, presents a new contact surface to the fixed contacts, thus prolonging the life of the switch. These contacts press against the center row of stationary contacts and one of the outer rows when the switch is in the forward position and against the center row and the other outside row of contacts when the switch is in the reverse position. The contacts are immersed in oil, the containing tank being bolted to the upper part of the switch. In this way, it is pointed out, oil cannot be splashed into the wiring chamber under ordinary conditions of use. The terminal board is provided with heavy binding posts and is rendered readily accessible by the use of a removable cover. No special fittings are required where the



Small Alternating Current Motors Can Be Started by Connecting Them Directly to the Supply Circuit and Reversed at Will

switch is installed in connection with conduits. The operating handle, shaft, star wheel and bell crank arm are one integral casting, the indications of the various positions of the operating handle being cast in the case. For mounting the switches on a wall, machine or post, lugs are provided.

The switches can be furnished with or without latches for holding the contacts securely in the desired position, but none are needed where the switch handle is operated by a rod or arm from an adjacent point. Where this form of operation is employed, it is explained that the friction between the arm or rod and its supports is sufficient to hold the switch contacts in the proper position. If desired, the switches can be furnished for single-throw operation, the movement of the handle being either to the right or the left.

Increased Efficiency

WASHINGTON, Aug. 14, 1917.—The railroads of the country are showing a marked increase in efficiency as the result of the adoption of the program of the War Board. The special committee on national defense of the American Railway Association announces that actual returns from railroads having 173,105 miles of line show that in May last year these systems gave service equivalent to carrying 25,426,845,011 tons of freight one mile, while this year they carried 29,522,870,109 tons one mile, an increase of exactly 16.1 per cent. This great increase in service was rendered with a very slight increase in the amount of equipment used.

The Shepard Electric Crane & Hoist Co. has located an export department at 30 Church Street, New York.

Government Control of Iron and Steel

A Bill Providing for the Taking Over of Manufacture and Sale, as in the Case of Coal and Coke

WASHINGTON, Aug. 14.—For the purpose of guaranteeing reasonable prices of iron and steel to private consumers as well as to the Governments of the United States and the Allies, Senator Pomerene of Ohio, a leading member of the Senate Committee on Interstate Commerce, has introduced a bill giving the President substantially the same authority with respect to the prices and distribution of "iron, iron ore, steel and their products," as is provided by the Lever act with reference to foods, feed, fuels and other articles included within the provisions of that measure. The bill has been referred to the Committee on Interstate Commerce and Senator Pomerene intends vigorously to urge a favorable report at an early date.

The bill, which follows closely the lines of the Lever act, provides that the President shall have power, whenever in his judgmet it is necessary "for the efficient prosecution of the war and for the purposes aforesaid, to fix the price of iron ore, iron, steel and their products wherever and whenever sold, either by producer or dealer, to establish rules for the regulation of and to regulate the method of production, sale, shipment, distribution, apportionment or storage thereof among dealers and consumers, domestic or foreign." The authority of the President is to be exercised through the agency of the Federal Trade Commission "during the period of the war or for such part of said time as in his judgment may be necessary."

May Take Over Plants

Whenever in the opinion of the President any producer or dealer in iron ore, iron, steel or their products fails or neglects to conform to the prices or regulations determined by the President or to conduct his business efficiently, the President is authorized "to requisition and take over the plant, business, and all appurtenances thereof belonging to such producer or dealer as a going concern, and to operate or cause the same to be operated in such manner and through such agency as he may direct." In the event that the prices fixed by the President are not satisfactory to the producer or dealer, or if the compensation tendered for the requisitioning of his plant or business is not regarded by him as adequate, he will be entitled to receive 75 per cent of the amount tendered and will then be entitled to sue the United States in the Court of Claims to recover any additional amount claimed.

Government May Sell All Iron and Steel

If at any time the President considers it to be advisable for the successful prosecution of the war, he may require "all producers of iron, iron ore, steel and their products in any section of the United States, or in the entire United States, to sell their products only to the United States through an agency to be designated by the President, such agency to regulate the resale of such iron ore, iron, steel and their products and the prices thereof, and to establish rules for the regulation of and to regulate the methods of production, shipment, distribution, apportionment or storage thereof among dealers, consumers, domestic or foreign, and to make payment of the purchase price thereof to the producers thereof, or to the person or persons legally entitled to said payment." Within 15 days after notice from the agency so designated the producers of iron and steel are required to cease shipments of their products upon their own account and thereafter may make shipments only on the authority of the agency designated by the President.

Additional authority is granted to the Federal Trade Commission by the Pomerene bill to investigate the cost of producing iron and steel products "under reasonably efficient management at the various places of production," and all the records of producers are required to be opened to the experts of the Trade Commission in connection with any such inquiry. In fixing maximum prices for producers the commission is directed to allow "the cost of production, including the expense of operation, maintenance, depreciation, depletion and to add thereto a just and reasonable profit." In fixing prices for dealers the commission is directed to allow the cost to the dealer and "a just and reasonable sum for his profit in the transaction." The maximum prices fixed by the President are not to be considered as involving any contract in which prices are fixed which was made in good faith prior to the establishment and publication of prices by the commission.

A penal section is added to the bill providing heavy penalties for refusal or failure to obey its provisions. The measure is further safeguarded by a provision that nothing therein shall be considered "as restricting or modifying in any manner the right the Government of the United States may have in its own behalf or in behalf of any other Government at war with Germany to purchase, requisition or take over any such commodities for the equipment, maintenance or support of armed forces at any price or upon any terms that may be agreed upon or otherwise lawfully determined."

Protection for Private Consumers

Senator Pomerene regards the enactment of his measure as of importance second only to the legislation giving the President the right to fix prices of iron and steel for the use of the Government during the war. Referring to his interview published in THE IRON AGE a fortnight ago and to the editorial suggestion in this journal that private consumers of iron and steel have some voice in any price fixing the Government may decide upon, he said:

> I think it will be generally agreed that, without such legislation as is embodied in my bill, it will not be possible for private consumers of iron and steel products to obtan the material necessary to carry on their industries except at extortionate prices. We have had ample evidence in recent months that certain large manufacturers do not intend to protect consumers, but rather to obtain the largest possible prices for their products. There are many industries which supplement the activities that go directly to supporting the war, and these are certainly entitled to consideration. In addition, there is the large consuming public which ought not to be required to pay prices representing enormous profits which could not be obtained in normal times and which are only possible because of the war.

Chairman Newlands, of the Committee on Interstate Commerce, has heretofore expressed himself as strongly in favor of the principles embodied in the Pomerene bill as applied to iron and steel products, and it is probable that Senator Pomerene will have no difficulty in securing consideration of his bill in committee, although there are no indications as to how his colleagues will regard the measure. W. L. C.

Charles E. Butler & Sons, who purchased the interests of the late David Benjamin in the Pennsylvania Stripping, Quarrying & Construction Co. at Hazleton, Pa., have also secured control of the new machine shops and iron works started by Benjamin last spring. The new owners are continuing the erection and work of construction. The shops will be devoted to the making of mine cars, steam shovels and other supplies needed about collieries.

The Davis-Bournonville Co. has moved its Detroit office from 88 Adams Avenue, W., to 427 Grand River Avenue, where it will carry a complete stock of welding supplies and maintain a demonstration shop.

SHIPBUILDING ACTIVITIES

Keels for Many New Ships Have Already Been Laid Under Government Program

Baltimore, Md., shipyards now have under construction steel ships with a total approximate tonnage of 290,000 and wooden ships of about 77,000 tons. There are 39 steel vessels and 29 wooden vessels now building, in addition to tug boats, lighters, barges, etc. The Bethlehem Steel Co. is building 15 steel ships, the Baltimore Dry Dock & Shipbuilding Co. 20 steel vessels, the Riter-Conley Co. two steel vessels, while the Henry Smith & Sons Co., the Howard E. Crook Co. and the Maryland Shipbuilding Co. have contracts to build wooden vessels for the Government. The Stedden Shipbuilding Co., the Coastwise Shipbuilding Co. and Charles L. Rhode & Sons Co. are engaged in building tug boats, lighters, seagoing schooner barges and other small vessels.

The Newport News Shipbuilding & Dry Dock Co., Newport News, Va., now has 11 merchant ships under construction, in addition to a battleship, several torpedo boat destroyers and other Government work.

The Newcomb Lifeboat Co., Hampton, Va., has under contract about $7,000,000 worth of Government work. The company now has a fully equipped plant which has been erected on Hampton Roads within the past year. This company has been building submarine chasers.

The Valk & Murdock Co., which was recently acquired by W. R. Bonsal of the Seaboard Air Line and associates, is equipping a yard at Charleston, S. C., and will be prepared to lay the keels of four ships in the near future. Whittlesey & Whittlesey have obtained an option on property near Charleston, S. C., and will erect a large shipbuilding plant as soon as a Government contract is obtained.

The Savannah Engineering & Construction Co., Wayne Cunningham, president, has launched a four-masted sailing schooner at its new shipyard near Savannah, Ga. Three other schooners are under construction. The Georgia Shipbuilding Co., which has a shipbuilding plant on Hutchinson's Island on the Savannah River, now has two wooden sailing vessels on the ways. The Terry Shipbuilding Co., which was awarded a contract for 20 composite vessels by the Emergency Fleet Corporation, is building its plant four miles above the city of Savannah on the Savannah River. Foundations have been laid for ways for 16 vessels. The National Shipbuilding & Dry Dock Co. has been incorporated recently with $300,000 capital and is said to have closed several contracts for ships. The piling foundation for ways for one vessel on the site of its shipyard on Hutchinson's Island, Savannah, has already been laid.

There has been great shipbuilding activity at Brunswick, Ga., where there are now four shipbuilding plants, two of which have been turning out vessels since the early part of the year. The other two shipyards are now under construction, while a fifth plant has completed arrangements for a site. The latest company to select Brunswick, Ga., for a shipbuilding plant is the Oscar Daniels Co. of New York, contracting engineer. The Brunswick Marine Construction Corporation, which was established in April, 1916, has two auxiliary schooners of 1500 tons in which engines have already been installed. The Carpenter-Watkins Shipbuilding Co. has a contract for about 40 seagoing barges and is building ways to build wooden steamships of 2500 tons. The American Shipbuilding Co., organized by officials of the American Tie & Timber Co. and the American Shipping Co., is building five ways and has contracts for four wooden steamers of 2500 tons each for the Emergency Fleet Corporation. The United States Marine Corporation is building a $2,000,000 plant at Brunswick, and expects soon to have work under way on six wooden steamships of 3500 tons for the Emergency Fleet Corporation. The Oscar Daniels Co. will, it is stated, build 12 steamships of 9500 tons each dead weight capacity for the Emergency Fleet Corporation. These steamships will be built of steel fabricated at the mills in standardized sections.

Shipyards at Jacksonville, Fla., are extremely busy, the largest of these, that of the Merrill-Stevens Co. having three composite ships under construction. This company has a contract to build 16 ships for the Emergency Fleet Corporation. There are at present seven shipbuilding companies constructing both wooden and steel ships at Jacksonville, and by Sept. 1 several vessels ranging from 1100 to 3000 tons will be launched. The Hillyer-Sperring-Dunn Co., has recently launched a 3000-ton steamer and is building three steam barges and has laid keels for four wooden ships of 3000 tons each for the Emergency Fleet Corporation. The G. S. Baxter Ship Co., Inc., of Jacksonville has launched a 3000-ton schooner and keels for three other vessels have been laid at this yard. The Florida Shipbuilding Corporation is constructing a new plant and will be laying the keels soon for 3000-ton schooners. The Florida Marine Construction Co. is building ways for two small schooners and the Morey & Thomas Co. will begin work soon on four 3000-ton wooden ships. The J. M. Murdock shipyard will also begin work soon on four 3000-ton ships.

Three shipyards at Tampa, Fla., will soon be busy on wooden ships for the Government. The Tampa Dock Co. has a contract for four wooden ships. The Williams Shipbuilding Corporation and the Stuart Shipbuilding Corporation expect to receive similar contracts.

The recent announcement of the Tennessee Coal, Iron & Railroad Co. that it will build a large shipbuilding plant near Mobile, Ala., has called attention to the ideal location of Mobile for shipbuilding. The Kelly-Atkinson Construction Co. of Chicago, which has a Government contract to build 18 cargo-carrying vessels of steel and wood, will also have a plant near Mobile, as has previously been announced. The Alabama Drydocks & Shipbuilding Co. of Mobile, which recently took over and consolidated the plants of the Alabama Iron Works, the Ollinger & Bruce Dry Dock Co., the Gulf City Boiler Works and the Gulf Dry Dock Co., is said to be expecting a Government contract. The Murnan Shipbuilding Corporation will build four composite vessels at its yard near Mobile. The Henderson Iron Works of Mobile, now the Henderson Shipbuilding Co., has almost completed two submarine chasers and has applied to the Emergency Fleet Corporation for other shipbuilding contracts.

At Pascagoula, Miss., and at Moss Point, Miss., neighboring towns, there are five new shipyards, which have contracts for 34 vessels. These shipbuilders are Henry Piaggio, the Dierks-Blodgett Shipbuilding Co., Mike Fletchas, Poitevin Bros., Dantzler Shipbuilding Co., the Hodge Shipbuilding Co., and the De Angelo shipyards. All of these concerns are actively at work, some having already laid keels of ships, while others are equipping the yards and will be ready soon.

At Orange, Tex., 21 ships are under contract and the following concerns are operating there: International Shipbuilding Co., National Shipbuilding Co., Southern Drydock & Shipbuilding Co., Orange Maritime Corporation, Weaver & Sons and the Sabine-Neches Shipbuilding & Navigation Corporation.

At Beaumont, Tex., three ships for the United States Government are nearing completion. Howland & Nelson, Henry Piaggio, the A. H. Tarver Shipbuilding Corporation, the Lone Star Shipbuilding Co., McBridge & Law, J. M. McCamon and the Todd Shipbuilding Co. are operating shipyards at Beaumont. The Longwell Lumber Co. plans to build wooden ships at Port Arthur, 20 miles below Beaumont.

Thirty hulls and ships are under construction by shipyards which have established plants along the ship channel near Houston, Texas.

A turbo-alternator having a maximum output of 70,000 kw. or 100,000 hp. is now in course of construction, according to J. A. Stevens, Lowell, Mass., in a paper read before the National Association of Cotton Manufacturers. The largest reciprocating engine yet built, he stated, belongs to the Lukens Steel Co., and is capable of developing 25,000 hp.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the DAVID WILLIAMS CO., 239 West Thirty-ninth Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: Equitable Building. Philadelphia: Real Estate Trust Building. Cleveland: Guardian Building. Cincinnati: Mercantile Library Building.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year. Entered at the New York Post Office as Second-class Mail Matter.

Cost Finding Not the Way

There is little reason to expect the cost inquiry now being conducted by the Federal Trade Commission to furnish the right solution of the problem of war prices for iron and steel. It would be much more to the point if the money and talent expended in this inquiry were applied to an investigation of actual market and manufacturing conditions in the industry—to the questions of supply and demand, conditions in dependent industries, and to ways and means of increasing production. It is objection enough to the emphasis put upon costs, that there are very wide divergences in the costs of different producers, for reasons often explained. In plates, for example, the costs of some concerns which buy their pig iron in the market are from 100 to 200 per cent higher than those of the Steel Corporation.

The investigators might very profitably find out at what prices the bulk of the iron and steel now going into domestic consumption was put on the order books of the mills, and how far these are below the prices reached in spot transactions. In plates it will be found that prices on prompt delivery material have been in a number of cases three times those at which plates were contracted for that are now going to shipyards, boiler works, car works and bridge works. It is a market that has been thrown entirely out of ordinary alignments by an insatiate war demand, and there is just about as much practical value in studying costs to know how to deal with it as there would be in studying anatomy to find out what to do for a man whose organism was in nearly every particular abnormal. A steel market that is lacking in all the usual adjustments cannot without great harm be wrenched into alignment with cost of assembling raw materials and of turning out finished product.

The proposed intervention of the Government in the steel trade means much more than arriving at prices which will eliminate undue profits on steel bought for war by the Government and its Allies. It means unmistakably the beginning of a Government participation in the determination of steel values, of which more will be heard, especially if the consolidation of the industry, which has been marked in the past two years, goes farther.

The dangers of high prices in steel have not been overlooked by the manufacturers. Some of these situations will cure themselves. High prices for structural steel are limiting construction and in time this will bring them down. High prices for foundry pig iron will have the effect in time of limiting foundry operations, though it is to be said that contract pig iron now being melted in foundry cupolas costs the user less than half and in some cases not more than one-third the prevailing prices for spot iron.

Any commission or board or official considered wise enough to say what is the right price for steel to be furnished the Government needs to know many things about present conditions in the iron and steel trade and in the trades working up iron and steel, that are little likely to come to the knowledge of mere cost investigators. What is the effect of present prices upon the agricultural implement market, for example? What is the effect on the demand for railroad material, for all forms of hardware and metal goods? What has been the result of efforts of leading producers to hold in check prices for wire products, for example, or wrought pipe, or tin plate? How have advances in articles manufactured from iron and steel compared with advances made by the manufacturers of steel? In some cases, as is well known, the former have been the greater. And yet on such products no Government regulation is proposed.

A practical question of highest importance in getting all the plate producers of the country behind the Government's needs is how to get raw materials for some of these producers at prices which would permit every one of them to participate in Government orders, for all plate capacity is needed and more. If a pooling arrangement is feasible, under which the larger steel interests would engage to supply pig iron at less than the market price to such of the plate mills as must buy pig iron in the market, such an arrangement is worth looking into. Some manufacturers have thought of it, but we hear of no proposal at Washington to do anything so practical as that.

If in certain steel products considerable stocks are being carried by jobbers and at the plants of manufacturers, it would be the part of a wise gov-

ernment that essayed to regulate prices to find out how long it would take to work off these stocks, and therefore how long a market price should be maintained that would prevent loss to those carrying them. If steel prices have gone to excessive heights, it would be well to take account of actual conditions in the consuming trades, that price readjustments may not bring disaster; for the problem the Government faces, in so far as it touches the general market, is in some respects the very problem handled by the steel manufacturers through the Gary dinners of the period following the panic of 1907. At that time it was found highly desirable, in getting the market down from boom levels, to make the descent gradual.

The questions involved are of vastly more consequence than seems to be appreciated in some high quarters. The manufacturers of steel and the long line of industries engaged in working up steel have a great stake, and the country likewise, in the right outcome of steel price fixing. With their limited experience in business, some of the men who are having to do with it may make mistakes whose effects would be far reaching. The course of the steel trade for the remainder of the war and after the war will be materially affected by the decisions now made. Cost finding may be a justifiable occupation under certain conditions, but what is wanted now is an agreement between the Government and the manufacturers and consumers of steel on fair prices, taking current contracts or those of the past six months as a basis, and then the co-operation of all to meet every war demand and to work out the price and other readjustments that are sure to come.

The Falling Off in Pig Iron

The appearance of the American Iron and Steel Institute statistics of pig-iron production in the first half of this year directs attention again to the fact brought out by the statistics gathered monthly by THE IRON AGE, that the output in the first half of this year was less than that for either half of 1916. The divergence between the production of coke and anthracite iron as reported by THE IRON AGE monthly and as now reported by the Institute for the six months is only 8108 tons, or one-twenty-third of 1 per cent.

The total production of all grades, including charcoal iron, has been as follows: First half 1916, 19,619,522 tons; second half, 19,815,275 tons; first half 1917, 19,258,235 tons. The production in the first half of this year was 2.80 per cent less than in the second half of 1916 and 1.84 per cent less than in the first half of 1916.

Such a showing is very far out of line with precedents, considering the market conditions. The average price of pig iron was higher by 104 per cent in the first half of this year when compared with the first half of 1916 and by 74 per cent when compared with the second half. In the past, when there was nothing like such an incentive of rising prices, there has been a strong tendency for production to increase. In the past 30 years, indeed, the production of each half year has exceeded that of the preceding half year 22 times out of 30.

There has been an increase in capacity that should have made an impression upon the output. The blowing in of the second Minnesota Steel Co. stack on Feb. 19, 1916, would not affect the showing materially, as it came in so early in the half year, but River Furnace No. 3 came in on May 15, 1916; Cambria No. 9 on June 5, 1916; United at Canton on Nov. 22, 1916, and Gary No. 4 on April 14, 1917. Besides these entirely new furnaces some very old furnaces were added that were entirely out of the reckoning for the first half of 1916, but would have figured in production in the first half of this year had circumstances permitted.

So far as furnace capacity goes, there could easily have been an increase in production from the first half of last year to the first half of this year of more than half a million tons, whereas the statistics show a decrease of 361,287 tons. Thus there was a deficiency of not far from a million tons in the production in the first half of this year, and that whole deficit is to be attributed to a scarcity in coke. The statistics of the Connellsville *Courier* show coke production in the Connellsville and lower Connellsville region of 11,609,226 net tons in the first half of 1916 and 9,247,113 tons in the first half of this year, a decrease of 2,362,113 tons, or 20.4 per cent. The decrease is much more than the amount required for the production of one million tons of pig iron. That pig iron production did not decrease by the full amount was due to the increase in the production of by-product coke, which helped out to a very considerable extent. All the Southern States showed increased pig-iron production, thus eliminating the beehive operations other than Connellsville as a cause of decreased pig-iron production, while all the Northern States showed decreases, except Ohio and Indiana and a few States with very small production, and, of course, it was by-product coke that saved the day for Ohio and Indiana.

A curious feature in the furnace operations was the variation in production by grades of iron. In the total output there was an increase from the first half of last year to the second half of 1.5 per cent, and then from the second half of last year to the first half of this year there was a decrease of 2.8 per cent. Basic iron showed no increase last year, but decreased the same as other grades this year. Bessemer showed an increase of 12 per cent and then a decrease of 7 per cent. Foundry iron decreased 20 per cent and then increased 5 per cent. No general law of supply could be formulated that would explain these divergences, and the explanation probably is that some of the merchant furnaces endeavored to anticipate demand and overshot the mark. At the middle of last year it appeared that there would be an exceptional call for basic iron, and in the second half the production of foundry iron was neglected, with the result that foundry iron proved the scarcer of the two after all.

In the whole of 1916 the amount made for sale was 28.54 per cent of the total, while in the first half of 1917 the proportion was 29.52 per cent, which means that about 190,000 tons more was made by merchant furnaces in the first half of this year than would have been the case if the proportion had not changed.

The usual divergence is noticed between rated capacity and actual production. The annual statis-

tical report for 1916, just issued, gives the total blast furnace capacity on Dec. 31, 1916, at 45,864,525 tons. The production in the first half of this year was at the rate of 38,516,470 tons a year, or 16 per cent less. About one-fourth of the discrepancy can be attributed to shortage of coke. The remainder is to be accounted for by failure to make allowance for relining and other contingencies, overrating capacity and including in the potential list furnaces that are really out of the running. Thus, of 446 bituminous and charcoal furnaces listed as completed on June 30, 1916, only 371 were in blast during any portion of the next six months.

Unusual Methods of War Time

The ease with which results can be accomplished in time of war is being illustrated in numerous ways, some of which are commendable, while others approach very near to being dangerous and would, in truth, be dangerous if followed in times of peace. To the latter class belong the various extraordinary powers conferred upon the President by newly enacted laws. In a recent address before the Indiana State Bar Association, Indianapolis, just published in pamphlet form, Newton W. Gilbert, a member of the New York bar, describes what he calls "the Eclipse of the Constitution." Mr. Gilbert tells the familiar story of the country's state of unpreparedness before war was declared. In the emergency which demanded that a great deal be accomplished in a short time, many persons desired to leave it all to the President, as some believe he has power under the constitution to do anything he chooses which may directly or indirectly affect the army or the navy, while others say the constitution was really written only for times of peace, and still others do not care whether the constitution exists at all or not. Mr. Gilbert shows how authority to exercise functions as autocratic as those performed by any ruler in the world has been granted to the President by recently enacted laws. He does not question the character or wisdom of the present Chief Executive, but points out that he must share the responsibility of enforcing the laws with thousands of men, some of whom will not equal the President in wisdom and in patriotism. Mr. Gilbert refers to the letter written by Abraham Lincoln to Horace Greeley in 1862, in which he said he would do his utmost to save the Union, but attention is called to the fact that those who quote this letter to justify extraordinary action are likely to omit one sentence, which was: "I would save the Union; I would save it in the shortest way *under the constitution.*" Mr. Gilbert indicates the danger of recent laws becoming engrafted upon our permanent political system. All desire first the defeat of Germany and her allies, but after the war there will be a struggle to re-establish the constitution with all its power.

Mr. Gilbert's words of description and warning are timely and cannot be too strongly emphasized. There are, however, other ways of accomplishing results which are proving effective. They are illustrated by the action of men in realizing the supreme importance of quick action by giving up their pet theories for the common good. This was shown in the getting together of the manufacturers of aircraft in an association to end the litigation over airplane patents and allow the use of all patents for the common good. This is a highly patriotic action which will hasten the carrying out of the very extensive aviation program outlined by the Government. Another case is the agreement reached by opposing groups of senators to open hundreds of thousands of acres of rich oil lands to make the oil available to relieve the threatened shortage of gasoline and other oil products. A long controversy is thus ended and another contribution to the successful waging of the war has been made.

Still greater problems remain to be solved, such as the control of the liquor traffic, for it is realized that the output of many products, of which coke is a conspicuous example, is being seriously curtailed by the excessive use of intoxicating liquors. Drastic measures will be necessary, and perhaps some old precedents will be upset, but we believe that in the long run the common sense of the American people can be trusted to prevent them from wandering too far from ancient landmarks. Doubtless, as has been said, we shall never return to the haphazard economic life out of which we are trying to organize the nation for a bitter test of its stamina. May a better, stronger country result!

New angles of the operation of the excess profits tax on industry seem to appear daily. One of the late cases is that of a jobber whose profits last year were large; but being able to get good supplies, he has put the bulk of the profits into fresh stock. At the moment this is not moving very fast and it represents a heavy investment. No fear is entertained that the stock cannot be moved at a good margin above cost, but the assets thus represented are not liquid and banking accommodation will undoubtedly be necessary to make the tax payment to the Government. The jobber succeeded in accumulating larger stocks than usual, but for foresight and capacity he is automatically penalized. One may hardly generalize on this case, but it may carry the moral that effort to make over much money is still fraught with obstacles.

The War Spirit of the People

The common view of those who realize the seriousness of the war undertaking is that the people as a whole are not aroused as they should be. When the declaration of war was made on April 6 it was said that it would take some time for the people to realize its full significance; but a period of four months has now elapsed and there has not been as rapid a development of the mental attitude as was hoped.

Much good advice was given as to how men of vision could stimulate the mental processes of others, but it does not appear that much of this advice was taken. Employers were told how they could distribute suitable literature in pay envelopes, for instance, but this practice certainly has not been general.

So unsatisfactory is the situation as to the mental attitude of great numbers of the people that the National Security League has set out to cover

the country with speakers whose text will be the seriousness of the war effort we have undertaken. It is to be hoped that the project will prove feasible and that it will produce discernible results.

There is one unfortunate feature of conscription that has been overlooked. Its operation involves no propaganda, no effort to arouse enthusiasm. It is all done by rote. Insensibly its influence is to discourage enthusiasm, for every man feels, even if he does not recognize the mental process as such, that if his number is not called, or if he is exempted, he is clear. He stood the chance. With voluntary enlistment great efforts are made to create the mental attitude conducive to enlistment. The appeal is loud and is directed to all. Those who fail to enlist are likely at any rate to seek something they can do. There is a desire to serve, even if it does not rise to the point of producing enlistment.

Car Purchases for Government Railroad in France

For the railroad work which the United States Government is to build in France, 8997 of the proposed 17,000 cars have been contracted for. They have been well distributed, a fact which will serve to expedite construction, and include 6000 cars for standard-gage track, of 30 tons' capacity, and 2997 cars for narrow-gage track. The awards are as follows:

Standard gage: American Car & Foundry Co., 1000 box and 300 tank; Pressed Steel Car Co., 1200 low side gondolas; Standard Steel Car Co., 900 high side gondolas and 800 box; Haskell & Barker Car Co., 600 flat and 300 refrigerator; Pullman Co., 900 box.

Narrow gage: Pressed Steel Car Co., 500 flat and 100 trucks for cars; American Car & Foundry Co., 166 tank and 700 low side gondolas; Ralston Steel Car Co., 400 low side gondolas; Magor Car Co., 400 low side gondolas; Standard Steel Car Co., 666 box and 165 gondolas.

For Belgian Railroads

WASHINGTON, Aug. 14.—The special Belgian Commission now in the United States is seeking loans aggregating $142,000,000 of which $100,000,000 is to be used for railroad materials and construction and for machinery for farms and factories. The remainder is desired for relief work. It is probable that the United States will advance $50,000,000 at an early date with the understanding that the money is to be used on the Belgian railways and that by the time the amount is expended as much more will be forthcoming.

A large amount of machinery for the equipment of factories of various kinds is also to be purchased for Belgium, together with agricultural machinery and implements. The Germans have destroyed all the Belgian factories in the occupied districts and upon retirement wrecked many shops which they had built and operated in the production of supplies for their own forces.

California Silico-Manganese

The Pacific Electro Metals Co., San Francisco, is preparing to manufacture silico-manganese at Bay Point, San Francisco Bay. It is planned to utilize low grade manganese ores which are available in California, and the product will contain approximately 20 per cent silicon and 60 per cent manganese. The Beckman & Linden Engineering Corporation, of which J. W. Beckman is president, is engineer and manager of the enterprise.

The Northwestern Steel & Iron Co., Eau Claire, Wis., has posted the following notice to employees: "On Dec. 24, 1917 (the day before Christmas), every man in the employ of this company will receive a check for 10 per cent of his entire earnings from Aug. 1, 1917, to Dec. 24, 1917. Any man leaving the company during that time, either voluntarily or otherwise, will not receive this bonus. E. R. Hamilton, General Manager."

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MAKING RAPID PROGRESS

United States Shipping Board Lets Contracts for Steel and Wooden Ships

WASHINGTON, Aug. 13.—The United States Shipping Board has practically completed its contracts for construction work and it is now up to Congress to provide an additional half billion to enable the board to realize its comprehensive program in all its features. During the past week, the board has let contracts for 50 steel and wooden ships aggregating 200,000 tons at a cost of approximately $25,000,000; it has perfected two contracts calling for the construction by two large corporations in Government owned ship-building plants of several hundred vessels; it has commandeered a large tonnage of privately owned merchant vessels to prevent their sale to foreigners; through the Exports Council it has served notice on Canada that the embargo on steel shipbuilding materials will become effective as to that country Aug. 15, and it has created a special bureau under the supervision of the board, the function of which will be the fixing of ocean freight rates in the transatlantic trade with a view to their substantial reduction from the present abnormally high level.

Under the terms of the two contracts for the construction of steel ships in Government owned plants, the United States will acquire two large tracts of land upon which all the necessary facilities for building cargo ships will be installed as rapidly as possible. These ships are to be built on a cost plus profit basis, the contractors for the ships buying their fabricated steel at prices to be fixed by the Government. The contracts for this construction were originally drawn by General Goethals, but were not signed. They are now awaiting assurances from the administration leaders in Congress that the money necessary to pay for the ships involved will be promptly forthcoming. As soon as they are executed the work on the two plants will be undertaken and rushed as rapidly as possible. As the result of changes made in the contracts, these ships will be built for considerably less money than was expected.

"Our preliminary work is about finished," said Chairman Hurley to the correspondent of THE IRON AGE in discussing the board's program, "and I am very well satisfied with the outlook. We shall get the ships we want and we shall get them on time. We will soon have under the jurisdiction of the board some 1500 ships exclusive of those for the construction of which contracts have been let or will be let in the course of a few days. I am confident that we shall have no difficulty in securing the additional appropriation for which we have submitted our estimate. As soon as we have adequate assurances on that point, we will be in position to sign the two pending contracts for the construction of fabricated ships which will about end the placing of orders for vessels, although from time to time thereafter we shall probably have occasion to contract for a few more as the opportunity may arise.

"Our policy will be to co-operate in every way with contractors and to assist them in completing their work at the earliest practicable moment. While we shall guard vigilantly the interests of the Government, we shall not stand on technicalities and will help rather than hinder everybody who is working for the Government in this connection. I am hopeful that I shall have an opportunity in the near future to make a personal visit to many of the shipyards where the work of building vessels for the board is going forward, as it will afford me satisfaction to get into close touch with the details of this big enterprise."

Shipbuilders who have taken contracts to build vessels for the shipping board have announced their intention to organize a national shipbuilding association with offices in Washington, the purpose being to provide a central agency to represent builders in their dealings with the Emergency Fleet Corporation and thus obviate the necessity of individuals coming to Washington to deal with subjects that could be quite as satisfactorily handled through a properly equipped organization. It is stated that B. W. Morris of the Groton Iron Works, Groton, Conn., will be named as president of the association and that G. R. Collins of Washington will be vice-president. Offices have already been secured and will be in charge of a secretary assisted by an adequate clerical staff.

Pittsburgh Steel Products Co. Contracts

The Pittsburgh Steel Products Co., which has started to build a large seamless tube plant at Allenport, Pa., has placed a number of contracts and will give out others later. The contract for the power plant was placed with E. M. Wichert & Co., engineers and contractors, Pittsburgh. In order to protect the plant from floods, a sea wall will be built 500 ft. long, 24 ft. wide at the base, 35 ft. high and 2 ft. wide at the top. The wall will rest on hardwood piling, the specifications calling for about 1800 piles 25 ft. long, and there will be needed about 8000 cu. yd. of concrete. The piles will be steel pointed and driven into hard concrete. The contract for the pumps was given to the Wilson-Snyder Mfg. Co., Pittsburgh, and the electrical equipment was divided between the Westinghouse Electric & Mfg. Co. and the Allis-Chalmers Co. A contract for condensers for the power plant was placed with the Alberger Pump & Condenser Co., Chicago, and the Pittsburgh office of the Babcock & Wilcox Co. was given an order for 5000 h.p. Stirling water tube boilers. These will be fired by Roney stokers, built by the Westinghouse Electric & Mfg. Co. The contract for all the electric cranes has been given to the Morgan Engineering Co., Alliance, Ohio. There will be three main mill buildings, each 950 ft. long. They will be erected by the McClintic-Marshall Co., Pittsburgh, and will require close to 4500 tons of steel.

Diminishing Amount of Fabricated Steel Work

The records of the Bridge Builders & Structural Society, as collected by its secretary, George E. Gifford, show that in July 41½ per cent of the capacity of the bridge and structural shops of the country was put under contract. This corresponds to about 75,000 tons of material. It is the lowest figure since February, 1915, and save for the seven months immediately following the outbreak of the war in August, 1914, for which period the average rate of contracting was only 30 per cent, the only other smaller figure since 1911 was 37 per cent in September, 1913.

Will Open Local Offices

WASHINGTON, Aug. 14.—Secretary of Commerce Redfield makes the official announcement that it has been decided to open local offices for the handling of export licenses at Philadelphia, Norfolk, Charleston, Savannah, Galveston and Los Angeles. The details are now being arranged by Acting Chief Cutler of the Bureau of Foreign and Domestic Commerce, to which the Division of Export Licenses is attached.

The International Aircraft Committee, which will standardize specifications for metals used in making airplane parts, met at 25 Pine Street, New York, last week, and reached a decision as to the kind of steel to be used in making the parts, but details as to its composition were withheld. Final agreement as to uniform specifications was not reached, it was stated, but progress was made in that direction. F. G. Diffin, representing the United States Government, is chairman of the committee.

A table of the causes of industrial injuries, covering a five years' experience on the part of Pickands, Mather & Co., has been issued by the National Safety Council, Chicago. The groupings cover about 50 different causes and the figures give subdivisions for accidents entailing no disability and for trivial, serious and fatal accidents.

The Youngstown Sheet & Tube Co., Youngstown, Ohio, has awarded a contract to Stone & Webster of that city for the erection of an oil storage house to cost about $125,000. The concern is completing the building of a supply storage house for the same company.

Labor Notes

Effective as of March 1, increases in wages have been granted to 1000 employees in the Coster shops of the Southern Railway, at Knoxville, Tenn. Six hundred machinists receive an increase of 8½ cents per hr.; 300 helpers an increase of 6½ cents and 100 apprentices an increase of 2½ cents.

An increase in wages of 12 per cent has been granted to the 1041 employees at the shops of the Illinois Central Railroad at Paducah, Ky. The advances range from 2 to 6 cents per hr.

The stockholders of the Rhode Island Perkins Horse Shoe Co., Providence, R. I., have voted to dissolve the corporation as a result of continued labor troubles. The company began business in 1867 with a capital of $150,000 and was reorganized in 1891 with capital of $2,750,000. The company has returned to its stockholders more than $2,600,000 in cash and has its plant and quick capital intact.

A threatened strike at the Bridgeport Projectile Co., Bridgeport, Conn., was settled July 31 by the granting of a 10 per cent increase in wages, an 8-hr. working day and the establishment of minimum wages for different classes of machinists. A provision of the settlement was that the company should have the right to discharge men who were not capable of earning the minimum wage. When the company discharged 16 men Aug. 1 as incompetent under this proviso, the machinists walked out, but voted the next day to return to work and live up to the agreement. The discharged men returned to work at the old rate under a separate agreement.

Employees of the H. C. Frick Coke Co., Connellsville, who were members of the National Guard when the war came, or who have since enlisted, will be paid part of their salaries or wage rate during their service and every effort will be made to retain their positions until they are able to return.

The Wisconsin Iron & Wire Works, 1660 Booth Street, Milwaukee, on Aug. 1 reduced the working day for all employees to 9 hr., without reduction in the wages, which are based on the 10-hr. day.

The Inglis Mfg. Co., 283 Fifth Avenue, Milwaukee, maker of tanks, pumps, etc., has advanced the hour of commencing work from 8 o'clock a. m. to 7 o'clock a. m. and for the present will close at 4.30 instead of 5.30 p. m. The new arrangement was made at the suggestion of the employees and may be continued throughout the winter months.

An increase in wages has been given to union boilermakers in St. Louis to hold until May 1, 1919. Inside men will receive 65 cents per hr., outside men 70 cents and foremen 80 cents. The minimum for helpers will be 40 cents per hr. Thirteen firms are affected. Three others did not sign the agreement, having operated open shops for two years.

Men employed at the scrap furnaces of the Duncannon plant of the Lebanon Valley Iron & Steel Co. have returned to work after a two weeks' strike. The men demanded an increase from $9.25 to $10.25 per ton. Although the company did not meet the demands new wage scales were adjusted.

Puddlers at the plant of the Reading Iron Co., Reading, Pa., have declared a strike with a demand for an advance in wages from $9.75 to $11.50 per ton. The company has offered the men $10.50; this would be the eleventh increase since Jan. 1, 1916, when the puddlers were receiving $4.50 a ton.

The New Jersey Zinc Co., Palmerton, Pa., is now paying laborers at the rate of 32 cents an hr., it is reported, the highest wages ever paid for unskilled labor in that section.

The John A. Roeblings' Sons Co., Trenton, N. J., has abolished its bonus system of 10 per cent a month to employees based upon money earned, and has established a flat rate increase in wages, with general average totaling at least the amount of the former bonus.

The E. I. duPont deNemours Co., Wilmington, Del., has increased the wages of all salaried employees, varying from 10 per cent for the highest paid men to about 25 per cent for the lower positions. The cash bonus rate has been changed to 20 per cent of the new salary rate.

The La Crosse Tractor Co., through B. F. Hamey, vice-president and general manager, has supplemented its recent offer to the factory employees of a bonus of 10 per cent of their wages from July 1 to Nov. 1, provided they stay with the company throughout the season, with an added bonus amounting to 8 to 10 per cent of their wages for the coming three months. This is contingent upon the amount of tractors produced up to Nov. 1.

The four lodges of union machinists in Bridgeport have voted to adopt the following minimum scale of wages: Tool makers, 60c. an hour; machinists, 50c. an hour; automatic and screw machine operators, 45c. an hour; toolsetters, 50c. an hour; assemblers and operators, 43c. an hour; machinists helpers, 38c. an hour; apprentices, first year, no rate set; second year, 25c. an hour; third year, 30c. an hour; fourth year, 40c. an hour. At the same time it was voted that eight hours should constitute a day's work in all shops. No active steps have been taken to put this program into effect.

New Steel Plant for Spain After American Plans

LONDON, ENGLAND, Aug. 15 (*By Cable*).

The Compania Siderurgica del Mediterraneo has been formed in Spain with a capital of 100,000,000 pesetas, of which 40,000,000 pesetas is reserved for Sota & Aznar, 40,000,000 pesetas will be offered to the public, and the remainder will be held in reserve. The plant will be located at Sagunto and will consist of a blast furnace, an open-hearth steel works and rolling mills for the production of shapes, ship plates and other forms of finished steel. The blast furnace will be supplied with the Sagunto ores available after export requirements are satisfied. Provision is made for an annual capacity of 100,000 tons of finished steel, increasing to 300,000 tons. The plans have been drawn by Frank C. Roberts, Philadelphia. Sota & Aznar are well known dealers in Spanish ores, with offices in London. For several years they maintained an office in Philadelphia.

Contracts for Sheet Mills

The Whitaker-Glessner Co., Portsmouth, Ohio, has let a contract for six additional sheet mills to be erected as an addition to its Portsmouth works. The Dravo Construction Co. was given the contract for the necessary concrete work and the McClintic-Marshall Co., Pittsburgh, will do all the steel construction work.

The six new sheet mills will have a weekly capacity of 600 tons and are expected to be in operation by Jan. 1, 1918. These new mills will make 16 in all that the company will have in operation at its Portsmouth works.

The import trade of European Russia in 1916 ($545,853,000) increased 100 per cent over the 1915 figures and came within $83,000,000 of the imports in the normal year 1913 ($628,577,000). Moreover, since the official figures do not include munitions, the value of the goods actually received and requiring transportation must have been greatly in excess of the value recorded. When it is considered that in 1916 European Russia received goods by two routes only (Archangel and Scandinavia-Finland), while goods were entered at 44 ports in 1913, it is easier to appreciate the tremendous freight traffic Archangel and the Russian railroads were called upon to handle and the great congestion that has made necessary the strict limitation of imports.

The Youngstown Sheet & Tube Co., Youngstown, Ohio, is about to place contracts for the erection of 125 houses for employees, and also a store building on its coal property in Greene county, Pa., and the buildings are to be completed in about one year.

Iron and Steel Markets

ORDERS PLACED FOR ITALY

Government Prices Made the Basis

Labor Situation Made More Acute by the Draft—Steel Billets Lower

Government orders for steel are increasing and the export movement is large in spite of embargoes; but ordinary domestic business in iron and steel is insignificant. Pressed by some of its Allies to get for them much needed steel, the Government is hurrying its cost-finding inquiry, but as telegrams for iron ore costs only went out this week the investigators are some distance from the end.

Without taking a final position on the question of selling to the Allies at the same prices as to the Government, steel manufacturers have accepted orders from officials at Washington this week applying on 10,000 tons of annealed wire and 20,000 tons of wire rods for Italy, prices to be fixed after the Trade Commission's findings are made up. When these Italian inquiries first appeared some weeks ago, 4.50c. was quoted on the wire and $85 on the rods.

While the general question is in abeyance, it is understood that some steel interests have expressed a willingness to take business from the Government at prices to be determined later, even though the material is for an Ally.

For the American army in France a 20,000-ton inquiry for 25-lb. rails has come out, for use in portable tracks. Unlike the recent contracts for 150,000 tons of 80-lb. sections no price is fixed, but bids are asked. Contrary to reports, none of the 80-lb. rails were refused by the mills, but on two of the lots concerning which a question was raised as to price, orders to go ahead with the rolling have not yet been given, though all these rails are wanted in six weeks.

While specifications on the Government's requirements for its standardized merchant ships will not come to the steel mills until early in 1918, plates are being placed each week for Government vessels that are being constructed after builders' plans. Independent steel companies are now getting considerable orders for such steel in view of the large tonnages already taken by the Steel Corporation. The latter, it is estimated, has on its books nearly 800,000 tons of steel for the Navy, for Government merchant ships and for private yards.

Of the 17,000 cars wanted for the American railroad in France 9000 have been placed in the past week, and thus far about 75,000 kegs of spikes have been ordered.

What was generally known as to the effect of present high prices on construction is definitely indicated in the report of July bookings representing 41.5 per cent of the country's fabricated steel capacity. This is the smallest total reported since February, 1915.

The outcome of efforts to secure exemptions for workers in iron and steel and metal-working plants has been disappointing to employers. It is of vastly more consequence to the Government than cost finding that there be adequate working forces at coke ovens, blast furnaces and steel works. One Eastern steel company has been seriously affected by the large drafts made upon its working forces. Only special intervention from Washington, even to the extent of new legislation, seems likely to avert an acute situation.

Short coke supply, in particular, is affecting the entire industry. With pig-iron production in the first half of the year 350,000 tons less than in the first half of 1916, and 550,000 tons less than in the second half, only an unusual use of scrap has made increased steel works output possible.

The supply of steel in the form of billets, sheet bars and slabs is increasing in the open market, and prices are yielding. A sale of 2000 tons of open-hearth billets and one of 1000 tons are reported from Pittsburgh at $85, or $5 less than the prompt market of one week ago. Italy is inquiring for 15,000 tons of rerolling billets.

In finished material, the weeks of inactivity have brought no appreciable price changes. Some increase in the supply of plates has been expected from the export embargo, but neither deliveries nor prices appear to be easier.

An easier pig-iron market has resulted from the inaction of the past month, but the condition is not one of positive weakness. With stocks about half those of one year ago, and in view of the inability of furnaces to get sufficient coke, producers are standing on their well-filled order books, and as yet are not conceding that Government revision of coke to a $3 or $4 basis will mean any considerable reduction in pig iron. Some concessions are being made by furnaces which have not been long in blast.

All records for iron and steel exports were broken in June, when the total of products reported by weight was 643,763 gross tons, as compared with 527,542 tons in June, 1916. For the fiscal year these shipments reached 6,885,543 tons, against 4,862,154 tons in the previous year. The embargoes came with July, and the June figures may long stand as high point.

Pittsburgh

PITTSBURGH, Aug. 14.

The entire Pittsburgh market report as given in the issue of THE IRON AGE of Aug. 9 could very well be repeated for this week, and it would give accurately the situation in the local pig iron and steel trade as it exists to-day. There is practically no new business in pig iron, semi-finished steel or in finished steel, with the exception of the orders the Government is placing, and these are heavy, especially for sheets. It is hoped that perhaps this week something may come from Washington in regard to the prices the Government is to pay for steel, and just as soon as this comes out, business is likely to start up again. In the meantime, consumers are not buying a pound of material they can possibly

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Aug. 15, 1917.	Aug. 8, 1917.	July 11, 1917.	Aug. 16, 1916.
No. 2 X, Philadelphia...	$53.00	$53.00	$53.00	$19.50
No. 2, Valley furnace....	53.00	53.00	55.00	18.25
No. 2 Southern, Cin'ti..	49.90	49.90	49.90	16.40
No. 2, Birmingham, Ala.	47.00	47.00	47.00	13.50
No. 2, furnace, Chicago*.	55.00	55.00	55.00	18.50
Basic, del'd, eastern Pa.	50.00	50.00	50.00	19.00
Basic, Valley furnace....	52.00	52.00	53.00	18.00
Bessemer, Pittsburgh ...	55.95	55.95	57.95	21.95
Malleable Bess., Ch'go*..	55.00	55.00	55.00	19.00
Gray forge, Pittsburgh..	46.95	46.95	47.95	18.70
L. S. charcoal, Chicago..	58.00	58.00	58.00	19.75
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	38.00	38.00	38.00	33.00
O.-h. rails, heavy, at mill	40.00	40.00	40.00	35.00
Bess. billets, Pittsburgh..	*85.00*	90.00	100.00	45.00
O.-h. billets, Pittsburgh..	*85.00*	90.00	100.00	45.00
O.-h. sheet bars, P'gh....	*85.00*	90.00	105.00	47.00
Forging billets base, P'gh	125.00	125.00	125.00	69.00
O.-h. billets, Phila.....	100.00	100.00	110.00	45.00
Wire rods, Pittsburgh...	*90.00*	95.00	95.00	55.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	**5.159**	4.659	4.659	2.659
Iron bars, Pittsburgh....	4.75	4.75	4.75	2.60
Iron bars, Chicago.....	4.50	4.50	4.50	2.35
Steel bars, Pittsburgh...	4.50	4.50	4.50	2.60
Steel bars, New York...	4.669	4.669	4.669	2.769
Tank plates, Pittsburgh.	9.00	9.00	9.00	3.50
Tank plates, New York..	10.169	10.169	9.169	3.669
Beams, etc., Pittsburgh..	4.50	4.50	4.50	2.50
Beams, etc., New York..	4.669	4.669	4.669	2.669
Skelp, grooved steel, P'gh	4.00	4.00	4.00	2.35
Skelp, sheared steel, P'gh	6.00	6.00	6.00	2.45
Steel hoops, Pittsburgh..	5.75	5.75	5.25	3.00

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire,	Aug. 15, 1917.	Aug. 8, 1917.	July 11, 1917.	Aug. 16, 1916.
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh	8.50	8.50	8.50	2.90
Sheets, galv., No. 28, P'gh	10.00	10.00	10.00	4.25
Wire nails, Pittsburgh...	4.00	4.00	4.00	2.60
Cut nails, Pittsburgh....	4.65	4.65	4.65	2.60
Fence wire, base, P'gh..	3.95	3.95	3.95	2.55
Barb wire, galv., P'gh...	4.85	4.85	4.85	3.45
Old Material, Per Gross Ton:				
Iron rails, Chicago.....	$40.50	$40.50	$45.00	$18.50
Iron rails, Philadelphia.	45.00	45.00	52.00	20.00
Carwheels, Chicago.....	30.50	30.50	37.00	11.50
Carwheels, Philadelphia..	35.00	35.00	38.00	15.50
Heavy steel scrap, P'gh.	*31.00*	33.00	40.00	16.00
Heavy steel scrap, Phila.	31.00	31.00	40.00	14.75
Heavy steel scrap, Ch'go.	29.00	29.00	34.00	15.25
No. 1 cast, Pittsburgh...	*30.00*	34.00	34.00	15.00
No. 1 cast, Philadelphia..	*33.00*	34.00	37.50	16.00
No. 1 cast, Ch'go (net ton)	23.00	23.00	29.50	11.50
No. 1 RR. wrot. Phila...	45.00	45.00	55.00	20.00
No. 1 RR. wrot, Ch'go (net)	33.50	33.50	39.00	15.25
Coke, Connellsville, Per Net Ton at Oven:				
Furnace, coke, prompt...	**$16.00**	$13.00	$13.00	$2.75
Furnace coke, future....	10.00	10.00	10.00	2.50
Foundry coke, prompt...	14.00	14.00	14.00	3.25
Foundry coke, future....	10.00	10.00	10.00	3.50
Metals,				
Per Lb to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York..	28.00	28.00	30.75	26.75
Electrolytic copper, N. Y.	28.00	28.00	30.75	26.50
Spelter, St. Louis	8.50	8.50	8.87½	8.75
Spelter New York.....	8.75	8.75	9.12½	9.00
Lead, St. Louis.....	10.75	10.75	11.00	5.90
Lead, New York.....	10.87½	10.87½	11.12½	6.00
Tin, New York.....	*62.25*	63.62½	63.00	39.00
Antimony (Asiatic), N. Y.	15.00	15.00	17.00	10.00
Tin plate, 100-lb. box, P'gh	$12.00	$12.00	$12.00	$6.00

avoid, nor are producers anxious to sell, as they know it would be useless to try to get orders under present conditions. Prices are holding up fairly well, largely for the reason that not enough business in any kind of material is being done to establish prices. The only changes in prices during the week are in coke and scrap, due to scarcity of cars and labor. Coke has gone up very rapidly this week, and sold to-day, Tuesday, at as high as $15 and $16 per ton. The scrap market is stagnant, and most prices have gone off $1 to $2 per ton, but low phosphorus stock is off $3 to $5 per ton. It is certain that business will not start up until the Government comes out with the announcement of the prices for steel it has decided to pay. The labor situation is steadily worse as the draft goes on, and this and the railroad situation are the two serious problems that confront the steel trade to-day.

Pig Iron.—There has not been an actual sale of pig iron of any moment in this market for over two weeks. Consumers will not buy, and producers are not trying to sell, so that the market is stagnant. Reports are that both Bessemer and basic iron could be bought at $50 Valley or less, but even these offers, if they were actually made, are of absolutely no interest to consumers, who will not buy a pound of pig iron at any price until it is known what prices the Government will fix, not only on pig iron, but on all the steel in various forms it proposes to buy. The last sales of pig iron made in this market were at about $55 for Bessemer and $52 for basic at Valley furnace. In this condition there is nothing else to do but repeat these prices in our report, but we wish to emphasize the fact that they are purely nominal, and are used in the entire absence of any sales at lower prices. It is the belief that when buying of pig iron starts again, prices for Bessemer, basic, foundry, and on all other grades will be lower than the nominal prices of to-day. Stocks of pig iron carried by consumers are very light, and several of the larger users of basic and foundry iron in this district have not bought a ton of iron for next year. When they do come in the market they expect to be able, and probably will be, to buy pig iron at very much lower prices than the present nominal market. We repeat our former prices, which are purely nominal in the absence of any sales, as follows:

Standard Bessemer iron, $55; basic, $52; No. 2 foundry, $53; malleable Bessemer, $53, and gray forge, $46, all at Valley furnace, the freight rate for delivery in the Pittsburgh and Cleveland districts from Valley furnaces being 95c. per ton.

Billets and Sheet Bars.—The supply of steel in the forms of billets, sheet bars and slabs in the open market for prompt shipment is steadily getting larger, due partly to the embargo of steel for export shipment and also because of the very large output, which has been greatly increased since the first of the year. Offerings of billets and sheet bars are fairly heavy for prompt delivery and one sale of 2000 tons of soft 4 x 4 in. open hearth billets has been made at $85, and a sale of 1000 tons of open hearth sheet bars has been made at the same price for prompt shipment, f.o.b. Pittsburgh. This price represents the top of the market to-day on both soft Bessemer and open hearth billets and sheet bars. Prices on forging billets are not as firm as they were, but they have not yet shown any material decline, and there have been no sales on this market for several weeks past.

We now quote soft Bessemer and open-hearth billets at $85, and soft Bessemer and open-hearth sheet bars at $85, maker's mill, Pittsburgh or Youngstown. We quote forging billets at nominally $125 per ton for ordinary sizes and carbons, f.o.b. maker's mill.

Steel Rails.—The new demand for reroll and also for light rails rolled from billets has quieted down a good deal, but prices are holding fairly firm. Consumers are holding off placing orders until they know what the Government is going to do in the matter of fixing steel prices. No new domestic orders are being placed

for standard sections, the recent Government orders for the Allies having preference in rolling, and this will delay, to some extent, deliveries of standard sections to domestic railroads. The rail mills are filled up for many months ahead both on light rails and standard sections, so that the falling off in new business has not seriously affected them. Prices on new light rails and standard sections are given on page 399.

Ferroalloys.—There is a fair amount of new demand for ferromanganese for prompt shipment, and prices are ruling firm. There have been sales of five or six carloads for this year's delivery at about $400 per gross ton for 80 per cent, f.o.b. Pittsburgh. For delivery in first half of next year, the price of 80 per cent domestic is about $375 at furnace. We quote 18 to 20 per cent spiegeleisen at $80 to $85 per gross ton, at furnace. It is said that some contracts for 50 per cent ferrosilicon for delivery over all of 1918 are being made on the basis of about $145 for less than 1000 tons and about $135 on quantities over this amount. Prompt 50 per cent ferrosilicon is bringing $200 to $225 against $75 to $85 at this time last year. The new demand for Bessemer ferrosilicon and silvery iron is quiet, as consumers are well covered over the remainder of this year.

We quote 9 per cent Bessemer ferrosilicon at $89, 10 per cent $90, 11 per cent $95, 12 per cent $100, 13 per cent $105, 14 per cent $115, 15 per cent $125, and 16 per cent $135. We now quote 7 per cent silvery iron at $84 to $89. 8 per cent $85 to $90, 9 per cent $86 to $91, 10 per cent $87 to $92, 11 and 12 per cent $88 to $93. All f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having a uniform freight rate of $2 per gross ton for delivery in the Pittsburgh district.

Structural Material.—The new inquiry is quiet, but local fabricators say they are not bidding actively on new work, as they are filled up for some months ahead, and in addition they desire to conserve some of their capacity for Government orders, which they expect to receive in a short time, and which they will have to get out promptly. The McClintic-Marshall Co. has taken 15,000 tons of structural steel to be furnished to the Keystone Construction Co. for subway work in Philadelphia, and the Blaw-Knox Co. has taken 1000 tons for work for the Curtiss Aero & Motor Corporation. The erection contract is held by the Austin Co. of Cleveland. Prices on structural material are given in detail on page 399.

Plates.—No new orders for steel cars are coming out and there are no inquiries. The Government is expected before long to make heavy demands on the steel car builders for cars of various kinds and the car builders are conserving some of their capacity to meet this demand. The current demand for plates has fallen off very materially and plates for fairly prompt shipment could be bought to-day at lower prices than ruled a month ago. Consumers know that the Government will fix prices on plates at very much lower figures than they have been selling for in the open market, and they are holding off buying, in order to have the benefit of lower prices, which they believe the mills will name to them just as soon as the Government fixes the prices that it will pay. We continue to quote ¼ in. and heavier sheared plates for delivery over the remainder of this year at 8c. to 9c. at mill, and small lots for warehouse from 11c. to 12c., Pittsburgh.

Sheets.—The Government has placed heavy orders in the past week for blue annealed, Bessemer and open-hearth black, and for galvanized sheets, which the mills have filled very promptly. In fact, most of the new business being placed in sheets for the past several weeks has come from the Government, as the new domestic demand is very dull. It frequently happens that a Government order for sheets will come by wire or telephone. It is then submitted to the mills in the same way and shipment made within 48 hr. or less, while the regular contract is received some days after the shipment is made. Consumers fully believe the prices on sheets have reached the crest, and before long they will be able to buy at lower prices, and they are holding off placing orders as much as they possibly can. A sale of 350 tons of galvanized sheets on a domestic order for prompt shipment has been made at 10.50c. and one of 360 tons of No. 9 blue annealed at 9c. at maker's mill. Prices on sheets to the domestic trade are given in detail on page 399.

Tin Plate.—The Government has placed orders recently for fairly large quantities of terne plate for lining cartridge cases, and also for charcoal plates for making cooking utensils for the various cantonments and encampments. The tin plate mills have pretty well finished up shipments on contracts for tinplate taken at the $5.75 and $6 prices, and are now working largely on contracts taken at the $7.50 price for Bessemer and $7.75 price for tin plate to be rolled from open hearth stock. Foreign inquiry is still heavy, but this is usually turned down by the mills, as they need their entire output of both tin and terne plate for domestic trade. The current demand for tin plate is quiet, but small lots of primes for shipment from stock are being sold by the independent mills at prices ranging from $11 to $13 per base box. The new prices on terne plate, effective from July 31, are given on page 399.

Iron and Steel Bars.—The new demand for both iron and steel bars has fallen off very materially, the larger consumers being covered over the remainder of this year, while any users that have to buy are holding off placing orders as long as they possibly can in the belief that prices on both iron and steel bars will be lower just as soon as the Government announces the prices it intends to pay for steel. The iron and steel bar mills are well filled up for some months ahead, but jobbers are inclined to carry as light stock as possible in view of the expected decline in prices. Mill prices on iron and steel bars in carloads and larger lots are given on page 399.

Hoops and Bands.—The new demand is dull, as consumers are well covered over the remainder of this year, and mills report specifications active. On small lots for fairly prompt shipments, steel hoops bring 6c. to 7c. and bands 5c. to 5.50c., extras on the latter as per the steel bar card.

Muck Bar.—There is no new buying, but prices are slightly lower, due to the softness in pig iron. We quote best grades of muck bar, made from all pig iron, at $90 per ton, but these prices might be shaded on a firm offer.

Wire Rods.—The new demand for wire rods is thoroughly active, but has quieted down to some extent, consumers evidently looking for lower prices as soon as the Government fixes the prices it is going to pay for steel. A sale of 200 tons of soft open hearth rods has been made at $90 and another sale of 150 tons at $95, maker's mill. We also note a sale of 200 tons of high carbon rods, made from special steel at $115 maker's mill. Prices on rods are given in detail on page 399.

Wire Products.—The situation in wire and wire nails is the same as noted in this report for several weeks. The new demand is very quiet, and specifications against contracts by domestic customers are dull. The trade has evidently decided that prices on wire and wire nails in effect at present by the independent mills will not be advanced and that there may be a sudden change in the market to a lower basis. Hence they are not buying any nails or wire they can possibly avoid. Jobbers are also inclined to work off their stocks as much as they can in view of the expected lower prices. It is said the bulk of the new business being placed is going to the American Steel & Wire Co. as its prices on nails and wire are still $16 per ton less than those of the independent mills. As yet the independent mills show no inclination to lower their prices, and just how the present situation on the wire nail and wire trade will work out is a question. Prices quoted on wire and wire nails by the independent mills, but at which they have taken a small amount of new business, are given in detail on page 399.

Shafting—The Government is taking at present from 30 to 35 per cent of the output of shafting, and may take even a larger quantity before long. These government orders are being shipped promptly and this is delaying deliveries to domestic customers considerably. The new demand for shafting is dull, consumers feeling that prices will not be any higher, and may possibly be lower in the future. Discounts remain at 10 and 5 per cent off list, while a very few small orders are sold at list.

Railroad Spikes and Track Bolts.—It is said the Government order for 100,000 kegs of railroad spikes for the Government railroads to be built in France has been practically placed with the different makers on a prorata basis, but this is not confirmed. The domestic demand for railroad spikes is quiet, but for boat spikes is very active. Most makers of boat spikes are not quoting to the general trade, desiring to conserve their output for the Government and it will be probably needed. Prices on railroad spikes and track bolts are given in detail on page 399.

Cold Rolled Strip Steel.—The Government is still placing fairly heavy orders for both hot and cold rolled steel and these are being shipped out by the mills promptly. The new demand has quieted down a good deal, as consumers are well covered over remainder of this year.

On contracts, mills are quoting 9c. at mill, but on small current orders prices range from 10c. up to 12c. at mill. Terms are 30 days, less 2 per cent off for cash in 10 days when sold in quantities of 300 lb. or more.

Nuts and Bolts.—The new demand has quieted down a good deal, and specifications against contracts are also less active. The consuming trade is looking for lower prices on nuts and bolts which they believe will come as soon as the Government gives out announcement of prices it intends to pay for steel. Discounts adopted April 12, which give prices to the large trade in carloads, advances being charged for small lots, are given on page 399.

Wrought Pipe.—Almost every day the subcommittee on tubular products places small or large Government orders for steel pipe with the mills and these are usually shipped out within 48 to 72 hours after they are received by the mills. It is often difficult for the pipe mills to get the steel, roll the skelp and then make it into pipe, but so far all Government orders have been filled very promptly, and to the entire satisfaction of the Government. On lap weld iron and steel pipe, mills are filled up for the remainder of this year, and some for a longer period. The National Tube Co. is filled up on lap weld steel pipe for a year to nearly 18 months, depending on the size. The new demand for both butt and lap weld iron and steel pipe has fallen off a good deal, as the trade is looking for lower prices on pipe to come very soon after the Government announces its policy as to steel prices. Discounts on steel pipe, as adopted on May 1, and being quoted by most of the independent mills, prices of the National Tube Co. being lower, and also discounts on iron pipe, as adopted by all the mills on July 1, are given on page 399.

Boiler Tubes.—The output of the mills rolling iron and steel boiler tubes is sold up for a year or more, but all the mills are taking care of very heavy Government orders for iron and steel tubes, and seamless steel tubing, these orders being given preference and shipped out as fast as the mills can make the product. One leading mill has large orders on its books for steel boiler tubes, to be used on vessels to be built by the Government in 1918, and in some cases running into 1919. One leading interest is furnishing probably 50 per cent of its entire output of steel boiler tubes and seamless steel tubing for Government purposes on direct and indirect orders. Nominal discounts, which do not represent actual prices, are given on page 399.

Old Material.—The leading railroads three or four days ago declared a general embargo on shipments of scrap, and now no shipments can be made on any of the roads leading into this city and into other scrap consuming centers without securing a permit to load the cars. In addition the railroads are furnishing practically no gondola cars, and instead will give shippers only box cars. It is the practice to unload scrap in steel gondolas with magnets, while box cars have to be unloaded by hand labor with wheelbarrows, and this adds very materially to what the scrap costs the buyer. For about a month there has been an embargo on scrap routed to the Pittsburgh Steel Co., Monessen, Pa., but this has been lifted. The local scrap market is almost stagnant, as far as new sales go, and in the meantime prices seem to be steadily seeking a lower level. None of the large consumers is buying any scrap, nor is there a great deal of material coming on the market to find sale. The larger dealers who can hold their scrap are inclined to do so, believing that the market will be higher later on. It is pointed out that the scarcity of coke is keeping quite a large number of blast furnaces banked, and this is materially cutting down the output of pig iron. In order to make up this shortage in pig iron, large steel companies are drawing heavily on their scrap piles, and it is known that stocks of scrap held by three or four of the larger users are getting low. Should a large consumer come in the market for 30,000 to 40,000 tons of scrap—and this may happen at any time—it would very quickly have the effect of putting up prices, and this is what some of the scrap dealers are counting on as going to happen. This can be considered as a bull factor, but, on the other hand, the railroads sell heir scrap every month regardless of prices ruling, and lately a good deal of scrap has been coming from the railroads, thus helping to depress prices in the face of the dull demand from consumers. About the only scrap moving is some small lots of heavy steel scrap, also borings, and a few small lots of low phosphorus melting stock, but prices on the latter have declined very materially. The whole situation is that not enough scrap is being sold to consumers to establish market prices, which are largely nominal.

Dealers quote for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$31.00 to $32.00
No. 1 foundry cast	30.00 to 31.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	38.00 to 40.00
Hydraulic compressed sheet scrap	25.00 to 26.00
Bundled sheet scrap, sides and ends, f.o.b. consumers mill, Pittsburgh district	23.00 to 24.00
Bundled sheet stamping scrap	21.00 to 22.00
No. 1 railroad malleable stock	26.00 to 27.00
Railroad grate bars	18.00 to 19.00
Low phosphorus melting stock	41.00 to 42.00
Iron car axles	45.00 to 46.00
Steel car axles	45.00 to 46.00
Locomotive axles, steel	52.00 to 53.00
No. 1 busheling scrap	24.00 to 25.00
Machine-shop turnings	18.00 to 19.00
Cast iron wheels	31.00 to 32.00
Rolled steel wheels	36.00 to 37.00
*Sheet bar crop ends	41.00 to 42.00
Cast iron borings	19.00 to 20.00
No. 1 railroad wrought scrap	32.00 to 33.00
Heavy steel axle turnings	23.00 to 24.00
Heavy breakable cast scrap	24.00 to 25.00

*Shipping point.

Coke.—On Monday and Tuesday of this week and also on Wednesday forenoon, there was an acute shortage in the supply of cars and labor in the coke regions and in addition several of the large steel companies, notably the Jones & Laughlin Steel Co., Republic Iron & Steel Co., Youngstown Sheet & Tube Co. and others were heavy buyers of prompt furnace coke, with the result that prices have advanced rapidly, and on Tuesday and also Wednesday morning best grades of blast furnace coke for prompt shipment to Valley furnaces sold at $15 and $16 per net ton at oven. There is a great scarcity in the supply of labor in the coke regions and this is likely to get worse as the army draft goes on and there is also a shortage in the supply of miners, there not being enough miners to mine sufficient coal to keep the ovens active. We now quote best grades of blast furnace coke for spot shipment to Valley furnaces at $16 per net ton at oven and coke for Eastern shipment over the Pennsylvania Railroad is higher. Lately the Government through the Federal Trade Commission has been making investigation of coke making by the larger operators and it is expected that the Government may later fix selling prices on both coal and coke. Nothing is being done in coke contracts. The output of coke for the week ended Aug. 4 was over 32,000 tons less than in the previous week, due to shortage in labor, mostly miners. Nothing is being done in contracts. Best grades of 72-hour foundry coke are selling at about $14 per net ton at oven for prompt shipment. The Connellsville *Courier* gives the output of coke in the Upper and Lower Connellsville regions for the week ended Aug. 4 as 335,073 tons, a decrease over the previous week of 32,282 tons.

Chicago

CHICAGO, Aug. 13.

Since the announcement of the Government's regulations which, after Aug. 15, will impose an almost complete embargo on foreign shipments of plates, shapes, billets, pig iron, and scrap, there has been great activity in obtaining licenses authorizing the export of these products. Most of the business of this character in the West has been with Japanese purchasers. Some modification of the stringent ruling is regarded as likely after the arrival in Washington of the Japanese mission which has landed at a Pacific port, especially if Japan consents to aiding the Allies by sending some of her vessels to the Atlantic. It is known that Japan is feverishly building a merchant marine with which she can cope with the flags of the world if permitted to pursue her present course of taking plates that may be needed to prosecute the war through the building of vessels in the United States. These plates, of course, were purchased before the present exigency arose. The United States Government has ordered about 6000 freight cars of various kinds for the railroad it will build in France, distributing the orders among several makers. It also has bought, altogether, 75,000 kegs of spikes for its French operations. Meanwhile domestic business is almost at a standstill except in various specialties. Local authorities believe that some relief in structural shapes is in sight, and one mill will have some light rails to offer next month. Lettings of fabricated steel work are more numerous. Pig iron is inactive, but prices are fully maintained, as they are in all other directions, except scrap. Old material, however, is lower in only one or two items, and it is believed the downward trend of the market has been checked.

Ferroalloys.—No change in prices is reported. Eighty per cent ferromanganese is around $400, delivered, for prompt; $375 for the latter part of this year, and $350 for first half of 1918. Some fear is expressed over the possibility of a shortage, but this feeling is by no means general. Bessemer ferrosilicon is around $100, Jackson County, for 10 per cent, and 50 per cent ferrosilicon ranges from $135 to $145, according to delivery and quantity.

Plates.—It is felt that the greatest demand for plates is yet to come, inasmuch as the Government will soon be calling for the material to meet its shipbuilding program. Since the announcement of the regulations which impose an embargo on the shipment of plates after Aug. 15, there has been a rush to obtain licenses and to get material in transit prior to that date. Meanwhile new domestic business in plates has been held in abeyance. It is felt that the embargo will surely operate to the advantage of home consumers by making plates easier to obtain. Meanwhile, the quotation for tank plates ranges from 10c. to 11c., delivery in 60 to 90 days. An Eastern mill will supply rectangular plates only when the order includes flanged heads.

For Chicago delivery out of stocks jobbers quote 10c.

Structural Material.—Local authorities are of the opinion that relief for the market in structural shapes is near, a view probably based on the embargo which becomes effective Aug. 15. About the only producing seller in this market is an Eastern mill which continues to quote 6c, Pittsburgh, or 6.189c., Chicago, for material out of stock. A local mill will supply some of the material needed for about 6000 cars which the United States Government has purchased for its railroad operations in France. Included in the orders are refrigerator, box, tank, flat and gondola cars which will be supplied by the American Car & Foundry Co., Standard Steel Car Co., Pullman Co., Haskell & Barker Car Co., and the Pressed Steel Car Co. They will require about 50,000 tons of steel. Jobbers continue to quote 5c. for material out of Chicago warehouse. Structural lettings are reported as follows:

Temple Malleable Iron & Steel Co., foundry buildings, Temple, Pa., 394 tons to unknown.

Commonwealth-Edison Co., addition to Fisk Street Station, Chicago, 240 tons, to Hansell-Elcock Co.

Minneapolis St. Paul & Sault Ste. Marie R. R. Co., deck plate girder spans, Spokane, Wash., 125 tons, to Minneapolis Steel & Machinery Co.

Missouri Pacific R. R. Co., one 156-ft. riveted truss span at Sweet Springs, Mo., 180 tons, to American Bridge Co.

Pacific Telephone & Telegraph Co., office building, Oakland, Cal., 708 tons, to California Steel Co.

Pig Iron.—There is little or no change to record in this market either as to prices or activity. Occasional resale lots are making their appearance, but otherwise iron is almost inactive. Deliveries are going forward at a fair rate, largely as a result of the hard work of the sellers. But little concern has been felt hereabouts over the restrictions placed on exports by the Government, inasmuch as most of the sales for foreign shipment were made f.o.b. furnace, and the delivery troubles are up to the purchasers. Some difficulty has been experienced in getting a lot destined for Chile to the seaboard, but it is believed that the New York buyers will manage to get a license and make the shipment. Furnaces in the South appear to be suffering more than others from the shortage of coke, and reports are current of this or that furnace having to bank, most of them small producers. Without exception, prices are unchanged. Northern producers quote $55, furnace, for basic, malleable Bessemer or No. 2 Foundry, any delivery. For this year, the sellers of Southern ask $50, Birmingham, or $54, Chicago, for No. 2, and $45 to $48 for the first half. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 1 to 4	$58.00
Lake Superior charcoal, Nos. 5 and 6, Scotch and No. 1 soft or special	60.50
Northern coke foundry, No. 1	55.50
Northern coke foundry, No. 2	55.00
Northern coke foundry, No. 3	54.50
Northern high-phosphorus foundry	55.00
Southern coke No. 1 f'dry and 1 soft	55.00
Southern coke No. 2 f'dry and 2 soft	54.00
Malleable Bessemer	55.00
Basic	55.00
Low-phosphorus	$90.00 to 93.00
Silvery, 8 per cent	82.75

Bars.—Agricultural implement makers are naturally keeping a close eye on the market, but it cannot be learned that they have placed any orders of late, and it is probable that they will refrain from buying until they have some assurance that prices will remain fairly stable over a specified period of time. A mill which ordinarily supplies a part of their requirements has received no 1918 business from them. Bars are not included in the export restrictions, and a few hundred tons were recently exported by a local mill. Mild steel bars are quoted at 4.689c., Chicago. An Eastern mill which has been quoting this price can sell only limited sizes, mostly small. Bar iron is fairly active at 4.50c. to 5c., Chicago. Rail carbon bars are quoted at 4.50c., Chicago, but the demand is lighter because of the lack of new construction. Jobbers have made no changes in their quotations.

We quote prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c. to 5c.; reinforcing bars, 4.50c., base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Wire Products.—The leading interest has not deviated from its policy of limiting deliveries on specifications to the actual needs of its customers, and in not taking new business except in urgent cases. It quotes on the basis of 3.20c. for wire nails. Independent manufacturers ask 4c. and upward. We quote on the basis of 4c., Pittsburgh, for nails, per 100 lb., to jobbers, as follows:

Plain fence wire, Nos. 6 to 9, base, $4.189; wire nails, $4.189; painted barb wire, $4.339; galvanized barb wire, $5.039; polished staples, $4.339; galvanized staples, $5.039; all Chicago, carload lots.

Sheets.—The local office of a Middle Western maker is not taking any business in black and blue annealed without submitting the inquiry to the mill. The quotation for No. 28 black sheets is about 9.189c., Chicago, with box annealed somewhat lower, 8.939c., Chicago, being probably obtainable. Galvanized, No. 28, range from 10.30c. to 11c., Pittsburgh, one maker quoting 10.45c., Pittsburgh, or 10.639c., Chicago. Jobbers have not changed their quotations.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 10c.; No. 28 black, 10c., and No. 28 galvanized, 11.50c.

Rails and Track Supplies.—Altogether, the Government has purchased 75 000 kegs of spikes for the railroad it will build in France. No domestic business is reported. An Eastern mill expects to be in a position to offer light rails in September. Quotations of the leading interest, with the exception of tie plates, follow:

Standard railroad spikes, 4.25c. base; small spikes, 4.50c., base; track bolts with square nuts, 5.25c., all in carloads, Chicago; tie plates, $70 to $90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base; open hearth, $40; light rails, 25 to 45 lb., $65; 16 to 20 lb., $66; 12 lb., $67; 8 lb., $68; angle bars, 3.25c., base.

Bolts and Nuts.—New business is quiet. For prices and freight rates see finished iron and steel prices, f.o.b. Pittsburgh, page 399.

Store prices are as follows: Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to ⅞ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to ⅞ x 6 in., 40-2½; larger sizes, 30-5; hot pressed nuts, square, $3, and hexagon $3 off per 100 lb.; lag screws, 50 per cent off.

Old Material.—Consumers are doing but little buying but there is more inquiry, and the market has a better aspect. If the inquiry attains any considerable volume, prices are bound to advance. A serious phase of the present situation is the difficulty which dealers are encountering in getting material shipped against orders they have placed. It is complained that the collectors of scrap use the dealer about as they see fit. There have been a large number of cases where these sellers have sold material, but have chosen not to deliver in the face of an opportunity to get a higher price elsewhere, sometimes making it necessary for the dealer to buy elsewhere to cover his commitments and lose money in the bargain. Heavy section rails are in good demand at full prices. The railroad offerings are not large. The C., St. P., M. & O. has issued a small list and the C. & A. is offering 250 tons of rerollers. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$40.50 to $41.50
Relaying rails	50.00 to 55.00
Old carwheels	30.50 to 31.50
Old steel rails, rerolling	38.00 to 39.00
Old steel rails, less than 3 ft	38.00 to 39.00
Heavy melting steel scrap	29.00 to 30.00
Frogs, switches and guards, cut apart	29.00 to 30.00
Shoveling steel	26.00 to 27.00
Steel axle turnings	21.00 to 22.00

Per Net Ton

Iron angles and splice bars	$38.00 to $39.00
Iron arch bars and transoms	41.00 to 42.00
Steel angle bars	30.00 to 31.00
Iron car axles	40.00 to 41.00
Steel car axles	40.00 to 41.00
No. 1 railroad wrought	33.50 to 34.50
No. 2 railroad wrought	30.50 to 31.00
Cut forge	30.00 to 30.50
Pipes and flues	21.00 to 22.00
No. 1 busheling	24.50 to 25.50
No. 2 busheling	17.00 to 18.00
Steel knuckles and couplers	41.00 to 42.00
Steel springs	42.50 to 43.00
No. 1 boilers, cut to sheets and rings	20.50 to 21.00
Boiler punchings	31.00 to 32.00
Locomotive tires, smooth	40.00 to 41.00
Machine-shop turnings	16.50 to 17.50
Cast borings	16.50 to 17.50
No. 1 cast scrap	23.00 to 24.00
Stove plate and light cast scrap	17.50 to 18.00
Grate bars	17.50 to 18.50
Brake shoes	17.50 to 18.50
Railroad malleable	30.50 to 31.50
Agricultural malleable	23.75 to 24.75
Country mixed scrap	16.00 to 16.50

Cast-Iron Pipe.—The 400-ton lot required by Whitefish Bay, Wis., went to the American Cast Iron Pipe Co. At the Akron, Ohio, letting, Aug. 6, 1340 tons went to the Hardware & Supply Co., bidding for the National Cast Iron Pipe Co., and 1240 tons to the United States Cast Iron Pipe & Foundry Co. The Government, among other orders placed in the East, gave one to the United States Cast Iron Pipe & Foundry Co. for 600 tons for delivery at Rockford, Ill. Prices are unchanged.

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., $68.50; 6 in. and larger, $65.50, with $1 extra for class A water pipe and gas pipe.

Philadelphia

PHILADELPHIA, Aug. 13.

Pressure for delivery forms the outstanding feature of the iron and steel markets here. New business is almost at a standstill, though export inquiry is still abundant in some lines such as plates, and transactions in iron are confined to the foundry grades, with very small tonnages involved. Government specifications in all lines continue to reach mills in this territory, but no total allotments have been filled up to this time. Pig iron houses are finding work to occupy themselves during the dull season, as the Federal Trade Commission has sent out an exhaustive inquiry for full details of the elements entering into the cost of making iron.

Pig Iron.—Transactions in eastern Pennsylvania iron are confined to filling-in purchases, for the most part, and the tonnages involved are slight. Good observers feel that the market is slightly softer in the absence of inquiries for any considerable amounts. With furnaces sold up anywhere from six to 12 months, and with many large consumers covered for corresponding periods more or less completely, the present situation was, perhaps, to have been expected. Prices are more or less nominal, and this applies to the Virginia irons as well as to the steel-making grades, in which no transactions have been recorded during the week. There was an inquiry in this market for about 5000 tons of basic to be supplied to a north Jersey concern, but it is understood that the inquiry was conditional and that the order has not been placed. In fact, some users of steel-making irons show a disposition to hold back for the present, awaiting developments in Washington and elsewhere. The Government inquiry as to costs to-day brought forth the comment that furnaces at this time are making shipments of iron in many instances at one-third of the present market prices. Reports of a great quantity of re-sale iron as a result of the embargo have not been verified here and have had no effect on prices. It is believed that any iron originally destined for Holland or Scandinavia would be taken gladly by Italy, and considerable quantities of pig have been forwarded on Japanese account under the export licenses which expire August 15. Standard brands range about as follows, for prompt shipment and delivery in buyers' yards:

Eastern Penn No. 2 X foundry	$53.00 to $55.00
Eastern Penna No. 2 plain	52.50 to 54.50
Virginia No. 2 X foundry	54.25 to 55.25
Virginia No. 2 plain	53.75 to 54.75
Basic	50.00 to 52.00
Standard low phosphorus	90.00

Ferroalloys.—Both ferromanganese and spiegeleisen have shown considerable activity during the past week. Transactions in ferromanganese involving more than 2000 tons have been reported and the price for prompt has been firm at $400. Last quarter delivery can be had for $375, with $350 still the quotation on first quarter, 1918. Inquiry for spiegeleisen during the week aggregated about 10,000 tons, and it is understood most of this amount has been placed. As a result, the price, which last week ranged from $78 to $80, furnace, is now firm at the latter figure for substantial lots.

Coke.—Car conditions have had an unfavorable effect on the coke market, and prices of $15 to $15.25 were paid last week, with more than $16 recorded in one sizable sale. Quotations on spot fuel to-day were $14 to $15.

Billets.—Italy is in the market for 15,000 tons of rerolling billets and bids have been asked here. Billets available for general sale are rather a rarity with mills in this territory and there are but few transactions. While it is reported that rerolling billets have been offered here, in small lots, at $100 through brokers, the last actual sale price recorded here was $110, announced to-day by a maker who had a fairly large lot made available through an odd combination of circumstances. Billets suitable for use in seamless tube plants are quoted at $115, and forging billets for 1918 delivery have been sold here for $125.

Sheets.—Conditions show little change with sheet makers in this district. Government work has the call and civilian orders, even when taken, are shoved to the rear. Quotations on the scattering work taken on show no change, being based on 8¾c. for No. 10 blue annealed, and 10¾c. to 11c. for galvanized.

Iron and Steel Bars.—Makers of bar iron are well sold up, and there has been continuous inquiry, largely as a result of the extensive shipbuilding program. Some inquiries in this market call for amounts up to 1000 tons, and smaller requests are numerous. Mills are maintaining 5.159c. Philadelphia as the minimum for carload lots, shipment at mill convenience. Several thousand tons of soft steel bars are wanted for export to Japan, and one large maker reports very satisfactory specifications on bars under contract at 4½c., base, Pittsburgh.

Structural Material.—Settlement of the Broad Street subway question, involving about 25,000 tons, has been deferred, though something definite may be expected after settlement of the new lease between the Rapid Transit Co. and the city, which goes to Councils to-morrow. Meanwhile, the mayor has not signed the awards of contracts. While no inquiries of moment have been received here during the week, it is understood that fabricating interests are endeavoring to cover on tonnages for the last quarter, but with little success. Mills are not eager for work, and some of them, between orders for their own customers and Government allotments, will take on nothing for the remainder of this year. Shapes from stock maintain prices anywhere from 5¼ to 6c., base, Pittsburgh.

Old Material.—Establishment of the embargo on scrap shipments by the Pennsylvania Railroad on recommendation of the defense authorities in Washington has had the effect of upsetting the market for old materials and restricting business. Under this ruling, the railroad will accept no scrap for shipment unless consignees give notice of acceptance and undertake to unload within a reasonable time. It is expected that the new order will eliminate speculative shipments, whereby the shipper undertook to find a buyer while his cars were enroute, with the frequent effect of tieing up cars and congesting junction points. Another effect has been to leave the shipper in a quandary should the mill find objection to the shipment as not up to its specifications, for he cannot re-ship without finding another buyer. It is expected that these difficulties will be overcome and firms handling old material incline to the view that their real interests will not suffer, though they say one result is likely to be a shortage of materials at the mills when real demand comes. The embargo and other factors have combined to make the situation hard to analyze, and the following quotations, per gross ton delivered in eastern Pennsylvania, are largely nominal in the absence of trading:

No. 1 heavy melting steel	$31.00 to $32.00
Steel rails, rerolling	43.00 to 45.00
Low phosphorus heavy melting	45.00 to 50.00
Old iron rails	45.00 to 47.50
Old carwheels	35.00 to 38.00
No. 1 railroad wrought	45.00 to 50.00
No. 1 forge fire	22.00 to 23.00
Bundled sheets	22.00 to 23.00
No. 2 busheling	16.00 to 17.00
Machine shop turnings (for blast furnace use)	19.00 to 20.00
Machine shop turnings (for rolling mill use)	20.00 to 21.00
Cast borings (for blast furnace use)	19.00 to 20.00
Cast borings (clean)	22.00 to 23.00
No. 1 cast	33.00 to 34.00
Grate bars	21.00 to 22.00
Stove plate	22.00 to 23.00
Railroad malleable	32.50 to 35.00
Wrought iron and soft steel pipe	31.00 to 33.00

Plates.—Between 10,000 and 20,000 tons for export were offered to plate makers since last Monday, but it is understood that save for a small percentage for Japan the inquiries were rejected. Mills are running at their utmost capacity, but it is estimated that as high as 85 or 90 per cent of the output is intended directly or indirectly for Government use. Rolling programs are arranged in accordance with instructions from Washington, and that is why private buyers are informed they cannot get delivery much under a year, and then only if Government requirements do not interfere. The letting of a contract for 750 additional locomotives, in addition to those already ordered for Russia and France, adds to plate requirements, for it is figured that the needs of this Government and the Allies will keep locomotive works crowded for a year. Quotations remain unchanged at 10.159c. Philadelphia for tank and 12.50c., mill, for boat steel, as the minimums.

Cincinnati

CINCINNATI, Aug. 14 (*By wire*).

Some improvement is noted in the inquiry for foundry iron to be shipped this year, although with very few exceptions the amounts wanted are rarely over 200 tons. An Indiana melter is expected to close soon for 500 tons of Southern No. 2 for September-December shipment. A local firm that has canvassed the situation thoroughly is authority for the statement that buying for this year will be continued for small amounts only, but predicts that when interest revives again in first half business, the activity will be more marked than at any time during the present year. Just now consumers are absolutely indifferent for that delivery. Southern iron for this year's shipment is sold all the way from $48 to $50, Birmingham, but most of the spot iron is bringing the higher price. First half quotations are somewhat in the dark, as it is rumored that firms who were willing to take business at $45, Birmingham, several weeks ago have withdrawn prices and generally are quoting more whenever any single inquiry comes to life. Northern is stationary at $55, Ironton, for either this year or the first half of next year. Very little, if any, foundry iron can be obtained in the Hanging Rock district for nearby shipment, as stocks are practically cleared out. The Ohio silvery irons are inactive, and no change in previous quotations is noted. A little Bessemer ferrosilicon was recently sold, but the price was not divulged. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, as follows:

Southern coke, No. 1 f'dry and 1 soft	$51.40 to $52.40
Southern coke, No. 2 f'dry and 2 soft	49.90 to 50.90
Southern coke, No. 3 foundry	49.40 to 50.40
Southern coke, No. 4 foundry	48.90 to 49.90
Southern gray forge	48.90 to 49.90
Ohio silvery, 8 per cent silicon	87.26 to 91.26
Southern Ohio coke, No. 1	56.26 to 57.26
Southern Ohio coke, No. 2	56.26 to 57.26
Southern Ohio coke, No. 3	55.26 to 56.26
Southern Ohio malleable Bessemer	56.26 to 57.26
Basic, Northern	56.26 to 57.26
Lake Superior charcoal	56.75 to 57.75
Southern carwheel foundry	48.90 to 49.90

(*By Mail.*)

Finished Material.—The jobbers are having a hard time in obtaining cars in which to make outside shipments. They are also suffering from the same cause on mill shipments that are held up frequently beyond the specified time. The demand for structural shapes is considered somewhat phenomenal at the present time, and a large part of this business is from local customers. Plates ¼-in. and heavier have been advanced to 10c. base, and No. 10 blue annealed sheets to 10c. All other store prices remain unchanged as follows: Iron and steel bars, 5c.; twisted steel bars, 5.05c.; structural shapes, 5.25c.; cold rolled shafting, 15 per cent plus list; machine bolts ⅝x4-in. and smaller, 40 per cent off list, larger and longer, 30 per cent. Hoops and bands are not quoted for nearby shipments, and only a selected tonnage is being taken on, either by mills or the jobbers for future delivery. The nominal quotation on No. 28 black sheets is now around 9.65c., Cincinnati or Newport, Ky., and No. 28 galvanized at 11.65c.

Coke.—The relief afforded by more moderate weather has enabled producers in all districts to increase the output, but this is offset by the car shortage, which is growing worse. Spot foundry coke loaded on cars would bring almost any price and furnace coke is equally as high where wanted badly, so that no definite prices can be named. Some 72-hr. coke is being disposed of in

small lots around $16 per net ton at oven in the Connellsville, Pocahontas and New River fields. In a few cases, spot foundry coke has been bought as low as $14.50, but the material was not loaded on cars, and there was some question as to its being moved forward promptly. Contract foundry coke is quoted all the way from $11 to $13 per net ton at oven and this wide range of prices is prevalent in all of the three fields named. Contract furnace coke is worth around $9 to $10 per ton.

Old Material.—All quotations are exceedingly weak, but no radical changes have been made within the past few days. Without exception, all dealers are complaining as to the car shortage and as to their inability to supply outside customers, especially those in the Pittsburgh district. Incoming shipments have, of course, been curtailed almost in the same proportion, but nevertheless offerings are somewhat heavy and exceed present demands. The following are dealers' prices f. o. b. at yards, southern Ohio and Cincinnati:

Per Gross Ton

Bundled sheet scrap	$19.50 to $20.00
Old iron rails	33.00 to 33.50
Relaying rails, 50 lb. and up	45.00 to 45.50
Rerolling steel rails	36.00 to 36.50
Heavy melting steel scrap	32.00 to 32.50
Steel rails for melting	32.00 to 32.50
Old carwheels	29.00 to 29.50

Per Net Ton

No. 1 railroad wrought	$31.50 to $32.00
Cast borings	12.50 to 13.00
Steel turnings	12.50 to 13.00
Railroad cast	23.00 to 23.50
No. 1 machinery cast	24.00 to 24.50
Burnt scrap	14.50 to 15.00
Iron axles	43.00 to 43.50
Locomotive tires (smooth inside)	36.00 to 36.50
Pipes and flues	17.50 to 18.00
Malleable cast	24.50 to 25.00
Railroad tank and sheet	15.50 to 16.00

Birmingham

BIRMINGHAM, Aug. 14 (*By wire*).

There has been no break in the deadlock in the southern iron market. There is little inquiry and few sales, with no change in quotations. Fifty dollars for this year, $48 for next, is the rule for furnace iron.

BIRMINGHAM, ALA., Aug. 11—(*By Mail*).

Pig Iron—Another listless week in the Birmingham iron market marked no change in prices. Delivery is the principal concern. One maker is due to deliver 55,000 tons this month and is delivering at the rate of 25,000. Stocks of all kinds are reported to have been reduced to less than a month's make. A large maker reports a small run of sales at $50 and over for 1917 and $48 and over for 1918. A lot of several hundred tons of silvery for prompt shipment brought $52 and one of over 3 per cent silicon brought $53. Brokers report spot sales at $50 and over with an occasional lot going slightly under $50. Inquiry from several foreign countries is active, but the domestic inquiry is nil. Consumers press for deliveries. Furnaces worked badly the latter portion of July on account of moisture and output fell below the usual. The small supply of charcoal is selling at $55 and $57, the latter being the more usual price recently. Very little is heard of iron left over at ports, what was available appearing to have been taken care of. Southern foundries, especially those in the Birmingham district, are unusually busy and the home metal consumption is increasing. We quote per gross ton f.o.b. Birmingham district furnaces for prompt delivery as follows:

No. 1 foundry and soft	$50.50 to $51.50
No. 2 foundry and soft	50.00 to 51.00
No. 3 foundry	49.50 to 50.50
No. 4 foundry	49.25 to 50.25
Gray forge	49.00 to 50.00
Basic	50.00 to 51.00
Charcoal	55.00 to 56.00

Steel Bars—Steel bars f.o.b. Birmingham in carload lots, 4.75c. to 5.00c.; iron bars, 4.40c. to 4.60c.

Cast Iron Pipe—The Government has let additional contracts for cantonment purposes and flange pipe for the oil fields has also been ordered in quantities. A Western municipality order for 1000 tons was booked; otherwise this trade is very dull. We quote per net ton f.o.b. makers' yards as follows: 4 in., $63; 6 in. and upward, $60 with $1 added for gas pipe and special lengths.

Coal and Coke—Coal operators are principally concerned in the ultimatum of the reorganized union miners to walk out Aug. 20, unless recognized. A few small concerns have recognized the union; the larger ones will not. Prices remain unchanged, but output has suffered owing to agitation. Coke reacted after a streak of sympathy with that of other districts and the lowest spot coke is held at $14. Efforts to secure spot coke at $16 were unsuccessful. A Chattanooga order for 1000 tons went begging owing to inability to fill it.

Old Material—The scrap market is reported as demoralized, especially on account of embargoes which have restricted sales territory to the advantage of the consumers in places where delivery is obtainable. Prices have not changed, but quotations are subject to special treatment in actual transactions. We quote per gross ton f.o.b. dealers' yards as follows:

Old steel axles	$50.00 to $51.00
Old steel rails	25.00 to 26.00
No. 1 wrought	28.00 to 29.00
No. 1 heavy melting steel	18.00 to 19.00
No. 1 machinery cast	22.50 to 23.00
Carwheels	25.00 to 25.50
Tram carwheels	23.00 to 23.50
Stove plate and light	16.00 to 17.00
Turnings	11.00 to 12.00

St. Louis

ST. LOUIS, Aug. 13.

Pig Iron.—Transactions in this market in pig iron are at about the lowest possible ebb, with carload lots seemingly the maximum, save for special offerings of iron which is off the standard analyses. A number of sales of this type are going on from day to day. An offering of some reclaimed iron by an insurance company which had salvaged it from a river accident, although it was practically at buyer's offer in price, attracted no attention although 400 tons was made available at considerably below the market. A considerable number of ferromanganese sales were made during the week, mostly in carload lots at $375 for future delivery and $400 for spot. An inquiry is also pending from an out of town concern for 300 tons of foundry iron, but a delivery problem is involved which interferes with closing, aside from the price. The figures here stand at about $48 Birmingham for No. 2 Southern for 1918, with Chicago No. 2 X at $55 and Ironton at the same figure. Lake Superior charcoal iron is held at $60.

Coke.—The market for coke has stiffened somewhat during the week and prompt shipment foundry grades are being held at $13.50 to $14 for best selected 72-hr. coke, while future contracts are being accepted at about $12.50, though not much is being handled at that price. Furnace coke is only slightly lower than foundry coke, but is not in demand, while by-product coke is not actively in the market, being well sold up. One inquiry for foundry grade coke for future delivery is from 1500 to 2000 tons for 1918 delivery.

Finished Iron and Steel.—In finished products the market is at a standstill save for the activities of those who are insisting with all their energy upon the delivery of material already under contract. Movement out of warehouse is very active. For stock out of warehouse, we quote as follows: Soft steel bars, 4.55c.; iron bars, 4.50c.; structural material, 5.05c.; tank plates, 8.05c.; No. 10 blue annealed sheets, 10.05c.; No. 28 black sheets, cold rolled, one pass, 10.35c.; No. 28 galvanized sheets, black sheet gage, 11.75c.

Old Material.—The scrap dealers report a slightly stronger feeling in the market as a result of shipments East and an increasing tendency to buy for that purpose, but the local demand remains without change and consumers are apparently content to await developments and to operate their plants on what they have in their yards and their contracts remaining to be filled. An incident of the situation is the piling up of car service charges because of the condition of the railroads and the rigid enforcement of rules. Lists out are very few

and railroads seem to be holding their material for two reasons, the uncertainty of the market and the difficulty in getting cars. The lists out at present include only 250 tons from the Chicago & Alton and 150 tons from the Kansas City, Mexico & Orient. We quote dealers' prices f.o.b. St. Louis industrial district, at customers' works, as follows:

	Per Gross Ton	
Old iron rails	$38.00 to	$38.50
Old steel rails, re-rolling	38.50 to	39.00
Old steel rails, less than 3 ft	38.00 to	39.00
Relaying rails, standard section, subject to inspection	50.00 to	55.00
Old carwheels	30.50 to	31.00
No. 1 railroad heavy melting steel scrap	29.00 to	30.00
Heavy shoveling steel	27.00 to	27.50
Ordinary shoveling steel	26.00 to	26.50
Frogs, switches and guards, cut apart	29.00 to	30.00
Ordinary bundled sheet scrap	18.50 to	19.00
Heavy axle and tire turnings	21.00 to	22.00

	Per Net Ton	
Iron angle bars	$35.00 to	$35.50
Steel angle bars	30.00 to	30.50
Iron car axles	40.00 to	41.00
Steel car axles	40.00 to	40.50
Wrought arch bars and transoms	39.00 to	39.50
No. 1 railroad wrought	33.00 to	33.50
No. 2 railroad wrought	30.00 to	30.50
Railroad springs	30.00 to	30.50
Steel couplers and knuckles	38.00 to	39.00
Locomotive tires, smooth inside, 42 in. and over	38.00 to	39.00
No. 1 dealers' forge	24.00 to	24.50
Cast iron borings	14.50 to	15.00
No. 1 busheling	22.00 to	22.50
No. 1 boilers cut to sheets and rings	20.50 to	21.00
No. 1 railroad cast scrap	20.50 to	21.00
Stove plate and light cast scrap	16.50 to	17.00
Railroad malleable	27.00 to	27.50
Agricultural malleable	22.00 to	22.50
Pipes and flues	19.50 to	20.00
Heavy railroad sheet and tank scrap	18.00 to	18.50
Railroad grate bars	17.50 to	18.00
Machine shop turnings	14.50 to	15.00
Country mixed scrap	14.00 to	15.00

San Francisco

SAN FRANCISCO, Aug. 10.—Nothing has occurred to ameliorate the stringent conditions of supply. Prices and terms of delivery are rigid, old materials being the only line showing any degree of flexibility, or any change other than that of advances. Mills and jobbers' offices are badly congested with orders which there is no immediate prospect of filling. Preference is given Government requirements, and, although contracts in bulk are being placed by the Government with the Eastern mills, the numerous rush orders given to local concerns aggregate a formidable amount. At Camp Fremont, the army cantonment in process of construction south of San Francisco, the Government is expending some $2,000,000, and this, in conjunction with many other works undertaken to provide for the needs of the Army and Navy, means a constant stream of orders for local mills and jobbers. On some lines deliveries are a little easier than on others, but speaking broadly, there is no relaxation in the difficulties of obtaining material at such long range.

Bars.—Local mills are not accepting orders, except when they have contracts for tonnage, as rollings are booked for a long time ahead. Stocks in hands of jobbers are very low. Quotations on bars have been withdrawn by the mills, which will quote only on receipt of specifications. Jobbers' quotations for merchant steel bars, out of stock, are 6c., base price; reinforcing bars, out of stock, carload lots, 5.50c.; less than carload lots, 6c. On account of the serious shortage in structural steel, 12 large buildings, on which work is about to be commenced, will not be constructed of steel and brick, but of reinforced concrete instead. This means an extra strain on a market already taxed to its utmost.

Structural Materials.—Structural shapes are quoted, tentatively, on a basis of 6.50c. by the local mills. This base price, however, cannot be relied upon, as the supply is so shortened and the demand so great that prices are governed largely by the necessities of the buyer. Some of the local fabricators have contracts with buyers sufficient to keep them running the rest of the year, yet they are not busy at the present time, because of the difficulties in the way of obtaining material. One concern placed an order for 5000 tons of steel with an Eastern mill, but has not yet been able to get delivery.

Plates.—It is becoming an increasingly difficult problem to obtain ship plates for the shipyards here. With the export of ship plates to Japan stopped, there will be more available for the yards in this vicinity and up the coast. New ship yards, however, are being established so plentifully on the Coast that it is not easy to forecast the future supply. Jobbers quote tank plates ¼-in. at 10c., with flanges at 10.25c., base price.

Sheets.—Sheets are now scarcer in this market than any other line of iron and steel, and stocks are almost entirely depleted. There is none available for export. The demand is of such an insistent nature that buyers are willing to pay premiums for reasonably early delivery. Recently, Eastern mills have been wiring jobbers, offering limited tonnage for prompt shipments. The situation is so uncertain as to price that jobbers seem reluctant about placing orders for extended deliveries until the price situation in the East has cleared up. Jobbers' quotations are: 13.03c. for No. 28 galvanized and for blue annealed No. 10, 11c., net 30 days, no discounts.

Wrought Pipe.—There has been considerable activity of late in the export of wrought pipe to Japan, which in all probability will cease after Aug. 15. This will prove of benefit to the local market, which is bare of supplies, with demand so heavy that jobbers decline to quote.

Cast Iron Pipe.—But little is being done in construction work, necessitating the utilization of cast iron pipe. The city of Pasadena is receiving bids for 100 tons of 4, 6 and 8-in. pipe, which is the only order of any commendable size placed on the market lately. The base price quotation remains at $60. At Camp Fremont, the U. S. Army Department is to use 6 and 12-in. wood stave pipe instead of iron pipe; partly for economy and partly because of delayed transportation.

Pig Iron.—Nearly all the local mills and foundries are operating under contracts for pig iron, made sometime ago; consequently they are not hampered to any extent by inability to obtain supplies. So little is being done on this market in pig iron that no basis of value, other than Eastern quotations, can be established.

Coke.—The market here has been stripped clean of coke and no firm quotations can be obtained. As high as $30 a ton has been paid lately. Some of the smaller foundries have been forced to use inferior grades.

Old Materials.—Nervousness over the approaching embargo has induced holders to accept lower figures and the scrap market is weakening. Good country scrap can be bought for $23.50, old rails for $29, and heavy melting for $33. Scrap has been arriving from Mexico in limited quantities; most of it destined for Japan. While stories of immense piles of scrap in Mexico have been somewhat exaggerated, there is a considerable quantity lying at a Mexican Gulf port, which would all be shipped here but for the opposition of the Mexican Government.

Buffalo

BUFFALO, Aug. 14.

Pig Iron.—Very little iron of any grade is being sold by Buffalo district furnaces because of the pronounced scarcity of iron not already under contract for a long period ahead and the further reason that users are as a rule simply sitting by awaiting developments. As a consequence, there is not much new business to report, carloads and small lots for emergency use being the only business transacted. Two small lots of 4 to 5 per cent silicon commanded $57 to $58 for delivery during the remainder of the year and one small tonnage of 2.25 to 2.75 per cent silicon was noted as taken at $54.50. Average foundry grades brought $55 for small tonnages. A 100-ton lot was reported taken by the Troy furnace at $53; but only a small proportion of the product of that furnace for remainder of year remains unsold. The basic iron situation is a little easier, although apparently none is being offered by the furnaces

of this district, it is procurable from other districts. An inquiry for 500 tons is now being negotiated. There is no change in prices for 1918 delivery and we quote nominal prices for such delivery the same as a week ago, as follows, f.o.b. furnace, Buffalo:

High silicon irons	$55.00 to $56.00
No. 1 foundry	54.00 to 55.00
No. 2 X foundry	53.00 to 55.00
No. 2 plain	52.00 to 54.00
No. 2 foundry	51.00 to 53.00
Gray forge	51.00 to 53.00
Malleable	54.00 to 55.00
Basic	54.00 to 55.00
Lake Superior charcoal, f.o.b. Buffalo	55.00 to 60.00

Finished Iron and Steel.—Buying, aside from orders covering Government work, is almost at a standstill, and general inquiry is of smaller volume, because buyers have apparently come to the conclusion that orders cannot be entered until Government requirements are taken care of. For such small tonnages as are moving, prices are above the nominal schedules of the leading producing interest. One producer of the district is, it is understood, offering fourth quarter contracts to its customers at 4½c. for bars and structural material and 8c. for plates. The selling agency of the largest manufacturer of turn-buckles reports prices have been advanced 10 to 20 per cent, according to new classification recently put into effect, which creates separate classification for turn-buckles, with stubs, 1 in. and under; 1⅛ to 1⅜ in.; 1½ to 1⅞ in., and 2 in. and over, with the same classification applying also to turn-buckles without stubs, which is quite a departure from the old classification. All inquiries are required to be submitted to the mill headquarters before acceptance. One of the contributing causes to this price advance is the expected heavy demand developing from the construction by the Government for turn-buckles for use in roof trusses, etc., for cantonment and aviation field buildings. The John W. Cowper Co., Buffalo, which has the general contract for factory and office buildings for the Curtiss Engineering Corporation at Garden City, L. I., has sub-let the structural steel, 800 tons, to the Ferguson Steel & Iron Co., Buffalo.

Old Material.—No buying of heavy melting steel has developed during the week and the market is sentimentally weaker in consequence. No stocks of this commodity are on hand in dealers' yards available for immediate shipment and on that account dealers are not inclined to make selling contracts, as in their opinion, as soon as demand is resumed, prices are bound to advance again. The fact that stocks in the hands of consumers are getting lower, will, they think, make visible a buying movement in the near future and push the market up. The week has shown an active demand for carwheels, railroad malleable and stove plate; but at no change in prices except for stove plate, which advanced 50c. to $1 per ton. In all other lines, trade has been practically at a standstill. Prices for wrought pipe, No. 1 and No. 2 busheling scrap and bundled sheet stamping scrap have receded slightly. We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$31.00 to $33.00
Low phosphorus	45.00 to 48.00
No. 1 railroad wrought	43.00 to 45.00
No. 1 railroad and machinery cast	30.00 to 31.00
Iron axles	45.00 to 50.00
Steel axles	45.00 to 50.00
Carwheels	35.00 to 36.00
Railroad malleable	33.00 to 34.00
Machine shop turnings	18.00 to 19.00
Heavy axle turnings	26.00 to 27.00
Clean cast borings	20.00 to 21.00
Iron rails	43.00 to 44.00
Locomotive grate bars	20.00 to 21.00
Stove plate	21.00 to 22.00
Wrought pipe	29.00 to 30.00
No. 1 busheling scrap	28.00 to 29.00
No. 2 busheling scrap	18.00 to 19.00
Bundled sheet stamping scrap	20.00 to 21.00

British Steel Market

Pig Iron More Active—Strong Demand for Finished Materials

LONDON, Aug. 14—(*By cable*).

Pig iron is more active. Hematite is strong. Basic output is increasing. American semi-finished material is strong. Wire rods are selling at $28 to $30 c.i.f., according to delivery. Tin plates are slow. Ferromanganese is nominal.

Benzol is quoted at 13d. and toluol and ammonium sulphate are unchanged. We quote as follows:

Tin plates, coke 14 x 20; 112 sheets, 108 lb., f.o.b. Wales, maximum, 30s.
Black sheets, £21 5s.
Ferromanganese, £45 nominal.
Ferrosilicon, 50 per cent, c.i.f., £35 upward.
On other products control prices are as quoted in THE IRON AGE, of July 19, p. 171.

Very Strong Demand Continues—Government Control Tightens

LONDON, ENGLAND, Aug. 3.—The tightening of control exercised by the authorities in one direction or another still further handicaps merchant business. This policy, of course, is chiefly connected with efforts made to protect steel supplies for national safety, and to keep down prices. Government requirements are more likely to increase than to diminish, and all available capacity is thus fully engaged in face of an insatiable demand, especially for steel material.

There is no alteration in pig iron, but the outlet for foundry descriptions looks like expanding with the turn of the month, in view of the greater demand from Scotland, where reserve stocks have run so low that the August allocations will be made on a larger scale to home consumers, with a possible further increase in the exports to Allies, as the output has been developed sufficiently to permit of this, provided additional steamer tonnage facilities can be secured. Greater efforts are being made in the Cleveland district to accelerate the output of ironstone for the production of basic iron. The supply of both basic and hematite still falls short of home and allied requirements owing to the phenomenal strain upon steel producers. Italy continues a pressing buyer of hematite, while the execution of old contracts for that country has remained much in arrears. The pressure upon East Coast hematite furnaces is greater than ever, while the Scotch output is all needed locally.

Conditions in semi-finished steel are absolutely dominated by the huge calls made for war needs, these absorbing the great bulk of current home output, so that very little spare material is available to satisfy requirements elsewhere. There is no prospect of relief for ordinary purposes and shell discards are disappearing as fast as they become available. As regards American material, only wire rods can be secured in limited quantities, at about £29 to £30 c.i.f. Liverpool, but merchants here expect that makers terms will be shortly raised considerably. Business in billets is absolutely dead.

Constant Influx of Orders

The position in finished iron and steel seems tighter, the constant heavy influx of orders, more particularly for steel, contrasting with a pronounced dearth of offers, and the possibility of reserve stocks accruing is more remote than ever, while the bulk of current output is already earmarked months ahead, and numerous old contracts are still outstanding. Merchants relying on the mills for relief are disappointed at the lack of response to their urgent applications. The scope for new business in uncontrolled material seems undergoing a further contraction, for the position in this direction is effected by the pressure upon the controlled branches. The tendency of prices all around is very firm. The price of mattress wire has been raised another £4 to £56 in the Birmingham district. Mild steel bars have been selling lately up to £18.10 net delivered to the home trade. Iron bar makers are heavily booked and North Staffordshire Crown bars stand at £13.15 f.o.t. at works.

Deadlock in Tin Plate

There has been a deadlock in the tinplate market since this has been taken under control, with the maximum basis price fixed at 30s. for I.C. 20 x 14 net at maker's works for all orders and contracts closed on July 19 and after. There are plenty of orders await-

ing to be placed, but makers are already fully booked and keeping aloof as well as merchants, pending the publication of the full and definite official order giving a schedule of all extras and allowances over the basis price. Merchants have been badly upset by this price regulation in view of the commitments they have outstanding, that were entered into at considerably higher prices prior to the regulation. Their position is more particularly awkward having regard to stock lots that were free from permit restrictions and sold up to 44s. per box basis. This concession has been withdrawn although holders of such free stock lots have been given permission to dispose of them without certificate until Aug. 31. The allocations of steel to the mills are more restricted than ever, and the output suffered a further contraction last month.

There has been no further change in ferromanganese, the tone, however, being strong owing to the rarity of offers. Prices are nominally on the basis of about £80 f.o.b. for loose for far forward shipment to Continental ports, and about $400 c.i.f. North American Atlantic ports. Requirements are somewhat more pressing in Indian manganese ores, but until the scarcity of tonnage can be remedied, new business is virtually at a standstill, and the tone is strong, the price being about 3s. 6d. per unit c.i.f. United Kingdom ports.

New York

NEW YORK, Aug. 15.

Pig Iron.—The pig iron market is lifeless, drifting along while awaiting action by the Government in regard to prices. The car situation is extremely bad, especially in New England. Embargoes exist against many shipping points and very little iron is being moved. The New Jersey open hearth steel works, which has been inquiring for 5000 tons of basic for the last quarter of this year, has not yet closed and may not do so. The same is true of several inquiries for foundry iron. Nothing more is heard about backlog sales for the furnace at Troy, N. Y., and the Buffalo market seems to be firm. The recent purchase of 6000 tons of foundry grades by the Navy Department at $27.50, furnace, has aroused some discussion. This transaction, however, is not important, and the $27.50 is not a final price, which is left to be determined by the Federal Trade Commission. The 6000 tons was for early delivery and divided among a number of furnaces in eastern Pennsylvania, Virginia and New Jersey. We quote for tidewater delivery in the near future as follows:

No. 1 foundry	$53.25 to $54.25
No. 2 X	52.75 to 53.75
No. 2 plain	52.50 to 53.50
Southern No. 1 foundry	52.75 to 53.75
Southern No. 2 foundry and soft	52.25 to 53.25

Structural Steel.—With 85,000 tons fabricating capacity, or according to the Bridge Builders & Structural Society, 41½ per cent of the country's total theoretical output, as the total of July business, one has a measure of the low ebb of new inquiry. Delivery promises on new offerings may with a few mills show signs of betterment, growing out of possible rearrangement of mill rolling schedules because of uncertainty of obtaining permits for export shipments, but no general improvement in this direction has been noted and prices remain strong. Numerous fabricators are in need of work and the period of uncertainty, awaiting on Government settlement of price questions, is not reassuring. The steel work for the Philadelphia subway is finally closed and it is possible all of this was included in July's totals. It includes 15,000 tons to be supplied by the McClintic-Marshall Co. and 7200 tons to be fabricated by the American Bridge Co. Additional steel work, amounting to 4500 tons, is now up for figures for the Beacon Light & Power Co. at Chester, Pa. For the Pennsylvania Railroad fresh bridge inquiries call for 1000 tons and for the Central Railroad of New Jersey 200 tons for a coal pier has been closed. Three buildings, to take 500 tons, are to be built at Elmira, N. Y., for the Willys-Morrow Co. The Richmond Structural Steel Co. is to furnish 200 tons in crane runways for the Richmond, Va., plant of the American Locomotive Co. We quote plain material from mill at 4.669 to 5.169c., New York, according to the delivery. Shipments from warehouses are 5c. to 5.25c. per pound, New York, according to sizes desired.

Steel Plates.—There are rumors that mills having a large percentage of orders for export may be able to make better deliveries on domestic account, particularly if the embargo on export shipments for other than war purposes is not soon lifted. So far no new transactions were learned of to indicate any change in delivery dates or prices. A distribution of about 9000 cars for the Government's railroad in France has been made, as noted elsewhere, and a large lot of locomotives have also been closed on this account. This work will get precedence and in this respect counts as another obstacle to the early delivery of plates to industrial plants having other Government work, as boiler furnaces, essential for ships under construction but so far removed from more towering contracts as not to command, apparently, any priority so far as the material producers are concerned. We quote tank plates for mill shipment at 10.169c., New York, and ship plates at 12.169c., New York. Plates out of store are 8c. to 9c. for tank quality and 8.50c. to 11c. for ship plates.

Iron and Steel Bars.—A lot of 1000 tons of soft steel bars for nearby shipment has been sold at 5c., Pittsburgh, and a smaller lot for concrete reinforcing purposes has been closed at better than 4.50c., Pittsburgh, for delivery in September. Generally new business is flat, even in export, except possibly in bar iron, of which some sizeable sales have been made at 4.75c. and 5c., Pittsburgh basis. In the absence of sales of importance, we continue to quote steel bars in mill shipments at 4.669c. to 5.669c., New York. We quote mill shipments of bar iron at 4.919c. to 5.169c., New York. From New York district warehouses steel and iron bars are sold at 5c. to 5.50c.

Cast Iron Pipe.—The Government is urging deliveries on pipe recently purchased, including some intended for shipment to France and other tonnages for shipment to cantonments. Business is not active either in pipe lettings or private contracts. Carloads of 6-in., 8-in. and heavier are quoted at $65.50 per net ton, tidewater, and 4-in. at $68.50.

Old Material.—Embargoes declared by the Pennsylvania and other railroads have brought about almost complete stagnation in the old material market. The Government has taken more than 20,000 cars additional for its own use in hauling various kinds of supplies. This means that the cars available for the hauling of scrap are greatly reduced. In one case a consignment of scrap was rejected and could not be shipped to its original destination, but the shipper was not able to ship it to a yard at Reading for the reason that embargo had been declared against that city. What would become of the scrap was at last accounts not determined. Prices are nominal and tending downward. Brokers quote buying prices as follows to local producers and dealers per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$29.50 to $30.50
Old steel rails (short lengths) or equivalent heavy steel scrap	29.50 to 30.50
Relaying rails	65.00 to 70.00
Rerolling rails	39.00 to 40.00
Iron and steel car axles	42.00 to 43.00
No. 1 railroad wrought	41.00 to 42.00
Wrought-iron track scrap	32.00 to 33.00
No. 1 yard wrought long	32.00 to 33.00
Light iron	10.00 to 12.00
Cast borings (clean)	21.00 to 21.50
Machine-shop turnings	18.00 to 19.00
Mixed borings and turnings	16.50 to 17.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long)	30.00 to 31.00

For cast-iron scrap dealers in New York City and Brooklyn are quoting as follows to local foundries per gross ton:

No. 1 machinery cast	$34.00 to $35.00
No. 1 heavy cast (column, building material, etc.)	29.00 to 30.00
No. 2 cast (radiators, cast boilers, etc.)	28.00 to 29.00
Stove plate	20.00 to 21.00
Locomotive grate bars	20.00 to 21.00
Old carwheels	33.00 to 34.00
Malleable cast (railroad)	32.00 to 33.00

Ferroalloys.—Quite a little ferromanganese has been bought in the past week for delivery in the last quarter

of this year and in the first half of 1918, the various transactions probably amounting to 6500 to 7000 tons. British licenses have been granted to one importer covering 5000 tons and of this amount 2200 tons is afloat. While this may be looked on as a loosening up of the British supply as compared with recent weeks, the amount is after all inconsequential in comparison with the present rate of consumption. Some increase in domestic production is to be looked for, but that too is inconsiderable. The smaller producers of steel apparently have a better supply in comparison with their needs than some of the larger interests. The price is around $400 for early delivery and $375 is obtained for fourth quarter shipment, while for the most part $350 is the basis for 1918. Consumers having relatively low priced ferromanganese coming to them on their contracts are naturally pressing for its delivery but are finding no lessening of the difficulty of getting long overdue shipments from Great Britain. A loss of 530 tons of spiegeleisen is reported in connection with the sinking of the Quernmore last week. For 20 per cent spiegel the market holds around $85 at furnace. The movement in ferrosilicon continues good, with conditions of supply and demand practically the same. Imports in the past year have shown a fair increase. Sales for early delivery are made at $200 and for delivery next year $130 has been done.

Cleveland

CLEVELAND, Aug. 14.

Iron Ore.—So severe has become the freight car congestion at lower Lake ports that shipment of Lake Superior ore inland has come almost to a standstill in certain sections. Lake vessels carrying ore are compelled to anchor off unloading ports in large numbers because they cannot unload. At times, fully a dozen vessels are swinging idly off the Cleveland Harbor awaiting their turns to proceed to the unloading docks. One day last week 17 such vessels lay off Ashtabula Harbor, while trains upon trains of loaded ore cars occupy sidings all the way south to Youngstown, unable to move, it is said by Cleveland ore authorities, because of lack of motive power. Committees of ore shippers, vessel men, coal shippers and railroad authorities have been wrestling with the various problems involving both ore and coal transportation, and some order is being brought about. It is figured now that 60,000,000 tons of ore will be the minimum that blast furnaces will require to operate until the new ore becomes available on June 1 next year, and at the same time 32,000,000 tons of bituminous coal and anthracite must be carried to the Northwest. In the effort to utilize the coal and ore unloading facilities at Toledo and Sandusky, they have been worked far beyond their normal capacity, and yet relief has not been adequate. To-day it has become manifest heroic measures must be resorted to, and, despite requisitions for certain maximum tonnages of ore made by individual furnaces, allotments of ore tonnages are being prepared and forwarded to furnaces. They will receive the tonnages of ore thus alloted and no more. Because of the mix-up in the railroad situation, it is the belief of competent Cleveland ore trade authorities that little, if any, more than 55,000,000 tons can be brought down this season in vessels, which would mean about 56,000,000 or 57,000,000 tons for the season by rail and water. In the meantime, every effort is being exerted by ore, coal and transportation men to remedy the present situation, and they will continue to exert every endeavor throughout the remainder of the season. But the handicap under which the season began, about 3,300,000 tons up to June 1, is a difficult one to overcome.

Pig Iron.—Little pig iron business is being done by any of the furnace or sales concerns in this city. Inquiries have fallen to the minimum and sales are almost nil. For instance, one large furnace interest the past week sold one carload of iron, while another disposed of five carloads. All was sold at the basis of $55, furnace, whether from Cleveland, Valley or Toledo furnaces. Shipments are going forward steadily from all stacks and melters are insistent upon steady deliveries of iron. No. 2 stack of the River furnaces of Corrigan, McKinney & Co. has been blown out after a campaign lasting almost five years, or ever since the stack was first lighted after being built. The stack is out for relining and will be lighted again just as soon as possible. We quote, f.o.b. Cleveland, as follows for prompt delivery:

Bessemer	$55.95
Basic	$53.30 to 55.30
Northern No. 2 foundry	55.30
Southern No. 2 foundry	51.00 to 54.00
Gray forge	50.95 to 52.95
Ohio silvery, 8 per cent silicon	88.62
Standard low phos. Valley furnace	85.00

Coke.—Contracting for coke has about disappeared in Cleveland either for furnace or foundry fuel. Almost all purchases made are for prompt delivery, or for no longer periods than a month. The sudden spurt the latter part of the week of the furnace coke price to around $15.50 to $16, ovens, for some small tonnages brought little surprise in Cleveland where it had been observed deliveries were below par. The decline of 46,000 tons in Connellsville coke shipments for the week ending Aug. 4 explains the sudden rise in price, the falling off in production being laid to short and inefficient oven labor supplies and not to lack of cars. The car supply had been 100 per cent up to the decline in production, but now the Monongahela railroad has withdrawn many of its cars, claiming they have not been loaded. Last Saturday, Cleveland coke makers received a long telegram from the Federal Trade Commission at Washington calling upon them to make report within three days of all coke oven producing costs for last year and June of this year in detail. This is believed to foreshadow a price fixing campaign on Connellsville coke by this federal body.

Semi-Finished Steel.—While reports have come to Cleveland steel makers of weakness having developed in the semi-finished steel markets in the Pittsburgh district, no change in prices is announced here. No inquiries of moment have been received by Cleveland mills for either billets or sheet bars, so that they have not been compelled to quote or even talk price. They expect, however, if selling actually begins upon the new basis, they will have to come down to $90 or thereabouts.

Finished Steel.—While there had been some feeling that a change in the wire products markets might come about around Aug. 1, but that date has come and gone and nothing has occurred to change the present anomolous wire price situation. Cleveland jobbers find the American Steel & Wire Co. is making better deliveries of wire nails at $3.20, mill, per keg and they say, if this continues, they will be satisfied. Independent companies which have continued to ask $4 per keg admit that they are getting few specifications at the high price. A local representative of an eastern plate mill the past week was permitted to offer for sale 500 tons of plate that had been destined originally for Japanese shipment, the price to be 8.50c. However, after canvassing the northern Ohio market, the Cleveland concern sold only about 50 tons. Another downstate consumer who had a surplus of plates sent out a list containing 400 tons and offered them at 8c. He, too, sold only a few tons at that price. It is known one Cleveland mill is offering to book fourth-quarter plates at 8.50c., and specifications are coming in slowly to such mills as took orders for plates for third quarter delivery at 10c. Several manufacturing projects offer prospects for some hundreds of tons of structural steel material, but private building is very limited. The Cleveland Motor Plow Co., Rollin C. White president, has awarded to the S. W. Emerson Co. contracts for building two structures 62 x 500 and 80 x 100 feet respectively for shops, while the Grant Motor Corporation has given a contract to the W. I. Thompson & Son Co. for the first unit of its proposed plant, 60 x 280 feet, estimated to cost $80,000. The concrete bar market is showing further softness, and while 4c. is the usual price for bars, it is said 3.50c. can be done without trouble for fair sized tonnages.

Old Materials.—Heavy melting steel has receded about $1 a ton although this has been due largely to trading between dealers. Heavy steel consumers are not in the market at this time. The railroads have

disposed of their lists at slight concessions which helped the market downward about 50 cents a ton all along the line. Dullness still is the characteristic feature to the local scrap market. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton

Steel rails	$30.50 to $31.50
Steel rails, rerolling	44.50 to 45.50
Steel rails, under 3 ft.	36.50 to 37.50
Iron rails	42.50 to 43.50
Steel car axles	26.00 to 26.50
Heavy melting steel	30.00 to 32.00
Carwheels	30.50 to 31.50
Relaying rails, 50 lb. and over	49.50 to 54.50
Agricultural malleable	23.50 to 24.50
Railroad malleable	30.50 to 31.50
Light bundled sheet scrap	23.50 to 24.50

Per Net Ton

Iron car axles	$46.50 to $47.00
Cast borings	17.50 to 18.00
Iron and steel turnings and drillings	16.50 to 17.00
No. 1 busheling	25.00 to 25.50
No. 1 railroad wrought	40.50 to 41.50
No. 1 cast	28.50 to 29.50
Railroad grate bars	21.00 to 22.00
Stove plate	20.50 to 21.50

IRON AND INDUSTRIAL STOCKS

Wall Street Uneasy Concerning Government Attitude on Steel Prices

Considerable uncertainty prevailed in the stock market last week. Wall Street was still worried about the attitude of the Government concerning prices, particularly prices of steel products, and the effect of this worrying was shown in the depressed condition of steel stocks for the most part. Fear was expressed that in adjusting prices of finished steel products due allowance would not be made for the greatly increased cost of raw materials. The final report of the Department of Agriculture promises a very large supply of grain. The total yield is expected to be greater than that of last year, although there is some shortage in wheat. The range of prices on active iron and steel stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com.	29 - 30¾	Int. Har. of N. J., com.	114 -116
Allis-Chal., pref.	86 - 86½	Int. Har. Corp., com.	75 - 78½
Am. Can, com.	46½ - 48½	Lacka. Steel	88¾ - 92¾
Am. Can, pref.	109	Lake Sup. Corp.	16¼ - 17
Am. Car & Fdry., com.	74¾ - 77¼	Lukens, 1st pref.	102
Am. Loco., com.	69½ - 71¾	Midvale Steel	57 - 58¾
Am. Loco., pref.	103⅞ -104	Nat.-Acme	35
Am. Rad., com.	295 -300	Nat. En. & Stm., com.	42⅛ - 43⅞
Am. Ship, com.	92¼ - 95¾	Nat. En. & Stm., pref.	99⅜
Am. Ship, pref.	94½ - 97⅞	N. Y. Air Brake	136
Am. Steel Fdries.	67½ - 72	Nova Scotia Stl.	101 -110
Bald. Loco., com.	69¼ - 73	Pitts. Steel, pref.	99½ -100
Beth. Steel, com.	116½ -125	Pressed Stl., com.	72⅛ - 73
Beth. Steel, class B	112¾ -124	Pressed Stl., pref.	101⅛ -102
Beth. Steel, pref.	115¼ -115½	Ry. Steel Spring, com.	51½ - 52½
Cambria Steel	155	Ry. Steel Spring, pref.	98¼ - 98½
Carbon Stl., com.	95 - 98	Republic, com.	88¾ - 91¾
Case (J. I.), pref.	83¼	Republic, pref.	103¼ -104
Central Fdry., com.	34¾ - 36½	Sloss, com.	54½ - 56
Central Fdry., pref	51 - 53½	Sloss, pref.	93
Charcoal Iron, com.	8⅝ - 8¾	Superior Steel	45 - 46
Chic. Pneu. Tool	69½	Un. Alloy Steel	43½ - 44
Colo. Fuel	47⅝ - 49¼	U. S. Pipe, com.	21 - 21¾
Cruc. Steel, com.	80¼ - 83½	U. S. Pipe, pref.	54⅛ - 56
Cruc. Steel, pref.	102½ -103	U. S. Steel, com.	122½ -126½
Deere & Co., pref.	100 -100½	U. S. Steel, pref.	117½ -118
Gen. Electric	152½ -155¼	Westing. Elec.	48¼ - 49
Gt. No. Ore. Cert.	33¾ - 34¾		

Dividend Reduction

The Studebaker Corporation, at a meeting in South Bend, Ind., Aug. 7, declared the regular quarterly dividend of 1¾ per cent on the preferred stock and 1 per cent on the common stock. The previous annual rate on the common was 10 per cent. The reduction was explained by the president of the Corporation, A. R. Erskine, in his report, in part, as follows:

The net profits of the corporation for the first six months of this year amounted to $2,966,198.37, after deduction for existing corporation income taxes, but without provision for excess profit taxes about to be enacted by Congress. The directors felt constrained to reduce the dividend on the common stock on account of the uncertainties of the future and the consequent necessity of conserving working capital.

The sales of automobiles in the first quarter of this year exceeded those of any previous similar quarter, but upon the entrance of our country into the war, sales declined, and our second quarter was unsatisfactory. Factory production schedules were changed in May to conform to the reduced volume of business, and we are now operating on a 65 per cent schedule as compared with last year. The effect of reduced volume in quantity production increases overhead costs, and when coupled with the existing high costs of materials and labor, is damaging to the profits of the business. Since July 1, sales of cars have improved, and the present demand is for about 1000 cars per week.

The regular business in the vehicle division for the first six months was excellent, and promises to continue heavy throughout the year. In addition thereto, we have received orders from the Government for large quantities of escort wagons, ambulances, drinking wagons, harness, etc., with the result that our vehicle factories will operate to the limit of their capacity far into next year.

United Alloy Earnings

The United Alloy Steel Corporation, Canton, Ohio, earned total net profits in the first six months of this year of $2,559,000, or 80 per cent, of its final net of $3,088,000 in the entire year 1916. This is at the rate of $10 a share for the year for the 500,000 shares of no par value.

July earnings were, however, the largest on record and indicate earnings of at least $3,500,000 for this second half year. For the rest of the year the company will have the advantage of its entire new construction, giving it an ingot capacity of over 50,000 tons per month as against something over 25,000 tons per month in the early months of the year. The following tabulation of monthly earnings of United Alloy Steel shows the profits January to June:

January	$176,917
February	207,114
March	411,158
April	635,037
May	691,989
June	437,455
Total net six months	$2,559,672

Colorado Earnings Increase

Net earnings of the Colorado Fuel & Iron Co. in the three months ended June 30 last aggregated $2,533,079, according to the quarterly report, an increase of $801,885, compared with the corresponding period of 1916. Gross receipts were $11,978,996, against $8,214,403 a year ago. Operating expenses increased $2,962,708.

The income statement for the quarter, compared with the corresponding period of 1916, follows:

	1917	1916
Gross receipts	$11,978,996	$8,214,403
Operating expenses	9,425,916	6,463,208
Net earnings from operations	$2,553,079	$1,751,195
Income from other sources	328,285	233,793
Total income	$2,881,365	$1,984,989
Deduct: Bond interest, taxes, sinking funds, etc.	803,181	708,568
Surplus for the quarter	$2,078,183	$1,276,420

Industrial Finances

The temporary receivership of the Stungo-Radium Rubber Co., at Washington, Pa., has been discontinued by the court. The temporary receivers were appointed upon petition of G. C. Swart, a stockholder, on behalf of himself and others. He alleged mismanagement and attempts to defraud the stockholders. The court stated that the company was incorporated under Delaware laws, that the acts complained of related to the internal management, over which the courts of Pennsylvania had no jurisdiction. Floyd Rose of Pittsburgh is president.

The change in the charter of the American Rolling Mill Co., Middletown, Ohio, from New Jersey to Ohio has been made and the capital stock of the company increased from $8,000,000 common to $20,000,000, and from $800,000 preferred to $1,500,000. These steps were necessary in the company's plans for merging with the Columbus Iron & Steel Co., Columbus, Ohio, which has now been accomplished.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c.; Denver pipe, 76.1c., minimum carload, 46,000 lb.; structural steel and steel bars, 76.1c., minimum carload, 40,000 lb.; Pacific coast (by rail only), pipe, 65c.; structural steel and steel bars, 75c., minimum carload, 60,000 lb. No freight rates are being published via the Panama Canal, as the boats are being used in transatlantic trade.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 4.50c.

Wire Products

Wire nails, $4 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire, $4.05 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.95; galvanized wire, $4.65; galvanized barb wire and fence staples, $4.85; painted barb wire, $4.15; polished fence staples, $4.15; cement-coated nails, $3.90 base, these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 43 per cent off list for carload lots, 42 per cent off for 1000-rod lots, and 41 per cent off for small lots, f.o.b. Pittsburgh.

Nuts and Bolts

Discounts in effect for large buyers are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days.

Carriage bolts, small, rolled thread, 40 per cent, small cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent; with c. p. nuts, 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq. blank, $2.10 off list, and tapped, $1.90 off; hex., blank, $1.90 off, and tapped, $1.70 off; nuts, c. p. c. and t. sq. blank, $1.70 off, and tapped, $1.50 off; hex. blank, $1.60 off, and tapped, $1.40 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Wire Rods

Soft Bessemer and open-hearth rods to domestic consumers at $95 to $100; high-carbon rods made from ordinary open-hearth steel, $100 to $110, and special steel rods with carbons running from 0.40 to 0.60, $100 to $110 at mill; above 0.60 carbon, $115 to $120.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $7.00 base; ⅝ in., 7/16 in. and ½ in., $7.00. Boat spikes are occasionally quoted $7.00 to $8.00, all per 100 lb. f.o.b. Pittsburgh, but some makers are quoting higher. Track bolts with square nuts, 7c. to 7.50c. to railroads, and 8c. to 8.50c., in small lots, for fairly prompt shipment.

Steel Rails

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails, and on carload and smaller lots, 4c. to 4.25c. at mill. Light rails: 25 to 45 lb., $75 to $80; 16 to 20 lb., $80 to $81; 12 and 14 lb., $82 to $83; 8 and 10 lb., $83 to $84; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard Bessemer rails, $38; open-hearth, $40, per gross ton, Pittsburgh.

Tin Plate

Effective July 31, prices on all sizes of terne plate were advanced from $2 to $2.50 per package. Prices quoted by leading makers are now as follows: 8-lb. coating, 200 lb., $16 per package; 8-lb. coating, I. C., $16.30; 12-lb. coating, I. C., $17.50; 15-lb. coating, I. C., $18.25; 20-lb. coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 4.50c. to 5c. for delivery late this year, and 5c. and higher from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c.; railroad test bars, 5.25c. in carload and larger lots f.o.b. mill.

Wrought Pipe

The following discounts on steel are to jobbers for carload lots on the Pittsburgh basing card in effect from May 1, 1917, all full weight, except for LaBelle Iron Works and Wheeling Steel & Iron Co., which quote higher prices, and National Tube Co., which adheres to card of April 1.

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛, ¼ and ⅜	42	15½	⅛ and ¼	23	+4
½	46	31½	⅜	24	+3
¾ to 3	49	35½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	42	29½	2	26	12
2½ to 6	45	32½	2½ to 6	28	15
7 to 12	42	28½	7 to 12	25	12
13 and 14	32½	..			
15	30	..			

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	38	20½	⅛, ¼ and ⅜	22	5
½	43	30½	½	27	14
¾ to 1½	47	34½	¾ to 1½	33	18
2 to 3	48	35½			

Lap Weld, extra strong, plain ends

2	40	28½	2	27	14
2½ to 4	43	31½	2½ to 4	29	17
4 to 6	42	30½	4½ to 6	28	16
7 to 8	38	24½	7 to 8	20	8
9 to 12	33	19½	9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

Nominal discounts on less than carload lots, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes, and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap-Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in.	28	1¾ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3¼ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in—No quotations	
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths. Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net, or 2 per cent discount in 10 days.

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer

	Cents per lb.
Nos. 3 to 8	8.00 to 8.50
Nos. 9 and 10	8.25 to 8.50
Nos. 11 and 12	8.50 to 8.75
Nos. 13 and 14	8.75 to 9.00
Nos. 15 and 16	9.00 to 9.25

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	8.30 to 8.80
Nos. 22 and 24	8.35 to 8.85
Nos. 25 and 26	8.40 to 8.90
No. 27	8.45 to 8.95
No. 28	8.50 to 9.00
No. 29	8.55 to 9.05
No. 30	8.65 to 9.15

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11	9.00 to 9.50
Nos. 12 and 14	9.10 to 9.60
Nos. 15 and 16	9.25 to 9.75
Nos. 17 to 21	9.40 to 9.90
Nos. 22 and 24	9.55 to 10.05
Nos. 25 and 26	9.70 to 10.20
No. 27	9.85 to 10.35
No. 28	10.00 to 10.50
No. 29	10.25 to 10.75
No. 30	10.50 to 11.00

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	7.80 to 8.30
Nos. 17 to 21	7.85 to 8.35
Nos. 22 to 24	7.90 to 8.40
Nos. 25 to 27	7.95 to 8.45
No. 28	8.00 to 8.50
No. 29	8.05 to 8.55
No. 30	8.05 to 8.55
Nos. 30½ and 31	8.10 to 8.60

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
		Electro-	New	New	St.	New	St.
Aug.	Lake	lytic	York	York	Louis	York	Louis
8	28.00	28.00	63.75	11.00	10.87½	8.75	8.50
9	28.00	28.00	63.75	11.00	10.87½	8.75	8.50
10	28.00	28.00	63.00	11.00	10.87½	8.75	8.50
11	28.00	28.00	....	11.00	10.87½	8.75	8.50
13	28.00	28.00	62.50	10.87½	10.75	8.75	8.50
14	28.00	28.00	62.25	10.87½	10.75	8.75	8.50

NEW YORK, Aug. 15, 1917.

The metal markets are still harassed by uncertainties as to the future, with particular reference as to the course of the Government price-fixing policy. Copper is quiet and unchanged, with the market almost nominal. There was some activity in tin futures on Monday and fair tonnages changed hands, but during the remainder of the week it has been dull. Lead is extremely dull, but prices remain remarkably firm under the circumstances. Government orders for lead were placed last week at 8c., St. Louis. Spelter is dull and without change. Bids for Government requirements of spelter were opened and contracts are said to have been awarded at 8.75c. and 9c., St. Louis.

Copper.—Trading has been quiet during the week, with prices the same as a week ago. There has been no pressure to sell and consumers have shown no inclination to buy. The uncertainties of the Goveriment price-fixing policy are held solely responsible for the present dullness. The market is almost nominal at 28c. for both Lake and electrolytic. There is naturally a great deal of speculation as to the price which the Government will eventually fix for copper, and 18c. has been talked of during the past few days. It should be understood, however, that this is all guess-work, and there is no official indication yet of what the price will be or how soon any announcement will be made. Some dealers report sales at 25.50c. to 27c. for last quarter. A little spot business at 29c. is reported. London cables yesterday were unchanged at £137 for spot electrolytic and £133 for futures.

Tin.—The price-fixing talk is having a serious effect on tin sales. Consumers will not pay present prices, if there is a likelihood of the Government fixing a lower price. Considerable interest attaches to the talk emanating from Washington that in return for the efforts of this Government to obtain the same prices for the Allies as this Government pays, the Allies must sell to this country and its consumers on a like basis. If such a policy is agreed to by England, it would reduce prices of tin. Trading in tin is made difficult by the delays in receipt of London cables, the censorship on this side added to that on the other side frequently causing a hold-up of several hours. Business for the day is often deferred until the daily cables are received, which is sometimes late in the afternoon. Business was quiet last week, coming to a dead stop on Friday, but on Monday there was more activity for futures and a fair tonnage changed hands. Yesterday the inquiry was lighter and sales correspondingly smaller. There has been a fair demand for off-grades. The quotation yesterday for spot Straits was 62.25c., a decline of 1.50c. during the week. Arrivals of tin from Aug. 1 to 13 were 1810 tons, with 4215 tons from the Straits and United Kingdom afloat.

Lead.—Lead is extremely dull, the lack of demand, as with other metals, being ascribed to the Government price-fixing investigation. Nobody is buying unless he is obliged to, but in spite of the dullness, the market prices were firm up to the end of last week, closing at 11c., New York, and 10.75c., St. Louis. The Government requirements of lead for August, September and October have been allotted to producers according to producing capacity, the total amount bought being 25,000 tons, according to unofficial report. The price paid is said to be 8c., St. Louis. There were indications the fore part of this week that lead might be had at 10.87½c., New York, and 10.75c., St. Louis.

Spelter.—Bids were opened last week by the Zinc Committee of the Council of National Defense for furnishing the 11,500,000 lb. of grade "C" or common spelter the Government requires. It is said that many of the bids were put in at 8.75c., St. Louis, and a smaller number at 9c., St. Louis. The Government intends to maintain secrecy regarding the buying of this lot of spelter and the information we give is not official. It is reported that the Government will place a large part of its requirements at the bid of 8.75c. and the remainder at 9c. Spelter for nearby shipment can be had at 8.50c., St. Louis, which was our quotation a week ago, while for last quarter the price in generally about 8.62½c., St. Louis. Some business is said to have been done for next year at a slightly higher price. The fact that the market is higher for futures than for nearby delivery is said to be due to the accumulation of stocks and lack of present demand. A preliminary report on spelter production in the United States in the first six months of 1917, issued by the United States Geological Survey, shows an increase over the last six months of 1916 of 13,000 short tons, to a total of 364,000 short tons.

Antimony.—The market is dull and Chinese and Japanese grades continue to be quoted at 15c. to 15.50c., New York, duty paid.

Aluminum.—The market is unchanged at 50c. to 52c. per lb., New York, for No. 1 virgin metal, 98 to 99 per cent pure.

Old Metals.—The market is a little higher. Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible	27.00 to 28.00
Copper, heavy and wire	26.00 to 27.00
Copper, light and bottoms	24.00 to 24.50
Brass, heavy	18.50 to 19.50
Brass, light	14.00 to 14.75
Heavy machine composition	24.75 to 25.25
No. 1 yellow rod brass turnings	17.50
No. 1 red brass or composition turnings	19.00 to 21.00
Lead, heavy	9.25 to 9.375
Lead, tea	7.75
Zinc	6.75

Chicago

AUG. 13.—Continued quiet in copper has caused prices to decline, but there is, of course, no radical change. For lead there has been a large volume of inquiry, but it resulted in but little buying, consumers holding quite generally to the opinion that prices are unreasonably high. Buying of tin has been of the routine sort. Spelter continues inactive. In antimony there has been a little movement and quotations are stiffer. We quote as follows: Casting copper, 26.75c.; Lake, 29.25c.; electrolytic, 27.50c.; tin, carloads, 63.25c.; small lots, 65c. to 66c.; lead, 10.75c. to 11c.; spelter, 8.37c. to 8.50c.; sheet zinc, 19c.; antimony, 17c. to 18.50c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 23c.; copper clips, 22c.; copper bottoms, 21c.; red brass, 21c.; yellow brass, 15c.; lead pipe, 8c.; zinc, 6c.; pewter, No. 1, 35c.; tinfoil, 40c.; block tin, 45c.

St. Louis

AUG. 13.—In non-ferrous metals the market has been rather quiet during the week, though firmer prices were looked for. In carload lots the quotations to-day at the close were: Lead, 10.87½c. to 10.92½c.; spelter, 8.50c. In less than carload lots, the figures were: Lead, 11.25c.; spelter, 9.50c.; tin, 68.50c.; electrolytic copper, 30c.; Lake copper, 31.50c.; Asiatic antimony, 18c. In the Joplin district, there was a firmer feeling in the seond grade zinc ores, with the basis range $65 to $75 per ton for 60 per cent metal. The average for the week in the district was $70 per ton. Calamine was steady at $35 to $42 per ton, basis of 40 per cent metal, with an average for the district for the week of $39 per ton. Lead was firm at $110 per ton, basis of 80 per cent metal, and the average for the district was $109 per ton. In general the demand for all ores was better than the preceding week and for all grades. On miscellaneous scrap metals we quote dealers' prices buying as follows: Light brass, 11.50c.; heavy yellow brass, 13c.; heavy red brass and light copper, 20c.; heavy copper and copper wire, $23.50; zinc, 5c.; lead, 7c.; tea lead, 6c.; pewter, 25c.; tinfoil, 42c.

STEEL-MAKING COSTS

A Brief to the Federal Trade Commission from Lackawanna Steel Co.

The Lackawanna Steel Co. has sent to the Federal Trade Commission at Washington what it designates as a "memorandum regarding cost in relation to the establishment of fair prices for steel plates, bars and shapes under existing conditions." At the outset, a distinction is drawn between selling costs and inventory costs. In calculating the former, everything is included that must be taken out of the selling price before a profit can be earned. In computing inventory costs everything is excluded that cannot with unquestioned propriety be carried as an asset until the goods are sold. It is inventory costs that appear on the books of a corporation but important adjustments of these are necessary before fair selling prices can be fixed.

It is stated that costs have increased rapidly in the steel industry in the past 18 months. In May, 1917, for companies controlling all raw materials the increase was about 50 per cent over the average for 1916 and 25 per cent over costs in January of this year. The Lackawanna Steel Co.'s figures showed an increase of 5.55 per cent in June over May and of 7.36 per cent in July over June.

The argument is elaborate as to labor and material costs under present conditions. It is noted that some of the uncertainty as to results from Government work might be eliminated if the Government would do as Great Britain did in some cases; that is, guarantee to the producer essential raw materials at fixed prices, or purchase such materials on Government account and deliver them to the manufacturer at a fixed price.

In discussing depreciation and depletion the brief argues that the value of ore in the ground at the moment when production begins is clearly capital and the producer should receive its capital value at that time as a part of cost, this principle being recognized in the present income tax law. It is pointed out also that where plants have been constructed at abnormal cost during the war period provision should be made for amortization of the excess of such cost from the normal value. Reference is made to the more intensive use of plant under war conditions, the lower efficiency of employees, the postponement of repairs because operations cannot be suspended, and to other factors growing out of the extraordinary conditions. Emphasis is put upon the consideration that should be given to war taxation in the establishment of prices. In the pre-war period prices of steel were low and the leading steel producers are quite sure to be subject to the maximum tax rate of 50 per cent on excess profits for 1917.

It is suggested that in a business where products are quickly realized the volume of sales annually may be several times the capital invested. In other industries the maximum annual output is substantially less than the capital investment. The disposition to make a percentage addition to cost in fixing the Government prices does not meet the question of the relation between the volume of output and the investment of capital.

In considering variations between costs of similar products in different plants, the memorandum points out that in one case the producer may be a self-contained unit owning adequate ore supplies and blast furnaces as well as steel plants. In another case these different facilities may be owned by corporations which may have the same stockholders but are technically separate entities. In a third case, they may be owned by entirely distinct interests. More frequently steel producers control a part, large or small, of the ore or furnace capacity needed for their requirements and are interested in, but do not entirely own, mining or furnace companies. If the allowance for profit is to be substantially uniform, the prices to be paid must vary widely. Such a method is characterized as economically unsound besides imposing a heavy burden upon the Government as to the verification of cost. The alternative suggested by the memorandum is "the establishment of prices on broader considerations, such prices to be sufficient to insure some profit to any reasonably efficient producer, leaving cases where it might yield a liberal profit to be adjusted through the operation of the war profits taxation."

Opens Detroit Office

PITTSBURGH, Aug. 15—(*By Wire*).—On account of its growing business in the Detroit territory, the Phillips Sheet & Tin Plate Co., Weirton, W. Va., has opened an office in room 2032, Dime Savings Bank Building, Detroit, and A. J. Bopp, who has been connected with the strip steel department since its inception, has been appointed district sales manager of the Detroit office. George Damerel, formerly New York sales manager for the American Tube & Stamping Co., has been appointed manager of sales of the strip steel department at the general office of the Phillips Sheet & Tin Plate Co. at Weirton. In addition to a full line of cold-rolled strip steel 16 in. and narrower, the Phillips company is now operating a modern 16-in. hot mill and late this year will have in operation a modern 10 in. hot mill.

Navy's Aircraft Factory

WASHINGTON, Aug. 14.—The construction of an aircraft factory at the League Island Navy Yard at Philadelphia has been authorized by the Secretary of the Navy. Contracts have been placed for the factory on the basis of completion of buildings and beginning of operation in less than 100 days. The total cost of the buildings and plant will be in the neighborhood of $1,000,000, and it is expected that when the completed plant is working up to its capacity it will utilize the services of approximately 2000 employees and be capable of producing 1000 small planes per annum, or a corresponding output of the larger types.

Inquiry for Foundry Iron

CHICAGO, Aug. 15—(*By Wire*).—A Racine manufacturer of agricultural implements is inquiring for 1500 tons of foundry iron, 500 for immediate delivery, 500 for first half and 500 for last half of 1918.

A war inventions committee has been created by the Engineering Council as follows: H. W. Buck, consulting engineer, New York; Prof. A. M. Greene, Jr., Rensselaer Polytechnic Institute, Troy, N. Y., and E. B. Kirkby. The committee is to co-operate with the Naval Advisory Board and other departments at Washington, if desired, in the promulgation to engineers of war problems now before the Government.

A course of 15 lectures on international trade is to be given to the employees of the Vulcan Steel Products Co., 120 Broadway, New York, by Dr. Roy P. MacElwee, head of the department of physics of the College of the City of New York. An additional course dealing with the iron and steel industry in detail is to follow the course given by Dr. MacElwee.

A chart on resuscitation from gas asphyxiation, drowning and electric shock has been prepared by the Bureau of Mines, Washington, D. C. It is suitable for posting, as in industrial establishments. Copies will be sent free of charge on request as long as the edition remains in stock.

The Public Service Commission of Pennsylvania has issued notices that the railroad companies of the State would file within a few days "revised rates on manufactured iron and steel, billets and pig iron, to become effective about Aug. 20."

The Minnesota Steel Co., Duluth, Minn., will build a $500,000 benzol-recovery plant. Construction will be rushed with a view to operation by next winter.

The city of Dayton, Ohio, will purchase a coal conveyor and a coal crusher to be installed at the waterworks.

PERSONAL

M. A. Neeland was chosen this week as president of the New York Shipbuilding Co. He recently returned from a mission to Russia for the American International Corporation. The latter company acquired last year an important interest in the New York Shipbuilding Co., whose yards are at Camden, N. J. Mr. Neeland succeeds S. M. Knox, who was elected chairman of the board of directors.

Gilbert L. Robinson, assistant manager of the steel department of Gaston, Williams & Wigmore, Inc., returned Aug. 8 after a seven months' trip abroad, where he visited the company's offices at Rome, Lisbon, Madrid and Paris, covering also Naples, Genoa, Turin and Milan in Italy, Bordeaux and Marseilles in France and Barcelona and Bilboa in Spain.

Ami L. Bouet sailed for Hong Kong from Vancouver on Aug. 2 in the interest of the Vulcan Steel Products Co., to establish an organization to care for the steel, machinery, automobile and other business of the company.

Robert G. Cook, production engineer Remington Arms & Ammunition Co., Bridgeport, Conn., has received a commission in the officers reserve corps as a first lieutenant, ordnance division.

De Barros Moreira, formerly general representative in Brazil of the United States Steel Products Co., has been appointed agency division manager of the Vulcan Steel Products Co. of 120 Broadway, New York. Mr. Moreira was a member of the Pan-American Conference in 1910, a delegate to the International Chamber of Commerce and a former president of the American Manufacturers' Export Association.

W. Stewart Horner, president of the National Association of Sheet and Tin Plate Manufacturers, Pittsburgh, and also chairman of the sub-committee on sheet steel, is spending his vacation in Canada, and expects to return to Pittsburgh about Sept. 15.

William Whigham, first vice-president and chief engineer of Carnegie Steel Co., Pittsburgh, is spending his vacation in Canada.

N. P. Hyndman, sales agent of the Washington Coal & Coke Co., Pittsburgh, has returned from a month's vacation spent in California.

E. G. Irwin, manager of the Cincinnati office of the Asbestos Protected Metal Co., Pittsburgh, has joined the Ohio National Guard, and this office has been closed temporarily. P. J. Young, chief engineer of the same company, has received a commission as First Lieutenant of Engineers, and is now in the service of his country under secret orders.

Major Bradley Dewey of the research department of the American Sheet & Tin Plate Co., Pittsburgh, who has been in the Government medical supply department at Washington, D. C., for some time, has been removed to the same department at New York to superintend the manufacture, purchase and inspection of gas masks and other defensive apparatus.

P. B. Shook, for some years with the Valley Investment Co., Youngstown, Ohio, has resigned to accept a position with the Semet-Solvay Co., Syracuse, N. Y.

Frank I. Ellis has recently opened offices at 2126 Farmers' Bank Building, Pittsburgh, as general contracting engineer. Mr. Ellis had charge of the designing, building and putting in operation of the new pipe mills of the Jones & Laughlin Steel Co. at Aliquippa, Pa. He was also chief engineer for 12 years of the United Engineering & Foundry Co., Pittsburgh, and later was general manager of the pipe mills of the Mark Mfg. Co. at Zanesville, Ohio.

Arthur C. Hubbard, purchasing agent for the Andrews Steel Co. and Newport Rolling Mill Co., Newport, Ky., has resigned to accept the position of treasurer of the Charleston Alloys Steel Co., Belle, W. Va. Mr. Hubbard has been connected with the Newport companies 26 years.

F. J. Page has been appointed representative in the Pittsburgh district of the Whiting Foundry Equipment Co., Harvey, Ill. Mr. Page, who has been in the employ of the company for many years, working in both the estimating and sales departments of the home office, will have offices at 411 Fulton Building, Pittsburgh.

Frederic Schreibman, a Belgian graduated from the University of Liege, and practising some years in this country as a consulting management engineer, has, by court decree, had his name changed to Frederic Meron.

Frederick H. Koch has been appointed district representative of the Heppenstall Forge & Knife Co. of Pittsburgh, with offices at 501 First National Bank Building, Milwaukee.

Harry G. Seltzer has been appointed assistant sales manager for T. A. Willson & Co., Inc., and is devoting his activities to the Willson goggle interests. When diplomatic relations with Germany were severed, he quit his post as United States consul in Breslau and became foreign trade advisor to the State Department.

George B. North has been appointed general sales manager of the Hazard Mfg. Co., Wilkes-Barre, Pa. He will have offices at 533 Canal St., New York.

The American Steel Export Co., New York, announces the appointment of Walter R. Morris as assistant traffic manager with headquarters in the Woolworth Building. Because of suspended service for an indefinite period of American-Hawaiian steamers via Panama Canal, Mr. Morris resigned his position as assistant traffic manager of the American-Hawaiian Steamship Co., New York, to accept employment with the American Steel Export Co.

M. V. Dryespocl, formerly New York representative of the Phoenix Iron Co., Phoenixville, Pa., has been appointed sales manager of the North American and British Isles department of the iron and steel division of the Vulcan Steel Products Co., 120 Broadway, New York. Mr. Dryespool was for five years connected in the purchasing department of the Central Georgian Railroad in Savannah, Ga., and the New York Central Railroad in New York.

Ray L. Baker, who for the past five years has been power sales engineer with the Commonwealth Edison Co., Chicago, has severed his connection with that company to become manager of the steam and electrical department of the Railway and Mine Supply Co., 332 S. Michigan Ave., Chicago, dealer in mining supplies and used steam and electrical machinery.

Stewart C. Coy, formerly assistant superintendent of the electrical department of the Youngstown Sheet & Tube Co., Youngstown, Ohio, has resigned to become general superintendent of the Celluloid Co. of America, operating a plant at Newark, N. J. His successor has not yet been appointed. Upon his departure from Youngstown Mr. Coy was presented with a diamond ring by his former associates in the company.

L. S. Henley, an electrical engineer for the Cornwall Ore Banks Co., has accepted a position with the Westinghouse Electric & Mfg. Co. at Philadelphia. He has been succeeded by Manford Daugherty, of Lebanon. Harry Hollis, electrical engineer for the Reading Transit Co. at Lebanon, has accepted a position with the local plant of the Bethlehem Steel Co. Mr. Daugherty was formerly his assistant.

Willard K. Smith, of the Chicago sales office of the Bethlehem Steel Co., has been commissioned in the Officers' Reserve Corps and has been assigned to active duty under the Chief of Ordnance at Washington.

James Albert Green, president of the Mathew Addy Co., Cincinnati, is in Canada on a midsummer vacation.

Benjamin Lissberger of B. Lissberger & Co., manufacturers, smelters and dealers in metals, with general offices in the Woolworth Building, New York, has been elected vice-president and a director of the Page Woven Wire Fence Co. of Monessen, Pa., and Adrian, Mich.

P. M. Kling has resigned as consulting engineer of the Laconia Car Co., Laconia, N. H., to take a rest. He

has been identified for 34 years with the car building industry.

Theodore Swann, sales manager of the Alabama Power Co. for the past three years, has resigned to become president and general manager of the Southern Manganese Corporation. This company is operating six electric furnaces in the production of ferromanganese at Anniston, Ala. Its offices are at Birmingham, Ala.

E. W. Mudge of Edmund W. Mudge Co., Frick Building, Pittsburgh, has gone to Canada on a hunting and fishing trip, to remain until about Sept. 10.

OBITUARY

ALFRED J. ORMSTON, JR., superintendent of motive power, at the Aliquippa, Pa., plant of the Jones & Laughlin Steel Co., Pittsburgh, died recently in the South Side hospital, Pittsburgh, from injuries received while at work. Mr. Ormston was formerly instructor in mechanical engineering in the Carnegie Institute of Technology.

P. H. BLODGETT, chief of the order department in the New York office of the National Tube Co., died Tuesday morning, Aug. 14.

Pittsburgh and Nearby Districts

The Pittsburgh Rolls Corporation, which recently took over the Phoenix Roll Works of the Seaman-Sleeth Co., Pittsburgh, plans to make some large additions and changes to the plant, and has retained Barton R. Shover, Oliver Building, Pittsburgh, as consulting engineer for the work. The first heat in the new 25-ton open hearth furnace recently built was made on Thursday, Aug. 9.

The Kirk Supply Co., Pittsburgh, has been appointed agent for the Sterling Wheelbarrow Co., Milwaukee, in the Cleveland district. The company has opened an office and warehouse at 422 Frankfort Ave., Cleveland. The Kirk Co. has represented the Sterling company in Pittsburgh for years.

Edgar E. Brosius, contracting engineer, Pittsburgh, is installing the Brosius automatic mud gun for stopping the tapping hole on blast furnaces of the Bethlehem Steel Co., Lackawanna Steel Co. and Mark Mfg. Co. The advantages claimed for the gun are increased output of pig iron, less skilled labor required to operate the equipment, and the important factor of safety, as no one is near the gun when the tap hole is stopped.

The strike at the plant of the Blaw-Knox Co., at Wheatland, Pa., has been settled, the company giving its men a slight increase in wages. The men demanded an 8-hr. day, but returned to work on the basis of 10-hr. per day, the same as before.

The Pittsburgh Mining Machinery Co., Pittsburgh, has been incorporated with a capital of $100,000 by T. H. Edelblute and others.

The annual meeting of stockholders of the United States Glass Co. will be held in Pittsburgh, Wednesday, Aug. 29.

The July payroll of all the leading industrial plants in the Youngstown, Ohio, district is given as $5,253,626, a slight decrease over June, which was about $300,000 higher.

Two men were killed and others seriously injured in an explosion in the galvanizing department last week in the Etna Iron & Tube Works of the Spang-Chalfant Co., Pittsburgh.

The latest locomotives built at Crewe, England, are finished in the "all-black" style adopted as a war time finish, considerable economy being effected by dispensing with lining out and other decorative work. The engines present a striking appearance in this garb.

PRIORITY BILL PASSED

President Given Important Power in Regard to Shipments

WASHINGTON, Aug. 14.—After a stormy passage through House and Senate, the bill authorizing the President to direct shipments in interstate commerce and to grant priority to those related to the conduct of the war became a law Aug. 10 and will immediately be put into effect through the medium of a new bureau of the Department of Commerce. The powers conferred upon the President are exceedingly broad and to a very substantial degree the provisions of the interstate commerce laws are suspended during the period of the war.

The bill authorizes the President, whenever in his judgment such action is necessary to the public security and defense, to "direct that certain kinds of traffic or particular shipments, as may be determined by him, shall have preference or priority in transportation by any common carriers by railroad or water, under such arrangements, rules and regulations as may be prescribed." Such directions may be modified, suspended or revoked whenever necessary. All common carriers are required to establish and maintain in Washington during the period of the war an agency in the form of a committee of railroad officers fully empowered to receive on behalf of the carriers notice and service of such orders and directions as the President may give and to arrange for the prompt compliance therewith. Failure promptly to execute orders issued by the President will render the offending officer, agent or employee of the carriers liable to heavy fine or imprisonment.

An important provision of the bill authorizes the President to enter into pooling agreements with two or more carriers looking to a proper division of earnings for a specified time and upon prescribed kinds of traffic. For the transportation of persons or property in accordance with orders of the President, the lawfully established tariffs will apply, while for the transportation of troops "reasonable rates" will be fixed by the Interstate Commerce Commission. Carriers are protected from legal actions brought by shippers who may suffer as the result of preference given to the Government.

Imports and Exports of Ferroalloys

Below are given the statistics of the imports of ferroalloys and special metals and ores into the United States in June and in the fiscal year ending with June, together with exports for the same periods and a comparison with the preceding year:

Imports (Gross Tons)

	June		Fiscal Year	
	1916	1917	1916	1917
Ferromanganese	*a*	3,817	*a*	73,741
Ferrosilicon	536	869	5,469	8,715
Manganese oxide and ore of	58,143	62,778	492,860	656,088
Nickel ore and matte	7,848	3,503	87,700	33,053
Tungsten bearing ore	*a*	343	*a*	3,823
Exports				
Ferrotungsten and tungsten metal (pounds)	*a*	172,079	*a*	1,784,306
Ferrovanadium (tons)	60	91	497	1,168
Nickel, nickel oxide and matte (tons)	1,022	804	11,451	13,842

a Not separately reported.

The Lau Iron Works Co., recently incorporated at Youngstown, Ohio, with a capital of $350,000, has elected officers as follows A. W. Lau, president and general manager; John R. Rowland, vice-president; Ward Beecher, secretary and treasurer, and M. E. McAndrews, assistant secretary-treasurer. This new company has taken over the former business of A. W. Lau, and will fabricate structural and decorative iron and steel.

The Mechanical Refrigerator Co. has been organized at Youngstown, Ohio, with a capital of $300,000, and proposes to manufacture mechanical refrigerator devices to be driven by electricity. S. Gillespie is patentee of the process, which is said to be of such a nature that the use of ice for refrigeration is entirely eliminated.

Government Contracting System Adopted

Straight Purchase-and-Sale Contracts at Fixed Prices Except Where Impracticable—Stipulations Governing These and Cost-Plus-Profit Contracts

WASHINGTON, Aug. 14.—A comprehensive system for the letting of Government contracts for the purchase of goods or for construction has been adopted by the Interdepartmental Cost Conference. The recommendations have been made public and will probably be accepted almost immediately by the War Industries Board and all the executive departments. The conference was organized by Secretary Redfield and Burwell S. Cutler, acting chief of the Bureau of Foreign and Domestic Commerce. Representatives of the most interested governmental bodies, including the War and Navy Departments, the Federal Trade Commission, the Council of National Defense, and the War Industries Board, took part in the meetings, which were also attended by men prominent in various lines of industry.

The conference strongly recommends the straight purchase-and-sale contract at fixed prices wherever practicable in preference to the cost-plus-profit contract which the Government has recently used in cases where it was not practicable to secure an upset price. The experience of the British Government, which has discarded the cost-plus-profit plan, has had considerable influence with the conference, but the results secured in the purchase of war materials on the two plans have demonstrated the superiority of the purchase-and-sale contract wherever that plan is practicable. The recommendations of the conference are as follows:

I. Where fair terms can be obtained, contracts should be in the form of straight purchase-and-sale contracts at fixed prices.

In the determination of "fair terms" the contractor, in so far as possible, should be required to state the cost and other factors upon which his price is based; such representations to be the subject of investigation by the contracting officer prior to the final execution of the contract, and if found to be incorrect, the price to be adjusted accordingly.

What constitutes "fair terms" can be arrived at only by consideration of many factors, such as:

The quality and quantity of the articles purchased.

Whether or not the plant is adaptable to business other than war business.

The duration of the job and the length of time the contractor's plant and capital will be tied up. Also the amount of capital tied up in comparison with the particular output contracted for.

The possibility of fluctuations in material and labor costs with attendant risk to the contractor.

Loss in commercial business by taking Government work, which must be given precedence; disarrangement in plant organization and labor conditions.

Comparison with prices of other manufacturers, competitive bidding, etc.

The prosperity of the trade and of the particular contractor.

In certain instances where the article is standard, ordered in bulk, delivered promptly, a profit amounting to 10 per cent of costs is unreasonably high. In other instances where the quality of the job is high, the quantity small, or where the job ties up the contractor's plant and capital for a long period of time, or where the material and labor risk is considerable, or for other similar reasons, such 10 per cent profit may well be unreasonably low.

Again, in agreeing upon "fair terms," the following factors should be considered, any or all of which greatly aid the contractor and should tend to lower the price.

United States to supply material or component parts.

United States to readjust price in the event of fluctuations in price of material or component parts resulting in increased costs.

United States to readjust price in the event of labor disputes resulting in increased labor costs.

United States to make frequent payments to reimburse the contractor for expenditures for material, component parts, or the like.

To skimp fair terms will inevitably tend to cause contractors to lose interest in production and disturb general business conditions. Fair terms can only be determined by consideration of these general principles as well as the special factors indicated above that may apply to the particular production contracted for.

II. A standard form of straight purchase-and-sale contract at a fixed price should be adopted for use wherever practicable.

It should contain clauses which will deal with the following subjects:

Method of delivery; storage of production; shipment to point designated.

United States to pay for raw material when delivered to contractor.

United States to have the right itself to supply material and component parts.

United States to adjust price on increased material costs above estimated costs.

United States to adjust price on increase in labor costs.

Liquidated damages.

War clause termination.

When Cost-Plus Contracts May Be Necessary

Although a straight purchase-and-sale contract for a fixed price adjusted as indicated is greatly to be preferred, nevertheless in numerous instances the United States will be obliged to obtain production by paying for the entire cost of the same and in addition a fair profit to the contractor. Such cost-plus contract may be necessary under the following conditions:

Where the production is novel and the contractor has had no past experience upon which to base a price; for example, steel helmets, large calibre guns and shells for same, aeroplane motors, and the like.

Where the production involves difficult and complicated manufacturing effort subject to changing plans and specifications, or wide fluctuations in material costs; for example, steel and wooden ships, aeroplanes, optical glasswork, and the like.

Where the contractor, though deserving of confidence, lacks sufficient working capital and plant equipment to carry through the job.

Engineering or building jobs for which the cost-plus contract has for many years been standard.

It must be borne in mind that a cost-plus contract establishes a relation of trust between the United States and the contractor, in which the contractor is legally responsible at all times to work in the interest of the United States and receive no profit beyond that definitely specified in his contract. For all excessive costs, hidden profits in the form of depreciation, overhead, discounts and the like, the United States may refuse to pay, or if the contractor has thereby profited may sue and recover. Practically, however, the interests of the United States and the contractor are inevitably opposed if the profit is based upon a percentage of cost. The temptation is great to the contractor to inflate his own costs, as well as the costs of subcontractors, and the task of the United States is difficult and burdensome in checking and determining proper costs.

III. In cost-plus contracts a fixed profit of a definite sum of money per article should be agreed upon instead of a percentage of cost.

Such fixed profit can be arrived at by taking a percentage, say 10 per cent, of the estimated cost of each article or the entire job. In instances where estimates of cost are impracticable it becomes of paramount importance to choose a contractor in whose integrity the United States may have the fullest confidence. Where a fairly close estimate can be made of the cost of the article or job, upon the completion of the contract, the

actual cost can be checked against the agreed estimate and the contractor permitted to share in the saving, or be charged with part of the excess of cost, depending upon the outcome. Such an arrangement stimulates the contractor to save costs and time, because the two go together. This cost-plus adjustable fixed-profit contract unquestionably affords the Government the greatest protection in cost-plus contracts. Great care should be used in fixing the estimated price, which, if too high, may result in giving the contractor a profit entirely undeserved.

IV. In cost-plus contracts the fixed profit agreed on should be subject to adjustment, so that the contractor may share in the saving of, or be charged with part of the excess of, actual cost over estimated cost.

In some instances the contractor may agree to pay for all excess over a certain named figure of cost, and the advantage to the United States in such an arrangement is too obvious for comment.

Determining Indirect Charges

In the determination of costs, direct labor and direct material are easily ascertainable; it is the indirect charges to the job, overhead and depreciation, that present difficulties. To contract to pay a proper charge for overhead and depreciation leaves the door wide open for endless discussion, and it is suggested that wherever possible the amount of these items be tentatively fixed in advance, based on definite representations of the contractor as to the amount of fixed capital assets to be depreciated and the estimated overhead. Such amounts should always be subject to revision in case such representations prove to be incorrect. This puts it up to the contractor to make an honest representation and provides ample opportunity to check the same.

It is of the utmost importance that standardized forms of contract as well as standardized methods of determining costs be applied to this class of contracts. Such standardization will produce clarity in the relation between the contractor and the United States and will fix precedents of construction for certain clauses and terms. Standardization will also afford great protection to the United States, not alone presently in determining points of difference, but also in Court of Claims suits that may arise.

V. A standard form of cost-plus contract should be adopted for use wherever practicable.

As conditions necessitate changes, the form of such standard contract can be changed to suit.

W. L. C.

Cleveland Company's Expansion

The Standard Steel Castings Co. of Cleveland, incorporated in 1912 for $125,000, has just increased its capital stock to $1,000,000. Its foundry is at present located on West Seventy-third Street and the Big Four Railroad, and has an output of 350 tons of steel castings per month, which will be doubled before the end of the year. This tonnage includes miscellaneous and automobile castings weighing less than 200 lb. each. The company is at present building on the East Side of Cleveland a new foundry and machine shop which will be devoted exclusively to the manufacture and production of cast steel truck wheels. This installation will cost approximately $350,000, and the melting equipment will include two 3-ton electric furnaces and three 2-ton converters. The output of the new foundry will be 400 machined wheels per day, or 1300 tons per month, giving a combined tonnage of 2000 tons per month for both plants.

The officers of the company are: Julius F. Janes, president; Edwin H. Janes, vice-president and treasurer; William R. McDonough, secretary and general manager. The directors, in addition to the officers, are E. W. Moore, P. J. Morgan, M. C. Rosenfeld, R. M. Calfee, J. G. Fogg and B. C. Tucker.

Vesta furnace at Watts, Pa., recently acquired by E. J. Lavino & Co., has been blown in on foundry iron and a little later will be turned on to the manufacture of ferromanganese.

Boiler Economy with Peat Fuel

Peat fuel, under favorable condition, can be economically utilized for the production of power through the media of the steam generator and steam engine, according to B. F. Haanel, chief engineer Division of Fuel and Fuel Testing, Department of Mines, Canada. He bases his claim on results of tests to determine the value of peat fuel for the generation of steam. They are described in Bulletin 17 by John Blizard, Department of Mines, Canada.

The cost of the peat fuel delivered to the power plant, he explains, must be less than that of a quantity of good steam coal equivalent in heating value, in order to permit of its competition, as peat is much bulkier than coal possessing equivalent heating value, and its storage in sufficient quantity to permit the continuous operation of a power plant is a difficult problem; also the handling of large quantities of peat fuel involves problems of a more or less serious nature. On the other hand, he points out that peat fuel burns freely to a fine, easily handled ash, permitting of its almost complete combustion, so that the cost of handling the ash can be reduced to a minimum. Generally, Dr. Haanel believes that peat fuel for steam raising cannot compete with good steam coal costing $5 or less a ton, but as the price of coal increases, peat fuel for steam generation, wherever large deposits of peat suitable for fuel purposes are available, will become a serious competitor of coal.

Peat for Making Combustible Gas

Economy and efficiency, however, are the keynote of these modern times and in the future, in his opinion, it is hardly likely that any form of fuel will be utilized for steam generation for the production of power unless steam is indispensable to the carrying out of some chemical process, or other industry, and he believes that so far as the generation of power is concerned, the more economical method to employ is the conversion of the peat fuel into a combustible gas which can, in this form, be burned in a gas engine or used for the different heating furnaces in metallurgical works.

Many of the peats so far examined in Canada, it appears, have a very high nitrogen content, which can be recovered in the form of ammonia when the peat is burned in a by-product recovery producer and, in this manner, many of the peat bogs may become the source of one of the most valuable artificial fertilizers, ammonium sulphate.

The tests described in the bulletin comprise a series of seven; four of which were carried out on a marine type Babcock & Wilcox water-tube boiler, and three on an internally fired boiler of the portable locomotive type. One of the tests on the water-tube boiler was for the purpose of obtaining complete flue gas analysis, the remainder being run to determine the economy of operation. The peat was hand fired and was said to be of excellent quality, containing only a small percentage of dust and from 16 to 20 per cent moisture. A summary of the results obtained from six tests as outlined in the bulletin is as follows:

Summary of Boiler Tests Using Peat

	Water-tube Boiler			Fire-tube Boiler		
No. of Trial	71	72	73	83	84	85
Moisture per cent in peat.	15.7	15.7	20.3	19.2	20.1	19.2
Net calorific value of fuel as fired, B.t.u. per lb..	7,490	7,490	6,990	7,130	6,970	7,110
Peat fired per hour, lb...	476	586	569	160	214	341
Peat fired per square foot of grate surface per hour, lb.	20.5	15.5	15.0	17.7	23.8	37.9
Equivalent evaporation per hour from and at 212 deg. Fahr., lb....	1,950	2,322	2,250	621	802	1,054
Equivalent evaporation per hour per square foot of heating surface, lb..	2.88	3.43	3.32	2.89	3.73	4.9
Pounds of dry flue gas per pound of peat.....	12.4	9.8	11.1	9.8	9.1	6.5
Temperature in flue leaving boiler, deg. Fahr...	720	760	715	690	690	750
Equivalent evaporation from and at 212 deg. Fahr. per lb. of peat as fired, lb.	4.10	3.96	3.95	3.89	3.74	3.09
Thermal efficiency of boiler furnace and grate, based on the net calorific value, per cent.....	53.1	51.3	54.8	52.9	52.1	42.2

Machinery Markets and News of the Works

WAR BUYING TREMENDOUS

Demand for Machinery from Many Sources

Ordnance, Munitions, Airplane, Shipbuilding and Tractor Plants Are Buying on Large Scale—New Government Ordnance Works

The Government's efforts to increase the ordnance production of the country have resulted in the organization of another new company to forge big guns, the Tacony Ordnance Corporation having been started by the Tacony Steel Co., Tacony, Pa., and will erect at once a $1,500,000 plant, including forge shop and machine shop. Purchases of equipment will be made through the War Department. It is understood that the Bullard Machine Tool Co., Bridgeport, Conn., will go ahead with its proposed gun plant. The Symington-Anderson Co., Rochester, N. Y., which recently bought about $1,000,000 worth of equipment, is building a gun plant at Rochester. Similar plants are under way for the Wisconsin Gun Co., Milwaukee, Wis., the Northwestern Ordnance Co., Madison, Wis., and the Root & Van Dervoort Engine Co., East Moline, Ill., these three latter concerns having been buying equipment in Chicago and Milwaukee. The Inland Ordnance Co., organized by the McMyler-Interstate Co., Cleveland, will presumably buy in that market. Nothing more definite has been learned regarding the gun plants which the Niles-Bement-Pond Co. and the Otis Elevator Co. are expected to provide. The American Brake Shoe & Foundry Co., Erie, Pa., which bought more than 200 new machine tools recently, has taken a Government order for 3000 6-in. guns. The order of the Colts Patent Firearms Mfg. Co., Hartford, Conn., mentioned last week, is for 20,000 Browning machine guns. The value of the contract is about $15,000,000. The Linderman Steel & Machine Co., Muskegon, Mich., has completed new buildings for the manufacture of gun mounts and projectiles for the Government. Contracts for projectiles are reported to have been awarded to the Bethlehem Steel Co., the Tredegar Co., Richmond, Va., and the W. J. Oliver Mfg. Co., Knoxville, Tenn.

A large Government shipbuilding contract, about which little definite information is to be had, has been taken jointly by the Liberty Steel Products Co. and the Foundation Co., both of the Woolworth Building, New York. The Foundation Co. will build the ships while engines, boilers and similar equipment will be furnished by the Liberty Steel Products Co. A large number of mine sweepers are said to be included in the contract. The Foundation Co. has issued an inquiry for about $100,000 worth of plate shop machinery. Lists of machine-shop tools and cranes will soon be sent out. The Federal Shipbuilding Co. is receiving bids on about $1,000,000 worth of plate and angle shop machinery and will soon inquire for machine shop tools and yard and shop cranes. The Chester Shipbuilding Co. has been reorganized and the yard which this company recently acquired at Bristol, Pa., has been taken taken over by the Merchants Shipbuilding Corporation, a new affiliated company, having the same officers. Considerable new equipment will soon be purchased for the Bristol plant, where 12 shipways are being constructed. The Newburgh Shipyards, Inc., Newburgh, N. Y., is making purchases and the American U-Boat & Arms Corporation, which is equipping a yard at City Island, N. Y., for steel and composite ships, expects to close soon on a list recently sent out. The Downey Shipbuilding Corporation, New York, has been making inquiries for a few new tools. The Imperial Japanese Navy, through Commander Godo, its representative here, and Mitsui & Co., has placed orders for about $250,000 worth of shipyard machinery. Government contracts, which are being given out in Washington by the Emergency Fleet Corporation, will doubtless cause a revival of inquiry for large quantities of shipyard equipment. Many of the concerns which inquired a few months ago will find prices advanced 20 to 25 per cent when they again come into the market.

The Curtiss Aeroplane & Motors Corporation has awarded a blanket contract to Manning, Maxwell & Moore, Inc., New York, for equipment and supplies for its new plant now being erected in Buffalo. The Aero Marine Plane & Motor Co., Keyport, N. J., is inquiring for some machines and is expected to engage in airplane engine manufacture for the Government or on a sub-contract. The Trego Motor Co., Fair Haven, Conn., is understood to be making parts for airplane engines. Henry M. Leland, who is equipping a plant in Detroit for making airplane engines, is reported to have a Government contract for 10,000, with deliveries to end about September, 1918. The Hall-Scott Motor Car Co., San Francisco, is co-operating with the Nordyke-Marmon Co., Indianapolis, in the manufacture of 1000 airplane engines for training machines. The Dayton-Wright Aeroplane Co., Dayton, Ohio, has placed a large order for sensitive drilling machines in Cincinnati.

Conditions among the automobile factories are said to be more satisfactory now that many of them are engaged on motor trucks, airplane engines or tractor parts. The Olds Motor Works, Lansing, Mich., will, it is understood, triple its output and will need equipment. The Smith Motor Truck Co., Chicago, has received a Government contract for 72 light trucks and the Reo Motor Car Co., Lansing, Mich., will furnish the same number. The Reading Standard Co., Reading, Pa., is inquiring in the New York market for machine tools and will make motorcycles for the Government. Several automobile plants are making machine tools for machine-tool concerns.

Buying for tractor companies continues on a large scale. Henry Ford & Son will build an addition at the Dearborn, Mich., plant to provide 7000 tractors for the British Isles by next January. Completion of the Ford tractor plant at Cork, Ireland, which was to have taken care of this tractor order, has been delayed until next summer. The Holley Bros. Co., Detroit, which

was building a plant at Coventry, England, for making kerosene vaporizers for Ford tractors, will not be able to complete its plant on time, and the vaporizers will be manufactured in Detroit. The Convertible Tractor Co. has completed a new plant in St. Paul, Minn., and will make tractor attachments for Ford cars. The Hackney Mfg. Co., St. Paul, has been reorganized and will purchase entirely new equipment soon for building tractors. The Enterprise Machinery Co., St. Paul, is building a new factory and will be in the market soon for equipment. The Phoenix Mfg. Co., Eau Claire, Wis., may build caterpillar tractors for the Government and will need new equipment. The La Crosse Tractor Co., La Crosse, Wis., is building a new factory and will inquire for equipment soon. New plants to be built by the Toro Motor Co., Minneapolis, and the Whitman Agricultural Co., St. Louis, have been previously recorded. The General Motors Co. has been buying additional equipment for its tractor plant at Stockton, Cal.

Crane business is still active. The Newport News Shipbuilding & Dry Dock Co. has closed for 11 cranes with the Milwaukee Electric Crane & Mfg. Co. The Midvale Steel Co. has bought two 60-ton cranes.

New York

NEW YORK, Aug. 14.

Machine-tool concerns are increasing their output whenever possible by "farming out" work to provide equipment for the new plants which are aiding in the war. Automobile factories affected by the slump in demand for pleasure cars, are making machine tools, some having taken large contracts.

There is a tremendous demand for machinery and tools, coming largely from makers of ordnance, munitions, ships, airplanes and tractors. The new ordnance plants will require a great deal of equipment. At the request of the Government the Tacony Steel Co., formerly the Philadelphia Steel & Forge Co., Tacony, Pa., has organized the Tacony Ordnance Corporation and will build a plant at Tacony to make big guns for the United States Army. It is understood that the Bullard Machine Tool Co., Bridgeport, Conn., will go ahead with its plans to construct a similar plant at Bridgeport, though no definite announcement has yet been made. Announcements are expected soon with regard to the plans of the Otis Elevator Co. and the Niles-Bement-Pond Co. to assist the Government along the same line. The American Brake Shoe & Foundry Co., which recently placed orders for a large quantity of equipment, has received a contract from the Government for 3000 6-in. guns, which will be built at Erie, Pa., in a special plant. The Symington-Anderson Co., Rochester, N. Y., which also bought equipment recently, is now erecting a plant in Rochester, where 4000 guns will be made. The order received by the Colts Patent Firearms Mfg. Co., Hartford, Conn., referred to in this column last week, consists of 20,000 Browning machine guns, which will cost the Government about $15,000,000.

The Bethlehem Steel Co., Bethlehem, Pa., the Tredegar Co., Richmond, Va., and the W. J. Oliver Mfg. Co., Knoxville, Tenn., are reported to have obtained contracts for projectiles from the Government.

A large number of shipbuilding contracts have been given out by the Emergency Fleet Corporation, as is noted elsewhere in this issue, and there will undoubtedly be a revival of inquiry this week for machinery and tools. Concerns which received bids two or three months ago will, upon renewing their inquiries, find that cost of the equipment they need has risen from 20 to 25 per cent. The Federal Shipbuilding Co., New York, is receiving bids on about $1,000,000 worth of plate and angle shop machinery, and will soon issue an additional list of machine shop tools and cranes. The Liberty Steel Products Co. and the Foundation Co., both in the Woolworth Building, New York, will jointly execute a Government contract for a large number of ships, including many mine sweepers. The Foundation Co. has sent out a list of plate shop machinery required for its yard and will soon supplement this with other lists of machine shop tools, cranes, etc. The Newburgh Shipyards, Inc., have been buying during the week. The Downey Shipbuilding Corporation has been inquiring for a few tools. The Chester Shipbuilding Co., Chester, Pa., has been reorganized and the Bristol, Pa., plant will be conducted hereafter by the Merchants' Shipbuilding Corporation, a new organization. These concerns have the same officers and are backed by W. A. Harriman. The Merchants' Shipbuilding Corporation is reported to have obtained a Government contract for 20 or more ships and will be in the market for shop and yard equipment, including cranes. The latter concern will erect 12 shipways at the Bristol plant. The American U-Boat & Arms Corporation, 21 Park Row, New York, is building a shipyard for steel and composite ships at City Island, N. Y., and will need cranes and shop equipment. Purchases will be made as soon as a Government contract is received.

Commander Godo of the Imperial Japanese Navy has closed for about $250,000 worth of machine tools for shipment to Japan. Orders were placed through Mitsui & Co. A. R. Brown, McFarlane & Co., Ltd., 120 Broadway, New York, are in the market for the following equipment for shipment to Japan:

Turbine lathes, height of center, 42 in.; distance between centers, 30 ft.

Shaft lathes, height of center, 24 in.; length of table, 30 ft.

Planing machine, 3 x 3 x 24 ft.

Horizontal boring and surfacing machine, diameter of spindle, 4½ in.

Horizontal boring, facing and milling machine, diameter of spindle, 3 in.

Full universal drilling machine, radius, 5 ft. 10 in.; the diameter of holes drilled, 3 in.

Hydraulic riveter, gap, 10 ft., 12 ft.; power, 100 tons, 120 tons.

Multiple drilling machine, having 6 drills and capable of drilling tube plates of water tube boilers.

Vertical milling machine, 34 x 13½ x 23½ in., 62 x 38 x 28 in.

Gear hobbing machine, to be suitable for finishing gear wheels of turbines.

Hydraulic press, 1500-ton, 2000-ton, 2500-ton.

Steam hammer, 5-ton.

Dry galvanizing plant.

Lift elevator, capable of lifting 1 ton.

Air compressor, capable of compressing free air of 1200 cu. ft.

Blue-printing machine, 4 ft. wide; length, as long as possible.

Round saws of more than 30 in. diameter, for cutting metals.

Pyrometer.

Manning, Maxwell & Moore, Inc., have taken a blanket order for equipment and supplies for the new plant of the Curtiss Aeroplane & Motors Corporation in Buffalo, N. Y., and will furnish a large part themselves. Henry M. Leland, Detroit, is reported to have a contract for 10,000 airplane motors for the Government, the last of which will be delivered by September, 1918. The Aero Marine Plane & Motor Co., Keyport, N. J., is said to be expecting a Government contract for airplane motors and has been inquiring for additional equipment. The Trego Motor Co., Fair Haven, Conn., is reported to have received a contract for airplane-engine parts. The Reading Standard Co., Reading, Pa., is inquiring for tools and is reported to be building motorcycles for the Government.

The Newport News Shipbuilding & Dry Dock Co., Newport News, Va., has closed with the Milwaukee Electric Crane & Mfg. Co. for nine 7½-ton and two 20-ton shop and yard cranes. This concern has also sold to the Staten Island Shipbuilding Co. a 20-ton crane and the Pawling & Harnischfeger Co. has sold the Staten Island concern a 75-ton crane. The Midvale Steel Co. has bought two 60-ton cranes. The Chile Exploration Co. and affiliated copper companies are still buying cranes on a list issued several weeks ago.

The Driver Harris Co., Harrison, N. J., is erecting a foundry building, 70 x 200 ft., which will be devoted mainly to the production of Nichrome castings, and which will house a 2-ton Heroult electric steel furnace.

The Christiania Machine Co., 30 Church Street, New York, has acquired property, about 75 x 100 ft., at Richmond Terrace and Bodine Street, West New Brighton, Staten Island, for the construction of a new shop.

The American Instrument & Tool Co., New York, has been incorporated with a capital of $10,000 to manufacture surgical and medical instruments. The incorporators are A. C.

Helfer and G. and H. V. Vollinger, 961 Mott Avenue, New York.

The American Spray Co., 26 Cortland Street, New York, has leased the former plant No. 5 of the United States Printing & Lithographing Co., at Elizabethport, N. J., for the establishment of a works for the manufacture of spraying apparatus.

The Auto Pedal Pump Sales Corporation, New York, has been incorporated with a capital of $100,000 to manufacture automobile trucks and accessories. C. L. Beck, K. C. Busch and A. R. Redburn, 798 Tenth Avenue, New York, are the incorporators.

The Progressive Smelting & Metal Corporation, 547-551 West Twenty-fifth Street, New York, is having plans prepared for alterations and additions in its foundry and other plant departments, to cost about $10,000.

The Albert & Davidson Pipe Corporation, New York, has filed articles of incorporation with a nominal capital of $5,000 to manufacture pipes, tubing, rails and kindred products. I. Albert and H. and E. Davidson, 200 Ross Street, Brooklyn, are the incorporators.

The Tacony Ordnance Corporation, New York, has been incorporated with a capital of $100,000 to manufacture ordnance. O. W. Bird, Jr., J. B. Warren and W. C. Pearson, 165 West Seventy-sixth Street, are the incorporators.

The Federal Shipbuilding Co., 54 Dey Street, New York, is having plans prepared for its new shipbuilding plant on the meadows, Newark, N. J. The company has acquired a total of about 140 acres for the proposed plant, which will comprise 12 shipbuilding berths, steel works and shop structures. The American Bridge Co., 30 Church Street, is engineer.

The West Motor Co., Inc., New York, has been inporated with a capital of $25,000 to manufacture commercial automobiles. The incorporators are A. M. Sullivan and S. S. and H. Myers, 318 West One Hundredth Street.

A seven-story refrigerating plant, 100 x 125 ft., will be constructed by the New York Butchers' Dressed Meat Co., Eleventh Avenue and Thirty-ninth Street, New York, at Eleventh Avenue and Fortieth Street. The structure will cost about $250,000.

The New Dorp Mfg. Co., Richmond, Staten Island, N. Y., has filed articles of incorporation with a capital of $15,000 to manufacture engines, boilers and foundry supplies. H. Rosenbusch, L. F. Goldman and W. H. Schuster, New Dorp, are the incorporators.

The Electric Auto-Lite Co., 214 West Forty-ninth Street, New York, manufacturer of electric lighting equipment for automobiles, has increased its capital from $13,000,000 to $15,000,00.

The Baker Economic Transport Corporation, New York, has been incorporated with a capital of $600,000 to manufacture motors, engines and kindred specialties. W. A. Hall, C. W. Baker and J. A. Chard, 250 Fulton Street, are the incorporators.

The Blava-Schrimer Co., Inc., New York, has filed articles of incorporation with a capital of $10,000 to manufacture machinery and allied appliances. G. Schrimer, L. Blava and J. Patterson, 43 Cedar Street, are the incorporators.

George H. Ames, Brooklyn, N. Y., and Louis Rebele, New York, have incorporated in Delaware the Foreign Crucibles Corporation, Ltd., with capital of $250,000, to manufacture crucibles of various kinds.

The Simmons Machine Co., 985 Broadway, Albany, N. Y., is planning for the construction of a new one-story addition to its plant to cost about $12,000. Thornton W. Price, Woolworth Building, New York, is architect.

The American Locomotive Co., Schenectady, N. Y., will build a new one-story erecting shop at its Pittsburgh, Pa., works. Contract has been awarded.

The Cohoes Rolling Mill Co., Canvass and Courtland streets, Cohoes, N. Y., specializing in the manufacture of wrought iron pipe, has increased its capital from $500,000 to $1,000,000.

The North East Electric Co., Whitney Street, Rochester, N. Y., will build a new machine shop at Orchard Street and Lyle Avenue to cost about $15,000.

The Symington-Anderson Co., Lincoln Park, near Rochester, N. Y., has awarded contracts for the construction of a new one-story plant, about 200 x 700 ft., to cost $300,000. The structure will be used for the manufacture of cannons.

The La France Motor Truck Co., Elmira, N. Y., has been incorporated with a nominal capital of $5,000 to manufacture motor trucks. H. C. Mandeville, A. La France and I. L. Booth, all of Elmira, are the incorporators.

The Elmira Foundry Co., Woodlawn Avenue, Elmira, N. Y., specializing in the production of iron castings, will build a new electric transformer station at its plant to cost about $10,000. A new boiler works will also be constructed at a cost of about $35,000.

The Geneva Cutlery Co., Lehigh Street, Geneva, N. Y., manufacturer of razors and cutlery, will build a one-story brick and steel power plant, about 60 x 120 ft., in Torrey Park, for factory operation.

The Smith Elevator Co., Buffalo, has been incorporated with a capital of $75,000 to manufacture elevators and elevator equipment. George E. Burford and C. W. and M. E. Smith, all of Buffalo, are the incorporators.

The American Brass Foundry Co., Buffalo, is planning for the erection of additions to its plant. The company has made application to the city for the closing of Arizona Street to provide for the new extension.

The Standard Fuse Corporation, Paulsboro, N. J., is planning for the immediate installation of new automatic machinery at its works.

The Auto Machine Parts Co., Jersey City, N. J., has been organized to operate a plant at 6 Provost Street. Lucien Stone, East Orange, and Philip Corridon, 191 First Street, Jersey City, head the company.

The International Loading Corporation, Jersey City, N. J., has been incorporated with a capital of $1,500,000 to manufacture machinery and tools. Samuel B. Howard, Arthur W. Britton and George V. Reilly, 65 Cedar Street, New York, are the incorporators.

The Crucible Steel Co., South Fourth Street, Harrison, N. J., has filed plans for the construction of a new one-story concrete addition to its plant, about 130 x 262 ft., to cost $165,000.

The General Electric Co., Harrison, N. J., has awarded a contract for the construction of a new two-story brick and reinforced-concrete addition to its plant on Gross Street. The structure will be 132 x 255 ft. Edward M. Waldron, Inc., 665 Broad Street, Newark, is the contractor.

The Atlas Aircraft Corporation, Bordentown, N. J., has been incorporated in Delaware with a capital of $500,000 to manufacture aeroplanes and other aircraft. J. V. Herron, Bordentown, and J. J. Bugsley, Merchantville, are the principal incorporators.

J. Wiss & Sons Co., 31 Littleton Avenue, Newark, N. J., manufacturer of razors and shears, is taking bids for the construction of additions to its plant to cost about $10,000. The structures will comprise a two-story and basement building, about 25 x 40 ft., and a one-story addition, 20 x 35 ft.

The Oxweld Actylene Co., 646 Frelinghuysen Avenue, Newark, N. J., will build a new one-story brick and concrete welding shop addition to its plant, about 42 x 60 ft., to cost $11,000.

The Ideal Wheel & Tire Co., Newark, N. J., has been incorporated with a capital of $50,000 to manufacture automobile wheels and tires. Joseph H. Dwork, Hyman Small and Max Munzer, Newark, are the incorporators.

The Board of Education of the Essex County Vocational Schools, 316 Essex Building, Newark, N. J., will receive bids until 4 p. m., Aug. 22, for a new motor generator set, panels and auxiliary equipment for the county vocational schools. Wesley A. O'Leary is director.

The Des Lauries Aircraft Corporation, Jersey City, N. J., recently incorporated with a capital of $500,000, has acquired property consisting of about six acres in Mulberry Street, Newark, N. J., for the construction of a plant for the manufacture of airplanes. The company has also leased an existing three-story building, about 200 x 400 ft., at the same location for a general assembling works.

The Willys-Overland Co., Newark, N. J., is planning for the erection of a new two-story reinforced-concrete service plant at Palen and Hackett streets, about 63 x 240 ft.

The Linn Mfg. Corporation, Morris, N. Y., L. Kenyon president, will erect a factory 50 x 230 ft., one story.

The Geneva Cutlery Co., Geneva, N. Y., will build a power plant 60 x 120 ft., one story. D. H. Henry is president.

The St. Lawrence Metal Products Corporation, Ogdensburg, N. Y., has been incorporated by E. J. Turley, P. H. Fitzgibbons and J. E. Fell. Capital stock, $200,000.

The two factory buildings to be erected at Park Hill, East Syracuse, N. Y., by the Onondaga Steel Co., will be 80 x 100 and 80 x 120 ft., respectively, each one story, and will cost $30,000.

The Simmons Machine Co., Albany, Charles A. Simmons, president, will build a one-story factory addition to cost $12,000.

The Sealright Co., Fulton, N. Y., has been incorporated with a capital stock of $30,000,000, to manufacture special

machines and tools. W. L. Wright, E. W. Skinner and J. T. Bond, Fulton, are the incorporators.

Plans have been completed for a one-story factory addition for the Oldbury Electro Chemical Co., Buffalo Avenue and Industrial Railroad, Niagara Falls, N. Y.

The Carborundum Company, Niagara Falls, N. Y., F. W. Haskell, president, has let contract to the Turner Construction Co. for the erection of four additional factory buildings at its plant, Buffalo Avenue and Eighteenth Street.

Contract has been awarded by the Continental Can Co. for the erection of a 55 x 250 ft., three-story addition to its factory at Syracuse, N. Y., to cost $200,000.

J. Hungerford Smith Co., 410 North Goodman Street, Rochester, N. Y., has let contract for construction of a boiler and engine house.

Burdick & Son, Albany, N. Y., are erecting a four-story factory addition, 160 x 67 ft., at Hamilton and Mosier streets, to cost $50,000.

The Caledonia Bean Harvester Works, Caledonia, N. Y., is completing a foundry building, 66 x 98 ft.

The Elmira Foundry Co., Elmira, N. Y., has had plans drawn for a one-story and basement boiler house, 60 x 80 ft., and a transformer station, 38 x 40 ft., the total cost of which, with equipment, will be $45,000.

The North East Electric Co., Rochester, N. Y., has let contract for a machine shop on Whitney Street, to cost $15,000.

The Taylor-Shantz Co., Rochester, manufacturer of dies and tools, is completing a two-story machine shop addition, 79 x 128 ft., to cost $27,000.

New England

BOSTON, Aug. 13.

The machine tool trade has been very quiet among the dealers the past week. Sales have been below normal and inquiries scattered and small in volume. Plant expansion is slowing up with one or two notable exceptions, although it is expected that within a few days some of the projects that have been hanging fire for weeks awaiting word from Washington may enter the market for actual purchases. It is reported that machinery is being ordered for the plant which is to be equipped in Bridgeport by the Bullard interests for the building of six-inch guns for the Government.

The machine-tool builders are very busy and several large orders are reported as having been placed for war industries in sections outside of New England. It is reported that local plants have received orders and inquiries from the American Radiator Co., Buffalo, for equipment to build three and four-inch guns; Bartlett, Hayward & Co., Baltimore, for similar equipment; the Wisconsin Gun Co., Milwaukee, Wis., which is to build howitzers; and the American Brake Shoe & Foundry Co., which is to build guns. The Curtiss Aeroplane Motors Co., the Packard Motor Car Co. and the Nordyke & Marmon Co. are ordering machine tools to be employed in building airplane engines. The Rockwell-Drake Corporation has ordered additional equipment for its Rockwell-Drake division, Plainville, Conn., and its Standard Roller Bearing division, Philadelphia.

The receivers of the Hopkins & Allen Co., Norwich, Conn., have been given permission by the United States Court to continue the business, and work on the Belgian contract will go on for the present. There is a possibility that the contract will be taken over by other parties.

The Crompton & Knowles Loom Works, Worcester, Mass., has awarded a contract for a foundry addition, 126 x 277 ft., two stories, at its plant in Providence, R. I.

The Plume & Atwood Mfg. Co., Thomaston, Conn., has awarded a contract for an addition, 33 x 72 ft., two stories, to its casting shop.

The East Coast Ship Co., Boothbay Harbor, Me., has been incorporated with authorized capital stock of $200,000 by Lezebes E. Cliff, president; Howard E. Womyss, treasurer; and Irving W. Wood, clerk.

The Stanford Steel Products Co., Milford, Conn., has increased its capital stock from $30,000 to $60,000.

The Torrington Co., Torrington, Conn., has issued additional stock to the amount of $7,999,000.

Work has been begun on a shipyard at Newington, N. H., to cost $250,000, by a corporation now forming, of which L. H. Shattuck, 208 Granite Street, Manchester, N. H., is to be president.

The Standard Electric Time Co., Springfield, Mass., is asking bids on an addition, 34 x 105 ft., three stories.

The Taft-Pierce Mfg. Co., Woonsocket, R. I., has bought the adjoining property and factory building, now occupied by the Woonsocket Spinning Co., which is to move to a new plant.

The Bureau of Yards and Docks, Navy Department, Washington, is preparing plans for a power plant and distributing system, to cost $450,000, at New London, Conn.

The Edward L. Sibley Mfg. Co., brass goods, Bennington, Vt., has awarded a contract for a factory, 60 x 157 ft., two stories.

The Gaynor Mfg. Co., Stratford, Conn., has increased its capital stock from $150,000 to $200,000.

Philadelphia

PHILADELPHIA, Aug. 14.

The United States Government has awarded a contract to the Austin Co., Cleveland, Ohio, for a one-story brick and steel building, about 400 x 400 ft., at the League Island Navy Yard, Philadelphia, for the manufacture of airplanes. The plant, with equipment, is estimated to cost $1,000,000, and will have a capacity of about 1000 airplanes a year.

The City of Philadelphia will build a new addition to its power plant at the Byberry Hospital to cost about $77,000. The William Linker Co., Heed Building, Philadelphia, has the contract for erection.

F. R. Hansell, Philadelphia, and associates, have incorporated in Delaware the Direct Drive Motor Co., with capital of $2,000,000, to manufacture automobiles and parts. S. C. Seymour, Camden, N. J., is also an incorporator.

The Morris Wheeler Co., Thirtieth and Locust streets, Philadelphia, has awarded a contract for the construction of a new shop addition at its plant, to cost about $7,000.

The Lyndall Motor Truck Co., Philadelphia, has been incorporated in Delaware with a capital of $10,000 to manufacture motor trucks, etc. Frank S. and Arthur C. Lyndall, both of Philadelphia, are the principal incorporators.

F. S. Jones, Philadelphia, operating machine repair shops at Media and Edgewood streets, has filed plans for the erection of a new two-story plant, 40 x 50 ft., at Sixty-first and Media streets.

The Philadelphia & Reading Railroad, Philadelphia, is said to be planning for the construction of a new roundhouse at its local yards, with capacity of sixteen locomotives of heavy type. A new machine shop and other shop buildings will be erected, including a power plant for works operation.

The Thermo Service Corporation, Philadelphia, has been incorporated in Delaware with a capital of $10,000 to manufacture fireless cookers and kindred metal specialties Wray C. Arnold, Frank J. Reed, Jr., and Robert C. Fender, all of Philadelphia, are the incorporators.

The Auto Radiator Co., 1315-17 Vine Street, Philadelphia, is taking bids for the construction of a new two-story plant, about 30 x 80 ft.

Charles Y. Scully, 5352 Germantown Avenue, Philadelphia, has had plans prepared for a new one-story machine shop at 5317 Germantown Avenue.

A new one-story reinforced concrete power plant for factory operation will be constructed by the William Freihofer Baking Co., North Twentieth Street and Indiana Avenue, Philadelphia, at its baking works to be erected at Wilmington, Del., at a cost of $75,000. Contract for erection has been awarded.

The Chester Shipbuilding Co., Chester, Pa., has been granted permission by the Commissioners of Navigation, Philadelphia, to construct four new shipways and auxiliary structures at its local works. The company has also received permission to erect its proposed new plant at Bristol on property recently acquired from the Standard Cast Iron Pipe & Foundry Co., to comprise, in initial installation, 12 shipways with shop buildings. It is said that about 6000 men will be employed at the latter plant.

The Lincoln Brass Foundry, Chester, Pa., has commenced the operation of a new plant at Fifth and Jeffrey streets. The company plans extensive operations; a branch office has been established at 105 Fulton Street, New York. J. A. Worrell heads the company.

The McClave-Brooks Co., Poplar Street and Park Place, Scranton, Pa., manufacturer of iron and steel castings, is planning for the construction of a one-story addition to its plant, about 30 x 50 ft., to cost $12,000. Duckworth Brothers, Coal Exchange Building, are architects.

The Eastern Pennsylvania Railways Co., Pottsville, Pa., will build a new one-story addition, about 75 x 100 ft., to its car repair plant at Palo Alto. The company is also planning for the construction of a new power house at that location to replace the plant recently destroyed by fire. The J. G. White Engineering Corporation, 43 Exchange Place, New York, will be in charge of construction.

The Interstate Feed Machine & Products Co., 647 East Mason Street, York, Pa., is building a new machine shop at Ephrata to provide for increased capacity.

Noble C. Righter, formerly connected with the Keeley Stove Co., Columbia, Pa., has acquired the Shawnee Brass & Iron Foundry Co. It is reported that extensions and improvements will be made in the plant.

The Ingersoll-Rand Co., Athens, Pa., manufacturer of machinery, has awarded a contract for the construction of a new one-story machine shop at its plant, 170 x 200 ft. The company is also having plans prepared for a new one-story addition, about 90 x 145 ft.

The Chambersburg Engine & Foundry Co., Chambersburg, Pa., has been organized to acquire the plant of the Quincy Engine Co. The new organization will specialize in the manufacture of gasoline engines, air compressors, pumps and similar products, and plans to increase the capacity of the plant with the installation of new equipment. Effective with the enlargement the present working force will be increased.

The United States Government has acquired about 20 acres of land at Middletown, Pa., from the Keystone State Fair & Industrial Exposition Co., and has commenced the erection of a new building, about 300 x 850 ft., to be equipped and used as an assembling plant for aeroplanes, hydroplanes and other aircraft. The initial works will cost about $400,000. The James Stewart Co., Pittsburgh, has the contract for erection.

The Johnstown Traction Co., Johnstown, Pa., is considering the construction of a plant near Coopersdale for car rebuilding and repair work.

The Light Mfg. & Foundry Co., Pottstown, Pa., manufacturer of aluminum specialties of various kinds, is taking bids for the construction of a new two-story and basement addition to its plant, about 30 x 50 ft. The company will also make improvements in its foundry. A. H. Heilman, Reading, is architect.

The Traylor Shipbuilding Corporation, Allentown, Pa., operated by interests conected with the Traylor Engineering Co., has received permission from the Commissioners of Navigation, Philadelphia, to construct 10 shipbuilding berths with auxiliary structures, at its proposed new works, Cornwells. Samuel W. Traylor heads the company.

Baltimore

BALTIMORE, Aug. 13.

Sites for shipbuilding plants are still drawing attention in this section. Several individuals are said to be working quietly to secure property which it is planned to use as sites for large plants. The various sections on Curtis Bay seem to be the most attractive.

The Mann Shipbuilding Co. has been incorporated with $150,000 capital stock, headed by W. B. W. Mann, head of the Mann Yacht Building Co., foot of Light Street, Baltimore. The new company is understood to have taken over the yacht building company and will build a plant on Curtis Creek. It also is said that the company expects to get some Government contracts shortly and the work of constructing the plant will begin in the near future. Mr. Mann is president of the company; Julius D. Sweet, Syracuse, N. Y., is vice-president and treasurer, and John E. Thomas is secretary.

The Baltimore Dry Docks & Shipbuilding Co., Baltimore, has been granted a permit for the construction of a 110 x 340 ft. building on Fort Avenue near Fort McHenry. It was to cost in the neighborhood of $100,000. Contract has been awarded to the Belmont Iron Works.

The Baltimore Tube Co., Wicomico and Ostend Streets, Baltimore, will build a 144 x 540 ft. rolling mill to cost in the neighborhood of $90,000. The contract has been awarded to the West Construction Co., American Building.

The High Point Machine Works, High Point, N. C., has been incorporated with $50,000 capital stock by W. W. and W. L. Smith and V. J. Melvin.

The Riter-Conley Co., Pittsburgh, manufacturer of steel plate, pipe, etc., is planning for the construction of an addition to its shipbuilding plant at Fairfield, Md.

The Maryland Shipbuilding Co., Baltimore, is having plans prepared for its proposed new shipbuilding plant to cost about $1,000,000. Charles E. F. Clarke is president. W. W. Ragan, Fidelity Building, is engineer.

The Smith Concrete Block Machine Co., Mount Airy, Md., has been incorporated with a capital of $50,000 to manufacture machinery to be used in concrete construction. Walter R. Rudy, Arthur E. Phebus and John Lewis are the incorporators.

The United States Government, Army Department, will build a new blacksmith shop at its remount station, Newport News, Va., in connection with other structures and improvements to cost about $85,000.

The Tredegar Co., South Sixth Street, Richmond, Va., is building a new one-story plant, about 100 x 100 ft., for the manufacture of munitions. The structure will cost about $75,000.

The W. J. Oliver Mfg. Co., Knoxville, Tenn., manufacturer of projectiles, is planning to increase the capacity of its plant with the installation of new machinery.

The Matthews Iron & Steel Co., Rome, Ga., is planning for the installation of new steel furnace equipment, electrically operated, at its plant.

The North Carolina Shipbuilding Co., Morehead City, N. C., recently incorporated with a capital of $200,000 is planning for the installation of new tools and other equipment for its proposed new shipbuilding plant. G. D. Canfield is president.

Chicago

CHICAGO, Aug. 13.

Buyers of machinery whose requirements have been for the manufacture of ordnance appear to have placed the bulk of their orders, and at the present time there are no new inquiries of large proportions. It is a certainty, however, that the companies referred to, including the Wisconsin Gun Co., Milwaukee; Northwestern Ordnance Co., Madison, Wis., and Root & Van Dervoort Engine Co., East Moline, Ill., will be looking for more or less equipment from time to time to round out their shops. The Wisconsin Gun Co., while it has bought many machine tools, will need considerable incidental equipment.

The buying by the Buda Co., Harvey, Ill., referred to a week ago, included machinery worth at least $100,000.

Most of the dealers report that the miscellaneous trade is lighter, but they consider business to be fair. Deliveries on standard machines are in many cases still further away as a resut of recent large orders. One order served to put the deliveries on several machines made by a Cincinnati builder about one month further off. The tractor interests have not bought all the equipment they need.

The General Electric Co. has acquired a tract of land at Harrison Street and Oakley Avenue, Chicago. Definite information as to the reason for the purchase cannot be obtained here, but it is understood that in the course of time either a large warehouse or factory will be erected.

Recent reports that the Baldwin Locomotive Works contemplates the erection of a plant on land it owns at East Chicago are supported to some extent by the location of a work train with living quarters for a construction gang on the property. The land was purchased a few years ago and is surrounded by a high fence.

The Red Devil Speed Hammer Co. has been incorporated in Indiana with a capital stock of $50,000, and it is reported that a factory will be built at Gary, Ind., for the manufacture of riveting machines and other machinery. Julius Cayo is president.

James G. Heggie & Sons has been formed as an Illinois corporation to erect smokestacks, tanks, piping and coke ovens. Robert B. Heggie, Gary, is the Indiana agent of the company.

The S. K. A. & S. Co., manufacturers of machinery, with offices at Peoria and a plant at El Paso, Ill., has been incorporated with a capital stock of $100,000. Among the incorporators are William M. Springer, John F. Skaggs and Granville Kesling.

Work has been started in laying out the plant of the Peoria Malleable Casting Co., Peoria, Ill. Hewitt & Emerson are the architects.

The name of the Morris Iron & Machinery Co., Springfield, Ill., has been changed to the McGowan Iron Machinery Co.

The business formerly conducted at Canton, Ill., by F. C. Moran has been taken over by the Canton Specialty Co., a new company, and will be removed to a new factory. The incorporators of the new company are W. P. Ingersoll, E. H. Negley and F. C. Moran.

The Foster Machine Co., Elkhart, Ind., has completed the erection of a one-story, fireproof addition, 93 x 300 ft., which will be used for assembly purposes. The company has under construction another building, 132 x 165 ft., which will be used as a store room for raw materials, and is preparing to build a building 132 x 128 ft., to house its power plant.

Contracts have been awarded for the construction of a factory for the Boone Tire & Rubber Co., Eau Claire, Wis. The main building will be 66 x 262 ft., and is to cost $22,000. It is expected that the factory will be in operation by Dec. 1.

The Minneapolis Steel & Machinery Co., Minneapolis,

Minn., has been granted a permit for the construction of a brick machine shop, 132 x 142 ft., at an estimated cost of $60,000.

The Twin City Forge Co., which has filed a certificate of incorporation in Minnesota with a capital stock of $500,000 is arranging to use an old plant of the Northwestern Thresher Co., Stillwater, Minn., for manufacturing tools and machinery. Among the incorporators are James L. Record and George L. Gillette of the Minneapolis Steel & Machinery Co., Minneapolis.

The Lake Shore Engine Works, Marquette, Mich., will build a new one-story machine shop to cost about $12,000.

The Grant Wire Wheel Mfg. Co., Chicago, a Delaware corporation, has increased its capital from $500,000 to $1,000,000.

The Peoria Malleable Iron Co., Averyville, Ill., will build two one-story foundry additions to its plant, each about 100 x 250 ft., to cost $65,000.

The C. R. Wilson Body Co. announces that its new factory building at Bay City, Mich., will be completed this week, and manufacturing operations started before Sept. 1. This plant is especially designed for woodworking, and is one of the most complete of its kind in the country.

The Auto Climb Out & Shovel Co., Saginaw, Mich., has been organized with a capital of $25,000 to manufacture a device for drawing out automobiles and motor trucks when mired.

The John Knape Machine Co., Grand Rapids, Mich., is building a brass foundry to cost about $4,000.

Milwaukee

MILWAUKEE, WIS., Aug. 13.

Local buying of tools has been unusually large during the last week or two by reason of the establishment of two large ordnance shops, one at Milwaukee and the other at Madison, which are financed by machine-tool and machinery makers.

The Manitowoc Shipbuilding Co., Manitowoc, Wis., operating the largest yards on Lake Michigan, received formal notice on Aug. 6 that it has been taken over by the Government. Beyond three trawlers under construction for a Boston corporation, all work in hand is commandeered. The company has issued a call for 1500 additional men, particularly plate fitters, riveters, helpers, and common laborers. It is now employing about 1600 operatives. Edward Carus is president.

The General Steel Co., a Delaware corporation organized recently to succeed the Valley Steel Co., incorporated in New York, has filed articles and an application to be authorized to do business in Wisconsin, which has been granted. The company is building a new mill in Milwaukee county, at St. Francis, just south of Milwaukee, on the shore of Lake Michigan. W. E. Moore & Co., Pittsburgh, are in charge as consulting engineers.

The Janesville Barb Wire Co., Janesville, Wis., has increased its capital stock from $150,000 to $250,000 to accommodate the growth of its business, which makes necessary important extensions of the works. D. C. Harker is secretary.

The Republic Phonographic Co., Manitowoc, Wis., organized with a capital stock of $200,000, as already noted, will establish a plant in Manitowoc for the manufacture of all-steel talking machines, office furniture, cabinets and similar goods. It is reported that the company will absorb the Invincible Metal Furniture Co., Manitowoc, and enlarge the plant, now employing 70 workmen. The Republic company, it is stated, is backed by Eastern capital, represented by Frank B. Keefe, T. C. McCullough and Alton Ripley, Manitowoc.

The Stowell Co., South Milwaukee, Wis., maker of hardware specialties, which recently awarded contracts for a foundry addition, 76 x 175 ft., will also build a storehouse and shipping room addition, 50 x 120 ft. The architects on both structures are Leenhouts & Guthrie, Milwaukee.

The Milwaukee Motor & Supply Co., Milwaukee, is being organized by local capital to establish a plant for the manufacture of electric motors and devices. Plans for the proposed factory are being prepared by Frank E. Gray, 86 Michigan Street.

The Modine Mfg. Co., Racine, Wis., organized in January, 1917, to manufacture automobile, truck and tractor radiators and cooling systems, is enlarging its capacity to 3000 radiators a month. A. B. Modine is president.

The Detroit Auto Radiator Co., 182 Fifth Street, Milwaukee, has incorporated its business, established two years ago, under the laws of Wisconsin without change of name. The capital stock is $10,000. Joseph Colker is president.

The Boone Tire & Rubber Co., Sycamore, Ill., awarded the general contract for the erection of its new factory at Chippewa Falls, Wis., to the Wisconsin Construction Co., local, at $22,000. It will be 66 x 262 ft., one story high, of reinforced concrete. The contract for electrical equipment and installation was awarded to the Kelley Construction Co. at $11,000. The work is to be completed within 90 days and it is hoped to have the plant in operation by Dec. 1. I. V. McLean is president.

The Lawson Aircraft Corporation, Green Bay, Wis., organized with a capital stock of $200,000 to manufacture airplanes, has elected the following officers: President, George W. Ellis; vice-president and general manager, Alfred W. Lawson; secretary, C. I. Smith; treasurer, George A. Richardson; counsel, Max H. Strehlow; directors, William Hoberg, F. E. Burrall and Messrs. Ellis, Lawson and Richardson. It was decided to issue at par $50,000 of preferred and $150,000 of common stock, the proceeds to go into machinery, tools, materials and labor. Practically the entire issue has been subscribed to by Green Bay capital.

The Janesville Products Co., Janesville, Wis., formerly the Wisconsin Carriage Co., having recently changed its style and increased the capital stock from $100,000 to $130,000, has purchased the entire business of the Skudder Car Co., Chicago, manufacturer of small self-propelled vehicles for children. The manufacture of buggies and sleighs will be discontinued and all production concentrated on children's vehicles. An output of 100,000 during the coming year is scheduled. R. E. Wisner is general manager.

The Landover Truck Co., Chicago, has decided to move its works and office to Marinette, Wis., where local capital has subscribed to a fund of $25,000 to be used for the purchase of machinery, materials and labor. The company will occupy the former plant of the Main Street Iron Works, which is now being overhauled and re-equipped. Production will begin about Sept. 1 or 15. E. W. LeRoy is chairman of the Marinette committee.

The Gisholt Machine Co., Madison, Wis., has amended its corporate articles to include among the business and purposes of the company the acquisition, subscribing for, purchasing and holding of stock of other corporations. This is done to enable the Gisholt company to finance the Northwestern Ordnance Co., Madison, organized with $100,000 capital stock, as already noted, at the request of the Government, to manufacture 4.7-in. field pieces. C. A. Johnson is president.

Joseph Benesch & Co., 1718 Vliet Street, Milwaukee, wholesale scrap metal and junk dealers, will establish new yards and warehouses at Western Avenue and South Pierce Street. Contracts have been awarded for the erection of a two-story brick and mill warehouse, 110 x 220 ft., costing $25,000.

The Appleton Auto Body Co., Appleton, Wis., has increased its capital stock from $5,000 to $25,000 for the purpose of erecting a complete new automobile body manufacturing plant, as already noted. C. G. Seeger is general manager.

The Independent Foundry Co., West Allis, Milwaukee, incorporated some time ago with $25,000 capital stock, has purchased a site at Fifty-fourth Avenue and Burnham Street for its proposed new gray-iron shop. Because the tract is in close proximity to the shops of the Obenberger Forge Co. a survey is being made to determine if the site is suitable for foundry purposes. August M. Fons is secretary.

The Silent Washer Co., Clintonville, Wis., has awarded a contract to Herman Kroll, local, for the erection of the first unit of its new factory, 40 x 120 ft., two stories and basement, of solid brick, to be ready within 90 days. The plant will be moved from Appleton to Clintonville upon the completion of the building. Robert Fischer is secretary.

The Pawling & Harnischfeger Co., Milwaukee, maker of cranes and hoists, awarded the contract to Riesen Bros. Co. for the erection of a power plant addition, 50 x 85 ft., to contain a 500 hp. installation, contracts for which have been noted previously. The engineers are Woodmansee & Davidson, Chicago and Milwaukee.

The Gas Motor Efficiency Co., Janesville, Wis., maker of sparking plugs for internal combustion engines, will double its capacity to provide for a production of 1200 plugs in 24 hr., by adding a full night force. Considerable new automatic machinery will be purchased as soon as such equipment is available on the market.

The Falls Motors Corporation, Sheboygan Falls, Wis., resumed operations with full day and night shifts on Aug. 6, after a recess of one week for inventory and overhauling. The usual midsummer recess was reduced from two weeks this year because of the urgent demand for gas engines for automobiles, airplanes, trucks and tractors. A 40-in. steel stack, 80 ft. high, was installed by the Optenberg Iron Works, Sheboygan.

The Chippewa Valley Auto Co., Chippewa Falls, Wis., will award contracts Sept. 1 for the erection of a $50,000 public garage and service building at Columbia and Bay streets. Plans are now being prepared by local architects.

Cincinnati

CINCINNATI, Aug. 13.

A number of orders for machine tools has lately been received for Government shops. Large tools are mostly in demand. There is a big demand for sensitive drilling machines from aeroplane makers, the Dayton-Wright Aeroplane Co., of Dayton, Ohio, having bought heavily from a local firm. There is also an improvement in the call for portable electric drilling machines from different sources. As a rule manufacturers are now too busy to change the designs in any of their machines.

The foundry strike at Hamilton, Ohio, is still giving trouble to several foundries in that city, the largest two being closed.

The Southern Locomotive Valve Gear Co., O. C. Martin, superintendent, Knoxville, Tenn., is inquiring in this market for the following equipment:

One 24 to 36-in. x 16 ft., or longer, engine lathe.
One 20-in. engine lathe.
One 30-in. upright drill press, with tapping attached.
One 5000 or 6000-lb. steam hammer.

The Ohio Welding & Mfg. Co., Cincinnati, has leased the former plant of the Wm. E. Gang Co., in West End and will remove its plant, now located on Sixth Street.

The Orez Mfg. Co., Middletown, Ohio, has been incorporated with $10,000 capital stock by George D. Coddington and others. A small automobile specialty will be manufactured.

The Dayton Reliance Tool & Mfg. Co., Dayton, Ohio, has been incorporated with $20,000 capital stock to make dies, jigs and fixtures. The company recently moved its plant to 818 East Monument Avenue, where more commodious quarters were obtained.

The Dayton-Wright Aeroplane Co., Dayton, Ohio, has purchased the three-story plant of the Enterprise Carriage Co., at Miamisburg, Ohio, and will fit it up for the manufacture of aeroplane propellers.

The Springfield Metallic Casket Co., Springfield, Ohio, has plans under way for an extensive addition to its plant.

The Toronto Foundry & Machine Co., Toronto, Ohio, has finished an addition to its plant.

The Columbus Novelty & Mfg. Co., recently organized, Columbus, Ohio, will engage in the manufacture of tools, dies, jigs and special machinery. George D. Barok is mechanical engineer in charge.

An auto spring company will be located at Richmond, Ind., by T. B. Jenkins of St. Louis. Particulars may be obtained from George Seidel, vice-president, Commercial Club of Richmond.

R. A. Jones & Co., Covington, Ky., are in the market for one No. 13 Brown & Sharpe gear cutter for spur or bevel gears, and one cam cutting machine. Offers of either new or second-hand machines will be considered.

The Central South

LOUISVILLE, KY., Aug. 13.

There has been a marked increase in inquiries for building materials, including structural and reinforcing steel, after a long lull in this field. Coal and oil development interests continue insistent demands for equipment and supplies, the past week having seen fully a score of these companies begin operations. Several fires have destroyed elevator equipment which will be replaced. Labor is very scarce.

The Southern Machinery Exchange, Somerset, Ky., is in the market for an electric hoist; load, 6000 lb.; lift, 40 ft.; speed, 100 ft. p. m. or more.

The John G. Duncan Co., Knoxville, Tenn., is asking for dealers' prices on a good, second-hand or rebuilt 1½-in. bolt threading machine, and is also in the market for two second-hand or rebuilt 10-ton gasoline road rollers, in first class condition for immediate delivery.

Birmingham

BIRMINGHAM, ALA., Aug. 13.

There has been no interruption in the persistent demand for machinery. New shipbuilding plants have added to the demand for lathes. Apprehension of trouble in coal mines has accentuated the inquiry for electrical apparatus.

The Henderson Shipbuilding Co. has been incorporated at Mobile by Frank Henderson, Dr. W. T. Henderson and others with a capital stock of $250,000. The company has contracts to build four submarine chasers and other craft.

The Oscar Daniels Co., New York, will erect a shipbuilding plant at Brunswick, Ga., to build 12 all-steel vessels of 9,500 tons each at an approximate cost of $18,000,000. Site has been secured.

Alachusa Phosphate Co., Jacksonville, Fla., capital stock $300,000, has been incorporated by George W. Haines, W. F. Kay and others.

Peninsular Metal Co., Jacksonville, Fla., capital stock $50,000, has been incorporated by Perry W. Zacharias and others.

Georgia Railway & Power Co., Tallulah, Ga., contemplates issuing $2,500,000 of notes in connection with plan for additional power developments embracing a total expenditure of $4,800,000.

Texas

AUSTIN, TEXAS, Aug. 11.

The deterioration of the cotton crop during the last two weeks has caused a big falling off in the demand for cotton-ginning machinery as well as for equipment for compresses and cottonseed oil mills. Considerable machinery for the crushing of peanuts is being installed in the different cottonseed oil mills, however. The small tool trade is in very satisfactory condition.

The Midland Bridge Co. has purchased a site on the Houston ship channel, where it will construct shipbuilding yards for the immediate construction of six wooden hulls for the United States Government.

The Lake Charles Iron Works, Inc., has purchased a site at Lake Charles, La., upon which it will erect several buildings to be occupied as machine shops. The plant will include a foundry, pattern shop and other departments and will cost about $50,000.

Hord Hardeman, of St. Louis, Mo., who recently purchased the property of the Hill Sugar Co., at Harlingen, including a sugar plantation of 1200 acres, will, it is stated, rebuild the sugar mill of the company which was recently destroyed by fire. The new plant will cost about $250,000.

The El Paso Valley Water Users' Association recently had a conference with L. M. Lawson, manager of the Elephant Butte Reclamation project, with a view of bringing about the construction of a hydroelectric plant at the Elephant Butte Dam which spans the Rio Grande at a point in New Mexico north of El Paso. The proposed plant will cost about $1,000,000 and will be built by the El Paso Water Users' Association. It will have a capacity of about 40,000 hp., it is stated.

The Grand Prairie Mfg. Co. will rebuild its factory at Grand Prairie which was devoted to manufacturing household refrigerators. The plant was recently destroyed by fire. The proposed new plant will cost about $125,000. The building will be of brick construction.

California

LOS ANGELES, Aug. 7.

The Fulton Shipbuilding Co., Wilmington, Los Angeles Harbor, has filed plans for the construction of a new one-story shop building, about 160 x 200 ft. C. E. Fulton heads the company.

The Davis Mfg. Co., Los Angeles, has filed notice of organization to operate a machine shop at 123 South Flower Street. H. S. Davis heads the company.

The George R. Bentel Co., Los Angeles, has completed the construction of a new four-story automobile building at 1015 South Grand Avenue. An extensive mechanical department will be installed, including a machine shop, fully equipped, on the second floor, together with construction and general service departments. Blacksmith equipment and heavy machinery, as hammers, etc., will be installed in the basement.

The Southern California Edison Co., Los Angeles, has received permission from the State Railroad Commission to issue bonds for $10,000,000 for extensions and betterments. The company is planning for the construction of an addition to its electric power plant at Big Creek, acquired through its consolidation with the Pacific Light & Power Co. The plant extension and equipment is estimated to cost $1,500,000, and with new transmission lines, about $3,000,000.

The Wilmington Shipbuilding Co., 621 Investment Building, Los Angeles, has acquired property with frontage of about 600 ft. on the East Wilmington Basin, Los Angeles Harbor, for the construction of a new shipbuilding works. The proposed plant is estimated to cost about $100,000 for initial operations, of which about $50,000 will be appropriated for necessary machinery. It is said that the company

has received contracts for the immediate construction of four ships. C. R. Runyon is president.

The new plant of the Los Angeles Shipbuilding & Dry Dock Co., Los Angeles, in the outer harbor district, Wilmington, is rapidly nearing completion, and construction of vessels for which the company has received contracts from the United States Government, will be begun at once. The plant will consist of a machine shop, 100 x 400 ft., plate shop, 100 x 300 ft., riveting shop and erection buildings. A power house, about 100 x 200 ft., will be constructed immediately for plant operation. The company's property comprises about 70 acres of tidelands, and plans are being prepared, it is said, for later additions, including a 15,000-ton dry dock, about 90 ft. wide and 750 ft. long, with shop and construction buildings for ship work. Fred L. Baker, head of the Baker Iron Works, 950 North Broadway, is president and treasurer.

Indianapolis

INDIANAPOLIS, Aug. 13.

The Rockford Bit Co., Kokomo, Ind., has filed articles of dissolution with the Indiana secretary of state.

The C. C. Madison Mfg. Co. has been incorporated at Indianapolis with $50,000 capital stock to manufacture attachments for traction wheels and other devices. The directors are M. O. Madison, R. L. Madison and G. L. Madison, all of Scandia, Kansas.

The Vincennes Electric Supply Co. has been incorporated at Vincennes, Ind., with $10,000 capital stock, to manufacture and deal in electrical supplies. The directors are A. J. Heitz, Jos. E. Gordon and Arrie Freeland.

The Ligonier Refrigerator Co., Ligonier, Ind., has secured a $27,500 contract from the Government for refrigerators.

The Indiana Truck Co., Marion, Ind., which recently reduced its capital stock from $250,000 to $100,000, is not in any way connected with the Indiana Truck Corporation of the same city, which does not intend to reduce its business activities in any way.

The Pacific Northwest

SEATTLE, Aug. 10.

The strike in the lumber mills and logging camps of the Northwest, which is still unsettled, has extended to a number of shipyards, where the employees have refused to handle "unfair" lumber. Two plants in Olympia and four in the Grays Harbor country have been closed. The plants were working on Government contracts. The embargo has not extended to Seattle and Tacoma shipyards, and the threatened strike in the Seattle plants, which had been set for Aug. 1, has been averted by settlement of demands between the employers and workers.

In the State of Oregon the lumber industry has never been in a more flourishing condition. All the mills are operating to capacity, their order books are filled, and it is impossible to supply the demand. The labor troubles experienced in Washington have not been felt in Oregon mills, and the plants in that state are getting a huge volume of work that would ordinarily go to the Washington plants.

Statistics show that the orders in the lumber business are 90 per cent normal; that shipments are 75 per cent of normal, and production is about 53 per cent normal. This vast curtailment of production means a shortage of lumber. Since the midsummer shutdown, followed by acute car shortage, both of which caused an immense falling off in production and the final clearance of stocks, it has been impossible for mills to catch up.

The healthy condition of Seattle's manufacturing industries is shown by figures recently compiled, indicating that the number of persons engaged in such industries during 1914 and 1916 has increased 39.5 per cent. Plants have increased 13.3 per cent, while the value of products manufactured has increased 55.3 per cent. There has never been a time in the history of the State when such a volume of products has been turned out.

The John Wilson Boat & Shipbuilding Co., Seattle, plans to immediately move its plant to a waterfront site, and to enlarge its scope to include construction of larger vessels. Plant has been building small craft and barges.

The plant of the Vancouver Engineering Works, Vancouver, B. C., is completely tied up by a strike of its employees, who are asking recognition of the union.

The Granby Consolidated Mining, Smelting & Power Co., operating a big copper plant and smelter at Anyox, B. C., and the smelter at Grand Forks, has acquired 2,000 acres of coal lands. About half a million dollars will be spent in developing the lands to produce coke. A coke manufacturing plant costing $1,500,000 will be erected near Anyox, it is reported.

The Tregoning Boat Co., operating a large plant in Seattle for the manufacture of metal lifeboats and rafts, has located a plant in Portland which will turn out 25 boats daily. H. N. Young will have charge of the Portland branch.

The Spokane Gas Acetylene Gas Co., Spokane, Wash., plans to re-incorporate its company, and reorganize for construction of an enlarged manufacturing plant.

L. H. Gray & Co., shipbuilders, Seattle, have purchased 124 acres near Bremerton, on which the company plans to establish a plant to manufacture concrete ships and ocean-going wooden vessels. Company now holds several wooden ship contracts.

Allen Shipbuilding Co., Seattle, recently incorporated, has completed plans for a 10-acre wooden shipbuilding plant in Seattle, to construct wooden ships. Yards will have six ways.

Somarstrom Bros., shipbuilders, St. Helens, Ore., have been awarded contracts by the Government to build four government steamships of the Hopp type. Vessels are to be delivered within eight months.

The Northern Pacific Railway Co.'s reclamation plant at South Tacoma, Wash., representing an investment of $50,000, will soon be in operation. Complete equipment, including bolt-threading machines, six-spindle tapper nut-reclaiming machine, 35-ton roller, etc., has been installed to reclaim large quantities of iron and steel.

The plant of the Watson Brothers' Iron Works, Astoria, Ore., has been sold to the Pacific Marine Engine Works of Portland, which will move the machinery of the plant to Portland. The Albany Iron Works, of Astoria, has taken over the patent for manufacturing the feed mill that the Watson Bros. plant has perfected, and will continue the manufacture of that machine in Astoria. S. E. Watson, member of the old concern, will join a shipbuilding concern in Seattle.

Henry Kern, owner of the North Bend Iron Works, Marshfield, Ore., has sold the site of his foundry to the North Bend Mill & Lumber Co. and will immediately begin work on the construction of a modern foundry plant.

The Dodge Mfg. Co., Mishawaka, Ind., has opened a branch warehouse and sales office at 522 First Avenue, South, Seattle, to handle products manufactured by the Dodge Steel Pulley Corporation, Oneida, N. Y., comprising complete line of Oneida steel split pulleys, National steel pulleys and Oneida wood split pulleys. Charles M. Weinberg is in charge.

The Railway Equipment Co., Portland, has removed its offices and salesrooms to Second and Stark Streets.

Fourteen shipyards in Oregon are affected by the action of the Shipping Board in commandeering all vessels under construction exceeding 2500 tons dead weight. These yards now have under construction 26 steel steamers and 81 wooden vessels, though some of the latter are under the 2500-ton limit. In the State of Washington 27 yards are affected. These yards have on the ways 69 steel steamers and 98 wooden vessels, of which a number are under the weight limit.

The American Shipbuilding Co., Portland, Ore., has been incorporated with a capital stock of $250,000 by George N. Black, Cecil H. Bauer and Thomas G. Greene.

The Marine Pipe & Machine Works, Seattle, Wash., will equip a new plant at Spokane and Whatcom streets, where 24,000 sq. ft. of floor space will be occupied. Machine tools will be put in for the manufacture of heavy oil marine engines. The equipment will include a 10-ton crane and an erecting platform with a capacity for eight engines. The plant will have a capacity of from 50 to 60 motors a year.

The Sloan Shipyards Corporation, Seattle, Wash., is installing a 60-ton shear leg crane for placing engines on boats in the yards. A 1500-lb. steam hammer and a two-ton electric furnace have just been installed.

The Pacific Engineering & Equipment Co., Portland, Ore., has opened at 92 First Street with a line of sawmill and logging supplies and shipbuilding equipment.

Canada

TORONTO, ONT., Aug. 13.

The William Lyall Shipbuilding Co., Ltd., Montreal, Que., has been incorporated with a capital stock of $1,000,000 by Errol Languedoc, Ralph E. Allan, William Taylor. William Lyall of the Peter Lyall Construction Co., Montreal, is also interested in the company, which will build and operate a shipbuilding plant.

The Dominion Carriage Co., Ltd., Montreal East, Que., has been incorporated with a capital stock of $500,000 by Pierre T. Legare, Joseph H. Fortier, Pierre C. Falardeau and others, all of Quebec, Que., to manufacture automobiles, carriages, vehicles, machinery, implements.

The Empire Stove & Furnace Co., Ltd., Owen Sound, Ont.,

has been incorporated with a capital stock of $100,000 by Archibald A. Parks, Abraham J. Creighton, Edgar W. McQuay and others to manufacture stoves, radiators, brass, steel and iron castings, etc.

The Sydney E. Junkins Co., Ltd., Montreal, has been incorporated with a capital stock of $400,000 by Sydney E. Junkins, Humphry R. Drummond-Hay, Alexander J. Milligan and others to carry on an engineering and general construction business, to build railways, drydocks, shipbuilding plants, etc.

The Mackinnon Steel Co., Ltd., Sherbrooke, Que., has been incorporated with a capital stock of $500,000 by Alexander Mackinnon, Jacob Nicol, Frederick C. Johnston and others to carry on the business of hydraulic, mechanical and electrical engineers, foundrymen, to manufacture electrical equipment, motors, steel, metals, etc.

The Fruit Machinery Co., Hamilton Street, Ingersoll, contemplate alterations and addition to building for foundry at Belleville, Ont. F. B. Foley is manager.

The Imperial Munitions Board have plans prepared for $5,000 factory addition at 56 Church Street, Toronto, Ont.

Roger Miller & Sons, Ltd., Lumsden Building, Toronto, Ont., have started work on a $70,000 reinforced concrete and steel forge and machine shop for the British Forgings, Ltd., Royal Bank Building, Toronto, Ont.

The Nicu Steel Corporation, Ltd., has been incorporated with a capital stock of $100,000 to engage in manufacture of steel and steel products.

Government Purchases

WASHINGTON, Aug. 13.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, opening date unassigned, schedule 1399, for four universal grinding machines for South Charleston, W. Va.; schedule 1404, opening date unassigned, for one back-geared engine lathe; one 66-in. horizontal drilling and boring machine; one 200-ton hydraulic forging press, all for Key West, Fla.

Bids were received at the Bureau of Supplies and Accounts, Navy Department, Washington, on August 7 for furnishing material and supplies for the naval service as follows:

Schedule 1341. Steam Engineering. Class 1, Mare Island—motor-driven lathes—Bid 147, $3,050. Alternate, f.o.b. works—Bid 147, $2,796. Class 2. Mare Island—motor-driven drills—Bid 112, $1,518; 147, $2,497. Alternate, f.o.b. works—Bid 27, $1,830; 112, $1,518; 123, $2,475; 147, $2,285. Class 3. Mare Island—milling machine—Bid 81, $4,320. Alternate, f.o.b. works—Bid 16, $3,430; 81, $4,190. Class 4. Mare Island—boring machine—Bid 129, $8,356. Alternate, f.o.b. works—Bid 129, $7,900. Class 5. Mare Island—boring and turning mill—Bid 75, $11,140; 81, $11,765; 129, $12,020. Alternate, f.o.b. works—Bid 75, $10,550; 81, $10,910; 129, $11,100. Class 6. Mare Island—1 toolroom lathe—Bid 81, $2,871; 112, $3,135; 125, $2,776; 143, $3,163. Alternate, f.o.b. works—Bid 81, $2,709; 92, $1,370; 112, $3,035; 143, $2,963.

The names of the bidders and the numbers under which they are designated in the above list are as follows: Bid 16, Brown & Sharpe Mfg. Co., Providence, R. I.; 17, Almond W. Barnes, Brooklyn; 18, M. S. Brooks & Sons, Chester, Conn.; 19, the Ball & Roller Bearing Co., Danbury, Conn.; 20, Berger Bros. Co., 231 Arch St., Philadelphia; 21, Otto Bernz, 17 Ashland Street, Newark, N. J.; 22, The Brecht Co., 1201 Cass Ave., St. Louis; 23, Bommer Bros., 270 Willoughby Ave., Brooklyn; 24, Barber & Ross, Washington; 25, F. S. Banks & Co., 149 Church St., New York; 26, Baldwin Tool Works (Ward & Co.), Parkersburg, W. Va.; 27, Baker Bros., Post and Westlake St., Toledo, Ohio.

Bids were received by the general purchasing officer of the Panama Canal, Washington, on August 8, for furnishing under circular 2142, material and supplies as follows: Class 16. Transformer—Bid 10, $1,200, 200 days; 20, $1,065, 140 days. Class 22. Centrifugal pumps—Bid 26, $1,784, New York delivery, 60 days; 31, $1,123.50, f.o.b. New York and freight, 30 days; 36, $2,380, 90 days.

The names of the bidders and the numbers under which they are designated in the above list are as follows: Bid 10, General Electric Co., Schenectady, N. Y.; 20, National Electrical Supply Co., Washington; 26, Southern Sales Co., Washington; 31, Ward & Co., Washington; 36, Edward J. Smith, 902 Widener Bldg., Philadelphia.

Edward T. Edwards, operating the East End rolling mill, Columbia, Pa., has inaugurated work at the Union Street iron mill, formerly operated by the Susquehanna Iron Co. The rolling mill has been remodeled and rebuilt and equipped with new machinery. Nine of the battery of furnaces have been started, giving employment to about 150 men.

NEW TRADE PUBLICATIONS

Chucks.—Cushman Chuck Co., Hartford, Conn. Catalog. Describes and illustrates a line of chucks and portable faceplate jaws for lathes and cutting-off machines and twist drills. Tables of the various sizes that can be supplied are presented and mention is made of a line of drill chuck arbors.

Screw Machine Parts.—Hartford Machine Screw Co., Hartford, Conn. Catalog. Illustrates a great variety of special turned and other parts that are produced by this company. These include pieces for electrical appliances, surgical and musical instruments, watches, clocks, optical work, bicycle and automobile parts, etc. A thumb index is provided to render the finding of any particular part a comparatively simple matter. Mention is made of the various kinds of screws and nuts that are regularly carried in stock and tables of useful information and a telegraph code are included.

Steel Wheels.—Geneva Metal Wheel Co., Geneva, Ohio. Catalog No. 15. Illustrates a line of steel wheels for barrows, carts, internal combustion engines, wagons, tractors, portable steam plants and derricks, agricultural implements and many other purposes. A story of the development of the wheel is given and this is followed by illustrations of the various styles of spoke heads used and a general description of the construction of the bearings and the wheels. Illustrations of the several types of wheels that are made are presented with brief descriptions of the work for which they are suitable and tables of the different sizes that can be supplied.

Twist Drills, Reamers, Wrenches and Drop Forgings.—Whitman & Barnes Mfg. Co., Akron, Ohio. Catalog No. 90. Size 4¾ x 7¼ in.; pages 158. Pertains to an extensive line of twist drills, reamers, wrenches and drop forgings. There is practically no text outside of a brief general introduction. In the arrangement of the catalog an illustration of the tool is given at the top of the page with a table of the various sizes that can be supplied underneath. Tables of the machines with which the twist drills can be used are given, and considerable useful information is included, together with instructions for grinding drills and ordering special tools. A number of illustrations of the drop forgings that can be made to order are presented and alphabetical and numerical indexes of the different tools are included.

Annealing Pans and Boxes and Hardening and Tempering Pots.—Garwood Bronze & Iron Works, Garwood, N. J. Forms PN, PO and R. Show various castings of special heat resisting metal. Brief statements of the advantages of using this metal for annealing pans and boxes and pots to contain hardening and tempering baths of lead, cyanide and oil are briefly touched upon, and mention is made of the facilities possessed for turning out special sizes and designs.

Automatic Steam and Water Service Valves.—Golden-Anderson Valve Specialty Co., Fulton Building, Pittsburgh. Catalog No. 19. Size, 6 x 9 in.; pages, 160. Lists an extensive line of non-return automatic steam and water service valves. These include automatic triple-acting valves, automatic non-return and automatic water service valves for high and low pressure and superheated steam service. Illustrations and brief descriptions of the various valves are given and in a number of cases tables of sizes and dimensions are included. A partial list of the users is given and mention is made of the facilities possessed for the design and construction of numerous special valves and other specialties for high and low pressure steam and water service.

Cranes.—Whiting Foundry Equipment Co., Harvey, Ill. Catalog No. 130. Refers to an extensive line of cranes which includes electric traveling, gantry, transfer, jib and pillar types. Illustrations and brief descriptions of the various kinds are presented and a number of views of the cranes in use at different plants are shown, particular attention being paid to their use in foundries. A partial list of users is included and mention is made of a line of railroad equipment.

Gaskets.—Fitzgerald Mfg. Co., Torrington, Conn. Catalog. Illustrates and describes a line of copper-asbestos, Mobilene and taper gaskets. Tables of the sizes regularly carried in stock are included.

Oil Burners and Oil Burning Systems.—Hammel Oil Burning Equipment Co., Inc., Providence, R. I. Catalog. Illustrates and describes a line of fuel oil burners under boilers as a substitute for coal. A number of plants in which these burners have been installed are shown and a partial list of users is included. Mention is made of a number of accessories which include oil firing valves, strainers, draft gage governors for the burner and supply pumps, etc.

THE IRON AGE

New York, August 23, 1917

ESTABLISHED 1855 VOL. 100 : No. 8

Expansion of the Gier Pressed Steel Co.

From Small Start Nine Years Ago to a Large Daylight Shop—Comfort and Convenience of Employees Considered

BY CHARLES LUNDBERG

THE new plant of the Gier Pressed Steel Co., Lansing, Mich., contains 108,000 sq. ft. When the company was founded in 1908 by Burton S. Gier it occupied 300 sq. ft. It was first engaged in the manufacture of postal-card racks. To-day it produces pressed steel work ranging from the smallest to the largest, and for various purposes and industries. Its capital has grown from $1,600 to $800,000, and the site upon which its plant stands comprises 8½ acres. Its equipment includes 69 power presses, including a 120-ton toggle press.

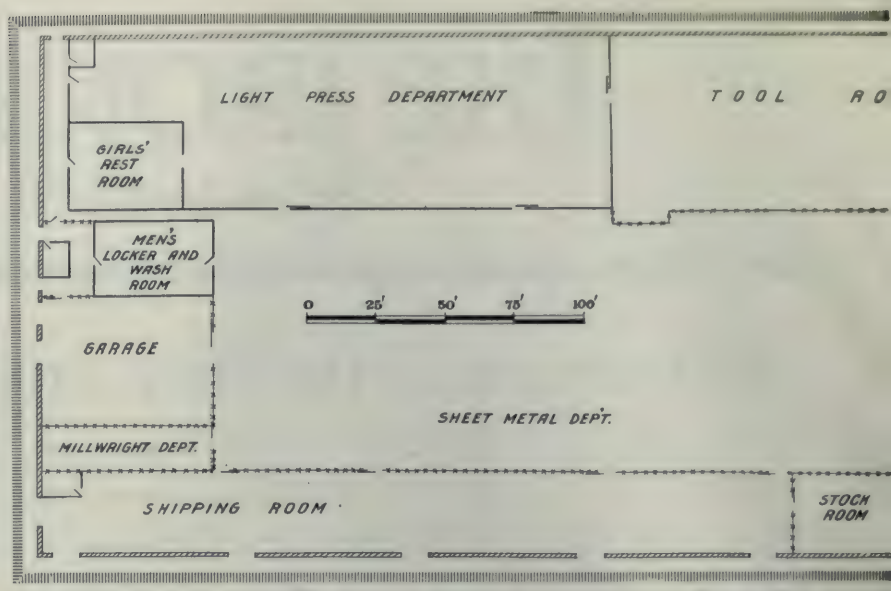
A thought inspired by the growth of the company is that while comment on the quick development and perfecting of automobile-building plants is frequent, with justifiable wonderment thereat, commensurate attention is not given to the industries which have grown with the automobile and without which the modern automobile would be impossible. The development of this company, and of the pressed-steel industry generally, has been a concomitant of progress in automobile manufacture because of quantity production, and the adaptability of pressed steel for automobile construction, a result being that a great assembly of equipment for pressing and stamping steel is available for service to other industries which of themselves would not have warranted such



The Men's Locker and Washroom Is Provided with Tables, Chairs and Benches to Enable the Employees to Eat Their Luncheon in Comfort and Afterward Read the Magazines Which Are Provided

a large investment of capital in a special line.

In attempting a general description of the new plant of the company one is puzzled to know just what, if anything, should be emphasized, for the reason that the plant in its entirety stands on such a high plane of excellence. One can easily expatiate on the design of the huge building itself, on the orderly arrangement within, on the consideration that has been shown for the workers, on the lighting, the ventilation, the broad aisles and even on the efficient method of cutting up and handling scrap material.



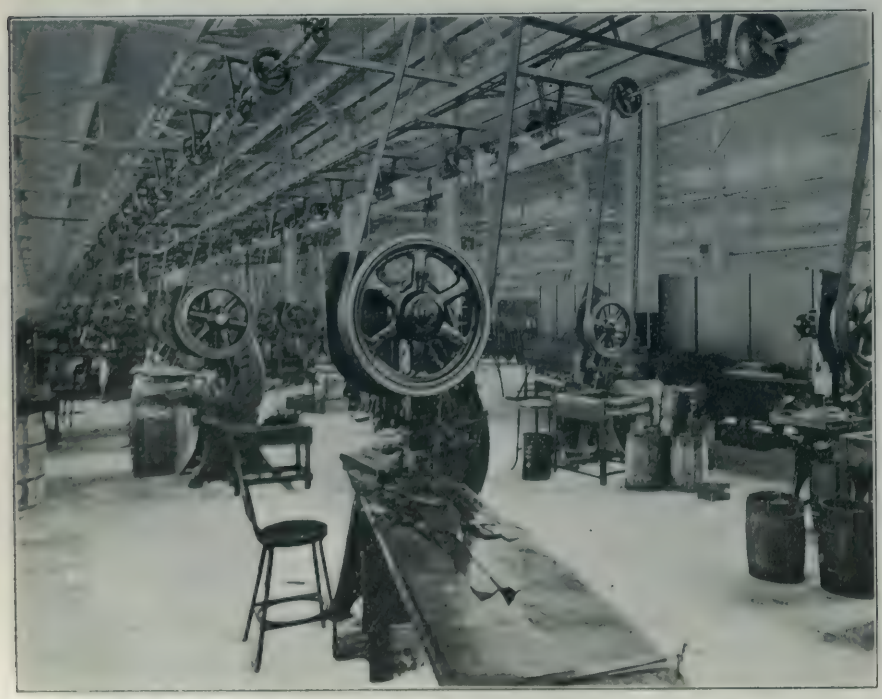
The Various Departments of the Shop Are Separated by Partitions of Heavy Wire Netting

The operating department of the company is contained in one steel and glass building of double monitor construction, 180 x 600 ft. It has dust-proof floors, and is essentially a daylight shop, the walls, except for about 4 ft. above the floor, being entirely of glass set in steel sash. There are no adjacent buildings to obstruct or lessen the admission of light. Along one side stretches a railroad dock, built of concrete, 10 x 600 ft. The building contains six long bays. Each monitor bay is served by a 20-ton crane running the length of the building, and each of the bays between by 5-ton cranes having similar travel. Running transversely across one end of the building is another 20-ton crane, the runway of which is extended a considerable distance outside of the building to carry material to and from cars, and later will serve a contemplated steel storage building as well as the shop. On the transverse runway also travels a 3-ton crane, which among other things is used for the handling of scrap material, more of which will be said later. A new office building and a power plant complete the number of structures now erected.

Made Shop Good Place to Work

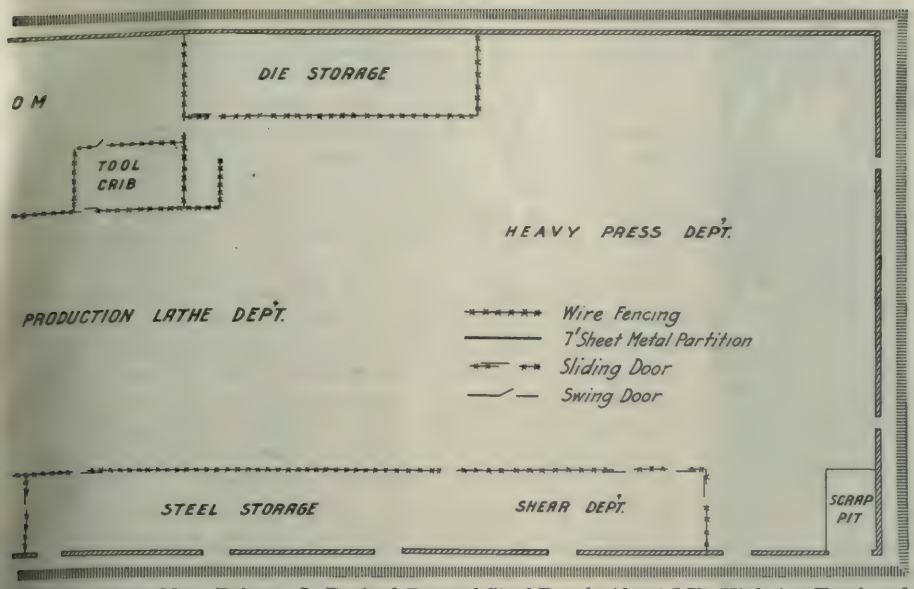
In its old quarters on North Grand Street, Lansing, the company was cramped for space to such a degree that B. S. Gier realized that conditions were unfavorable both to production and the welfare of the men, and he had both in mind when he went about planning a new plant. With regard to the welfare of the employees Mr. Gier was desirous of creating a shop in which men would like to work, in fact, this was one of his dominating ideas. An interesting point of consideration for the human element is exemplified by the placing of clear glass in the bottom row of panes in the steel sash. To some this may seem unimportant, others may not like the idea at all. Mr. Gier explains it as follows:

> We wanted to make the shop a good place to work in. Here we are with plenty of grass and trees around. Certainly the men like a glance at these surroundings once in a while, and they do not have a sense of being penned in. If a severe storm should come up suddenly they would become uneasy if they could not look out, and they would be itching to get to the doors, but if they can raise their heads and see through the windows that everything is all right, they are more disposed to go on with their work. Business men are pretty well agreed that the better surroundings men are given, the better men they are. Therefore you will see we have not provided what we have as an act of philanthropy. A thoroughly modern and well-equipped plant, with proper attention given to the comfort and convenience of the employees, in our estimation, is only good business.



Some Privacy Is Afforded the Women Employed in the Light Press Department by a Steel Paneled Partition

First observed, on entering the shop building through a passageway from the office building, is a first-aid room equipped with all of the essentials for treating accident cases. This room which, with its equipment, is entirely in white, is in charge of an experienced nurse who is on duty throughout working hours. She is competent to attend to minor injuries, also to dress those of a more serious character after they have first been treated by a physician. In addition to these duties, the nurse also serves as a matron for the women who are employed in the light press department, which adjoins the first-aid room. For men and women there are separate and



Although Where More Privacy Is Desired Pressed Steel Panels About 7 Ft. High Are Employed

commodious rooms equipped with steel lockers, white enamel washbowls, hot and cold water, and tables, chairs, and benches.

The light press department, wherein the women are employed, is about 60 x 160 ft. and is inclosed by a partition of pressed steel panels, about 8 ft. in height and painted olive green, this color being agreeable to the eye as well as durable. The small presses are equipped with safety devices of one kind or another, mostly of the type which prevent the tripping of the press until two levers are pressed down, this action engaging both arms and necessarily taking the hands away from the die. Stools with backs are provided for the women.

Heavy Stamping Department Equipment

A view of the heavy stamping department is reproduced herewith, and it sets forth more concisely than can be done by words the orderly arrangement of the big presses and the abundant aisle space which permits the free movement of shop trucks. Shown, also, back of the presses, are large hoods for collecting and carrying away heat, smoke and gases which may escape from a battery of oil-burning annealing ovens. The largest press, in point of size, is one of the toggle type, weighing 120 tons, used for the forming of automobile body shrouds and panels, fenders and similar sheet metal parts. Two slightly smaller toggle presses are used for the production of radiator pans, radiator casings, etc. Also conspicuous is a battery of large, heavy, straight-sided presses, one of which, with its 17-in. shaft, is capable of drawing cold a pan 21 in. in diameter by 6 in. deep out of ⅜-in. steel. This press is also capable of working cold steel up to ¾ in. in thickness. All the large presses have direct motor drive.

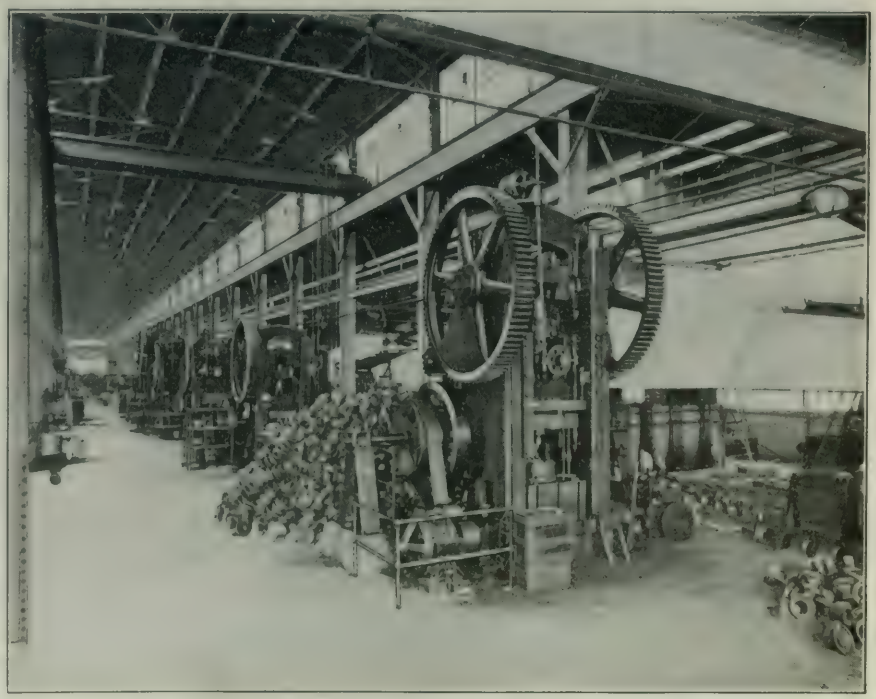
Among other departments may be enumerated one for working light sheet metal, such as door panels; one for automobile body work, a woodworking shop for crating and the making of patterns, a storage room for factory supplies, another for storing dies, a lathe department for rough finishing certain kinds of stampings, a shearing department equipped with three plate-shearing machines, shipping and receiving departments and what may be called a scrap department. The last named deserves some detailed mention.

How Scrap is Handled

At one end of the building is a concrete pit 19 x 28 ft. and 8 ft. deep, at the edge of which are placed two power shearing machines. To the latter are fed the steel strips from which blanks have been punched, and as they are sheared the pieces slide down a metal chute into the pit, the chutes permitting an even distribution of the pieces over the area of the pit. The 3-ton crane, previously referred to, is equipped with an electric magnet and with its aid 50 tons of cut material can be placed in a car in 3½ hours.

Of prime importance in the plant is the large toolroom or die-making department, a view of which accompanies this article. Like the small-press department, it is separated from the main part of the shop, but only in part, by the pressed-steel panels, the remainder of the partition being heavy wire netting. In this department the company takes special pride and asserts that every machine and device for expediting the manufacturing of dies has been provided.

In all production departments the company uses the Gisholt Machine Co.'s Periodigraph which enables it to effect proper control over time and its distribution against various operations and over the complete job. It is particularly important to know if an operation is requiring an excessive amount of time for its performance, as once this is ascertained steps may be taken to improve the time on that operation. A feature of all depart-



In the Heavy Press Department Abundant Aisle Space Is Provided for the Free Movement of Shop Trucks



The Steel Strips from Which Blanks Have Been Punched Are Brought to Two Power Shearing Machines Located at the Side of the Scrap Pit Into Which the Cuttings Drop Through Chutes. A Lifting Magnet Is Employed for Handling the Scrap and It Is Possible to Load a Freight Car with 50 Tons in 3½ Hr.

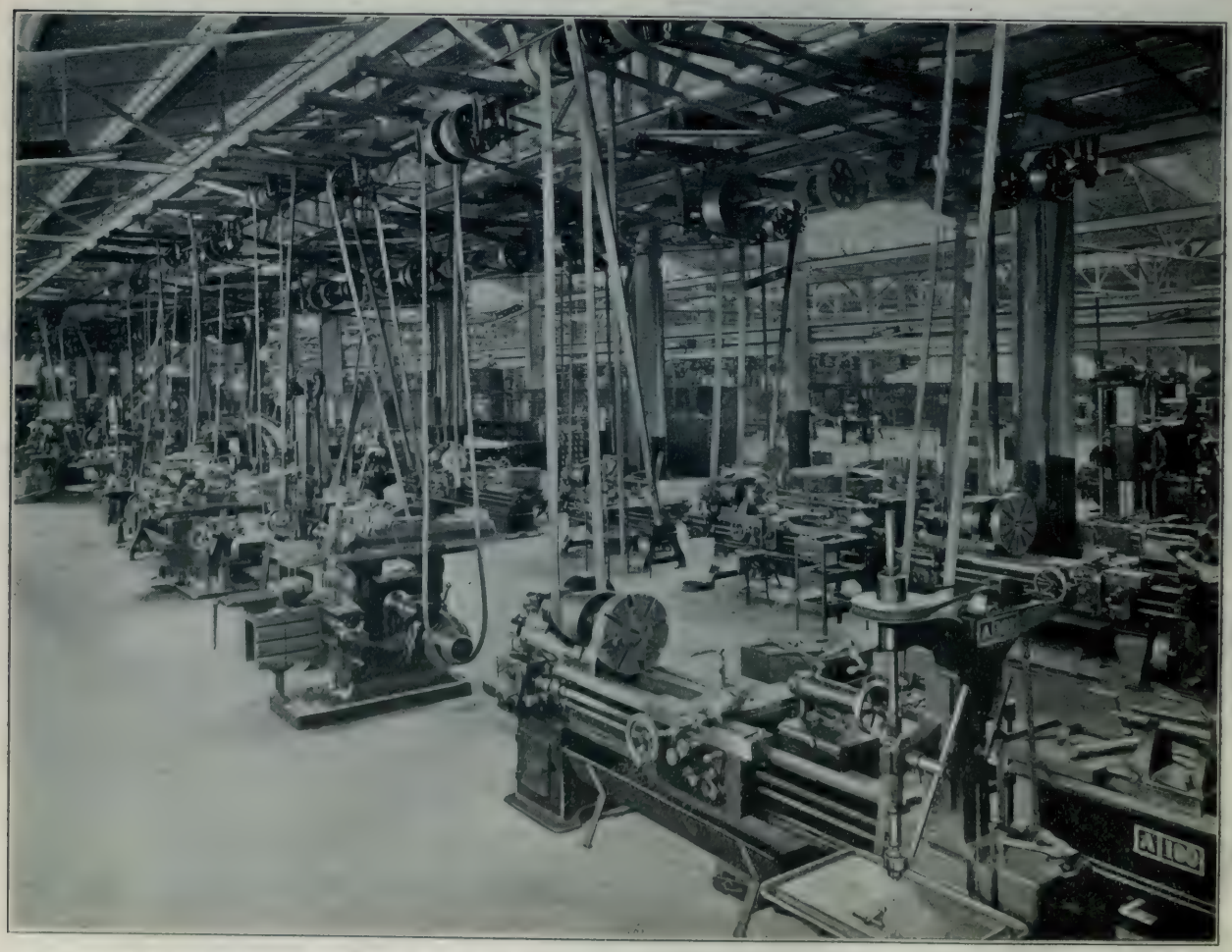
ments consists of raised platforms where the department foremen and clerks can sit and have a clear view of the floor.

Heating and ventilating are effected by an overhead system with American Blower Co. apparatus. Artificial light is furnished by the Cooper-Hewitt mercury vapor system, it being sought in this connection to obtain a maximum diffusion of light with a resultant elimination of shadows. Toilet rooms, constructed of pressed-steel panels, are centrally located at either end of the building, standing on the shop floor, and therefore readily accessible to the men. Sanitary drinking fountains are conveniently located in each department. The office building is a two-story and basement structure of light pressed brick.

The business of the Gier Pressed Steel Co. has been largely making such parts as automobile brake drums, hub flanges, radiator casings, body shrouds and panels, wire wheel hub shells, hub bodies, universal joint casings, wheel parts, etc., as well as general contract work. The general management of the company is in the hands of Burton S. Gier, its founder; David F. Edwards is treasurer; Leo O. Benner, manager of sales; James W. Gier, purchasing agent, and John R. Winter, factory manager.

British Cognizance of American Shipbuilding

A transfer of the supremacy in building ships from Great Britain to the United States is likely, according to *Engineering* of London, if organized labor of that nation is unreasonable after the war, if their engineers do not adopt standardization and other economical methods, and if British statesmen do not give industry the best possible consideration. The advantages now held by British shipbuilders in the proximity of coal and iron supplies, steel works and shipyards and shipping ports are, of course, emphasized. High cost of construction and of operation in the United States is also a British advantage. A tramp steamer costing $330,000 in England in 1913 would, it is said, have cost $690,000 in the United States, with an expense in sailing favor of the British ship of $400 per month in wages and $100 per month for supplies, food, etc.



The Toolroom or Die Making Department Is an Important Section of the Factory and Is Separated in Part by Wire Netting and in Part by Steel Paneled Partitions

Organizing Many Fighting Industries

With Voluntary Discipline, They Will Support Fighting Armies—Director Gifford Reviews Accomplishments of Council of National Defense

An inspiring résumé of the recent accomplishments of the Council of National Defense and its Advisory Commission in the work of industrial organization for the war has been prepared by W. S. Gifford, director of the council. The progress made embraces the active direction and adaptation of the nation's railroad facilities for war purposes; the further development of sources of supply for all kinds of war munitions and their component parts, from artillery and machine guns to various forms of motor transport; unusual progress on a comprehensive aviation program; very material assistance to the War Department in the construction of the new army cantonments; the adaptation and augmentation of electric communication lines, both telegraph and telephone; the procuring of leather and textile supplies of all kinds for the new armies; the cooperative development of lumber, copper, aluminum, steel and other raw material sources for the war needs of the Government; notable progress on many phases of the difficult labor problem; extensive assistance in the consummation of the medical preparations for the care of the military forces of the country; and definite accomplishments in the adjustment of commercial conditions and methods to war needs.

Marshaling of Munitions

"In the work of assisting the War and Navy Departments in securing munitions," says Mr. Gifford, "the General Munitions Board, whose functions the new War Industries Board has taken over, through its committees, composed in part of army and navy officers and in part of civilians, has performed yeoman service in developing new sources of supply for gun forgings and other essentials to the manufacture of artillery. It is not permissible for military reasons to make public details, but the board's work has greatly increased the possibilities for securing both field and machine guns in quantity at a much earlier date than was at first thought possible. Like other branches of the council, the board has done its work in large part through personal conference with manufacturers, securing their loyal cooperation in subordinating commercial demands to the needs of the Government and often in adapting large sections of plant, hitherto used for commercial purposes, to war operations.

"The efforts of the board have not been confined to guns and munitions, however. All kinds of allied supplies come under its jurisdiction, including carriages, limbers, caissons, forge wagons, military vehicles, steel helmets, surgical supplies, optical glass, gages, tools and dies of many kinds. Besides this, all kinds of questions as to price, priority of shipment and methods of expediting production have been referred to the board by the departments for advice. Extensive aid in accountancy problems has been furnished. The board has served as a general clearing-house for innumerable related problems coming both from the Government departments and from the committees on munitions, raw materials and supplies of the council.

Work of the Railroads

"The work of the railroads, combined under a voluntary centralized organization through the council, has been directed in wartime channels through Chairman Willard of the Advisory Commission and the war executive committee of railroad presidents, co-operating with the council. Under this scheme, according to Mr. Willard, the roads have made all transfers of troops on schedule without serious disruption of regular traffic. In spite of an admittedly serious shortage of freight cars and terminal facilities, moreover, through a general effort throughout the country to develop added efficiency in freight car use, the effective supply of coal cars has been greatly increased and general freight traffic has been effectively spurred up. Regular traffic has been the largest in the history of the country and has been constantly increasing, but in spite of that the shortage of freight cars was reduced from 148,627 on May 1 to 105,000 at the end of June."

The work of the Aircraft Production Board has developed rapidly. A bill providing for the increased service has been passed in record time by Congress and signed by the President, making provision for the manufacturer of thousands of military airplanes and training thousands of men for service at the front. Notable progress on the accomplishment of the plan has already been made. The program has been worked out in great detail, including personnel, the standardization of machines for quantity production, equipment of all kinds, including machine guns and scientific apparatus.

Three Fields Completed

Three of a system of 24 big training fields have already been completed in record time, training machines are now being shipped to them, and instruction in flying has already begun. Reciprocal arrangements have been made for training American cadets in Canada in return for the training of Canadians in the South in the winter. A mission of technical experts has been in Europe for several weeks gathering information for the use of the American Government and American manufacturers.

Through committees and subcommittees of men representative of the producers, the Committee on Raw Materials has been able to keep in touch with the whole range of raw products needed for war uses and has been able to ascertain the amounts of each available and to place at the disposal of the Government departments sources from which it could draw them. Through personal conferences it has been possible frequently to secure speed and convenience in delivery impossible under normal conditions as well as most reasonable prices. Included in the list covered fully by the organization have been steel, sheet steel, ferro alloys, pig tin, tin plate, scrap iron and steel, wire products, wire rope, tubular products, cold rolled and cold drawn steel, copper, aluminum, brass, rubber, cement, alcohol, asbestos, magnesia and roofing, coal tar by-products, lead, mica, nickel, oil, pig iron, iron ore and lake transportation, sulphur, wool and zinc.

Stimulating Coal Production

"The Committee on Coal Production," Mr. Gifford says, "has been constantly engaged in the work of stimulating production and in arranging for an adequate supply of coal to meet the combined needs of the navy and army, the American civil population, and to some extent the European allies. Through conference with railroad officials and shippers, it has brought about a pooling arrangement for the Atlantic tidewater region which already promises to do away with the waste in car and barge service under the old system of individual consignments and make possible a great increase in shipments to New England and the other northeastern states. A similar arrangement for the Great Lakes and the northwest has been in successful operation for many weeks. It has also been of material service in the readjustment of prices. Particular attention has been given to securing prompt shipment for all war purposes, both military and industrial.

"Dr. Godfrey's Committee on Engineering and Education has been giving thorough study to the relations of American educational institutions to the war and to the best methods to be used in adapting their courses to the national needs both for the conduct of the war and

to the reconstruction period to follow the war. Conferences have been held with leading educators on the problems and their co-operation secured in carrying out the recommendations of the committee. During the past month, a group of distinguished Canadian educators went to Washington for a two-day conference to give American institutions the benefit of their experience during the past two years of war. In addition, the production engineering section of the committee has been working with other divisions of the council in developing new sources of supply for various materials needed in munitions work."

In the Motor Truck Field

The Co-operative Committee on Automotive Transport has had most important work to perform in adjusting commercial and industrial conditions to the needs of the Government in its requirements for motor trucks, tractors, airplane engines, motor boats and other forms of machinery driven by internal combustion engines. Its services have been particularly valuable in bringing to the Government the fruit of the standardization work which has made the quantity production of American motor cars one of the marvels of modern industry. Other committees which have performed valuable service, which it is impossible here to set out in detail, have been those on Gas and Electric Service, Locomotives and Cars, Electric Railroad Transportation and Inland Waterways.

"Our nation possesses more producing resources than any other two nations in the world," says Mr. Gifford in conclusion. "Organized as a producing machine, we shall win the war. Individual initiative and self reliance are normally developed in a democracy to a higher degree than in any other form of government. Peoples and institutions have grown under the spur of competition and freedom of action, so that we are noted for our individual efficiency and enterprise. An army must obviously be highly organized and subject to discipline. Individual efforts, no matter how great, must be organized so as to work for a common purpose, if they are to be effective. Not alone team work, but a voluntary acceptance of discipline in the cause of national defense, is imperative. We do not wish to Prussianize America, but each of us must voluntarily submit to the rules and regulations of organization in order that we may build up fighting industries which with their voluntary discipline will stand side by side in efficiency with our fighting armies."

Abell-Howe Co. Organized

The Abell-Howe Co., Chicago, has been incorporated to provide for the expansion of the sales and engineering organization inaugurated some months ago by Oliver J. Abell, 565 Washington Boulevard, that city. The new company has acquired important interests in some of the manufacturing companies for whose products it will be the national distributor, and in addition it will continue to market other equipment as sales agent. Among the products to be sold exclusively through the Abell-Howe Co. are "American High-Speed" chain and Howe "One Man" detachable tongue trucks.

Oliver J. Abell is president and treasurer of the new company, Glenn G. Howe is vice-president and C. E. Kane, secretary. Arrangements for representation in the principal distributing centers of the country will be shortly completed.

The General Electric Co. will supply the entire electrical equipment for the Commonwealth Hotel, to be erected in the Times Square district, New York. The power equipment would suffice for a city of 20,000 people. The hotel will have 2500 rooms, and will cost $15,000,000. Electrical apparatus for lighting, ventilating, heating, pneumatic tube service, vacuum cleaner system, as well as the operating and controlling devices for the kitchen, laundry and refrigerating departments, together with the necessary conduits, cables, wires and lamps.

MINING EXPERIMENT STATION

Establishment Is Authorized by the Secretary of the Interior

WASHINGTON, Aug. 21.—The establishment of a mining experiment station at Minneapolis, Minn., under the jurisdiction of the Bureau of Mines, was authorized by an order issued by Secretary of the Interior Lane on Aug. 17. The station will represent the iron mining districts and will work in co-operation with the School of Mines of the University of Minnesota, which is located at Minneapolis. Director Van H. Manning of the Bureau of Mines in recommending the establishment of such a station in a formal letter to the Secretary said:

> The bureau should, as soon as possible, give attention to the treatment and concentration of low grade iron ores with the purpose of increasing the iron ore reserves of this country by making available those low grade ores which at present cannot be economically smelted.
>
> Vast as are the ore reserves of Minnesota, at the present rate of production the high grade ores now developed will be almost exhausted within 30 years. However, there are huge deposits of lower grade ores not now utilized, and these will become of great value, if their treatment can be made profitable. Some important problems that must be solved, if the high standards of the mining industry are to be maintained, are:
>
> The concentration of the hematite ores, carrying from 35 to 50 per cent iron, which are now practically worthless.
>
> The concentration of great quantities of magnetite ores, particularly those on the east end of the Mesaba range.
>
> The utilization of titaniferous ores that occur in considerable abundance in northeast Minnesota. Owing to metallurgical difficulties, these are not now utilized.
>
> The concentration of the low grade manganese ores of the Cuyuna range. If these ores could be concentrated and their phosphorus content decreased, they would be very valuable, whereas they are not now utilized to any great extent.

In the opinion of the experts of the Bureau of Mines, there is a large field for experimental and economic work in the iron mining industry. The iron ore mined in the Lake Superior region amounts to about 85 per cent of the total production of the United States. At present, there is a growing interest among operators of this district in regard to beneficiating the lower grades of ore material. This is also true of other districts of the United States which have not been so favorably endowed by nature with high grade ores. The entire question is therefore of national importance and the Bureau feels that it is the duty of the nation to utilize its reserves of iron ores most effectively and economically in view of the fact that high grade ores are rapidly being depleted by the enormous annual draft upon them, the grade of ore produced each year gradually decreasing. The possibilities of beneficiating the leaner material should be determined in order to safeguard the iron and steel industry of the future. Many individual operators are conducting more or less haphazard experiments in regard to the treatment of their particular material and in many instances they are doing the same work, repeating the same mistakes and arriving at the same final results obtained by operators in other districts.

To be most effective the bureau believes the data from all such work should be assembled and supplemented by special investigations which may seem of greatest importance and value to the State as well as the Nation and the results made public for the benefit of individuals taking up such matters in a commercial way. By combining the equipment and personnel of the Minneapolis School of Mines Experimental Station with the United States Bureau of Mines and establishing a main iron ore and central concentrating station, a very effective organization would be obtained and unusual facilities would be available for the coordination and dissemination of data relative to the conservation of the ore reserves of the country.

Record Production of Fluorspar in 1916

American mines broke another record last year in the production of fluorspar, as shown by statistics compiled under the direction of Ernest F. Burchard, of the United States Geological Survey, Department of the Interior. In 1916 the shipments were 155,735 short tons, valued at $922,654, an increase of 14 per cent in quantity and of 21 per cent in value over the shipments of 1915, which had been the record year.

The increased demand for fluorspar has come largely from the manufacturers of open-hearth steel, who use the mineral as a flux, but the demand for it in other metallurgic operations and for the manufacture of hydrofluoric acid has been very active.

The bulk of the fluorspar sold in 1916, as in former years, was gravel spar, the quantity in 1916 amounting to 133,651 short tons, or nearly 86 per cent of the total. The average prices per ton received at the mines in 1916 were, gravel $5.34, lump $7.94, and ground $12.38, and the general average price for all spar sold was $5.92. These prices compare with $4.89, $7.51, $10.80 and $5.58, respectively, in 1915. At the close of 1916, owing to a shortage in supplies, the price of gravel spar for prompt delivery, not covered by contracts, was about $21.50 per ton, although it is believed that not much was sold at this price.

Shipments (or sales) of fluorspar were reported from five states in 1916—Illinois, Kentucky, Colorado, New Hampshire and Arizona—in the order named. In 1915 the first four shipped spar and also New Mexico, which reported none in 1916. Probably the output would have been larger in 1916 had not the mines in southern Illinois been shut down for part of July on account of miners' strikes.

The imports of fluorspar in 1916 entered for consumption in the United States were 12,323 short tons, valued at $54,000, compared with 7167 short tons, valued at $22,878, in 1915, an increase of nearly 72 per cent in quantity and of about 136 per cent in value. From 1910 the imports of fluorspar steadily declined until 1915, but difficulties in getting supplies from American mines when needed, on account of freight embargoes, lack of cars, uncertainties of transportation on Ohio River, and labor troubles, coupled with higher prices, have led to an extra effort on the part of importers to bring in spar from Great Britain.

Agrees to Build Plant

Frank A. Cooper, New York City, representing the Superior Iron & Steel Co., has entered into a contract with the City Commission of Superior, Wis., to purchase a site now owned by the city for a proposed iron and steel plant which ultimately will cost $3,000,000. The contract provides that the company must construct a plant costing not less than $200,000, work to start by Jan. 1, 1918, and give employment to not less than 60 persons. If the company fulfills the terms of the contract, the lessee is given an option to purchase additional city lands within three years' time, at $500 an acre. The deed will provide that the company manufacture and sell iron or steel for a period of 10 years.

The Industrial Commission of Wisconsin has issued a special report on female labor in positions formerly occupied exclusively by men, in which it is indicated that the employment of women is increasing by leaps and bounds. Machine shops of Wisconsin, it is pointed out, are employing women on an especially large scale. Many large concerns in Milwaukee and elsewhere which have never before hired women, are placing females at light manufacturing operations, where they give splendid satisfaction and show a high degree of skill. One great difficulty in machine shops, the report says, is to procure competent forewomen. The commission is cooperating with employers, not only in obtaining female help, but to make suitable arrangements for their comfort and convenience.

Nine teams have been selected to represent the Lebanon, Reading and Steelton, Pa., plants of the Bethlehem Steel Co. at a first-aid meet to be held at Bethlehem, Pa.

A New Device for Marking Steel Tools

As a substitute for the older methods of marking steel tools by etching with acid or with a hammer and stamp, William Brewster & Co., 30 Church Street, New York, have brought out a device employing electric current. The Etchograph, as it is known, is intended for marking dies, cutters, etc., the piece to be marked resting on a metal plate which is connected to one side of the circuit, while the marking pencil is connected to the other side. Ease and speed of marking are the advantages claimed. Under the old method the piece to be marked was coated with an asphaltum paint and after this had dried a brush was employed to remove the paint and trace the design that was to be etched. The piece was then immersed in an acid bath, which marked the tool. When the etching process was completed the remaining paint had to be removed and the tool thoroughly cleaned from traces of the acid. All this took time and with the Etchograph all the time that is required, it is explained, is that needed for tracing the design with the marking pencil.

The device includes a transformer which takes current from the nearest lighting socket at 110 volts and steps it down to approximately 5.5 volts. A resistance



The Tool to Be Marked Rests on a Metal Plate Forming One Side of an Electric Circuit and the Design Is Traced by a Pencil Having a Copper Wire Point Which Is Connected to the Other Side

is connected across the terminals of the primary winding of the transformer to vary the amount of current according to the width of line desired. One of the terminals from the secondary winding of the transformer goes to the marking pencil, while the other is connected with the metal plate on which the piece to be marked rests. The pencil consists of a fiber holder with a copper wire point that can be touched up with a file when it becomes dulled and easily removed when it has become too short for use. After the tool to be marked has been placed on the metal plate and the resistance adjusted to give the desired width of line, the pencil is brought into contact with the piece and the marking proceeds as rapidly as it is possible for the operator to trace a design.

It is pointed out that no great amount of skill is required and the amount of current drawn from the line is between 1.5 and 2 amp. When the pencil is lifted at the end of a stroke there is practically no arc to cause a hole to be burned in the metal.

Among the applications of the device are the marking of tools in a shop to discourage unprincipled workmen from stealing and selling them to dealers. Another use to which it may be put is the marking of precision gages, either with the maker's trademark or to indicate their acceptance by Government or other inspectors where marking with a hammer and steel stamp might distort the gages and render them unfit for use.

GAS FIRED WELDING FURNACE

The Surface Combustion Principle Applied to the Utilization of Illuminating Gas

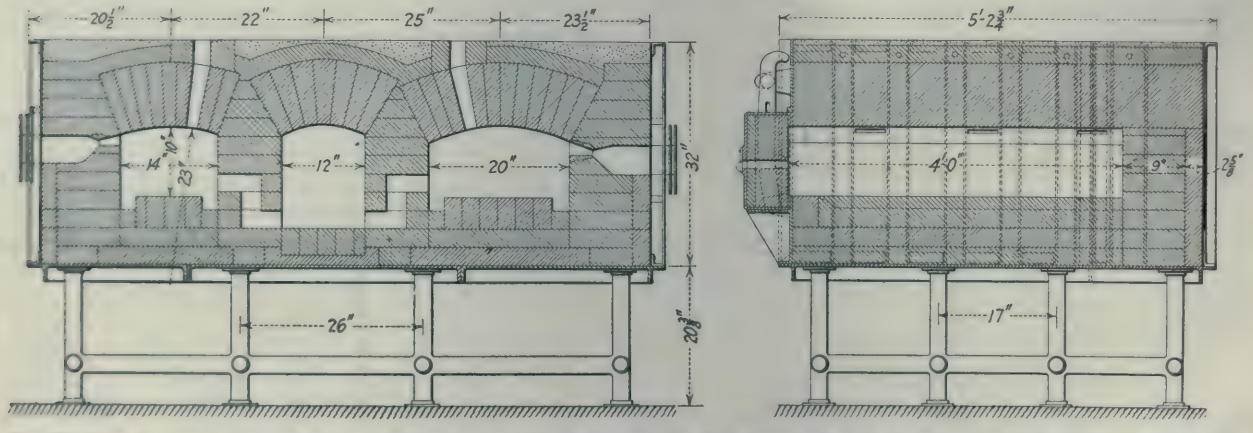
BY CHARLES E. RICHARDSON*

UNTIL recently welding has been considered impossible in furnaces with city gas, the chief deterrent to successful operation being a number of rather vague theories. Probably the most common of these was the belief that the chemical composition of the gas itself in some way rendered it unfit for use as a fuel for welding. It was believed, however, by those designing welding furnaces that welding was produced solely as a result of temperature plus a furnace atmosphere that was slightly reducing at all points. The only relation the chemical composition of the fuel bore to the result, it was considered, was that it must be of such a composition as to yield a gas strong enough to give a flame temperature sufficient to make it possible to secure the temperatures required for welding economically. Bearing in mind that it was readily possible to secure the necessary temperatures and that suitable proportioning and mixing devices could be obtained, the Surface Combustion Co., Long Island City, N. Y., recently installed a welding furnace at the plant of D. Lovejoy & Sons, Lowell, Mass. This furnace is used for the production of machine knives for rotary woodworking cutters and similar machines. The knives consist of a slab of soft steel with a thin layer of tool steel welded on one face.



From the Furnace the Work Passes under a Power Hammer Where It Is Welded Together

The furnace consists of two working chambers, one 32 in. deep and 14 in. wide, and the other 48 in. deep and 20 in. wide, the height of both being 10 in., with a preheating chamber measuring 48 in. in depth, 12 in. in width and 16 in. in height between them. The working chambers were intended to be used either separately or together, according to the size and amount of work to be handled, but thus far one chamber has been found sufficient to handle the tonnage required. The furnace is fired with the company's high pressure burners and the quantity and quality of the mixture are regulated by its high pressure control devices. The burners heat the working chambers and the flue gases from them pass into the preheating chamber and out at the rear. The temperature of the working chamber is between 2700 and 2800 deg. Fahr., which gives a temperature of approximately 1800 deg. Fahr. in the preheating chamber.



The Welding Furnace Consists of Two Working Chambers Heated by Gas Burners with a Preheating Chamber Located between That Is Heated by the Flue Gases from the Other Two

In operation a pile of eight or ten soft steel slabs, measuring 1½ x 8 x 34 in., is placed in the preheating chamber at the beginning of the day's run. When the slabs have been brought to the desired temperature, one of them is removed and the surface sprinkled with borax, after which it is placed in the working chamber. As soon as the temperature of the slab has been raised to between 1900 and 2000 deg. Fahr., it is removed and the scale scraped from the surface. The strips of tool steel are then placed in position so that they are flush with one edge of the soft steel slab and the whole is sprinkled with borax. The piece is then replaced and brought to a welding temperature, after which it is removed and welded under a power hammer. When the welding operation is completed the stock is put through a set of rolls to reduce it to the desired thickness. In a number of cases the piece has to be reheated several times before the welding and rolling operations are completed. After rolling the piece is allowed to

*Surface Combustion Co., Long Island City, N. Y.



After Being Warmed in the Preheating Chamber a Soft Steel Slab with a Tool Steel Strip on the Upper Face Is Placed in the Working Chamber and Brought to a Welding Heat

cool, cut to size, hardened, tempered and ground to the finished dimensions.

As the time required for preheating and a number of reheats necessary varies greatly, no definite figures can be given as to the efficiency of the furnace. It has, however, handled 1700 lb. of work in 9 hr. with a consumption of 12,700 cu. ft. of gas, having a heating value of 580 B.t.u. These figures do not, however, represent the capacity of the furnace, but serve to give an indication of the gas consumed per ton of welded stock. They were obtained in a test of the large working chamber and it is possible to at least treble the output.



The Final Stage in the Process Is Rolling the Stock to the Desired Thickness

The installation has been in operation for several months and among the advantages which have been found to result from it are quick heating of the furnace and the work, a cool and clean shop, close control of temperature and furnace atmosphere, continuity of operation and a minimum amount of scale.

Coal Gas as a Motor Fuel

A development in the use of coal gas for automobiles has passed the experimental stage, according to U. S. Vice Consul H. C. Claibourne of Bradford, England, a motor bus using coal gas having made the journey from London to Eastbourne and return, or 130 miles.

The Grimsby municipality, which operates a system of motor-driven omnibuses to outlying districts, is said, after a trial extending over four months, to have effected a reduction in fuel cost per mile from 4.30d to 1.66d., the price of gasoline being 61c. per gal., and gas 61c. per 1000 ft. The only change made in the motor is the fitting of a butterfly which allows the engine to draw the gas in the correct quantity according to load and speed. It is claimed that an advantage accruing from the use of gas is that the engine is cleaner and the valves do not require grinding so often. The apparatus is relatively cheap and easily adjusted, consisting of a canvas bag with an inner layer of rubber, shaped like a mattrass, which holds the gas drawn from the main, and is strapped to the top of the motor omnibus or to the rear of the automobile. The gas in the bag is connected with the induction pipe and the engine is worked by the suction process in the same manner as the ordinary gasoline vapor induction.

The principal disadvantage in the use of coal gas for automobiles is the bulky container necessary for the gas. The use of gas for small cars has proved unsatisfactory by reason of the problem of adequate space for storage. A suitable cylinder for containing compressed gas is said to be necessary for the general use of such fuel for motor cars.

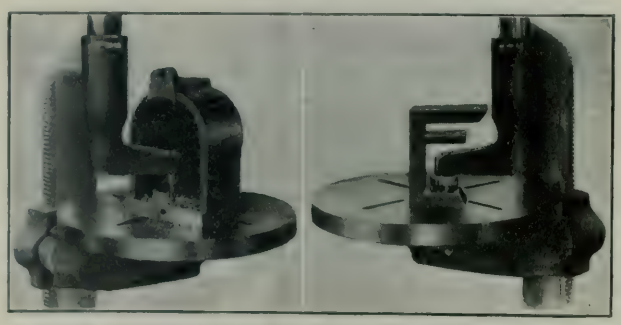
An Offset Drilling Attachment

To enable holes and bosses located in places which cannot be reached by the usual methods to be drilled, faced and counterbored, the H. E. Harris Engineering Co., Bridgeport, Conn., has developed an attachment for vertical drilling machines. Among the work that can be handled by the attachment are the drilling of screw and oil cup holes in pulley hubs, balancing or lubricating holes in engine crankshafts, the facing of bosses in frames, automobile parts, etc. The attachment is also designed for use in the production of standard munition and automobile parts and machine tools, in railroad and machine shops and also in establishments handling jobbing and contract work.

The attachment consists of a tool holder for the drill, counterbore or milling cutter, an auxiliary spindle into which the holder fits, a square shaft for receiving power from the spindle of the drilling machine and a set of heat treated vanadium steel gears for transmitting power from the drilling machine spindle to the tool holder. In this way the tool holder is driven positively and the tool is held centrally so that it will run true. The auxiliary spindle runs in a hardened and ground tool steel sleeve and the thrust is taken care of by a ball bearing. One holder is furnished with each attachment to which the tool is fitted. When it is necessary to grind or change tools, it is recommended that the holder and tool be removed from the attachment instead of removing the tool from the holder only. This, it is pointed out, can be done easily without disturbing the set-up of the attachment in the drilling machine and the replacing is an equally simple proposition. The attachment can be swiveled around the center of the drilling machine spindle to the most convenient position for performing the work.

For drilling holes in pulley hubs it is pointed out that the use of the attachment does away with weakening of the rim by drilling through it, and in the case of oil cup holes to supply lubrication to bearings, the use of a copper tube to carry the oil from a location where it would be more convenient to drill by ordinary means is done away with. One of the special uses of the attachment is to place an end mill in the attachment on a drilling machine with a compound slide mounted on the table for milling in an inaccessible place which could not be readily reached with an ordinary end or face milling cutter in the milling or profiling machine.

The attachment is made in eight sizes to fit all standard makes and sizes of drilling or similar machines. If, however, there is not room enough for the regular attachment to be used or a longer extension would prove more desirable, the standard form can be modified to suit the machine or the work in hand and a special attachment supplied.



Drilling, Facing and Counterboring Holes and Bosses in Out of the Way Places Is Possible with an Offset Attachment for Drilling Machines

The National Board of Fire Underwriters, 76 William Street, New York, is mailing to a list of 66,000 manufacturers of the country a booklet, prepared for the Council of National Defense, of directions for the prevention of fire, particularly in plants working under the abnormal conditions of wartime emergency. It has been given the title of "Safeguarding Industry."

Leaders of Congress Are Again Startled

Secretary of the Treasury Asks for Nine Billions More to Meet War Needs —Large Loans to the Allies Included

WASHINGTON, August 21.—The leaders of Congress have again been startled by a demand from the Secretary of the Treasury for $9,000,000,000 to meet the war needs of the current fiscal year ending June 30, next, in addition to the sums already provided. Of this huge amount $2,000,000,000 or $3,000,000,000 will be loaned to the Allies with the understanding that the money is to be spent in the United States for the purchase of war material. Mr. McAdoo is insistent that $4,000,000,000 or $5,000,000,000 shall be appropriated at the present session and that of this sum at least $500,000,000 shall be provided by increasing the producing capacity of the pending war revenue bill. The probability that this large amount will be added to the revenue measure by increasing the income and excess profits taxes foreshadows the laying of still heavier burdens on the corporations and developments will therefore be awaited with the liveliest interest by the entire business community.

It is altogether probable that Congress will very promptly comply with the request of the Secretary of the Treasury for the authorization of a big bond issue. That another "liberty loan" would be issued during the coming fall has been understood for some time and recently circumstantial reports have been current to the effect that the new loan would be floated in October and would amount to at least $3,000,000,000. Legislation for this purpose must originate in the House of Representatives, according to the constitution, and Chairman Kitchin has called a meeting of the Ways and Means Committee for August 25 for the consideration of a bond bill which has already been drafted by the Treasury Department. No amount has yet been written into this skeleton measure, but the rate of interest has been fixed at 4 per cent as against 3½ per cent for the recently floated "liberty loan" which now, however, will automatically be increased to 4 per cent to keep it on a parity with the new loan. As finally perfected, the bill will authorize the distribution of a specified portion of the proceeds of the loan among the Allies and may contain other provisions with respect to the participation of the allied nations in benefits obtained by the United States in the form of less than market prices on war material. This interesting phase of the matter is under serious consideration in connection with the effort now being made by the War Industries Board to find authority for requiring manufacturers to supply goods to the Allies at the same low prices that have already been conceded to the United States Government.

Part May Be Postponed

Any part of the $9,000,000,000 required by the Treasury Department, not provided at the present session, will be authorized in a special measure to be introduced immediately upon the convening of Congress in regular session next December. The purpose of the Congressional leaders in thus dividing the authorizations is two-fold: first, to avoid the depressing effect upon the financial community of an immediate demand for $9,000,000,000, and second, to make it certain that when Congress acts next December it may have before it, the final demand of the Treasury Department and not be placed in the embarrassing position of being obliged to bring forward later on a supplemental budget for the fiscal year 1918. No less than three times during the present session the Treasury Department has sent to the Capitol new estimates of liabilities for this fiscal year and on each occasion the assurance has been given that no more money would be needed before July 1, 1918. The supplemental estimates have proved decidedly embarrassing, especially in the drafting of the revenue bill, which, as the result of repeated changes, is far from being a symmetrical measure.

As to whether the war revenue bill shall be increased by the addition of another half billion dollars, the Conference Committee to which the measure is about to be sent will decide. Chairman Kitchin of the Ways and Means Committee, who will head the House conferees, is an advocate of heavy taxation to meet the war needs and would favor the raising of a much larger proportion of current revenues by imposts upon the corporations than would Chairman Simmons of the Senate Finance Committee. Mr. Kitchin is in thorough sympathy with the minority members of the Finance Committee led by Senator La Follette, of Wisconsin, who advocates a graduated scale of war profits that would produce not less than $2,000,000,000 per annum from this source alone. Like Senator La Follette, Mr. Kitchin declares that to advocate lower tax rates at present on war profits with a view to leaving a margin for a later day is to ignore the fact that this prolific source of revenue will automatically disappear with the end of the war and that the opportunity to tax each year's profits passes with the year. Failure to draw upon this source to the fullest extent while the war lasts will therefore result in throwing a much larger burden of taxation upon the people and the normal industries of the country at a time when the easily made war profits will be no longer available and when the business of the country will be staggering under the burden of readjustment.

Mr. Kitchin's Argument

Mr. Kitchin demands to know why, if it is fair and reasonable to impose a tax of 50 per cent on normal incomes of a certain size as is proposed in the Senate bill, should there be any hesitation in applying a flat 50 per cent tax or even a 70 per cent tax on excessive war profits. Mr. Kitchin and Senator La Follette also make the specious plea that neither the war profits tax nor the income tax affects the amount of existing capital and therefore neither is in any sense "a burden on industry." Both of these taxes are levied, it is claimed, upon extraordinary and unusual profits and, even if they absorbed the greater part of the profits of individuals or corporations, such taxes would not in any way affect the income of the next year. These taxes, it is asserted, do not impair the earning power of capital, which will continue without regard to taxes limited to profits and in the case of the war profits tax, even if it were fixed at a rate of 100 per cent, the normal profits would be left untouched.

This is the reason, Senator La Follette says, why the conservative British Finance Minister does not hesitate to impose a rate of 80 per cent on war profits without fear of any ill effect so far as further revenue from the same source is concerned. Both Mr. Kitchin and Senator La Follette also demand that both income and excess profits taxes for the war period shall be fixed in the pending bill "otherwise any attempt to revise the rates upward in the next few months, as will be necessary if this bill in its present form becomes a law, will be denounced as retroactive taxation, which has been so ably criticized and condemned in the report of the majority of the Senate Finance Committee." On the basis of the war profits obtained by American corporations in the calendar year 1916, it is estimated that a flat 80 per cent tax would produce $2,300,000,000 and a larger amount if based on the earnings of the calendar year 1917. A 70 per cent tax on the earnings of 1916 would net $2,021,000,000; a 60 per

cent rate would produce $1,732,500,000, and a 50 per cent rate $1,443,700,000.

An Interesting Table

In this connection, Treasury experts, at the instance of the Finance Committee, have compiled some interesting figures with regard to the earnings of the principal manufacturing corporations of the country and the taxes that would be paid thereon at the rates provided by the revenue bill as revised by the Finance Committee. These figures show net income for 1916, the average income for the pre-war period including the calendar years 1911, 1912 and 1913, the 6 per cent corporate income tax and the excess war profits tax as applied to the 1916 incomes. The accompanying table presents these figures for those corporations of special interest to the readers of THE IRON AGE.

Estimated Taxes of Leading Corporations

Name of Corporation	Net Income, 1916	6 Per Cent Corporate Income Tax	Average Income Pre-war Period	Tax on War Profits
Allis-Chalmers Mfg. Co.	$3,165,020	$189,901	$755,125	$881,377
American Can Co.	7,962,981	477,779	5,195,003	2,767,978
American Car & Foundry Co.	2,816,018	168,961	3,467,538	168,261
American Locomotive Co.	10,769,429	646,166	3,872,807	1,970,534
American Smelting & Refining Co.	22,152,250	1,329,135	9,060,396	3,117,867
American Steel Foundries	3,418,057	205,083	517,439	1,228,591
American Zinc, Lead & Smelting Co.	9,307,968	558,478	197,384	4,470,713
Anaconda Copper Mining Co.	58,892,980	3,533,579	11,741,185	18,544,799
Atlas Powder Co.	2,939,789	176,387	322,837	1,170,141
Baldwin Locomotive Works.	2,619,246	157,168	3,653,287	*
Bethlehem Steel Corporation	43,593,968	2,615,638	3,075,108	18,941,746
Butte & Superior Mining Co.	8,873,446	532,407	942,988	3,561,159
Calumet & Arizona Mining Co.	11,155,004	669,300	2,966,934	2,822,705
Colorado Fuel & Iron Co.	2,201,170	132,070	1,596,031	95,491
Continental Can Co. (Inc.)	2,143,554	128,613	788,016	381,854
Wm. Cramp & Sons Ship & Engine Building Co.	1,087,704	65,262	173,651	382,618
Crucible Steel Co. of America	13,223,656	979,419	3,629,467	3,241,869
E. I. Du Pont De Nemours & Co.	82,107,693	4,926,462	5,525,964	35,922,989
Federal Mining & Smelting Co.	868,198	52,092	942,186	*
General Motors Corporation	28,789,560	1,727,374	4,557,338	10,163,293
Great Northern Iron Ore Properties	2,088,884	125,333	2,060,322	3,427
Greene-Cananea Copper Co.	3,435,879	206,153	1,407,902	528,777
Hercules Powder Co.	16,658,873	999,532	1,017,212	7,384,956
International Harvester Co.	5,137,098	308,226	7,155,253	*
International Nickel Co.	13,557,970	813,478	4,125,955	2,992,179
International Mercantile Marine Co.	26,299,596	1,697,976	1,608,166	12,158,007
Lackawanna Steel Co.	12,218,234	733,094	1,282,500	4,918,317
Maxwell Motor Co.	5,426,636	325,598	†	†
Miami Copper Co.	7,759,784	465,587	1,296,602	2,675,997
National Enameling & Stamping Co.	1,917,803	115,068	728,952	327,196
Nevada Consolidated Copper Co.	15,002,051	900,123	3,419,266	4,326,237
New York Air Brake Co.	8,214,962	492,898	424,897	3,712,965
Nipissing Mines Co.	1,805,243	108,315	1,799,298	713
Phelps, Dodge & Co.	21,974,263	1,318,456	7,442,399	4,298,217
Pittsburgh Coal Co.	3,143,927	188,636	2,047,896	190,043
Pittsburgh Steel Co.	4,564,067	273,844	1,191,855	1,175,400
Pressed Steel Car Co.	2,751,152	165,069	1,412,665	290,653
Railway Steel Spring Co.	3,710,805	222,648	1,276,808	713,771
Ray Consolidated Copper Co.	11,716,428	702,986	1,634,365	4,340,711
Republic Iron & Steel Co.	14,789,162	887,350	2,265,694	5,290,887
Shattuck Arizona Copper Co.	3,039,077	182,345	1,923,573	542,426
Sloss-Sheffield Iron & Steel Co.	1,990,674	119,440	545,457	488,881
Studebaker Corporation	8,611,245	516,675	2,184,383	2,277,848
Tennessee Copper Co.	387,658	23,259	793,209	*
U. S. Cast Iron Pipe & Foundry Co.	1,308,641	78,518	525,591	206,564
U. S. Smelting, Refining & Mining Co.	8,898,464	533,908	3,552,988	1,413,157
U. S. Steel Corporation	271,531,730	16,291,904	63,585,777	76,726,472
Virginia Iron, Coal & Coke Co.	‡	‡	‡	‡
Utah Copper Co.	39,738,675	2,384,321	7,733,435	12,688,844
Westinghouse Air Brake Co.	9,585,928	575,156	3,934,661	1,472,339
Westinghouse Electric & Mfg. Co.	18,079,889	1,084,793	3,581,966	5,714,089
Willys-Overland Co.	10,884,383	653,063	5,653,899	1,125,313

*Net income 1916 less than during pre-war period.
†Not available.
‡Deficits in 1916 and during the pre-war period.

It is pointed out by members of the Senate Finance Committee that the actual taxes to be paid by the corporations in the list on incomes received during 1917 will be very much larger than the returns figured on the basis of 1916 incomes. This is due, first, to the fact that in nearly all cases the 1917 incomes will be greater than last year, and second, to the application of the higher brackets of the graduated excess profits tax authorized by the pending bill. In the case of the United States Steel Corporation, for example, the 6 per cent corporate income tax, if paid on earnings of approximately $400,000,000 in 1917, will amount to $24,000,000 instead of $16,291,904, while the war profits tax for the earnings of 1917 in excess of those of 1916, being levied under the terms of Section 200 of the pending bill on a 50 per cent basis, will increase this impost by approximately $64,000,000, making a total tax on war profits of $140,000,000. Adding the 6 per cent corporate income tax for 1917, the total levy under the pending bill upon the Steel Corporation would be not far from $165,000,000.

W. L. C.

Low Carbon Ferromanganese

Ferromanganese as low in carbon as 1 per cent is claimed to be commercially possible by Ernest Humbert, Niagara Falls, N. Y., in a patent (U. S. 1,228,925—June 5, 1917) he has taken out. The reduction of the carbon is effected by treating commercial ferromanganese containing up to 6 per cent of carbon with manganese oxide. An electric furnace of the Heroult type is used. An example of the process is given as follows:

Take 2000 lb. of ferromanganese containing 6 per cent carbon. This is 120 lb. of carbon and requires 160 lb. of oxygen. This amount of oxygen will be found in 710 lb. of manganese oxide (MnO.). If the reaction were perfect there would result 2000 — 120 + 550, a total of 2430 lb. of ferromanganese containing no carbon. These calculations are for pure oxide of manganese. As commercial manganese ore is never pure MnO, the calculations must be made on the MnO content. Also a certain excess of the oxide must be used, about 10 to 20 per cent over the theoretical amount, because a certain amount of the oxide remains in the slag. The ferromanganese is introduced into the furnace either cold or molten. If cold it is first melted in the electric furnace. The manganese oxide is then added. Probably the best voltage to use is 50 volts at each arc, but it may be varied according to the design of the furnace and other considerations. The quantity of current, amperes, should be sufficient to keep the mass at the temperatures stated. A test of the metal will show a reduction of carbon by the appearance of the fracture, being less crystalline and more like steel than in high-carbon ferromanganese. Also the specimen will be less brittle the lower the carbon.

The low-carbon ferromanganese produced by this method is stated to be of special use in the making of manganese steel containing a comparatively high percentage of manganese, ordinarily from 10 to 15 per cent.

FOUR PLANTS TO FORGE GUNS

Government Has Worked Out Plans for Adding to Ordnance Production of the Country

Plans of the Ordnance Department of the United States Army to increase the number of ordnance plants in the United States have finally been worked out in such a way as to insure the production of a sufficient number of guns, from 3 in. to 9.5 in., to supply our army in France.

In addition to the Tacony Ordnance Corporation, mentioned in THE IRON AGE last week, which was formed by the Tacony Steel Co., and will build a $1,500,000 plant at Tacony, Pa., it now develops that three other concerns, the Heppenstall Forge & Knife Co., Pittsburgh, the Buckeye Steel Castings Co., Columbus, Ohio, and the Standard Steel Castings Co., Cleveland, will forge guns, also. The Heppenstall company is building a new plant in Pittsburgh for the purpose, while the Buckeye and Standard companies are building additions to their plants, which will be completed soon. This work has been conducted so quietly that few outside of the War Department have known of these preparations.

The guns forged in these four plants will be shipped to other concerns, which have been recently formed, where the machining will be done, after which the guns will probably go back to the forge plants for heat treatment. Some of the concerns which are building plants for machining guns are as follows: The Symington-Anderson Co., Rochester, N. Y.; the American Brake Shoe & Foundry Co., Erie, Pa.; the Wisconsin Gun Co., Milwaukee, Wis.; the Northwestern Ordnance Co., Madison, Wis.; the Inland Ordnance Co., Bedford, Ohio; the Bullard Machine Tool Co., Bridgeport, Conn., and the American Radiator Co., Bayonne, N. J.

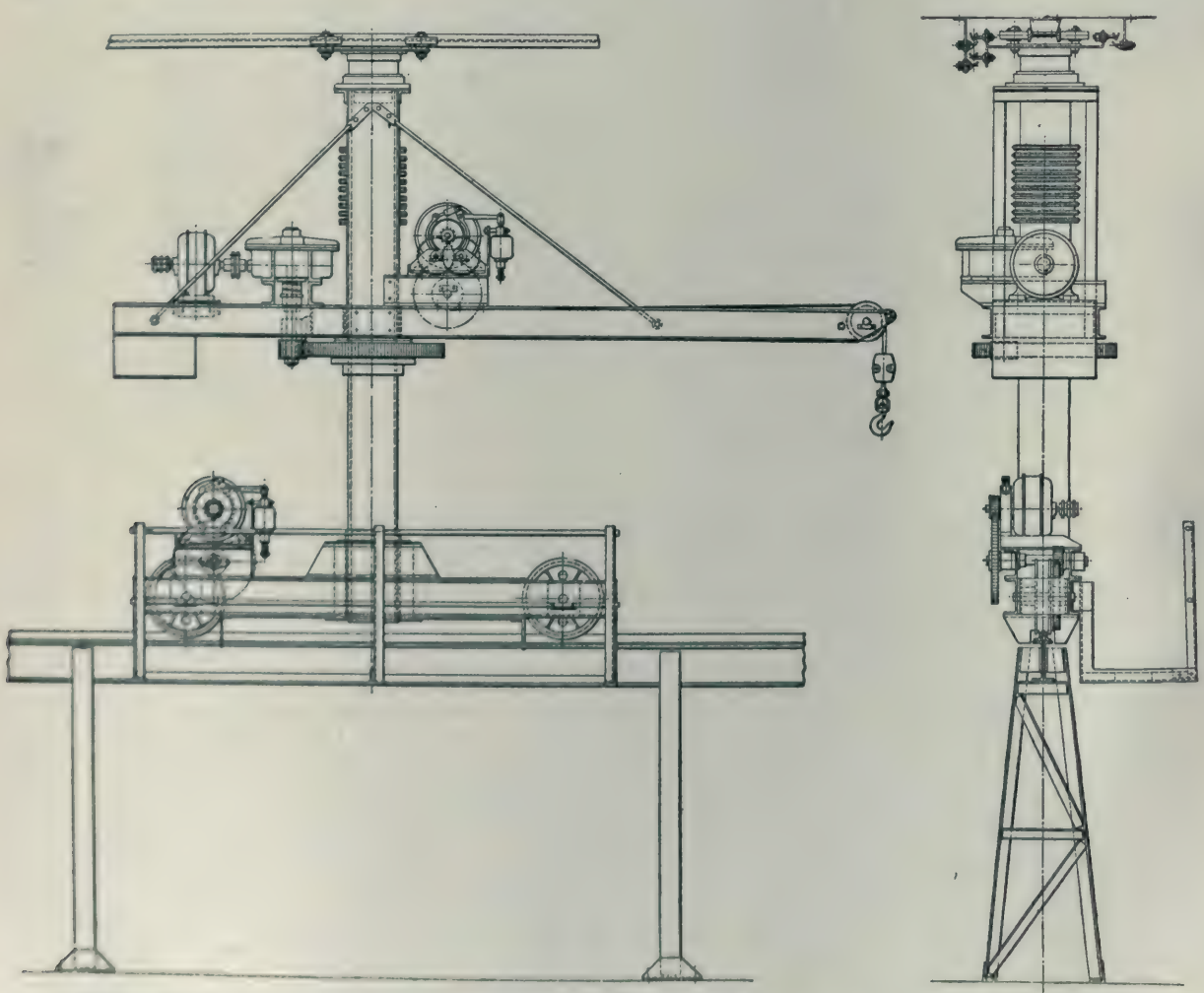
Before these arrangements were made it is understood that only two concerns in the United States were in a position to turn out heavy guns on a large scale, these being the Bethlehem Steel Co. and the Midvale Steel Co. The Government arsenals and navy yards also did such work, but their capacity, of course, was not sufficient to provide all of the guns that the United States Army will need.

SHELL HANDLING EQUIPMENT

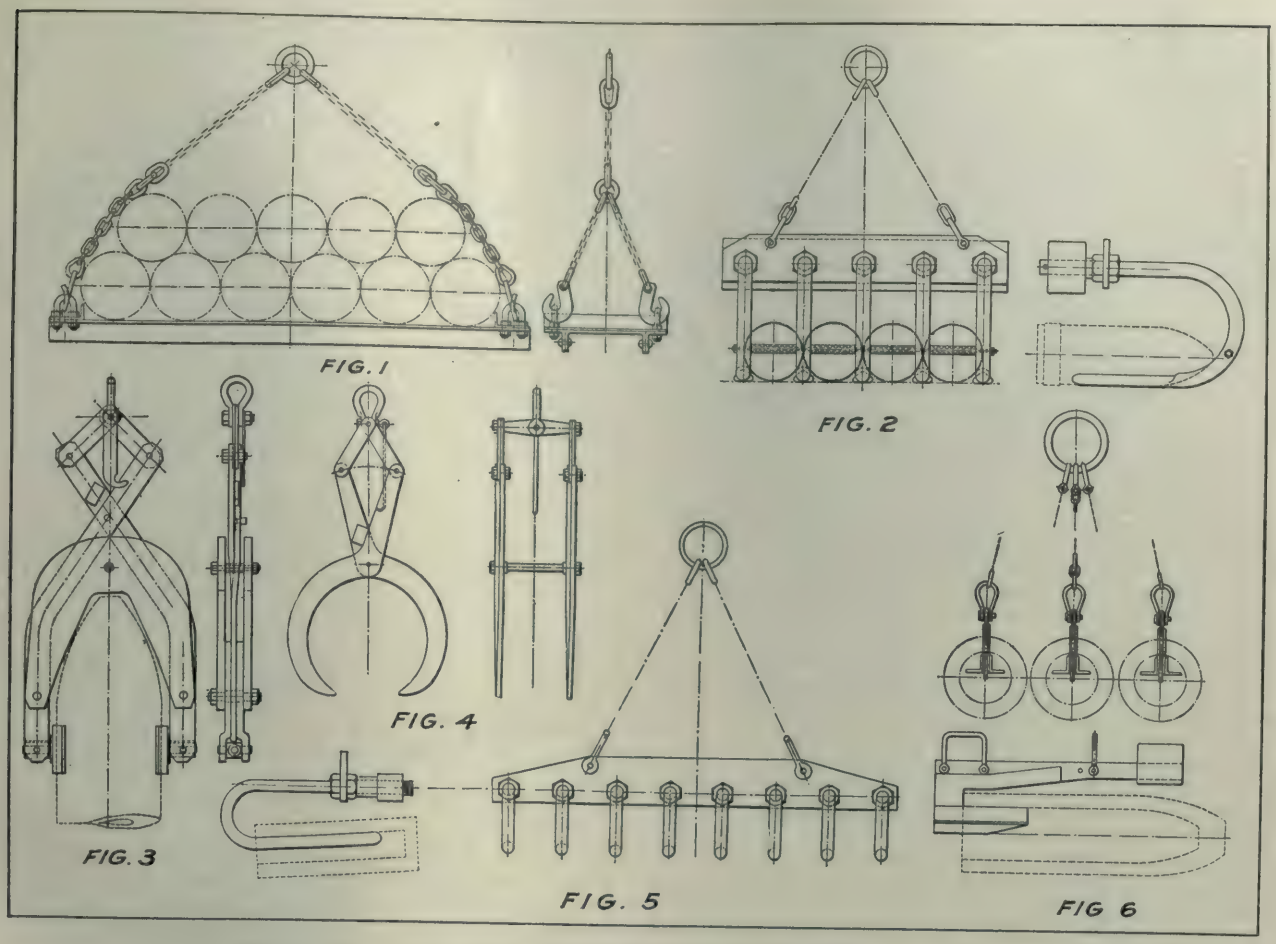
Interesting Traveling Cranes and Accessories Installed in a British Factory

A SOMEWHAT novel type of traveling crane and lifting fixtures have been supplied by Babcock & Wilcox, Ltd., London, to a large British munitions plant turning out heavy shells. The equipment is described at some length in a recent issue of *Engineering*, from which the accompanying illustrations were taken.

The machine shop in which the equipment was installed consists of two bays, each measuring approximately 50 ft. in width and 400 ft. in length. Two rows of machines are located in each bay, together with two traveling cranes. The latter, which are employed for lifting and transporting the forgings and the shells in various stages of their manufacture, are of the monorail type. They travel on a single rail riveted to an I-beam forming the top of the supporting A-frame, and are prevented from tipping over by two pairs of rollers at the top of the crane column which bear against a structural shape fastened to the roof of the shop. Each crane has a jib with a 10½-ft. radius, which is



The Traveling Crane for Lifting and Transporting the Forgings and the Shells Runs on a Single Track on Top of an A-Frame and Is Prevented from Tipping Over by Two Sets of Rollers at the Top of the Crane Column Which Bear Against a Structural Shape Fastened to the Roof



Some of the Various Lifting Fixtures Employed in Connection with the Cranes

long enough to extend to the center line of each row of machines served, the cranes passing between the driving shafts and the pulleys. The maximum load for which the cranes are designed is 1500 lb. The top of the A-frame is approximately 7 ft. above the floor and the space underneath is utilized for storing shells and blanks. The cranes have separate electric motors for lifting, slewing and traveling, and are controlled from the small attendant's platform. The motors are of the slip-ring type, designed for operation on a three-phase, 25-cycle, 440-volt circuit. The power for the hoisting and traveling motions is transmitted by ordinary spur gears and magnetic brakes of the customary type are provided. In connection with the slewing motors, worm reduction gearing is employed. The worm runs in an oil bath and a friction clutch is provided to take up any shock which may result from sudden starting or stopping.

A number of lifting fixtures have been designed and built to facilitate the handling of the shells and billets. The rough forgings are carried on a cradle made of inverted channel irons, as shown in Fig. 1. This cradle is fitted with chain slings and will carry 11 shells of the 12-in. size. For lifting heavy shells from the floor and turning them into a vertical position, a special type of gripping device has been designed. As will be noticed from Fig. 3, it consists of two heavy cross-heads fitted with levers, which are relied upon to give a powerful grip on the shell. The gripping parts, which are lined with friction material to reduce the likelihood of slip, are pivoted on the ends of the levers, an arrangement which permits the shell to swing into the vertical position.

For lifting four finished shells from the floor the fixture shown in Fig. 2 was supplied, the prongs passing between an adjacent pair of shells, each of which is supported by two of the prongs. After the billets have been forged they are lifted by the fixture illustrated in Fig. 5. For handling shells at other stages of manufacture the fixture illustrated in Fig. 6 has been devised, the way in which both are employed being obvious. For lifting large shells the double prongs illustrated in Fig. 4 are used.

A New Bearing Metal Alloy

What is claimed to be an improved metal alloy has been patented (U. S. 1,223,001—April 17, 1917) by Henry K. Sandell, of Chicago. The alloy consists of copper and antimony, in substantially the proportion of two parts by weight of the former to one of the latter, together with a small proportion of lead, and preferably in addition thereto a percentage of nickel. In general it appears that the antimony possesses the property of crystallizing the copper, thereby greatly increasing the hardness of the alloy and lowering the frictional resistance. The nickel toughens the alloy by binding together the highly crystalline mass, thus increasing the tensile strength and preventing disintegration under abrasive action. A typical alloy for supporting the steel shaft of a 10-kw. dynamo running 1800 r.p.m., would be, in parts of metal used, copper 4, antimony 2, lead 1 and nickel 1. It is claimed that alloys of this type will permit a bearing to run for an indefinite period without lubrication and without showing substantial wear. The alloy shows no overheating tendency, does not itself score or score the shaft and is in all respects satisfactory for use as a bearing-bushing operating under sliding friction, either without lubrication or with very little lubrication at moderate bearing pressure and high speeds.

The employees of the American Tool Works Company, Cincinnati, held their annual picnic at Highland Grove, Aug. 18. About 3500 employees and their friends attended the outing, which was arranged by President J. B. Doan and General Superintendent A. E. Robinson. A number of athletic contests between the different shop departments took place.

Work on the railroad yards for the Philadelphia & Reading Railway Co. near Bethlehem, Pa., has been started by C. P. Bower, contractor, Philadelphia. The estimated cost of the construction work is $900,000. Complete plans are being made for a large engine house to be built in connection with the yards, at a cost of $300,000.

A CASE OF MAN HANDLING

How Hostility to the Management Was Changed to an Attitude of Devotion

BY FREDERIC MERON*

A factory located "somewhere in Europe" and manufacturing an article of general use was able to make huge profits, having patent protection. Gradually the success of the company stimulated the inventive spirit of specialists in other countries. Modern factories well equipped were installed. The company first mentioned lost prestige and customers little by little. Then to retain them prices were reduced, but things continued to move adversely and the company lost every year more and more money. Instead of attempting then to modernize equipment and to introduce new working methods, it decided to reduce salaries and wages. The result was that the better employees left, and the old men, inexperienced boys and the "good-for-nothings" who remained did not lose sight of the company's policy. They showed their mood in a most expressive and expensive manner. Not only carelessness but sabotage occurred daily. Bribery in the purchasing department developed; stealing of materials from the storeroom occurred and imaginary names were entered on the payroll. When the company was near bankruptcy it was decided to engage a new manager.

The new man found that wastes of every kind were to be seen everywhere in the shops. These were due to incapacity of workmen, lack of practice in precision work and the lack of proper raw materials as well as to sabotage. After a while he succeeded in eliminating the drawbacks as far as the machines, purchasing department, etc., were concerned, but he had yet to contend with the resistance of the workmen.

He first decided to verify for himself at least once a day the output of each workman not as to quantity but simply as to quality. In making the rounds he was always accompanied by the foreman and the superintendents of the various shops. He took care on these occasions to resort to no punitive measures for blameworthy acts, for he would have made everybody his enemy, the management as well as the workmen, as the latter would have lost no opportunity to complain of him to the owners.

Awarding Bonus for Quality Work

After some reflection, he decided to give bonuses for good workmanship. As the manner of giving is more important than the thing given, he proceeded in the following manner: Every time in verifying work he found that it was well done he took pains to compliment the workman, and made out for him on the spot before all the others, a slip of paper or certificate on which he wrote the amount for which it was good, the date granted, the workman's number and the fact that the bonus was for superior workmanship. In giving this in a conspicuous way he was always careful to add, "You can cash this bonus from me in eight days."

By this means the workman was obliged to carry the certificate around with him for several days. Thus he would naturally show it to everybody, as a proof of his superiority justly recognized by his chief; and far from criticizing his new manager he advertised his good qualities. The interest of the workman counseled him to do this, for by praising the new manager he added also to his own reputation.

The method succeeded even better than was hoped. The men became interested in their work and tried to see who could excel. They would even stop the new manager as he went through the shops and ask him not to forget on his next rounds to inspect their jobs. Although there were about 500 workmen employed the total amount of these certificates did not exceed $50 per month, and once his daily rounds came not merely to be tolerated but to be looked forward to, he dared now and then to criticize both quality and quantity. The manner of going about a task is often of the greatest importance.

*Formerly Frederic Schreibman, consulting management engineer, name having been changed by court decree.

German War Profits

The Hahn Tube Works, at Berlin and Grossenbaum, last year earned net profits amounting to 2,754,435 marks, against 1,445,258 marks for the previous year; the shareholders obtain a dividend of 16 per cent and an additional bonus of 600,000 marks, or another 8 per cent. As the capital, however, is not fully paid-up, the dividend in reality amounts to 30 per cent.

The Rhenish Lignite & Briquette Co., Cologne, has a surplus for last year of 11,995,274 marks, against 7,605,567 marks for the previous year. Writings-off have risen from 2,532,717 marks in the previous year to 3,814,810 marks for last year, and the dividend has been fixed at 12 per cent, against 10 per cent for the previous year.

The United Cologne-Rottweiler Powder Companies had during last year a turnover which exceeded the highest peace figure 10 or 12 times. With the heavy writings-off and the cautious financial policy adopted by the concern, the dividend was restricted to 20 per cent.

The German Cast Steel & Machine Co. at Schweinfurt paid a dividend of 25 per cent for last year, and the Frankfort Machine Mfg. Co. 20 per cent, although a higher dividend was asked for. The company has so far reserved 3,200,000 marks for war profit taxation and 350,000 marks for alterations necessitated by the return of peace. The foregoing is taken from *Engineering*.

Shipbuilding in Canada

The following concerns in Canada are reported to be engaged in building steel ships: Canadian Vickers, Ltd., Montreal; Collingwood Shipbuilding Co., Collingwood, Ont.; J. Coughlan & Sons, Vancouver, B. C.; Midland Drydock Co., Midland, Ont.; Nova Scotia Steel & Coal Co., New Glasgow, N. S.; Polson Iron Works, Toronto, Ont.; Port Arthur Shipbuilding Co., Port Arthur, Ont.; Wallace Shipyards, Ltd., North Vancouver, B. C. These concerns are reported to have contracts for wooden ships: Cameron-Genoa Shipbuilders, Ltd., Victoria, B. C.; the Foundation Co., Victoria, B. C.; Grant & Horne, St. John, N. B.; Lyall Shipbuilding Co., North Vancouver, B. C.; Pacific Construction Co., Coquitlam, B. C.; Quinlan & Robertson, Ltd., Montreal, Que.; St. John Shipbuilding Co., St. John, N. B.; D. A. Saker, St. John, N. B.; Thunder Bay Contracting Co., Fort William, Ont.; Toronto Shipbuilding Co., Ltd., Toronto, Ont.; New Westminster Construction & Engineering Co., Ltd., New Westminster, B. C.; Western Canada Shipyards, Ltd., Vancouver, B. C.

Gisholt Machine Co. Will Do Full Share

It is authoritatively stated that while the principals of the Gisholt Machine Co., Madison, Wis., hold the control of the Northwestern Ordnance Co., also of Madison, their interest in this company will in no way interfere with the usual, and even enlarged, output of the regular products of the Gisholt company—turret lathes, boring mills, grinding machines, small tools, periodigraphs, etc. The Northwestern Ordnance Co. has in course of construction an entirely independent plant and will operate with an entirely separate organization. The Gisholt Machine Co. will continue free and unhampered to do its full share in supplying machine tools which will be needed, like the products of other machine-tool builders, in the manufacture of war materials and for industrial use. Although, as stated, the ordnance company is a separate enterprise, there has been some misapprehension on the subject.

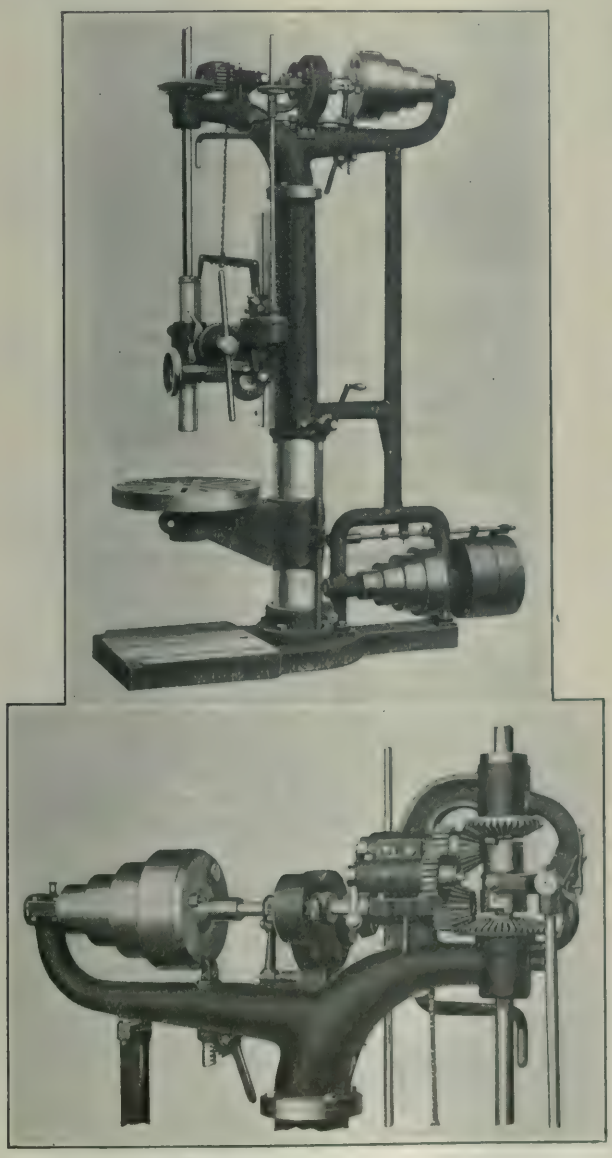
The sale, purchase, hiring or loan or even sending on approval of a new or second-hand machine tool is not allowed under the defense of the realm acts and regulations of Great Britain without the permission in writing of the ministry of munitions.

A 25-In. Vertical Drilling Machine

The Silver Mfg. Co., Salem, Ohio, has recently added a 25-in. size to its line of vertical drilling machines. The construction follows in general the conventional design for machine tools of this class. The back gears are fully inclosed in the upper cone pulley and are engaged by a conveniently located lever and the sensitiveness of the spindle counterbalance is controlled by a notched lever and chain.

The spindle is of crucible steel with a ball thrust bearing and, together with the sleeve in which it runs, is finished by grinding. The counterbalance weight for the spindle and the sliding head is located inside the column, and a chain connects it with a notched lever, the function of which is to vary the sensitiveness of the counterbalance as conditions may require by changing the position of the chain on the lever. The bearing of the sliding head on the column is large. The head is rigidly secured to the column and it is pointed out can be readily adjusted on account of its balance. Two quick-return levers are provided, the one at the right sliding back and forth in its bearing. When this lever is withdrawn to its full length it can be employed for hand drilling in light work.

Eight spindle speeds, ranging from 14 to 315 r.p.m., are available. Four of these are secured with the ordinary open belt drive and the remainder by the back gears, which are fully inclosed in the upper cone pulley. The feed, which is of the positive geared type, has six changes ranging from 0.0056 to 0.0310 in. per revolution of the spindle. Any of these rates can be obtained while the machine is running, and to enable holes to be drilled to any desired depth an automatic stop is provided. This is set by graduations on the spindle and can be thrown out by hand if necessary before the depth for which it is set has been reached.



The Use of a Notched Lever Enables the Sensitiveness of the Spindle Counterbalance to Be Adjusted to Suit Operating Conditions and the Intermediate Pinion of the Tapping Attachment Is Mounted on an Eccentric to Facilitate Disengagement When the Attachment Is Not in Use

The frame is of rigid construction and is bolted to the base. The swinging table is of rigid construction and the supporting arm has a wide bearing on the column. The table, which is 21¼ in. in diameter, has a vertical adjustment of 16 in. through a screw and bevel gear arrangement.

The tapping attachment consists of four bevel gears, an intermediate pinion and two positive clutches. When the attachment is not in use the intermediate pinion, which is mounted on the eccentric, is thrown out of engagement.

Alterations in British Steel Sections

The question of alterations or additions to the existing list of British standard steel sections received further attention from steel makers at a meeting in London recently. Some time ago, Sir John Cowan of Redpath, Brown & Co., Ltd., addressing the Engineering Standards Committee, recommended that various sections should be made to metric dimensions. The result of recent conferences is that steel makers see no present need to prepare rolls for sections designed in metric dimensions. They state, however, that if engineers will design a series of scientific sections, they will study the test and if there are no practical difficulties in rolling, they will prepare rolls to produce the sections desired.

John H. Skelton of H. J. Skelton & Co. urged that the steel makers' point of view should be considered and adopted by engineers, adding that there were already too many British standard sections. He stated that the unit capacity of steel production in Great Britain is too low to permit the maximum efficiency in cost. There are many steel works which have only two rolling mills and which ought not to be expected to produce the whole list of British standard sections. The steel makers would be driven to arrange among themselves an allocation of orders for different sections if they were to produce steel shapes at minimum cost and without incessant change of rolls. He considered that great advances in knowledge and practice of steel making had been made in Great Britain during the past three years.

Mr. Ennis of Dorman, Long & Co., Ltd., explained the difficulties of producing some of the shapes by reason of higher speed of rolling mills in some competing countries. Sir Archibald Denny is to bring the whole matter before the Shipbuilding Steel Committee.

High Speed Steel Without Tungsten

A tool steel stated to be equal in durability and hardness to high-speed steel, yet of which tungsten is not a component, is announced in *Engineering*, of London. It has been brought out by Darwin & Milner, Sheffield, under the trade name, "Cobaltcrom." About twelve months ago the head of the firm, by adding cobalt to chromium-carbon steel, converted a product which had no appreciable red-cutting hardness into one which had this qualification.

It is stated that the maximum temperature for hardening the new steel is 1000 deg. C.; also, that hardening in practically all applications is satisfactory when the tool is allowed to cool naturally in still air free from drafts.

There is a scarcity of toluol for making high explosives, and the chemical committee of the Council of National Defense is taking steps to have the gas supply of large cities stripped of this by-product. This will change the nature of gas to some extent, but it will be treated in other ways to maintain a satisfactory illuminating standard. Gas consumers in cities will have to become accustomed to a different kind of gas. Toluol is used in making trinitrotoluol, one of the most valuable high explosives.

The Alien and the Industrial Worker

Some of the Effects of War—Strife Creates a Kindlier Feeling for Men of Other Lands—Summary of Requirements for Americanization

BY WINTHROP TALBOT, M.D.*

THE war affects the employment of aliens in America in a somewhat peculiar way, and it is important to any thoughtful manager to realize that every alien's ability to work is affected materially by the war. What these ways may be it is our present duty to inquire and we show the deepest human sympathy and evince the greatest kindliness if we make our analysis so far as possible free from sentimental sympathies. We can do our best to be of service to our foreign brethren if we handle the problem of management not in the spirit of mere welfare, but of sound business reasoning.

One of the most evident lessons of the war is that strife cements friendship and creates fraternal feeling. It is probably true that neyer has there been a kindlier feeling among employers for aliens in our country than now, for on the one hand we are really trying to understand more about the peoples with whom we are allied, such as the Russians, the Roumanians, the Serbians, the Italians, the Portuguese, the Japanese, the French, the Belgians and the English, for we are working for and with them, while as for neutral countries, Norway, Sweden, Spain and Greece, it is so short a time since we ourselves were vainly attempting neutrality and were suffering the sorry consequences that we can sympathize and do sympathize intelligently with them. As for Austrians, Bulgarians, Turks and Greeks with whom we are technically not at war and with the Germans against whose government all our forces are now being focused, we can have only a feeling of compassion, realizing that they represent the passing of autocratic government. So for the workers in our industrial plants coming from these countries our feelings are similar, and in the endeavor to understand we are drawn into a closer brotherhood of feeling. If in the past, wrapped up in the selfishness engendered by the arts of peace, we have been indifferent and neglectful of the human rights of aliens, we must make it our business now in the pursuit of the science of war to adopt a kindlier and more intelligent study of our alien brothers in a more helpful spirit, if we wish to strengthen them—and by strengthening them insure ourselves. War has ever been the demolisher of selfishness. In war it can never be "Every man for himself and the devil take the hindmost," rather must it be "Each for all and all for each."

Results of Mismanagement

Short-sighted management in Hopewell, Va., built a huge powder works and utterly neglected the human side. It created social conditions worse than ever existed in Goldfield or earlier in Leadville, or any of the wild mining centers of the West, with the result that Hopewell is wiped out of existence by fire. Colorado became a byword and a reproach so long as the alien human element was neglected. Its wasteful management has had to be revolutionized. We could say the same of Lawrence, the West Virginia coal fields, Roosevelt, Bayonne, and dozens of other alien centers where management has never sensed the fact that industry may never be divorced from home, that industrial concerns are responsible and by the public will be held responsible more and more, where they fail to take their share in establishing right standards in the civic communities which cluster around them. Bayonne, N. J., has one saloon for every eight adult male workers. In the neighborhood of a great plant in Stamford, Conn., cluster scores of rum shops. Bridgeport, Conn., is infested with these places. The same may be said of the majority of industrial centers in the North, and yet I venture to believe that the saloonkeeper has been a better friend to the alien than his employer. For employing concerns have had the power to make civic conditions right and have failed to make the effort, while the saloonkeeper has done much to ameliorate and palliate the alien's social isolation and economic hardships. The saloonkeeper has been the alien's banker, adviser and friend. He has obtained employment for him when out of work. He has given him help in sickness, he has buried the alien's dead babies. The saloon has been the alien's social center, a place of warmth and light and human companionship —his club. Why? Because the industrial manager, the natural leader of labor, has been blind to his opportunity, his privilege and his duty. His duty, and, may we say it, his largest material gain.

Alien Working Power

Now what is the actual status with regard to alien working power as affected by this indifference of industrial managers to civic conditions? First, with regard to health. If a workman is ill or not in good health industry suffers. Examination of alien employees in large numbers has demonstrated absolutely that a large percentage of aliens are far below normal in working power because of avoidable disorders. We must realize that most illness among workers is avoidable and can be prevented through proper industrial civic administration. It is the industries which pay the taxes, it is the industrial taxes which mainly support municipal administration; municipal administration is responsible for clean streets, proper sewage, pure water supply, smoke prevention, removal of garbage, isolation of contagious disease, inspection of slaughter houses, restaurants, and the whole matter of clean food and food adulteration. On all these things the health of the individual largely depends. If the civic administration fails where industrial corporations are large taxpayers, does not the responsibility for failure rest on the shoulders of the industrial manager?

What has been said with regard to health applies with equal force to cost of living. The industrial manager being of necessity the natural industrial leader, however he has played his part in the past, is again responsible if American industrial communities have been lacking in living conveniences for the benefit of all such as municipal bakeries, laundries, markets, cold storage facilities, such as are widely provided and fostered in industrial communities abroad by industrial concerns.

Recreation, too, is another matter of vital moment to every community and to alien people used to singing, dancing and joyous doings in their own countries, the lack of harmless pleasures is perhaps the keenest deprivation they could suffer. Fortunately now the playground and community center movements are well under headway, but to every industrial concern it should be merely a matter of business thrift to contribute effectively to the establishment and maintenance of such wholesome community activities—activities without which an actual premium is placed upon immorality, vice and crime. Public baths and swimming pools, athletic grounds, gymnasium are all civic essentials in which industrial management should take active interest.

The public schools and library have been kept at arm's length by industrial managers. The school authorities and the library authorities have long stood ready to co-operate, but industry has held aloof.

We must take off our hats to German industrial insight as we realize the intimate relations existing between industry in Germany and the schools. We have good reason, and England, France, Belgium, Serbia

*Adviser in alien industrial education, Bureau of Industries and Immigration, New York State Industrial Commission.

and Roumania all have good reason to realize the forceful might which industrial management gains when it calls into its councils the schoolmaster and technical expert, for we are fighting the wonderful results of German industrial system in this regard. With the passage of the national laws this year the industrial manager is enabled effectively to co-operate with the schools in the vocational training of workers.

Finally we come to the most important aspect of the alien in his home life—namely, that of housing, for this most intimately affects the alien woman, and a man's working power depends, more than on anything else, upon whether his wife is content in her home. But no alien woman either could or would be contented or happy in the crowded tenement quarters, the squalid and vile neighborhoods, the stupid household arrangements with which she is forced to battle from morning till night, due to unintelligent planning of houses.

Conclusion.

In this brief series of articles concerning the alien worker we have considered of first importance for Americanization and through Americanization for efficient production the fact that in these days when information is made common property through the printed page, literacy should be made universal.

That the use of the English language should be required.

That works conditions and methods should be modernized and efficient and

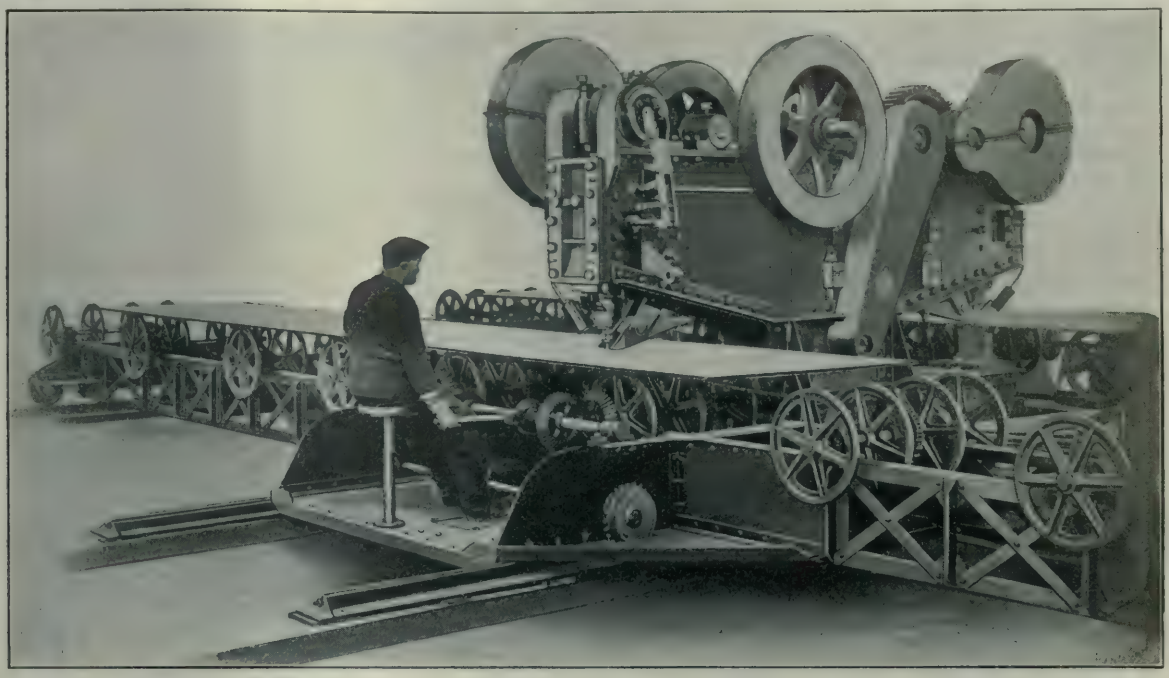
That community living should be rendered safe, wholesome and happy.

In these four essentials it is difficult to see how the industrial manager can disclaim responsibility. It is clear that no single employer can battle successfully with these industrial community problems, nor can the community apart from the employing concerns hope for much relief until industrial managers agree to cooperate on constructive civic programs. When we realize that the alien in general is without a vote, or even when registered as a citizen is exploited politically for private profit, it becomes our unavoidable conclusion that industrial management can no longer keep aloof, but must perform its share in removing civic management from party politics.

America at war means not merely America on the firing line, but America active in the factory, the mine, or on the farm, and as the aliens to the number of 13,000,000 are bearing the brunt industrially of providing means for defense and offense, it becomes the economic, as well as the patriotic duty of managers everywhere, to take immediate steps by pooling their knowledge to provide the largest opportunities for individual growth as well as the greatest measure of hopefulness and happiness to those strong and adventurous spirits who have come to seek their fortunes in a new world—our alien friends, brothers and co-workers.

Norbom Plate Punch Table

The great expansion in steel shipbuilding industries has made the rapid handling of plates at the punching machines a real necessity, and this need has been filled in many of the new plate shops by the use of the Lysholm plate punch roller tables, manufactured by the Norbom Engineering Co., Denckla Building, Philadelphia.



Considerable Time and Labor Are Saved in the Punching of Plates by the Use of the Lysholm Plate Punching Roller Tables, the Product of the Norbom Engineering Co., Philadelphia. By means of this machine from 420 to 670 holes per hour can be punched

In using this plate punch roller table the plate is laid on the table and the operator, from his seat, moves the table backward and forward with the aid of an operating lever at his right hand. At his left hand is another lever, which can be operated to move the plate sideways, thereby placing it in the desired position for punching. Operation of the punch can be effected by the use of a foot lever.

By this method plates from ¼ in. to 1⅛ in. thick and up to 30 x 8 ft. may be handled. The tables are built with roller bearings to make operation easy. It is claimed that plates can be handled in one-half the time required by the old method, and the services of only one man at a machine are required.

The Norbom Engineering Co. has records which were kept at various shipyards, showing that the number of holes punched per hour by this method has averaged from 420 to 670 on material varying in thickness from 9/16 in. to 1⅛ in., and from 5 to 8 ft. wide by 24 to 30 ft. long, the holes punched being 13/16 in. diameter up to 1 1/16 in. diameter. A good average in a number of shipbuilding plants was 4000 holes in a 9-hr. working day.

Practically all of Venezuela's imports of construction materials and supplies are now coming from this country, but we are in danger of losing much of the trade as soon as the war is over. Just where the danger lies and what the trouble is is carefully explained by Special Agent W. W. Ewing in a publication, "Markets for Construction Materials and Machinery in Venezuela," Special Agents Series No. 144. Copies may be obtained at the nominal price of 10 cents each at the Bureau of Foreign and Domestic Commerce, Washington.

Lathe for Turning Torpedo Heads

A special machine for turning the air flask heads on torpedoes has been built by the Luster-Jordan Co., Norristown, Pa., for the Spanish Government. While the machine is a standard lathe, a number of modifications have been made in it and the method for producing the work differs, it is stated, from that employed heretofore. While a standard lathe was formerly employed for turning these heads, the different radii on the various surfaces were obtained by the use of several radius attachments. This necessitated the employment of 10 different adjustments on the radius attachments to complete both sides of one head, since there were from two to five distinct curves on the inside of the head alone. The new method dispenses with the radius attachment, but uses a forming attachment on the tail-stock and in some cases one on the carriage as well. Another change in the construction of the lathe are increases in the width and weight of the tool post on the carriage.

The upper part of the tailstock has been removed and replaced with a special attachment made to conform to the outline of the head that is to be machined. A straight slot, which is parallel with the center line of the lathe, extends across the upper face of the tool post and the cutting tool is located at one end, while the forming guide is placed at the other. The adjacent ends of the tool and the forming guide are circular, the distance of the center of the circles between the cutting tool and the guiding tool being approximately ¾ in. apart, which is the width of the slot.

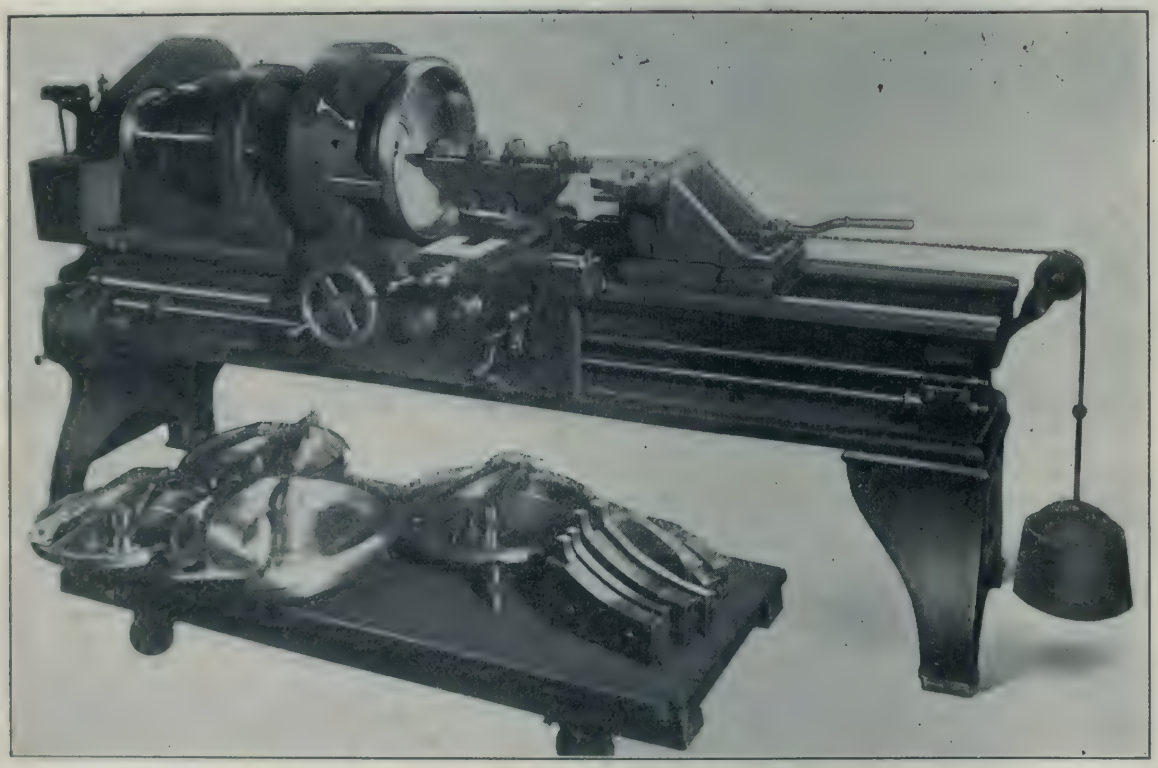
The forming plate has two graduations marked "center of work" and "center of tool" respectively, the two being about ¾ in. apart to register correctly. A circular cutting edge is employed to enable the tool to follow all around the form and go into the recesses. The forming plate is not of the same outline as the finished torpedo head. If, for example, the radius of a certain portion of the head is 16 in., the radius of the forming plate will not be the same since the cutting tool does not always cut on the same point, but changes around the circular form of the tool. Each forming plate has been developed according to the outline of the head with which it will be used.

To have the machine operate correctly, the tool post screw has been disconnected and reconnected with the feed of the carriage, so that as one is thrown out the other is engaged without interruption. This has been secured by splitting the screw operating the tool post and connecting this attachment with the clutch on the carriage that operates the carriage feed. In this way the machine has been made practically automatic. The tool post carriage has a counterweight to pull the tool away from the work when the guiding tool strikes a spot in the forming plate that is concave with relation to the front of the tailstock. A progressive boring tool, which is registered by the guide in the center of the form, is provided for boring the center of the head.

For gaging the heads a plug gage is inserted in the center and the inside form of the head is measured from the plug gage by a flat gage. The outside contour of the head is measured by a second flat gage that rests upon the upper surface of the inner flat gage. In this way not only the inside and outside contours but the thickness of the head are measured.

The equipment of the machine includes an oil pump to supply cutting compound at the tool point and progressive feeds on the cross slide to compensate for the different peripheral speeds.

The time required for finishing the heads with this machine is approximately 6 hr. for one having a diameter in the neighborhood of 12 in. and between 10 and 14 hr. for one having a diameter of 22 in. As this record was made wtih cast-iron pieces, it is believed that the time can be materially improved when the forgings from which these heads are regularly made are used.



A Forming Attachment on the Tailstock of a Standard Lathe Is Employed in Place of a Radius Attachment to Turn the Curves on the Interior of an Air Flask Head for Torpedoes

Iron Ore Production in Missouri

While not yet reflected in actual production, much more interest has been shown in the various deposits of iron ore in the state during the past two years, according to the biennial report of the State Geologist of Missouri. In part this has been due to putting in blast the old St. Louis Blast Furnace Co.'s stack at St. Louis by the Mississippi Valley Iron Co. The charcoal furnace of the Sligo Iron Works at Sligo, Mo., has been operated continuously at full capacity.

The production of iron ore for 1914 was 36,304 tons valued at $75,696, while in 1915 there was an increase to 40,290 tons, valued at $99,853. The producers for 1915 were the Sligo Furnace Co., Salem; L. C. McSpadden, Salem; Iron Mountain Mining Co., Iron Mountain; Julian Pickes, Morrellton; A. J. Sanders, Steelville, and Kingsbury Mining Co., West Plains.



Employees' Restaurant at Whitaker-Glessner Works

A restaurant run on the co-operative plan entirely has been established by the Whitaker-Glessner Co. at its Portsmouth, Ohio, works. The scheme originated with one of the company's officials, who conceived the idea that the mill workmen would more liberally patronize the restaurant if they had a voice in its management, and he also thought that the co-operative plan would bring about a closer community of interests between employers and employees. After a year's trial the plan has proved to be very successful.

To carry out the idea the Whitaker-Glessner Co-operative Association was formed, made up from one man in each department of the plant. The men in each mill department choose their representatives, and these committeemen act as a board of directors for the association. A meeting is held of the committee or board of directors the second Saturday of every month, when recommendations are considered as to the operation of the restaurant, and such changes recommended as may seem desirable.

The most important question that has lately confronted the committee concerns the prices that should be charged. The restaurant is operated with the idea of having it pay its own expenses, charging the men only sufficient to cover the cost of the food and of preparing and serving it. With the late rapid changes in costs, this has proved to be somewhat difficult, and some prices were necessarily raised. The committee, having access to all records, explains this in detail to the men they are representing, and as a consequence there is no feeling that any unfair advantage is being taken. Each employee now seems to feel that he has a personal interest in the restaurant.

Even at present high costs, a substantial meal may be obtained around 23c. to 26c., as may be noted by the following prices on a few staple articles of food: Meat, 6 cents; vegetables, 5 cents; coffee and milk, 3 cents; pie, 4 cents, and ice cream, 4 cents.

The company operates its own bakery and the only prepared food bought on the outside is ice cream. The system of buying has been perfected to such a point that it is not necessary to serve any left-over food the following day. This fact is known to the men and is a matter of considerable favorable comment among them.

Another unusual feature is that the restaurant is open both night and day and at any time a workman can get something substantial to eat. The main meal is served between 11 a.m. and 2 p.m., and within that time approximately 1400 men are fed. The dining room will seat 450 at a time, and there is a smaller one in the basement, but large enough to take care of the colored workmen. The kitchen, which is located in the rear, is fitted with all modern conveniences, and an elevator is provided for conveying food to the colored men's dining room.

The men enter the building at the rear, passing a stand on which there are waiters, and they select their own food, passing out by a cash register. Each one is furnished with a check showing the amount due for the food selected. The workman leaves by the front door, passing another register, where he can either pay in cash or in coupons from a book that is provided by the association. These books range in value from $1 to $5.

At the start the company provided china dishes for sending meals to the workmen in the mills who were unable to leave their tasks, but found that the expense of breakage and loss from other causes was too great, so that now wooden containers are provided. In addition Mason fruit jars are sold to the workmen at cost, so that coffee, milk or other liquids may be carried to different parts of the plant.

An American Company for the Greaves-Etchells Electric Furnace

T. H. Watson & Co., Ltd., Sheffield, England, who control the patents of the Greaves-Etchells Electric Furnace, announce the formation of an American company to handle the furnace business in the United States and Canada. The new company will be known as the Electric Furnace Construction Co., with head offices in the Finance Building, Philadelphia.

The Greaves-Etchells furnace is well known in the Sheffield district and other parts of England, and over thirty furnaces ranging in size from ¼ ton to 12½ tons capacity have been contracted for, including special government equipments. The American company has just received awards for 6-ton equipments to be installed in the United States Navy Yards at Puget Sound, Norfolk and Honolulu.

Frank Hodson, a partner of the T. H. Watson & Co., is now in this country to arrange the details of the new company, and will act as its president. He has been identified with the metallurgical field and general iron and steel trade for many years. F. J. Ryan, who resigned as eastern manager of the Snyder Electric Furnace Co. on June 1, will be general manager. He has been connected with the foundry and steel equipment business for a number of years, and is well known in the eastern districts. The two inventors, Mr. Greaves and Mr. Etchells, will act in associate capacity to the company's technical staff and when necessary will take charge of actual installation.

Efficiency and Fatigue in British Munitions Factories

An interim report on "Industrial Efficiency and Fatigue," recently issued by the Health of Munition Workers Committee of the British Ministry of Munitions, has been reproduced in bulletin 230 of the Bureau of Labor Statistics of the U. S. Department of Labor.

On the whole, night-work is regarded as undesirable, although there is no significant difference between the rate of output in night and day shifts managed on the discontinuous system which is preferred to continuous night-work, the latter being productive of definitely less output. The report shows that health and efficiency of workers are influenced by the earnings. In one factory 17 girls drilling fuses and working on the piece-rate basis, in one week increased their output by 24 per cent on the day-shift and by 40 per cent on the night-shift over their output when working on a time-wage basis. Among the men sleepiness on the night-shift, headache, footache, and muscular pains, together with nervous symptoms, are probably the most common signs of overwork. Eighty per cent of the lost time among the 1543 men was due to sickness and 20 per cent to accident.

State-subsidized steel making is under discussion in Norway. It appears that the Strömmen Works is to receive a subsidy, allowing an increase of steel production from 5000 to 10,000 tons per annum, and the Christiania Spikerverk is to receive for a period of five years a premium of 8 kroner per ton of rolled steel and is to install a rolling mill of 10,000 tons annual capacity. The Strömmen Works is not supposed to commence operations until war mobilization takes place and the steel is for projectiles; while the Christiania Spikerverk is to start in peace time only and its products are mainly for reinforced concrete work.

Manufacturers and Section 3 of Lever Act

Government Contracts by Companies to Which Committee Members Belong Need Not Be in Violation of Law

WASHINGTON, Aug. 21.—Upon the authority of the Director of the Council of National Defense, the correspondent of THE IRON AGE is able to state that there is no substantial basis for the apprehension recently reported as being entertained by the officers of certain large corporations, who are members of the subordinate committees of the council, that the exercise of their functions may be in violation of the terms of section 3 of the Lever food control law which received the President's signature a few days ago. The matter is one of very general importance to the business community as the subcommittees of the council include several hundred prominent officials of the most important manufacturing corporations of the country.

Original Prohibition Drastic

According to widely published reports, many of the members of the council's subcommittees have been advised by their attorneys that Section 3 of the Lever act, taken in conjunction with Section 41, Chapter 321, 35th Statutes at Large, makes it unlawful for them to take any part in negotiating with the Government contracts with corporations with which they are connected or in which they have any pecuniary interest. It is obvious that if this contention were sound, the Lever act would operate to legislate the entire membership of the council's subcommittees out of office. According to Director Gifford, however, the provision of the Lever act referred to was carefully drawn to avoid the exact situation now said to have developed. The section as finally written into the bill was offered by Senator Pomerene with the knowledge of the Council of National Defense as a substitute for a very drastic provision incorporated in the measure by the Senate Committee on Agriculture which read as follows:

That it is hereby declared unlawful for any person acting either as a voluntary or paid agent or employee of the Government in any capacity, including an advisory capacity to any commission, board, or council of the Government, to procure, attempt to procure, or make any contract for the purchase of any supplies for the use of the Government either from himself, from any firm of which he is a member, or corporation of which he is an officer or stockholder, or in which he has any financial interest. Any person violating this section shall, upon conviction thereof, be punished by a fine not exceeding $10,000, or by imprisonment for not more than five years, or both, in the discretion of the court.

The Amended Section 3

This provision was frankly intended to prevent the officers or agents of corporations or persons financially interested therein from having anything whatever to do with the placing of Government business with their respective corporations. If this section had been retained in the bill, there is no question that practically all the subcommittees of the council would have been forced to resign, as their usefulness would have been at an end. Realizing, however, the logical effect of such an enactment, several Senators holding more conservative views than Chairman Gore and his colleagues on the Committee of Agriculture, after conferring with members of the council, decided to oppose the committee amendment, and Senator Pomerene subsequently offered a substitute for Section 3 which was adopted in the following language:

Sec. 3. That no person acting either as a voluntary or paid agent or employee of the United States in any capacity, including an advisory capacity, *shall solicit, induce, or attempt to induce any person or officer authorized to execute or to direct the execution of contracts* on behalf of the United States to make any contract or give any order for the furnishing to the United States of work, labor, or services, or of materials, supplies, or other property of any kind or character, if such agent or employee has any pecuniary interest in such contract or order, or if he or any firm of which he is a member, or corporation, joint-stock company, or association of which he is an officer or stockholder, or in the pecuniary profits of which he is directly or indirectly interested, shall be a party thereto. Nor shall any agent or employee make, or permit any committee or other body of which he is a member to make, or participate in making, any recommendation concerning such contract or order to any council, board, or commission of the United States, or any member or subordinate thereof, *without making to the best of his knowledge and belief* a full and complete disclosure in writing to such council, board, commission, or subordinate of any and every pecuniary interest which he may have in such contract or order and of his interest in any firm, corporation, company, or association being a party thereto. *Nor shall he participate in the awarding of such contract or giving such order.* Any willful violation of any of the provisions of this section shall be punishable by a fine of not more than $10,000, or by imprisonment of not more than five years, or both: Provided, That the provisions of this section shall not change, alter or repeal section 41 of 35th Statutes at Large.

What Existing Statute Prohibits

That the full purpose of this section may be understood the text of Section 41, Chapter 321, 35th Statutes at Large, is here reproduced, as follows:

Sec. 41. No officer or agent of any corporation, joint stock company, or association, and no member or agent of any firm or person directly or indirectly interested in the pecuniary profits or contracts of such corporation, joint-stock company, association, or firm shall be employed or shall *act as an officer or agent of the United States* for the transaction of business with such corporation, joint-stock company, association, or firm. Whoever shall violate the provision of this section shall be fined not more than $2,000 and imprisoned not more than two years.

In the opinion of the Council of National Defense, the two provisions above quoted contain four specific prohibitions: First, that no person who happens to be a member of a subcommittee of the council "shall solicit, induce or attempt to induce any person or officer authorized to execute or to direct the execution of contracts on behalf of the United States to make any contract or give any order, etc.;" second, that no member of such subcommittee shall "make or participate in making any recommendation concerning such contract or order" to the council without making "a full and complete disclosure in writing" to the council "of any and every pecuniary interest which he may have in such contract or order, etc.;" third, that no such person shall "participate in the awarding of such contract or giving such order," and fourth, that no officer or agent of any corporation "shall act as an officer or agent of the United States for the transaction of business with such corporation."

New Method of Awarding Contracts

As to the first prohibition, it is frankly conceded by members of the council that, prior to the enactment of the Lever law, members of the subcommittees, as the result of direct representations made by them to purchasing officers of the Government, may have "solicited, induced or attempted to induce" such officers "to execute or to direct the execution of contracts." Since the organization of the War Industries Board and since the Lever act became a law, nothing of this kind has taken place. Under the present system, Government officials desiring material bring their needs to the attention of the War Industries Board, whose members are constantly in attendance in Washington. The board then calls upon the appropriate subcommittee to ascertain where the material can be obtained and all pertinent facts in reference thereto. With these facts before it,

the board decides upon the recommendation it shall make to the purchasing officer. In this way the members of the subcommittees are not brought into touch with the executive departments at all and in their dealings with the War Industries Board they represent, not the Government, but the industry which is to supply the material. Had there been time to carry out so comprehensive a project, the Council of National Defense would have arranged for the appointment of all the industrial subcommittees at conventions called for the purpose and attended by representatives of every producer in the country who cared to be present. This being impracticable under the circumstances, the committees were chosen from among representative men and it was intended that they should act for the sellers rather than for the Government, while at the same time placing at the disposal of the Government their comprehensive technical knowledge of the various industries.

In accordance with the second prohibition above enumerated, no recommendation is now made by any subcommittee or member thereof without filing with the recommendation "a full and complete disclosure in writing" of such member's interest in the contract in question. This provision of the law is being rigidly executed because it is the law; obviously, however, the War Industries Board and the purchasing agents of the departments are already fully informed as to the interest of all the various subcommittees in contracts for material produced in their respective industries.

As to the third provision, it is claimed that under the present system no member of any subcommittee of the council "participates in the awarding of such contract or giving such order." Even the War Industries Board makes no awards and lets no contracts, its work, like that of its subcommittees, being advisory only.

Committees Not Government Agents

The fourth prohibition quoted is found in Section 41, Chapter 321, 35th Statutes at Large, and prohibits an officer or agent of a corporation, etc., from acting as "an officer or agent of the United States for the transaction of business with such corporation, etc." This statute was passed long before the Council of National Defense was created and when the council's various advisory subcommittees were appointed, it was the unanimous opinion of the members of the council, at least two of whom are lawyers of high attainments, that the members of such subcommittees were in no sense "officers or agents of the United States" within the meaning of the law. The courts have rendered numerous decisions which furnish a sound basis for this contention.

Up to the present time, no official cognizance has been taken of this controversy and no resignations based upon the contentions involved have been received from members of the council's subcommittees. Should the matter assume more serious proportions, however, the issue will be definitely formulated by the council and probably referred to the Attorney-General for a formal opinion.

Electric Steel Co. Buys Property

The Electric Steel Co., Chicago, has purchased the property it occupies at the Southwest corner of Thirty-first and Wood Streets, Chicago. The land comprises about 175,000 sq. ft., and is improved by a two-story foundry building. The company was organized two years ago by officials of the Link-Belt Co.

There is an urgent demand throughout Italy for pipe fittings, according to a report to the Department of Commerce from Consul F. T. F. Dumont of Florence. He says that stocks of German and Swiss goods have been sold out, Great Britain requires its goods for its own use, and France seems to be unable to pick up the Italian trade. A good market is open to American manufacturers, he reports, if they will conform to the Italian requirements. The principal requirement is that fittings must have right-hand threading of English standard. Even left-hand thread might be used if of English standard.

NATIONAL SAFETY CONGRESS

Meeting Will Include Reading of Papers and an Exhibit

The sixth annual meeting of the National Safety Congress will be held at the Hotel Astor, New York, Sept. 10 to 14. A feature will be a national exposition of safety and sanitation at the Grand Central Palace in which the American Museum of Safety will cooperate. Monday, Sept. 10 will be devoted to special committee meetings. Tuesday morning will be given up to registration and the annual meeting, including reports and election of officers. There will be a general round table discussion Tuesday afternoon and a general session Wednesday with addresses. The remaining days will be devoted to sectional meetings. The iron and steel section will meet Wednesday, Thursday and Friday afternoons and the foundry section will have its meeting Thursday morning. The program for these sessions is as follows:

IRON AND STEEL SECTION

Wednesday, Sept. 12

Chairman, George T. Fonda, safety engineer, Bethlehem Steel Co., South Bethlehem, Pa.; vice-chairman, Earl B. Morgan, safety engineer, the Norton Co., Worcester, Mass.; secretary, J. C. Smith, safety director, Inland Steel Co., Indiana Harbor, Ind.

Unsettled Accident Prevention Problems in Iron and Steel Industries, L. H. Burnett, assistant to president, Carnegie Steel Co., Pittsburgh.

Analyses of Accidents, Dr. Lucian W. Chaney, U. S. Department of Labor, Washington. Discussion: D. R. Kennedy, assistant to president, Youngstown Sheet & Tube Co., Youngstown, Ohio; L. W. Hatch, chief statistician, Department of Labor, State of New York, Albany, N. Y.

Thursday, Sept. 13

Safety in Yard Practice, F. G. Bennett, safety director, Buckeye Steel Castings Co., Columbus, Ohio. Discussion: J. Stanford Brown, supervisor, department of labor, safety and welfare, the Carpenter Steel Co., Reading, Pa.

Safe Practices in Sheet Mills, Frank E. Morris, safety engineer, American Rolling Mill Co., Middletown, Ohio. Discussion: J. M. Woltz, safety director, Youngstown Sheet & Tube Co., Youngstown, Ohio.

Open Hearth Hazards, Leslie M. Rice, district safety inspector, American Steel & Wire Co., Worcester, Mass.

Safety and the Foreman, J. S. Herbert, superintendent, safety department, Cambria Steel Co., Johnstown, Pa. Discussion: J. M. Larkin, service department, Fore River Shipbuilding Co., Quincy, Mass.

Friday, Sept. 14

Low Voltage Hazards, Dr. C. A. Lauffer, medical department, Westinghouse Electric & Mfg. Co., East Pittsburgh. Discussion: Harold Kirshberg, consulting illuminating engineer, Pittsburgh.

Round Table Conference—New Kinks in Eye Protection, L. L. Parks, safety and apprentice supervisor, American Locomotive Co., Schenectady, N. Y.; Drinking Water, J. H. Ayres, superintendent of safety, sanitation and welfare, National Tube Co., McKeesport, Pa.; First Aid, J. R. Mulligan, assistant safety engineer, Bethlehem Steel Co., South Bethlehem, Pa.; Lunch Rooms and Change Houses, John P. Elb, supervisor of safety and labor, Illinois Steel Co., Joliet, Ill.; Problems of Returning Injured Men, Earl B. Morgan, safety engineer, the Norton Co., Worcester, Mass.

FOUNDRY SECTION

Thursday, Sept. 13

Chairman, F. G. Bennett, Buckeye Steel Castings Co., Columbus, Ohio; vice-chairman, F. W. Shepard, safety inspector, American Cast Iron Pipe Co., Birmingham, Ala.; secretary, S. W. Ashe, educational and welfare department, General Electric Co., Pittsfield, Mass.

Method of Training and Obtaining the Co-operation of Foundry Foremen in Safety Work, W. E. Watters, National Malleable Castings Co., Melrose Park, Ill.

Treatment of Foundry Burns by Paraffine Substances, Dr. L. F. Mutschman, chief surgeon, American Steel Foundries, Alliance, Ohio.

How Improvement in Safety Conditions Reduces Labor Turnover and Accidents.

Practical Welfare Work in Foundries, S. W. Ashe, educational and welfare department. General Electric Co., Pittsfield, Mass.

Mechanical Safeguarding of Electric Traveling Cranes, J. Claude Smith, safety director, Inland Steel Co., Indiana Harbor, Ind.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the DAVID WILLIAMS CO., 239 West Thirty-ninth Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: Equitable Building. Philadelphia: Real Estate Trust Building. Cleveland: Guardian Building. Cincinnati: Mercantile Library Building.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year. Entered at the New York Post Office as Second-class Mail Matter.

Steel Exports to Allies

It is known that shipments on a large tonnage of ship plates bought for Japan have been cut off by the Government's embargo which went into effect Aug. 15. A cablegram of Aug. 20 from Tokio says that urgent representations have been cabled the Ishii commission, now in the United States, to secure the lifting of the ban on these exports. The continuance of the embargo, the cablegram said, would mean "a death blow to shipbuilding and other industries in Japan."

The amount of ship steel for Japan on the books of American manufacturers has been put as high as 300,000 tons. It is understood that Japan now seeks to contract for several hundred thousand tons more. The steel is desired for purely commercial reasons and its delivery cannot be urged on the ground that its shipment to Japan would help to win the war. The plate requirements of the shipyards of the United States and of Italy and France are bound to have pre cedence. In all friendliness, how can our Government say anything to Japan than that her purchases of plates in this market must stand aside while the plate mills of the country are speeded to the fullest extent to meet imperative war needs?

The embargo on exports of certain forms of finished steel involves a number of questions affecting this country's relations with its Allies, and the decision respecting plates for Japan does not stand by itself. The embargo certainly was not undertaken with any intention of reducing steel exports from the United States or of interfering with this country's commercial relations with any other country. It is naturally the desire of the authorities at Washington to keep the country's export trade at the highest point consistent with the forwarding of the war plans of the United States and its Allies. It is no part of this country's duty to restrict its exports in certain kinds of steel to the war needs of its Allies, while at the same time an allied country is exporting for commercial purposes steel which it might turn to its own war uses. Recently a Canadian exporter wired to Washington for permission to ship steel to Japan by way of Seattle. It was found on investigation that steel of the same character was going from the United States into Canada for war uses. Other questions of this sort are now before the War Industries Board at Washington and their right solution calls for the fullest and frankest co-operation by this country's Allies. England is exporting a very considerable amount of steel. The United States is not called on to give up any part of the export steel trade built up in the past few years in order that Great Britain may increase her commercial exports of steel. We have no doubt this point will be freely made by the representatives of the United States and as freely conceded by the British commissioners in the conferences now being held at Washington.

Larger Steel Output

We have already called attention to the increased production of steel in the United States in the first half of 1917 as a partial explanation of the freer offering in the past month of semi-finished steel in the market. Returns from a large part of the steel producing capacity of the country indicate that the output of steel ingots in the first half of this year was close to 21,475,000 gross tons, or at the rate of 42,950,000 tons a year. In 1916, according to the official statistics, our production of ingots was 41,401,000 tons. It thus appears that production in the first half of this year was at an annual rate greater by 1,550,000 tons than that of 1916.

As pig-iron production in the first half of this year was 350,000 tons less than in the first half of 1916 and 550,000 tons less than in the second half of last year, the increased production of steel must have been due to one of two things or to both; namely, a much larger use of scrap in the making of open-hearth steel and the use of a considerable tonnage of cold pig iron drawn from stocks. It is probable that both of these things happened. The larger buying of scrap by steel works is quite well established; it is known also that stocks of pig iron were roundly a half million tons less on July 1, 1917, than one year previous. At all events, the larger output of steel in the first half of this year

and the continuance of this higher rate through July with some further increase are of interest as bearing on the immediate future of steel values.

Iron Trade Organization for War

The value of the various organizations built up in the iron trade in recent years has had fresh demonstration in the effective work they have done on various situations created by the war. The American Iron and Steel Institute, the American Pig Iron Association, the Lake Superior Iron Ore Association and the ore and vessel interests represented in the Lake Carriers' Association have all co-operated to put the iron and steel industries at the disposal of the Government.

With little publicity, the Lake Superior Iron Ore Association has done an important work in determining within close limits the amount of Lake ore which must be delivered by the railroads from lower Lake docks to the blast furnace yards within the season of navigation. The Council of National Defense has viewed with much concern the apparent inability of the railroads to carry to the furnaces as much ore as they delivered last year, that quantity seeming fairly to measure the furnace requirements as indicated by the requisitions furnished the association in the early canvass of the blast furnace situation. The council through its sub-committees has brought this question home to the individual blast furnace companies and the ore association. In consultations between the president of the Lake Superior Iron Ore Association and the blast furnace managers the actual requirements of ore in each case have been analyzed so as to determine the amount of the various grades required up to June 1, 1918. This method promises to bring about exact results, avoiding any unnecessary ore movement and at the same time meeting the important requirement of providing each plant with enough ore of the proper grades to enable it to run to full capacity, so that the Government, its Allies and the public may be supplied with the greatest of war essentials, the products of iron.

The blast furnace interests are making a gratifying response to the efforts made to have this matter worked out on the right basis and the Railroads' War Board is alive to the necessity of furnishing equipment—even to the subordination of other interests not so essential—after the ore requirement has been definitely fixed.

It is not amiss to point out that the machinery for marshaling and acting upon the facts relative to the industry on which the country must chiefly depend in this time was ready to hand. The quick mobilization of that industry has been in contrast with much that has been done through strictly Government agencies. It may also be said without elaborating the point that there is much to gain from a closer co-operation between the Government and iron and steel manufacturers than Government representatives have invited thus far.

Reports from practically all industrial centers of England show much unrest and a unanimity in charging it to the high cost of living. There is a widespread belief that considerable profiteering is going on, and, as the special war taxes are taken from corporations and not from individuals, it is believed that the individuals in ownership of corporations are not carrying the load that the wage earner is, and thus there is a feeling of a lack of equality of sacrifice.

Prospects of Freight Congestion

Some railroad officials have assured shippers that a serious freight congestion is in prospect. This is rather disturbing, when the news lately has been of better results in transportation, for the monthly reports of car supplies have been showing decreasing shortages, and shippers generally have had less cause for complaint than during the winter and early spring. The Lake coal and ore movement has been smoother than expected.

The railroads have been hauling the record freight tonnage in their history. Their carrying capacity has been increased by resort to certain expedients adopted on account of the war. The railroads of the country are being operated, in theory, at least, as one system. By a vigorous propaganda car loadings have been increased. Many passenger trains have been annulled while others have had their time reduced so that their movement is less of a misfit with the more slowly moving freight trains.

The danger ahead, according to the predictions, is on account of the heavy movement of building material to the 16 army cantonments, and later the movement of men and food to them. It is to be noted, however, that already a great deal of material has been moved to the cantonments and general conditions have not suffered.

The question whether there will be a greater strain upon the railroads one month or three months hence hinges largely upon whether the progress toward greater efficiency can continue. If all that can be done has already been done it will be impossible to stand a farther straining of the physical equipment.

The building of the cantonments is new work, necessitating freight movement that would not occur if we were not at war. The feeding of the men in the cantonments is nothing new; they would have to be fed in any event. It is a question whether in rushing construction material to the cantonments the dislocation to other traffic has not resulted in some decrease in the total of railroad efficiency, for speed has been the sole desideratum. In the case of furnishing regular supplies to the cantonments, once they are in operation, system can be employed, and perhaps the movement of food will involve less work for the railroads than the movement of the food that has been going to the men at their homes, for the movement certainly can be systematized.

A very large proportion of the men assembled at the cantonments will be taken from the ranks of productive industry. Necessarily certain industrial operations will be slowed down, requiring less raw materials and producing less freight. The conclusion is unavoidable, and the change may amount to a material reduction in freight traffic.

Thus there seems to be a possibility that an increase in the freight congestion may be avoided, but the situation is full of dangers. It is unfortunate that the plan for the Government to purchase

freight cars to help out the railroads was abandoned. Nothing has been heard of it for weeks and the explanation offered is that just after it was proposed the railroad situation improved. That was hardly a sufficient cause, for there was no proof that the improvement was to be permanent. There is reason to doubt that it would have been extremely difficult to secure the plates for the cars. There are reports of plates accumulating at shipyards and there is certainly a great deal of new plate rolling capacity being built. At any rate it would have been enterprising to speed up work on the orders now on the books of the car shops so as to clear the way for additional orders should it be found desirable to place them.

Scrap Dealers and the Fall in Prices

Dealers and brokers in old material had a distressing experience in the recent period when prices of scrap advanced by leaps and bounds to record-breaking levels. They found it impossible in many instances to obtain delivery of material for which they had contracted and which they urgently needed to meet their commitments. They were unable to get what they had purchased, for the reason that the sellers with whom they dealt had deliberately resold the material to buyers who were willing to pay a higher price, or were shipping it against more profitable orders. With the market rapidly advancing, prices of the afternoon being higher than those of the morning, there was frequent opportunity for this procedure.

For the most part the offenders were the smaller collectors of scrap—junkmen, really, although some of these do business on an extensive scale. A result of their tactics was that reputable dealers who adhere to their contracts were compelled to deliver material for which they paid far more than they received. They had bought at low prices, and, as the market went up, at higher prices. The low-priced material lagged in delivery or did not arrive at all, while that purchased at high prices came along in a satisfactory manner and constituted the entire stock available for the dealer to fill his contracts.

Taking losses is by no means unknown in the scrap trade, but a loss due to a misjudgment of the market is borne with a very different feeling from one due to double dealing. The decline which followed the excited ascent of prices was welcome relief to the dealers when the situation was so serious that some of them withdrew from active operations. There is a means of redress for losses due to the methods complained of, but for various reasons there has been a reluctance heretofore to appeal to the law in some cases, while in others the value of such an appeal has been only rated in proportion to the financial responsibility of the offenders.

Any easing of the plate market, now considered likely in respect to delivery dates, is predicated on the results of an indefinite export embargo on shipbuilding material not needed for war purposes. Certain it is that some mills producing the forms of steel going into cars and ships have rarely enjoyed large business relations with car and locomotive builders. They had not been called on, as industry was rapidly expanding, and their order books were not early crowded, so that for months latterly they have been able to pick and choose. The result has been the booking of a good-sized business, averaging high in unit prices. Much of this being for export, and the exporting of ship material now being under the ban, domestic orders seem sure to reach the rolling departments earlier than would have been the case. Admitting that orders from foreign sources remain good, the result is merely a rearrangement of scheduling.

CORRESPONDENCE

Manganese in Ordnance Steel

To the Editor: Your issue of Aug. 2 contains an article by Dr. Henry Howe on the use of manganese in steel. Dr. Howe is an eminent authority on steel structure and no doubt his advice will be followed by some steel manufacturers.

As our people in the States will, no doubt, be occupied for some time in the manufacture of ordnance, I would caution them to make haste slowly in running their manganese above 0.90 per cent. My experience would lead me to believe that 0.90 is about the saturation point of that element and up to that point, if equally distributed, is a benefit to the steel.

The German shell steel occasionally runs up to 1.25 per cent in manganese but it is possible that scrap conditions in that country are such that they have no choice in the matter.

These remarks refer particularly to steel for ordnance.

JAMES J. MAHON,
Steel Expert, Imperial Munitions Board.
Ottawa, Ont., Aug. 18.

Continuous Record of Plant Equipment

To the Editor: It has happened to many of us, and continues to be a source of more or less mystery, how some plant managers can tell you in a few minutes anything you want to know, not from memory, but from practical records. When at a meeting not long ago the very pointed question was asked, "How many feet of 3-in. double-ply leather belting is in service in your plant?" the answer was correctly given in 2½ minutes.

In some plants the individual machine is buried almost as much as the underground piping, and when repairs are necessary, as for instance, to a drill press, it may not be in the drilling department, but may be found in the smith shop or some other place, but usually it has to be looked for by the repair mechanics.

Also, when the time comes for inventory, the shutdown for measurement of belts and tagging fixtures, etc., has always seemed necessary. To eliminate all this lost time and to know at all times exactly where everything is, its value, etc., a simple record in the form of a plant chart is essential with your departments segregated into divisions and a keyed card index to take care of the continuous changes. Then the chart shows location of machinery, electric motors, shafting, belting, pulleys, fire equipment, telephone system, watchman's stations, electric time clocks, wiring and piping. The cards show machine or fixture number, quantity, cost, depreciation, etc. Each department head is furnished with a chart and when repairs are necessary, the request is made according to chart. If new equipment is installed or changed from one department to another, a record is kept on the cards.

After you have your department layout lined up the way you want it, with the location of machines and fixtures, etc., the cost for perpetual upkeep is practi-

cally nothing, as the few minutes to record the changes each day make it a routine matter, automatically taken care of like production entries. When you want to know quantity, original cost for repairs, etc., it is necessary that you have this information when wanted, not a day or so later.

The question reminds me of a story a master mechanic on the Santa Fé told me some years ago. His chief clerk, Charlie, had a very elaborate letter filing system, but could never find anything within a reasonable length of time. One day, after the whole office force had looked for a certain letter for about an hour, he called Charlie in and asked him if he had found that letter. "No," said Charlie. "All right," said the master mechanic; "now I want you to go out and get a big barrel and put all the letters we receive in that barrel, so we will know where they are."

We all know that the machines are in the plant some place, but not where motor number so and so is, nor how much of a load it is pulling. To know your plant like your letter file is the idea.

H. M. FITZ.

Sheboygan Falls, Wis.

Bids on Projectiles

In asking for bids on common 1-lb. projectiles recently the Navy Department asked for alternate bids, in the one case the contractor to furnish steel and in the other case the Government to furnish the steel at 3.75c. The bids were as follows:

Driggs Ordnance Co. (Inc.), 120 Broadway, New York, bid A, 700,000 projectiles, not including lead plugs, contractor to furnish steel, 47c. each; begin delivery 60 days and will deliver 120,000 each month thereafter. Government to furnish steel at 3.75c., 45c. each; begin delivery 60 days and will deliver 120,000 each month thereafter. Bid B, 700,000 projectiles, own drawing, 46c. each; begin 60 days, will deliver 120,000 each month thereafter, contractor to furnish steel. Government to furnish steel, 44c. each; begin delivery 60 days, will deliver 120,000 each month thereafter.

Wagner Electric Co., 6400 Plymouth Avenue, St. Louis, 700,000 projectiles, 45c. each; begin delivery 60 days, will deliver 150,000 per month. Alternate bid, Government to furnish steel at 3.75c., 42c. each.

Poole Engineering & Machine Co., Woodbury, Baltimore, Md., for furnishing 2,000,000 or more projectiles, 40c. each; for further 700,000 projectiles, 41c. each; begin delivery Oct. 1, will deliver 400,000 in October, 300,000 November, and complete in November.

Bethlehem Steel Co., South Bethlehem, Pa., 700,000 projectiles, 95c. each; begin delivery 120 days, will deliver 75,000 each month thereafter.

Edwards Valve & Mfg. Co., 72 West Adams Street, Chicago, Ill., 700,000 projectiles, 57.5c. each; begin delivery 60 days, will deliver 75,000 each month thereafter.

Coit Machine & Engineering Co., Irvington, N. J., 700,000 projectiles, 45.5c. each, begin delivery 60 days; 700,000 projectiles, 36c. each, begin delivery 30 days; will deliver 50,000 first month, 75,000 second month, 100,000 third month, 100,000 fourth month, 100,000 fifth month, 100,000 sixth month, 100,000 seventh month, complete eighth month.

Tucker Supply Co., York, Pa., 700,000 projectiles, 39.25c. each; begin delivery 90 to 110 days, will deliver 100,000 each month thereafter.

Worcester Mfg. Co., Worcester, Mass., 700,000 projectiles, 45c. each; begin delivery 60 days, will deliver 25,000 first month, 50,000 each month for eight months, balance 3 months later. Alternate bid, steel at $3.75 per 100 lb., 42½c.; delivery as above. This firm also submitted a bid on the cost-plus-percentage basis.

Fostoria Screw Co., Fostoria, Ohio, 700,000 projectiles, 53c. each; begin delivery 75 days, will deliver 100,000 first month, 150,000 second month, 175,000 third month, 200,000 fourth month, balance fifth month.

A successful test of a remodeled Colt machine gun, made by the Marlin Rockwell Corporation at its Marlin arms plant, New Haven, Conn., will be followed, it is reported, by large Government orders for the gun, which has been developed for aircraft service. The Marlin plant has made under license from the Colt Co. the regular Colt machine gun, which weighs 38 lb., and it is reported that in the new model the weight has been cut to 21 lb.

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FORMS FOR EXPORT LICENSES

Detailed Data Required Where War Materials Are to Be Shipped

WASHINGTON, Aug. 21.—New rules governing the issuance of export licenses have been adopted by the Exports Council. Hereafter all applications for licenses must be made on one of the regular forms provided by the Division of Export Licenses or on identical forms provided by shippers. The practice of stamping the word "Licensed" on the back of the application itself has been discontinued and hereafter a regular form of license will be used which in certain cases may be issued by the district offices and which will bear the seal of the Department of Commerce. Collectors of customs, however, will honor any licenses already issued on application forms but upon the condition that they cover goods licensed on or before August 14.

Three application forms known as A-1, A-2 and A-3 have been adopted by the Division of Export Licenses and have been sent to all the district offices of the Bureau of Foreign and Domestic Commerce at Boston, New York, Chicago, San Francisco, Seattle, New Orleans and St. Louis, and to all the so-called co-operative offices working in conjunction with the Bureau. Shippers who care to do so may reprint these official forms with their names and addresses filled in for convenience, provided such reprints are identical with the official forms and are printed on paper of the same color.

For Shipments to Neutrals

Form A-1 is to be used for proposed shipments to countries not associated with the United States in the war or to their colonies, possessions and protectorates. On this form the applicant for license certifies that he has satisfied himself that the merchandise which it is proposed to export will not reach the enemy directly or indirectly and that neither the consignee nor purchaser is dealing with or is engaged in activities on behalf of the enemy. Each applicant must furnish the following information:

(1) Consignor; (2) consignee; (3) purchaser abroad; (4) name and address to which license should be sent; (5) name of line and (or) vessel by which shipment will go forward; (6) approximate date of intended ocean shipment; (7) port of intended shipment from this country; (8) prospective port of entry abroad; (9) if goods are to be re-exported, state to what country; (10) quantity in tons; (11) purpose for which goods are to be used; (12) name of manufacturers of the goods; point of origin; (13) if shipped, date of R. R. B/L; if arrived at seaboard, date of arrival; (14) if not shipped from factory, are goods ready for shipment; or when will goods be ready? (15) Have you a firm order for the goods; date of order? (16) Were you engaged in exporting goods of this kind to the proposed country of destination previous to August, 1914? (17) State the period during which you have maintained regular business relations with these purchasers; (18) Is the present order from them a normal one as compared with their orders previous to August, 1914? (19) If a guarantee has been issued in accordance with requirements as to shipments to certain countries give name, address and reference number of guarantor. (20) What proofs have you that the goods are for consumption by neutrals or by allies of the United States?

Form A-2 is to be used for shipments to countries associated with the United States in the war, their colonies, possessions and protectorates. The information required of the applicant for this form of license includes merely a statement of quantity and value of the goods, the name and address of the consignee, the date when the goods will be ready for shipment and the country, if any, to which the goods are to be re-exported by the consignee.

Form for War Material

Form A-3 is intended to be used for shipments of war material to countries associated with the United States in the war or to their colonies, possessions and protectorates and is of special interest to readers of THE IRON AGE as the articles which require the use of this form at present are pig iron, steel billets, iron and steel plates and iron and steel scrap. In addition to stating the quantity and value of the goods which it is proposed to ship, the name and address of the consignee and the date when the goods will be ready for shipment, applicants are required to answer the following questions:

(1) State name and address of person or firm by whom the material or stores will be used, and whether engaged on Government work, and if so, of what kind and to what extent.

(2) Is the material indispensable for efficient maintenance or repair work?

(3) State the nature and extent of the plant to be maintained, repaired, or manufactured and the evidence of urgency.

(4) State the specific purpose for which the material, etc., is required.

(5) Why is it impossible to obtain the supply required, either in the country of destination or elsewhere than the United States, or to substitute some other material for that now asked for?

(6) How long will the supply now asked for last?

(7) What is your normal consumption for the period mentioned in your reply to No. 6?

(8) What stocks, if any, do you now hold of the goods asked for? In the case of machinery or plant what spares have you in hand at present? Name all firms in the United States or elsewhere from whom you have obtained the material, articles, or parts thereof in the past.

(9) Have you any stores or material of the description referred to in this application now under indent order or supply from the United States, or elsewhere; if so, what is the quantity? When and with what firm or firms was the order placed?

(10) Give the name and address of United States manufacturer of the goods referred to in this application.

Questions 1, 3, 7 and 9 need not be answered if the buyer is a foreign government.

In filling in applications shippers are required to observe the following rules:

(a) This form must be filled in in duplicate, and both copies signed by the foreign purchaser or by his duly authorized representative in the United States. Both copies must then be given to a representative of the Government of destination who has been authorized to indorse, on this fourth page, applications for goods destined for war purposes or directly contributing thereto. One copy bearing this indorsement will be returned to the applicant or such representative as he may designate, and this copy must be filed immediately at Division of Export Licenses, 1435 K Street, N. W., Washington, D. C.

(b) A separate application must be made for each country of destination.

(c) A separate application must be made for each class of goods and for each consignment. If only a portion of the goods covered by a specific license is exported, and the applicant desires to export the balance, another application should be made on application Form D entitled "Application for Supplementary Export License."

(d) The statement in regard to the quantity should be made in definite units of net weight or measure, such as tons (of 2240 lb. each), pounds, bushels, gallons, etc., and not in such terms as boxes, cases, sacks, etc.

(e) To avoid delays applicants are requested, in case of further communication, to refer to their own reference number and date, as well as to the reference number of the Division of Export Licenses if known, and to refer to each application in a separate letter.

(f) If the space allowed on page 1 is not sufficient adequately to describe the goods, a more complete description may be given in an accompanying letter. All documents which an applicant may wish to submit in connection with the application must accompany the application in the first instance.

Every applicant for a license under Form A-3 is required to make an affidavit declaring that he has been duly authorized to apply for an export license on behalf of the foreign purchaser, that he has full knowledge that the statements made in the application are true and that all the materials, articles or parts thereof mentioned in the application "are destined for actual war purposes or will directly contribute thereto."

The Exports Council announces that as rapidly as possible agents are being placed in all the neutral countries, especially Holland, Sweden, Norway and Denmark, to investigate the needs of importing firms in those countries. Delay of several weeks has been caused on the shipment of certain cargoes to these countries because the Exports Council was unable to make adequate investigation into the necessity for shipment. Applicants for licenses are now required to authorize the Council to use the cable in making any necessary investigations and agree to pay the expense thereof.

It is understood that a new list of commodities to be placed under the control of the Exports Council will be announced within a few days. It is not known whether the new list will include additional items of iron and steel but it is reported that it will embrace cotton and other materials employed in the manufacture of munitions.

LABOR AND THE DRAFT

Many Workers in Industrial Plants Are Going Into the Army

CHICAGO, Aug. 20.—A local draft appeal board has requested from Washington a ruling in the case of 200 claims for industrial exemption which were filed with it by the Western Electric Co., Chicago, on behalf of employees who have been certified for military service. It was stated that the Western Electric Co. has 9000 employees, of which number about 6000 are of selective military age. Of the latter number, about 600 are expected to be called out in the first quota, 200 of them being diemakers and other skilled workmen who are needed to enable the fulfillment of Government orders.

There is a great scarcity of electricians, a situation which has been felt by some of the local steel mills and other industries. Meanwhile the Government wants more of this class of workers. At one of the large local mills, the disposition has been to let the men depart freely for military service where their places can be filled by others with a reasonable amount of training. Many valuable machinists have joined the colors, causing some embarrassment in mill repairs.

The American Car & Foundry Co., Terre Haute, Ind., is advertising for women workers. About 400 are wanted for various departments, where they will be paid the same wages as men.

The strike of the polishers at the Remington Bridgeport Works of the Remington Arms Union Metallic Cartridge Co. has not been settled, and it is reported that a Federal mediator is expected to start new negotiations for a settlement. The machinists' strike at the Lake Torpedo Boat Co. is also still in force, and it is reported that the union machinists have sent J. J. Keppler, vice-president of their organization, to Washington to lay their case before the Navy Department.

All employees at the Government Arsenal, Springfield, Mass., earning less than $1,200 a year, have received a 10 per cent increase in wages and a 5 per cent increase has been given to workmen earning between $1,200 and $1,800. There has been no complaint concerning piece rates, but the armorers have been engaged for months in an endeavor to raise the day rates.

It is reported that the Fore River Shipbuilding Corporation will put into effect about Oct. 1 the same wage schedule that is being prepared for the Charlestown Navy Yard. The men will get time and one-half for overtime up to four hours and double time after that, also double time for Sundays and holidays. The average pay is expected to be about $4.50 a day.

Wages for puddling for August and September in England will be $4.25 per ton, all other mill and forge wages remaining unaltered. To this is to be added 12c. per ton bonus. The average net selling price for May and June of bars, angles and tees, plates and sheets, hoops, strips and miscellaneous forms was $74.35 per ton, figuring the normal rate of exchange.

The Youngstown Sheet & Tube Co., Youngstown, Ohio, has sunk two shafts on its coal property in Greene County, Pa., which it proposes to develop rapidly. The two shafts are being sunk by the Dravo Construction Co., Pittsburgh, while Stone & Webster of Boston have a contract for building about 150 houses for miners.

The formal announcement of the merging of the Columbus Iron & Steel Co. with the American Rolling Mill Co., Middletown, Ohio, has been issued. Correspondence should be addressed to the American Rolling Mill Co., Columbus Works, Columbus, Ohio.

FEDERAL SHIPYARD BEGUN

Contracts Let and Work Proceeds on Shipbuilding Plant Backed by Steel Corporation

More than 200 men are now at work on the site of the Federal Shipbuilding Co.'s plant, Hackensack Meadows, New Jersey, and the place resembles a mining camp. Temporary buildings have sprung up almost over night. Additional workmen will be employed as rapidly as possible, and every effort will be made to complete the shipbuilding plant, which, according to present plans, is expected to be one of the largest in the world, on scheduled time. The schedule calls for completion of shipways in a few months, so that keels may be laid for initial launchings about April 1, 1918. Two vessels are expected to be ready for service on June 1, 1918, and from that time on the plant will turn out steel cargo-carrying vessels with greater rapidity than has ever been attained in the shipbuilding industry in the United States.

The United States Steel Corporation, which organized and financed the Federal Shipbuilding Co., is said to have provided $10,000,000 for initial outlays at the plant. Ten steel shipways, about 500 ft. long, are being put up by the Fraser, Brace Co., 1328 Broadway. The shop buildings are being constructed by Post & McCord, Inc., 101 Park Avenue, New York, and structural steel for shipways and buildings is being furnished by the American Bridge Co., which is reported to be giving precedence to this work. The buildings will require 10,000 tons of steel.

Robert MacGregor, vice-president and general manager of the company, received his early shipbuilding training in the yards of Scotland, and it is said that the Federal plant will be patterned to a considerable extent after the best of the plants on the Clyde. So far as possible, everything for the ships will be manufactured on the ground. Plates and shapes will be fabricated in the company's own plate shop, woodworking will be done on the premises and even marine boilers and engines and such supplies as electric fittings will eventually be made in the Federal shops.

The plant is located on the Hackensack River, south of the Lincoln Highway. The site is bounded on one side by the tracks of the Central Railroad of New Jersey, and there will be ample sidings for simplifying the traffic problem. An indenture of 1000 ft. is being made into the land for a basin in which five or six ships can be simultaneously fitted out after they have been launched.

The plate shop is to be 165 x 800 ft., with a mold loft 126 x 800 ft. on the second floor. At one end of the plate shop will be a furnace building, 165 x 150 ft., one story. The machine shop will be 125 x 150 ft., one story and galleries. The boiler shop will be 160 x 500 ft., one story; the forge shop, 150 x 300 ft., one story; the power house, 100 x 200 ft.; the rigging loft, 50 x 150 ft., one story; the brass and iron foundry, 100 x 300 ft., one story; the copper and tinsmithing shop, 50 x 150 ft., two stories; the joiner and carpenter shop, 100 x 150 ft., two stories; the main office building, 70 x 500 ft., two stories; a main storehouse, 50 x 150 ft., two stories, and two branch storehouses, each 20 x 50 ft., two stories. The buildings are to be of steel framework with glass, iron and terra cotta sides, which will be covered with stucco. The roofs will be of wood with slag or asbestos covering.

Power for the plant will be supplied by the Public Service, Newark. All machinery will be electrically operated.

E. H. Gary, James A. Farrell, Joshua Hatfield, Robert MacGregor, Richard Trimble, August Ziesing and W. J. Filbert are directors of the Federal Shipbuilding Co. E. H. Gary is president; Richard Trimble is treasurer, and W. J. Filbert secretary.

The American Car & Foundry Co. has advanced the wages of all employees 10 per cent at its Milton, Pa., works, commencing the present month. About 1100 men are affected.

Iron and Steel Markets

STEEL PRICES TO ALLIES

Issue Raised on Italian Order

Lower Prices for Semi-Finished Steel and Resale Pig Iron

The President's anouncement of a $2 base on bituminous coal instead of the concession of a $3 price made by the operators is no surprise and it does not furnish the key to the vastly more complicated problem of steel prices. Coke prices, it is to be expected, will be fixed in line with coal, but as the fixing of a low price for coke will not increase the supply and may lessen it, the effect on the pig-iron market is yet to be determined.

Cheaper coal, however, will mean lower cost in melting and heating operations at steel works and hence some revision of cost sheets now in the hands of the Government.

While the steel trade waits for the Government to decide what it will pay for munition and ship steel, and expects that decision soon, the situation as to prices of steel for the Allies and the public is in no respect clearer. The Government's advisors are working to avoid a direct legal issue as to the taking of orders from the Allies at the same prices charged the Government, but two developments of the week indicate that the situation cannot be allowed to drift much longer.

The first of these was the practical suspension of the activities of the American Iron and Steel Institute's committee on steel, which has been the distributing medium for Government orders for war and ship steel. The question had been raised whether under the Lever bill members of this committee could legally take part in negotiating Government contracts with their respective companies. The Council of National Defense, to which the steel committee is attached, is satisfied of the legality of present procedure, but an authoritative ruling is still awaited.

A second important development was the holding up of the Government's orders for 10,000 tons of annealed wire and 20,000 tons of wire rods to be furnished to Italy. Half of this had been accepted by the manufacturers at prices to be determined later, with the proviso that the Government actually place the order and become responsible for payment. It was found that no appropriation existed which could be drawn upon to buy steel for a foreign government. Meantime the needs of the Allies in various forms of steel are pressing.

In the past week the last 15,000-ton lot in a total of about 175,000 tons of plates and shapes lately given out by the Shipping Board was placed in the Chicago district. The next distribution, which will come later in the year, will involve 400,000 tons for the standardized ships which are next in the board's program. The American Bridge Company is to hurry 10,000 tons of fabricated work for the new yard of the Federal Shipbuilding Company.

For the Government's railroad in France 3000 more standard gage cars have been placed. The 5000 cars yet to be bought are expected to be distributed shortly. The 20,000 tons of 25-lb. rails for portable track are still to be ordered and meantime quick delivery is wanted on 1000 tons of 35-lb. rails for the French line.

The French Commission wants 2000 tons of plates, and inquiries are noted from Italy for 5000 to 15,000 tons of 2-mm. to 3-mm. wire, 5000 tons of 4-in. billets, and 10,000 boxes of double-size tin plates.

Active inquiries in the week from Japanese sources for wire, chain rods, rivet rods, as well as plates, are not taken to mean that early adjustment of the embargo is expected, but rather the testing of prices for weak spots. It is understood that there are some plans for the rolling and storage of considerable tonnages of finished steel of which export is now prohibited.

As in previous weeks, the market has shown no significant change in prices, and in this respect interest has centered in pig iron, scrap and semi-finished steel. At Pittsburgh, offerings of billets and sheet bars have been freer, and prices are off $20 to $25 from the highest point reached. Three 1000-ton sales of billets are reported at $80. Large consumers of billets and sheet bars are having steel shipped to them faster than they can use it.

Any softening of pig-iron prices is usually found in resale transactions. Cases are cropping up in which there was overbuying, and not a little Southern iron has sold at concessions on this account. Embargoed export iron likewise is coming upon the market, and can only be moved at less than recent prices. The Government has placed 10,000 tons additional foundry iron in the Middle West at $35, and an effort is being made to gather up 40,000 tons of Bessemer iron for export to Italy. Bessemer iron has sold at $53 at Valley furnace, representing a decline of $2.

Pittsburgh

PITTSBURGH, Aug. 21 (*By wire*).

Conditions in the steel trade are in direct contrast with those existing a month or more ago. Up until early July, new demand for iron and steel products was fairly heavy, specifications were coming in actively and the whole steel trade was moving along nicely with prices firm. Then came the announcement from Washington that the Government might regulate steel prices on both domestic and export business, and business at once practically stopped and is still in that condition. With the possible exceptions of pig iron and semi-finished steel, specifications are quiet and there is very little new demand for finished steel of any kind, consumers not buying a pound that they can possibly avoid.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Aug. 22, 1917.	Aug. 15, 1917.	July 18, 1917.	Aug. 23, 1916.
No. 2 X, Philadelphia...	$53.00	$53.00	$54.50	$19.50
No. 2, Valley furnace...	53.00	53.00	55.00	18.25
No. 2 Southern, Cin'ti...	49.90	49.90	49.90	16.40
No. 2, Birmingham, Ala.	47.00	47.00	47.00	13.50
No. 2, furnace, Chicago*.	55.00	55.00	55.00	18.00
Basic, del'd, eastern Pa..	50.00	50.00	50.00	19.00
Basic, Valley furnace...	52.00	52.00	53.00	18.00
Bessemer, Pittsburgh ..	*53.95*	55.95	57.95	21.95
Malleable Bess., Ch'go*..	55.00	55.00	55.00	19.00
Gray forge, Pittsburgh..	46.95	46.95	47.95	18.70
L. S. charcoal, Chicago..	58.00	58.00	58.00	19.75
Rails, Billets, etc. Per Gross Ton:				
Bess. rails, heavy, at mill	38.00	38.00	38.00	38.00
O.-h. rails, heavy, at mill	40.00	40.00	40.00	40.00
Bess. billets, Pittsburgh.	*80.00*	85.00	100.00	45.00
O.-h. billets, Pittsburgh.	*80.00*	85.00	100.00	45.00
O.-h. sheet bars, P'gh....	85.00	85.00	105.00	45.00
Forging billets, base, P'gh	*115.00*	125.00	125.00	69.00
O.-h. billets, Phila.....	*90.00*	100.00	110.00	46.00
Wire rods, Pittsburgh....	90.00	90.00	95.00	55.00
Finished Iron and Steel				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	**5.185**	5.159	4.659	2.659
Iron bars, Pittsburgh....	4.75	4.75	4.75	2.60
Iron bars, Chicago.....	4.50	4.50	4.50	2.35
Steel bars, Pittsburgh...	*4.00*	4.50	4.50	2.60
Steel bars, New York....	**4.695**	4.669	4.669	2.769
Tank plates, Pittsburgh..	9.00	9.00	9.00	4.00
Tank plates, New York..	**10.195**	10.169	10.169	4.169
Beams, etc., Pittsburgh..	*4.00*	4.50	4.50	2.50
Beams, etc., New York..	4.669	4.669	4.669	2.669
Skelp, grooved steel, P'gh	4.00	4.00	4.00	2.35
Skelp, sheared steel, P'gh	6.00	6.00	6.00	2.45
Steel hoops, Pittsburgh..	5.75	5.75	5.25	3.00

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire,	Aug. 22, 1917.	Aug. 15, 1917.	July 18, 1917.	Aug. 23, 1916.
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh	8.50	8.50	8.50	2.90
Sheets, galv., No. 28, P'gh	10.00	10.00	10.00	4.15
Wire nails, Pittsburgh...	4.00	4.00	4.00	2.60
Cut nails, Pittsburgh....	4.65	4.65	4.65	2.60
Fence wire, base, P'gh..	3.95	3.95	3.95	2.55
Barb wire, galv., P'gh..	4.85	4.85	4.85	3.45
Old Material, Per Gross Ton:				
Iron rails, Chicago.....	$40.50	$40.50	$44.00	$18.50
Iron rails, Philadelphia.	45.00	45.00	45.00	20.00
Carwheels, Chicago	*29.00*	30.50	35.00	11.50
Carwheels, Philadelphia.	*34.00*	35.00	35.00	15.50
Heavy steel scrap, P'gh.	31.00	31.00	38.00	16.00
Heavy steel scrap, Phila.	**33.00**	31.00	32.00	14.75
Heavy steel scrap, Ch'go	**30.00**	29.00	32.00	15.25
No. 1 cast, Pittsburgh....	30.00	30.00	32.00	14.50
No. 1 cast, Philadelphia..	33.00	33.00	35.00	16.00
No. 1 cast, Ch'go (net ton)	**24.00**	23.00	28.50	11.50
No. 1 RR. wrot, Phila....	45.00	45.00	48.00	20.00
No. 1 RR. wrot, Ch'go (net)	**34.00**	33.50	37.00	15.25
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	*$15.00*	$16.00	$11.00	$2.85
Furnace coke, future....	10.00	10.00	10.00	2.50
Foundry coke, prompt...	14.00	14.00	12.00	3.25
Foundry coke, future....	**12.50**	10.00	10.00	3.50
Metals,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.	*26.50*	28.00	26.50	27.25
Electrolytic copper, N. Y.	*26.50*	28.00	26.50	26.87½
Spelter, St. Louis	8.50	8.50	8.62½	9.50
Spelter, New York.....	8.75	8.75	8.87½	9.75
Lead, St. Louis.....	*10.50*	10.75	10.37½	6.50
Lead, New York.....	*10.62½*	10.87½	10.50	6.62½
Tin, New York.....	*61.75*	62.25	62.50	38.50
Antimony (Asiatic), N. Y.	15.00	15.00	16.00	13.50
Tin plate, 100-lb. box, P'gh.	*$10.00*	$12.00	$12.00	$6.00

This has all come about because of the uncertainty as to what action the Government will take in regard to steel prices. It is not believed the Government will fix prices at which steel shall be sold to domestic consumers, but the fear that it may do so has put an effectual brake on new business. It is believed the Government will make its announcement about steel prices within a week or ten days at the farthest, and no matter what it may decide as to what prices shall rule for steel, its announcement will remove the tension that has existed for nearly a month, and may result in business starting up again. Bessemer iron at $52 to $53, billets and sheet bars at $80 to $85, and finished steel selling at fabulous prices are all taken as representing a fictitious market brought about by the fact that the export demand for steel products had been enormously heavy, and domestic consumers in order to get material were bidding against themselves for some months to get the mills to put them on their books, and this pushed prices up at a very rapid pace. As soon as the Government takes hold and names prices it will pay for steel for its own uses and also for the Allies, the market is likely to settle down to a more legitimate basis, and no doubt lower values will come. We do not look for any decided break in prices, but rather expect to see a gradual leveling of the market to a more reasonable basis. The embargo declared by the Government recently against export shipment on several kinds of steel has released a good deal of semi-finished steel in the forms of billets and sheet bars, and this has resulted in market prices going from $20 to $25 per ton below the highest figure reached. It also has resulted in some fair-sized lots of pig iron and steel being turned back for resale, and this has affected prices and caused a decline. Hardly enough business in pig iron, steel, finished material and in raw material, such as coke and scrap, has been done in the past month to fix prices. Prompt furnace coke has been held up in price because of the scarcity of cars and labor, but heavy steel scrap has gone off $16 to $18 per ton over the high prices reached some time ago. The recent embargo against shipments of scrap declared by the railroads has greatly helped to depress the market, as dealers cannot make shipments on old contracts, except by getting special permits from the railroads over which the scrap is to be moved. Prices on finished steel have as yet shown no material decline, but are softer and will likely be lower in the very near future.

Pig Iron.—The local pig-iron market is still very quiet, but several fairly large inquiries are in the market for Bessemer iron and one sale has been closed of about 1500 tons for delivery over the next three months at $53, or less, at Valley furnace. It is verified that Bessemer iron has been offered as low as $52, Valley furnace, or $52.95, Pittsburgh, and basic iron at less than $52, Valley furnace. Several sales of Bessemer may go through this week which will give a better line on the market than it has been possible to get for some time. It is known that the United States will be called on to furnish large quantities of Bessemer and basic iron to our Allies, notably Italy, and it is said that several large lots of Bessemer iron for export shipment may be wanted within a short time. The Government lately placed 10,000 tons of foundry iron with Western furnaces for early shipment. Some in the trade look for an active pig iron market early in October or before, and if the present heavy consumption of steel is maintained, there may be higher prices on pig iron before this year ends. It is pointed out that there has been a very heavy increase in output of open-hearth steel this year without corresponding increase in output of pig iron. For this reason, it is figured out that an active demand for Bessemer and basic iron for steel making purposes in the last three or four months of this year may bring prices on iron to a higher point

than now ruling. We have lowered our price on Bessemer iron $2 per ton, or to the basis of $53, Valley furnace, as there is no doubt that Bessemer iron can be bought without any trouble at that price or even lower.

Standard Bessemer iron, $53; basic, $52; No. 2 foundry, $53; malleable Bessemer, $53, and gray forge, $46, all at Valley furnace, the freight rate for delivery in the Pittsburgh and Cleveland districts from Valley furnaces being 95c. per ton.

Billets and Sheet Bars.—The offerings of both billets and sheet bars in the open market are getting freer right along, several large consumers of billets and sheet bars stating that steel is being shipped into them faster than they can use it, and they are offering some of it for resale. One leading interest recently offered 4000 to 5000 tons of billets and sheet bars for prompt shipment on the basis of $85 Pittsburgh. They were unable to make any sales at this figure, but finally sold 1000 tons of 4 x 4 in. soft open-hearth billets at $80 per gross ton, and a sale of 1000 tons of narrow slabs is reported at the same price. Another interest reports a sale of 1000 tons of soft Bessemer billets on the basis of $80 Pittsburgh. There seems to be more steel offering just now than there is a demand for and prices are soft. There has also been a decline in prices of forging billets, though not to the same extent as in soft billets. We are advised that ordinary carbons forging billets have been offered at as low as $115 Pittsburgh, with an intimation that a firm offering a lower price might be named. We have not heard of any sales of forging billets in this market for some time.

We now quote soft Bessemer and open-hearth billets at $80, and soft Bessemer and open-hearth sheet bars at $85, maker's mill, Pittsburgh or Youngstown. We quote forging billets at nominally $110 to $115 per ton for ordinary sizes and carbons, f.o.b. maker's mill.

Steel Rails.—The demand for new and re-rolled light rails has quieted down very much and prices are only fairly firm. The mills are filled up for some months ahead, but specifications against contracts have fallen off and it is said in some cases there have been cancellations of contracts for both new and re-rolled light rails placed sometime ago at high prices. It is understood the local mill will furnish a considerable part of about 20,000 tons of 25 lb. rails for use in building portable tracks in France. It is said no price has been fixed on these rails, but they are to be shipped out in about six weeks and the price will be agreed on later. The Cambria Steel Co., Johnstown, Pa., will likely roll part of this order. Both the Carnegie and Cambria companies took a good part of the 150,000 tons of 80 lb. rails that are to go to France. A double track railroad is to be built from some prominent port in France, probably Havre, to positions back of the firing lines for the movement of American troops and war supplies. This will result in a much quicker transportation of troops and supplies than by trucks, which are now used in France for this purpose. Prices on new light rails and standard sections are given on page 455.

Ferroalloys.—The new demand for ferroalloys of all kinds is quiet. A sale has been made of 350 to 400 tons of 80 per cent domestic ferromanganese for delivery in first quarter at $350 per gross ton delivered. For prompt shipment domestic ferromanganese is firm at about $400; for first quarter, $375; and for first half of next year $350 delivered. It is said that some fairly large contracts for 50 per cent ferrosilicon have been made lately for delivery all through next year at $130 delivered, this being the price of the leading producer. Small lots of 50 per cent ferrosilicon are being sold at $175 to $185 delivered. We quote 18 to 22 spiegeleisen at $75 to $80 delivered. There is not much new demand for Bessemer ferrosilicon or silvery iron, all consumers being pretty well covered over this year.

We quote 9 per cent Bessemer ferrosilicon at $89, 10 per cent $99, 11 per cent $95, 12 per cent $100, 13 per cent $105, 14 per cent $115, 15 per cent $125, and 16 per cent $135. We now quote 7 per cent silvery iron at $84 to $89, 8 per cent $85 to $90, 9 per cent $86 to $91, 10 per cent $87 to $92, 11 and 12 per cent $88 to $93. All f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having a uniform freight rate of $2 per gross ton for delivery in the Pittsburgh district.

Structural Material.—New inquiry is quiet and very little new work is being placed. It is said the American Bridge Co. is bidding on very little except Government work, and it will be called on to fabricate and erect the steel buildings for the Federal Shipbuilding Co. to be built in Hackensack Meadows, N. J., which will take a good part of its capacity for some months after active work on the plant starts. Several other local fabricators are also bidding on very little new work, stating they have about all the orders they can turn out over the next five or six months. The McClintic-Marshall Co. has taken 15,000 to 20,000 tons of steel for extensions to sheet mill buildings of the Whitaker-Glessner Co. of Wheeling, W. Va. The Jones & Laughlin Steel Co. has also taken about 2700 tons of reinforcing steel bars for a causeway at Galveston, Texas. Prices on beams and channels are easier and mill prices now range from 4c. to 4.50c. depending on the order and how soon the material is wanted.

Plates.—The plate market is easier in both demand and prices. The Government embargo on plates has made available large quantities of plates that would have gone abroad but that can now be had by domestic consumers. The pressure on the mills for plates by the new demand has eased up very much and it is now possible to get fairly prompt delivery from mills that sometime ago were refusing to quote. Of the order for 9000 steel cars for France, the Pressed Steel Car Co. has taken about 1600 cars, which will require 15,000 to 16,000 tons of plates and shapes to be furnished by the Carnegie Steel Co. No domestic orders for steel cars are being placed, and steel car builders say they would prefer not to take on any more domestic orders until they know more about what demands will be made on them by our Government for cars for its own use and for the Allies. We now quote ¼ in. and heavier sheared plates for fairly prompt delivery at 8c. to 9c. at mill, but possibly the lower price might be shaded by a few mills on certain sizes for delivery over the next two or three months. Small lots of sheared plates from warehouse bring 10c. to 11c., Pittsburgh.

Sheets.—Nearly all the new business that is being placed in sheets is coming from the Government, the domestic demand being quiet and specifications are not as active as they were some time ago. The consuming trade is evidently looking for lower prices on all grades of sheets to come very soon after the Government has announced the prices it will pay for steel. It is said that so far there have been very few cancellations of contracts of sheets placed some time ago at relatively high prices, but the trade is pursuing a conservative policy in regard to placing new orders. Several orders for Bessemer black sheets No. 28 gage have lately been placed at about 8c. at mill, which is slightly under what has been regarded for some time as minimum of the market. Prices on sheets to the domestic trade, which are none too firm, are given on page 455.

Tin Plate.—Food Administrator Hoover has called a meeting of the tin plate makers to be held in Washington, Friday of this week, Aug. 24. While the purpose of the meeting was not definitely stated, it is believed to be to talk over the present situation in tin plate and especially in regard to whether the mills will be able to furnish promptly bright plate to packers of perishable goods as fast as they will need it. The current domestic demand for tin plate is dull, but export inquiry is heavy from the Orient, India and other countries. A recent sale is reported of 22,000 base boxes of tin plate for export that netted $17.40 at mill. All the tin plate mills are filled up for the year, and with obligations now on their books, some mills are sold up into April next year. We quote small lots of bright plate from stock at $10 to $11 per base box at mill, while prices in effect on terne plate are given in detail on page 455.

Iron and Steel Bars.—Mills report that the new demand for both iron and steel bars has fallen off a good deal, due to the uncertainty as to what action the Government will take as regards prices for steel. Specifications from the implement trade are fairly active, but consumers believe that lower prices on both iron and steel bars are coming in the near future and are placing orders conservatively. Mill prices on steel

bars range from 4c. to 4.50c., but local mills for some months have been furnishing large quantities of steel bars to the Government at the price of 2.50c. at mill agreed upon some months ago. Mill prices in carlots and larger lots on iron and steel bars to the domestic trade are given on page 455.

Hoops and Bands.—There is not much new demand, consumers being covered, but the supply of both hoops and bands for prompt delivery is larger now than it has been for some time. We quote steel hoops in small lots for prompt shipment at 5.50c. to 6c. and steel bands 5c. to 5.25c., extras on the latter per the steel car card.

Muck Bar.—Prices are lower, due to the decline in mill iron. We now quote best grades of muck bar made from all pig iron at $85 to $90 per gross ton Pittsburgh.

Wire Rods.—Three local mills will furnish nearly half of the 20,000 tons of wire rods for Italy placed lately by the Government, the price not having been fixed, but will be after the Federal Trade Commission has made public its findings in regard to steel cost. The domestic demand for wire rods is fairly active, but not as heavy as some time ago. We note several sales of soft open-hearth and Bessemer rods at $90 to $95, maker's mill, while high carbon rods made from special steel bring $110 to $115, maker's mill. Prices on rods are given in detail on page 455.

Wire Products.—The situation in the wire and wire nail trades is very quiet and specifications against contracts are dull. The jobbing trade is hesitating very much in specifying against contracts for wire nails placed with the independent mills some months ago at $3.50 base per keg, while the price of the American Steel & Wire Co. is $3.20 per keg. Jobbers say they cannot compete if they have to pay 30c. higher for nails than their competitors and are insisting they should have a reduction in the price. Very little new business was placed at the $4 price or in bright basic wire at the $4.05 price, and some in the trade believe that these prices may soon disappear. Prices quoted on wire and wire nails by the independent mills, but which are now largely nominal, prices of the American Steel & Wire Co. being $16 per ton less, are given on page 455.

Shafting.—The Government has placed fairly heavy orders for cold rolled shafting for making airplanes and has also been a very heavy buyer of hot rolled material for making Government trucks. Makers of shafting say they are well sold up for the remainder of this year and desire to conserve a good part of their output for the Government, so that the falling off in new demand is not as yet being seriously felt. Specifications from the automobile trade are dull. Discounts remain at 10 to 5 per cent off list, depending on the order.

Railroad Spikes and Track Bolts.—Three of the local makers of spikes participated in the recent Government order for 53,000 kegs of spikes for the American railroad to be built in France, but one other maker did not bid on the inquiry, as its spike mill is being removed to another location. The new demand for railroad spikes is dull, but for boat spikes is very active. Spike makers are still conserving a large part of their output over this year and in the first half of next year for the expected needs of the Government. Prices on railroad spikes and track bolts are given in detail on page 455.

Cold Rolled Strip Steel.—The new demand has fallen off a good deal from domestic consumers, but the Government is still placing heavy orders for both hot and cold rolled material. Consumers are well covered over this year on contracts and specifications are fairly active. So far, there have been very few cancellations in contracts due to the general belief that prices may be lower in the near future.

On contracts, mills are quoting 9c. at mill, but on small current orders prices range from 10c. up to 12c. at mill. Terms are 30 days, less 2 per cent off for cash in 10 days when sold in quantities of 300 lb. or more.

Nuts and Bolts.—Makers say the new demand is not nearly so heavy as sometime ago, while specifications against contracts are still fairly active. The trade is evidently looking for lower prices on nuts and bolts in the near future and is not inclined to place new orders until more is known as to what prices the Government will fix on steel. It is said present prices on nuts and bolts are being firmly held and discounts to the large trade are given on page 455.

Coke.—The supply of cars in the Connellsville region last week was very short with the result that prices on blast furnace coke for prompt shipment held very high during the entire week and demand was heavy. Several large steel concerns that are heavy buyers of coke ran very short in the latter part of last week and as high as $15 and $16 per net ton at oven was paid for high grade blast furnace coke for prompt shipment three or four days in the past week. Tuesday there was a sale of 100 cars of high grade blast furnace coke for spot shipment at $15 per net ton at oven. One large coke producer that is furnishing coke to three or four consumers, fixing the price from day to day, charged these consumers $12 per net ton at oven for all blast furnace coke shipped to them in July. A contract for a considerable tonnage of foundry coke for delivery over six months from September was made a few days ago at $12.50 per net ton at oven. We now quote high grade blast furnace coke for prompt shipment at $15 per net ton at oven, but nothing is being done in contracts. Best grades of 72 hr. foundry coke are held at about $14 for prompt shipment and we quote the market on contracts at $12.50 per net ton at oven, but contracts were made several months ago for best grades of 72 hr. foundry coke for last half of this year at $9 and $10 per net ton at oven. There is still a great scarcity of coal miners and coke labor and some coke producers are not getting out more than 60 to 70 per cent of the amount of coke they should be making. *The Connellsville Courier* gives the output of coke in the upper and lower Connellsville regions for the week ending Aug. 11 at 441,953 tons, an increase over the previous week of 6880 tons.

Wrought Pipe.—The Manufacturers Light & Heat Co., this city, supplier of natural gas, has put out an inquiry for its supply of line pipe and other tubular products for delivery into late 1918. Included in the inquiry are 26,000 ft. of 10-in. pipe, 35-lb. to the foot, 100,000 ft. of 8¼-in. 24-lb., 30,000 ft. 6⅝-in. 20-lb., 150 000 ft. 6⅝-in. 17-lb., 50,000 ft. 5 3/16-in. 17-lb., 175,000 ft. 4-in. tubing, 100,000 ft. 2-in. tubing, 75,000 ft. 6-in. standard line pipe, 100,000 ft. 4-in. standard line pipe, 50,000 ft. 3-in. standard line pipe, 100,000 ft. 2-in. line pipe, 35 000 ft. 1½-in. merchant pipe, 75,000 ft. 1¼-in. merchant pipe, and 6000 ft. 1-in. merchant pipe. As yet, the prospective buyer has not covered for any part of this large inquiry, and expects to have some trouble in finding mills that will take it, owing to their filled up condition, and the fact that they are conserving as much of their output as posible to meet Government demands. All the above pipe is for delivery up to Sept. 30, 1918, and it may be some little time before the inquiry is covered. The Government is still buying more or less pipe and tubing, all of which the mills are shipping out about as promptly as the orders are placed. Recently a fairly large lot of 10-in. pipe was divided between the leading interest and the independent mills. None of the pipe mills has any lap-weld pipe to sell for delivery this year, and on some sizes mills are sold up far into next year. On butt-weld pipe, largely used in building operations, the demand is quiet owing to the great falling off in new building all over the country. On butt-weld sizes of iron and steel pipe, most mills can make delivery in 10 to 12 weeks, or less, from date of order. Discounts on steel pipe being quoted by most of the independent mills, prices of the National Tube Co. being much lower, and also discounts on iron pipe, as adopted by all the makers of iron pipe on July 1, are given on page 455.

Boiler Tubes.—None of the mills rolling iron and steel boiler tubes has any to offer on new orders over the next 6 to 12 months, but can occasionally fill small orders for certain sizes from stock. On seamless steel tubes, mills are sold up for a year to 18 months. The Government has been a very heavy buyer of boiler tubes to cover the vessel program which has started, and several makers of boiler tubes having Government orders on their books will not be called on to fill these orders before very late next year, or early in 1919. Fabulous

prices are being paid for small lots of iron and steel boiler tubes from stock, and also on oil country goods for fairly prompt shipment. The high prices and scarcity of casing and other oil country goods have stopped a good deal of new drilling that otherwise would have gone forward. Nominal discounts, which give prices very much below those that are actually ruling, are given on page 455.

Old Material.—The embargo recently declared by all the railroads against shipments of scrap, even over their own lines, noted in this report last week, has almost stopped shipments of scrap. All the leading railroads serving the Pittsburgh district are absolutely refusing to accept any shipments of scrap for delivery on their own lines, unless the shipper secures a special permit from the superintendent of transportation. In addition, the consumer to whom the scrap is to be shipped must furnish a letter to the superintendents of transportation of the railroads, stating they are ready to accept the shipment and unload the cars promptly. Reports printed recently that the new demand for scrap had improved, and that prices had shown some advance, were entirely incorrect. Not enough scrap has been sold to consumers in this district in the past three or four weeks to accurately fix prices, and in the meantime the market has steadily declined, and is still very soft. At the same time, dealers know it is useless to try to force sales of scrap, and are simply resting on their oars, waiting until the situation changes. Three or four of the larger dealers in this district report they have not made an important sale of scrap for nearly a month, and in this condition prices quoted are largely nominal. Dealers quote for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$31.00 to $32.00
No. 1 foundry cast	30.00 to 31.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	38.00 to 40.00
Hydraulic compressed sheet scrap	25.00 to 26.00
Bundled sheet scrap, sides and ends, f.o.b. consumers mill, Pittsburgh district	23.00 to 24.00
Bundled sheet stamping scrap	21.00 to 22.00
No. 1 railroad malleable stock	26.00 to 27.00
Railroad grate bars	18.00 to 19.00
Low phosphorus melting stock	41.00 to 42.00
Iron car axles	45.00 to 46.00
Steel car axles	45.00 to 46.00
Locomotive axles, steel	52.00 to 53.00
No. 1 busheling scrap	24.00 to 25.00
Machine-shop turnings	18.00 to 19.00
Cast iron wheels	31.00 to 32.00
Rolled steel wheels	36.00 to 37.00
*Sheet bar crop ends	41.00 to 42.00
Cast iron borings	19.00 to 20.00
No. 1 railroad wrought scrap	32.00 to 33.00
Heavy steel axle turnings	23.00 to 24.00
Heavy breakable cast scrap	24.00 to 25.00

*Shipping point.

Chicago

CHICAGO, Aug. 20.

Buyers and sellers of steel and allied products are awaiting definite action on the part of Washington, particularly in regard to prices, and the hope is fervently expressed that some basis on which to proceed will be made known soon. That the Government will deal fairly with the producers is quite generally believed. Indications of a slightly easier market are in evidence, a result, it is stated, of the Government's embargo on exports. An Eastern mill which is a factor in the West, expects to have soon some plates to offer. It is offering light rails, but at prices ranging from $95 to $100. It is reported that some of the builders with whom cars for shipment to France were placed have had their orders increased 50 per cent. The agricultural implements' interests are feeling around for materials, particularly bars, but it is not felt they will buy for 1918 until the price atmosphere has cleared. Some authorities express the opinion that this industry erred in being slow in raising its prices; that if it had made advances as the market went up, it would not now be so apprehensive over the inevitable decline. One effect of the war has been to cause vast quantities of hay to be baled, with a consequent heavy demand for bale ties. Rail carbon bars are in good demand except for concrete reinforcing. The taking of about 3000 tons of ferromanganese is reported, all domestic product, mostly for the first and second quarters, and the price has been advanced $25 for first quarter delivery, or to $375. Pig iron is quiet, and firmly held by first hands, but some resale lots have been sold at concessions, the iron coming from foundries where strikes have interfered with melting. Old material presents a healthier appearance, although dealers have been the chief buyers. The mills, while not yet buying scrap, are showing interest by stating what they will pay.

Pig Iron.—The situation in general is unchanged, first hands holding firmly to their quotations, but getting less inquiry than has come to them at any time in recent weeks. The Northern makers quote $55, for basic, No. 2 foundry and malleable Bessemer, delivery this side of next July. It is reported that makers of agricultural implements find it none too easy to obtain malleable castings. The Southern furnaces quote $50, Birmingham, for 1917 delivery of No. 2 foundry, and all the way from $45 to $50 for the first half. The chief feature of the market lies in the placing at concessions of resale lots of both Northern and Southern iron, the sellers being foundries which have serious strikes on their hands. One such foundry is in Chicago and another is in Milwaukee. Of course, there is not much iron made available in this way, but what has been offered has been quickly taken. In some cases, it is understood the resale price has been less than $50, furnace. The Tennessee furnaces are in a bad way for lack of coke, which they plead in responding to the numerous letters sent to them urging that deliveries be hurried. One furnace in that predicament, has not banked, but it has been unable to make the high silicon iron which is its usual product. Throughout the South, the inadequate coke supply, lack of labor and shortage of cars harass the producers, the situation being most acute with the smaller furnaces. With their explanation for non-delivery, some Southern makers ask that they be apprised of any spot coke they can secure. A South Chicago steel mill is casting around for some basic, delivery in 1918. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 1 to 4	$58.00
Lake Superior charcoal, Nos. 5 and 6, Scotch and No. 1 soft or special	60.50
Northern coke foundry, No. 1	55.50
Northern coke foundry, No. 2	55.00
Northern coke foundry, No. 3	54.50
Northern high-phosphorus foundry	55.00
Southern coke No. 1 f'dry and 1 soft	55.00
Southern coke No. 2 f'dry and 2 soft	54.00
Malleable Bessemer	55.00
Basic	55.00
Low-phosphorus	$90.00 to 93.00
Silvery, 8 per cent	82.75 to 83.00

Ferroalloys.—Some good-sized tonnages of 80 per cent ferromanganese have been placed with domestic makers, and $350 has been withdrawn as the price for the first quarter. Quotations are now $400 for delivery this year, $375 for the first quarter (an advance of $25) and $350 for the second quarter. It is reported that a Birmingham mill took 600 tons, a Peoria mill about 800 tons, and Pittsburgh interests about 1500 tons, mostly for the first quarter and first half. Advices from England have been to the effect that not much must be expected from that quarter. Ten per cent Bessemer ferrosilicon is held around $100, Jackson, Ohio.

Plates.—An Eastern mill holds to the belief that the Government embargo on exports will make delivery somewhat easier in the near future. Meanwhile prices range from 10c. to 10.50c. The leading interest and other large makers are not selling, except to the Government. Jobbers report that their stocks of plates and other materials are getting very low, and to them the situation looks as though it might become worse.

For Chicago delivery out of stocks jobbers quote 10c.

Structural Material.—The quotation, so far as there is any, hangs around 6c., Pittsburgh, or 6.189c., Chicago, but the leading makers are unanimous in saying they

are out of the market. It is learned that some of the carbuilders who recently received orders from the Government for cars to be shipped in knock-down form to France have had their orders increased by 50 per cent. It is believed that some, if not all, of the cars sent to France will be assembled in a plant which the Standard Steel Car Co. maintains in that country. For their diminishing stocks, jobbers continue to quote 6c., for material out of Chicago warehouses. Four structural lettings are announced, but they are all small, as follows:

Tumbling room for Scott Street Works of the American Steel & Wire Co., Joliet, Ill., 110 tons, to the American Bridge Co.

Power house building, for James S. Kirk & Co., Chicago, 139 tons, to the South Halsted Street Iron Works.

Steel work for a machine shop at Bingham, Utah, for the Utah Copper Co., 280 tons, to the Minneapolis Steel & Machinery Co.

Factory and power house for the National Lamp Works of the General Electric Co., Chicago, 280 tons, to A. Bolter's Sons.

Bars.—Mild steel bars are unchanged at 4.50c., Pittsburgh, or 4.689c., Chicago. Agricultural implement makers have been sounding the market for bars for 1918 delivery, but it is questionable how far they will go while the present uncertainty prevails as to prices. They have done some buying of rail carbon bars, the current market for which is about 4.50c., Chicago. The bedstead makers also have purchased this class of stock. The demand for concrete reinforcing bars is under normal. The quotations for iron bars range from 4.50c. to 5c., Chicago, and the market has been active, partly as a result of the scarcity of steel. Jobbers' quotations are unchanged.

We quote prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c. to 5c.; reinforcing bars, 4.50c., base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Wire Products.—The situation is without change, the leading interest continuing to quote on the basis of $3.20 for nails. Specifications for most products continue good, although fencing is not particularly active. The quotations of independent makers are based on $4 per keg for nails. It is intimated that a new price may soon be announced on wire rods, but further than that the intimation does not go. The lack of new building, so generally reported, does not seem to have lessened the demand for nails to any appreciable degree. We quote as follows on the basis of $4, Pittsburgh, for nails per 100 lb., to jobbers:

Plain fence wire, Nos. 6 to 9, base, $4.189; wire nails, $4.189; painted barb wire, $4.339; galvanized barb wire, $5.039; polished staples, $4.339; galvanized staples, $5.039; all Chicago, carload lots.

Sheets.—Hardly any change can be reported, except that one mill which was quoting 10.50c. for No. 28 galvanized has withdrawn that price, and only passes on inquiries after they have been submitted to the mill. The quotation for No. 28 black sheets is about 9.189c., Chicago, No. 10 blue annealed range from 8.939c. to 9.189c., Chicago. Jobbers have made no change in their quotations.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 10c.; No. 28 black, 10c., and No. 28 galvanized, 11.50c.

Rails and Track Supplies.—Light rails from 12 to 45 lb. are procurable from an Eastern mill at prices ranging from $95 to $100. The leading interest also has placed some light rails, but at lower prices than those referred to. The quotations of the principal maker, with the exception of tie plates, follow:

Standard railroad spikes, 4.25c. base; small spikes, 4.50c., base; track bolts with square nuts, 5.25c., all in carloads, Chicago; tie plates, $70 to $90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base; open hearth, $40; light rails, 25 to 45 lb., $65; 16 to 20 lb., $66; 12 lb., $67; 8 lb., $68; angle bars, 3.25c., base.

Bolts and Nuts.—New business is light and expected to remain so until there is some definite outcome to the Government price-fixing program. Awaiting this action, large interests are holding up their orders for the first half of 1918, and it is felt there will be a rush to place contracts when the desired information is at hand. For prices and freight rates, see finished iron and steel, f.o.b. Pittsburgh, page 455. Store prices are unchanged.

Store prices are as follows: Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to ⅜ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to ⅜ x 6 in., 40-2½; larger sizes, 30-5; hot pressed nuts, square, $3, and hexagon $3 off per 100 lb.; lag screws, 50 per cent off.

Cast-Iron Pipe.—Minneapolis, Minn., is expected to enter the market for 1300 tons, although prices may prove a stumbling block. Wauwatosa, a suburb of Milwaukee, will buy 200 tons. The Government has placed about 500 tons of 6-in. pipe for its aviation camp at Grassland, Ill.

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., $68.50; 6 in. and larger, $65.50, with $1 extra for class A water pipe and gas pipe.

Old Material.—The market is a peculiar one in that most of the buying is on the part of dealers who need material to close up contracts made at recent high levels, and they are willing to pay more than consumers will give at the present time. The situation is healthier because mills which would not consider business a few weeks ago are now at least willing to say what they will pay. While one or two items show some further decline, based on actual transactions, others show more strength. The railroad offerings continue moderate, the Wabash offering about 1000 tons, while the Grand Trunk and C. & A. have issued small lists. There appears to be sufficient material available, the main trouble being in getting cars in which to move it. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$40.50 to $41.50
Relaying rails	50.00 to 55.00
Old carwheels	29.00 to 30.00
Old steel rails, rerolling	38.00 to 39.00
Old steel rails, less than 3 ft.	38.00 to 39.00
Heavy melting steel scrap	30.00 to 31.00
Frogs, switches and guards, cut apart	30.00 to 31.00
Shoveling steel	27.00 to 28.00
Steel axle turnings	21.00 to 22.00

Per Net Ton

Iron angles and splice bars	$38.00 to $39.00
Iron arch bars and transoms	40.00 to 41.00
Steel angle bars	30.00 to 31.00
Iron car axles	40.00 to 41.00
Steel car axles	40.00 to 41.00
No. 1 railroad wrought	34.00 to 35.00
No. 2 railroad wrought	31.00 to 32.00
Cut forge	31.00 to 32.00
Pipes and flues	21.50 to 22.50
No. 1 busheling	25.50 to 26.50
No. 2 busheling	17.50 to 18.50
Steel knuckles and couplers	41.00 to 42.00
Steel springs	42.50 to 43.00
No. 1 boilers, cut to sheets and rings	20.50 to 21.00
Boiler punchings	31.00 to 32.00
Locomotive tires, smooth	40.00 to 41.00
Machine-shop turnings	16.50 to 17.50
Cast borings	16.50 to 17.50
No. 1 cast scrap	24.00 to 25.00
Stove plate and light cast scrap	17.50 to 18.00
Grate bars	17.50 to 18.50
Brake shoes	19.00 to 19.50
Railroad malleable	30.50 to 31.50
Agricultural malleable	23.75 to 24.75
Country mixed scrap	16.00 to 16.50

Philadelphia

PHILADELPHIA, Aug. 20.

New business, particularly in iron, is almost at a standstill in this market. There is a constant demand for delivery, both in iron and steel, and continuous requests for anticipation of shipments, but new buying for domestic business is on a limited scale. Government work keeps coming along, and there is, of course, a large demand for materials to be used on work in which the United States or the allied Governments have an interest more or less direct. Bar iron, boat spikes and plates come under this classification, as does an inquiry from a large locomotive builder for approximately 650 tons of spring steel to be used in repairs to British locomotives.

Pig Iron.—Light inquiry and small sales sum up the week. Two or three carloads constitute a sizable sale in the foundry grades as things go, and the steel-making irons are still quiet with prices nominal. Prices which have ruled for the last few weeks have been maintained in the small transactions involving Pennsylvania iron,

while the only transaction reported in No. 2 X Virginia was made on a basis of $52.50, furnace, which has been the recognized top in that grade. Small tonnages of off-grade Southern iron have been sold at $41, Birmingham, and $85 is reported as the price in a sale of copper-bearing low phosphorus. There have been no transactions in basic and standard low phosphorus. With the bulk of the furnaces sold far ahead, buyers seem to feel that it is good policy to wait, on the ground that after all prices probably will not go higher. Quotations on standard brands, largely nominal, are as follows for prompt shipment, delivery being made in buyers' yards:

Eastern Penna. No. 2 X foundry	$53.00 to $55.00
Eastern Penna. No. 2 plain	52.50 to 54.50
Virginia No. 2 X foundry	54.25 to 55.25
Virginia No. 2 plain	53.75 to 54.75
Basic	50.00 to 52.00
Standard low phosphorus	90.00

Ferroalloys.—Activity continues in ferromanganese, good sales being accompanied by stiffening prices. For the most part, sales are now being made on a basis of $400 for the remainder of this year, with $375 reported in transactions for the first quarter of 1918 and $350 quoted for the second quarter. Spiegeleisen is likewise stronger, at $82.50 to $85, furnace. Reports indicating additional difficulty in the near future over obtaining Brazilian ore have added to the strength of the ferromanganese market. Quotations of $165 on small lots of 50 per cent ferrosilicon for first half 1918 are heard, and a quotation of $105, furnace, for prompt shipment was given on 11 per cent Bessemer ferrosilicon.

Coke.—Spot fuel was quoted to-day at $15 to $16, with $15.50 apparently the ruling figure. The general fuel situation is reflected in the fact that to-day's quotations on ordinary bituminous coal were $4.50 to $5 per gross ton at the mine as against the price of $3 per net ton and 25 cents commission, as proposed in the agreement the operators submitted to the Government some time ago, but which was rejected by Secretary Baker.

Billets.—Mills in this territory, for the most part, report no billets to offer and no transactions have been reported this week. In some instances, old customers are being scaled down in their allotments. However, influences which have been at work in other steel-making districts are being felt here, and one of the leading houses in this territory is offering small slabs and soft steel billets, 4 in. and up, at $95, with moderate tonnages available. Forging billets are virtually off the local market, and the price of $125 for 1918 delivery, as recorded in the last sale reported, still obtains as the nominal basis.

Plates.—Many small orders for civilian work were entered during the past week and more could be had by the mills if guarantee of reasonable delivery could be given. Mills are doing their best to look after the smaller consumers, so far as Government interests will permit. Export orders continue to appear, but receive scant attention. Locomotive builders and bridge shops are placing orders constantly, while shipyards are specifying heavily. The increase in specifications means longer delay in deliveries, particularly on domestic business. Prices are unchanged, the minimum being 10.159c., Philadelphia, for tank and 12.50c., mill, for ship steel.

Structural Material.—An inquiry for about 4500 tons of car shapes, of which no disposition has yet been made, constitutes the week's main feature in structural materials. Mills have virtually nothing but odd lots to sell, and prices on this "left-over" material are reported by one Eastern interest as 6.10c., f.o.b. mill. Prices as high as 10c. for fabricated material are reported on small jobs.

Sheets.—Additional inquiry on material for army stoves is reported, and the prospects for supplying domestic orders is dimmer, so far as mills in this territory are concerned. Such orders as can be filled are taken on the old basis of 8¾c. for No. 10 blue annealed.

Iron and Steel Bars.—Soft steel bars are being held at 4½c. to 5c., Pittsburgh, by makers, the former price being cited by one mill which qualified the statement with the information that it had few, if any, to sell. One maker of bar iron gives 4¾c., Pittsburgh, as the price for carload lots, with 5c., Pittsburgh, asked for lesser quantities. Another considerable maker stands firmly on 5c., Pittsburgh, as the minimum and reports plentiful inquiry. The shipbuilding program, which is bringing a great deal of work to the Delaware River, is responsible for stimulating this branch of the trade, and it has likewise boomed the demand for ship spikes, inquiries usually stating that amounts sufficient for 10 wooden ships are desired.

Old Material.—Owing to the requirements of the Pennsylvania Railroad embargo on scrap shipments, whereby the purchaser must certify the transaction before cars will be accepted from the shipper, the movement of old material is falling back and some houses report that they are ten days behind. Dealers say that the extra work involved is so great that any revival of business will necessitate the establishment of traffic departments, or something very like them, in order to get shipments under way. There has been comparatively little trading during the last week, but in spite of the embargo a distinctly better tone is reported, largely on account of the improvement in Pittsburgh conditions. Quotations, largely nominal, per gross ton delivered in eastern Pennsylvania are:

No. 1 heavy melting steel	$33.00 to $34.00
Steel rails, rerolling	43.00 to 45.00
Low phosphorus heavy melting	40.00 to 43.00
Old iron rails	45.00 to 47.50
Old carwheels	34.00 to 35.00
No. 1 railroad wrought	45.00 to 50.00
No. 1 forge fire	22.00 to 23.00
Bundled sheets	22.00 to 23.00
No. 2 busheling	16.00 to 17.00
Machine shop turnings (for blast furnace use)	19.00 to 20.00
Machine shop turnings (for rolling mill use)	20.00 to 21.00
Cast borings (for blast furnace use)	19.00 to 20.00
Cast borings (clean)	22.00 to 23.00
No. 1 cast	33.00 to 34.00
Grate bars	20.00 to 21.00
Stove plate	21.00 to 22.00
Railroad malleable	32.50 to 35.00
Wrought iron and soft steel pipe (new specifications)	29.00 to 31.00

Cincinnati

CINCINNATI, Aug. 21, 1917. (*By Wire.*)

Pig Iron.—The slowing down in sale of spot shipment foundry iron characterizes the entry of the present week and as a continuation of a long drawn out dull period. Few new entries have been made in order books during the past few days, and the small amount of iron bought consists of Southern foundry that is urgently needed. The inquiry is exceedingly light, although a northern Ohio melter is asking for 3000 tons of mixed Northern and Southern grades for shipment through the last quarter of this year and into the first half of next year. Rumors that resale iron in the South is being offered below market prices have not yet been substantiated, but a number of consumers have iron due on contracts made at lower prices, and some of them are not averse to selling any surplus they may have for this year. First half prices are hard to obtain. The last furnace quotation issued was $45, Birmingham, but $44 has recently been offered by at least one holding interest for that delivery. Both buyers and sellers are waiting on Washington. The foundry iron melt has fallen some on account of the hot weather, but the consumption of steel making irons in this vicinity is above normal. Northern foundry is unchanged at $55, Ironton, with few transactions reported of any nature. The Virginia irons have not been heard of lately, with the exception of a few rush cars that were sold to melters badly in need of the metal. Norton furnace, Ashland, was banked Monday on account of labor troubles. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, as follows:

Southern coke, No. 1 f'dry and 1 soft.	$51.40 to $52.40
Southern coke, No. 2 f'dry and 2 soft.	49.90 to 50.90
Southern coke, No. 3 foundry	49.40 to 50.40
Southern coke, No. 4 foundry	48.90 to 49.90
Southern gray forge	48.90 to 49.90
Ohio silvery, 8 per cent silicon	87.26 to 91.26
Southern Ohio coke, No. 1	56.26 to 57.26
Southern Ohio coke, No. 2	56.26 to 57.26
Southern Ohio coke, No. 3	55.26 to 56.26
Southern Ohio malleable Bessemer	56.26 to 57.26
Basic, Northern	56.26 to 57.26
Lake Superior charcoal	56.75 to 57.75
Southern carwheel foundry	48.90 to 49.90

Coke.—The difficulties at the ovens are increasing. Labor is still causing trouble on account of its scarcity and unreliability. A recent visit made by a dealer to one of the large producing fields discloses no relief is in sight in that section. The hot weather again prevailing is calculated to still further disturb conditions. The car supply improves one day and slips back the next, so that shippers are nearly always uncertain as to being able to keep promises on shipments to their customers. Spot foundry coke prices are so far apart that it is almost useless to quote them. For instance, last week some 72-hr. coke was sold in the Connellsville district as low as $14 per net ton at oven, to be followed by other sales the same week at $16. Pocahontas, Wise County and New River prompt prices are on the same level, but there has been no change in contract quotations that range from $11 to $12.50 for foundry coke in all the different districts named. The absence of any transactions in furnace coke renders it difficult to quote, but the nominal contract prices are from $9 to $10 per net ton at oven.

Finished Material.—The jobbers report a recent very heavy demand for twisted reinforcing concrete rods. Some of this business is from bridge builders, but most of it is from contractors who are putting up manufacturing buildings. Dayton, Ohio, builders have lately bought heavily from warehouse stocks, owing to their inability to get more prompt shipments from the mills. The store price on both iron and steel bars is 5c. and on twisted steel bars 5.05c. Plates ¼-in. and heavier are firm at 10c. base and No. 10 blue annealed sheets 10c. Cold rolled shafting from jobbers' stocks is quoted at 15 per cent plus list. One Pittsburgh mill is quoting 5 per cent off the list Pittsburgh, but has only odd sizes to offer for nearby shipment. Machine bolts ⅜ x 4-in., and smaller are unchanged at 40 per cent discount; larger and longer, 30 per cent discount. No. 28 black sheets are quoted nominally at 9.65c. Cincinnati or Newport, Ky., and No. 28 galvanized around 11.65c. Wire nails are sold by the jobbers at $3.90 per keg base, but business is light and confined to less than carload lots. Barb wire remains at 5c. a lb.

Old Material.—An unexpected advance occurred on nearly all grades of scrap material. Steel scrap probably responded more quickly to the increased demand than any other kind. Mills in the Pittsburgh district especially are reaching out quietly for a future supply, but little or no buying is reported for next year's shipment. Orders now placed are mostly for delivery this year. The present situation refutes the statement made several weeks ago that the steel mills had covered for their entire requirements this year. The following are dealers' prices f.o.b. at yards Cincinnati, and Southern Ohio:

Per Gross Ton

Bundled sheet scrap	$20.00 to $20.50
Old iron rails	34.00 to 34.50
Relaying rails, 50 lb. and up	45.50 to 46.00
Rerolling steel rails	37.00 to 37.50
Heavy melting steel scrap	33.00 to 33.50
Steel rails for melting	33.00 to 33.50
Old carwheels	30.00 to 30.50

Per Net Ton

No. 1 railroad wrought	$32.00 to $32.50
Cast borings	13.00 to 13.50
Steel turnings	13.00 to 13.50
Railroad cast	23.00 to 23.50
No. 1 machinery cast	25.00 to 25.50
Burnt scrap	14.50 to 15.00
Iron axles	44.00 to 44.50
Locomotive tires (smooth inside)	37.00 to 37.50
Pipes and flues	18.00 to 18.50
Malleable cast	25.00 to 25.50
Railroad tank and sheet	16.00 to 16.50

Birmingham

BIRMINGHAM, ALA., Aug. 20—(*By Mail*).

Pig Iron.—There is a steady run of small orders in the case of the only two iron makers who appear interested in sales, but the average is small. The price deadlock continues, resale iron left over at ports being small in quantity and not affecting the general run. Spot sales during the week have been at $50 and $52. Two furnace interests reports 1917 sales at $50 and 1918 sales at $48. There are furnace interests which would sell at $45 if there was any manner of competition, but there is none. Several interests have not scratched order books in ten days to two weeks. Furnace operators have found difficulty in delivering higher grades of iron as specified, because wet weather has produced more low grades than usual. Alabama yard stocks went down 45,000 tons in July. Freight movements were unusually good, the report of the Alabama Demurrage Association for July showing movements of 91,520 cars, an increase over July, 1916, of over 24,000 cars. Buyers who have sought advice of operators as to advisability of purchasing at present prices have been advised to hold off until Washington does something definite. Makers are not anxious to assume responsibility as to the future. Government contracts for shells and other iron and steel shapes have been received in quantities by Birmingham foundries. We quote per gross ton, f.o.b. Birmingham furnaces, for prompt delivery as follows:

No. 1 foundry and soft	$50.50 to $51.50
No. 2 foundry and soft	50.00 to 51.00
No. 3 foundry	49.50 to 50.50
No. 4 foundry	49.25 to 50.25
Gray forge	49.00 to 50.00
Basic	50.00 to 51.00
Charcoal	55.00 to 56.00

Cast-Iron Pipe.—There has been very little new pipe business since the reception of one or two sizeable Western orders and more Government specifications. The latter are taken at $5 under the regular price and specify rush delivery. We quote per net ton, f.o.b. pipe shop yards, as follows: 4 in., $63; 6 in. and upward, $60, with $1 added for gas pipe and special lengths.

Coal and Coke.—Coal production suffered some during the week owing to unrest incident to the threatened walkout scheduled for the 20th but called off Saturday pending effort of Secretary Wilson to adjust differences. Prices remain firm around the basis fixed by the Government. Coke is firm at a minimum of $12.50 on contracts and $14 for spot. As high as $17 has been paid for rush beehive foundry coke. Delivery in the southwest is reported as good.

Old Material.—The scrap market shows further recessions. The yards have large quantities, but consumers seem well-provided for, thus producing stagnant conditions. All schedules are down $1 to $2 per ton. We quote per gross ton, f.o.b. dealers' yards, as follows:

Old steel axles	$50.00 to $51.00
Old steel rails	24.50 to 25.00
No. 1 wrought	26.00 to 27.00
No. 1 heavy melting steel	17.00 to 18.00
No. 1 machinery cast	22.00 to 22.50
Carwheels	22.50 to 23.00
Tram carwheels	21.00 to 22.00
Stove plate and light	15.50 to 16.00
Turnings	11.00 to 12.00

Iron and Steel Bars.—Steel bars in car lots, f.o.b. Birmingham, 4.75c. to 5.00c.; iron bars, 4.40c. to 4.60c.

British Steel Market

LONDON, Aug. 21—(*By Cable*).

The pig iron market in the Cleveland district is more quiet. Hematite is strong. Semi-finished material is dull. Iron rods are unchanged. Tin plates are slow but firm. Ferromanganese sold at £80 f.o.b. for September and October. We quote as follows:

Tin plates, coke 14 x 20; 112 sheets, 108 lb., f.o.b. Wales, maximum, 30s.
Black sheets, £21 5s
Ferromanganese, £45 nominal.
Ferrosilicon, 50 per cent, c.i.f., £35 upward.
On other products control prices are as quoted in THE IRON AGE, of July 19, p. 171.

New York

NEW YORK, Aug. 22.

The principal activity in the pig iron market is for export. Inquiries amounting to about 25,000 tons for Bessemer and low phosphorus for export to a foreign country are pending and Italy is in the market for 500 tons per month of basic for 12 months, beginning with January. Owing to the limited amount of pig iron available and high freight rates, there is much uncertainty as to whether this iron can

be furnished for export. Recent sales for foreign shipment are 500 tons for Japan and the same amount for Italy, both low in phosphorus, sulphur and silicon. No large inquiries from domestic millers are pending. One for 600 tons of foundry iron for delivery through the remainder of this year has been withdrawn, and one for 400 tons for Western shipment is pending. A sale of 200 tons of Virginia iron has been made for delivery in New Jersey. In spite of the dullness, prices are being firmly adhered to. Embargoes continue throughout New England and shipments are made only for Government work and many foundries are badly in need of iron. We quote for tidewater deliveries in the near future as follows:

No. 1 foundry	$53.25 to $54.25
No. 2 X	52.75 to 53.75
No. 2 plain	52.50 to 53.50
Southern No. 1 foundry	52.75 to 53.75
Southern No. 2 foundry and soft	52.25 to 53.25

Structural Material.—Government business continues to monopolize attention, and export inquiry is, on the whole, of diminished volume, with general building operations a negligible factor. For export on 1200 tons of 3-in. and larger angles for the Far East for shipment in September, 5c., Pittsburgh, was offered to one mill. In this connection, an interesting development may be noted in a mill charge on 500 tons for India of 1c. per pound to cover inspection, the steel having been sold at 6c. For buildings for the Government projectile plant at Charleston, W. Va., 500 to 750 tons will be required, covering three general buildings and six magazine storehouses. Perhaps 500 tons is involved in a general storehouse for the naval operating base at Hampton Roads. Government buildings are also to be built as follows: Two each at Hingham, Mass.; Lake Denmark, near Dover, N. J., and at Fort Mifflin, on St. Julians Creek, Va. For the Charleston plant, the American Bridge Co. is fabricating three 6-ton Heroult furnaces. Additional railroad bridge work has appeared, including 100 tons for the Boston & Albany, 125 tons for the Baltimore & Ohio and 100 tons for the New York Central, the last placed with the American Bridge Co. Of other structures on which bids will soon be taken, mention may be made of a Y. M. C. A. building, Rahway, N. J.; the Cumberland Street Hospital, Brooklyn; a Long Island City postoffice; Knickerbocker Hospital, New York; a power house for the General Hospital, Philadelphia, and 300 tons for the New York Belting & Packing Co., Passaic. Owing to the increase in freight rates from Pittsburgh of approximately 15 per cent, quotations are now as follows: Mill shipments, 4.695c. to 5.195c., New York, largely according to the urgency of shipment; while from warehouse, shipments are made at 5c. and 5.25c. per pound, New York, according to sizes desired.

Steel Plates.—Practically no business has been done and chief interest centers on what will be done with existing Japanese contracts, owing to the Government embargo. From Japanese buyers, inquiry on various forms of finished steel have been numerous, but they seem more to be attempts to test market prices than to indicate a belief in an early lifting of the embargo. In some of the unfilled contracts, it appears that mills may, in the event of embargoes, exact payment if material can be loaded on cars, though it is not clear that, should cars be available, the Government's restriction on limiting the rolling date to Aug. 10, would not supersede. All told, 9000 cars of standard gage have now been bought for the Government's railroad in France, with the likelihood that the 5000 cars remaining of the ultimate total of 17,000 will shortly be distributed among the car builders not yet participating. The additional 3000 cars were distributed among the six companies awarded the first 6000 cars. Of plate inquiries, 2000 tons are noted from Japan and 2000 tons from the French Commission. Allowing for the increased freight rates, effective Aug. 20, we quote tank plates from mill at 10.195c., New York, and ship plates at 12.169c., New York, both for domestic and foreign consumption, the freight rates being the same for export as for seaboard shipment. Out of stores, we quote plates at 8c. to 11c.

Iron and Steel Bars.—No transactions of importance have occurred, but a recent sale of 800 tons of small rounds is noted at 4.60c. at mill. Consumers are pretty well covered for this year and jobbers are not notably concerned over fourth-quarter supplies, the industry playing a waiting game, expecting lower prices, predicated on hopes of regulation from Washington and on a belief in a considerable increase in steel rolling capacity. This view seems to be contradicted so far as all forms of finished steel are concerned in view of the general practice of the mills for weeks not to consider new business offered. Reductions in the amount of tonnage booked from week to week could, it is explained, have been prevented if mills chose to maintain bookings months in advance of rollings. Allowing for the increased freight charges, effective Aug. 20., we quote steel bars from mill at 4.695c. to 5.695c., New York, and mill shipments of bar iron at 4.945c. to 5.195c., New York. From New York district warehouses, steel and iron bars are sold at 5c. to 5.50c.

Ferroalloys.—It has been a comparatively light week in ferromanganese after the considerable sales reported one week ago. It is now indicated that roundly 3000 tons of ferromanganese is in process of shipment from British furnaces, a considerable part of it being afloat. The tendency of prices is upward, and whereas the sales referred to above were made at $350 for the first half of 1918 and at $375 for this year, some makers are now asking $350 for the second quarter of 1918, $375 for first quarter and $400 for this year. For spiegeleisen, 18 to 22 per cent, $85 is generally the market. In ferrosilicon there is an advancing tendency, and whereas $130 was the basis some time ago of contracts for the first half of 1918 as high as $165 is now asked on such delivery. On spot transactions, carload lots, $200 is commonly asked.

Cast Iron Pipe.—Cast iron pipe shops have received word that the Government has decided to establish another cantonment at Tenafly, N. J., and will need some pipe, though the tonnage has not been stated. Very little new business is pending. Carloads of 6-in., 8-in. and heavier are quoted at $65.50 per net ton tidewater and 4-in. at $68.60.

Old Material.—It has developed that the recent declaring of embargoes by the Pennsylvania and other railroads is a part of a carefully devised scheme of the Government to regulate car supply and prevent speculative dealing. It is impossible to ship to very many points without obtaining permits, which are not granted unless assurances are given that the material can be delivered and will be accepted without delay. There has been a fair movement of scrap under the permit plan and slightly more activity has developed in the market. Some dealers are looking forward confidently to improved conditions within the next two or three weeks. Brokers quote buying prices as follows to New York producers and dealers per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$29.50 to $30.50
Old steel rails (short lengths) or equivalent heavy steel scrap	29.50 to 30.50
Relaying rails	65.00 to 70.00
Rerolling rails	39.00 to 40.00
Iron and steel car axles	42.00 to 43.00
No. 1 railroad wrought	41.00 to 42.00
Wrought-iron track scrap	32.00 to 33.00
No. 1 yard wrought long	32.00 to 33.00
Light iron	10.00 to 12.00
Cast borings (clean)	21.00 to 21.50
Machine-shop turnings	18.00 to 19.00
Mixed borings and turnings	16.50 to 17.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long)	30.00 to 31.00

For cast-iron scrap, dealers in New York City and Brooklyn are quoting as follows to local foundries per gross ton:

No. 1 machinery cast	$34.00 to $35.00
No. 1 heavy cast (column, building material, etc.)	29.00 to 30.00
No. 2 cast (radiators, cast boilers, etc.)	28.00 to 29.00
Stove plate	20.00 to 21.00
Locomotive grate bars	20.00 to 21.00
Old carwheels	33.00 to 34.00
Malleable cast (railroad)	32.00 to 33.00

The Seaboard By-Products Co. has completed its plant of 110 ovens at Newark, N. J., and is making 1400 tons of coke per day. The Debevoise-Anderson Co., New York, is the sales agent.

Cleveland

CLEVELAND, Aug. 21.

Iron Ore.—The action of the Government in taking control of the distribution of coal and ordering railroads to give preference to shipments of coal to Great Lake ports over other commodities in order to prevent a shortage in the northwestern markets is expected to considerably improve the iron ore situation, as coal cars now used in other traffic or in hauling fuel to Eastern points will be diverted to carrying coal to Lake Erie ports. As a result, there will be a better supply of cars for hauling ore to the interior furnaces than there has been for many weeks. The movement of ore has been seriously delayed all the season by the scarcity of cars which has kept boats at Lake Erie docks several days waiting for cars to haul their cargoes. However, with the expected improvement in the car supply railroads reaching Lake Erie docks will be unable to handle all the Lake Superior ore sold for this season's delivery, and on this account the tonnage that will be brought down will be distributed pro rata among the various inland furnaces. A decision to that effect was taken late last week at a meeting in Cleveland of the subcommittee of the ore and pig iron transportation committee of the Council of National Defense, of which H. G. Dalton is chairman. Letters will be sent to ore consumers asking them to cut down their requirements for this year to actual needs and assuring them that, if this is done, every effort will be made to distribute the ore received equitably. It is expected that some of the consumers will be able to cut down the minimum requirements they specified when called upon a number of weeks ago to report the amount of ore they would need to last them until the opening of next season of navigation. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, $5.95; Mesaba Bessemer, $5.70; old range non-Bessemer, $5.20; Mesaba non-Bessemer, $5.05.

Pig Iron.—The market, which has been lifeless for several weeks, has taken on some activity. Several inquiries have come out for foundry and malleable iron for the last half of this year and the first half of next year, mostly for small lots, although one consumer is inquiring for 3000 tons. Several small lot sales of foundry grades are reported at $55 by Lake furnaces for No. 2, but a number of inquiries have so far not resulted in the placing of orders, consumers apparently being undecided whether to buy now or to wait until prices are fixed by the Government. While $55 is the ruling quotation for foundry iron by Lake furnaces, this iron is being quoted at $53 for No. 2 by a Valley furnace. The dullness of the market is indicated by the sales of one leading selling agency, which so far this month have aggregated about 8000 tons. We note the sale of a small tonnage of Virginia iron at $54.70, delivered, for early shipment. We quote, f.o.b. Cleveland, as follows:

Bessemer	$53.95
Basic	$52.30 to 52.95
Northern No. 2 foundry	55.30
Southern No. 2 foundry	51.00 to 54.00
Gray forge	50.95 to 52.95
Ohio silvery, 8 per cent silicon	88.62
Standard low phos. Valley furnace	85.00

Coke.—There is practically no demand for either furnace or foundry coke. Foundries are getting shipments on contracts as needed and there is very little inquiry for prompt shipment fuel. Standard grades of Connellsville foundry coke are quoted from $14 to $14.50 per net ton at oven for prompt shipment.

Finished Iron and Steel.—There is very little new inquiry for finished steel. Consumers generally are buying only to meet their immediate requirements owing to the unsettled price situation, which doubtless will not be cleared up until the Government fixes prices it is to pay for steel. This condition has affected the plate market in particular, the demand for plates having fallen off materially. Local mills continue to quote plates at 10c., Pittsburgh, but some fourth quarter business has been placed with other mills at 8c. The embargo on exports has not entirely cut off the foreign demand, some small lot sales for export being made during the week, the buyers apparently taking their chances on securing delivery. The semi-finished steel market is inactive, although a sale of odds and ends for billets is reported by a Cleveland mill at $85. Sales of the same class of material representing various analyses were made recently at $95.

Bolts, Nuts and Rivets.—Bolt and nut specifications are heavy, being largely for Government work. There is not much new inquiry, although there is an improvement in the demand from the automobile field. Rivet makers are getting a heavy volume of specifications but little new business is coming out. Buyers are apparently holding off in view of the possible Government regulation in prices. Prices are firm at 5.25c., Pittsburgh, for structural and 5.35c. for boiler rivets for this year's delivery. Bolt nut discounts are as follows, round lot buyers being allowed from 5 to 10 per cent discount from these prices:

Common carriage bolts, ⅝ x 6 in., smaller or shorter, rolled thread, 35 off; cut thread, 30 and 5, larger or longer, 20. Machine bolts, with h. p. nuts, ⅝ x 4 in., smaller or shorter, rolled thread, 40; cut thread, 35; larger and longer, 25. Lag bolts, cone point, 40. Square h. p. nuts, blank, $1.90 off list; tapped, $1.70 off list. Hexagon, h. p. nuts, blank, $1.70 off; tapped, $1.50 off. C. p. c. and t. hexagon nuts, all sizes blank, $1.25 off; tapped, $1 off. Cold pressed semi-finished hexagon nuts, 50 and 5 off.

Old Material.—The market continued dull, the only demand being from dealers who have not covered on short sales. Not much scrap is being offered at present, as many producers and dealers are holding it for higher prices and yard stocks are well cleaned out. Dealers who are in the market are offering somewhat higher prices for heavy melting steel than recent quotations, sales of this grade being made as high as $34. Busheling is firmer. While a small lot has sold at $25, one dealer is offering $27 for this grade. Cast scrap is weaker and has sold at $27. The embargo of the Pennsylvania Railroad on scrap shipments to Pittsburgh and all other points east of Cleveland is still in force, but is expected to be lifted this week. We quote f.o.b. Cleveland as follows:

Per Gross Ton

Steel rails	$30.50 to $31.50
Steel rails, rerolling	44.50 to 45.50
Steel rails, under 3 ft	36.50 to 37.50
Iron rails	42.50 to 43.50
Steel car axles	26.00 to 26.50
Heavy melting steel	31.00 to 33.00
Carwheels	30.50 to 31.50
Relaying rails, 50 lb. and over	49.50 to 54.50
Agricultural malleable	23.50 to 24.50
Railroad malleable	30.50 to 31.50
Light bundled sheet scrap	23.50 to 24.50

Per Net Ton

Iron car axles	$46.50 to $47.00
Cast borings	17.50 to 18.00
Iron and steel turnings and drillings	17.00 to 17.50
No. 1 busheling	26.00 to 27.00
No. 1 railroad wrought	40.50 to 41.50
No. 1 cast	27.00 to 28.00
Railroad grate bars	21.00 to 22.00
Stove plate	20.50 to 21.50

The Linde Air Products Co. will start its new plant at Youngstown, Ohio, within a short time for the manufacture of oxygen. The company has similar plants in about 30 industrial centers in the United States, and heretofore has shipped oxygen to steel fabricators and others in the Youngstown district from other factories, but the starting of the new plant will allow it to supply oxygen direct. The new plant is said to be modern in every detail, and will be operated electrically throughout. The company has made an arrangement with the Mahoning & Shenango Railway & Light Co. for current.

The National Castings Co., Inc., Marietta, Pa., which recently started its new foundry, is now making gray iron and semi-steel castings in all weights up to 20,000 lb. Its plant is located between Harrisburg and Philadelphia, and the company is receiving orders for castings from a number of the larger Eastern cities. The company states it has all its equipment purchased and installed. It has its own railroad siding, and is in position to make prompt shipments.

IRON AND INDUSTRIAL STOCKS

Pope's Peace Proposal Has No Effect—Discussing New Liberty Loan

Previous peace moves aroused keen interest on the stock market, but the effort of the Pope to bring about a reign of peace was apparently without effect last week, when the changes were rather uninteresting and it was difficult to trace their cause. A number of railroad stocks declined sharply and some steel shares also lost ground, while others were well maintained. Discussion in regard to the next Liberty loan has been started in Wall Street, which promises to respond again in helping the Government to raise a few billion dollars more.

Among the industrial stocks that registered gains during the past week were the following: International Harvester, 2½; Midvale Steel, ⅞; Republic Iron & Steel, ½; United States Steel, ⅞. Among the stocks that made losses during the week were the following: American Can, ⅝; American Car & Foundry, ½; American Locomotive, ¾; Baldwin Locomotive, 1; Bethlehem Steel, 4½; Bethlehem Steel, Class B, 2½; Crucible Steel, 2⅛; Gulf States Steel, 7; Lackawanna Steel, 1¾; National Enameling & Stamping, ½; Pressed Steel Car, ¼; United States Steel, preferred, ½. Allis-Chalmers, American Steel Foundries and Colorado Fuel & Iron remained the same at the end of the week as at the beginning, being 29¾, 72 and 49¼, respectively.

The range of prices on active iron and steel stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com..	28	- 29½	
Allis-Chal., pref..	85	- 85⅞	
Am. Can, com...	45½	- 46½	
Am. Car & Fdry., com.	73½	- 75¼	
Am. Car & Fdry., pref.	116	-117	
Am. Loco., com..	68	- 70½	
Am. Loco., pref..	104	-105½	
Am. Rad., com...	300	-302	
Am. Ship, com...	93	- 94	
Am. Ship, pref.		94½	
Am. Steel Fdries.	69	- 70½	
Bald. Loco., com.	68	- 71⅝	
Bald. Loco., pref.	100	-100½	
Beth. Steel, com.	114	-118½	
Beth. Steel, class B		107¼ -115½	
Beth. Steel, pref..	115¼	-115½	
Cambria Steel		155	
Carbon Stl., com.	92	- 99	
Case (J. I.), pref.		84	
Cent. Fdry., com.	32¾	- 34¼	
Cent. Fdry., pref.	49½	- 53	
Chic. Pneu. Tool.	67½	- 68½	
Colo. Fuel	47¾	- 49¼	
Cruc. Steel, com.	78¼	- 81¾	
Cruc. Steel, pref.		100½	
Deere & Co., pref.	99½	-100¾	
Gen. Electric	151	-153	
Gt. No. Ore Cert.	34	- 36¾	
Gulf States Steel	109¼	-113	
Gulf States Steel, 1st pref.		108	
Int. Har. of N. J., com.		114⅞-118⅞	
Int. Har. of N. J., pref.		117½	
Int. Har. Corp., com.		79	
Int. Har. Corp., pref.		105	
Lackawanna Stl..	88¼	- 91½	
Lake Sup. Corp..	16¼	- 16½	
Lima Loco.	56	- 57½	
Midvale Stl.	57	- 58	
Nat. En. & Stm., com.	41⅛	- 42⅝	
N. Y. Air Brake.	131	-133	
Nova Scotia Stl..	100½	-106	
Pressed Stl., com.	69	- 71¼	
Ry. Steel Spring, com.	51	- 51½	
Ry. Steel Spring, pref.	98	- 98¼	
Republic, com. ..	88⅛	- 90⅛	
Republic, pref.		103⅞	
Sloss, com.	53⅛	- 53¾	
Superior Steel...	44	- 45½	
Transue-Williams	41½	- 42	
Un. Alloy Steel..	42½	- 43¾	
U. S. Pipe, com..	20⅛	- 20¾	
U. S. Steel, com.	122⅞	-125½	
U. S. Steel, pref..	117⅜	-118	
Warwick	9	- 9⅛	
Westing. Elec....	47⅝	- 48⅞	

American Shipbuilding Report

The report of the American Shipbuilding Co. for the fiscal year ended June 30, 1917, shows earnings of all properties after deducting manufacturing expenses, amounted to $4,866,011. The net profit for the fiscal year was $3,148,040 and from this is to be deducted $400,000 for excess profits taxes for the past six months.

Industrial Finances

The Eastern Motors, Inc., New Britain, Conn., is in financial trouble and attachments on the plant have been placed by creditors. It is reported that but one car has ever been built and that the company heads cannot be located. The company was incorporated last November with authorized capital stock of $1,000,000 and later took over the former State Trade School building, New Britain, as an assembling plant.

The Mechanical Refrigerator Co. of Youngstown, Ohio, of which Gustave Doeright, president of the Vulcan Bronze Co.; George Rudge, Jr., formerly president of the Enterprise Boiler Co., and J. T. Harrington, a corporation lawyer, are the promoters, has decided to issue $100,000 in preferred stock and $200,000 in common stock, to erect a plant and supply working capital.

The capital stock of the Engel Aircraft Co. of Cleveland, which recently took over the plant of the Niles Car & Mfg. Co. at Niles, Ohio, is to be increased from $10,000 to $3,000,000. The company will go into the manufacture of airplanes for the United States Government. It is said part of the aircraft will be made at the Niles plant, but it will be used chiefly as an assembling center. The motors and planes will be shipped to this plant and completed there. The product will be tested on a nearby site. Of the new capital stock, there will be 20,000 shares of common and 10,000 of preferred each of a par value of $100. The preferred stock will be 7 per cent.

The Dayton-Wright Airplane Co., Dayton, Ohio, has been authorized to increase its capital from $500,000 to $1,000,000. There will be 6000 shares of common stock issued at $100 and 4000 shares of preferred, the latter to pay 7 per cent. The company amended its articles of incorporation to permit it to deal in both airplanes and hydroplanes. H. E. Talgott, Jr., of Dayton is president, and A. C. Craighead secretary.

The Benoist Aeroplane Co., Canton, Ohio, has been incorporated with a capital of $500,000.

In connection with the dividend of 1¾ per cent on the preferred stock, declared last week by the Crucible Steel Co. of America, Pittsburgh, Chairman DuPuy states that in order to conserve the company's working capital, and to meet the heavy costs of the improvements required to meet Government demands, and with the restrictions made by the Government surrounding the company's output, declaration of a dividend on its common stock was not considered at the meeting of the Board of Directors.

The capital stock of the Standard Sanitary Mfg. Co. has been increased from $10,000,000 to $20,000,000. Of the increase $6,000,000 is common stock and $4,000,000 preferred. The company is incorporated under the laws of New Jersey, and manufactures plumbing requisites.

The directors of the Cambria Steel Co. have declared an extra dividend of 1½ per cent on the $45,000,000 capital stock in addition to the regular quarterly disbursement of 1½ per cent. This is the same amount as was paid extra in the preceding quarter.

An announcement was made last week of an offering of $1,000,000 7 per cent cumulative preferred stock of the Buda Co., a concern engaged in the manufacture of railway supplies and internal combustion engines. The issue is being sold at 96, to yield about 7.30 per cent. The purpose of the new stock issue is to take care of the company's expanding business.

Dividends

The Crucible Steel Co. of America, quarterly of 1¾ per cent on the preferred stock, payable Sept. 29. This dividend was declared out of, and will be charged to, surplus earned prior to Mar. 1, 1913. No action was taken on an expected dividend on the common stock.

The Cambria Steel Co., 1½ per cent quarterly, and also an extra of the same amount, both payable Sept. 15.

The Carpenter Steel Co., Reading, Pa., is planning for the construction of additions to its works. The company has recently acquired a large tract of property on the Schuylkill River, opposite its plant. Plans have been completed for the construction of a reinforced concrete bridge across the river with double-track driveway and footpath to connect the properties.

The Bethlehem Steel Co., Bethlehem, Pa., commenced the operation of a new 200-ton open-hearth steel-tilting furnace at its local works Aug. 17. The new furnace will increase the output of the works from 50,000 to 60,000 tons a month. It has been in course of construction for a year.

The new No. 3 furnace at the Worth plant of the Midvale Steel & Ordnance Co. at Coatesville, Pa., was blown in this week.

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin.	Lead		Spelter	
		Electro-	New	New	St.	New	St.
Aug.	Lake	lytic	York	York	Louis	York	Louis
15	27.50	27.50	62.50	10.75	10.62½	8.75	8.50
16	27.00	27.00	62.50	10.67½	10.50	8.75	8.50
17	27.00	27.00	62.50	10.67½	10.50	8.75	8.50
18	27.00	27.00	....	10.67½	10.50	8.75	8.50
20	26.50	26.50	62.00	10.67½	10.50	8.75	8.50
21	26.50	26.50	61.75	10.67½	10.50	8.75	8.50

New York

NEW YORK, Aug. 22.

Prices of copper, tin and lead are lower than a week ago, but business has not been stimulated thereby, and it is certain that all of the metal markets will remain in a dull and stagnant condition until the Government price-fixing decision has been announced. Copper is nominal at 26.50c., New York. Some business in tin futures has been done. Yesterday's price was 61.75c., New York. Lead is dull. A little business has been done for export at 10.75c., St. Louis, and at 10.50c. in bond. Yesterday quotation was 10.67½c., New York, and 10.50c., St. Louis.

Copper.—Many have believed that the President could not and would not fix arbitrary prices for copper and other non-ferrous metals. Now that he has established a precedent by announcing fixed prices for coal, however, it is realized that he not only can but must fix prices for steel, copper and other similar products for Government purchases. The trade seems reconciled to the idea that such a drastic policy must soon come. Buyers and sellers are now doing nothing but waiting until uncertainty as to the Government prices has been removed. In reflection of this waiting attitude the market has become slightly weaker, and our quotation shows a decline of 1c. since a week ago. However, this price is largely nominal, as not a pound of copper is changing hands except for actual nearby reqpirements. We quote Lake and electrolytic at 26.50c., New York, for August and 25c. for last quarter delivery. London cables of Aug. 20 show no change there from a week ago, spot electrolytic being quoted at £137 and £133 for futures.

Tin.—On Aug. 15 there were reports in the trade of sales for all positions aggregating about 200 tons. On Aug. 16 the market was nominal, with practically no business done. There were some cheap offerings of tin about to be shipped from England, but these were not taken up. On Aug. 17 there developed considerable interest by consumers in shipments from the Straits Settlements late this year, but on account of delays in cables nothing was done. Since Aug. 17 the market has been stagnant, although on Saturday, Aug. 18, a slight interest in futures developed and some business was transacted. On Monday, Aug. 20, there were also light sales for future. Delays in the receipt of cables from abroad are greatly hindering transactions. Prevailing prices for Straits tin during the past week were about 62.50c. until yesterday, when this quotation was marked down to 61.75c. Arrivals from Aug. 1 to 20 totaled 2470 tons and the quantity afloat from the Straits and United Kingdom was 4215 tons.

Lead.—This market continues to be extremely dull, with domestic business and demand practically nil. A small tonnage for export changed hands a few days ago at 10.75c., New York, but most handlers ask 11c., delivered at Eastern points. Other lots were offered at 10.50c., St. Louis. A good-sized lot was sold at 10.50c., New York, in bond last week. More lead was offered during the week than was wanted, and as a result prices slightly weakened. We quote 10.67½c., New York, and 10.50c., St. Louis, the spread between New York and St. Louis prices now representing only the actual freight difference. Little is known about the policy that the Government may pursue with regard to lead prices, except that lots which have been purchased to meet the Government requirements of approximately 8000 tons a month have been sold at 8c. It is understood that there has been little criticism of this price among producers, and that it offers a fair profit.

Spelter.—There are not enough transactions in spelter to make a market, but the few lots that change hands for current needs fetch 8.50c., St. Louis, which was our quotation a week ago. However, there were indications of a slight weakenng on the part of some small handlers, who, either becoming tired of holding onto their stocks so long or else being anxious to stimulate activity, made offerings for nearby at about 8.37½c., St. Louis.

Antimony.—Antimony remains exceedingly dull. There virtually is no market. We quote Japanese and Chinese grades without change at 15c. to 15.50c., New York, duty paid.

Aluminum.—The market is dull and No. 1 virgin metal, 98 to 99 per cent pure, is nominal at 50c., New York.

Old Metals.—Dealers' selling prices are unchanged as follows:

	Cents per lb.
Copper, heavy and crucible	27.00 to 28.00
Copper, heavy and wire	26.00 to 27.00
Copper, light and bottoms	24.00 to 24.50
Brass, heavy	18.50 to 19.50
Brass, light	14.00 to 14.75
Heavy machine composition	24.75 to 25.25
No. 1 yellow rod brass turnings	17.50
No. 1 red brass or composition turnings	19.00 to 21.00
Lead, heavy	9.25 to 9.375
Lead, tea	7.75
Zinc	6.75

Chicago

AUG. 20.—Inquiry for copper is fairly active, and there is some buying, but little of it is for future delivery. Copper consumers are watching the market closely, and it develops that the recent inactivity was chiefly on the part of the smaller melters. For tin there is only a routine demand, with more easiness than appears on the face of quotations. In lead there is practically no business, with both sellers and consumers apparently indifferent. Interest in spelter has not revived, and antimony pursues a monotonous course. We quote as follows: Casting copper, 26.75c.; Lake, 29c.; electrolytic, 27.50c.; tin, carloads, 63c.; small lots, 65c. to 66c.; lead, 10.50c.; spelter, 8.37c. to 8.50c.; sheet zinc, 19c.; antimony, 17c. to 18.50c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 23c.; copper clips, 22c.; copper bottoms, 21c.; red brass, 21c.; yellow brass, 15c.; lead pipe, 8c.; zinc, 6c.; pewter, No. 1, 35c.; tinfoil, 40c.; block tin, 45c.

Demand for Brazilian Zircon

Consul General Alfred L. M. Gottschalk of Rio de Janeiro, Brazil, reports to the Department of Commerce that Brazilian zircon appears to be becoming more and more a marketable product in the United States. An American company, he writes, is reported to be offering it here at $50 to $60 per ton. His report says:

Zircon is used chiefly in the manufacture of refractory crucibles and for the refractory linings of furnaces. It is therefore a material for which there may be increasing demand under the pressure that is being put on the steel industry of the United States.

Silicate of zirconia, the mineral known as zircon, is found in small crystals mixed with monazite in the sands out of which the Brazilian monazite is washed. In the processes of recovering monazite from these sands—processes carried on in Bahia, Espirito Santo, and in a smaller way in Minas Geraes and Rio de Janeiro—the zircon and the ilmenite (black oxide of titanium and iron) are separated. As the ilmenite has apparently no commercial value it is thrown away, but according to exporters zircon can be marketed at $50 a ton with a small profit, in spite of high freight rates.

With the present electric separating machines it is practically impossible to remove all the monazite from the zircon, and a residuum of 2 to 6 per cent of monazite is bound, it appears, to remain with the zircon. This percentage, it is claimed, is irrecoverable and has practically no value.

It is stated that increasing quantities of zircon exports may be expected from Brazil provided this article is not too heavily burdened with customs duties in the United States and is classified as zircon and not as monazite.

PERSONAL

George De A. Babcock, production manager H. H. Franklin Mfg. Co., automobile manufacturer, Syracuse, N. Y., has been commissioned a major to go to France in the supply division of the ordnance section of the U. S. Army. He is on an indefinite leave of absence from the company.

Maurice Joseph, general manager, the Joseph Joseph & Brothers' Co., Cincinnati, is absent on a vacation trip to eastern summer resorts.

Charles W. Rowlands, formerly secretary of the Crucible Steel Co. of America, Pittsburgh, and later with its sales department, has severed his connection with the company.

John B. Nicklas, who was formerly secretary of the Union Foundry & Machine Co., is now connected with the machinery sales department of the Somers, Fitler & Todd Co., Pittsburgh.

C. S. Vought, assistant general manager of sales American Steel Export Co., New York, sailed for France on Aug. 7, to attend to business for the company. He will be absent about 60 days.

William A. Hart, formerly of the Burroughs Adding Machine Co. advertising department, has joined the advertising staff of the Detroit Steel Products Co. as assistant advertising manager.

R. B. Farquhar, Jr., recently assistant superintendent of the foundry at the Midvale Steel Co. in Philadelphia, has received an appointment as superintendent of the Watertown Arsenal foundry at Watertown, Mass., and has accepted it. Mr. Farquhar has had a wide experience at the Taylor Iron & Steel Company, Highbridge, N. J., and at the Pennsylvania Steel Casting & Machine Co. as well as at the Midvale Steel Co.

George Satterthwaite has resigned as superintendent of the Midvale Steel Co., Philadelphia, and has been succeeded by Henry D. Booth, formerly in charge of munitions. Newell C. Bradley, as assistant superintendent, has resigned, and John L. Cox has been appointed assistant to superintendent in charge of engineering and research.

Eli Joseph, president Jos. Joseph & Bros. Co., New York, started last Saturday with friends on a month's hunting and fishing trip in Maine.

Edwin C. Eckel, having been appointed a captain in the United States Army, and attached to the American Expeditionary Force in France, has given up his private practice in engineering and mining geology and his office in the Munsey Bldg., Washington, has been closed. Captain Eckel writes: "I trust that my friends and associates, particularly those in the cement and iron industries, will accept this general statement in place of a more personal leave taking." His address is Headquarters, American Expeditionary Force, France."

Frederick P. Hurlburt, manager of the New York office of the Cleveland Crane & Engineering Co., Cleveland, is taking a six months' rest from work. He will spend three months in the Adirondacks and three months in the South.

W. W. Tarleton, heretofore of the Anniston Ordnance Co. and the Anniston Steel Co., has been made purchasing agent of the Southern Manganese Corporation, with offices in Birmingham and Anniston, Ala.

Oliver J. Abell, president Abell-Howe Co., Chicago, has been elected a director of the American High Speed Chain Co., Indianapolis.

J. P. Bennett, assistant superintendent of the rolling mills at the Steelton plant, Bethlehem Steel Co., has resigned to accept a position with the Keystone Steel & Wire Co., Peoria, Ill. Mr. Bennett has been connected with the Steelton plant for four years. He has been made assistant superintendent of the Peoria plant.

W. Lloyd Wolfe, Lebanon, Pa., who recently resigned as general superintendent of the local furnace plant of the Bethlehem Steel Co., was given a dinner by his associates at Mineral Springs Park, Reading, prior to his departure for Holt, Ala., to become vice-president of the Central Iron & Steel Co. He was presented with a watch and chain and handsome clock. Mr. Wolfe has been succeeded at the Bethlehem furnace by Charles F. Entwistle, Steelton.

David Smith has been appointed superintendent of the merchant mill department of the Steelton, Pa., works of the Bethlehem Co., succeeding Richard Crouch, resigned.

Lincoln B. Patterson, of the Emporium Iron Co., Emporium, Pa., has been made superintendent of the West End furnace of the Old Dominion Pig Iron Corporation at Roanoke, Va.

B. A. Shutts, superintendent North Cornwall furnaces, Bethlehem Steel Co., Lebanon, Pa., has resigned, effective Sept. 1, to become superintendent of the Central Iron & Steel Co. Harrisburg, Pa. Mr. Shutts will be succeeded by Ira Hoover, Lebanon, who has been recently an assistant to the former superintendent, W. L. Wolfe, at the Lackawanna plant of the Bethlehem Steel Co.

Urged by friends, Archibald Johnston, vice-president Bethlehem Steel Co., has consented to be a candidate for mayor of the newly chartered city of Bethlehem, Pa. Petitions to have his name placed on the official primary election ballot contained the signatures of more than 5000 residents.

A. W. Gauger has resigned as secretary of the Pittsburgh section of the American Chemical Society, and has also been granted leave of absence by the United States Bureau of Mines, to accept a commission as first lieutenant in the sanitary engineering corps.

Edward Bennet has been appointed chief clerk of the Canton Sheet Steel Co., Canton, Ohio.

W. W. Wallace has accepted a position as chief engineer with the Hussey-Binns Shovel Co., Charleroi, Pa.

H. A. Richmond has been elected managing director and treasurer of the General Abrasive Co., Niagara Falls, N. Y., and has relinquished his connection with the American Emery Wheel Works of Providence, R. I., of which he has been president and technical expert for the past 20 years.

Freight Service 26 per Cent Greater

Fairfax Harrison, chairman of the Railroads' War Board, reports that with an increase in equipment of only 3 per cent the railroads of the country rendered nearly 26 per cent more freight service in June this year than in the same month last year. Returns were received from 29 railroads having a combined mileage of 125,488 miles, or approximately half the total railroad mileage of the United States.

In June, 1916, these roads gave freight service equivalent to carrying 15,650,194,737 tons of freight one mile, while for the same month this year they carried 19,676,463,348 tons one mile. In June of last year the roads in question owned 1,284,160 freight cars. June this year found them with only 1,284,644, an increase of barely 3 per cent. The number of locomotives used by them to haul freight has been increased only one-half of 3 per cent. Intensive car loading plus an increase of 13.6 per cent in the number of miles a day which the railroads have been able to make their freight cars travel is largely responsible for the excellent showing for June. The distribution of empty cars, irrespective of ownership, into districts where they have been most needed, has also helped to increase efficiency.

The Adamson Mfg. Co., East Palestine, Ohio, maker of automobile accessories and specialties, has recently completed a large addition to its foundry, giving a total floor space of more than 50,000 sq. ft. The concern makes fine light gray iron castings, weighing one ounce to several pounds, and also manufactures the Adamson vulcanizer for repairing automobile casings and inner-tubes.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 19.5c.; Philadelphia, 18.5c.; Boston, 21.5c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c.; Denver pipe, 76.1c., minimum carload, 46,000 lb.; structural steel and steel bars, 76.1c., minimum carload, 40,000 lb.; Pacific coast (by rail only), pipe, 65c.; structural steel and steel bars, 75c., minimum carload, 60,000 lb. No freight rates are being published via the Panama Canal, as the boats are being used in transatlantic trade.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 4.00c.

Wire Products

Wire nails, $4 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire, $4.05 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.95; galvanized wire, $4.65; galvanized barb wire and fence staples, $4.85; painted barb wire, $4.15; polished fence staples, $4.15; cement-coated nails, $3.90 base, these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 43 per cent off list for carload lots, 42 per cent off for 1000-rod lots, and 41 per cent off for small lots, f.o.b. Pittsburgh.

Nuts and Bolts

Discounts in effect for large buyers are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days.

Carriage bolts, small, rolled thread, 40 per cent, small cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent with c. p. nuts, 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq. blank, $2.10 off list, and tapped, $1.90 off; hex., blank, $1.90 off, and tapped, $1.70 off; nuts, c. p. c. and t. sq. blank, $1.70 off, and tapped, $1.50 off; hex. blank, $1.60 off, and tapped, $1.40 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Wire Rods

Soft Bessemer and open-hearth rods to domestic consumers at $90 to $95; high-carbon rods made from ordinary open-hearth steel, $95 to $100, and special steel rods with carbons running from 0.40 to 0.60, $100 to $110 at mill; above 0.60 carbon, $115 to $120.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $7.00 base; ⅜ in., 7/16 in. and ½ in., $7.00. Boat spikes are occasionally quoted $7.00 to $8.00, all per 100 lb. f.o.b. Pittsburgh, but some makers are quoting higher. Track bolts with square nuts, 7c. to 7.50c. to railroads, and 8c. to 8.50c., in small lots, for fairly prompt shipment.

Steel Rails

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails, and on carload and smaller lots, 4c. to 4.25c. at mill. Light rails, 25 to 45 lb., $75 to $80; 16 to 20 lb., $80 to $81; 12 and 14 lb., $82 to $83; 8 and 10 lb., $83 to $84; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard Bessemer rails, $38; open-hearth, $40, per gross ton, Pittsburgh.

Tin Plate

Effective July 31, prices on all sizes of terne plate were advanced from $2 to $2.50 per package. Prices quoted by leading makers are now as follows: 8-lb. coating, 200 lb., $16 per package; 8-lb. coating, I. C., $16.30; 12-lb. coating, I. C., $17.50; 15-lb. coating, I. C., $18.25; 20-lb. coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 4c. to 4.50c. for delivery late this year, and 4.50c. to 5c. from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c.; railroad test bars, 5.25c. in carload and larger lots f.o.b. mill.

Wrought Pipe

The following discounts on steel are to jobbers for carload lots on the Pittsburgh basing card in effect from May 1, 1917, all full weight, except for LaBelle Iron Works and Wheeling Steel & Iron Co., which quote higher prices, and National Tube Co., which adheres to card of April 1.

Steel			Iron		
		Butt Weld			
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	42	15½	⅛ and ¼	23	+4
½	46	31½	⅜	24	+3
¾ to 3	49	35½	½	28	10
			¾ to 1½	33	17
		Lap Weld			
2	42	29½	2	26	12
2½ to 6	45	32½	2½ to 6	28	15
7 to 12	42	28½	7 to 12	25	12
13 and 14	32½	..			
15	30	..			
		Butt Weld, extra strong, plain ends			
⅛, ¼ and ⅜	38	20½	⅛, ¼ and ⅜	22	5
½	43	30½	½	27	14
¾ to 1½	47	34½	¾ to 1½	33	18
2 to 3	48	35½			
		Lap Weld, extra strong, plain ends			
2	40	28½	2	27	14
2½ to 4	43	31½	2½ to 4	29	17
4 to 6	42	30½	4½ to 6	28	16
7 to 8	38	24½	7 to 8	20	8
9 to 12	33	19½	9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

Nominal discounts on less than carload lots, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes, and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap-Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in.	28	1⅞ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3¼ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in.	No quotations
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths. Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net, or 2 per cent discount in 10 days.

[Open-hearth stock, $5 per ton above these prices.]

	Cents per lb.
Blue Annealed—Bessemer	
Nos. 3 to 8	8.00 to 8.50
Nos. 9 and 10	8.25 to 8.50
Nos. 11 and 12	8.50 to 8.75
Nos. 13 and 14	8.75 to 9.00
Nos. 15 and 16	9.00 to 9.25
Box Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21	8.30 to 8.80
Nos. 22 and 24	8.35 to 8.85
Nos. 25 and 26	8.40 to 8.90
No. 27	8.45 to 8.95
No. 28	8.50 to 9.00
No. 29	8.55 to 9.05
No. 30	8.65 to 9.15
Galvanized Black Sheet Gage—Bessemer	
Nos. 10 and 11	9.00 to 9.50
Nos. 12 and 14	9.10 to 9.60
Nos. 15 and 16	9.25 to 9.75
Nos. 17 to 21	9.40 to 9.90
Nos. 22 and 24	9.55 to 10.05
Nos. 25 and 26	9.70 to 10.20
No. 27	9.85 to 10.35
No. 28	10.00 to 10.50
No. 29	10.25 to 10.75
No. 30	10.50 to 11.00
Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16	7.80 to 8.30
Nos. 17 to 21	7.85 to 8.35
Nos. 22 to 24	7.90 to 8.40
Nos. 25 to 27	7.95 to 8.45
No. 28	8.00 to 8.50
No. 29	8.05 to 8.55
No. 30	8.05 to 8.55
Nos. 30½ and 31	8.10 to 8.60

Book Reviews

Handbook for Machine Designers, Shop Men and Draftsmen. By Frederick A. Halsey. Pages, 561, 8½ x 11 in.; illustrated. Published by McGraw-Hill Book Co., New York. Price $5.

When the first edition of this book appeared in 1913 it was justly characterized as one of the most valuable collections of data that had ever been placed in the hands of machine designers. The second edition has lifted the high standard attained in the first to a still higher plane, and it may safely be said that the book is indispensable to every designer and user of metal-working machinery. While it cannot take the place of the standard engineering pocketbooks, it supplements them with the practical usable shop information which is needed every day, and which properly has no place in the pocketbooks. A close comparison of this work with one of the best-known pocketbooks reveals comparatively few overlapping data. The designer and shopman equipped with this book and one of the pocketbooks will have little need for any greater engineering library.

From the standpoint of the author of general engineering treatises such as the one under review, it is unfortunate that engineering practice advances as rapidly as it does. This advance imposes on him the necessity of close watch on and careful study of the state of the art, otherwise his book will become obsolete in many sections, and will contain gaps in relation to the later developments. The author in the present case has recognized this duty and has discharged it in a brilliant manner. A simple list of the more important additions and revisions of the second edition fills one-half of one of the large pages of the book.

While it is impossible to give here these changes and revisions in detail, some of the more notable ones may be mentioned as follows: Bearings, including data on thrust, knife edge and roller bearings; gearing, including notes on herringbone, friction and worm gears, gaging of gear teeth, the cutting of bevel gears and parallel depth bevel gears, axial thrust of bevel gears, skew bevel gears; friction clutches; spiral springs of the watch spring type; pipe fittings and flanges; the measurement of tapers and dovetails; press fits, straight and taper; balancing of revolving parts; permissible cost of shop equipment; hardness tests, including the relation of Brinell and sclerescope numbers to each other and the strength of steel; heat treatment of steel, including the alloy steels. Many new tables have been added which enhance the value of the book to the practical man.

As in the earlier edition, much space has been saved by means of alignment diagrams, and the use of these convenient and accurate methods of presenting information has been extended.

The number of pages in the book has been increased by upward of 100, all of which represent highly condensed information. Its value to the user is therefore just that much greater.

Organization and Accident Prevention.—By Sydney Whitmore Ashe. Pages, 130, 6x9¼; illustrated by charts and half-tones. Published by McGraw-Hill Book Co., New York. Price, $1.50.

Vigorous methods to develop caution in workmen, the author believes, must accompany the use of mechanical safety devices to make them effective in accident prevention. Fellowship, system, education and discipline, he says, may be effectively used for this purpose, and he describes in detail the application of each to general safety work. Considerable attention is also paid to the function of education in the prevention of specific accidents such as electric shocks, asphyxiation, etc., and numerous illustrations of the value of safety placards and bulletins are emphasized by the reproduction of some now in use. The prone pressure method of resuscitation is explained and illustrated as well as its application at the Pittsfield works of the General Electric Co. Other topics of interest are: Rules for wiremen, foundry safety work, accidents from defective hammers and upturned nails, punch press accidents, crane accidents, dangers from wood alcohol, infection from gasoline, and fire prevention. The relation of tuberculosis and hernia to safety work is discussed under the broader topic, the medical examination of employees. Numerous suggestions regarding first aid and hospital work are offered. One chapter is devoted to the keeping of records, the analysis of data and curves showing the ratio of accidents to numbers employed, and another chapter to the relation between accidents and age diversity of population, labor turnover, and the health of employees.

English and American Tool Builders. By Joseph Wickham Roe. Pages, xvi + 315, 6½ x 9½ in. Published by the Yale University Press, New Haven, Conn. Price, $3.

The development of machine tools is second in importance only to the invention of the steam engine in its effect on modern civilization. Indeed, the machine tool may lay a just claim to even greater importance than the steam engine, for upon it depends the manufacture of practically all of those devices and mechanisms which are essential to present-day comfort and progress. In fact, as the author relates, the steam engine was crude and imperfect, but little more than a scientific toy, until the first machine tools were built. These enabled the engine to be built with some semblance of accuracy and possibility of extensive use. The close interrelation of these two great inventions forms the subject of the earlier chapters of Professor Roe's book.

It is hard to believe, when the vast development and wonderful perfection of the machine tools of the present day are considered, that the machine-tool industry is but two years older than the United States. It was in 1774 that the first successful boring machine was built in England, although an attempt to build a machine for boring cannon had been made a few years earlier. It was this boring machine of Wilkinson that enabled Watt to make his steam engine a commercial success. From this humble beginning, crude though it was, has grown the vast machine-tool industry of to-day.

The earlier chapters of Professor Roe's book are of absorbing interest. He shows how, when the start had once been made, progress was rapid. The basic inventions followed each other at relatively short intervals, and the part that those masters of their trade, Wilkinson, Bramah, Bentham, Brunel, Clement, Maudslay, Murray, Fox, Roberts, Whitworth and Nasmyth are clearly portrayed. Particularly interesting is his settlement in favor of Maudslay of the long controversy for the credit for the invention of the slide rest, probably the most important single contribution to machine tools.

While the basic inventions must be credited to England, America, by the development of the system of interchangeable manufacturing, gave great impetus to their use, and stimulated the invention of specialized machines. These play such an important part in the economic life of to-day that they must be set down as of value almost equal to that of the basic inventions themselves. It is of interest to note here that this phase of the subject first came up in connection with the manufacture of munitions of war, and also that some of the earlier English inventions were stimulated by the needs of the British army and navy. The account of the work of Whitney and Colt in the introduction of interchangeable manufacture in American armories is particularly interesting.

Professor Roe traces the growth of the industry from these beginnings down to the great establishments of to-day. He brings in the names of men whose work is familiar to the present generation, such as Warner, Swasey, Lodge, Steptoe, Le Blond, Brown and Sharpe, Gould, Landis, Sellers and many others.

While the book is necessarily biographical in character, nevertheless the work of the men is indissolubly linked with their biographies. The reader, when he has finished it, will have a clear idea of the steps taken to bring machine tools to their present state of perfection, and the book might well be called a history of the machine tool. The author is to be commended for the great work he has done in putting on record the facts concerning this industry before they were irretrievably lost.

The Iron Ores of Lake Superior. By Crowell & Murray, Cleveland. Pages 315, 9¼ x 6½ in.; illustrated by numerous maps. Published by the Penton Press Co., Cleveland. Price, $3.50.

This book, which has had two previous editions, is a valuable source of information. The authors have brought the facts up to date, have located the new mines on the maps, have rewritten and corrected errors in reading matter and have included some original papers of well-known men on subjects of interest. Among the papers are: Geology of the Wakefield Area of the Eastern Gogebic, by Mack C. Lake, geologist of M. A. Hanna & Co.; Progressive Development of the Cuyuna District, by Edmund Newton and Harlan H. Bradt, and Wetherbee Iron Ore Concentrator at Larue Mine.

Fourth National Forum Trade Convention. Pages 587, 9¼ x 6¼, issued by the Secretary, National Foreign Trade Headquarters, India House, Hanover Square, New York. Price, $2.

This elaborate report of the convention held in Pittsburgh last January consists of a stenographic report of the proceedings, the discussions, the speeches at the several group sessions, the addresses of the banquet, together with the papers prepared in advance and a list of the delegates present, the organizations and companies represented and the organization of the convention and contains a vast amount of information in regard to foreign trade. The convention was the greatest of its kind ever held, and it is well to preserve its record in permanent form.

Poor's Manual of Industrials for 1917 has just been issued. The general information is revised to Aug. 1. The book is the largest work of its kind. It contains the latest income accounts and balance sheets of industrial companies, in which there is a public interest. These are in most cases presented in comparative form, showing at a glance the growth of the business. In view of the fact that during the past year the industrial organizations have had a phenomenal volume of business, Poor's Manual of Industrials is particularly interesting at this time. It is invaluable to the investor or banker interested in industrial securities. (Poor's Manual Co., 80 Lafayette Street, New York. Price, $10 a copy.)

"The Determination of Nitrogen in Substances Used in Explosives" is the title of Technical Paper 160 of the U. S. Bureau of Mines by W. C. Cope and Guy B. Taylor. The bureau has had frequent requests for the methods used in its laboratories for determining nitrogen in nitro-derivations. This report covers not only these methods, but those used for all classes of compounds containing nitrogen used in explosives.

Purchasing Agents Will Meet

The annual congress of the National Association of Purchasing Agents, to be held in Pittsburgh, Oct. 9, 10 and 11, will, it is estimated, have an attendance of 1500 men. The details of the convention are being worked out by Robert F. Blair, Pittsburgh Gage & Supply Co., who is chairman of the convention committee. E. L. McGrew, Standard Underground Cable Co., is national association's president. The William Penn Hotel will be headquarters.

A. W. Ransome, for nearly 20 years closely identified with the developing and manufacture of concrete machinery, has become connected with the Blaw-Knox Co., Farmers' Bank Building, Pittsburgh. For two years or more, Mr. Ransome has been developing and putting into practice patents on improved concrete machinery, all of which have been purchased by the Blaw-Knox Co., and will be marketed and probably further developed under his direction as manager and chief engineer of the mixer department of the above named company.

Steel Supplies and the War

Discussing the hope that the increase in the production of steel both in the United States and in England would overtake the war requirements and provide some residue for ordinary commercial and industrial uses, the London *Ironmonger* said recently:

We do not know exactly to what extent British production has increased, as the published figures do not pretend to be more than approximately correct; moreover, statistics of past years are of little use at a time when the output is growing rapidly. The British steel production may now be estimated at between 10,000,000 and 11,000,000 tons a year, while the United States can turn out roughly 42,000,000 tons. France and Russia, particularly the last-named, may be left out of the calculation for the present, leaving an output of about 52,000,000 tons to reckon with. Of this practically the entire British production goes into war material, but probably not more than two-thirds of the American output can be relied upon for such uses, giving a total of about 38,000,000 tons a year.

Assuming that we are committed to a long war, the question arises whether 38,000,000 tons of steel is sufficient to carry it on. According to particulars recently published, some 6,000,000 shells were used in the operations that resulted in the capture of Messines. Reckoning these at an average weight of 1 cwt.—probably the average was higher—this would represent a consumption of about 300,000 tons of steel. Steel is used for many purposes other than the making of shells and it would probably be a generous estimate to allow half our annual supplies of war steel, or roughly 20,000,000 tons, for shell production. [A much exaggerated estimate.—ED.] The steel trade will certainly be in the grip of the war for a long time to come, whatever progress may be made in production.

Copper and Steel Prices

WASHINGTON, Aug. 21.—It was stated at the headquarters of the Federal Trade Commission to-day that a preliminary report upon the cost of producing steel and copper has been completed and will be transmitted to the President within a day or two. No information concerning the findings of the commission will be given out until the President acts upon the report. It was stated at the White House to-day that the President will probably find it necessary to devote several days' study to the report before he will be in position to give consideration to the actual fixing of basic prices for steel.

New Steel Plant Starts

CLEVELAND, Aug. 22 (*By Wire*).—The Cromwell Steel Co., Cleveland, has placed its new steel plant at Lorain, Ohio, in operation, starting up one of its 75-ton open hearth furnaces last week and the second to-day. The two remaining furnaces will be in operation in about 30 days. Only ingots will be produced at present, as it will be several weeks before the finishing equipment is ready for operation.

The American Boron Products Co., Inc., 636 Court Street, Reading, Pa., has prepared a little message addressed to those who are to participate in the foundry meetings and exhibition at Boston in the week of Sept. 24. It ventures the prediction that the world by that time will have decided practically upon and "declared in favor of a reconstruction program rather than for further plans for destruction of the comparatively little that is left in the warring nations," and urges for the preparation for the "reconstruction boom" the desirability of remembering the advantage of co-operation between what may be termed the laboratory of the foundry industry and the foundry itself, or a complete understanding between science and practice, such as the meetings mentioned foster.

Fire, Aug. 14, destroyed a portion of the plant of the Bethlehem Steel Co., New Castle, Del., consisting of four buildings, with loss estimated at about $25,000.

Norwegian Market for American Machinery

A good deal of American machinery has recently come into the district of Stavanger, Norway. It is considered first class but United States Consul Maurice P. Dunlap considers it doubtful if the United States can hold the market in this line after the war, unless special efforts are made by individual makers. The great increase of Norway's material wealth, the development of the unused hydroelectric power in the mountain lakes and falls and the realization of the necessity of being more economically independent through the use of natural sources all increase the possibilities of Norway as a buyer in the American market for machinery. It seems likely, however, that as soon as the war is over the greater part of the orders will go to Germany. Reasons for the preference Norwegian engineers have for dealing with Germany are the following:

Norwegian engineers are practically all educated in Germany. They believe in the superiority of German methods and system, in the thoroughness of the instruction they have received and the superiority of that country's textbooks. Measurements, calculations and catalogs are all more intelligible to them than others.

Germany has for years had an almost exclusive market here for these products. Norwegians are conservative and prefer what they have tried to something new.

The opinion prevails that Germany can furnish wares more cheaply than other lands. High cost of production and freights are believed in most cases to put American machinery beyond reach. In bids for construction materials for public works, Germany is the first foreign country considered, then Sweden and England.

Much German material is already installed. When parts must be renewed they can be more easily obtained from that country. Other installations will usually not fit. For instance, a new patent electric stove ordered from America on trial could not be fitted to any electric socket because the sockets are made on the German plan.

Traveling agents from Germany are nearly always on hand to make contracts personally or to aid in installations. They usually speak Norwegian and take great pains to please possible customers.

American salesmen handling machinery and intending to visit Russia or other parts of Europe, should devote a little time to that part of Scandinavia. Even though they do not speak Norwegian, English is well understood there and personal courtesy backed up by good materials could do a great deal.

Takes Over Canton Company

CLEVELAND, Aug. 22—(*By Wire*).—The Canton Sheet Steel Co., Canton, Ohio, has been purchased by Philadelphia interests, whose names have not yet been made public. The purchasers will acquire all of the company's stock consisting of $563,000 par value in common stock at $375 a share and $1,000,000 of preferred stock at $110. C. A. Irwin will remain in his present capacity as general manager and it is expected that nearly all of the present official organization will be retained under the new ownership. The company makes black and galvanized sheets and sheet metal products. The plant equipment includes seven black sheet mills, four cold mills and eight galvanizing pots. It now has nearing completion an open-hearth steel plant for making its own sheet bars. This consists of three 50-ton open-hearth furnaces and a continuous blooming and sheet bar mill.

Will Build Aircraft

PITTSBURGH, Aug. 22—(*By Wire*).—The Benoist Aeroplane Co., Canton, Ohio, has been incorporated with a capital of $500,000 for the purpose of making aircraft for war purposes and other uses. The company is building a plant at Canton for making airplanes and has an option on 360 acres of ground near Canton, which it will use for a land school in connection with its factory. The company is also operating a flying school at Sandusky, Ohio, at present under instructions of Elmer Straub, a well-known flyer.

New American Company Shipping Brazilian Manganese Ore

That Manganese ore is being shipped from Brazil by a new American company is reported by United States Consul General Alfred L. M. Gottschalk of Rio de Janeiro. The company is said to have purchased four mines in the State of Bahia. The largest of these is in the municipality of Bom-Fim, northwest of the city of Bahia. It is accessible by the Central Railway of Brazil, but has not yet been explored to any extent. Three other mines are near the town of Nazareth, southwest of Bahia. They have no railroad outlets at present, and such ore as is mined must be taken by lighters to the Bay of Bahia and there placed aboard ship. These properties are said to be smaller than the one at Bom-Fim.

Only two ships have been loaded at Bahia with ore from these mines, the steamer Suffolk taking 4000 tons in the month of May and the Peter H. Crowell 4300 tons in April. Both vessels are of American register. It is claimed that much ore is in sight at all of these mines and American engineers who have been prospecting there are said to have reported very favorably upon them. The local agents of the American company mentioned estimate that with better railroad facilities from 15,000 to 20,000 tons of manganese ore could be shipped monthly from these mines, with Bahia as the point of general export. They claim, however, that even had they enough bottoms to carry 24,000 tons of ore monthly, the lack of sufficient railroad facilities to carry the mineral to tidewater is the important drawback. This is a general condition and applies to the State of Minas Geraes as well. In fact, it is the prevailing belief among technical men that the entire manganese problem of Brazil and, even further, the problem of disposing of its vast natural resources, is one of communications by highway in many interior districts and from the commercial centers of those districts by rail to tidewater.

Coking Value of Illinois Coals

The Bureau of Mines, Department of the Interior, in co-operation with the Illinois State Geological Survey and the Department of Mining Engineering of the University of Illinois, has completed a study on the coking of Illinois coals, and has published the results of this investigation in Bulletin 138, by F. K. Ovitz. The tests indicate that coke from Illinois coal unmixed with other coals can be used for fuel purposes and that coke from mixtures of Illinois coal with low-volatile coking coal are suitable for some metallurgical work. It is also stated that the yield of ammonia was larger than is obtained from eastern coal. The quality of coke from Illinois coals alone and from mixtures of Illinois coals with low-volatile coals is described, and the uses for which the coke is suitable are discussed. The gas making properties and the value of the coals for making by-products are noted. Methods of preparing the coals, the impurities in them, and the effect of these on the value of the coals for coke and gas making are considered.

The second part of the report deals with the character of Illinois coals, their nature, physical properties, and chemical composition. The non-homogeneous structure of the coal and the variation in composition of different beds and even of the same bed in different localities are pointed out. The tests are considered under three classes: those with beehive ovens, those with by-product ovens and those with gas retorts. The results of a few tests of the coke for furnace or other use are given.

The Youngstown Sheet & Tube Co. is installing shower baths, toilet and clothes drier facilities in its puddling mills at Youngstown. The company recently bought 62 acres of ground at East Youngstown for use in connection with its project of building houses for employees. The new tract adjoins about 200 acres before acquired for that purpose, and which is now being platted and developed. Baseball ground and other athletic features will be included in the equipment of the new town for the benefit of employees.

GREAT ORE PRODUCTION

Lake Superior Region Produced 85 per Cent of Last Year's Total

The iron ore mined in the United States in 1916 reached a total of 75,167,672 gross tons, the greatest annual output ever made. The shipments from the mines in 1916 were 77,870,553 gross tons, valued at $181,902,277. The quantity mined in 1916 was more than 19,600,000 tons greater than mined in 1915. The increases in quantity and in value of iron ore shipped in 1916 amounted to 40 and 80 per cent, respectively. The average value per ton at the mines in 1916 was $2.34 as against $1.83 in 1915. These figures, which were compiled under the direction of E. F. Burchard, of the United States Geological Survey, Department of the Interior, include for 1916 only iron ore containing less than 5 per cent of manganese.

Iron Mining by States.—Iron ore was mined in 24 states in 1916 and 23 in 1915. Minnesota, Michigan and Alabama, which have for many years produced the largest quantities of iron ore, occupied in 1916 their accustomed places.

Iron Ore Mined in the United States in 1915 *and* 1916, *in Gross Tons.*

State	1915	1916	Per cent of change in 1916
Minnesota	33,464,660	44,585,422	+33
Michigan	12,514,516	18,071,016	+44
Alabama	5,309,354	6,747,901	+27
New York	998,845	1,342,507	+34
Wisconsin	1,095,388	1,304,518	+19
Pennsylvania	363,309	559,431	+54
Wyoming	434,513	545,774	+26
New Jersey	415,234	493,004	+19
Tennessee	284,185	455,834	+60
Virginia	348,042	440,492	+27
Georgia	115,701	256,949	+122
New Mexico	34,806	157,779	+353
North Carolina	66,453	64,306	—3
Utah	(a)	45,514	(a)
Missouri	40,290	34,914	—13
Iowa	.....	11,351	...
Nevada	3,993	9,910	+148
Massachusetts	3,950	(a)	(a)
Maryland	5,500	4,455	—19
West Virginia	.....	3,605	...
California	646	3,000	+364
Ohio	3,455	1,800	—92
Other States[b]	23,650	28,190	[a]167
	55,526,490	75,167,672	+35

[a]Less than three producers in Massachusetts in 1916 and in Utah in 1915, and permission was not granted to publish State totals. Increase in 1916, therefore, included in "Other States."

[b]1915: Colorado, Connecticut, Idaho and Utah; 1916: Colorado, Connecticut and Massachusetts.

The Lake Superior district mined nearly 85 per cent of the total ore in 1916, and the Birmingham district about 8 per cent. No other district except the Adirondack mined as much as 1,000,000 tons. The increase in production in 1916 was especially marked in the Adirondack and Chattanooga districts, 54 and 55 per cent respectively, but every district showed an increased output over that of 1915.

Will Blow in New Furnace

PITTSBURGH, Aug. 22—(*By Wire*).—The Whitaker-Glessner Co., Wheeling, W. Va., will blow in its new blast furnace at Portsmouth, Ohio, on Thursday, Aug. 23. It is a 500-ton stack and will furnish pig iron for the open-hearth steel plant of the company at Portsmouth. The stack was built by the Wm. B. Pollock Co. of Youngstown. The Whitaker-Glessner Co. is adding six new hot sheet mills at Portsmouth with a view of producing highly finished sheets. Contracts for these mills were placed some time age, but the company does not expect to have the new mill in operation before the second quarter of next year.

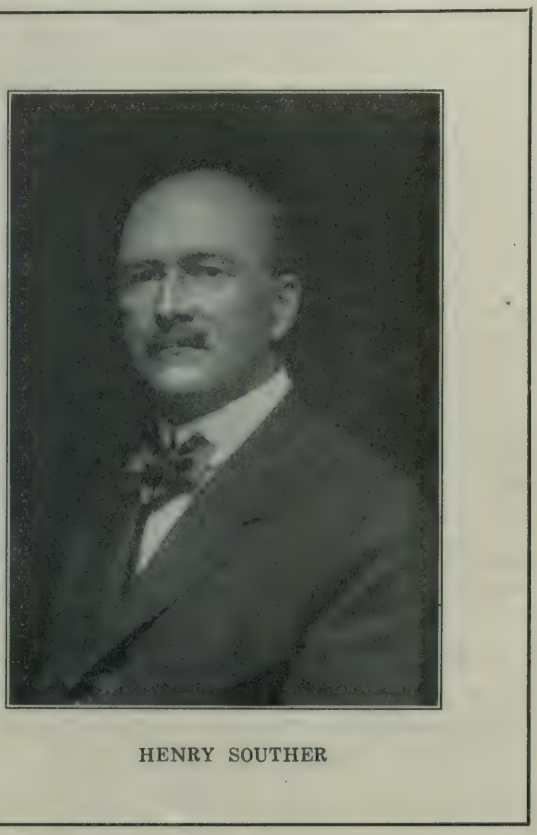
The plant of the Framingham Machine Works has been re-equipped with machinery and appliances for the production of gray iron castings and the galvanizing of metal goods and will be known as the Framingham Foundries of Framingham, Mass.

The Republic Iron & Steel Co., Youngstown, Ohio, has commenced the construction of two new open-hearth furnaces.

OBITUARY

Henry Souther

Major Henry Souther, senior officer, aircraft engineering division, aviation section, Signal Corps, U. S. A. and vice-president Henry Souther Engineering Corporation, Hartford, Conn., died Aug. 15 in the post hospital at Fortress Monroe, Va., following an operation. He was born at Boston in 1865 and was graduated in 1887 from the Massachusetts Institute of Technology, where he specialized in mining and metallurgical subjects. After studying abroad the manufacturing methods and processes employed in the German iron and steel industry, he entered in 1888 the employ of the Pennsylvania Steel Co., at Steelton, and was made assistant foreman the following year. He was engineer of tests for the company from 1890 to 1893, resigning to become engineer of tests for the Pope Mfg. Co., a position which he held for six years. At the Pope works he organized the first testing plant ever installed, it is believed, by a consumer of steel for the scientific testing of materials and developed the use of cold drawn tubing for bicycles and automobiles. In 1894 he went abroad for the Pope company to investigate the manufacture of horseless vehicles which had just been begun, and was largely responsible for the first Pope model which was placed on the market in 1897.



HENRY SOUTHER

When the Pope organization was dissolved in 1899 he engaged in business as an independent consulting engineer and established a metallurgical and testing laboratory and did consulting work for the automobile industry. He was president and treasurer of the Henry Souther Engineering Corporation from 1899 to 1909 and became president in 1911. Of late years he was not very active in the management of that organization and was vice-president and general manager of the Ferro Machine & Foundry Co., Cleveland, from 1913 to the outbreak of the war. Latterly he had charge of the aircraft development of the army and created a corps for the inspection of aircraft.

He was a member of the American Society of Mechanical Engineers and was prominent in the Association of Licensed Automobile Manufacturers. He was a founder member of what is now the Society of Automotive Engineers and had much to do with the develop-

ment of the iron and steel standards of that body. He was president of that society in 1911 and served as chairman of the standards committee for a number of years. In 1915 he was made a life member in recognition of this work. He leaves his widow and two married daughters.

OTTO P. STEHN, general sales manager Hydraulic Pressed Steel Co., Cleveland, died at Baltimore, Aug. 5, aged 41 years. He was born June 5, 1876, at Sheboygan, Wis., and the only educational advantages he had were the public schools of his birthplace. He worked for his grandfather, who was a small manufacturer in Sheboygan, for some time and later became a salesman of machine tools for the Northern Machine Co., Chicago. After several years as a salesman for other organizations he joined the selling force of Manning, Maxwell & Moore at Cleveland and subsequently became manager of that office. In 1911 he entered the employ of the Hydraulic Pressed Steel Co. as sales manager and developed the selling organization of that company. He leaves a widow and daughter.

HARRY CLIFTON ADAMS, vice-president of the Westmoreland Coal Co., Philadelphia, died Aug. 18. He was a graduate of the class of 1880, University of Pennsylvania; became connected with this company in 1881, was elected secretary in 1886, and in 1892 was elected vice-president in charge of sales. Mr. Adams was a recognized authority on gas coal, and wrote various papers on the gas coals of the United States.

GEORGE C. BLICKENDERFER, vice-president of the Blickenderfer Mfg. Co., Stamford, Conn., and inventor of the typewriter made by the company, died at his home in Stamford, Aug. 15. Since the beginning of the war, he had invented several devices which had been adopted by munitions makers.

FRANK W. DAVIS, manager of railroad sales of the Lake Erie Iron Co., Cleveland, died suddenly Wednesday, Aug. 8.

$750,000,000 MORE FOR SHIPS

Government to Finance Higher Wages—Lake Vessels for the Atlantic

WASHINGTON, Aug. 21.—The United States Shipping Board is about to submit for President Wilson's approval an estimate for an additional appropriation probably in excess of $750,000,000 to be expended in completing the board's program for an emergency fleet of cargo vessels, aggregating between 4,000,000 and 5,000,000 gross tons. The original figure of $500,000,000, fixed for the additional appropriation by General Goethals, would be inadequate to meet the cost of the contracts already let and the large amount of tonnage confidently counted upon as the output of the two Government-owned shipyards about to be contracted for. President Wilson will be disposed to favor the expansion of the building program, but it is expected that he will give some consideration to the advisability of seeking so large a supplemental appropriation at this time.

Government Will Finance Wage Increases

Contracts for the Government-owned shipyards for the construction of fabricated steel vessels have been held up for the consideration of a number of minor details. There has also been a disposition to await assurances that the supplemental appropriation would be granted. The board has also been following with interest the developments in connection with the threatened nation-wide strike in steel shipyards. Information received here to-day indicates that the Government is preparing to assume the burden of an increased wage scale for work on all vessels heretofore ordered and it is understood that this advance will prevent the strike. Shipyard owners have been unwilling to concede increases amounting in most skilled trades to 50c. a day without specific authorization from the Government, and a pledge from the Shipping Board that the federal treasury will pay the difference on the contracts already taken over. It is thought the strike situation has been so much improved as the result of concessions by the Government that it no longer threatens rapid progress with the program of the Shipping Board.

The Shipping Board will probably retain control of the foreign vessels now building in American yards, which have been commandeered along with vessels under construction for the American flag. This question has been held in abeyance pending negotiations with the British Government, but an agreement has now been reached under which the United States will reimburse the owners for all outlay and pay the builders for the completion of the vessels, after which they will go under the American flag to remain there indefinitely.

The plans of the Shipping Board for organizing an operating department have been finally worked out. An experienced railroad man will head the operating department, with three assistants, one to handle traffic on the Atlantic, another on the Pacific, while the third will be in charge of vessels in the South and Central American trades.

Lake Vessels for the Atlantic

For the purpose of increasing to the utmost the amount of trans-Atlantic and coastwise tonnage the Shipping Board is now considering diverting a large number of ships from the Great Lakes to the Atlantic. An estimate has been received showing the number of vessels which could be sent to tidewater through the canal, including those that would have to be cut in two, and it is believed that a very important addition to the Atlantic shipping could be secured in this way and with a minimum of hardship to shippers who rely upon lake vessels to carry their goods in view of the fact that all this tonnage is tied up during the winter. Most of the ships would not go back to the Lakes during the war but would be replaced by tonnage now building in Lake ports.

Real Admiral F. T. Bowles and Chief Constructor Snow of the Navy have been named as special assistants to Rear Admiral Capps, general manager of the Emergency Fleet Corporation. Admiral Bowles is regarded as one of the most competent men in the country for his new post. He served a long tour of duty as constructor of the Navy and subsequently resigned to become president of the Fore River Shipbuilding Company. Constructor Snow has been in charge of naval construction at the League Island, Philadelphia, yard, and is one of the leading experts in the service. Admiral Bowles at the outset will devote himself to speeding up construction work on ships building in American yards which were last week commandeered by the Shipping Board. Constructor Snow will serve as his aide in this work.

To Build More Destroyers

The Shipping Board has been informed that, as the result of the conference here between Secretary Daniels and more than a score of shipbuilders additional steps have been taken to add a large number of destroyers to the Navy at the earliest practicable date. The representatives of the leading shipyards present at the conference reported that their facilities were taxed to the limit by warships already under construction but that work on certain large vessels for the Navy might be postponed in order to build more destroyers.

Lack of Engine Building Capacity

The Navy Department is having difficulty in finding plants with adequate facilities for building engines for destroyers. As these vessels are very fast, the engines are required to have maximum power and minimum weight, a combination difficult to secure in any but specially designed power units. Naval experts are confident that as rapidly as engines can be procured hulls can be built and the additional destroyers fully equipped.

Every day adds to the evidence that the destroyer is the most formidable enemy of the submarine. The submarine commanders are fully alive to the danger of an attack by destroyers and rarely expose themselves within range of their guns. The average underwater speed of submarines is about 10 knots an hour and as troop transports make from 12 to 14 knots they do not fear the submarines if destroyers are employed to protect them ahead.

Can Not Fix Prices for the Public

War Industries Board Will Not Attempt to Exercise Such Power—Question of Prices for Allies Is Perplexing—Other Problems Pending

WASHINGTON, Aug. 21.—Developments of the past few days make it clear that the newly created War Industries Board will soon be called upon to meet squarely the issue concerning its authority to compel manufacturers to supply the war needs of the Allies at the same low prices as are to be paid by the American Government. It has been made equally clear that the board does not contemplate taking any definite steps to secure for the general public a lower level of prices than that now prevailing and that in its opinion additional legislation would be required to clothe it with power to do anything in this direction beyond the exercise of moral suasion.

It can be stated on high authority that the board has thus far received no definite refusal from any American manufacturer to furnish goods for the Allies at the same prices charged the United States. More than one manufacturer, however, has frankly expressed to the officials of the board a serious doubt as to the authority of anyone connected with the Government to prescribe the conditions governing dealings between American producers and the purchasing agents of foreign nations. It has also been pointed out to the board that however anxious domestic manufacturers are to co-operate with the Government and to help in winning the war, the interests of their stockholders cannot be sacrificed and individual officers of corporations are not justified in assuming the heavy responsibility of cutting prices not only on the goods required for the United States, but also those needed by the Allies, the combined requirements in some cases absorbing the entire output of large producing concerns. Under the circumstances, it is pointed out, there should speedily be a definition of the board's authority and, if necessary, the enactment of further legislation to clarify the situation and furnish a legal basis for the course which the board desires to pursue.

Allies' Orders Accepted

Certain contractors are accepting orders on behalf of the Allies at the same prices paid by the United States. Others, while not definitely refusing, have demurred and have delayed undertaking the work involved. Some contractors, who have accepted orders for the Allies at the suggestion of the board, are carrying on animated correspondence with sub-contractors who have been invited to take a part of the business at less than market rates. An argument that is being urged in this connection is the effect of the enforcement of the board's policy upon the interest of the private consumer. The prices paid by the board on account of the United States are not generally regarded as representing a satisfactory return on the entire output of the average manufacturing concern; therefore, if these prices must also be conceded to the Allies, the loss must be recouped by raising rates to the private consumer, and this increase must be considerably greater if the Allies as well as the United States are to be supplied at cut prices.

At present, the board is considering several important questions. Can the issue be satisfactorily disposed of by negotiation with the leading producers? Can the Government buy as if for its own requirements and then sell to the Allies? If the Government cannot go into the business of buying and selling war supplies, will Congress authorize it to do so by specific legislation? Has Congress the constitutional power to compel an American manufacturer to sell his goods to a foreign nation or individual at fixed prices? Can the legislation providing new loans for the Allies be so drafted as to clothe the administrative officers with power to use the proceeds of these loans to buy for the Allies at reduced prices?

A Mere Makeshift

There can be no doubt that negotiations can be relied upon to accomplish much in the direction of providing for the needs of the Allies, assuming, of course, that the Government does not insist upon unreasonably low prices. It is obvious, however, that with the great volume of business in prospect, any reliance upon individual negotiations in each case must be regarded as a mere makeshift. The weight of opinion is all against the authority of the Government to purchase war material and resell it to the Allies, especially if such transactions are resorted to because of the acknowledged lack of power in the Government to compel manufacturers to make concessions to the Allies. Existing statutes forbid administrative officials from disposing of any property belonging to the Government without special authority of law, and it follows that if the Government cannot sell, it cannot buy, as it has no available funds except such as are definitely appropriated from time to time for specified objects.

With all the circumstances in view, the simplest way out of the difficulty would appear to be through the enactment of legislation authorizing the administrative officers of the Government to expend the money loaned to the Allies, in whole or in part, in the purchase of war material and requiring manufacturers to sell for this purpose on terms to be fixed by the War Industries Board. Congress would no doubt feel justified in taking any risk that such a statute might be of doubtful constitutionality.

Coal Prices Fixed

President Wilson issued an order this evening fixing the price of bituminous coal in all producing districts of the country. The order, which applies to every mine in the United States, virtually cuts the price in half. Figures show the actual reduction by the President's order to be 44 per cent in the specific case of Virginia coal, which furnishes the general ratio of reduction, although the new price to the navy is 50 per cent of the old. The price of a long ton of Virginia coal at the pier has been $6.50. The new price is $2.20 a long ton plus $1.45 freight, or $3.65 at the pier, 56 per cent of the old price and a reduction of 44 per cent. A price of $2 a ton is fixed for the Pennsylvania, West Virginia and Ohio fields, which supply practically all the coal used in the Eastern States. The other prices range from $1.50 to $2 for Alabama fields to $3 for Oklahoma. These compare with a price of $3 offered by the Pennsylvania operators at the coal conference held here last June and the same figure presented by the West Virginia operators.

The prices fixed are practically $1 a ton below the scale drawn up by the Peabody committee after a conference with the 400 coal operators last June.

President Wilson took the first step looking to governmental control of the coal industry by naming Robert S. Lovett of the War Industries Board as Director of Priority of Transportation, at the same time giving his official approval to an order issued by Judge Lovett directing that rail and steamship lines give bituminous coal shipments to the Northwest preference

over all other freight movements. It is expected that within a day or two the President, acting upon authority conferred upon him by the Lever food and fuel control act, will appoint a coal administrator charged with power to direct production and distribution of both bituminous and anthracite coal, coke, petroleum, etc.

Eastern Freight Rates Increased 14 Per Cent

New freight rates from Pittsburgh to points east of that city went into effect Aug. 20. On rails and semi-finished material they represent a horizontal increase of 44 cents per ton, making the advance, say to Philadelphia, 17 per cent and to New England points 14 per cent. Against the old rate of $2.56 per ton from Pittsburgh to Philadelphia is one now of $3; similarly for New York district shipments, the old rate was $2.76 and the new one is $3.20, and for New England, the old and new rates are $3.16 and $3.60 respectively. On the whole, as noted in THE IRON AGE of July 5, the new rates average about 14 per cent higher than those obtaining up to this week and cover about one-fourth of the freight handled by the Eastern roads securing the advance.

On finished iron and steel, wire products, etc., the rates represent an increase of 12 per cent as for Rockland, Me., to about 17 per cent for Baltimore. The following table gives the recent and new carload lot freight rates and the new less than carload rates, and it is to be remembered that export freight rates are now the same as the domestic rates to Atlantic seaboard:

Freight Rates on Finished Iron and Steel Products from Pittsburgh to Points Listed, Effective Aug. 20, Cents Per 100 Lb.

	Old, Carloads	New, Carloads	New, Less than Carloads
Albany	16.9	19.5	23.0
Baltimore	15.4	18.0	21.5
Boston	18.9	21.5	25.0
Binghamton, N. Y.	14.2	16.5	19.5
Elmira, N. Y.	14.2	16.5	19.5
Harrisburg, Pa.	15.4	18.0	21.5
New York	16.9	19.5	23.0
Philadelphia	15.9	18.5	22.0
Rochester, N. Y.	12.2	14.0	16.5
Rockland, Me.	21.9	24.5	28.0
Syracuse, N. Y.	14.2	16.5	19.5
Utica, N. Y.	15.5	18.0	21.0
Richmond, Va.	21.3	24.5	29.5
Norfolk, Va.	21.3	24.5	29.5
Williamsport, Pa.	14.2	16.5	19.5

Government Needs More Metallurgists

The National Bureau of Standards at Washington, Dr. S. W. Stratton, director, has not yet obtained all the men needed to fill metallurgical positions with salaries varying from $1,200 to $2,000, depending upon the training and experience of the candidate. Men are desired with experience either in ferrous or non-ferrous metallurgy. The duties will be almost entirely of an investigational nature in connection with problems of military importance. Qualified men are urged to communicate to the Bureau of Standards at once a statement of training and experience, names of references and minimum salary which would be accepted, so that they may be advised of appropriate civil service examination for which to file papers. Until further notice such papers are received by the Civil Service Commission at any time and rated promptly.

McLain Furnace for Houston Foundry

McLain's System, Inc., Milwaukee, Wis., announces that it has closed a contract with the Lucey Mfg. Corporation, Houston, Tex., for a furnace designed to melt five tons when pouring medium and heavy castings and two tons when working on small and intricate castings of light section. The Houston company expects to melt steel about Oct. 1, which means quick delivery by the furnace builder.

The Marshall furnace, Newport, Pa., has increased the wages of all employees 15 cents a day, effective Aug. 16.

SHIP CONTRACTS THIS WEEK

Emergency Fleet Corporation Expected to Authorize Two Big Assembling Plants

Recent changes in the legal staff of the United States Shipping Board Emergency Fleet Corporation are believed to have caused the delay in the formal signing of contracts with the American International Corporation for its proposed ship plant on Hog Island, near Fort Mifflin, Pa., and with the Submarine Boat Corporation and the Lackawanna Bridge Co. for the plant which they propose jointly to establish on the Newark Meadows. Lawyers representing all parties are now examining the contracts and it is believed that they will be signed before the end of this week. The Merchants' Shipbuilding Corporation, which is affiliated with the Chester Shipbuilding Co., Philadelphia, is also expecting to close a contract this week with the Emergency Fleet Corporation. The latter company has a plant at Bristol, Pa.

All three plants will differ from the ordinary shipbuilding plants in that they will receive their steel already fabricated, and their work will, in reality, be more in the nature of an assembling proposition. About 20 per cent of the steel going into the ships will have to be fabricated on the premises, however, and for this equipment will be required. It is said that it is an easy matter to fabricate steel for the sides and bottom of the hull, but when it comes to the bow and stern, where bending of plates and shapes is required, the work must be more accurate and cannot be satisfactorily accomplished at a fabricating plant at a distant point.

Men have been at work for a week or two surveying the site for the plant of the American International Corporation on Hog Island. As soon as the formal contract is signed, actual work of erecting the necessary shipways and buildings will proceed rapidly. There will be 50 shipways at this plant and the contract will call for 200 vessels, if entered into as has been contemplated. The plant of the Submarine Boat Corporation and the Lackawanna Bridge Co. will be similar to that of the Hog Island plant, but it is understood that only 30 shipways will be built, and a correspondingly smaller number of vessels will be contracted for. It is expected that by the assembling process ships of 8000 to 10,000 tons can be built complete in about six to eight months.

The Board of Street and Water Commissioners of Newark, N. J., at a special meeting a few nights ago, agreed to renew for a period of 10 years the temporary lease which the Submarine Boat Corporation had taken on the site for its plant on the Newark meadows.

More Cars for Government Railroad in France

For the United States Government's railroad in France, 3000 more standard gage cars have been bought. As noted on page 383 of last week's issue, the first award covered 6000 standard gage and 2997 narrow-gage cars distributed among six car builders. The lots of standard-gage cars have now been increased 50 per cent with each company, an arrangement spelling economy, inasmuch as there are at least six different types of car involved. There remains about 5000 cars to be placed and these, it is expected, will be given probably this week, largely to companies not yet participating.

The Youngstown Sheet & Tube Co., Youngstown, Ohio, has taken Government certificates of indebtedness to the amount of $2,000,000. The notes are for a short term, being dated Aug. 10 and payable in November. This corporation has 1686 young men at its plant registered under the draft. Of this number it is expected that fully 1000 will be taken into the Government service for army duty. L. T. Campbell, son of President James A. Campbell, is at the officers' training camp at Fort Benjamin Harrison.

Machinery Markets and News of the Works

NEW GUN PLANTS EQUIPPING

Four Concerns to Forge Heavy Artillery

Airplane List Issued—Buying of Cranes For Railroad Work in France—Shipbuilding Concerns Are Placing Large Orders

Government ordnance, munitions, airplane and shipbuilding work continue to absorb most of the attention in machinery and machine-tool markets. It has just come to light that the Government has contracted with four concerns to forge guns, from 3 in. to 9.5 in., and plants are now being gotten ready. In addition to the $1,500,000 plant of the Tacony Ordnance Corporation, mentioned last week, the Heppenstall Forge & Knife Co. is building a gun-forging plant in Pittsburgh and the Buckeye Steel Castings Co., Columbus, Ohio, and the Standard Steel Castings Co., Cleveland, are building additions to take care of gun work. These guns will be machined in various plants. The Bullard Machine Tool Co., which, it was announced, is going ahead with a new gun finishing plant, has purchased part of its equipment. One of its first purchases was 10 10-ton cranes. The American Radiator Co. is rapidly equipping a gun-machining plant at Bayonne, N. J., and its purchases have aggregated several hundred thousand dollars.

Various other ordnance and munition projects follow. Walter Scott & Co., Plainfied, N. J., printing press manufacturers, have obtained a Government contract for gun carriages and will require about 200 new machines. The Yale & Towne Mfg. Co., Stamford, Conn., has a mine contract, but it is said will not need much new equipment. The Bausch & Lomb Optical Co., Rochester, N. Y., which is making periscopes and gun sights for the Government, is buying additional tools and needs a number of automatic screw machines. The Goss Printing Co., Chicago, has taken a contract for sights on 4-in. guns and has placed orders in Chicago for new equipment. Stone & Webster, general contractors for the machine shop at the Rock Island Arsenal, will place orders through their Boston office for about $1,500,000 worth of tools. Orders for 94,500 hubs for caisson and gun carriages have been distributed, the Wagner Electric Mfg. Co., St. Louis, and the American Car & Foundry Co., obtaining a large share. The latter concern has sub-let a part of its contract to the Rich Tool Co., Chicago. The Root & Van Dervoort Engine Co., Moline, Ill., is operating on an order for 40,000 8-in. shells. The A. O. Smith Co., Milwaukee, has issued a list of tools needed, and is presumed to be preparing to make munitions. The Wagner Electric Mfg. Co., St. Louis, has obtained contracts to build 1000 4-in. guns and $3,000,000 worth of 8-in. shells. The Poole Engineering & Machine Co., Baltimore, Md., has been awarded a contract for 700,000 one-lb. shells. St. Louis manufacturers are being urged to build a special plant to make gun carriages.

The airplane program seems to be assuming more definite form. Purchases of the Curtiss Aeroplane & Motors Corporation for its Buffalo plant will, it is said, aggregate $1,000,000. Manning, Maxwell & Moore, Inc., which has the blanket order, sent out requests for bids last week. The Curtiss corporation is said to have orders aggregating $200,000,000. The Simplex Automobile Co., New Brunswick, N. J. (Wright-Martin Aircraft Corporation) sent out a list last week, requesting bids on about 100 machines, and may duplicate this list soon. The company is reported to have received a Government contract and is asked to deliver 50 engines a day, which will necessitate increasing present capacity. The Sperry Gyroscope Co., Brooklyn, is expected to come into the market soon for equipment for a new factory, which will be busy on Government work. The Government is buying machine tools for an airplane plant of its own at Philadelphia, and also for repair stations at the aviation training fields.

Demand from shipbuilding companies continues fairly active. The Federal Shipbuilding Co., the Groton Iron Works and the Merchants' Shipbuilding Corporation (affiliated with the Chester Shipbuilding Co.) have been placing large orders. The Merchants' Shipbuilding Corporation bought 24 overhead electric traveling cranes for its 12 shipways at Bristol, Pa. The American International Corporation is reported to be going ahead now with its shipbuilding plant on Hog Island, near Philadelphia, and the Submarine Boat Corporation and the Lackawanna Bridge Co. will also proceed with their much-talked-of plant near Newark. Though details for these plants have not been fully worked out, it is said that there is no longer any uncertainty that they will be built. The Navy Department has contracted for about 50 torpedo boat destroyers, it is unofficially reported, with various large yards in the East.

Buying for the needs of the United States Army in France continues. The Pennsylvania Railroad Co. took bids up to Aug. 20 on seven cranes wanted for American railroad shops and for locomotive cranes for railroad construction work in France. The Quartermaster General's office in Washington has placed orders for belt-driven hammers, forging machines, bolt machines, etc., which presumably are wanted for motor and tractor repair shops in France. The Phoenix Construction Co., New York, has been placing orders on behalf of the Government for tools to be shipped promptly to France.

Several contracts for fuses are about to be placed in Washington, according to report, and companies which are expecting them have been making quiet inquiries for tools. Detroit motor truck companies are expecting additional truck contracts as the result of tests conducted on the Mexican border recently.

The Hay Foundry & Iron Works, Newark, is in the market for 10 5-ton cranes and Henry Steers, Inc., 17 Battery Place, New York, wants four small gantry cranes for pier construction.

French railroads want 40 to 50 locomotive cranes for railroad construction work. Australia wants power plant equipment and tools for new and expanding plants. General export trade is good, despite restrictions and scarcity of freight bottoms.

New York

NEW YORK, Aug. 21.

War preparations are advancing steadily, but there has been somewhat of a lull in buying of machinery and machine tools in this market during the past week. However, the period has been by no means dull, except as it is compared with the extraordinary activity which has preceded.

One of the interesting developments of the week was the issuance of a list by the Simplex Automobile Co., New Brunswick, N. J. (Wright-Martin Aircraft Corporation), for about 100 lathes, milling machines, grinders, drills and automatic screw machines. It is said that another list approximating this one will soon be issued. The Simplex Company is reported to have obtained a contract from the Aircraft Production Board for a large number of Hispano-Suiza motors, delivery of which is requested at the rate of 50 per day. The Sperry Gyroscope Company, which is erecting a new 11-story building in Brooklyn for the manufacture of airplane apparatus, gyro-compasses and searchlights for the Government, will probably buy equipment soon. Inquiries were sent out during the week by Manning, Maxwell & Moore, Inc., which is buying equipment for the new plant of the Curtiss Aeroplane & Motors Corporation, Buffalo. The equipment purchases of the Curtiss corporation will aggregate about $1,000,000. The concern is reported to have contracts worth $200,000,000. The Government is also a large buyer of machine tools for airplane work, orders having been placed during the past week for the Government airplane plant to be built at Philadelphia and for the repair stations at aviation training fields.

Efforts of the Ordnance Department of the United States Army to increase the production of big guns seem to be bearing fruit rapidly. In addition to the gun forging plant to be built by the Tacony Ordnance Corporation, 50 Church Street, New York, at Tacony, Pa., as mentioned in THE IRON AGE last week, three other concerns will forge guns. The Heppenstall Forge & Knife Co., Pittsburgh, is building a new plant for such work and the Buckeye Steel Castings Co., Columbus, Ohio, and the Standard Steel Castings Co., Cleveland, Ohio, are building additions to their plants, and will engage in the work of forging guns as rapidly as possible. Some of this work will be begun about Sept. 1, the plant additions having been speedily erected and equipped. These guns will be sent to various plants for machining. The Bullard Machine Tool Co., Bridgeport, Conn., is buying equipment for the plant it will erect for the Government for machining guns. The American Radiator Co. is rapidly equipping its new plant at Bayonne, N. J., for the finishing of 4-in. guns, it having recently closed a big contract with the Government. The American Radiator Co.'s purchases of equipment aggregate several hundred thousand dollars. The lathe order, alone, is said to have totaled more than $200,000.

A Government contract for gun carriages has been awarded to Walter Scott & Co., Plainfield, N. J., builders of printing presses, and this concern is buying about 200 new machines. The Yale & Towne Mfg. Co., Stamford, Conn., has obtained a contract for mines, but probably will not need much addition to present equipment. A number of contracts for time fuses are pending in Washington, and several concerns which are expecting to engage in this work have been quietly inquiring for new turret lathes and small tools. The Bausch & Lomb Optical Co., Rochester, N. Y., is buying additional equipment, and is said to be in need of many automatic screw machines for work on submarine periscopes and gun sights. The North East Electric Co., Rochester, N. Y., manufacturer of electric starting systems, is buying tools for a new machine shop it is erecting. Rubber tire companies are buying boring mills for making tire molds.

The Quartermaster General's Department of the United States Army has purchased two dozen or more belt-driven hammers, several forging machines, bolt machines, etc., presumably for motor truck and tractor repair shops in France. The machines are desired for early shipment. The Phœnix Construction Co., 41 Park Row, New York, has placed a number of orders for tools on behalf of the Government.

It is understood, though not officially announced, that the American International Corporation, New York, will go ahead with its steel shipbuilding plant on Hog Island, near Philadelphia, and that the Submarine Boat Corporation and the Lackawanna Bridge Co., New York, will now build a similar plant near Newark. Details of the plans are not yet fully worked out by the Emergency Fleet Corporation, but it seems certain now that the yards will be built. The Merchants Shipbuilding Corporation, which is affiliated with the Chester Shipbuilding Co., Philadelphia, is buying new equipment for the Bristol, Pa., plant. Twenty-four overhead electric traveling cranes for the shipways have been purchased from the Pawling & Harnischfeger Co., Milwaukee. The Federal Shipbuilding Co., New York, has been closing contracts for equipment on its list recently sent out. Lists of other tools and cranes are expected soon. The Oscar Daniels Co., Woolworth Building, New York, is ready to go ahead with a shipbuilding plant at Brunswick, Ga., as soon as a contract is received from the Government. Inquiries for equipment may be sent out soon. The Groton Iron Works, New London, Conn., has received a Government contract for six steel vessels.

The Navy Department has awarded contracts for torpedo boat destroyers, it is reported, to the Fore River Shipbuilding Co., Newport News Shipbuilding & Dry Dock Co., New York Shipbuilding Corporation, William Cramp & Sons Ship & Engine Building Co., Union Iron Works and the Bath Iron Works. The total number ordered is believed to be about 50.

The Pennsylvania Railroad Co. received bids up to Aug. 20 for 12 5-ton, two 30-ton and four 65-ton cranes for the United States Army in France, these to be used in locomotive and car shops of the new American railroad. Bids for several locomotive cranes for construction work on the railroad were also received. Shipments of these cranes are to begin in six or eight weeks and must be completed within three months. The commander process will be invoked to obtain them within that short time. The Bullard Machine Tool Co., Bridgeport, Conn., awarded to the Pawling & Harnischfeger Co., Milwaukee, an order for 10 10-ton cranes for the gun plant to be erected for the Government. The Hay Foundry & Iron Works, Newark, N. J., is in the market for 10 5-ton cranes. Henry Steers, Inc., 17 Battery Place, New York, wants four small gantry cranes for work on pier construction in New York Harbor. Westinghouse, Church, Kerr & Co., New York, want a 3-ton crane for an addition to one of the plants of the Savage Arms Co. The Du Pont Co., Wilmington, Del., has purchased a number of hoists, electric and hand power, up to 1000 lb. capacity.

Export trade in machinery lines is excellent. The railroads of France are in the market for 40 to 50 locomotive cranes, Australia wants power plant equipment, machinery and tools for new manufacturing establishments.

Strikes of workers in the foundries of the Niles works and Bement works of the Niles-Bement-Pond Co. are embarrassing that company in delivering machine tools on Government work.

The business in machine tools, special and automatic machinery of Lewis Russell, 30 Church Street, New York, has been incorporated as Russell, Holbrook & Henderson, Inc., with an authorized capitalization of $25,000. The business will be continued at the same address with enlarged facilities for doing business. The officers of the new corporation are Lewis Russell, president; C. H. Holbrook, vice-president; Lucien G. Henderson, secretary and treasurer.

The Sperry Gyroscope Co. is building an 11-story concrete factory, south side of Concord Street, west of the Flatbush Avenue extension, Brooklyn, to cost several hundred thousand dollars. This is to accommodate the rapidly growing business of the company, which results from Government orders for gyro-compasses, searchlights and airplane apparatus.

A. Schrader's Son, Inc., Brooklyn, mentioned recently as having purchased machine tools for making munitions, says that it is not making munitions, but is continuing the manufacture of its regular products, which include diving apparatus, tire valves, etc. The Government demand for diving apparatus is said to be considerable and the Schrader plant is extremely busy.

The Defiance Lantern & Stamping Co., Rochester, N. Y., has purchased the plant of the Wood Mosaic Co., same city, and will occupy it. This will give the Defiance company more room for the manufacture of its products and also gives it a location on a railroad siding. The Wood Mosaic Co. moved to New Albany, Ind.

The Ball Gear & Machine Co., Inc., Brooklyn, N. Y., has been incorporated with a capital of $12,000 to manufacture boilers, engines and machinery. F. J. and G. M. Ball, and L. E. Eason, 233 Halsey Street, Brooklyn, are the incorporators.

The United States Aero Propeller Co., Inc., New York, has been incorporated with a capital of $12,500 to manufacture aeroplanes and equipment for aircraft. The incorporators are C. N. Flint, F. Angelocj and F. A. Huck, 254 Echo Place.

S. Weisglass & Co., 110 West Street, Brooklyn, N. Y., manufacturers of brass beds, are making rapid progress in the construction of a new four-story and basement addition to their plant at Atlantic Avenue and Milford Street. The structure will be about 100 x 160 ft., and is estimated to cost about $75,000.

The Charles T. Gullette Motors Corporation, New York, has been incorporated with a capital of $50,000 to manufacture automobiles and motorcycles. L. H. Siebel, C. T. and E. T. Gullette, 421 West 119th Street, are the incorporators.

The Todd Shipyards Corporation, 15 Whitehall Street, New York, has awarded a contract for the construction of a three-

story building, about 100 x 150 ft., on Third Avenue, near Twenty-fourth Street, to cost $70,000.

The Kar Engineering Co., Inc., New York, has filed articles of incorporation with a capital of $125,000 to manufacture machinery and tools. M. and S. Karasick and G. P. Robbins, 129 East Eighty-second Street, are the incorporators.

Barber & Co., New York, have filed articles of incorporation with a capital of $500,000 to operate a foundry and machine shop. A. Skillman, E. E. Hurley and A. Foshay, 120 Broadway, are the incorporators.

The P. H. Gill Forge & Machine Co., Loraine Street, Brooklyn, N. Y., is taking bids for a two-story addition to cost $4,000.

The M. H. Keyless Lock Co., Inc., New York, has been incorporated with a capital of $10,000 to manufacture special keyless locks. I. Heinz, J. Mainzer and R. Applebome, 224 Fifth Street, are the incorporators.

The Nametco Products Co., Inc., New York, has been incorporated with a capital of $10,000 to manufacture metal supplies of various kinds. M. Halperin, M. Levin and I. Krainess, 88 Walker Street, are the incorporators.

The Christian Machine Co., 30 Church Street, New York, plans for the construction of a new one-story concrete building, about 75 x 100 ft., on Richmond Terrace, West New Brighton, Staten Island.

Kahn Bros., 785 Humboldt Street, Brooklyn, N. Y., manufacturers of metals and kindred specialties, will build a new one-story brick addition to their plant, about 145 x 240 ft., to cost $18,000.

Samuel B. Howard, 65 Cedar Street, New York, L. H. Gunther and John H. Moore, also of New York, have incorporated in Delaware the United States Airplane & Engine Co., with a capital of $1,500,000 to manufacture engines for airplanes and automobiles.

The Safety Machinery Corporation, New York, has been incorporated with an active capital of $150,000 to manufacture clutch and brake equipment and safety devices of various kinds, particularly for sewing machines. J. J. Axilrod and H. and H. Frankel, 318 East Thirty-second Street, are the incorporators.

The Watson-Stillman Co., 50 Church Street, New York, manufacturer of hydraulic pumps, tools, etc., will build a new one-story machine shop, about 60 x 130 ft., at its works, Roselle Park, N. J. Contract for erection has been awarded to William Clifford & Sons Co., Elizabeth, N. J.

The Sheffield Iron Corporation, New York, has been incorporated with an active capital of $777,500 to manufacture iron and steel products. J. R. Floyd, J. Gayley and H. K. Wood, 65 Cedar Street, are the incorporators.

The Lopez Shock Absorber Mfg. Co., New York, has filed articles of incorporation with a capital of $25,000 to manufacture shock absorbers and hardware specialties. J. Murla, J. M. Lopez and B. A. Quires, 120 Broadway, are the incorporators.

The McDowell Ash Sifter Co., Inc., New York, has been incorporated with a nominal capital of $5,000 to manufacture ash sifters and other sheet metal products. M. L. Wohltman, G. McDowell and S. F. Glover, 383 Pearl Street, are the incorporators.

The General Electric Co., Schenectady, N. Y., is taking bids for the construction of a new brick and reinforced concrete forge shop addition to its works, one-story, 80 x 400 ft.

The Mogul Tires Co., Inc., Pearl River, N. Y., has filed articles of incorporation in Delaware with a capital of $2,500,000 to manufacture automobile tires and other rubber goods. Arthur R. Oakley, Pearl River, N. Y.; William E. Shields, Jr., Brooklyn, and Richard A. Webster, New York, are the incorporators.

The Linn Mfg. Corporation, Morris, near Oneonta, N. Y., manufacturer of farm tractors, has commenced the erection of a new one-story plant to cost about $8,000. W. H. Linn is president.

The Gleason Works, 1000 University Avenue, Rochester, N. Y., manufacturer of gears, etc., has awarded the contract for its proposed new factory extension. The structure will be one and two-story reinforced-concrete, about 50 x 120 ft., and will cost $75,000. The Alexander, Shumway & Utz Co., Exchange Place Building, Rochester, has the contract for construction.

The Lindner Laundry Machine Co., Buffalo, has been incorporated with a capital of $10,000 to manufacture laundry machinery. William W. Lewis and John H. Brogan, Buffalo, and Arthur Lindner, Rochester, are the incorporators.

The Donner Steel Co., Buffalo, has filed plans for the construction of a one-story addition to its plant on Abbott Road to cost about $10,000.

The Tiffany Never-Wind Clock Corporation, Buffalo, has been incorporated with an active capital of $150,000 to manufacture electric clocks. W. C. Newcomb, E. M. Gunnison and I. L. Fisk, Buffalo, are the incorporators.

The proposed extensions to the plant of the Sizer Forge Co., 238 Larkin Street, Buffalo, will consist of a one-story brick and steel addition, 40 x 88 ft.; electric furnace, 90 x 210 ft.; and scrap yard, 40 x 320 ft. The work is estimated to cost $110,000.

The H. G. Trout Co., 226 Ohio Street, Buffalo, manufacturer of iron and brass castings, has awarded a contract for the construction of two one-story additions to its plant, 52 x 80 ft., and 40 x 50 ft., comprising foundry and blacksmith shop, respectively. The extension will cost about $18,000.

The Somerset Motors Corporation, Plainfield, N. J., has been incorporated with a capital of $25,000 to manufacture automobiles, etc. C. Holt, Jr., 149 East Fourth Street; F. L. Holt, and I. L. Englehart, are the incorporators.

The United States Government is planning for the construction of a new two-story brick and stone assembling works at its Picatinny Arsenal, Dover, N. J.

The New York Belting & Packing Co., Passaic, N. J., has taken bids for the construction of a five-story and basement brick and reinforced-concrete addition to its plant, about 90 x 250 ft. Lockwood, Greene & Co., 101 Park Avenue, New York, are the architects.

The Worthington Pump & Machinery Corporation, Harrison Avenue, Harrison, N. J., has commenced the erection of a one-story brick addition to its pump works, 150 x 400 ft., to cost about $200,000.

The Riverside Steel Casting Co., Plant Road, Kearney, N. J., has filed plans for the erection of an addition to its foundry in the meadows section.

Rapid progress is being made in the construction of the new foundry of Reuther Bros., 415 Middlesex Street, Harrison, N. J., specializing in the production of gray iron castings. The new plant will cost about $40,000.

The American Smelting & Refining Co., Perth Amboy, N. J., has commenced the erection of a new tin furnace plant, about 40 x 115 ft., at its works.

The Gamon Meter Co., 282 South Street, Newark, N. J., manufacturer of water meters, is establishing a new plant at Mulberry and Murray Streets for the manufacture of tools, fasteners and other water meter equipment, replacing the tool works formerly located outside of the city limits. The new plant consists of a three-story structure, about 45 x 225 ft.

The Building Committee of the Common Council, Newark, N. J., will receive bids until Sept. 4 for the installation of a refrigerating plant at the City Hospital.

The Hanson & Van Winkle Co., 269 Oliver Street, Newark, N. J., manufacturer of dynamos and kindred specialties, has awarded a contract for the construction of an extension to its plant at Adams and Chestnut Streets.

The Whitehouse LeCompte Mfg. Co., 44 Elm Street, Newark, N. J., manufacturer of hardware, has increased its capital from $200,000 to $300,000.

The Board of City Commissioners, Bayonne, N. J., has authorized an appropriation of $25,000 for the purchase of new machinery for the City Vocational School. A new one-story extension will be erected to the school to provide for the installation of the new equipment.

New England

BOSTON, Aug. 20.

Orders and inquiries coming to metal working plants of all kinds show a sharp increase in volume. Virtually all the orders are for industries outside of New England and come from widely varied sources. So far the increased demand has not been reflected in a corresponding expansion of New England plants but reports of contemplated additions to plant and equipment are more numerous and the completion of the pending legislation affecting prices and taxes will surely be followed by a period of industrial growth commensurable with the large total value of the orders flowing into this section for machine tools, general and special machinery, small tools, jigs and gages, forgings and castings.

The Stanley Works, New Britain, Conn., is to build a billet mill, 100 x 160 ft., one story, and a hoop mill, 45 x 260 ft., with a wing 55 x 60 ft., one story.

The Nutting Mfg. Co., Worcester, Mass., has been incorporated with authorized capital stock of $10,000 to manufacture machinery, pressed metal goods and screw machine products. The directors are George H. Stearns, president; Jason C. Stearns, treasurer; Charles H. Prior and Archer I. Nutting.

The Commercial Machine Co., Franklin, N. H., is building a machine shop, 96 x 98 ft. The company has a force working at the Esty machine shop, Laconia, N. H., on a Government contract.

The American Whaley Engine Co., Boston, has been incorporated with authorized capital stock of $1,000,000. The directors are George C. Coit, president; Henry A. Stebbins, 136 Federal Street, treasurer, and Thomas S. Spinney.

J. Byron Colvin, Worcester, Mass., who has been managing the foundry of the late James A. Colvin for the past year, has bought the business and property, which has an assessed valuation of $26,500. The new owner will continue the business.

The Paper Products Machine Co., Boston, has been incorporated with capital of $50,000. The directors are Patrick T. Jackson, Jr., president; Charles H. Howard, Cliftondale, treasurer, and John Noble.

The Fitchburg Automatic Machine Co., Fitchburg, Mass., has secured a permit to erect an addition, 30 x 66 ft., to cost $4,000.

The Baker Machine Co., New Bedford, Mass., has been incorporated with capital stock of $12,000. The directors are Luke T. Keith, president; Frank H. Macy, treasurer, and I. E. Baker.

The Deane Steam Pump Works, a subsidiary of the Worthington Pump & Machinery Corporation, Holyoke, Mass., has purchased a tract of land adjoining its present property and contemplates building a one-story addition.

The Worcester Machine Screw Co., Worcester, Mass., has had plans drawn for a new building, 51 x 115, 60 x 75 and 42 x 45 ft., five and one-story sections.

Butterfield & Co., Derby Line, Vt., contemplates building an addition, 68 x 165 ft., three stories.

The Potter & Johnston Machine Co., Pawtucket, R. I., has awarded a contract for an addition, 48 x 290, 49 x 141 and 49 x 141 ft., one story.

The Wyman & Gordon Co., Worcester, Mass., has awarded a contract for an addition to a forge shop, 40 x 100 ft., one story.

The Sperry & Barnes Co., New Haven, Conn., has filed plans for the construction of a new one-story blacksmith shop, about 52 x 52 ft., at Long Wharf.

The Taunton-New Bedford Copper Co., West Water Street, Taunton, Mass., has awarded a contract for the construction of a new one-story machine shop, about 60 x 100 ft., to cost $10,000.

The American Steel & Wire Co., Fair Haven, Conn., will build a new one-story wire rope mill addition to its plant, about 70 x 200 ft. C. W. Murdock, New Haven, has the contract for construction.

Philadelphia

PHILADELPHIA, Aug. 21.

The Midvale Steel Co., Philadelphia, is taking bids for the erection of a new machine shop addition at its Nicetown works.

The Cosmic Metal Co., Philadelphia, a Delaware incorporation, has increased its capital from $500,000 to $1,000,000.

J. & G. Sutton, operating a roofing and sheet metal works at 866 Locust Avenue, Philadelphia, have filed plans for the construction of a new one-story brick shop building, about 20 x 70 ft., on Chelton Avenue.

The Keystone Emery Mills, 4329 Paul Street, Philadelphia, manufacturers of abrasive materials, are having plans prepared for the construction of a new two-story brick extension, about 36 x 100 ft.

The Fox Motor Co., Philadelphia, has been incorporated in Delaware with a capital of $100,000 to manufacture motors. F. R. Hansell, Philadelphia; S. C. Seymour, and J. Vernon Pimm, Camden, N. J., are the incorporators.

The Pierce Arrow Tire & Rubber Co., 932 North Broad Street, Philadelphia, will soon call for bids for the construction of a new two-story factory, 160 x 225 ft., at Twenty-first and Lippincott Streets to cost about $150,000. J. Osborn Hunt, 114 Montgomery Street, Trenton, N. J., is architect.

The Public Service Corporation, Trenton, N. J., has acquired property at Brunswick and New York Avenues adjoining its power plant, and plans for the construction of extensions. The proposed new buildings and equipment will cost about $200,000.

The American Steel & Wire Co., Hamilton Avenue, Trenton, N. J., has filed plans for the erection of a new wire rope mill addition to its plant, about 100 x 310 ft., to cost $35,000. The company will also build a new one-story machine shop, about 50 x 70 ft., to cost $9,000.

The Delion Tire & Rubber Co., Trenton, N. J., has awarded a contract for the construction of a two-story addition to its plant, about 60 x 170 ft., on Whitehouse Road. J. H. Morris, Broad Street Bank Building, Trenton, is the contractor.

The Essex Rubber Co., Beakes and May Streets, Trenton, N. J., manufacturer of mechanical rubber goods, has had plans prepared for a one-story addition to its plant to cost about $20,000.

The Imperial Porcelain Co., Trenton, N. J., manufacturer of electrical porcelain specialties, has awarded contracts for its proposed new plant at Manasquan, N. J., to cost $50,000. Three one-story structures will be erected for the initial works, 100 x 100 ft.; 60 x 360 ft., and 30 x 40 ft. The Austin Co., 1319 Filbert Street, Philadelphia, is the contractor.

The Eagan Rogers Steel & Iron Co., Crum Lynne, Pa., specializing in the production of iron and steel castings, is building additions to its plant to double the present capacity. The company has received orders from the Government for a quantity of castings.

The American Car & Foundry Co. is making rapid progress with the erection of a large addition to its Bloomsburg, Pa., local plant. New equipment and machinery is being installed to handle an order received from the United States Government.

The Denite Steel Co., New Eagle, Pa., has been incorporated with a capital of $100,000 to operate a local plant for the production of steel products. S. A. Davis heads the company

The Richard Mfg. Co., Bloomsburg, Pa., is operating its plant at full capacity for the manufacture of wire-drawing machinery and allied equipment. The company has recently reopened its foundry, closed for a considerable period, to provide for increased operations.

The Hahn Motor Truck & Wagon Co., South Fourth Street, Hamburg, Pa., manufacturer of motor trucks, wagons and parts, is building a new one-story extension, about 64 x 120 ft., to be used as an asembling works. The structure will cost $10,000.

The Jeanesville Iron Works, Hazleton, Pa., is planning for early operations at its plant for the manufacture of shells. Considerable new equipment is being installed to handle a large order for munitions from the United States Government.

The State Department of Education, Harrisburg, Pa., is planning for the establishment of a new vocational high school at Blain. A shop building will be provided for instructions in scientific and general work.

The Federal Equipment Co., West and Lincoln Streets, Carlisle, Pa., is building a one and three-story addition to its plant to cost about $10,000.

The Righter Castings Co., Columbia, Pa., has been organized by Noble C. Righter to operate the former plant of the Shawnee Brass & Iron Foundry Co., recently acquired. It is proposed to commence operations before the close of the month. The present capacity will be considerably enlarged and extra hands employed.

Fire recently destroyed a portion of the sheet metal plant of Grant C. Knobbs, 2522 Smallman Street, Pittsburgh, with loss estimated at $8,000. It is said that the plant will be immediately rebuilt.

The Camden Forge Co., Mount Ephraim Avenue, Camden, N. J., manufacturer of iron and steel forgings, has filed plans for the erection of a one-story addition to its plant, about 80 x 100 ft., to provide for increased capacity.

The Apex Machine Co., Philadelphia, has been incorporated with a capital stock of $25,000 to manufacture machinery, tools and mechanical devices. The incorporators are W. C. Arnold, 3626 Hamilton Street, Frank J. Riera, Jr., 228 East Meade Street, H. Wolfenden, 4651 Sheldon Street, all of Philadelphia.

Baltimore

BALTIMORE, Aug. 20.

Morrow Brothers, Fidelity Building, Baltimore, have been awarded the contract for the construction of buildings and shipways for the Maryland Shipbuilding Co.

The West Construction Co., American Building, Baltimore, has been awarded the contract for the construction of additional buildings for the Baltimore Dry Docks & Ship Building Co.

The Baltimore Tube Co., Wicomico and Ostend Streets, Baltimore, has purchased more land in the vicinity of the present plant. No announcement of plans has been made.

The Tin Decorating Co., Boston Street and Linwood Avenue, Baltimore, will construct two additional one-story buildings.

The Pusey & Jones Co., Wilmington, Del., will construct three additional buildings at a total cost of about $70,000. The new buildings will consist of a two-story steel and brick machine shop, 60 x 100 ft., to cost about $30,000; a three-story, 40 x 60 ft., steel and brick toolhouse, to cost about the same amount, and a three-story addition to the mold loft to cost about $10,000.

The Chesapeake Shipbuilding Co., Baltimore, Md., recently incorporated with a capital of $100,000, has acquired property consisting of about 75 acres at Curtis Bay for the construction of its new shipbuilding plant. The proposed works will comprise machine shop, erecting works, and other structures and shipways. Sheldon H. Tolle, James H. Foster and Roger C. Hyatt, all of Cleveland, will head the company.

The Maryland Brass & Metal Works, Guilford Avenue and Federal Street, Baltimore, Md., has awarded a contract for the construction of a new foundry, 46 x 90 ft., to cost $15,000. William Gieriel is president.

The Pusey & Jones Co., Wilmington, Del., has filed plans for extensions at its shipbuilding plant to cost about $70,000. The structures will include two-story brick and steel machine shop, 60 x 100 ft., to cost about $30,000; three-story tool house, 40 x 60 ft., $30,000; and two-story general shop addition, $10,000.

The Hupp Mfg. Co., Asheville, N. C., has recently been incorporated with a capital of $500,000 to manufacture machinery. T. H. Smith, Knoxville, Tenn.; J. M. Boone, Bryson City, N. C., and H. E. Groover, Asheville, are the principal incorporators.

The York River Shipbuilding Co., Mutual Building, Richmond, Va., is planning for the erection of a shipbuilding plant at Westpoint, Va., to cost about $250,000. The initial works will consist of machine shop, erecting shops, etc., to a total of about 10 buildings, with power plant for operation. William Moore is president.

The Chesapeake & Ohio Railroad, Richmond, Va., has had plans prepared for a new one-story engine house and shop building to be erected at Raleigh, W. Va., at a cost of about $15,000. The structures will be 58 x 140 ft., and 30 x 70 ft., respectively.

The American Car & Foundry Co., Huntington, W. Va., is arranging to award contracts for the erection of structural steel frame machine and blacksmith shops at its local plant, to replace structures recently destroyed by fire. Headquarters of the company are at St. Louis.

The Porcelain Enamel & Mfg. Co., Eighth Street, Canton, Ohio, is having plans prepared for a new plant to be erected on Bayard Street, Baltimore, Md., at a cost of about $200,000. P. O. Keilholz, Continental Building, Baltimore, is engineer for the company.

Chicago

CHICAGO, Aug. 20.

The pressure on machinery makers and dealers is almost entirely confined to large heavy machines, including lathes, planers, punches and shears, bending rolls, etc., required for the manufacture of large guns and shipbuilding. With all such tools, deliveries are many months away, and when sales are made, prices are not always definitely fixed. In the case of an 18-ft. planer, for instance, the price named is only tentative, it being agreed that the price may be increased up to 10 per cent should conditions at time of delivery warrant an advance, this arrangement being made because of uncertainties pertaining to the cost of materials and the desire of the builders to protect themselves against further advances. Pig iron at $55 per ton is of itself a big item in a tool that weighs many tons. The demand for smaller machines, coming from miscellaneous sources, is a little easier with most of the dealers, but this condition will change quickly should the Government place more orders for shells. Heretofore it has been mostly the tractor and ordnance makers who have been buying and who still are expected to take considerable equipment.

Additional war orders for machine tools are nearer fruition, inasmuch as several firms have received Government contracts, and more are bidding on such business. The Goss Printing Press Co., Chicago, has a contract for sights on 4-in. guns, and has placed some orders for tools. The company has inquired for steel castings as well as for the tools to machine them. The list of tools which will be bought by Stone & Webster for the machine shop they are building at the Rock Island Arsenal, previously reported, will total no less than $1,500,000. The buying will be done at the home office of the company in Boston, Arthur Fuller having charge, but action will be determined by recommendations from the arsenal. The machines will be set up as well as purchased by Stone & Webster. The new shop will replace the old one, the latter being used for storage purposes. Orders for 94,500 hubs for caisson and gun carriages have been distributed, the Wagner Electric Co., St. Louis, receiving an order for about 30,000 hubs for 56-in. wheels. The original requirement was 61,000 56-in. (wheel) hubs, 2500 58-in. hubs and 31,000 60-in. hubs. The American Car & Foundry Co. has a contract for a part of the total number and has sublet a contract to the Rich Tool Co., Chicago.

It is stated authoritatively that not many metal working tools will be required for the building which is being constructed at the Rock Island Arsenal by Westinghouse, Church, Kerr & Co. as it is to be used for shell loading.

The Root & Van Dervoort Engine Co., Moline, Ill., already operating on an ordnance contract, has received an order for 40,000 8-in. shells. The company successfully executed a foreign shell order. A good-sized list has been issued by the A. O. Smith Co., Milwaukee, Wis., maker of automobile stampings, and inasmuch as the inquiry includes lathes, it is surmised by the trade that the company has a contract or subcontract for war supplies.

Moline and Rock Island, Ill., are busy places because of the activities of the arsenal, the Root & Van Dervoort Engine Co. and the tractor department of the Moline Plow Co.

Bids are being received by W. P. Whitney, architect, 122 South Michigan Avenue, Chicago, for a one-story mill construction manufacturing building, 50 x 200 ft., at Wauconda, Ill.

All bids for the industrial school to be built for the Chicago & Cook County School for Boys having been rejected, it has been decided to have the work done by the day under the supervision of the Bureau of Engineers. A bond issue of $250,000 is available.

Contracts have been awarded for a seven-story manufacturing building, 130 x 150 ft., at 1032 to 1046 Kingsbury Street, Chicago, for Louis Schetnitz. It will be of reinforced concrete construction, cost $150,000, and be erected under the supervision of the John P. Cowing Engineering Co., 30 North La Salle Street, Chicago.

Contractors are working on plans for the preliminary construction work on a new plant for the National Tube Co. at Gary, Ind.

The Electrical Supply & Machinery Co., Chicago, has been incorporated with a capital stock of $25,000. Among the incorporators are Henry Blum and D. S. McKinlay, Chicago.

The Calumet Machine & Casting Co., Chicago, has been incorporated in Delaware with a capital stock of $250,000 to operate a foundry and manufacture machinery. Samuel C. Rowland and Harry Lewis are the incorporators.

The Holt Mfg. Co., Peoria, Ill., maker of caterpillar tractors, has added to its holdings of land, and contemplates trebling the size of its factory to handle Government contracts aggregating $10,000,000. New machine shops, foundry, etc., will be required. The beginning of the expansion depends more or less on the settlement of labor difficulties which now confront the company. About 900 employees have been on strike.

The Mixrite Carburetor Co., Decatur, Ill., has been incorporated with a capital stock of $10,000 by C. H. Gillespie, E. H. Williams and A. A. Granger.

The Richardson Ball Bearing Co., Chicago, has been incorporated with a capital stock of $75,000, by J. E. Owens, P. A. Abderson and Robert E. Turney, 111 West Washington Street, Chicago.

The United Stoker Corporation, Chicago, has been incorporated with a capital stock of $50,000 by T. M. Pratt and others of that city.

The Moline Forging & Mfg. Co., Moline, Ill., is contemplating the erection of a one-story forge shop and office building, 110 x 264 ft., to cost $75,000.

The Mitchell Motors Corporation, Racine, Wis., has purchased the plant of the Mitchell Wagon Co., Racine, and will use the works for the manufacture of automobile bodies and coach work. The wagon company sold its stocks, patents, etc., to Deere & Co., Moline, Ill.

Work has been started on an addition, 180 x 320 ft., to the plant of the Webster Electric Co., Racine, Wis.

The Manistee Iron Works, Manistee, Mich., is building an addition to its plant, and will add 200 employees.

The Rempis & Gallmeyer Foundry Co., Grand Rapids, Mich., will build a new plant on property recently acquired.

The Smalley General Co., Bay City, Mich., has increased its capital from $20,000 to $50,000, and will build a plant addition, 60 x 250 ft. This company and the Cooley Castings Co. are reported to have Government orders. The castings company is completing extensions to its plant.

The Hackett Motor Car Co. has purchased five acres in Grand Rapids, Mich., and the erection of a modern factory will be begun in the near future, according to present plans.

The Jenkins Vulcan Spring Co., St. Louis, is reported to have bought an eight-acre site at Richmond, Ind., on which a factory will be erected. The company, which is capitalized at $300,000, makes automobile springs.

The Greenberg Iron Co., Terre Haute, Ind., is reported to have received a $500,000 order for chainwales required for Government ships.

The Gray Tractor Co. has announced its acquisition of

land in Minneapolis, Minn., as a site for a factory in which tractors are to be built. The company at present occupies the plant of the Peteler Car Co., Minneapolis.

Williams & White, Moline, Ill., are to erect a large general forging plant at Davenport, Iowa., at a cost of about $100,000. Contracts are about to be let for the work.

The Advance Caulking Co., Chicago, has been incorporated with a capital of $15,000 under Delaware laws to manufacture caulking materials. S. M. Paulsen, William L. Topper and F. A. Bennett, all of Chicago, are the incorporators.

The Burnside Steel Co., Ninety-second Street, Chicago, will build a one-story addition to its foundry to cost about $10,000.

The Monighan Foundry Co., Carroll Avenue, Chicago, has had plans prepared for a one-story addition to its foundry, about 60 x 100 ft.

The Simmons Co., Kenosha, Wis., manufacturer of brass beds, has increased its capital from $8,000,000 to $10,000,000.

The Winslow Mfg. Co., Kansas City, Mo., manufacturer of farm tractors, is planning for the construction of an addition to its plant. The company recently increased its capital to provide for expansion.

Milwaukee

MILWAUKEE, Aug. 20.

The metal-working industry of Milwaukee and Wisconsin is passing through the greatest period of activity that it has ever experienced. While a large percentage of the vast bulk of work in hand is traceable directly and indirectly to the requirements for the prosecution of war, private demands are piling up in such volume that the industry cannot help but be kept fully occupied for a long time after the war requirements are filled. Industries of all kinds in the metal trades are making extensions and additions of huge volume and at no previous time, it is believed, has there been so great a demand for machine tools and many other kinds of equipment. The labor situation, which has been aggravated by the mobilization of troops and is being accentuated by the selective draft, has been relieved to some extent by the employment of women for light manufacturing operations and women are being paid practically the same wages as men, especially on piece-work. In the heavier machine-shop duties, however, it is hardly practicable to employ women and considerable complaint is heard over the shortage of male help.

The expansion of the motor truck and tractor manufacturing industry is one of the features of the situation in Wisconsin.

The Heil Co., Twenty-sixth and Montana avenues, Milwaukee, manufacturer of boilers, tanks, etc., will expend approximately $100,000 in the construction and equipment of a new shop, 130 x 200 ft., for the accommodation of the department established some time ago for the production of electrically welded motor dump-truck bodies. The company is in the market for a 3-ton and a 5-ton crane; electric motors; 150-hp. boiler, and welding equipment. The work is in charge of Klug & Smith, consulting engineers, Mack Block. Julius P. Heil is president and general manager.

The Four Wheel Drive Automobile Co., Clintonville, Wis., which recently accepted contracts for 3750 class "B" army trucks for the Government, has broken ground for a new heat-treating room, 60 x 70 ft.; a new receiving, stock and shipping building, 100 x 120 ft., and a paint and finishing shop and warehouse, 100 x 180 ft. The present assembling shop will be converted into a machine-shop addition, and the present paint shop and storehouse will be made over as an assembling shop. All structures are of brick and steel, with sawtooth roof, and when completed will give the company an aggregate of 117,850 sq. ft. of floor space, in 16 buildings. Peter Batenberg is general superintendent.

The Oneida Motor Truck Co., Green Bay, Wis., is preparing to erect a complete new manufacturing plant on a tract of 47 acres bounded by the Fox River, State Street and the C. & N.-W. R. R. tracks, at an estimated expenditure of $200,000. Since its organization about five months ago, the company has been occupying leased quarters in buildings of the former American Woodworking Machinery Co. at Green Bay. The main building of the new plant will be of brick, steel and concrete, 150 x 300 ft., one-story, with sawtooth roof, with a separate power plant, foundry and blacksmith shop. Work will be undertaken in time to have the plant ready by Dec. 1. Practically the entire capital of $300,000 will be utilized in buildings, equipment, materials and labor. F. E. Burrall is president.

The Titan Truck & Tractor Co., Milwaukee, has been incorporated with a capital stock of $100,000 to engage in the manufacture of motor trucks and tractors. At the head of the company is Joseph C. Millmann, who recently retired as secretary-treasurer of the Stegeman Motor Car Co., truck builder, Milwaukee. An experimental shop has been in operation in one of the buildings of the Monarch Machine Works, 841-847 Thirtieth Street, Milwaukee, for five months, and the company will be ready within a few weeks' time to undertake a regular production of motor trucks in 4 and 5-ton sizes. It intends to build a plant of its own at some future date. Richard S. Boemer is associated with Mr. Millmann in the project.

The Four Wheel Tractor Co., Clintonville, Wis., organized several months ago with $250,000 capital to manufacture tractors employing a quadruple transmission and steering system, has changed its corporate style to the Topp-Stewart Tractor Co. and increased the capital stock to $500,000 preparatory to the erection of the first unit of its plant at Clintonville, on a 100-acre tract adjacent to the site of the plant of the Four Wheel Drive Auto Co., from which, however, it is distinct. The buildings will consist of a machine shop, power plant, smithing shop, with an aggregate of about 15,000 sq. ft. of floor space, and of brick and steel construction, one story. Until the plant is ready about Nov. 1, the tractor will be built under contract with a machine shop at Waukesha, Wis.

The William Rahr Sons Co., Manitowoc, Wis., will erect a $500,000 dairy and stock food manufacturing plant in connection with its elevators, brewing and malting plants, as soon as the Common Council orders the vacation of the stub ends of two streets. The new industry will require a considerable amount of electrical, conveyor and other equipment. It will employ between 100 and 150 operatives.

The Pelton Steel Co., Milwaukee, is erecting a new molding floor, 50 x 60 ft., to be ready Sept. 1. The company operates two Snyder electric steel furnaces of 1½-ton capacity each, which have been in use alternately. When the new floor is available, both will be operated continually, practically doubling the output.

The Hendley & Whittemore Co., Beloit, Wis., machinist, formerly the Slater, Marsden & Whittemore Co., will build a reinforced concrete, steel and brick machine-shop addition, 60 x 120 ft., costing $25,000 with equipment, now being purchased. The work is in charge of the Newton Engineering Co., Milwaukee.

The Wehr Steel Co., Milwaukee, manufacturing steel castings by the converter process, will erect two 80 ft. bays and increase its capacity to about 450 tons of castings a month. Specifications of new equipment have not been completed. The erection work is in charge of the Northwestern Bridge & Iron Co., Milwaukee. C. F. Wehr is superintendent.

The John Obenberger Forge Co., Milwaukee, which established a large drop forge shop at Fifty-third Avenue and Burnham Street, West Allis, less than a year ago, is erecting a one-story shop addition, 80 x 100 ft., and will install considerable new equipment. The consulting engineers are Klug & Smith, Milwaukee.

The Burlington Motor Truck Co., Burlington, Wis., has been incorporated with a capital stock of $50,000 by G. C. Rasch, George W. Waller and W. G. Rasch, to manufacture motor truck attachments for Ford chasses. A shop is now being equipped.

The Weyenberg Shoe Co., Milwaukee, will require considerable new electric motor and other equipment.

The Federal Rubber Co., Cudahy, Milwaukee County, Wis., has awarded contracts to the Leonard Construction Co., Chicago, for erecting a six-story rubber mill addition, 45 x 300 ft., and a factory addition, 56 x 133 ft., of brick and steel construction.

The Lake Geneva Motor Boat Co., Lake Geneva, Wis., has been organized by Tillford E. Stuyvesant and Arnold J. Stuyvesant, and incorporated with a capital stock of $10,000 to manufacture power craft.

The Automatic Machine Co., Superior, Wis., has been incorporated with a capital stock of $25,000 to engage in the manufacture of automatic machine tools and similar equipment. The corporators are Gustaf Engelbrekt, Fritz Henderson and Erick G. Hoglund.

The D. J. Murray Mfg. Co., Wausau, Wis., builder of complete saw and planing mills, has purchased the entire sawmill machinery manufacturing equipment, patterns, patents, drawings, etc., of the Giddings & Lewis Mfg. Co., Fond du Lac, Wis., which is said to be concentrating on the manufacture of turret lathes and other machine tools. The Murray works consist of a machine-shop, 120 x 330 ft.; a foundry, 80 x 200 ft., with two cupolas, one 15-ton electric crane; two fireproof pattern buildings, 50 x 150 ft. and 30 x 60 ft., and a separate steam generating plant of 500 kw. capacity. Donald J. Murray is general manager.

The Automobile Ice Box Mfg. Co., Superior, Wis., has been incorporated with a capital stock of $50,000 to manufacture patented refrigerating units for attachment to auto-

mobiles, motorboats, carriages, etc. The promoters are Gustaf Engelbrekt, Theodore Meronk and Nels L. Jensen.

The Federal Bridge & Structural Co., Waukesha, Wis., has accepted a contract valued at $2,000,000, for furnishing the steel work for eighteen cargo ships to be constructed by the Kelly-Atkinson Construction Co., Chicago, for the Emergency Fleet Corporation. The contract will keep the Waukesha plant busy for at least one year's time. C. J. McIntosh is president.

Detroit

DETROIT, Aug. 20.

Machine-tool dealers are expecting an excellent business during the coming month, because of the large orders the Government is placing in this district for munitions. Already the result of Government orders is evident in the market, two of the three large concerns making airplane motors in this district having ordered considerable equipment.

Automobile plants are operating quite heavily, and brass, copper aluminum and grey iron concerns report excellent business. The shipbuilding companies are working to capacity, largely on Government orders. Truck companies are expecting large orders from the War Department, following the completion of test runs conducted on the Mexican border.

It is reported that Henry M. Leland and son, Wilfred, who recently withdrew from the Cadillac Motor Co., are forming a $3,000,000 corporation to manufacture airplane motors. The Lelands recently purchased the plant of the Rands Mfg. Co. in Detroit. It is reported that the stock is oversubscribed.

A threatened strike at the Great Lakes Engineering Works, Detroit, one of the largest shipbuilding concerns in the country, was forestalled through the expelling of I. W. W. agitators, and employers generally seem to have the labor situation well in hand. High wages are being paid and skilled workmen are in great demand.

Work on the plant of the Triangle Motor Truck Co., St. Johns, Mich., was begun last week and will be rushed to completion.

The Sturgis Steel Go-Cart Co., Sturgis, Mich., which recently lost its plant by fire, and was reported to be planning to cease business, will resume operations on a larger scale than before, it has been announced. A new factory building will be erected as soon as the contracts can be let. T. R. Bradford, general manager, will continue in active charge.

The Day-Hamlin Mfg. Co., Jackson, Mich., has put on the market a tractor attachment which may be fastened to Ford automobiles. It is probable that the concern will build a large factory in Jackson.

The Zenith Carburetor Co., Detroit, Mich., is building a new four-story addition to its plant. This will increase the output 80 per cent. V. R. Heftler is president of the company.

The Crossman Stamping Co., Ypsilanti, Mich., has been incorporated and is occupying the building owned by the Ypsilanti Machine Co. George J. Crossman is president and treasurer of the company.

The Walker Universal Joint Co., Detroit, has been incorporated with a capital stock of $350,000. George E. Walker is head of the concern.

Nelson Bros. Co., Saginaw, Mich., will shortly build an addition to its plant to manufacture the new Jumbo commercial truck.

The Canadian Steel Corp., Ltd., will soon start construction of huge docks and wharfs for landing the company's boats at the Ojibway, Ont., plant, it has been announced. This move is said to be in preparation for the actual building of the mammoth steel plant. The cost of the work on the docks will be $250,000.

The new Grand Trunk railway shops at Port Huron, Mich., will be completed in November and will employ more than 800 men. The steel car shops now in service will not be abandoned but will be enlarged with the opening of the new plant.

The Barnes Foundry & Mfg. Co. has announced plans for the erection of a large plant on 30 acres of land which it has acquired at Ecorse, a suburb of Detroit. The company is a $2,000,000 corporation organized in Detroit to engage in manufacturing products used in the automobile industry, making a specialty of cylinders and pistons, and turning out as well grey iron castings of all types. Claire L. Barnes is president of the company, George W. Smith, vice-president, and Charles E. Pelton, secretary and treasurer. Prominent Detroit business men and manufacturers make up the directorate. C. E. McArthur will be the company's general superintendent. He was formerly with the Western Electric Co. and International Harvester Co.

The American Cigar Banding Machine Co., Battle Creek, Mich., has been organized with a capital stock of $10,000.

The Acason Farm Tractor Co. has been organized, with headquarters at 429 Brooklyn Avenue, Detroit, to manufacture the Aca-Tractor, an attachment making Ford cars into farm tractors. Herbert Acason is president of the company.

The Wood Hydraulic Hoist & Body Co., 1026 Belleview Avenue, Detroit, has prepared plans from which it will erect a one-story plant, 60 x 250 ft., to cost $20,000. G. A. Wood is the general manager.

The Morrill & Morley Mfg. Co. and the Electric Specialties Mfg. Co., both of Benton Harbor, Mich., have combined their resources and in the future will operate under the name of the Benton Harbor Auto Machine Co. The new concern has an authorized capital stock of $174,000. The officers of the new company are: president, J. N. Klock; vice-president, Y. N. Allen, Detroit; secretary, H. S. Gray; treasurer and manager, R. C. Eisley.

The Hess Pontiac Spring & Axle Co., Pontiac, Mich., will receive bids early in the fall for the construction of two additional factory units.

The Star Motor Co. has sold its plant in Ann Arbor, Mich., to a group of local men.

The Comstock Automatic Pump Co., which has been located at Comstock, Mich., has moved its offices to Kalamazoo and changed its name to the Kalamazoo Pump Co.

The C. R. Wilson Body Co., announces that its new factory building at Bay City will be completed and manufacturing operations will be started before Sept. 1. The company is planning an addition to its Detroit metal working department to cost $175,000.

The Atlas Electric Storage Battery Co. has been organized at Greenville, Mich., with a capital stock of $40,000 fully subscribed. R. C. Ecker, Greenville, is secretary and treasurer of the company. A new building will be constructed to take care of the manufacture of storage batteries.

The Universal Truck Body Co., Jonesville, Mich., is enlarging its force of workmen preparatory to turning out large orders which have been received.

The Marvel Carburetor Co., Flint, Mich., has been organized to manufacture a carburetor invented by T. B. Britton of Cleveland.

The Leonard Four-Drive Tractor Co., Lansing, Mich., a new $1,500,000 corporation, is conducting negotiations for a Lansing factory location. H. M. Leonard, formerly with the Duplex Truck Co., is organizer and president of the new concern.

The Bean Spray Pump Co., Lansing, Mich., is planning to erect a 60 x 100-ft. addition of concrete, steel and glass construction. The factory space will be devoted to enlargements of the machine and other departments.

The National Spring & Wire Co., Albion, Mich., has sold its branch plant at Windsor, Ont., to the McGregor-Banwell Co., of Ford City, Ont., manufacturer of wire fence.

Dodge Bros., Detroit, manufacturers of motor cars, will erect a seven-story brick and concrete addition to its factory.

The Michigan Copper & Brass Works, Detroit, has awarded a contract for the erection of a one-story addition to its plant.

The Diamond Power Specialty Co., Detroit, is erecting a factory building at a cost of $70,000. R. Herman is president of the concern.

Ground has been broken for the new Triangle Truck Co., of St. Johns, Mich. The building will be ready for occupancy early in the fall.

The Muskegon Valve Co., Muskegon, Mich., a recently organized corporation, is planning the erection of a factory to manufacture plumbing specialties.

The O. J. Beaudette Co., Pontiac, Mich., manufacturer of automobile bodies, has begun work on a new plant to cost $35,000.

The Cadillac Auto Truck Co., Cadillac, Mich., has awarded a contract to erect a new assembling building, 67 x 160 ft.

The Michigan Central Railroad is replacing its 80-lb. rails on the Saginaw branch with those weighing 100 lb. It has three large gangs of men at work. As soon as the main work is done the side tracks and yards will be improved.

The Pere Marquette Railroad has announced that car repair shops will be installed at Boardman, Mich., and the working force at the railroad yards will be increased until the shops will have a capacity of 500 cars weekly. W. L. Kellogg, superintendent of motive power, made the announcement.

The Kent-Owens Machine Co., Toledo, Ohio, is building a new four-story machine shop to cost $75,000.

The General Electric Co., Schenectady, N. Y., is having plans prepared by Harris & Richards, architects, Fifth and Chestnut Streets, Philadelphia, for the construction of a five-story reinforced-concrete addition, about 75 x 500 ft., to its Fort Wayne works, Fort Wayne, Ind.

Indianapolis

INDIANAPOLIS, IND., Aug. 20.

The Rodgers-Burris Mfg. Co. has been incorporated at Newcastle, Ind., with $10,000 capital stock, to manufacture farm machinery. The directors are John W. Rodgers, E. M. Rodgers and Harry Burris.

The American High Speed Chain Co., Indianapolis, has increased its capital stock from $100,000 to $150,000.

The Roof Motor Specialty Co. has been incorporated at Anderson, Ind., with $50,000 capital stock, to manufacture automobile specialties. The directors are Robert M. Roof, James A. McMyler and William N. Durbin.

Adam Beck, Huntington, Ind., is at the head of the Indiana Portland Cement Co., which will build a $1,000,000 cement plant at Richmond, Ind. Peter Martin is vice-president; Will H. Hart, secretary, and Marshall Beck, treasurer, of the company.

Cincinnati

CINCINNATI, Aug. 20.

Local machine tool builders are somewhat worried over having some of their best mechanics drafted into the army. Several firms are working exclusively on Government orders, or are building machines for Government munition contractors. Naturally they will be handicapped in case these men are accepted, but local manufacturers as a rule are cautious in making affidavits for the release of their mechanics, believing that the examining boards will use judgment in releasing skilled men that are urgently needed in the shops. If this policy is not carried out, however, it will curtail production to a considerable extent.

Makers of shaping machines report business as being still very good indeed with the present orders coming from die and tool concerns that are being organized in this part of the country at a very rapid rate. In Dayton, Ohio, alone within the past few weeks several new companies have been formed and others will join the ranks shortly. Small lathes can be obtained without difficulty for prompt shipment, but the demand for larger sizes holds up deliveries on these to some extent.

The Carlton Machine Tool Co., Cincinnati, lathe maker, has removed nearly all of its equipment to its new plant on Spring Grove Avenue, and expects to have it in full operation before the end of the present month.

Work has proceeded so fast on the new plant of the Champion Tool Works Co., Cincinnati, that it expects to have it in operation by Sept. 15. The new plant is at Winton Place, and the company's present quarters are in the Camp Washington district.

The Modern Foundry Co., Oakley, Cincinnati, has commenced work on a large foundry addition, estimated to cost $35,000.

Construction work on the new plant of the Steel Forging Co., in Oakley, is now well under way. The company has temporary headquarters at 401 Bell Block, Cincinnati.

The Interstate Folding Box Co., Middletown, Ohio, has increased its capital stock from $10,000 to $75,000 and intends moving its factory to larger quarters. Only special equipment will be required.

The Dayton-Wright Aeroplane Co., Dayton, Ohio, has increased its capital stock from $500,000 to $1,000,000. The company intends to use the three-story plant at Miamisburg, mentioned as recently acquired, for the manufacture of airplane propellers and wire parts.

Further particulars from the Reliance Tool & Mfg. Co., Dayton, Ohio, give the location of a new plant at 818 East Monument Avenue, and in addition to tools, dies, jigs, etc., special machinery will be manufactured. The officers are: President, J. J. Schneider; vice-president, J. F. Schneider; secretary and treasurer, C. F. Swissgabel, and general manager, P. D. Waugh.

The Ohmer Fare Register Co., Dayton, Ohio, is making an addition to its plant, estimated to cost $35,000.

The new plant of the Dayton Body Co., Dayton, Ohio, is nearly ready for occupancy and installation of the necessary equipment will be commenced early in September.

The Dayton Metal Products Co., Dayton, Ohio, is making a still further addition to its Taylor Street plant that will be used for manufacturing and garage purposes.

A fire last week destroyed the test room, carpenter shop, pattern and hardening departments of the Reliable Engine Co., Portsmouth, Ohio, entailing a loss of $25,000. Rebuilding operations are already under way, and as the main plant of the company was not damaged, no appreciable delays will be experienced.

The daily press reports that the Government contemplates establishing a large repair shop for river boats at Marietta, Ohio.

The Columbus Lathe & Engineering Co., Columbus, Ohio, has been incorporated with $150,000 capital stock by Robert L. McCabe, J. W. Anderson and others. Manufacturing plans are not yet available.

The Standard Register Co., Dayton, Ohio, will make an addition to its plant on Albany Street that will be 60 x 200 ft., one story and of reinforced concrete construction.

The Central South

LOUISVILLE, KY., Aug. 20.

Government contracts continue to engage the attention of several of the largest concerns in this field.

The Louisville Industrial Foundation announces that negotiations looking toward location of a malleable iron foundry here are nearing a successful conclusion.

The Roy C. Whayne Supply Co., Louisville Ky., is in the market for an electric hoist, two or three drum, with swinger; 25 to 50-hp., 440-volt, 3-phase, 60-cycle.

Fire destroyed the power house of the Atlas Mining Co., Capito, Ky., with a loss of $7,500. The equipment included air and electrical machinery and will be replaced at once.

M. B. Parker, Chattanooga, Tenn., is in the market for a 10-in. suction, 8-in. discharge, duplex compound steam pump, second-hand; and a locomotive crane with a capacity of from 12 to 20 tons.

The John G. Duncan Co., Knoxville, Tenn., is asking for prices on the following: One 25-hp. locomotive boiler on wheels; two jack hammer drills; four sets of steels for jack hammers, with three sets of hose and couplings for the same; 300 ft. of 1¼-in. pipe; one single surfacer planer and matcher, to plane and match in not less than 12 x 3-in. lumber; 600 ft. of second-hand ¾-in. steel rope, 1000 ft. of 12-in. steel rope, second-hand; sheave wheels for 6/8 x ¾-in. rope; three dozen clamps for wire rope ¾-in. and ½-in.; one double-drum hoisting engine and derrick, with concrete bucket; two 3¼-in. steam drills with tripod and hose for same, for 10-ft. hose.

Birmingham

BIRMINGHAM, ALA., Aug. 20.

Cotton ginning machinery is moving in quantities from two Birmingham plants. Structural operations have increased demand for machine tools. Hydro-electric apparatus is continuously active.

Harrison Bros., Mobile, will build a plant for construction and repair of ships, especially fishing schooners.

Horace Turner, president of Turner Terminal Co., will establish shipyards at Mobile.

The Alabama Drydock and Shipbuilding Co., Mobile, has purchased land for another shipbuilding plant to be connected with its present one.

The Gulf, Mobile & Northern Railway, W. F. Owen, president, announces plans for immediate expenditure of $1,000,000 on piers and warehouses at Mobile.

The Brewton Iron Works, Brewton, Ala., capital stock $10,000. incorporated by W. F. Wilson, W. Y. Lovelace, A. V. Lovelace and others

The Southern Welding and Reclaiming Co., Birmingham, capital stock $2,500, has been incorporated by E. H. Ross, E. B. Bryant and others.

The proposed new shipbuilding plant of the Kelly-Atkinson Construction Co., 189 West Madison Street, Chicago, to be erected near Mobile, Ala., will consist of machine shops, blacksmith shop, erecting plant, power house, office buildings and other structures. W. L. Kelly is president.

Texas

AUSTIN, Aug. 18.

The machinery and tool trade of Texas and the Southwest is beginning to show an improvement over what it has been for the last two or three weeks. Crop conditions on the whole are better than they were a week ago due to scattered rains that have been of particular benefit to cotton.

The Swift Oil & Sulphur Co., which has been incorporated at Houston with a capital stock of $250,000, will build an oil and sulphur refining plant. O. A. Swift of Houston is a stockholder.

The Dallas Southwestern Traction Co. has awarded the contract for the construction of 49 miles of its proposed interurban electric line between Dallas and Cleburne to the Cherokee Construction Co., Sapulpa, Okla. The contract calls for an expenditure of $2,500,000. The survey was made some time ago and the right of way has all been obtained. The

route of this first division of the road is through Eagle Ford, Irving and other towns.

The Loomis Wheel & Body Works Co. has been incorporated at Dallas for the purpose of manufacturing wheels and bodies for vehicles. A. L. Loomis is a stockholder.

G. M. Stone of Quincy, Ill., and associates have purchased a site at Texarkana upon which they will construct a plant for the manufacture of farm tractors, motor trucks and various kinds of farm machinery. An initial unit of the plant will cost about $100,000.

H. M. Gray and associates are promoting the construction of an interurban electric line to run between Las Cruces, N. M., and El Paso, Texas, through the valley of the Rio Grande. The proposed road will be about 30 miles long.

California

LOS ANGELES, Aug. 14.

The United States Auto Spring Co., 1120 South Los Angeles Street, Los Angeles, has completed arrangements for the erection of a new one-story shop building, about 50 x 140 ft., at its plant. The company specializes in the production of springs for automobiles and motor trucks, and the extension will be used for increased capacity.

The A. J. Savage Munitions Co., San Diego, Cal., has filed articles of incorporation with a capital of $1,000,000 to manufacture firearms of different kinds. The company will be operated by officials of the Savage Tire Co., and plans for the erection of a large plant to cost, for initial operations, about $225,000. A. J. and Arthur W. Savage, Horton L. Titus, Charles W. Oesting and Ernest George are the incorporators.

The Hobbs Storage Battery Co., Los Angeles, recently incorporated, is arranging for the immediate installation of machinery at its new plant to be located at 1231-35 South Olive Street. The company will specialize in the production of a special storage battery, particularly for motor car service. H. V. Andrews heads the company.

The Southern Sierras Power Co., Riverside, Cal., is planning for the construction of a new electric power plant at Blythe, to furnish service in the Imperial Valley section.

The Typhoon Pump Works, Los Angeles, has filed notice of organization to operate a plant on Cudahy Avenue, near Florence Street. Morden K. Turner, 231 East Seventh Street, Long Beach, heads the company.

The Public Service Commission has granted the city Power Department, Los Angeles, permission to build its proposed power plant No. 2, in the San Francisquito Canyon, for municipal light and power service, expending funds at the rate of $10,000 per month for construction and equipment. The electric station is estimated to cost $125,000.

The Board of School Trustees, Orange, Cal., is planning for the construction of a machine shop addition to the Orange Union High School, to be equipped for instruction in machine and kindred work.

The Union Iron Works, San Francisco, has commenced the construction of a new machine shop at Oakland. It is said that the structure with equipment will cost about $400,000.

The Union Ice Co., Pine Street, San Francisco, is having plans prepared for a new one-story ice-manufacturing and cold storage plant to be erected at Stockton. The structure will be about 200 x 300 ft., and is estimated to cost $100,000, of which about $40,000 will be expended for machinery and equipment.

San Francisco

SAN FRANCISCO, Aug. 14.

There is a large and increasing demand for heavy tools and machinery and local supply houses are experiencing considerable difficulty in getting orders filled. Many industrial corporations are enlarging plants and increasing capacity. The commandeering of vessels now building at California ports as well as of some of the larger shipbuilding plants is expected to lead to a number of changes and additions.

The Union Iron Works in this city has under construction 26 vessels, practically all of which are of steel over the 2500-ton dead weight limit. Eleven are tankers and seven are 12,000-ton vessels for the Cunard Steamship Co. The Moore & Scott yards in Oakland have 18 steel steamers under construction, of which, however, 10 are for the Federal Shipping Board. The Hanlon Drydock & Shipbuilding Co., Vallejo, has two vessels of 5500-tons under way, and three large wooden vessels are building at Benecia. Outside of San Francisco harbor, the Rolph yards at Eureka are building three wooden steamers and two barkentines; the Hammond yards at the same place are building for wooden steamers, and the yards at San Pedro and Long Beach have under way six wooden and eight steel steamers. It is reported here that, following the taking over of the plant and yards of the Union Iron Works at this place extensive shipbuilding yards will be put in at Hunter's Point at an approximate cost of $5,000,000.

The Holt Mfg. Co., Stockton, Cal., is making additions to its harvester assembling plant at a cost of $25,000. The company is also constructing a coke and pig iron storage platform to be on the same level as the charging platform for the cupolas. Mechanical conveyors will raise the coke and pig iron to their respective bins.

The Schaw-Batcher Co., San Francisco, which operates a large and well equipped plate shop in South San Francisco, will at once equip a plant for the making of steel cargo steamers. Three ways are to be put in at once to care for contracts for the Emergency Fleet Corporation. Dredging and other preliminary work is already under way.

The Adams Implement & Engine Co., San Francisco, has been incorporated with a capital stock of $10,000 by W. F. Adams, N. Bertunelli and G. Donnelly.

The Ewa Plantation Co., Honolulu, T. H., has authorized the purchase of electrical and pumping equipment to cost between $40,000 and $50,000. A 750-kw. steam turbine, centrifugal pump, motors, etc., are included.

The Olowalu Co., Honolulu, T. H., will enlarge its sugar plant by the addition of a 12-roller mill and additional boilers at a cost of about $80,000.

The Union Lumber Co., Fort Bragg, Cal., will put in a 750-kw. generator set at a cost of $35,000 and will add six machines with a daily capacity of 50,000 ft. of lumber to the planing mill now in course of construction. An electric crane with a clearance of 40 ft. and running a distance of 1600 ft. is being installed.

The Wilmington Shipbuilding Co., Los Angeles, Cal., has secured 600 ft. of frontage on East Wilmington Basin on which a plant will be erected at a cost of $100,000, of which approximately $60,000 will be spent for machinery.

The Fulton Shipbuilding Co., Los Angeles, recently incorporated, has now taken over the plants of C. E. Fulton and of the C. H. Sharp Mfg. Co. Permits have been secured for the erection of a work shop, battery charging station and other structures.

The Swift Tack & Nail Co., San Francisco, has been incorporated with a capital stock of $60,000 by F. G. Phillips, H. A. Swift and C. W. Kelly. The company will erect a tack and nail manufacturing plant at Richmond on San Francisco Bay, to be completed about Jan. 1.

The Orange Union High School, Orange, Cal., has called for bids for the erection of a machine shop on the High School grounds.

W. A. Boole, Benicia, Cal., has bought the James Robertson shipyards at that place and has leased 50 acres of water front land across Carquinez Straits from Benicia on which a shipbuilding plant for making wooden ships will be erected.

The Hanlon Dry Dock & Warehouse Co., Oakland, Cal., will erect an additional machine shop at a cost of $2,250.

The Union Ice Co., San Francisco, will expend about $40,000 for machinery and equipment for an ice manufacturing and cold storage plant to be erected at Stockton, Cal.

The Pacific Gas & Electric Co., San Francisco, will install new gas making machinery at Oroville, Cal., at a cost of $15,000 and will make additions to its electrical equipment at that place at a cost of $25,000.

The Hammond Lumber Co., San Francisco, will add to its plant at Eureka, Cal., a complete mill for sawing heavy ship timbers. The equipment will include a special band saw outfit and extra long carriages and cranes for handling materials.

The Pacific Northwest

SEATTLE, WASH., Aug. 13.

All efforts to end the strike of the lumbermen in the Northwest have proved failures, and the majority of the camps and mills in this section are still shutdown. A few of the plants have agreed to the demands of the workers, but the majority of the mills, including the larger plants, are idle. Mill owners assert that the settlement of the strike will be brought about soon, and have pledged themselves to furnish the Government with 300,000,000 to 400,000,000 ft. of spruce, if such an amount is needed. If the Government requires the spruce, the mills will be operated to capacity, and a greater percentage of usable timber will be cut from each log.

The sheet metal problem is affecting all lines of industry at present. Supply houses on the coast are having a hard time supplying the demand. Many plants are running overtime. There are more than fifty such plants in Seattle all operating and doing a large business. The shipyards in the city are taking a large portion of the products.

The car shortage problem has again come up in Oregon, where the situation is so serious that circulars have been sent out by the Public Service Commission, asking the co-operation of shippers in meeting the demands for cars.

Shipbuilding operations in three plants in Portland, involving twenty-nine steel ships, building or under contract, have been taken over by the Government to date. Wooden ships are not yet affected.

The Columbia River Shipbuilding Co., Portland, Ore., is establishing a marine boiler shop as an adjunct to its shipbuilding plant. The construction of boilers has been started, but installations of machinery is not complete. Several new machines will be needed, and a 50 ft. extension added to the shop building. The company will build and equip complete the 8800-ton steel steamers under construction at the plant. The plan will employ 2300 men.

The Northport Mfg. Co., Northport, Wash., will be placed in operation this month and will manufacture a saw invented by A. R. Brewer, president of the concern.

The Standard Boiler Works, Seattle, Wash., has purchased a new site on which will be erected a new plant.

It is reported that a syndicate is negotiating for the purchase of the property of the Dominion Drydock & Shipbuilding Co. in North Vancouver, B. C.

The Pacific Coast Railroad Co., Seattle, has completed plans for a pattern shop to cost $3,500.

The Markey-Campbell Machinery Co., Seattle, will construct a frame machine shop, 65 x 100 ft., 1½ story, to cost $6,000.

The Willamette Iron & Steel Works, Portland, will erect a three-story building of brick, 56 x 31 ft.

Plans have been completed for the plant of the Allen Shipbuilding Co., to be built on Salmon Bay, and work will be started in the near future. Work will include two-story machine shop, 56 x 250 ft., beside other buildings and six shipways. Cost of the plant will be $150,000.

The plant of the Todd Drydock & Construction Co., Tacoma, Wash., is well under way. The four main working structures, the drydock, machine shop and office buildings, the iron works and the power house, are almost completed.

The Tacoma Shipbuilding Co., Tacoma, Wash., will install machinery immediately for the construction of wooden vessels. Plant is nearing completion and will handle Government contracts.

The Moran Engineering Co., Seattle, report an increase of more than 60 per cent in the demand for its output of Moran centrifugal pumps.

The Portland Shipbuilding Co., Portland, Ore., has contracts for rebuilding the steamer Elmore for the Willamette Navigation Co.

Canada

TORONTO, ONT., Aug. 18.

The Pere Marquette Railway has awarded contracts for the construction of a large reservoir at Blenheim, Ont. The company will also install a pumping station and equipment, also a large tank.

The Galt, Ont., Hydro Commission decided to increase its voltage from 6600 to 13,200 volts. Considerable new equipment will be installed, for which Superintendent Elliott will receive prices.

The Fruit Machinery Co., Ingersoll, Ont., will build an addition and make alterations to a building at Belleville, Ont., to be used as a foundry. F. B. Foley is manager.

The Canada Copper Co., owner of the British Columbia Copper Co., plans the erection of a concentrating mill of 2000 daily capacity at Copper Mountain, B. C. The improvements include hydro-electric power installation and a 12-mile railway spur from Princeton, B. C., to Copper Mountain, B. C., at a cost of $2,000,000. Oscar Lachmund is general manager.

The Dartmouth (N. S.) Board of Trade and Town Council is carrying on negotiations for the establishing of a steel shipbuilding plant and dry dock at Dartmouth.

A building permit has been issued to the Quebec Harbor Commission for extensions and additions to the grain elevator on the Louise Embankment, Quebec, Que., to cost $371,000.

The International Paper Co. has purchased a site from the Lake Superior Corporation at Sault Ste. Marie, Ont., on which it will build a large paper pulp plant.

The Dominion Rubber Co., St. Gerome, Que., has awarded the contract for the erection of a $45,000 addition to its plant to Charles Jouvet, 112 St. Therese Street.

The St. John Shipbuilding Co., St. John, N. B., will start work at once on the erection of a large shipbuilding plant, which will at first be used for turning out wooden ships and will later be equipped for building steel boats of all kinds. Mr. Norcross of the Canada Steamship Lines is interested in the company.

The British America Nickel Corporation, Ltd., Royal Bank Building, Toronto, Ont., will build a smelter and nickel refinery at Sudbury, Ont., to cost $6,000,000.

L. H. Bacque, care Hotel Dufresne, Three Rivers, Que., will build a plant for the manufacture of pressed lime cement brick at Three Rivers to cost $100,000. The company will be known as the Three Rivers Sand-Lime Brick Co. Mr. Bacque is asking for quotations on electric motors, belting, etc. Contracts will also be let for the erection of three buildings. Henry W. Terry, 31 Rosborough Street, West, Toronto, Ont., is consulting engineer.

The Muskoka Wood Mfg. Co., Ltd., Huntsville, Ont., is in the market for a 20 or 25 kw., d.c. generator.

Roger Miller & Sons, Ltd., Lumsden Building, Toronto, Ont., has been awarded the contract and started work on the erection of a reinforced concrete and steel forge and machine shop for the British Forgings, Ltd., Royal Bank Building, Toronto, to cost $70,00.

The Thor Iron Works, Toronto, Ont., has been notified by the Toronto Harbor Commission that it will be required to vacate its property within the next few months so that dredging can be completed in connection with the construction of a dock. It is the intention of the company, which has a number of contracts on hand for building steel ships, to build a new plant in the Ashbridge's Bay industrial district, Toronto.

The British Columbia Sugar Refinery, Vancouver, B. C., has taken out a permit for the erection of an addition to its boiler house to cost $9,000.

The Cotton Co., Ltd., Vancouver, B. C., plans the erection of a shipbuilding plant at False Creek, to cost $100,000.

The Pacific Metal & Galvanizing Co., Seattle, Wash., proposes to establish a plant at Vancouver, B. C., to cost $35,000. Henry Gray is secretary.

James Whalen, president of the Port Arthur Shipbuilding Co., Port Arthur, Ont., announces that his company has just secured additional contracts amounting to $2,000,000 for the construction of ships.

In the three principal shipbuilding plants in Vancouver, B. C., there are $20,000,000 worth of steel and wooden ships under construction, including two for the British Government, four for Norway and seven wooden vessels for the transportation of lumber.

Bids are being received by J. C. Hartley, clerk, of Woodstock, N. B., for the erection of a filtration plant and pumping station to cost $65,000.

The National Potash Co., Ltd., 257 Confederation Life Building, Toronto, Ont., will spend $15,000 on frame buildings and about $150,000 on technical machinery.

The Canadian Hession Tiller & Tractors, Ltd., Hamilton, Ont., proposes to build a factory to cost $65,000.

The Maple Leaf Harvest Tool Co. has secured a site on Tillson Avenue, Tillsonburg, Ont., and will build a plant there at a cost of $50,000.

The Elmira Transmission Co., Elmira, Ont., has let the contract to the Elmira Planing Mill Co. for the erection of an addition to its foundry.

Willys-Overland, Ltd., Weston Road, Toronto, Ont., has awarded the contract for the erection of a one-story, reinforced concrete machine shop to cost $17,500.

The Maxwell Motor Co., Detroit, has awarded contracts in connection with the erection of a reinforced concrete factory at Windsor, Ont., to cost $140,000.

The S & F Motors Corporation, Ltd., Montreal, Que., has been incorporated with a capital stock of $46,000 by Arthur Sansoucy of Troy, N. Y., Mitchel Trend of Montreal, Que., Alexander N. Dufresne of St. Cesaire, Que., and others to manufacture automobiles, aeroplanes, motors, engines, etc.

The Dominion Molybdenite Co., Ltd., Ottawa, Ont., has been incorporated with a capital stock of $5,000,000 by Stanley G. Metcalfe, Charles Murphy, Arthur C. Craig and others to smelt, refine and treat minerals, etc.

The Pacific Mining & Mfg. Co., Ltd., 569 Hornby St., Vancouver, B. C., has been incorporated with a capital of $1,000,000 by Angus A. Crowston, William S. McClure, Reuben Tiffin and others to manufacture metals, machinery, etc.

The Montreal Machine Shop, Ltd., Montreal, Que., has been incorporated with a capital stock of $100,000 by George Mayrand, Hector Hardy, Dudger Grulbault and others of Montreal to operate machine shops, foundry, to manufacture metals, iron, steel, tools, machinery, etc.

The Quebec Charcoal Co., Ltd., Montreal, Que., has been incorporated with a capital stock of $50,000 by Arnold Wainwright, Charles G. Ogden, George V. Cousins and others to manufacture charcoal, wood products, etc.

T. R. McMackon, Shedden, Ont., is in the market for a drag sawing machine.

The Western Salt Co., Ltd., Courtright, Ont., is in the market for a high pressure pump, size about 14 x 7 x 12, for 300 lb. pressure.

Government Purchases

WASHINGTON, Aug. 20.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, opening date unassigned, schedule 1417, for 14 geared-crane ladles; schedule 1418, for one roll-over molding machine, all for Philadelphia; schedule 1423, for 12 engine lathes for Norfolk, Va.

Bids will be received by the light house inspector, Post-office Building, Detroit, until Aug. 27, for two oil engine-driven air compressors for Sand Hills Light and Fog Signal Station.

Bids will be received by the commandant, Navy Department, Mare Island, Cal., until Aug. 28, for electric-traveling cranes for extensions to machine shop, Mare Island.

The following bids were received by the chief clerk, Department of Commerce, Washington, for furnishing one milling machine:

Brown & Sharpe Mfg. Co., Providence, R. I., $1,809; 160 days.

Kemp Machinery Co., Baltimore, Md., $1,570; 120 days.

E. A. Kinsey Co., Cincinnati, bid on attachments only.

Carey Machinery & Supply Co., Baltimore, Md., $1,360.66; 90 days.

Bids were received at the Bureau of Supplies and Accounts, Navy Department, Washington, for furnishing material and supplies for the naval service as follows:

Schedule 1344. Steam Engineering. Class 14, Philadelphia—one bevel gear planer—Bid 13, $3,914; 56, alternate, $3,113, $3,217, $3,197 and $3,124.

Schedule 1378. Ordnance. Class 22. South Charleston, W. Va.—five motor-driven lathes—Bid 23, $1,450 and $1,545; 27, $2,552.50; 42, $3,918.51, $1,513.53, $1,720; 56, $2,490. Class 24—five engine lathes—Bid 2, $4,953 and $4,885; 29, $3,950; 42, $6,120; 56, $4,615. Class 24—electrically driven planing machine—Bid 2, $9,932; 23, $10,470 and $10,570; 29, $10,240; 41, $11,380; 42, $16,310; 55, $9,413; 56, $11,877.50 and $11,595. Class 25—motor-driven boring and turning mill—Bid 23, $13,360 and $13,370. Class 26—universal shaping machines—Bid 23, $1,595 and $1,805; 28, $1,248; 29, $1,920; 34, $1,298; 42, $1,313. Class 27—two vertical shapers—Bid 25, $1,627; 36, $1,501. Class 28—universal milling machines—Bid 2, $2,894.50; 11, $2,696; 23, $3,220 and $3,335; 54, $2,382. Class 29—motor-driven milling machines—Bid 23, $4,885 and $4,930; 56, $5,072.70. Class 30—motor-driven drill press—Bid 2, $683 and $610; 11, $697; 14, $855; 23, $725 and $835; 28, $642 and $627; 40, $690; 42, $825; 53, $628 and $592; 55, $619; 56, $681.50. Class 31—universal radial drill—Bid 2, $5,067 and $5,050; 11, $4,975; 23, $5,260 and $5,385; 29, $3,831; 56, $4,870. Class 32—universal tool and cutter grinders—Bid 2, $930; 22, $658.61; 23, $975; 42, $2,140; 56, $1,931.60. Class 33—one self-contained grinding machine—Bid 21, $7,480; 23, $8,305 and $8,435.

Schedule 1387. Ordnance. Class 51. South Charleston, W. Va.—one surface-grinding machine—Bid 23, $6,390 and $6,492; 56, $5,039.

Schedule 1388. Steam Engineering. Class 61. Philadelphia—two motor-driven milling machines—Bid 44, $3,510; 47, $2,959; 56, $3,020.98; alternate, $3,425.98; alternate, $3,397.60. Class 62. Philadelphia—two turret-screw machines—Bid 11, $1,510; 44, $1,556; 49, $1,185.50; 55, $2,245; 56, $1,147.

Schedule 1389. Steam Engineering. Class 63. Boston—vertical boring and turning mill—Bid 29, $12,409; 35, $14,355; 38, $12,000.

The names of the bidders and the numbers under which they are designated in the above list are as follows: Bid 2, Brown & Zortman Machinery Co., 2535 Liberty Avenue, Pittsburgh; 11, The Fairbanks Co., 416 Broome Street, New York; 13, Gleason Works, 1000 University Avenue, Rochester, N. Y.; 14, Hoefer Mfg. Co., Freeport, Ill.; 21, Landis Tool Co., Waynesboro, Pa.; 22, McDonough Mfg. Co., Eau Claire, Wis.; 23, The Motch & Merryweather Machinery Co., 711 Lakeside Avenue, northwest, Cleveland; 25, Newton Machine Tool Works (Inc.), Twenty-third and Vine streets, Philadelphia; 27, the National Lathe Co., 11 West Second Street, Cincinnati; 28, D. Nast Machinery Co., Bourse Building, Philadelphia; 29, Niles-Bement-Pond Co., 111 Broadway, New York; 34, Potter & Johnston Machine Co., Pawtucket, R. I.; 35, Henry Prentiss & Co. (Inc.), 149 Broadway, New York; 36, Pratt & Whitney Co., Hartford, Conn.; 38, Standard Roller Bearing Co., 8001 Lancaster Avenue, Philadelphia; 39, B. F. Sturtevant Co., Hyde Park, Mass.; 40, the Sipp Machine Co., Keen and Warren streets, Paterson, N. J.; 41, William Sellers & Co. (Inc.), 1600 Hamilton Avenue, Philadelphia; 42, Sherritt & Stoer Co. (Inc.), 603 Finance Building, Philadelphia; 44, W. E. Shipley Machinery Co., Morris Building, Philadelphia; 47, Vandyck-Churchill Co., Room 529 Singer Building, Liberty Street, New York; 49, Warner & Swasey, Cleveland; 51, Ward & Co., Washington; 53, the Kemp Machinery Co., 223 North Calvert Street, Baltimore; 54, Brown & Sharpe Mfg. Co., Providence; 55, Swind Machinery Co., 1110 Widener Building, Philadelphia; 56, Manning, Maxwell & Moore, New York.

The National Shear Co., Westmoreland and Hurley Streets, Philadelphia, has discontinued the manufacture of scissors and shears. As a result, the name of the company has been changed to the Quaker Tool Co. and in the future mechanics' tools only will be made. No changes have been made in the management of the company.

NEW TRADE PUBLICATIONS

Automatic Screw Driving Machines.—Reynolds Pattern & Machine Co., 101 Third Avenue, Moline, Ill. Pamphlet. Contains illustrations and brief descriptions of a line of automatic machines for driving screws. The advantages of a reduced cost of assembly, increased output and simple operation are briefly touched upon, followed by a general description of the machines. In connection with the illustrations of the various machines which are built either with or without a boring attachment in a number of different styles the distinguishing features of each type are briefly touched upon, together with concise statements of the work for which they are especially adapted.

Storage Battery Trucks.—Edison Storage Battery Co., Orange, N. J. Bulletin No. 600. Describes and illustrates the part that is being played by storage battery trucks in industrial transportation. After a brief discussion of the advantages of the company's battery, which has nothing about it to break or crack, the remainder of the bulletin is given over to illustrations of the trucks in use for handling a great variety of material, one showing a heavy steel girder, 64 ft. long and weighing 20,000 lb., being pushed by an electric tractor. A brief description of the construction of the battery and a table of specifications and dimensions are included.

Small Tools.—Cleveland Twist Drill Co., East Forty-ninth Street and Lakeside Avenue, Cleveland. Catalog No. 39. This is the company's 1917 catalog illustrating and describing a line of small tools which includes drills, reamers, sockets, counterbores, mills, screw extractors, arbors, mandrels, etc. The catalog is divided into 10 sections, each devoted to some particular line of tools and a thumb index enables the user to locate easily the special subdivision desired. Each section is prefaced with a detailed index referring to the particular page in the section on which each tool is described. An illustration showing some stage in the manufacture of the tools or some unusual sales point in one of them is given on this sub-index page. The whole catalog is prefaced by a classified index arranged alphabetically by the various tools and another of list numbers with the code word and the page in the catalog on which the description appears. Suggestions for ordering various tools, a number of tables of useful information and a complete telegraph code are included.

Turret Lathes.—International Machine Tool Co., Indianapolis. Catalog. Lists the various features of the Libby turret lathes, which include single pulley drive, the use of a side carriage to permit the full swing of the work, independent carriage feeds, ample power and rigid construction. Following this condensed data tables are given. A general description of the lathe, which is built in three sizes with swings ranging from 16 to 26 in., is presented, the text being supplemented by numerous illustrations. The various tools and accessories employed with the lathes are illustrated and briefly described and floor and countershaft plans are included.

Storage Battery Lift Trucks.—Wright-Hibbard Industrial Electric Truck Co., 42 Parkridge Avenue, Buffalo. Folder. Calls attention to a storage battery elevating truck of all steel construction for use in industrial plants. The truck is driven and elevated by one motor through a special gear arrangement. Several views of the truck in use are presented and the results of a test made of a 3 per cent grade with an empty truck and a load of 4000 lb. are included.

Structural and Plate Workers' Tools.—Cleveland Steel Tool Co., Cleveland. Catalog No. 7. Describes and illustrates a line of structural and plate workers' tools which includes punches, dies, chisels, coupling nuts and rivet sets and tools. Drawings of the various tools with the principal dimensions marked are included, and in a number of cases tables giving the different sizes that can be supplied are presented.

Taps and Dies.—J. M. Carpenter Tap & Die Co., Pawtucket, R. I. Catalog No. 22. Supersedes all previous editions and illustrates an extensive line of taps and dies for all classes of work. In general a separate page is given to each tool with an engraving at the top and a table of the sizes that can be furnished below. In a number of cases brief descriptions are included. Several tables of useful information complete the catalog.

Lock Nuts.—Roller Lock Nut Co., Inc., 61 Broadway, New York. Pamphlet. Calls attention to a special type of lock nut in which a roller is used to perform the locking. Among the advantages claimed for the nut, which was illustrated in THE IRON AGE, March 8, 1917, are simplicity of construction, reduced labor expense for installation and maintenance and

the absence of lost or loose nuts to be replaced. Views showing the way in which the roller lock acts are included.

Leather Belting.—Charles A. Schieren Co., Cliff and Ferry streets, New York. Pamphlet entitled "Belt Buyers' Guide." Pertains to the transmission of power by leather belting and the maintenance of the belts in a plant. After a brief discussion of the problem of transmitting power by belting, the service which the company is prepared to render users of its belting is briefly touched upon. This is followed by instructions on the lacing of belting and the precautions to be observed in installing and using the belts. Considerable useful information is presented and tables showing the horsepower transmitted by various widths of single and double leather belts at different speeds are included.

Automatic Fire Detector.—New York Brass Foundry Co., 102 Centre Street, New York. Pamphlet. Lists the advantages of the Monitor detector system for calling attention to changes in temperature, opening exit doors, controlling automatic sprinklers and closing fire doors and shutters, etc. A number of applications of the detector are illustrated and briefly described.

Tongueless Industrial Truck.—Columbus Lift-Truck Co., 105 West Broad Street, Columbus, Ohio. Folder. Refers to an elevating industrial truck of the tongueless type, in which the load carrying platform is raised from the floor by a ratchet. Several views of the truck are presented, and a condensed table of specifications is included.

Pattern Shop Equipment.—Wellman Pattern Supply Co., Cleveland. Bulletin No. 8. Lists and illustrates various appliances for use in a pattern shop. These include a line of heavy duty universal side spindle Duntley drills, which use either single-phase alternating or direct current, a stand for electric drilling machines, portable electric disk and hack saw blade grinding machines, glue pots, bench planing machines, power grindstones, embossing presses, band saws, vises, pattern lumber and special screw machine products.

Roller Bearings.—Hyatt Roller Bearing Co., Newark, N. J. Engineering bulletin No. 1809. Devoted to the use of roller bearings in steel mills. Among the applications are rolling tables, hot saws, soaking pit covers and charging, ingot, ladle, cinder and slag cars. The special advantages of reduction in friction, good lubrication and durability are briefly touched upon. A number of diagrams showing the way in which the bearings are installed are presented, together with a table of dimensions and specifications.

Turret Lathes.—Gisholt Machine Co., Madison, Wis. Pamphlet. Devoted to the company's turret lathe and the rapidity of production possible with it. The pamphlet consists of reprints of advertisements in the trade and technical press. In each case some part that was finished by the lathe is shown and the time required for its production emphasized. Brief descriptions of the different parts and sectional drawings serve to supplement the halftone illustrations.

Air Compressors.—Nagle Corliss Engine Works, Erie, Pa. Bulletin No. 27. Calls attention to a line of belt and steam driven power air compressors which are built in sizes ranging from 3 to 8000 cu. ft. of air. A general description of the construction of the compressors, which is supplemented by illustrations of the different parts, is presented and this is followed by specification tables of the various sizes of compressor that can be supplied. Mention is also made of a line of air receivers and views of the different types of air compressors built are included.

Ball Bearings.—S.K.F. Ball Bearing Co., Hartford, Conn. Folder. Gives the opinions of a number of prominent machine tool builders concerning the use of the company's ball bearings in different kinds of machine tools.

Laboratory and Workshop Appliances.—Buffalo Dental Mfg. Co., Buffalo. Catalog B, List No. 37. Mentions a line of appliances burning gas, gasoline and kerosene for chemists, experimental laboratories, workshops, toolrooms, colleges, schools, etc. The line includes crucible and muffle furnaces, tool forges, brazing stands, blowpipes, foot and power blowers, burners, etc., and the various accessories used in connection with them. Illustrations and brief descriptions are presented and in some cases tables of the different sizes that can be supplied are included.

Rivet Cutting Gun.—Rivet Cutting Gun Co., 220 East Second Street, Cincinnati. Pamphlet. Points out the advantages of cutting rivets with a patented pneumatic tool instead of the cutting bar and sledge. Among the features upon which emphasis is laid are a reduction in cost and safety. A number of views of the gun in use are presented and its application to each particular case is briefly described. An illustrated description of the tool appeared in THE IRON AGE, March 15, 1917.

Machinists' Tools.—Slocum, Avram & Slocum Laboratories, Inc., 231 West Twenty-first Street, New York. Two folders. Illustrate and describe an improved form of sine bar and an indicating square for tool makers and machinists. Applications of both tools are shown and a list of the other tools made is included.

Motor Reversing Oil Switch.—Crocker-Wheeler Co., Ampere, N. J. Bulletin No. 179. Describes an oil switch that has been developed for reversing two or three phase alternating current motors. In the bulletin the operation of the switch is demonstrated by illustrations rather than by text. These show the different arrangements of operating levers that can be provided, as well as the positions of the contacts for operation in either forward or reverse directions. The various features of the switch, such as simple and rugged construction, easy access and the use of few parts, are briefly touched upon. An illustrated description of this switch appeared in THE IRON AGE, Aug. 16, 1917.

Rust-Resisting Finish.—Rust-Resisting Black Finish Co., 202 John Street, Bridgeport, Conn. Circular. Describes the application of a rust-resisting treatment to iron and steel to give a permanent finish. The process, which can be applied to steel and wrought and malleable iron, is not a paint or a lacquer and employs a muffle furnace and superheated steam in connection with certain non-poisonous or explosive gases. The size of the material treated, it is emphasized, is limited only by the size of the furnace in use.

Fuel Oil Burning Equipment.—Fess System Co., 218 Natoma Street, San Francisco. Circular No. 18. Presents a brief illustrated description of a turbine burner for fuel oil. The special advantage claimed for this arrangement is that the rotation of the atomizing cup and its turbine blades subjects the oil to a high centrifugal velocity and the velocity of the air assists in breaking up the oil, as well as carrying it into the combustion chamber. A number of views showing the application of the burner, to various forms of heating apparatus are presented and a series of dimension diagrams and tables are included.

Speed Changing Device.—Moore & White Co., Philadelphia. Pamphlet. Refers to a special type of speed changing device which was illustrated in THE IRON AGE, Feb. 22, 1917. The special advantages claimed for this arrangement are the elimination of friction slip and the providing of a gradual change in the speed. A number of illustrations of the device in use are presented, together with a detailed description of its construction.

Metal Cleaner.—Oakley Chemical Co., 22 Thames Street, New York. Information sheet No. 857. Points out the advantages of using Oakite in the cleaning of munitions at various stages in their manufacture. In addition to a general discussion of the subject of cleaning shells, photomicrographs of oil that has been emulsified by Oakite and saponified by a caustic are given. Instructions for using Oakite and Oakite cutting compound in connection with the production of munitions are presented. A number of views showing the various steps in munitions manufacture for which the company's products are used are included.

Grinding Machines.—Ott Grinder Co., Indianapolis. Loose leaf circulars. Illustrations and descriptive matter explain the construction and operation of a universal grinding machine adapted for general toolroom service and a plain machine designed for producing large quantities of small duplicate straight or taper cylindrical parts. The leaflets are punched to fit a dealer's price book and specification tables of both machines are included.

Twist Drills and Machinists' Tools.—Detroit Twist Drill Co., Detroit. Catalog No. 18. Size, 5 x 7½ in.; pages, 251. Covers an extensive line of machinists' tools which includes twist drills, reamers, chucks, sockets, milling cutters, taps, etc. Both high speed and carbon steel tools are made in a number of cases and for convenience in ordering contrasting colors of ink are used to designate each kind of material. Illustrations of the tools are presented at the top of the pages with tables of the various sizes that can be supplied underneath. Mention is made of the facilities possessed for turning out special tools and a number of tables of useful information are included. An alphabetical index of the various tools listed forms a part of the catalog.

Vertical Turret Lathe.—Bullard Machine Tool Co., Bridgeport, Conn. Circular VT-624. Concerned with a 24-in. vertical turret lathe having one swivel turret head and one non-swiveling side turret head. The construction of the lathe is gone into at some length with sideheads in contrasting type to call attention to the subject matter contained in the paragraphs. A condensed table of specifications and an installation diagram and data are given, together with two views of the lathe.

Turret Lathes.—Gisholt Machine Co., Madison, Wis. Folder. Treats of the part played by the company's turret lathes in the manufacture of internal combustion engines. The successive stages from the billet to the finished cylinder are illustrated together with views of some of the operations.

THE IRON AGE

New York, August 30, 1917

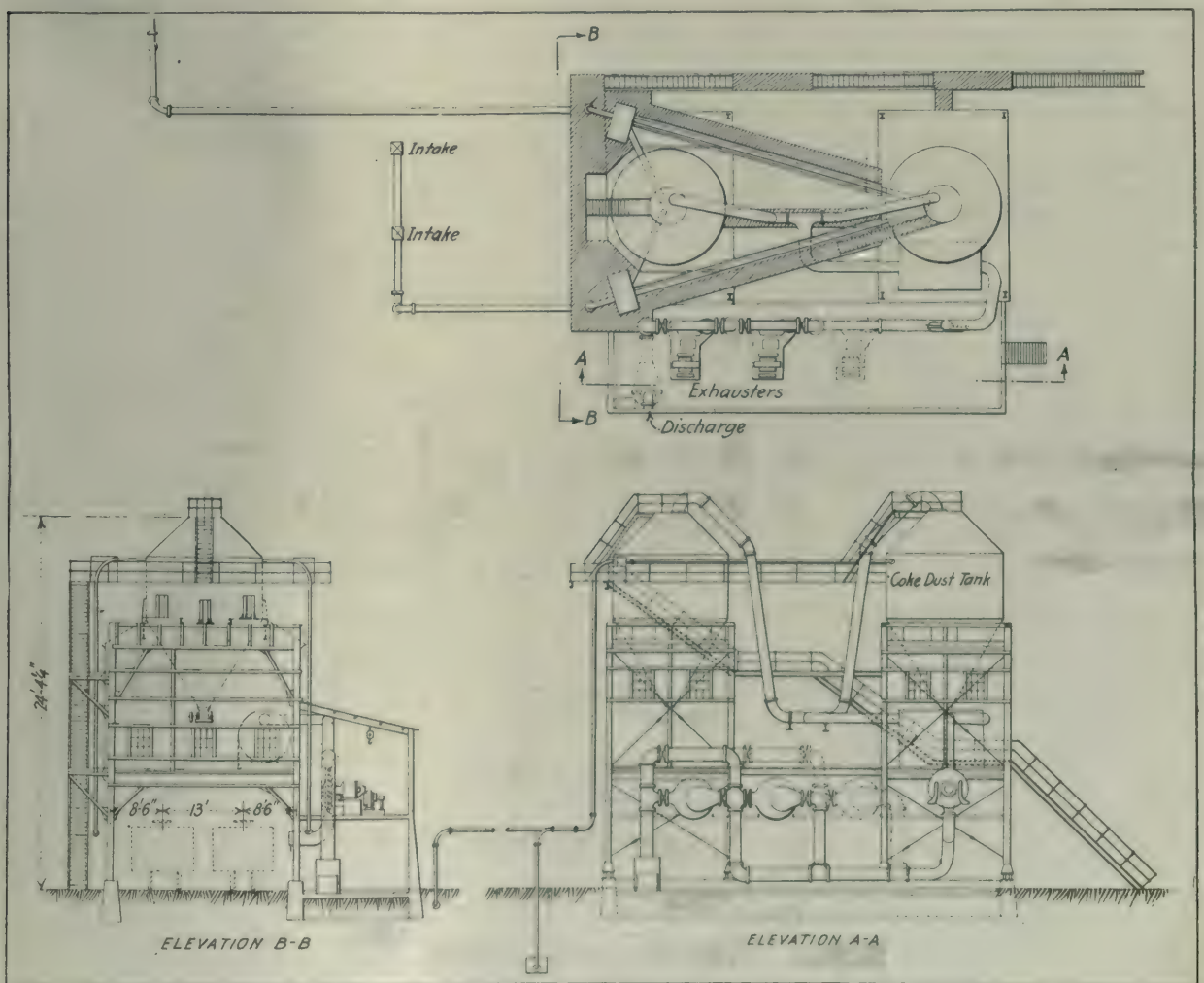
ESTABLISHED 1855 VOL. 100: No. 9

Recovery of Coke Breeze at Skip Hoists

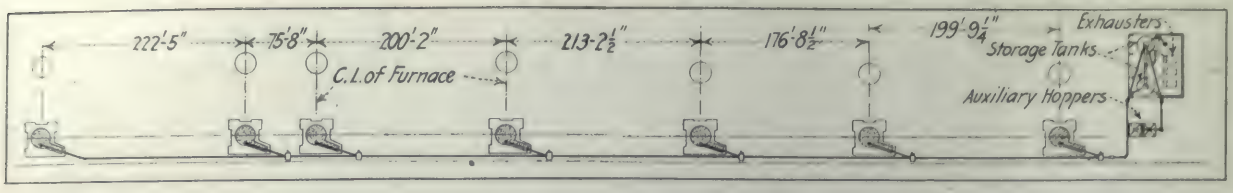
Pneumatic Conveyor at Edgar Thomson Works, Carnegie Steel Co., Carries Breeze to Storage Tanks—Automatic Control Features—Applied Also to Unloading Lime

PNEUMATIC conveying systems for handling coke screenings from blast furnace ship-hoist pits and for removing lime from railroad cars are to be installed at the Edgar Thomson Works of the Carnegie Steel Co. by the Guarantee Construction Co., New York. The design of the conveyors is practically complete and fabrication of parts is now under way. In the case of the coke, the charge to the skip bucket from the larry car will fall over a screen through which the fine coke will drop to the pit, and the plant provides for emptying the pits periodically by suction maintained by centrifugal exhausters which will deliver the coke breeze to storage hoppers for subsequent use. Besides the fact of the unusual method of handling coke and lime, interest attaches to the apparatus to control automatically the operation of the exhausters whatever may be the load.

The coke-handling system comprises a main conveyor duct with branches extending beneath the skip-hoist hoppers with an intake at each, two storage tanks, a dust collector or air scrubber, and two



Air from the storage tanks passes through the washer for final cleaning before reaching the exhausters. The exhausters' by-pass valves are motor-driven and automatically adjusted to maintain series operation. A by-pass valve in each intake branch to the storage tanks will permit either tank to be used. A bifurcated chute and a separator below each tank (not shown) will sort the coke breeze according to size and direct it to cars



Coke breeze falling into the skip-hoist pits will be transferred from them to the storage tanks. Provision for automatic regulation of the exhausters is made to compensate variations in the length of the conveyor duct

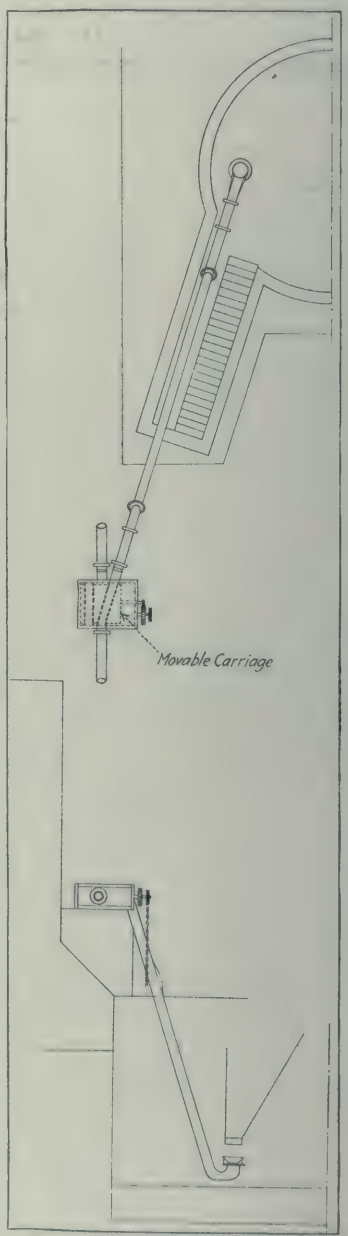
General Electric exhausters, with provision for a third. Each exhauster will be direct connected to a 150-hp. direct-current motor and will be controlled by automatic governing apparatus actuated by the air blast. This governing apparatus consists of a steel disk which will be balanced against the air blast by adjustable counterweights and steadied by a dash pot. Reduced air blast will allow the counterweights to raise the disk and speed up the exhauster. Increased air blast will force the disk in the reverse direction and reduce the exhauster speed, thus to maintain a constant flow of air under all conditions.

At each intake will be a button switch for throwing the exhausters in or out of service. When the conveyor duct in use is short, say, not over half the length of the line, only one exhauster will be required and its speed, determined by the governor, will vary with the frictional resistance of the duct. When the length of the duct causes frictional resistance which cannot be overcome by the single exhauster, or if the coke dust is fed too rapidly or clogs the duct, the second exhauster will be automatically thrown in in tandem by the governor.

As indicated in the illustration, the exhausters are to be fitted with by-pass piping and valves to facilitate this operation. The valves will be operated by electric motors controlled by the constant volume governor and will be automatically properly adjusted when the second exhauster is thrown in or out of service.

The main conveyor duct will consist of a 10-in. pipe paralleling a line of seven blast furnaces and terminating at its discharging end in the two storage tanks. The coke screenings, as stated, will be collected in pits, one for each furnace, located beneath the loading hopper of the skip-hoists, and will enter the main conveyor pipe through the branch lines. The conveyor equipment will have a rated capacity of 40 tons per furnace in 24 hr. and the total distance traversed from the storage tanks to the farthest furnace pit will be approximately 1350 ft. The discharge head to the storage tanks, that is the net lift, will be approximately 63 ft. above the level of the pits. The automatic governor arrangement for regulating suction with load is expected to maintain full capacity under all conditions of service.

The design provides for separate cleaning of each pit and the branch pipes will be equipped with specially designed valves to disconnect automatically all pits from the line excepting the one being emptied. This valve is to comprise a section of the main conveyor pipe and a section of the corresponding branch pipe. The two pipe sections will be mounted on a carriage which will move within a stationary air-tight box. Into this both the main suction line and the branch line will open. The movable sections will be operated by a screw, the screw which moves the carriage, being operated by the larryman by an endless chain. When one suction circuit is made continuous the other will be automatically broken, and the open pipe of the broken circuit will be sealed by a plate attached to the carriage and moved with it. This makes a positive interlocking system in which only one inlet can be operated at a time. It is important that the stationary box enclosing the sections prevent air from leaking into the suction line.



Each branch duct will be provided with a by-pass valve consisting of a section of the main conveyor duct and a section of the branch pipe mounted on a carriage. Throwing any branch in service will automatically disconnect all others

The two storage tanks for coke dust will have each a capacity of 200 tons and will be provided with valves similar to those designed for use on the conveyor pipe, so that when one tank operates the other will be disconnected free for cleaning. The tanks will act also as storage bunkers for coke dust from a second row of four furnaces extending at right angles to the other seven. This dust will be brought in cars to the track hoppers indicated in the illustration and lifted into the storage tanks through an independent pipe.

Air will be exhausted from the tanks through large diameter pipes which will bend down and join to a common header as shown. Two hand-operated gate valves, one on either side of the union to the common header, will be used to maintain suction in one tank or the other as desired. The large diameter of these pipes insures low velocity of air so that a minimum amount of dust will be carried over from the storage tanks. This separating action will be supplemented by the large diameter of the storage tanks and the correspondingly low velocity of air through them.

Such fine particles of dust as may be carried over from the storage tanks will be removed before reaching the exhausters by an air washer located as shown. This consists of a sheet steel compartment with vertical baffles and water sprays. The air intake will be at the upper part of one end and the outlet at the upper part of the opposite end.

The traversing air will be directed alternately up and down by the baffles and will be washed by the water from the sprays. The spacings between the baffles will increase in width toward the discharging end to lessen the velocity of flow and provide greater time for thoroughly removing the dust. A water-sealed overflow pipe will drain the water as it collects at the bottom of the washer.

An interesting feature of the piping equipment of the conveyor is in the design of bends. These will be protected on the outside circumference by segmental semi-steel wearing pieces of the same curvature as the bends and clamped on by U-bolts. They are approximately 3 in. thick at the center, and will provide renewable wearing surfaces at all turning points in the conveyor duct.

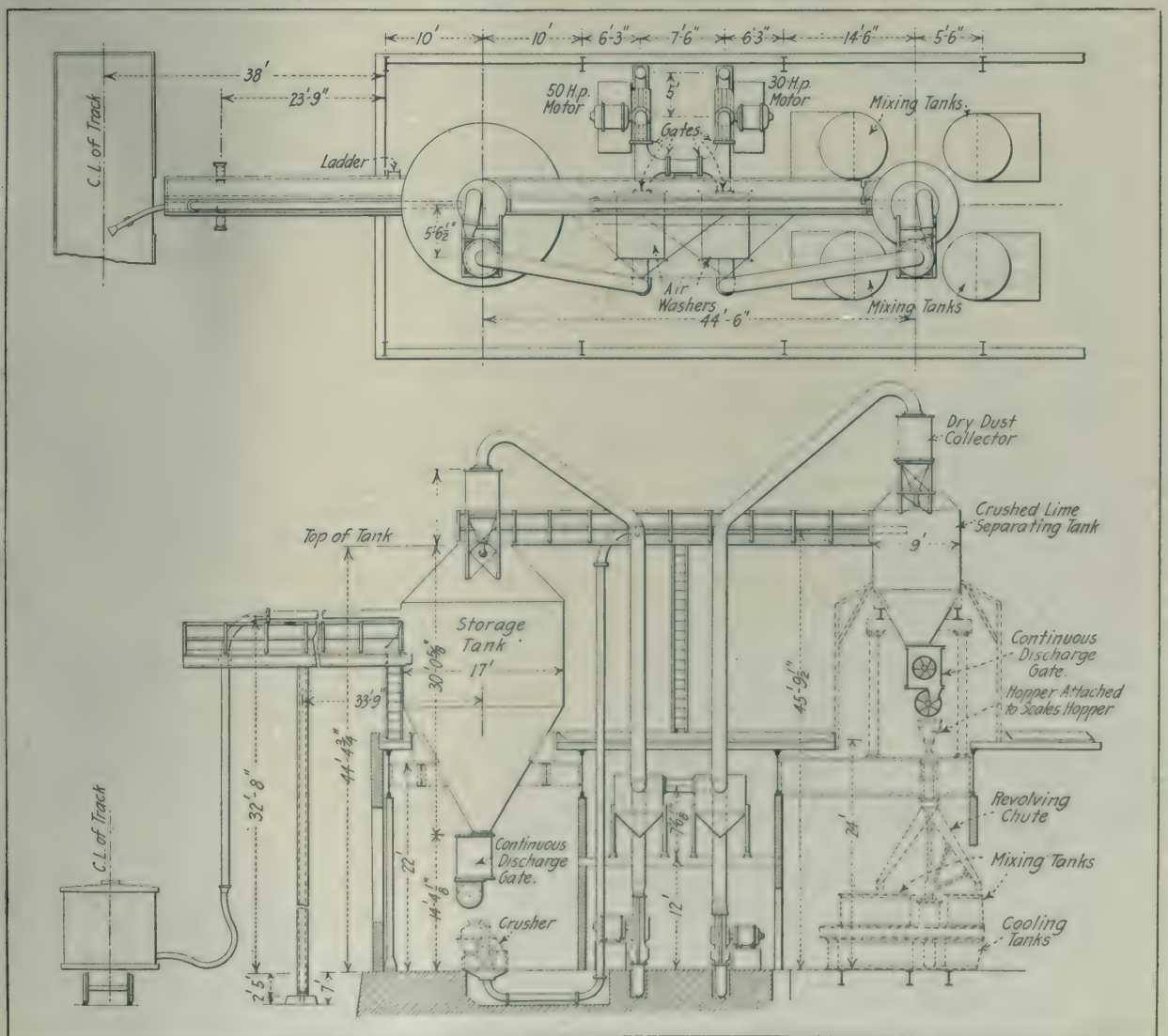
Pneumatic Conveyor for Lime

The Carnegie Steel Co. is also planning a suction conveyor for handling lime used for treating boiler feed water at its Edgar Thomson plant. Handling lime is hardly regarded as an agreeable task because of the large amount of dust set up, but it is believed the suction conveyor will remedy this condition.

The plan for handling lime provides for a continuous process by which the lime will be unloaded from box cars in which it comes to the plant, crushed, weighed and delivered to mixing tanks for use in treating feed water. The use of the suction conveyor, it is believed, will obviate dust clouds within the car, so that a man may without discomfort direct the suction nozzle which will be attached to a flexible hose for picking up the lime. Material from powder to lumps of 100 cu. in. may, it is said, be handled in quantities up to 10 tons per hour with power requirements varying from 20 to 25 hp. The lime as unloaded will be carried by the air blast through an 8-in. pipe to a storage tank of 20 tons capacity. From here it will pass through a continuous discharging gate at the bottom of the tank into a crusher, there to be crushed and transferred by suction to a second tank indicated in the illustration as a crushed lime separating tank. It will then pass through another continuous discharging gate into the scale hopper, automatically weighed and dumped to mixing tanks in proper quantities for treating feed water.

Air will be exhausted from each tank and will pass through dust collectors and air washers before reaching the exhausters. The dust collectors will be of the usual centrifugal type, allowing the dust to settle and fall back into storage tanks, above which they are located. They are supplemented by the air washers, which are similar to those employed in the coke-conveying apparatus. A by-pass pipe connecting the outlets of the washers will permit the use of either exhauster as desired for either branch of the installation.

Continuous discharging gates are required as the process is not intermittent. Each gate will consist of radial revolving pockets of sheet steel.



The plan for handling lime provides a continuous process by which the lime will be unloaded from cars, crushed, weighed and delivered to mixing tanks. The gate valves and by-pass pipe will enable the use of either exhauster on either tank. The continuous discharging gates are designed to prevent air infiltration

As the hub revolves the lime will pass into the compartments and fall into the hopper. The contact between the plates and their casing will be air-tight, and only negligible quantity of air, it is said, will be carried back into the tanks. A revolving drum or rotary feeder above the gate will control the rate of discharge of the material.

HEAVY TIN PLATE OUTPUT

Bureau Estimate Shows Large Increase for Present Year

WASHINGTON, Aug. 28.—A total production of tin plate for the calendar year 1917 of 32,898,597 base boxes is foreshadowed by a special census of the industry just completed by the Bureau of Foreign and Domestic Commerce. These figures as compared with mill obligations make a very interesting exhibit in connection with the shortage of tin plate throughout the world at the present time.

Returns received from 15 of the leading tin plate producers of the country indicate an increase of approximately 25 per cent in the domestic production of tin plate this year over last. The returns for the six months ended June 30, last which are based upon actual production, show an output of 16,038,732 boxes. The estimated production for the half year ending Dec. 31, 1917, is 16,859,865 boxes.

Notwithstanding the fact that the estimated production of the calendar year 1917 is 5,918,603 boxes more than in 1916, practically all of the plate that can be produced has been contracted for to be delivered before December 31, next, and a shortage is in sight equal to the output of the first two months of 1918. Following are the official figures as reported by the Bureau of Foreign and Domestic Commerce:

Production of tin plate, boxes:	
1914	20,271,683
1915	22,925,437
1916	26,979,994
1917, first half	16,038,732
1917, second half (estimated)	16,859,865
1917, total	32,898,597
Contracted for delivery first half of 1917 and not shipped June 30, 1917:	
Domestic	2,424,261
Export	982,984
Contracted for delivery second half of 1917:	
Domestic	13,747,730
Export	1,346,293
Total obligations of mills for delivery last half of 1917	18,501,218
Estimated 1917 production for export	3,405,071

In giving out these figures, the bureau calls attention to the very urgent necessity that substitutes for tin plate be used to the greatest possible extent, as the Government's demand upon the steel producers for war material is daily growing heavier and this may at any time result in decreasing the supply of steel for the tin plate mills, thereby resulting in a diminished production of plate. The bureau is informed that England and France are both experiencing a shortage in tin plate and have taken steps similar to those pursued in this country to conserve the supply of tin cans for use as food containers.

Figures compiled by the Bureau of Foreign and Domestic Commerce showing the export movement of tin plate for the seven years beginning with 1911, the first year of the so-called pre-war period, and ending June 30, 1917, constitute a striking exhibit, showing as they do an increase in exports of no less than 645 per cent in quantity and more than 1000 per cent in value. Shipments in 1911 aggregated 70,199,398 lb. valued at $2,489,094. In 1912 there was a marked increase, the total exports amounting to 181,899,366 lb. valued at $6,269,325, but during the next two years there was a heavy decline. In 1915, however, the upward tendency again developed and in 1916 there was an increase of nearly 340,000,000 lb. The following table shows the exports from the beginning of the pre-war period to the end of the fiscal year just closed:

	Pounds	Value
1911	70,199,398	$2,489,094
1912	181,899,366	6,269,325
1913	164,362,281	5,767,043
1914	105,899,762	3,643,806
1915	179,221,644	5,712,104
1916	516,257,473	18,703,773
1917	521,861,390	28,404,433

The extraordinarily comprehensive export distribution of American tin plate is graphically shown in figures which have just been made up by the Bureau of Foreign and Domestic Commerce showing the exports by countries for the fiscal year 1917 as compared with 1916. These figures emphasize the great increase in the cost of iron and steel products during the past year, for while the gain in exports in 1917 over 1916 was less than 1 per cent, the increase in value was more than 50 per cent. The minimum amount shipped to any one of the 11 countries enumerated was 4,384,430 lb., which went to Mexico, while the maximum was 133,624,965 lb., shipped to Canada. Argentina ranks second in 1917, taking 51,378,225 lb., a gain of 20 per cent over 1916 and understood to be due to the demand for cans for the packing of meats for war supplies. Japan took 46,430,277 lb. in 1917, ranking third, but this total was a substantial decrease from the 55,189,308 lb. absorbed in 1916. The following table shows the details of the export movement by countries of destination for the two fiscal years 1916 and 1917:

	1916		1917	
Country	Pounds	Value	Pounds	Value
United Kingdom	66,715,359	$2,288,425	19,477,988	$854,090
Canada	117,364,108	3,979,108	133,624,965	7,691,901
Mexico	6,154,491	211,179	4,384,430	289,728
Cuba	8,564,353	304,371	8,975,391	535,407
Argentina	41,926,801	1,519,110	51,378,225	2,954,310
Brazil	24,540,519	860,167	31,154,451	1,718,225
Uruguay	8,422,480	288,931	11,586,175	728,174
China	35,408,911	1,248,678	30,515,220	1,534,253
British Indies	45,548,953	1,656,154	39,841,103	1,623,500
Hongkong	31,940,917	1,269,799	22,169,791	1,173,017
Japan	55,189,308	2,315,506	46,430,277	2,722,426
Other countries	74,481,273	2,762,384	122,260,374	6,559,402
Total	516,257,473	$18,705,812	521,861,390	$28,404,433

For many years, Canada has been the largest consumer of American tin plate, but while in 1914 that country took 75 per cent of our total exports, in 1917 we shipped to the Dominion less than 26 per cent.

New Tin-Plate Plant at Warren, Ohio

The Liberty Steel Co., organized some time ago to build a sheet mill plant at Warren, Ohio, has changed its plans, and will erect a tin-plate plant. The company is installing eight tin mills at this time on one drive, which, however, has a capacity for 12 mills. It is the intention of the company to install these other four mills after the first eight have been started. For the eight mills there are being installed 12 to 14 tin pots, and a very modern tin house is also being erected. Contracts for all this equipment have been placed. A main mill building to contain the hot and cold mills, shears, heating and annealing furnaces, and other equipment is a two-aisle building, each aisle being 75 ft. wide with 30-ft. lean-tos on each side, each aisle being about 500 ft. long. The tin mills are being built by the Hyde Park Foundry & Machine Co., Hyde Park, Pa., the cranes by the Pawling & Harnischfeger Co., the motors will be furnished by the Westinghouse Electric & Mfg. Co., gears by the Fawcus Machine Co., and the pickling machines by the Mesta Machine Co. The company expects to turn out between 650,000 and 750,000 base boxes of tin plate per year, with its first equipment of eight hot mills, and is counting on starting operations in February or March next year. It expects to be in position to deliver tin plate at least in the second quarter of 1918. E. A. Clark is president.

The Wheeling Mold & Foundry Co., Wheeling, W. Va., has been making improvements at its plant for work on a United States Government shell contract. The company formerly had two separate shell departments, one machining 3-in. American and the other 3-in. Russian high-explosive shells. These two departments have now been consolidated and will work on the new type American H. E. shells. About 25 additional lathes of the company's own manufacture have been added to the equipment.

Flash Annealing of Large Projectiles*

In the manufacture of large projectiles, the rough shell is brought to a temperature of 1650 deg. Fahr. and then waterquenched. This leaves the metal, especially the outer skin, glass hard, and this must be softened to allow machining without affecting the hardness of the inner metal. To obtain this result, the shell surface must be heated to about 900 deg. Fahr., with sufficient rapidity to preclude the possibility of the inner sections of the metal having time to absorb enough heat to materially affect their hardness. This softening of a thin skin of metal is called flash-annealing.

The accomplishment of the effect explained above has been a rather difficult task. In one of our large steel mills quite a variety of types of oil and electric furnaces were tried out, but the shells would come through with hard spots and could only be machined with difficulty. Two Surface Combustion Company's gas-fired flash-annealing furnaces were finally installed and satisfactory results obtained.

The furnaces are run on a low-pressure system, air being delivered from a positive pressure blower. The quality and quantity of the mixture are controlled



A Mixture of Gas and Air at a Low Pressure Is Delivered at a Tangent with the Inner Wall of the Furnace by a Series of Radially Placed Burners to Produce a Revolving Sheet of the Mixture and Insure a Uniform Temperature to Soften a Thin Skin of Metal on the Projectile

by the builder's one-valve low-pressure control. The heavy firebrick walls of the furnace, backed up by ample insulation, are incased in a heavy sheet metal casing, mounted on a cast-iron base. The base rests on a foundation set in a shallow pit of a depth to bring the top to a convenient working height. The covers are of the usual swing type.

Later, due to manufacture of a larger shell, an order for two additional units was placed. In the latter type of furnace, the burners are placed radially, and their nozzles are made, so as to shoot the mixture tangentially upon the inner furnace walls. This causes a revolving sheet of mixture, thus giving rise to a scrubbing action of the hot gases, insuring as nearly a uniform temperature as possible at all points on the surface of the furnace. When furnace is cold, the tunnels at the end of burners allow complete combustion of the mixture to take place by retarding its velocity before the cold furnace walls are reached. These furnaces are of a later design, using firebrick walls and insulation as in the former installation, but run on a high-pressure gas system.

The quality and quantity of the mixture are controlled by a single-pipe, one-valve high-pressure control. Gas at 2 in. of water pressure is raised to 10 lb. gage pressure by a booster. This high-pressure gas draws in the necessary amount of atmospheric air through an inspirator, thus eliminating any air pipes and making a very compact furnace. In this second installation it was deemed advisable to set the furnace at the floor level and build a platform around to enable the men to operate from a convenient working level.

In operation it takes 1½ hr. to bring furnace from room temperature and soak it at 1650 deg. Fahr., using 720 cu. ft. of 600 B.t.u. gas per hour. This time can be cut down if desired. When the furnace has come to the desired temperature the door is swung open and a shell lowered into it by an overhead crane. The shells remain in furnace anywhere from 7 to 14 min., the average being 10 min. During this time a gas rate of 540 cu. ft. per hour is maintained and at the end the furnace temperature drops to about 1420 deg. Fahr., while the shell surface is brought to about 900 deg. Fahr. After the shell has been removed and the door closed the gas rate is raised to 720 cu. ft. per hour, bringing the furnace back to 1620 deg. Fahr. in 5 min.

In this manner two furnace units turn out seven shells, weighing 330 lb. each, per hour. A few minutes are lost in handling the shells, and during this time the furnace temperature is held with 480 cu. ft. per hour with the door open. The total gas consumed per hour by the two units amounts to 1170 cu. ft., or 168 cu. ft. per shell.

*From information supplied by Edward A. Pilnacek, engineering department, Surface Combustion Co., Long Island City, N. Y.

Adopts Group Insurance

The Moore Drop Forging Co., Springfield, Mass., has arranged to insure the lives of all employees who have been with the company for one month, through a group insurance policy. Persons in the employ of the company for less than three months will receive $200 insurance, and the amount of protection increases with length of service until, when an employee has been with the company for three years, he will be insured for $1,000.

Each employee may select his own beneficiary, and an attractive certificate of insurance will be issued. On the seconnd page of the certificate is a half-tone of the plant, and on the third page a letter from the company to its employees. The letter says, in part:

> We all know that the health, happiness and co-operation of its employees are important factors in the success of this corporation.
>
> It is also clear that freedom from worry on the part of any man or woman is necessary to the fullest enjoyment of this condition of well-being.
>
> Realizing this, the Moore Drop Forging Co. has arranged to have your life insured in Massachusetts Savings Bank Life Insurance and herewith delivers to you this certificate of insurance.
>
> This certificate is issued without any expense to you. In effecting this arrangement, the Moore Drop Forging Co. desires to show, in a practical manner, the value of true co-operation and its appreciation of faithful service as rendered to this company.

This insurance is issued by the insurance department of the Berkshire County Savings Bank, and was arranged for by Harry W. Kimball, 307 State House, Boston, the secretary of Savings Bank Life Insurance, under the management of the commonwealth.

The first half of an initial trip of coal barges from St. Louis to St. Paul, which is to be completed with a return load of iron ore has been completed through the co-operation of the Government with the Mississippi Valley Iron Co., of which Edward F. Goltra is president. The barges, each carrying 1000 tons of coal and numbering six in all, were towed by a Government steamer. The return trip with ore will be made within a week or 10 days and will determine whether the plan will justify continuance on a permanent basis. The ore will come from the northern Minnesota iron ore fields.

The Pennsylvania Railroad is said to be breaking all records at its Altoona, Pa., car shops by the construction of nine completed all-steel box cars daily.

Conflict of Opinion as to Destroyers

Secretary Daniels and Shipping Board Do Not Agree—Another Serious Question Relates to Commandeering Vessels of Allies and Neutrals

WASHINGTON, Aug. 28.—The announcement on Aug. 24 of a huge new building program for the Emergency Fleet Corporation, involving in its entirety the construction of 1272 merchant vessels aggregating 7,968,000 gross tons and costing nearly $2,000,000,000, has been followed by a sharp clash between the Shipping Board and Secretary of the Navy Daniels, who has issued orders to the leading shipyards of the country to abandon all merchant construction and to concentrate every facility upon the building of 150 new torpedo boat destroyers, to cost approximately $200,000,000. The shipbuilders whose work for the Emergency Fleet Corporation has thus been suspended have protested vigorously to the Navy Department and to the Shipping Board, but Secretary Daniels shows no signs of yielding and the President may once again be required to step in and straighten out a tangle that threatens the big shipbuilding project designed to defeat the object of the submarine campaign.

The building program of the Shipping Board, set out in detail in a memorandum forwarded to the Secretary of the Treasury for transmission to Congress during the past week, calls for an appropriation of $1,134,500,000, in addition to the $800,000,000 heretofore authorized. Only $915,000,000 of the total estimate will be required during the rest of the current fiscal year and it is probable that the remainder of the $219,500,000 will be asked at the regular session of Congress which convenes in December.

According to the figures submitted by the Shipping Board, the appropriation heretofore made and that recommended will be spent as follows: Contracts already let, 433 ships of 1,919,200 tons, $285,000,000; contracts ready to let, 452 ships of 2,968,000 tons, $455,500,000; under negotiation, 237 ships of 1,281,000 tons, $194,000,000; miscellaneous vessels, 150 ships of 1,800,000 tons, $300,000,000; cost of constructing Government-owned fabricating shipyards, $35,000,000. The commandeering program will cost $515,000,000 and the purchase of ships approximately $150,000,000 additional.

The contracts under consideration for some time for the construction of three Government-owned shipyards in which are to be built fabricated steel vessels will probably be signed almost immediately. The contracts go to the Submarine Boat Corporation for a plant at Newark, N. J., to the American International Corporation for a plant at Hog Island, Pa., and to the Merchants Shipbuilding Corporation for a plant at Chester, Pa. At the outset, the fleet corporation will contract for but 100 ships in these yards because it cannot legally anticipate its appropriations, but as soon as Congress has provided the money, orders will be given for 150 additional vessels, making a total of 250, the aggregate cost of which will be between $300,000,000 and $400,000,000.

Question as to Commandeering

Notwithstanding the announcement heretofore made that the British Government had acquiesced in the commandeering of merchant vessels building in American yards for the account of the government or of subjects of Great Britain, it is now stated that a formal protest has been filed with the State Department by the London Foreign Office, demanding that the United States release about 1,000,000 tons of ships building for British interests. The Secretary of State has entered into negotiations with the British Government in the hope of securing the reaffirmation of the assurance given by Mr. Balfour some weeks ago that Great Britain would interpose no objection to the commandeering of the vessels in question in view of the fact that they are to be used chiefly for the transportation of troops and supplies in aid of the Allies' forces. The members of the Shipping Board are anxiously awaiting the outcome, as these vessels will probably be available much sooner than any contracted for by the board and the War Department is counting upon this tonnage for the movement of troops and supplies. Inasmuch as several neutral countries have also protested against the commandeering of vessels being built for their account in American yards, a decision as to the British ships may be of far-reaching consequence, although the suggestion has been made here that the United States may release the British ships upon condition that they be employed exclusively in the transatlantic trade, while at the same time retaining possession of all merchant vessels of neutral countries. Officials of the administration are not a unit as to the treatment of commandeered vessels and the issue is regarded as furnishing another problem for the President's determination.

Great Fleet Proposed

Secretary Daniels' program for the construction of a giant fleet of destroyers, to be the largest in any navy, would cut heavily into the Shipping Board's construction plans. A week ago, the Secretary conferred here with representatives of 25 of the leading shipyards and told them that the Government would insist upon the construction of 150 destroyers regardless of what steps might have been taken to carry out this plan. The shipbuilders frankly informed the Secretary that the Government would have to finance large extensions of the principal shipyards, as the companies could not undertake to provide the necessary facilities for the building of a type of vessel of which, presumably, very few would be ordered during a long period following the war. It was roughly estimated that if the Department's program were insisted upon, the special equipment for the construction of the proposed destroyers would cost as much as the vessels themselves, making a total outlay of approximately $400,000,000. The Secretary was told that, in addition to financing these extensions, the Government must induce the Priority Board to give the shipyards precedence in obtaining materials, it must let the contracts on a cost-plus-profit basis, and it must condemn several large tracts of land where the new shipbuilding plants would be located. Secretary Daniels is understood to have informed the shipbuilders that the conditions stipulated by them would not deter the Department from proceeding with the project for doubling the number of destroyers now in the Navy or under construction.

Daniels Gives Order

Following the conference referred to, Secretary Daniels gave a formal order that half a dozen of the largest shipyards should turn all their energies toward the building of destroyers. This action evoked protests from many shipbuilders who have appealed to Secretary Daniels urging that his plan is not in the interest of the Government. It is pointed out that the need of merchant vessels is much more acute than that of destroyers and that unless the cargo vessels can be built rapidly in the best-equipped yards, the destroyers will have little to do in the way of convoying for protection against the submarines. It is further pointed out that, notwithstanding the effectiveness claimed for the destroyers as a weapon against the undersea boat, the British Government has added few warships of this type to its Navy, but, on the other hand, is bending every energy to secure the largest possible output of merchant ships. The effect of this policy after the war, it is contended, will be very disastrous to American interests. This Government will be obliged to take care of a large and wholly useless fleet of destroyers, while Great Britain will have built up a big merchant marine with which to monopolize the world's trade. Notwithstanding the forcible

character of these representations, Secretary Daniels does not appear to have been greatly impressed and there is no reason to believe that he will modify the orders already given.

A problem in connection with the construction of the proposed fleet of destroyers is engine production. Engine building companies have also received peremptory instructions from the Navy Department to increase their output of high power destroyer engines and, in certain cases, the orders given would involve an increase of several hundred per cent. It is probable that the Navy Department will be required to utilize a large amount of its available funds in financing extensions for the engine building plants as well as for shipyards, and before the Department's plans have been completely worked out it is believed its commitments on account of the new destroyers will amount to nearly half a billion dollars.

Shipowners Must Help

On the basis of reports received from the American fleet in European waters, the Navy Department has taken steps to compel American ship owners to cooperate in the task of combating the undersea boat. The War Risk Bureau, which insures vessels and their cargoes, and the United States Shipping Board have been asked by the Secretary of the Navy to compel vessel owners to make their ships as nearly nonsinkable as possible by dividing the cargo holds into smaller watertight compartments and by giving all newly launched vessels a speed of 15 or 16 knots. Experience has demonstrated that the division of cargo holds into several small compartments makes it practically impossible for a submarine to sink a vessel so constructed, even if two torpedoes strike the hull. The question of speed is also highly important, as carefully assembled statistics show that only a very small number of vessels having a speed in excess of 15 knots have been sunk. The Shipping Board is giving special attention to these recommendations and will probably incorporate them in many of its contracts and will also utilize them in completing vessels now on the stocks which have been commandeered under the board's recent order.

An Important Agreement

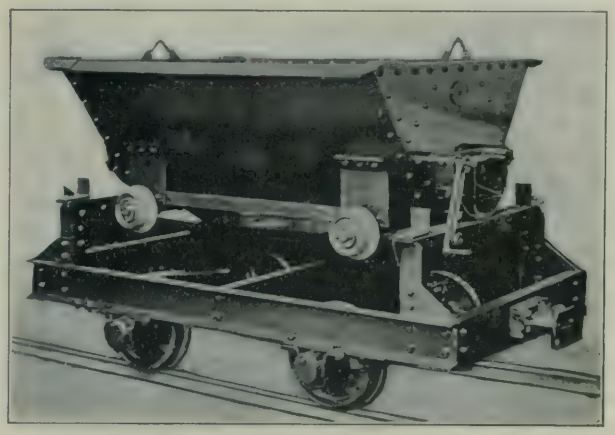
For the purpose of bringing about a rapid and peaceable adjustment of labor disputes in shipyards throughout the country, in order that the work of ship construction in public and private establishments may continue during the war without danger of serious interruption, an agreement has been entered into by representatives of the Navy Department, the Emergency Fleet Corporation and the American Federation of Labor. The agreement, which is signed by Acting Secretary of the Navy Roosevelt, Chairman Hurley of the United States Shipping Board, Admiral Capps, general manager of the Emergency Fleet Corporation, and a dozen high officials of the American Federation of Labor, calls for the immediate creation of an adjustment commission, which will consist of three, four or five members, according to the nature of the problem to be solved. The President has designated V. Everit Macy, of New York, president of the National Civic Federation, as chairman of the Commission, the Emergency Fleet Corporation will designate the second member, and Samuel Gompers, president of the American Federation of Labor, will name the third. Where Navy work is in whole or in part concerned, the Assistant Secretary of the Navy will sit as a member of the commission, and when trouble on a large scale is threatened in private yards, a representative of local labor and of the local shipping interests will sit as members of the commission, with full voting powers. In the event of a tie when Assistant Secretary Roosevelt's presence raises the membership to four, the deciding vote will be cast by the Secretary of War as chairman of the Council of National Defense.

The importance of this agreement to the shipbuilding program can hardly be overestimated. The Government and the labor representatives, parties thereto, believe that it will hasten the settlement of the controversy in the New York district, where more than 12,000 skilled workmen are now out on strike and much Government work is being held up. It is announced that through the efforts of President William H. Johnson of the National Association of Machinists and James O'Connell, president of the Metal Trade Workers Department of the American Federation of Labor, aided by Mr. Gompers, the workers who went out of the Pusey & Jones Shipbuilding Co.'s yards at Wilmington last week have returned to work to await the result of this effort at adjustment. A strike of more than 100,000 men on the Pacific Coast has been threatened since Aug. 14, but the men have been held back through the efforts of President J. A. Franklin of the International Brotherhood of Boilermakers and Iron Shipbuilders. If these men went out, work on more than 700,000 tons of steel and wooden ships would come to a standstill. W. L. C.

Dump Car for Use in Limited Spaces

The Easton Car & Construction Co., Easton, Pa., has developed an interesting type of dump car for use on industrial railroads. The special features of the car are the use of two sets of wheels and the crane lifting rings attached to the top of the body at each end.

This arrangement makes it possible for the body of the car to be lifted off the frame and set down on another track of narrow gage. It can be then run on the



The Body of a Recently Developed Dump Car Can Be Lifted from the Truck and Run on a Set of Auxiliary Wheels into a Limited Space for Loading

auxiliary wheels under a hopper for loading where the headroom is limited or the space is so narrow that the whole car cannot enter. After the car has been loaded it can be pulled out and hoisted on the under frame by the crane. After the dump body has been placed on the frame the whole car is moved to the dump in the regular way. The car is constructed of metal throughout and is designed for operation on the narrow gage industrial railroads found in so many plants.

Practical Course for Foundrymen

Due to conditions existing in manufacturing plants all over the country, and with which industrial managers are very familiar, there is at present, and has been almost since the time the war broke out, a great demand for trained foundrymen to fill responsible positions. At this time, opportunities are numerous and salaries are attractive not only for men who have a practical knowledge of the foundry business, but also for those whose services would be valuable by taking a course of specific training. To insure itself of as large a supply of such men as possible, the Westinghouse Electric & Mfg. Co., East Pittsburgh, has recently established a course in foundry work for those of its employees between the ages of 17 and 31 years who have completed at least the eighth grade of public school or its equivalent. The shop courses include the following: Bench and floor molding, machine molding, car making, tempering of sand, cupola operation, mixing of alloys, and cost of calculating. Classroom instructions will be given during the course on blue print reading, mechanical drawing, shop problems and metallurgy, particular attention being given to the alloys of iron and copper. The idea of the company is to give those desiring it a thorough all-round knowledge of this very important phase of its work.

Hearings on Iron and Steel Control Bill

Pomerene Measure Aims at Government Regulation of Prices and Sale—Consumers to Give Testimony

WASHINGTON, Aug. 28.—Senator Pomerene, author of the comprehensive measure empowering the President to regulate the sale and distribution of iron and steel not only to the Government and the Allies but to all dealers and consumers, domestic or foreign, a synopsis of which appeared in THE IRON AGE of Aug. 16, is planning to secure hearings on his measure before the Senate Committee on Interstate Commerce to begin soon after the pending war revenue bill is disposed of. Senator Newlands, chairman of the committee, is an avowed advocate of governmental price fixing of steel for the private consumer and several other members of the committee favor the Pomerene bill and will assist in bringing about the desired hearings. The taking of testimony on the measure will be limited to a reasonable period, however, as it is Senator Pomerene's desire that the bill should be reported to the Senate at the earliest practicable date.

In furtherance of his plan to secure hearings on the steel price-fixing bill Senator Pomerene has already secured the co-operation of the Federal Trade Commission which is compiling data for use in committee and on the floor. It is probable that the commission will assist Senator Pomerene in preparing a list of witnesses which will include representative manufacturers who are obliged to buy their raw materials from the leading producers of iron and steel. The hearings will be designed to develop many facts in connection with present conditions which have not been referred to in the public discussion of price fixing for the Government and the Allies, and some highly interesting developments may be looked for in this connection. It will be the purpose of the author of the pending bill to determine by a thorough investigation just what class of manufacturers in the iron and steel industries have been reaping the big profits currently reported, and the inquiry will follow production through all processes back to the ore in the ground.

Abnormal Conditions in Iron and Steel

"I have always been opposed to governmental price fixing or to unnecessary governmental interference of any kind with the private business," said Senator Pomerene in speaking of his bill to the correspondent of THE IRON AGE. "Under normal conditions I should not think of advocating such a measure as I have introduced for the control of the iron and steel industry. But we are now facing two facts which must be met squarely and without evasion. One of them is that the business of the entire country is in a highly abnormal condition as the result of the war, and the other is that certain men are deliberately seeking to take advantage of the necessities of the Government and of the people. In such a crisis I am for governmental price fixing or any other form of control that will enable the Government and the people to supply their every day needs at prices representing only reasonable profits to the producers.

"I yield to no man in my desire for the success and prosperity of the iron and steel industry and I have the greatest possible admiration for the brains and skill of the men who have developed this industry in the United States to its present superb proportions. But the so-called prosperity of the iron and steel industry to-day is a one-sided affair. It is the prosperity of a few big concerns engaged largely with the basic products of the industry and it is not the general prosperity of the thousands of men who must buy their materials from these big manufacturers.

Reaction from High Levels Certain

"One has only to look at a current price list of iron and steel commodities to realize that present conditions are wellnigh impossible and that their maintenance ought not to be desired by the very men who are responsible for the present extortionate prices. The leading producers in the industry, who are chiefly responsible for the present condition of the market, are riding for a fall, and when one considers the shrewdness and great business ability of these men it is a matter of surprise to me that they cannot see it. Yet this whole subject has been under discussion in and out of Congress for months and so far as I am able to see now not a move has been made to remedy it; on the other hand, it grows more critical every day with the price of basic products climbing so rapidly that consumers of iron and steel must be at their wits' ends to know what to do. The price of pig iron today is incredible and no one knows what it will be to-morrow. Nothing could be more unhealthy than such a status, and as surely as the sun rises there will be a reaction whether Congress interferes or not.

"I strongly favored including iron and steel in the list of commodities to be regulated by the President under the Lever food, feed and fuel control bill, but after the Senate committee had put them in other articles were added and the measure was finally so loaded down that its passage became problematical, and in common with many other Senators I felt that iron and steel and other metals might well be omitted from the Lever measure and provided for in such a separate bill as I have introduced. The Lever bill has become a law and already the President, by the exercise of the authority bestowed upon him by the act, has reduced the price of coal, both bituminous and anthracite, all along the line, and consumers will soon feel the benefit of the action taken.

"Certain of my colleagues, who are ever mindful of the interests of the farmer, succeeded in having agricultural implements left within the control provision of the Lever bill but apparently they overlooked the fact that manufacturers of these implements must buy their steel and pay extortionate prices for it. This only illustrates what a universal basic product steel is and how necessary it is that its price shall be kept within reason, by governmental control if it cannot otherwise be done, in order that thousands of other industries may prosper and the consumer be protected against robbery.

Iron and Steel Labor Conditions

"To my mind the labor situation in the iron and steel industry is such as to warn every experienced operator that there is grave danger ahead. The well authenticated current reports of profits made in the industry naturally inflame the minds of the workmen employed in it with the result that demands are being made for unheard of wage scales. Where these demands are not granted there is always danger of strikes and where they are the workmen are tempted to expand their scale of living and to develop surroundings that are absolutely artificial.

"What will be the end of this movement so far as labor is concerned? When the war is over there is certain to be a shrinkage appalling to contemplate. The country will be fortunate, indeed, if it escapes a great financial crash followed by a long period of depression. Labor, which is always the last to feel the benefits of higher prices, will be the last to yield to the downward tendency, and the industries of the country will be torn by labor troubles, for it is not to be expected that workmen will abandon without a fierce struggle a scale of living to which they have become accustomed.

"I am very hopeful that the Committee on Interstate Commerce will begin hearings on my bill as soon as the revenue measure is out of the way if not before. There

is a strong disposition in Congress to hasten action on all important legislation and I do not think it will take very long to dispose of my measure either in committee or in the Senate."

Power to Examine Consumers' Books

A feature of the Pomerene bill that is attracting considerable attention in the Senate is the provision which authorizes the Federal Trade Commission to examine not only the books, correspondence and other records of concerns engaged in the mining, production, sale or distribution of iron or steel, but also the "books, correspondence, records and papers of any person applying for the purchase of iron ore, iron, steel or their products." While the Lever act and other statutes which recognize the Federal Trade Commission clothe that body with authority to investigate the affairs of producers, the Pomerene bill is the first measure to empower the commission to inquire into the affairs of consumers. The object of this provision is far-reaching. Among other things, it would enable the governmental agency controlling the distribution of basic products of iron and steel to inquire into the good faith of every consumer seeking to buy materials from the Government. Speculation could be checked and hoarding of standard commodities in anticipation of higher prices could be wholly prevented. Consumers wishing to take advantage of prices fixed by the President's representative would be obliged to demonstrate their needs and the supplies conceded them would be limited to actual requirements. The data secured by the Federal Trade Commission from such investigations of consumers' records would also be useful in connection with any prorating of output that might be necessary in temporary emergencies.

W. L. C.

FOUNDRYMEN'S CONVENTION

Large Number of Reservations for Space—Program of Papers and Entertainment

Nearly 150 manufacturers of foundry equipment and supplies have made reservations amounting to about 45,000 sq. ft. of space to make displays in connection with the meeting of the American Foundrymen's Association and the American Institute of Metals at Boston the week of Sept. 24. The success of the exhibit feature of the convention is assured and an extended program of papers has been prepared. The program of the convention in full is as follows:

MONDAY, SEPT. 24

10 a. m.—Registration, Mechanics Building.

1 p. m.—Opening of exhibition, Mechanics Building.

3 p. m.—Joint opening session, American Foundrymen's Association and American Institute of Metals, Paul Revere Hall, Mechanics Building.

Address of welcome by Hon. James M. Curley, Mayor of the city of Boston.

Response to the address of welcome, by R. A. Bull, Duquesne Steel Foundry Co., Coreopolis, Pa.

Annual address by J. P. Pero, Missouri Malleable Iron Co., East St. Louis, Ill., president, American Foundrymen's Association.

Annual address by Jesse L. Jones, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., president, American Institute of Metals.

Report of executive board of the American Foundrymen's Association.

Report of the secretary-treasurer of the American Foundrymen's Association, by A. O. Backert, Cleveland.

"Fire Prevention in Large Industrial Establishments," by C. Johnson, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Appointment of nominating committee and committee on resolutions.

TUESDAY, SEPT. 25, 10 A. M., PAUL REVERE HALL

"The Foundry from the Viewpoint of the Sales Engineer," by H. R. Atwater, Osborn Mfg. Co., Cleveland.

"The Relationship of the Engineering Department to the Pattern Shop and Foundry," by F. J. McGrail, Struthers-Wells Co., Warren, Pa.

"How Character Analysis Solves the Men Problem," by William Judson Kibby, employment specialist, Cleveland.

Report of A. F. A. Committee Advisory to the United States Bureau of Standards, by Richard Moldenke, chairman, Watchung, N. J.

"Efficiency in the Foundry," by James A. Fitzgerald, Reno, Pa.

"Co-operative Shop Training," by W. B. Hunter, Fitchburg High School, Fitchburg, Mass.

1.30 p. m.—Boat ride in and about Boston Harbor. Luncheon will be served on board.

WEDNESDAY, SEPT. 26, 10 A. M., PAUL REVERE HALL

"Improving the Relationship Between Employer and Employee," by J. F. Kent, American Cast Iron Pipe Co., Birmingham, Ala.

Report of A. F. A. Committee on Safety, Sanitation and Fire Prevention, by Victor T. Noonan, chairman Industrial Commission of Ohio, Columbus, O.

Report of A. F. A. Committee on Foundry Costs, by B. D. Fuller, chairman, Westinghouse Electric & Mfg. Co., Cleveland.

Report of A. F. A. Representatives on the Conference Board on Training of Apprentices, by Frank M. Leavitt, chairman, University of Illinois, Chicago.

"The Labor Situation as Relating to Co-operation Between the Employer and Employee," by G. E. MacIlwain, Babson's Statistical Organization, Wellesley, Mass.

"Micro-Metallography for the Foundry," by Robert J. Anderson, Cleveland Metal Products Co., Cleveland.

Report of nominating committee and election of directors.

MALLEABLE SESSION, 10 A. M., MECHANICS BUILDING

"The Theory of the Modern Waste-Heat Boiler and Possible Application of Such Boilers to the Malleable Melting Furnace," by A. D. Pratt, The Babcock & Wilcox Co., New York.

"Application of Waste-Heat Boilers to the Malleable Melting Furnace," by C. D. Townsent, Danville Malleable Iron Co., Danville, Ill.

"Application of Pulverized Coal to the Air Furnace," by W. R. Bean, Naugatuck Malleable Iron Works, Naugatuck, Conn.

"The Application of Pulverized Coal to Malleable Melting Furnaces," by Joseph Harrington, advisory engineer, Chicago.

"How Malleable Iron Has Improved," by Enrique Touceda, consulting engineer, Albany, N. Y.

"Troubles Encountered in Machining Malleable Iron: Causes and Remedies," by A. T. Jeffery, Dayton Malleable Iron Co., Dayton, O.

"Comparative Carbon Losses in Malleable Iron Annealing by Muffle and Pot Oven Methods," by Joseph B. Deisher, the T. H. Symington Co., Rochester, N. Y.

"The Effect of Iron Oxide in Molding Sand," by W. R. Bean, Naugatuck Malleable Iron Works, Naugatuck, Conn.

3 p. m.—Baseball game, Fenway Park, Boston and Cleveland, American League teams.

8.15 p. m.—Theatre party.

GRAY IRON SESSION, THURSDAY, SEPT. 27, 10 A. M., PAUL REVERE HALL

"Note on Fine Molding Sands," by C. P. Karr, associate physicist, United States Bureau of Standards, Washington, D. C.

Report of A. F. A. Committee on General Specifications for Gray Iron Castings," by W. P. Putnam, chairman, Detroit Testing Laboratory, Detroit.

"Briquetting Foundry Borings," by A. L. Stillman, General Briquetting Co., New York.

"Cast-Iron Shells in Permanent Molds," by Edgar Allen Custer, consulting engineer, Philadelphia.

"The Seasoning of Gray Iron Castings," by L. M. Sherwin, Brown & Sharpe Mfg. Co., Providence, R. I.

"Factors in the Economical Production of Small Cores in Large Quantities," by R. E. Kennedy, University of Illinois, Urbana, Ill.

"Modern Centrifugal Cupola Blowers," by J. W. Shugg, General Electric Co., Schenectady, N. Y.

"The Effect of High Sulphur in Gray Iron Castings," by T. Mauland, International Harvester Co., Chicago.

STEEL SESSION, 10 A. M., MECHANICS BUILDING

"Molding and Casting Large Slag Pots," by C. J. McMahon, Illinois Steel Co., Chicago.

"A Description of a Small Open-Hearth Furnace," by David McLain, McLain's System, Milwaukee.

"Small Steel Castings for Ordnance Purposes," by Major C. M. Wesson, Watertown Arsenal, Watertown, Mass.

"A New System of Burning Crude Oil," by W. A. Janssen, chairman, Davenport, Iowa.

"The Use of Vanadium in Steel Castings," by J. Lloyd Uhler, Union Steel Castings Co., Pittsburgh.

Report of A. F. A. Committee on Steel Foundry Standards, by W. A. Janssen, chairman, Davenport, Iowa.

12 a. m.—Luncheon for the ladies, followed by an automobile trip.

12.30 p. m.—Visit to the West Lynn plant of the General Electric Co. Luncheon will be served at the works.

7 p. m.—Annual banquet, Copley-Plaza Hotel.

FRIDAY, SEPT. 28, 10 A. M., PAUL REVERE HALL

"Solution of Foundry Transportation and Conveying Problems," by Robert E. Newcomb, Deane Works, Worthington Pump & Machinery Corp., Holyoke, Mass.

"Sand-Blasting in the Foundry," by H. L. Wadsworth, Sand Mixing Machine Co., Cleveland.

"Results of Tests in Blending and Mixing Sand by Means of Mullers," by R. F. Harrington, Hunt-Spiller Mfg. Corp., Boston.

"Factors Contributing to the Economical Use of Grinding Wheels in the Foundry," by Wallace T. Montague, Norton Co., Worcester, Mass.

"Refractory Materials Employed in the Metallurgical Industries," by H. C. Arnold, University of Illinois, Urbana, Ill.

STEEL SESSION, 10 A. M., MECHANICS BUILDING

"Electric Furnace Design," by John A. Crowley, John A. Crowley Co., Detroit.

"Recent Developments in the Application of the Electric Furnace to the Melting Problem," by Douglas Walker, Booth-Hall Co., Chicago.

"Comparison of Electric Furnace and Steel Converter for the Manufacture of Small Steel Castings," by C. R. Messinger, Sivyer Steel Casting Co., Milwaukee.

"The Electric Furnace from the Central Station Standpoint," by E. L. Crosby, Detroit Edison Co., Detroit.

"The Electric Furnace in the Iron and Steel Foundry," by Max Trembour, metallurgical engineer, Ludlum Steel Co., Watervliet, N. Y.

Plant visitation.

American Institute of Metals

MONDAY, SEPT. 24.

10 a. m.—Registration, Mechanics Building.

3 p. m.—Joint opening session American Foundrymen's Association and American Institute of Metals, Paul Revere Hall, Mechanics Building.

TUESDAY, SEPT. 25, 9.30 A. M., HOTEL SOMERSET

Melting and Casting Nonferrous Metals

"Raw Materials Used for Crucibles," by Prof. A. V. Bleininger, Bureau of Standards, Washington, D. C.

"Melting Yellow Brass in New Form of Induction Furnace," by G. H. Clamer, Ajax Metal Co., Philadelphia.

"Casting Bearings in Sand and Metal Molds," by R. R. Clarke, Pennsylvania Lines West of Pittsburgh, Pittsburgh.

"Negative Experiments on Waste Core Sand," by Dr. H. W. Gillett, Bureau of Mines, Ithaca, N. Y.

"The Crucible Situation," by M. McNaughton, Jos. Dixon Crucible Co., Jersey City, N. J.

"The Electric Furnace and Nonferrous Metals," by Dwight D. Miller, the Society for Electrical Development, New York City.

"My Experience with Metal Melting Furnace," by W. H. Parry, National Meter Co., Brooklyn, N. Y.

"The Briquetting of Nonferrous Light Metal Scrap," by A. L. Stillman, General Briquetting Co., New York.

1.30 p. m.—Boat ride in and about Boston Harbor. Luncheon will be served on board.

WEDNESDAY, SEPT. 26, 9.30 A. M., HOTEL SOMERSET

Uses of Nonferrous Metals for Munitions, Etc.

"The Present Status of Tin Fusible Plug Manufacture and Properties," by Dr. Geo. K. Burgess, Bureau of Standards, Washington.

"Stellite," by Elwood Haynes, Haynes Stellite Works, Kokomo, Ind.

"The Use of Die Castings in Munitions," by Chas. Pack, Doehler Die Casting Co., Brooklyn, N. Y.

"Shrapnel Bullets," by Harold J. Roast, the Jas. Robertson Co., Ltd., Montreal, P. Q.

"A Few Points on Alloy Patents," by Wm. J. Rich, Patent Office, Washington.

Address by a representative of the United States Tariff Commission.

"The Use of Bronzes in Railroad Turntables and Movable Bridges," by O. E. Selby, Big Four Railroad, Cincinnati.

"Recent Industrial Uses of Aluminum," by F. G. Shull, Aluminum Co. of America, Boston.

"The Consumption of Copper and Its Varied Uses," by H. D. Hawks, United Metals Selling Co., New York.

3 p. m.—Baseball game, Fenway Park, Boston and Cleveland American League teams.

8.15 p. m.—Theatre party.

THURSDAY, SEPT. 27, 9.30 A. M., HOTEL SOMERSET

Testing of Nonferrous Metals

"Comparative Tests on Test Bars and Actual Castings," by W. M. Corse, Titanium Bronze Co., Niagara Falls, N. Y.

"Analysis of Babbitts and Brasses," by E. W. Hagmaier, Buffalo.

"Standard Test Bars of 88-10-2 and 88-8-4, Being the Result of Co-operation Work of Six Foundries; a New Series of Tests," by C. P. Karr, Bureau of Standards, Washington, D. C.

"The Expansion Coefficients of Alpha and Beta Brass" and "The Corrosion of Manganese Bronze Under Stress," by Dr. Paul D. Merica, Bureau of Standards, Washington.

"Corrosion of Brasses of the Muntz Metal Type," by H. S. Rawdon, Bureau of Standards, Washington.

Address by Richard C. Maclaurin, President, League to Enforce Peace.

"The School End of the Job in Training Foundrymen," by Dean C. B. Connelley, Carnegie Institute of Technology, Pittsburgh.

"The Flux and Cleaner Question of Brass," by E. D. Frohman, S. Obermayer Co., Pittsburgh.

"Pyrometers—Their Construction and Application," by John P. Goheen, Brown Instrument Co., Philadelphia.

"Electrically-heated Core Ovens," by Dr. C. F. Hirshfeld, Edison Illuminating Co., Detroit.

"Brass Rolling Mill Alloys," by Roy A. Wood, Cheshire, Conn.

12 m.—Luncheon for the ladies, followed by an automobile sightseeing tour.

12.30 p. m.—Visit to the West Lynn plant of the General Electric Co. Luncheon will be served at the works.

7 p. m.—Annual banquet, Copley-Plaza Hotel.

FRIDAY, SEPT. 28, 9.30 A. M., HOTEL SOMERSET

Metallurgy and Metallography

"The Electrolytic Production of Antimony," by Prof. D. J. Demorest, Ohio State University, Columbus.

"The Electrical Properties of Some High Resistance Alloys," by Prof. M. A. Hunter, Rensselaer Polytechnic Institute, and F. M. Sebast, Troy, N. Y.

"The Amorphous Theory in Metals," by Zay Jeffries, Aluminum Castings Co., Cleveland.

"The Volatility of Zinc and Cadmium," by John Johnston and Edward Schramm, American Zinc, Lead & Smelting Co., St. Louis.

"Surface Tension and Deoxidizing of Metals," by W. J. Knox, Metals Deoxidizing & Refining Co., New York.

"Antimony—Its Metallurgy and Uses," by K. C. Li, Wah Chang Mining & Smelting Co., Inc., New York.

"Development and Reabsorption of the Beta Constituent in Alloys Which Are Normally of the Alpha Type," by Prof. C. H. Mathewson, department of mining and metallurgy, Yale University, and Philip Davidson, New Haven, Conn.

"The Swelling of Zinc Base Die Castings," by H. M. Williams, National Cash Register Co., Dayton, O.

Plant visitation.

Chicago Men Buy Control

H. A. Stocker and W. N. Rumeley, well-known business men of Chicago, have acquired a controlling interest in the Long & Allstatter Co., Hamilton, Ohio. Fred. C. Avery, also of Chicago, has been placed in charge of the plant as general manager.

The Long & Allstatter Co. was established in 1856 and was incorporated in 1878. At first, considerable attention was paid to the manufacture of farming implements, but later the building of heavy punching, shearing and forging machines was undertaken, to which line all of the company's energies will be directed exclusively in the future. Machines weighing from 1000 to 300,000 lb. are now turned out. Within the past week, the company has acquired the patents, patterns and machinery of the alligator shear department of the Thomas Carlin's Sons Co., Pittsburgh, which will be removed to Hamilton at once, thus adding another type of shear to those already made.

It is noteworthy that the company has been uniformly able to retain its old employees, and one molder now in its employ has seen over 50 years' service.

The Lackawanna Bridge Co., 2 Rector Street, New York, will build a two-story hotel and restaurant in the meadow district, Newark, N. J., to cost $30,000. The structure will be used by employees of the Submarine Boat Co., Bayonne, N. J., in connection with its proposed new boat works to be constructed on property recently acquired in this section.

The first outing and picnic of the Acme Steel Goods Co., Chicago, will be held Sept. 1, at Glenwood Park, Ill., a beautiful spot on the Fox River, reached by an electric traction line. Special music, athletic games and other attractions have been arranged.



Low Phosphorus Pig Iron and Wash Metal Made from Scrap Steel. Slabs in the last row are the wash metal

High Grade Pig Iron from Scrap Steel

Synthetic Conversion of Old Material Back Into Iron by an Electric Process — Description of the Ludlum Electric Furnace

BY EDWIN F. CONE

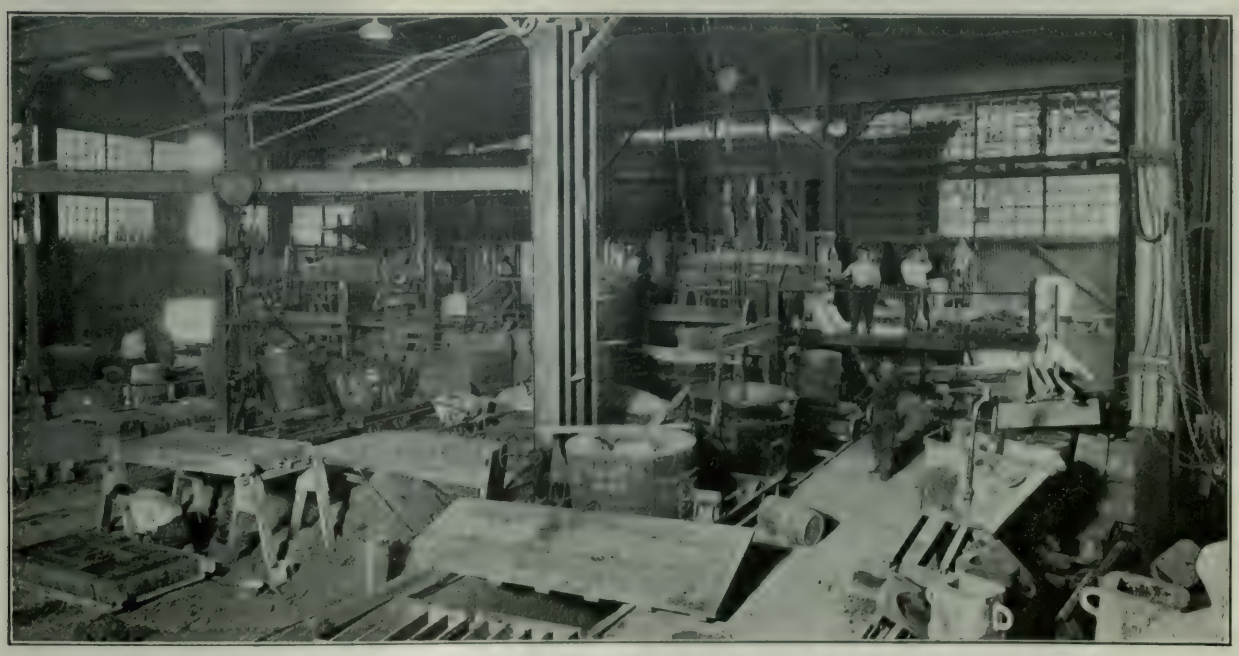
A METALLURGICAL operation of distinct novelty and importance is being carried out commercially in a large electric steel plant in the East, in the conversion of ordinary scrap steel into a high-grade low-phosphorus pig iron. The process is the synthetic reconversion of steel into the original raw material. Not only is pig iron being produced in large quantities but wash metal and iron and steel castings are being made in the same furnaces. The pig iron is being sold in the open market as a competitor with regular low-phosphorous blast-furnace iron, the wash metal goes to crucible steel makers and the iron castings are sold to nearby users or used by the company itself in its rolling mill or for other purposes.

The idea is not a new one, but this is the first record of its commercial execution in the United States. Late in 1912, Horace W. Lash, of the Garrett-Cromwell Engineering Co., Cleveland, organized a company for the purpose of converting scrap steel and iron into pig iron in an electric furnace on the Pacific Coast. Announcement was made in THE IRON AGE, Jan. 30, 1913, of the formation by Mr. Lash of the Western Iron Co. of San Francisco. Pig iron being very expensive in that section and the fact that it could be made by this process without the use of coke, charcoal or coal, which are also scarce there, were the impelling reasons. It is not known that the company carried out its plans.

It is also understood that Robert Trumbull, an engineer at one time identified with Heroult in his efforts to introduce his electric furnace in America, is now producing pig iron from scrap in an electric furnace in Canada.

The Eastern company that has been successfully operating as noted above is known as the Sweetser-Bainbridge Metal Alloy Corporation of Watervliet, N. Y. For several months it has been producing the products named in the Ludlum electric furnace. About 50 tons per day is the present output from two 5-ton furnaces.

The new company, organized a few months ago,



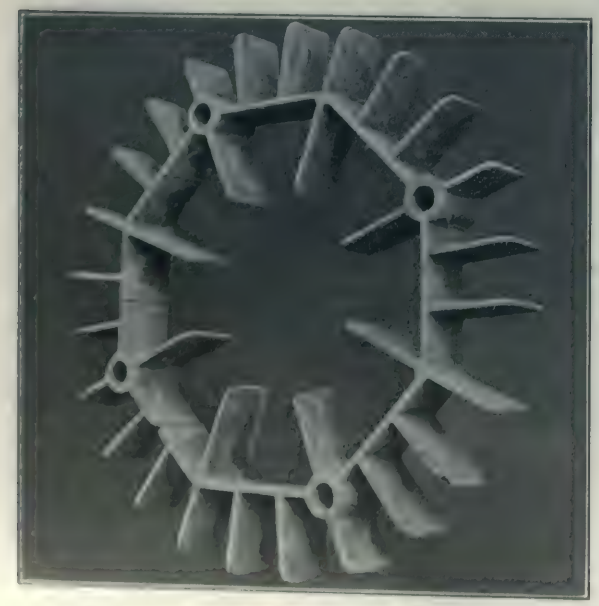
Two Ludlum 5-Ton Electric Furnaces Making Pig Iron, Wash Metal and Iron or Steel Castings from Scrap Steel. This is the old portion of the Ludlum Steel Co.'s plant converted into a foundry and casting shop for the Sweetser-Bainbridge Metal Alloy Corporation



Pig Iron from Scrap Steel and the Iron Molds into Which the Metal Runs from the Electric Furnaces. The molds are halves of discarded ingot molds



Gray Iron Castings from Scrap Steel. A rolling mill wabbler lies near the track



Gray Iron Core Arbor from Scrap Steel. Metal section about half inch

leased from the Ludlum Steel Co. at Watervliet the older portion of its plant in which there were three 5-ton Ludlum electric furnaces. The Ludlum company is operating at full capacity its new electric steel plant and rolling mill, described in THE IRON AGE, April 26, 1917, and was able to release the old capacity to the new company. This older part has been converted into a modern foundry and pig-iron casting plant, as shown by one of the illustrations.

Metallurgy of the Process

There is no secret about the process. It is made possible by the unusual metallurgical feats which the electric furnace can perform. The actual process used by the company is not revealed. In general, however, ordinary scrap steel of any grade is introduced in the furnace cold. The process is basic. The material is melted and refined if necessary, depending on the quality of the scrap and the degree of refinement desired in the product. These considerations also decidedly influence the cost. After the desired refinement is reached, the slag is removed. The necessary amount of ferrosilicon and ferromanganese is added to bring the iron to the composition desired and then the carbon addition in the form of fine coke is easily absorbed by the hot metal.

Five or six 5-ton heats per day in each of two 5-ton furnaces are being regularly produced by the above or a similar process. There is no difficulty in its execution and no question as to the quality of the products. In respect to sulphur and phosphorus, they equal if they do not surpass any blast-furnace or cupola product, as shown by the analyses that follow. Regulation of the temperature or the composition is apparently simple, and a range from high-grade low-phosphorus iron and wash metal down to the high-phosphorus foundry and other irons is claimed possible, and probably is.

The graphitic carbon content is regulated by the introduction of varying percentages of silicon. The manganese can be made anything desired, and the total carbon is not difficult to regulate. The amount of phosphorus and sulphur is readily placed at almost any percentage desired, depending on the composition of the scrap charged and the degree of refinement before conversion into pig iron or iron castings.

Composition and Properties of the Iron

The commercial possibilities of the new process are shown, so far as the composition of the products is concerned, by the following analyses made in ordinary operation:

Composition of Pig Iron Made from Scrap Steel

	Sample No. 1 Per Cent	Sample No. 2 Per Cent	Sample No. 3 Per Cent
Total carbon	3.60	3.73	3.38
Manganese	0.41	0.35	0.31
Silicon	1.77	1.52	1.15
Sulphur	0.007	0.008	0.028
Phosphorus	0.019	0.030	0.032

The average phosphorus content of this iron so far made has averaged 0.023 per cent. The graphitic carbon can be made anything desired or as high as 3.50 per cent, depending on silicon content.

Composition of Wash Metal Made from Scrap Steel

	Sample No. 1 Per Cent	Sample No. 2 Per Cent
Total carbon	3.55	3.83
Graphite carbon	None	None
Manganese	0.37	0.32
Silicon	0.20	0.14
Sulphur	0.020	0.012
Phosphorus	0.014	0.018

Composition of Cast-Iron Castings Made from Scrap Steel

	Sample No. 1 Per Cent	Sample No. 2 Per Cent
Total carbon	3.36	3.63
Graphite carbon	....	3.08
Manganese	0.36	0.31
Silicon	1.30	1.15
Sulphur	0.019	0.014
Phosphorus	0.024	0.018

These analyses show how varied compositions can be controlled. The low silicon content of the wash metal permits the carbon to remain almost entirely in the combined state.

The pig iron that has been made is reported to be very tough and strong. As to cast iron in the form of castings, the experience of the Ludlum Steel Co. is cited. Cast-iron wobblers, for use in the company's rolling mill, which were purchased in the open market, were breaking at the rate of 10 or 12 per day. Wobblers from iron made in the electric furnace have been in use for two or three months without a case of breakage. The company also made the breaking boxes on the mill of electric cast iron. These should break easily when performing their normal function, but when made of this iron they were found to be entirely too tough and their section had to be reduced considerably.

It is believed that a partial explanation of these qualities may be found in the crystalline structure of the iron as well as its greater purity compared with cupola iron. Contrary to cupola practice, in which the sulphur rises with each remelting of scrap, the sulphur is lowered with each remelting in the electric process. In making steel castings the conversion loss is put at 5 per cent.

The Question of Cost

The cost of production is one of the vital points in the process. So long as low-phosphorus pig iron is selling at its present war price of $90 per ton or over there can be no question as to the liberal profits obtainable. Whether in normal times such a method of making this grade or any other grade of pig iron or castings is economically possible depends on several important factors. Primary among these are the consumption of electricity and the grade of scrap used. If a relatively pure scrap steel is the starting point, practically no refinement is necessary and the kilowatt-hour consumption is at a minimum. The converse is true if poorer scrap requiring more refinement is used. The matter of other materials and the question of labor and electrode charges are fairly constant in all cases.

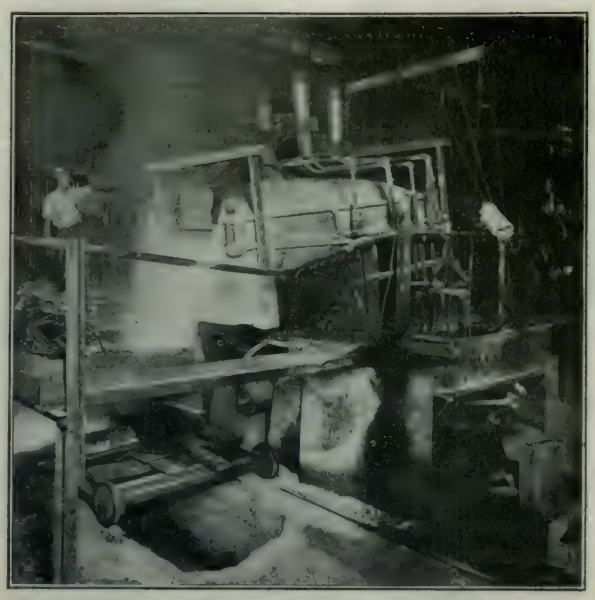
Owing to the fact that the Sweetser-Bambridge Company has only been operating this process for a short time and under more or less imperfect conditions, actual data as to cost of production are not available at present. Extensive experiments are being made to determine costs under various conditions and at various stages of the process and these will be available in the near future.

It is the estimate of the metallurgists of the company that the kilowatt-hour consumption of electricity per ton of pig iron produced can be brought under 400 kw-hr. depending upon transformer capacity, grade of scrap used and the product desired. Electrode consumption and refractory renewals, it is said, are low, even under present abnormal costs of these materials.

One melter and four men for each shift of eight hours are employed to operate the two furnaces which in 24 hours are reported to produce 5 tons each or 50 tons in all. With cheaper iron and steel scrap in normal times it is claimed the total cost would be lower.

The furnace in which the foregoing products are being made has come to be known as the Ludlum furnace. Besides the two now making pig iron, etc., there are two 10-ton furnaces producing high-grade special and tool steels in the new plant of the Ludlum Steel Co. The company is a large producer of the new chromium permanent magnet steel and also makes chromium roller bearing steels.

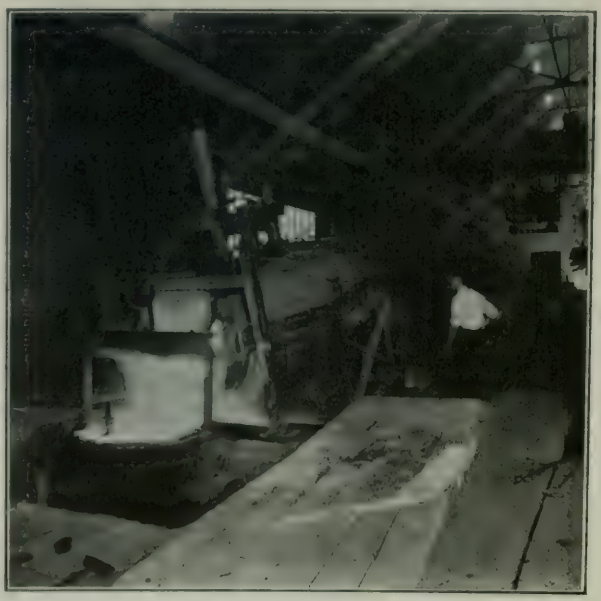
Considerable interest has always been attached



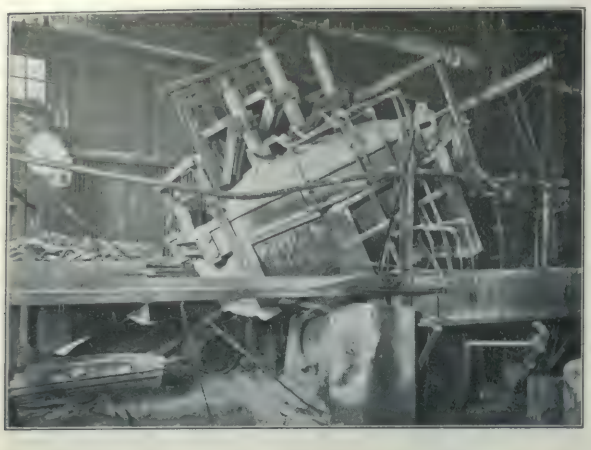
Pouring Low Phosphorus Pig Iron from a 5-Ton Ludlum Electric Furnace. The iron runs through a ladle and in a trough to the pig beds



Pouring Cast Iron for Castings from a 5-Ton Ludlum Electric Furnace



Pouring High-Speed Steel from a 10-Ton Ludlum Furnace for the Ludlum Steel Co.



A 5-Ton Ludlum Furnace in the Tilting Position

to this special type of furnace. The Ludlum Steel Co. especially emphasizes the fact that it has been solely developed as a tool-steel making furnace. The steps leading to an abandonment of the crucible process and the various stages in the perfection of the present type, involving the trial of five different types, were recounted in THE IRON AGE article already mentioned. The present furnace is largely the work of M. R. Trembour, one of the metallurgical engineers of the company.

The Ludlum Furnace and Its Claims

Simplicity is one of the features of the Ludlum furnace. Its elliptical shape is a departure. Its low roof gives an approach to the shape of the average crucible. The shell, built of structural steel, is oblong with an arc-shaped bottom. It tilts lengthwise by means of special motors, as shown by the illustrations. The three electrodes are in a row extending through the roof. Some of the claims made are given as follows:

There are but two doors, one at each end of the elliptical section, minimizing the inlet of cold air. One door acts, also, as a pouring spout. The two outer electrodes are not far from the doors, tending to offset any cooling effect when the doors are open.

It has no straight or side walls and no unsupported arch, lessening the liability to erosion from reflected heat or the tendency to weaken when brick are burned out.

There being no angles or corners and the metal and slag being in a direct line with the doors, the removal of all slag is facilitated.

Uniform heat in all parts of the furnace results from the three electrodes being in a row, made possible by the elliptical shape. They are practically equidistant from all sides, eliminating uneven burning of the lining.

The cradle shape permits a low arch at the top, reducing the amount of waste heat and increasing thermal efficiency.

The time of relining is brief. On account of the shape, it is found possible to reline a 5-ton furnace in 23 hr., counting from the time the furnace is tapped until ready to recharge.

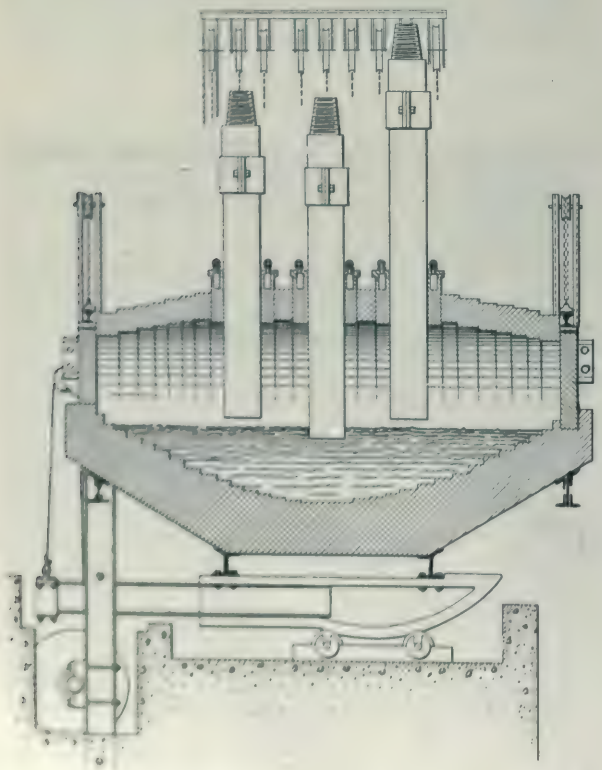
The lining of the bottom is simple. Two layers of magnesite brick are laid in the bowl shape, cemented together with magnesite cement made of crushed worn-out brick, making the lining over 9 in. thick. An average of 96 heats per lining is maintained when making steel. From present indications the life of a lining when making pig iron is much greater. In one furnace 138 heats have already been made on one lining which still appears to be as good as new. It is estimated that 200 to 300 heats can still be made on it.

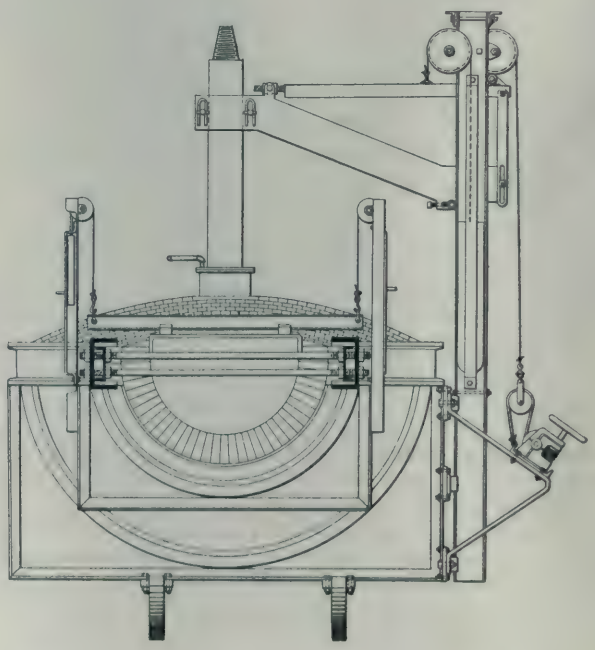
The roof lining is made of Woodland clay brick and each roof is reported to last about 90 heats. A roof can be readily replaced. One is shown in one of the illustrations.

Electrode consumption is proportional, among other things, to the length protruding into the furnace and the amount of air. The shape of this furnace is designed to minimize these two conditions.

The kilowatt-volt-ampere (kva.) rating is 150 kva, per ton of steel furnace capacity.

Lower furnace capacities can be obtained by increasing the lining by extra layers of brick instead of using smaller shells.



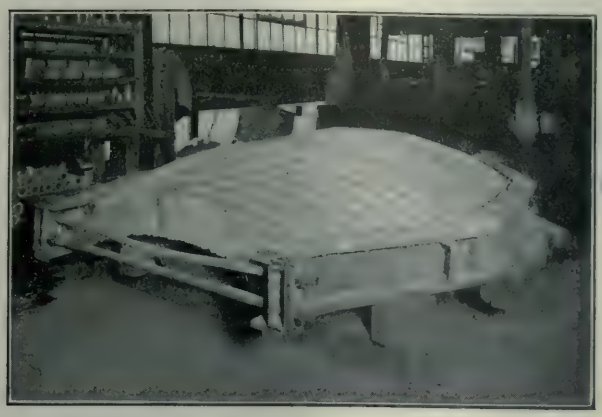


Sectional Views of the Ludlum Electric Steel Furnace, Showing Details of End and Side and the Tilting Mechanism

The power factor of the furnace is about 90 to 95.

The furnace is 3-phase, the current being transformed from 11,000 volts, 40 cycles by a 1500 kva. General Electric transformer for the 10-ton and a 750-kva. transformer for the 5-ton furnace. It is taken off at the furnace at 90, 95 or 100 volts.

The principal point in the patent claim is that the central electrode is projecting into the metal during operation of the furnace, while the other two



A Roof for a Ludlum Furnace, Showing the Low Arch

are just above the slag. This is entirely practical while making tool steel or pig iron, but some difficulty would be experienced in making low carbon steel under such conditions.

The first Ludlum furnace apart from the original plant will soon be in operation. The Hammond Steel Co., Syracuse, N. Y., will be making special and high-speed steels in a 10-ton furnace in its new plant early this fall. A new company, known as the Ludlum Electric Steel Furnace Corporation, originally contemplated as the Seneca, has been organized to sell the Ludlum furnace to other users. Thornton W. Price, consulting engineer, New York, is vice-president and general manager and Edwin Corning is treasurer. The Ludlum Steel Co. itself is now installing a third 10-ton furnace and contemplating the building of a fourth.

To the unusual performances in electric steel making, resulting from war conditions, has thus been added the conversion of scrap back into pig iron, also a result of abnormal conditions. It is hoped that more normal times will furnish a way to make permanent both classes of results, at least for certain purposes.

Buys New Plant to Make Airplanes

The Standard Aero Corporation, Plainfield, N. J., has bought the John Stephenson Co. plant of the J. G. Brill Co. at Elizabeth, N. J., and will immediately alter and equip it for the manufacture of airplanes. The engineers in charge of the work are Paine, McClellan & Campion, 25 Church Street, New York. About $300,000 worth of new machinery, both metal-working and wood-working, will be purchased. For the present, the company will confine its activities to the manufacture of the planes themselves, but eventually will build engines also. The purchase price of the Stephenson plant is said to have approximated $750,000.

The American Car & Foundry Co.'s Detroit plant is the first in that city to employ women as munitions makers, 300 having been hired to operate drill presses. The plant is turning out shells for anti-aircraft guns and buoys for floating mines.

APPEAL TO STEEL MEN

Casings and Drilling Machinery Badly Needed in Oil Well Operations

WASHINGTON, Aug. 28.—Urgent representations have been made to the Council of National Defense by the Bureau of Mines that the petroleum supply of the country will soon be curtailed unless some arrangements can be made whereby adequate supplies of steel casings, drilling machinery and other equipment can be assured to the oil producers. The bureau suggests that a special arrangement be made by the council with representatives of the steel industry to take care of the demand for casings and drilling machinery. At the same time, the bureau urges oil producers themselves to employ every expedient that will save supplies and reduce requirements to a minimum, including the abandonment of steel casings where they are not absolutely necessary.

The situation in the petroleum industry is reviewed in a statement prepared by Van H. Manning, Director of the Bureau of Mines, which embodies the substance of the recommendations made to the Council of National Defense. Mr. Manning declares that any way that can be pointed out for providing the supplies of petroleum so essential to the successful prosecution of the war "requires material from the steel industry, and, if these supplies are not forthcoming, our petroleum needs cannot be secured." The situation is said to be critical because the operators find themselves unable to obtain adequate supplies to continue the drilling of oil wells. If they are unable to drill new wells, the present production cannot be maintained, much less increased, for the reason that oil wells do not maintain a constant production, but show a steady diminution from the time they are completed. Were no wells to be drilled for one year's time, it is estimated that our petroleum production would drop by at least one-fourth. Mr. Manning's statement is in part as follows:

At the present time drilling is being curtailed because of the difficulty in obtaining supplies. Not only have the costs of oil-well supplies been increased, but it has become impossible to get them in adequate quantities for any price, and the situation is now worse than at any time since the war in Europe started. Perhaps the situation of the producer is best illustrated by the fact that from California to the fields of Pennsylvania the small producing wells are being abandoned in order to use the casing and other equipment of these wells in new wells from which larger productions are expected; thus, wells still capable of small profitable productions are being permanently abandoned in the desperate search for well-drilling materials.

Swedish Iron Prices Prohibitive

The difficulty of procuring coal in Sweden threatens to curtail seriously the output of its blast furnaces and steel works, according to *The Ironmonger*, London, which says:

"The high prices of Swedish iron and steel have put these materials quite out of the British market. Swedish pig iron, if bought to-day, would cost the British consumer about £45 per ton, compared with £6 per ton before the war. The cost of rough bar iron for making crucible steel, and of steel billets, averages £65 per ton or a little more, compared with £10 10s. and £12 in ordinary times."

The Union Smelting & Refining Co., Inc., Fourteenth Street and Avenue D, New York, producer of white metal alloys, is distributing a celluloid case to contain the card issued by the Government in connection with the recent Federal registration. One of these cases may undoubtedly be obtained by writing to the company.

According to announcement of an official of the Pacific Coast Steel Co. in Seattle, Wash., the old Irondale iron blast furnace near Port Townsend, Wash., will be in operation about Sept. 1.

Steel Makers and Government Buying

The Council of National Defense Takes Steps to Have Status of Committee Members Definitely Decided

WASHINGTON, Aug. 28.—In view of the critical situation that has arisen concerning the propriety of the service on the advisory committees of the Council of National Defense of officers of manufacturing corporations which may be awarded Government contracts, the council has decided to take immediate steps to settle this important question and to determine as promptly as possible the exact status of the various subcommittees. While no formal resignations have yet reached the director of the council, many informal announcements that resignations will be speedily forthcoming unless the legality of service on the subcommittees can be promptly assured have been received by Mr. Baruch and other members of the advisory commission. In the hope of securing the desired assurance without delay an informal request has been made upon the Attorney General for an opinion as to the scope of section 3 of the Lever act and the ruling is expected at almost any time.

Formal Ruling from Department of Justice

Because of the importance of maintaining the present organization of the advisory committees the Council of National Defense has decided to take the matter up in a very comprehensive way and will speedily prepare a formal memorandum describing the duties of each of the important subcommittees and the relation of their duties to the manufacturing organizations with which they are connected. In the event that the informal ruling of the Attorney General is neither sufficiently positive nor broad enough to satisfy the committee members who are in doubt as to their present status, this memorandum will be forwarded to the Department of Justice with a request for a formal opinion designed to cover every phase of the question at issue.

While the members of the Council of National Defense have no doubts as to the intention of Congress, they will be guided by the Attorney General, and in the event that he holds that either section 3 of the Lever act or section 41 of the 35th Statutes at Large precludes the officers of corporations having contractual relations with the Government from serving on the advisory committees, it is probable that a general reorganization will be effected and the committees given a new and entirely unofficial status as representatives of the various industries from which their members have been chosen. In this event their membership may be revised as the result of trade conferences in order that manufacturers generally may have no reason to complain of favoritism in connection with the make-up of the respective committees.

The settlement of this question is of the utmost importance to the work of the Council of National Defense. More than one of the committees, it is understood, is merely marking time pending an authoritative statement as to the legality of the present advisory organization of the Council, and certain individual members have gone so far as to absent themselves from committee meetings with a view to avoiding any possible criticism until the matter is settled. In one case members of an important subcommittee, while continuing to act, have abandoned for the present all official stationery and other forms and are doing their work as informally as possible.

Views of the Author of Section 3

For the purpose of shedding as much light as possible on this interesting and important question the correspondent of THE IRON AGE has secured from Senator Pomerene, the author of section 3 of the Lever food, feed and fuel control act, a statement as to his purpose in framing it and the general object of the Senate in accepting it as a substitute for the original provision reported by the Senate Committee on Agriculture. It is the Pomerene amendment, read in connection with section 41, chapter 321, 35th Statutes at Large, which imposes the restrictions on members of the advisory committees of the Council of National Defense that has raised this issue.

It is the opinion of the author of this provision that there is no basis whatever for any suggestion of the impropriety of the service on advisory committees of the council of either individual manufacturers or officers of manufacturing corporations.

"My amendment," said Senator Pomerene, "was offered as a substitute for the original provision after I had satisfied myself that the section as reported by the committee would greatly embarrass the Government and would do either one of two things: It would force the resignation of all the really important members of the advisory committees of the council or it would preclude the Government from buying supplies of these men or the corporations which they represented. Either of these results would have been little short of a national calamity. At a time like the present the Government needs the aid of every intelligent man in this broad country, and it especially needs the assistance of our experienced manufacturers who alone are able to advise concerning the great problems of production which is now being carried on upon a scale never before dreamed of. It is only necessary to formulate the proposition that the Government should not buy war material from the concerns represented by these captains of industry to show its absurdity. They must buy from these concerns, and the only question we have had to consider has been how the Government could utilize the brains of these experienced men and their enormous manufacturing facilities while at the same time protecting the people against the exercise of improper influences or imposition in the way of extortionate charges.

Advice Not Prohibited

"When I made the first draft of my amendment it provided that 'no person acting either as a voluntary or paid agent or employee of the United States in any capacity, including an advisory capacity, shall advise, induce, or attempt to induce any person or officer authorized to execute or to direct the execution of contracts on behalf of the United States, to make any contract, or to give any order for the furnishing to the United States of work, labor, or services, or of materials, supplies, or other property of any kind or character, if such agent or employee has any pecuniary interest in such contract or order, or if he or any firm of which he is a member, or corporation, joint stock company, or association of which he is an officer or stockholder, or in the pecuniary profits of which he is directly or indirectly interested, shall be a party thereto.' Upon close examination of this draft I became convinced that the use of the word 'advise' would defeat the whole purpose of my substitute. It was highly important that the Government should have the right to call upon these big manufacturers to advise it with respect to contracts of all kinds, yet with such a prohibition in the law they would be absolutely prohibited from giving any such cooperation. I therefore decided to change the word 'advise' to 'solicit.' By employing the latter term the amendment merely prohibits members of the advisory committees from soliciting business for themselves. Under the present organization of the War Industries Board they have no opportunity to solicit contracts and they are serving, as Congress intended they should serve, in a purely advisory capacity.

Committeemen Simply Declare Their Interest

"Of course I realized and the Senate realized that it would frequently happen that these committees must advise the Council of National Defense to place con-

tracts with the concerns in which the members of the committees were financially interested. This could not be avoided, but in my opinion all reasonable criticism could be forestalled by requiring that whenever a member of one of these committees was personally interested in a contract into which his committee advised the council that the Government should enter, he should file with the recommendation a written statement embracing a full and complete disclosure of his own pecuniary interest and of his interest in any firm, corporation, or association involved in the proposed contract. It seemed to me at the time this matter was under discussion and it seems to me now that these provisions fully safeguard the Government while securing for it the valuable aid of these well-equipped technical and business experts.

"It will be noted also that my amendment provides that no member of these advisory committees shall participate in the awarding of any contract or the placing of any order. The War Industries Board has recently been reorganized and under the system now employed I am advised that it is impossible for any of the subcommittees to have any part in the awarding of contracts or of the placing of orders. The departmental officials consider recommendations and suggestions transmitted through the War Industries Board and themselves place all orders and sign all contracts.

Members Not "Agents" of Government

"Perhaps a word should be said with regard to the proviso which was added at the end of my amendment at the instance of Senator Reed, of Missouri, if my memory serves me. This proviso stipulates that section 3 of the Lever act 'shall not change, alter or appeal section 41 of the 35th Statutes at Large.' I understand that the suggestion of the doubtful legality of the advisory committees of the Council as at present composed is based to some extent upon the language of section 41, which prohibits any officer or agent of a corporation, joint stock company or association from acting as an officer or agent of the United States for the transaction of business with such corporation, etc. In the first place, I do not think that the members of advisory committees are 'officers or agents of the United States' within the meaning of this statute, but the broad question that would be presented to any court before which this provision of the Lever act might be brought is this: What was the object of Congress in enacting section 3? In accordance with a recognized principle of legal construction the court would place section 3 and section 41 side by side and construe them together. What Congress was seeking to accomplish is so perfectly obvious from such a comparison of its enactments that I do not see how there can be any further doubt with regard to the matter."

Senate Considered Publicity a Full Cure

That Senator Pomerene's view of the provisions of section 3 prevailed generally in the Senate at the time this provision was adopted is amply evidenced by an examination of the *Congressional Record* in which the debate appears. Senator Wadsworth, of New York, voiced the general opinion of his colleagues in the following brief statement:

> Mr. President, I am in entire agreement with the contention of the Senator from Ohio—that the pecuniary interest which any one of these gentlemen may have in any article which is to be purchased by the Government shall be made a matter of the greatest publicity. I think, if you do that, you would not need to do anything else. The situation is then cured by the weapon with which you are all familiar—"pitiless publicity." If the Government itself knows and the public knows and Congress knows that John Smith, a member of some subcommittee of the advisory commission of the National Council of Defense owns so many shares of stock in such and such a corporation which is about to sell some of its goods to the Government, following the advice of the committee of which John Smith is a member—if the public knows that, we will not have to have any additional provisions of law to protect the Government against fraud. Furthermore, be it remembered, Mr. President, it is not these committees that make contracts; it is the head of the department, the Secretary of War or the Secretary of the Navy. And it is to be presumed that they are exceedingly anxious to protect the Government against extortionate prices.

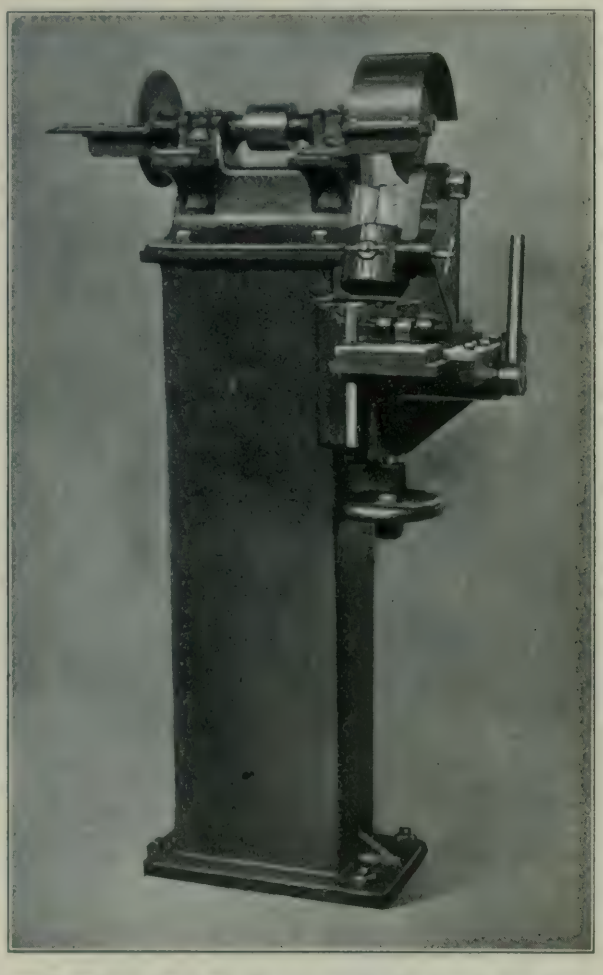
Senator Knox, one of the ablest lawyers in the Senate, who has served both as Secretary of State and Attorney General, collaborated with Senator Pomerene in the framing of his amendment and is strongly of the opinion that there is neither illegality nor impropriety in the relation now sustained by members of the advisory committees toward the business of the Government.

W. L. C.

Improved Nail Die Grinding Machine

Sleeper & Hartley, Inc., Worcester, Mass., has placed on the market a machine for finishing standard nail machine dies of all kinds. This machine was originally designed for use in connection with installations of the builders' wire nail machinery made in foreign countries.

The machine consists of two wheels mounted at opposite ends of the spindle. The function of one of these wheels is to square the dies and guides are provided upon the work-rest for this purpose. The other wheel, which is intended for grinding the pointing dies, has a V-shaped formed edge. A table is mounted on the machine frame underneath the latter wheel and has a vertical adjustment which is controlled by a screw and handwheel. A support adapted to receive the holder in which the die is mounted for grinding is located on the table. Lateral adjustment to bring the dies in line with the wheel is provided for the support, and it is possible to rotate the die holder itself within the support, this arrangement enabling the die to be located at will in any one of the three grinding positions. When the die has been properly located it is traversed back and forth past the wheel, together with both the die holder and its support. At the same time the table can be fed toward or away from the wheel, as may be desired.



Two Wheels, One for Squaring the Dies and the Other Which Is V-Shaped for Grinding the Pointing Dies, Are Employed in a Recently Developed Machine for Finishing Standard Nail Machine Dies

The machine occupies a floor space of 16 x 22 in. and its net weight is 350 lb. The equipment of the machine includes one die holder built to conform to the purchaser's specifications and a countershaft. For each section of die stock an additional holder is required.

Cost of Health Supervision of Employees

Results of an Investigation of 99 Industrial Plants for the Conference Board of Physicians in Industrial Practice

A SECOND compilation of the cost of health supervision in industry has been made for the Conference Board of Physicians in Industrial Practice by Magnus W. Alexander, executive secretary of the National Industrial Conference Board. This report, virtually in full, but without the detailed reports of the industries other than the steel and iron and metalworking plants, follows:

The first compilation, published in THE IRON AGE of Oct. 19, 1916, comprised data, mostly for 1915, submitted by 41 industrial plants with an aggregate average of 223,416 employees. The average annual health supervision cost, as then reported, was $1.88 per person. The lowest cost ($0.53) was reported by a metal trades plant employing 385 persons, the highest ($7.79) by a paint factory employing 2448. Some of the reports, however, were approximations only, based on more or less incomplete records or on a short experience while the work was in its infancy. It was therefore decided to make a new compilation, based on longer, more varied and more mature experience.

The later compilation covers data for the year 1916 as reported by 99 industrial plants located in 15 states. The total average number of employees represented was 495,544; the average number per plant was 5005; the maximum 37,107; the minimum 141.

Annual Cost per Employee $2.21

While the average cost per person, as indicated in the summary, is $2.50, it is not representative, as the total cost on which the average is based includes that of four plants which render unusual service, giving both medical and surgical attention to their employees at the plant and in their homes as well, besides assuming the medical care of employees' families. Omitting these four plants from consideration, the average cost for the 479,634 employees in the other 95 plants was $2.21.

Where the average cost appears to be unusually high or low, the reason is in many cases indicated in a detailed table available in the complete report, which may doubtless be had by addressing Mr. Alexander at West Lynn, Mass. The size and character of the medical staff is usually the determining factor. In some cases the cost is influenced greatly by the number of injuries treated in private or public hospitals; in others by the amount of care given to all injuries whether serious or slight, or by extension of the service to include physical examination of all employees, treatment of sickness of employees at the plant and at home, and even by medical care of employees' families, or by a combination of all these features.

The cost is also influenced, of course, by the kind of work done in particular plants and by the character of the industry. Shops doing very light work, with little hazard exposure, naturally have fewer and less serious accidents than those doing heavy work, particularly where there is much overhead handling of materials, or where many men work in elevated positions, as in the power and light industry. The cost in plants manufacturing chemicals and paint reflects the great care exercised to safeguard the health of workers in those industries.

A total of 3,165,114 cases was reported, an average of more than six cases per person employed, at an average cost of $0.39 per case. The number of cases reported, however, does not include all of the service rendered. In many plants no record is kept of slight injuries, of injuries redressed, of medical cases treated, of home visits made, or of physical examinations. In others, even the most trivial cases are counted. Furthermore, as "cases" are so varied in gravity and in the time required for treatment, any comparisons of costs per case are not of much value.

Cost Does Not Include Compensation

The "total medical and surgical cost" includes salaries of physicians and nurses, cost of outside medical and surgical service and cost of medical and surgical supplies, whether or not paid for by insurance companies as a part of the insurance contract; it excludes all compensation for injuries, all overhead expenses and any wages paid to employees while off duty to have their injuries treated.

The aim of this compilation is to inform employers of the actual cost of health supervision of employees in different industries. To this end, the data were secured from plants engaged in many industries, in light, medium and heavy work, in comparatively safe

SUMMARY OF THE ANNUAL COST OF HEALTH SUPERVISION IN INDUSTRIAL ESTABLISHMENTS

Industry	Number of Establishments Represented	Total Average Number of Employees Supervised	Total Cases of All Kinds	Total Medical and Surgical Cost	Average Annual Cost of Medical and Surgical Supervision Per Employee
Metal trades	47	294,646	1,988,991	$541,771	$1.84
Rolling mills	7	49,317	358,574	137,047	2.78
Smelting and refining	1	1,270	2,832	6,932	5.46
Light and power	7	24,921	49,046	92,601	3.72
Transportation	5	35,795	81,591	69,633	1.95
Chemicals	6	10,572	78,744	34,797	3.29
Food	5	13,650	69,565	39,875	2.92
Rubber	5	27,462	234,069	76,089	2.77
Textiles	4	8,939	67,380	24,177	2.70
Paint	2	4,023	10,255	29,635	7.37
Leather	2	3,026	9,440	6,102	2.02
Publishing	2	3,358	6,742	3,473	1.03
Coal mining	1	2,454	2,842	4,637	1.89
Gold mining	1	2,500	62,126	35,590	*14.24
Coal and iron mining	1	11,000	131,898	130,000	*11.82
Miscellaneous	3	2,611	11,019	6,126	2.35
	99	495,544	3,165,114	$1,238,485	*$2.50

*The average annual cost per employee, excluding plants for which the cost includes sickness treatment of employees and their families at home, was $2.21.

	Plant Number	Average Number of Employees	Physicians Employed Full Time	Physicians Employed Part Time	Physicians Engaged for Call Service	Nurses Employed M—Male F—Female	Others Employed	Surgical Cases Treated	Medical Cases Treated	Redressings Made	Home Visits Made	Physical Examinations Made	Total Medical and Surgical Cost	Average Cost per Employee
Metal Trades	1	400	0	0	1	0	1 first-aider	240	240	80	0	0	$2,000	$5.00
	2	500	0	0	2	0	1 attendant	1,451	506	654	.....	.....	692	1.38
	3	720	0	0	1	0	0	300	0	.....	.....	0	2,651	3.68
	4	762	0	1 4 hrs. daily	0	1 F.	1 boy	2,032	895	1,399	17	1,715	3,112	4.08
	5	776	0	1 5 hrs. daily	1	1 M.	2 first aiders	7,543	255	6,117	36	40	5,744	7.40
	6	875	0	0	1	1 F.	0	715	150	4,127	.....	.....	1,297	1.48
	7	918	0	1 2 hrs. daily	0	0	0	696	0	4,000	15	563	1,925	2.10
	8	1,000	0	0	1	0	0	1,618	388	.....	.....	0	1,038	1.04
	9	1,100	0	0	Yes	2 F.	0	959	0	678	204	1,500	3,160	2.87
	10	1,157	0	1	7	2 F.	1 first aider	327	1,382	970	.....	.....	5,878	5.08
	11	1,244	0	1 daily	0	2 F.	0	7,984	2,400	.....	200	40	4,040	3.25
	12	1,561	0	0	1	1 F.	0	5,332	3,802	3,826	0	0	1,332	.85
	13	1,730	0	1 2 hrs. daily	0	1 M.	1 stenographer	2,660	.....	4,872	144	2,782	3,485	2.01
	14	1,928	0	1 1½hrs. daily	0	1 F.	Part time clerk	2,628	572	6,416	716	.....	4,939	2.56
	15	2,000	0	0	0	1 M.	0	3,000	.....	936	144	0	2,330	1.16
	16	2,200	0	0	0	0	1 first aider	1,294	0	0	0	0	1,165	.53
	17	2,400	0	0	0	1 M.	0	7,200	1,000	3,200	0	0	5,250	2.19
	18	2,565	0	0	0	2 F.	0	6,657	.....	11,163	.....	0	4,074	1.58
	19	2,600	1	0	0	1 F.	0	1,628	1,772	812	112	176	3,040	1.17
	20	2,862	0	4 4 hrs. daily	4	2 M.	1 stenographer	4,596	(1)	17,948	148	5,516	9,068	3.17
	21	3,097	1	1 daily	0	0	1 clerk	3,098	220	4,350	20	0	4,491	1.45
	22	3,250	1	0	Yes	1 M., 1 F.	0	1,648	990	13,844	.....	12,117	7,517	2.31
	23	3,503	0	0	Yes	1 F.	0	318	0	0	0	0	3,550	1.01
	24	3,794	1	0	0	2 M., 1 F.	1 clerk	25,782	(1)	32,688	.....	.....	8,820	2.32
	25	4,000	1	0	Yes	2 M.	0	1,280	(2)	24,000	380	8,000	10,980	2.74
	26	4,534	0	2 2 hrs. daily	0	2 M.	0	6,522	0	10,000	1,000	4,278	11,376	2.51
	27	4,848	1	1 1 hr. daily	2	1 M., 3 F.	1 clerk	2,360	4,944	3,850	3,962	6,246	15,494	3.20
	28	5,300	0	0	8	1 F.	4 first aiders	1,109	(1)	4,671	.....	0	5,157	.97
	29	5,655	0	1 1 hr. daily	Yes	1 M.	1 clerk	3,968	4,843	4,433	0	1,000	5,728	1.01
	30	5,809	3	0	0	1 F.	2 first aiders	15,992	.....	15,188	0	7,864	8,272	1.42
	31	6,000	1	1	0	2 F.	3 (3)	14,394	11,772	17,416	0	1,004	7,074	1.18
	32	6,727	0	0	2	1 F.	0	10,580	.....	14,000	.....	0	7,713	1.15
	33	6,806	0	0	1	1 F.	1 steward	5,194	2,012	7,417	64	7,000	9,646	1.42
	34	7,608	0	6 6 hrs. daily	0	0	5 (4)	15,659	2,998	53,252	65	23,136	19,897	2.62
	35	7,745	2	0	0	1 F.	3 (5)	3,164	848	5,349	584	1,970	9,002	1.16
	36	7,922	1	1 3 hrs. daily	0	5 F.	1 stenographer	8,122	18,644	7,254	406	6,388	14,997	1.89
	37	8,000	4	0	0	5 M.	2 clerks	1,327	30,500	2,745	1,078	15,565	18,897	2.36
	38	10,000	3	0	1	2 F.	1 stenographer	23,112	9,350	42,972	1,724	25,458	17,680	1.77
	39	11,000	0	1 1 hr. daily	0	1 M., 4 F.	6 (6)	17,516	.....	39,931	.....	.....	17,267	1.57
	40	12,786	2	0	0	1 M., 2 F.	0	11,177	1,526	24,502	1,719	17,318	13,641	1.07
	41	14,500	5	0	0	9 F.	7 (7)	9,600	3,800	32,000	3,000	18,600	30,200	2.08
	42	15,793	1	0	0	4 M., 2 F.	1 attendant	32,160	(1)	36,676	1,032	0	32,961	2.09
	43	16,776	12	0	Yes	5 F.	(8)	53,006	54,273	62,891	(9)	16,000	28,749	1.71
	44	16,880	5	0	0	1 M., 10 F.	0	29,626	.....	71,914	.....	5,749	34,409	2.04
	45	17,387	2	0	Yes	5 M., 1 F.	0	12,200	742	32,364	1,110	15,648	22,650	1.30
	46	18,521	2	0	0	6 M., 5 F.	5 (10)	55,728	(1)	83,648	0	0	21,606	1.16
	47	37,107	9	0	0	24 M.	(11)	86,611	133,036	202,095	3,643	41,175	87,717	2.36
Rolling Mills — Brass	48	1,321	1	0	1	3 M.	0	3,165	17	6,538	19	3,514	4,130	3.13
	49	2,653	1	0	0	0	3	8,918	1,118	37,746	970	0	9,113	3.43
	50	2,700	0	0	2	1 M., 1 F.	1 supervisor	2,880	.....	8,092	1,364	0	5,606	2.08
	51	4,500	0	0	Yes	2 F.	3	16,463	32	37,492	0	0	16,084	3.57
	52	4,910	0	0	Yes	1 F.	3	12,001	0	40,642	849	0	11,010	2.24
	53	8,233	4	4	0	8 F.	(12)	21,590	5,098	40,602	640	18,624	36,104	4.39
	54	25,000	0	Yes	0	2 M., 11 F.	Orderlies	30,000	0	60,000	200	0	55,000	2.20

[1] Included with surgical cases.
[2] Included with redressings.
[3] One attendant, one clerk, one stenographer.
[4] Three clerks, one masseur, one janitor.
[5] One clerk, one janitor, one messenger.
[6] Five clerks, one janitress.
[7] Three clerks, four cleaners.
[8] Supt., 16 clerks, janitor, doorkeeper, and scrubwoman.
[9] Included with other cases.
[10] Two clerks, two drivers, one assistant.
[11] Clerical force, dentist, hygienic laboratory, judicial and transfer departments.
[12] Nine clerks, two drivers, one janitor, three cleaners.

as well as hazardous operations, and in shops of various sizes and character, located in various parts of the United States. Some are situated in cities where hospitals and specialists are available, some are in small places where such service can be secured only at considerable expense and delay. With such a large variety of experience to choose from, it is hoped that each employer may find in the detailed table at least one instance which will give him a fair idea as to what such service would cost in his own plant.

The chief significance of these data, from a general viewpoint, is that it is possible to give such a large amount of medical and surgical service at a cost which averages only $2.21 per employee per year.

Convincing proof of the economic value of health supervision in industry is afforded by the fact that, when collecting the data contained in this report, it was found that no employer had abandoned the health supervision activities established in his plant. On the contrary, the prevailing tendency has been to invest even more money in extending the service.

Will Move to New York

The American Car & Foundry Co. has leased for five years a half of the seventeenth floor of the Hudson Terminal Building, 30 Church Street, New York, and will consolidate its New York and St. Louis offices there. At present the company has New York offices at 165 Broadway, but could not obtain sufficient space in that building to provide for the departments that will be moved to New York from St. Louis.

MAY CALL GENERAL STRIKE

Meeting of Bridgeport Machinists Called for This Week—Labor Notes

The minimum scale committee of the local Machinists' Union, Bridgeport, Conn., has called a general meeting for Aug. 31, to consider the calling of a general strike of machinists in the city. Demands have been sent to 133 factories in Bridgeport for an increase of 10 per cent in wages and for the establishment of minimum scales for different branches of the trade, that for tool makers being 60 cents an hour and for machinists 50 cents an hour. It is reported that previous to this action, two local factories had made these concessions but that none of the other factories has replied to the demands. The union officials state that this move is a direct result of the refusal of the Lake Torpedo Boat Co., where a strike is in progress, to grant any of the demands.

More than 200 machinists have gone on strike at the Baush Machine Tool Co., Springfield, Mass., following the refusal of the management to agree to give preference to union machinists and to grant what virtually amounts to a wage increase of 15 per cent.

The entire force of pattern makers at the Brooks plant of the American Locomotive Co., Dunkirk, N. Y., declared a strike on Aug. 23, due, it is said, to existing working conditions.

The Grymes Engineering Co., Morris Street, Jersey City, N. J., has advanced the wages of mechanics in its shipbuilding works to $4.50 a day.

The Erie Railroad Co., Jersey City, N. J., is employing women at its local machine shops for the operation of drill presses and shapers. It is said that other women will be employed in the shops to take the place of men who are called into military service. The same scale of wages as paid to the men workers prevails.

The American Car & Foundry Co., Milton, Pa., has advanced the wages of employees at its local shops 10 per cent. About 1100 men are affected. The plant is now operating on a 24-hour schedule.

Employees at the plant of the Jansen Steel & Iron Works, Columbia, Pa., have received an increase in wages from 20 to 22 cents per hour.

Boiler makers at the plants of the Alabama Dry Docks & Shipbuilding Co., the Hodges Boiler Works, and the Home Industry Iron Works, all of Mobile, Ala., have recently been granted a wage increase of from $4 to $4.50 a day.

Labor questions are practically all settled throughout France, according to *La Métallurgie.* The women number 14 to 30 per cent of the total number employed in metallurgical plants.

Several hundred guns were irrevocably lost to the British army as the result of a recent strike, according to Sir L. Worthington Evans, one of the parliamentary secretaries of the Ministry of Munitions, in a speech at Manchester, Eng., July 6. One man's grievance, he said, is almost insignificant compared with the result of stopping the whole train of war work. In a late offensive in France, more shells were fired than in the 18 weeks of the Somme offensive. On one type of shell alone, 500,000 were fired in one week. A strike in April lost to the country between 150 and 200 airplanes.

A 6-hr. working day was recently advocated by Lord Leverhulme in an interview printed in a British paper. He would run the machinery 12 hr. with two shifts of operatives, expressing the belief that the human machine would do as much in 6 hr. as in 8, except in a few industries where exceptional conditions prevail and that the extra number of hours worked by the mechanical machines would enable such an increased output as to allow possibly for the same wages now paid for 8 hr. Incidentally, he expressed faith in co-partnership rather than in profit-sharing.

In transferring labor placed through the employment exchange of the ministry of labor of Great Britain, arrangements have now been made to provide a reduced rate of five-eights the ordinary fares, that is, the fares in operation before Jan. 1, 1917, or without the 50 per cent increase that now obtains.

As justifying the so-called dilution of labor through the admission of women to industrial plants, F. J. Kellaway, Parliamentary secretary to the ministry of munitions, Great Britain, in a speech before the Allied Engineering Trades at Luton, Eng., said that the total output of ammunition in the third year of the war was 20 times the output of the first year.

An exhibition of women's work in munitions manufacture was recently opened at Leeds, Eng. According to a review of it published in *Engineering,* of London, it was shown that two or three weeks are enough to enable a girl to learn to do the rough turning and screw cutting required to produce screw gages, and after a shop experience of about two weeks girls are able to make screw dies complete except for backing-off and hardening.

The Norton furnace, of the Norton Iron Co., Ashland, Ky., resumed operations Aug. 25, after having been banked several days on account of labor troubles, which have now been adjusted.

Colorado Company's Wage Increases

The Colorado Fuel & Iron Co., in reviewing "two years of industrial democracy" in its *Industrial Bulletin* of July 31, gives a summary of results obtained under the company's industrial representation plan and agreement. So far as the steel works are concerned the arrangement went into effect May 4, 1916, by vote of 2321 to 863, while the plan was adopted at the mines in October, 1915, by vote of 2404 to 442. The average individual monthly wage in January, 1916, was $79.24. In May, 1917, the average was $114.59. Typical cases taken from the company payroll are given as follows, showing the increase in two years:

	May, 1915	May, 1917
In Iron Mines:		
(a) Miner	$0.31½ per hr.	$0.49 per hr.
(b) Steam shovel engineer	.55 per hr.	.99 per hr.
(c) Underground laborer	.24 per hr.	.38 per hr.
In Steel Works:		
(a) Common laborer	.19½ per hr.	.30 per hr.
(b) Blast furnace keeper	.24 per hr.	.36 per hr.
(c) First helper, open hearth (per 100 gross tons)	8.80	12.34
(d) Wire drawer (per 1000 lb.)	.52	.69

In referring to the provision for bettering employees under the service retirement plan adopted March 22, 1917, the review says that 24 employees have been retired on monthly allowances and that 200 25-year service buttons have been awarded. The report gives in considerable detail the work that has been done in improving homes, in education in mining camps, progress in safety precautions, establishment of sanitary standards, work of Y. M. C. A., churches, Sunday schools, employees' organizations, etc. More than 90 complaints have been adjusted through the president's industrial representatives, apart from a much larger number of less important misunderstandings between employees and local managements.

The Marlin-Rockwell Corporation having acquired the assets of Standard Roller Bearing Co. of Philadelphia; Rockwell-Drake Corporation of Plainville, Conn., Mayo Radiator Co., New Haven and Marlin Arms Corporation, New Haven, announces that owing to the well developed sales organization of the Standard Roller Bearing Co., Philadelphia, it will direct the sales of the above companies with the exception of the Marlin Arms Division.

Extensive expansions are being made to the York, Pa., electric welding plant of the American Chain Co. which will increase the number of employees from 1800 to 2600. Ground has been broken for a new building, four stories, 72 by 420 ft.

Canton Railroad Co., Baltimore, Md., W. B. Brooks, president, will enlarge its terminal yards in the suburbs of Baltimore.

MOVING BLAST FURNACES

One from Alabama to be Rushed to India—Two at Troy Dismantled

THREE more blast furnaces, stacks which have not been in service for years, are to be moved to new fields, one as far away as India. Recently the Algoma Steel Co. arranged to dismantle and erect at its works 400 miles away the blast furnace at Midland, Ont. Lately two Breaker Island furnaces of the American Steel & Wire Co. at Troy, N. Y., were bought for use elsewhere, and now Battelle furnace at Battelle, Ala., is being knocked down to be in use within seven months, making ferromanganese in India for the Tata Iron & Steel Co. These developments are a commentary on the stress for deliveries of iron and steel on the one hand and the difficulty of getting new equipment in desired time on the other. A sidelight is thrown on the situation in the case of the Battelle furnace in the plan to send the steam boilers with the furnace equipment not for steam raising purposes, but for tanks for various needs, such is the difficulty of getting tank steel, fabricated or otherwise.



The Boilers of the Battelle Furnace Plant Will Also Go to India But for Use as Tanks

The moving of the Battelle furnace will be one of expedition. The work is in charge of the engineering firm of Charles P. Perin and Stewart M. Marshall, New York. It is planned to have the stack and the rest of the furnace plant down within 60 days, and they have arranged with the British Government, agreeable to the United States, to ship in a special vessel, either from Mobile or New Orleans. F. W. Claflin, in charge of construction for Perin & Marshall, of the large electric steel plant of the British Government at Toronto, is now engaged on the Battelle moving project. It is understood that the furnace will make twice as much ferromanganese as the Tata steel works will need and a supply is likely to be available for sale in this country through Hickman, Williams & Co.

The Battelle furnace was the central feature of the property of the Lookout Mountain Iron Co., at Battelle, Ala., 34 miles south of Chattanooga, Tenn. The plant, which was described in THE IRON AGE of Aug. 4, 1904, was put into operation Sept. 10 of that year. J. G. Battelle was president. Since 1906 the furnace has not been active and the property has been controlled for some years by William S. Rowe, Cincinnati. The furnace stack is 85 ft. high with a 19-ft. 6-in. bosh and has a Brown single-track skip hoist and stock distributer. There are four 21 x 80 ft. Whitwell four-pass stoves. The boiler plant comprises 20 100-hp. horizontal flue boilers, 72 in. x 20 ft. These, as stated, will be used as tanks. The three simple Tod blowing engines, with 46-in. steam ends, 84-in. air tubs and 60-in. stroke, are for sale, as the Tata plant has ample blowing capacity with three Escher-Wyss and one Ingersoll-Rand centrifugal blowers. Some of the other equipment will also be subject to sale, as not needed in India, part probably of a boiler and steam-air compressor and steam electric plant provided for working the mines contiguous to Battelle furnace.

Breaker Island Furnaces Shipped

One of the Breaker Island furnaces was bought by the Seaboard Steel & Manganese Co., which last year acquired Temple furnace at Temple, Pa., and which is now to increase its production of ferromanganese. The plant is now in process of shipment, the dismantling, moving and re-erection being also in the hands of Perin & Marshall as engineers. The Seaboard gets its ore from Elkton, Va., and further south, from Cuba and from Brazil. C. F. P. Hopkins, Cleveland, is chairman of the board of directors, H. C. Wolle, formerly assistant superintendent of the Cambria Steel Co., is president and Milford Wortham, formerly of the Lucy furnaces of Carnegie Steel Co., is general superintendent.

The other Breaker Island furnace is going to be erected near Phillipsburg, N. J., for the Northern Ore Co., which recently purchased the Keystone furnace, Island Park, Easton, Pa., from the Thomas Iron Co. S. H. Chauvenet, formerly connected with the Robesonia and Sheridan blast furnaces in the Lebanon Valley, is manager.

The Breaker Island furnaces were owned successively by the Troy Steel & Iron Co., the Troy Steel Co., the Troy Steel Products Co. and the American Steel & Wire Co. The island where they were built is opposite Troy, N. Y. They date from 1886-7 and were last active in 1897. The stacks are 18 x 80 ft. and have each four Whitwell stoves.

New Rates on Pig Iron

The rates on pig iron from various Middle Western furnace points to Atlantic tidewater follow:

From Erie: To New York, old rate $3.10; to Philadelphia, old rate $2.58, new rate $2.90; to Boston, old rate $2.75, new rate $3.30; to Baltimore, old rate $2.28, new rate $2.80.

From Cleveland: To New York, old rate $3.18, new rate $3.70; to Philadelphia, old rate $2.98, new rate $3.50; to Boston, old rate $3.38, new rate $3.90; to Baltimore, old rate $2.88, new rate $3.40.

From the valleys: To New York, old rate $2.98, new rate $3.50; to Philadelphia, old rate $2.78, new rate $3.30; to Boston, old rate $3.18, new rate $3.58; to Baltimore, old rate $2.68, new rate $3.08.

From Buffalo to New England points, old rate $2.58, new rate $3.10.

The Commonwealth Steel Co., Granite City, Ill., has begun the construction of a housing system for its conveyors for transporting the molding sand from the storage bins to the molding floors. It will be electrically operated, doing away with the hand labor and barrows which have been used heretofore. The new building is 550 ft. long of structural steel and corrugated iron and will cost about $100,000.

It is expected that the two blast furnaces at Dayton, Tenn., recently acquired by H. S. Matthews will go in blast in January, 1918. Improvements and repairs are now under way.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the DAVID WILLIAMS CO., 239 West Thirty-ninth Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: Equitable Building. Philadelphia: Real Estate Trust Building. Cleveland: Guardian Building. Cincinnati: Mercantile Library Building.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year. Entered at the New York Post Office as Second-class Mail Matter.

Danger in Profit Paring

In its price regulation policy, the Government presumably has three objects in view: Protection of the consumer including the Government against excessive prices, guaranteeing the producers a reasonable return and keeping up production. In achieving these results, the President evidently has succeeded much better with anthracite than with bituminous coal. There is general concurrence in the opinion that the prices of anthracite are reasonable and that production will be continued at not less than the present rate. As to bituminous coal, the feeling is very different and the outlook is that some mines will be compelled to suspend operations after they complete present contracts, which the law provides shall not be disturbed by any price regulation policy. From the South particularly, loud complaints against the alleged injustice of the prices fixed for the product of that section have come, and a delegation has been sent from the Birmingham district to Washington to protest.

It is evident that the official and other advisers of the President were not well informed in regard to the cost of mining bituminous coal, and the announcements relating to the various kinds of coal mined in widely separated sections show how easy it will be to fall into similar error in the case of iron and steel products, which are manufactured in many parts of the country under greatly different conditions. It has been widely published in the past week that the Federal Trade Commission has found such wide variations in the cost of rolled steel at different plants as to make it virtually impossible with any justice to fix one price for all. The President's order, it is therefore intimated, will fix varying prices for the different plants on transactions with the Government, rather than prices differing according to districts. The intricacies of such a plan are so devious as to make it admittedly impossible as a solution of the problem of prices to the general public.

But there is the naive suggestion in that connection that the Government will rely upon the announcement of its price to each plant to bring down prices for private purchasers "who it is believed will be unlikely to pay more than a reasonable profit" over the cost figure ascertained by the Government. Yet for many months private purchasers have known full well that market prices represented far more than a "reasonable profit" without that knowledge being of the slightest use to them in getting cheaper steel. Such filterings from the Trade Commission's inquiry suggest that the disturbing possibilities of price fixing in steel are even greater than are indicated in the coal industry, for the proposal to pay different prices to different producers implies that the Federal Trade Commission is able to make so nice an adjustment of profit that no producer shall have too much or too little. The danger is that in paring profits the Government may cut so deep as to defeat its own objects.

Government Should Stimulate Output

Undoubtedly there are commodities the price of which the Government should seek to reduce. It is no time for some to make inordinate profits and add largely to their wealth, when the total material wealth of the country is increasing less rapidly than usual, if, indeed, it is not actually decreasing, as maintained by some students of the economic situation. It is, however, a drastic operation to reduce market prices by Government fiat, and when any alternative presents itself promising the same result it should be embraced and utilized to the fullest extent.

The President's appeal of April 15 that every one should do his bit must not be forgotten. It may be well to review it, in the light of what has since occurred. To the farmer there was the appeal that the harvests of food should be made as large as possible, and the Administration, on its part, promised the farmers full supplies of seeds and labor. One thing that has occurred is that the price of the 1918 wheat crop is fixed at not under $2 a bushel to the farmer. Compared with prices in previous years, the $2 price suggests either a famine in labor or a very unusual profit to the farmer.

The miner was called upon not to slacken or fail; he was expected to work as hard as possible. There is every reason to believe, however, that if the coal miners were doing their best the bituminous operators would not complain as loudly as they do of the $2 coal price fixed last week. It is true that the production of bituminous coal in the first half of this year exceeded the production in the

same period a year earlier by 8 per cent, but it is quite certain that the difference between production and capacity last year was much more than 8 per cent.

In the case of coke, the statistics of the Connellsville *Courier* show a decrease in production from the first half of last year to the first half of this year of 20 per cent. The fact that the production of pig iron in the first half of this year was less than in either the second half or the first half of last year has been well advertised, and it is equally well known that there was blast-furnace capacity available to make a materially greater output.

Undoubtedly the war necessitates practices that would not be resorted to in time of peace, but such practices are no better than necessary evils. They do not become good in essence because they are forced by war. All other means should be tried first. Certainly it would not be right for the price of coal to be fixed at a low level and nothing be done to stimulate production. The common surmise is that if it is found that there is not enough coal being produced the Government will take over some or all of the mines, but that should be the last resort, not the first.

The idea is common, but it is quite erroneous, that during the progress of a war the rank and file of the people grow continuously more and more enthusiastic. In the early weeks after the declaration of war a common suggestion was, "Wait until the people wake up!" They do wake up to an appreciation of the horrors of war, but those who have observed the progress of thought in other countries are clear in their judgment that there is not a spontaneous increase in the enthusiasm of the people each to do his part. When they actually do increase their efforts it is because they have been subject to influences from outside. They have been taught, cajoled, stimulated, forced, to do more.

The President's appeal of April 15 was excellent. It was timely and sound. But it does not follow that four months later we can assume without question that every one has lived up to it. As with publicity in the sale of merchandise, it is now high time for the "follow-up" literature and the personal call. What more appropriate at this time than to take up that appeal, paragraph by paragraph, and sentence by sentence, and see whether or not there are slackers? Are the coal miners and the coke workers putting forth their maximum effort? Do the farmers need the stimulus of $2 wheat for next year? Are the workers in the mills and furnaces giving a full week's work each week?

These questions are particularly timely when the food control is being put into practical operation. It is the testimony of a host of employers that their men work enough hours per pay period to give them the income they require to meet expenses. If the food control decreases their expenses there is no reason to expect more continuous service in the future.

There have been echoes from draft exemption boards in various districts that men who have received exemption by reason of the nature of their work, or even because they have shown that they have dependents, are going to be watched to see that they remain at the calling and render full service, or to see that they exert their maximum effort to provide for their dependents. At best, this would apply to but a small proportion of the workers. The spirit of the selective draft is that every one has a duty. Men between 21 and 31 were called not because they owe a greater service to the country, but because it was thought they were best fitted to render the particular service of fighting. Those not called are exempted merely from that particular form of service. It is time that more effort be made to see that these others do their full duty. It would be an egregious blunder to assume for a moment that all will do their duty spontaneously.

Pig Iron from Steel Scrap

"Synthetic pig iron" produced in commercial quantities is an interesting metallurgical development of which details are given on other pages. Steel scrap is being reconverted into high grade pig iron in an electric furnace; in other words, the original constituents of pig iron are made to reunite in the condition originally assumed. This unusual achievement is another evidence of the adaptability of electrical energy to the production of results impossible by any other means.

While distinctly an outgrowth of war conditions in the steel industry, the process presents some unusual features and has interesting possibilities. The question of cost is the vital one, when the process is regarded from the viewpoint of normal times. It is not difficult at present prices to compete with the blast furnace in making high grade iron; what can be done under peace conditions is another question. However, it should not be overlooked that scrap, electrodes, refractories and labor are high to-day, as well as the final product, and that the prices of the former may so readjust themselves as to make possible what to some minds seems improbable.

Outside of raw materials and overhead charges, high grade pig iron can be made by the synthetic process at from $7 to $8.50 per ton in the ladle, under present conditions. Knowing that these costs can be lowered in normal times gives some basis, even if not approximate, for a judgment of the future of the process. At any rate there are two fields in which synthetic pig iron may become a factor. It is practical and economical in districts where pig iron is always high priced, as on the Pacific coast. It is also likely that its purity and its dynamic and static properties will make it a worthy competitor of charcoal iron.

Prospects for Steel Demand

The present theoretical capacity of this country for the production of steel ingots, according to a careful compilation recently made, is about 50,000,000 tons a year, while about 3,500,000 tons of new capacity now under construction is expected to be completed by February, 1918. The annual statistical report of the American Iron and Steel Institute, just published, shows for steel ingots and castings combined a capacity of 45,787,780 tons at the beginning of 1916, and a capacity of 49,613,888 tons

at the close, this representing an increase of 4,826,108 tons for the year. The annual summary of THE IRON AGE, published Jan. 4, showed new construction amounting to 4,205,000 tons. The slight divergence in the figures may be accounted for by capacity being slightly increased at works where there were no new furnaces built. Assuming that the average theoretical capacity for the year lay midway between the extremes, and allowing for a loss of 5 per cent in output due to transportation difficulties, the actual capacity in 1916 would be about 95 per cent of the rated capacity. In other words, with all conditions favorable, the possible production may be taken at 95 per cent of rated capacity. Applying this factor to the present capacity of 50,000,000 tons of ingots (excluding castings), the output under favorable conditions should be 47,500,000 tons of ingots a year.

The actual ingot output in 1916 was 41,401,917 tons, so that there is an excess now over the 1916 average of 6,100,000 tons, or 15 per cent. Study of prospective demand for steel must be based upon this increased capacity. It cannot serve the purpose to allow for a curtailment in actual output due to shortage of raw materials. For at least eight months the production of pig iron has been much less than the capacity on account of a shortage in coke, and it would be absurd to conclude that for an indefinite period the iron and steel producing industry is going to be shackled by such an incidental item as coke. The recent report of the Geological Survey shows that in 1916 an average of only 70 per cent of the beehive ovens were in blast. If 80 per cent were operated, instead of 70 per cent, there would be about 5,000,000 tons more of coke, which would solve all difficulties. Apparently the Government is going to take charge of coke prices, and if so, it will soon find that one good way to help the decline in steel prices it is so anxious to bring about will be to force the production of coke. Then, too, there is some new capacity in by-product coking coming along.

There were 30,557,818 tons of rolled steel produced in 1916. Exports of rolled steel and manufactures accounted for about 6,500,000 tons, or 20 per cent. With a 15 per cent increase, on the basis of increased ingot capacity, there should be for the future about 35,000,000 tons of rolled steel.

Last year there was ordinary domestic demand and export demand. For the future there is domestic demand, export demand, and Government demand. Last year's exports went in considerable part to neutral countries. In future, such exports will undoubtedly be very light. It is by no means certain that the requirements of the Entente Allies will be greater in future than they were in 1916. England has very considerably increased her steelmaking capacity, but if exports remained the same the Entente Allies could be given considerably more steel by the curtailment in exports to neutrals, whereby our total exports might not be increased. Deducting the 6,500,000 tons from last year's production leaves 24,000,000 tons for the domestic demand. Deducting the same amount from the present capacity leaves 28,500,000 tons for the domestic demand, plus requirements of our own Government. To engage the full capacity, on these assumptions, either the Government must require for its own use more than 4,000,000 tons of steel a year, or domestic consumption must be greater in these war times than it was in our time of peace last year.

As to the Government's own requirements for war purposes, the greatest item is shipbuilding material. The total production last year of sheared plates, ¼ in. and heavier, was only 1,864,500 tons, and a great part of this was in ship plates, some exported and some consumed at home. If the remaining tonnage were diverted to shipbuilding the consumers thus deprived of plates could not in any great degree substitute other forms of steel. Thus the main increase in total demand for steel created by the Government's activity in shipbuilding must be in plates from new plate-mill capacity, a liberal estimate for which is 1,000,000 tons a year, and in the structural shapes that would go with them, for which 400,000 tons would probably be an outside estimate, unless the building of composite ships reaches very large proportions.

In rails, the heaviest requirements of the Government are satisfied with the 150,000 tons recently placed. In sheets, pipe, wire, etc., the aggregate requirements can hardly mount to more than a very few hundred thousand tons at the outside. In shell steel there will doubtless be several hundred thousand tons a year. Thus it is difficult to count up more than 4,000,000 tons for the Government, which leaves it that to engage the capacity fully the ordinary domestic consumption must be as great as last year, absorbing 24,000,000 tons of rolled steel.

For the month of July the Bridge Builders' and Structural Society reported bookings equal to 41½ per cent of a month's fabricating capacity, there having been a continued decrease since March. New building operations are light everywhere. The railroads have ceased buying, and on the whole it seems impossible to expect a continuance of the 1916 rate of domestic consumption, particularly when labor is scarcer than in 1916, and is to become scarcer still. If the supply of steel does not eventually exceed the requirements it will be because the supply is far short of the physical capacity, by reason of scarcity of labor and materials involved in making steel.

Apart from the relation between supply and requirements it must be noted that buyers have developed their familiar waiting attitude, and whenever in the past they have done this the demand upon the mills has fallen quite short of the actual ultimate consumption, through the widespread reduction in stocks in the hands of jobbers and manufacturing consumers. At such times the demand, as expressed in the market, is materially less than the actual ultimate consumption. At other times, when prices are rising and mills filling up with orders, the market demand exceeds the requirements.

The Derby Mfg. Co., Derby, Conn., has secured an injunction to prevent the Seymour Mfg. Co., Seymour, Conn., from placing attachments on its plant in a threatened suit involving about $300,000 for default on a contract for copper shell bands. The Derby Mfg. Co. claimed that an oral agreement had been broken by the Seymour Mfg. Co., and a temporary injunction has been issued to enable the disagreement to be settled in the Superior Court.

The New Furnace at Coatesville

The new No. 3 blast furnace of the Worth Brothers Co., Coatesville, Pa., which was blown in on Aug. 22, has a capacity of 600 tons per day, and is the largest unit of its kind in the East. The stoves are of the side combustion type and equipped with improved gas burners, and draught is supplied by a stack 14 ft. in diameter and 200 ft. high. Each of the four stoves is 22 ft. in diameter and 100 ft. high. Blast is supplied by two Bethlehem gas blowing engines each of 3000 h.p., and having a capacity of 29,000 cu. ft. of air per minute. There is also a spare set of two blowing engines. Two gas-cleaning plants have been provided, the first, or primary, washers consisting of two strands of two towers each, the towers being 13 ft. by 60 ft. The second or clean gas washers consist of two units of Theisen rotary washers. The gas leaving the furnace is conveyed to the primary washer through a main 100 in. in diameter.

On account of the small amount of water available for cooling purposes and gas washing, unusual means had to be resorted to for the conservation and re-use of the cooling water. To accomplish this a spray cooling system has been installed. The water is first pumped to Nos. 1 and 2 furnaces, discharged into a collecting basin and then pumped to the No. 3 furnace and the primary gas washer. Water for the condensers and for washing the gas in the secondary washers is taken directly from a standpipe on the Nos. 1 and 2 blast furnace system, affording cooler water for these purposes. Filters were provided for filtering the gas engine cooling water and this installation consists of four filters and one spare having a capacity of 2000 gallons per minute. The water system is supplied by a turbine driven centrifugal pump of 10,000 gal. per minute capacity. For starting the gas blowing engines two air compressors have been installed, each with a capacity of 500 cu. ft. of air per minute at 225 lb. pressure per sq. in.

A New Export Company

The Peerless International Corporation has been formed with $800,000 capital to carry on an international export and import and general engineering and contracting business. Plans are maturing for the sending of representatives of the company into foreign fields. An affiliated engineering interest is the L. K. Comstock Co., which will be represented on the board by its president, L. K. Comstock. Another director is Walter W. Birge, president Air Reduction Co., who recently negotiated the projected combination of the Union Carbide Co., the National Carbon Co., the Air Reduction Co. and their associated interests.

The president of the company, Alfonse Kaufman, was formerly engaged in consulting engineering in New York and Chicago. The vice-president, S. Weiner, is well known to the metal trade. The treasurer, Wm. M. Blain, has just resigned as treasurer and director of Viele, Blackwell & Buck and associated companies, with which he has been connected for the past eleven years. The secretary, Frederick A. Beardsley, has been engaged in engineering and exporting for a number of years.

It is probable that the Halladay Motor Car Co., now operating a plant at Mansfield, Ohio, in the manufacture of the Halladay automobiles, will build a plant at Warren, Ohio. The Board of Trade at Warren has made a proposition to give the company 25 acres just east of the tin-plate plant of the Liberty Steel Co., on condition that the company spends $40,000 in the building of a new plant, and moves its machinery and other equipment from Mansfield to Warren.

The next meeting of the American Gear Manufacturers Association will be held at Edgewater Beach, Chicago, on Sept. 14 and 15. F. W. Sinram of the Van Dorn & Dutton Co., Cleveland, is president, and F. D. Hamlin of the Earle Gear & Machine Co., Philadelphia, is secretary.

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The General Steel Co., a Delaware corporation, which is building a large electric steel plate, bar and billet mill at St. Francis, Milwaukee county, Wis., in its application for authority to do business in Wisconsin states that its capital stock is $730,000, and names these officers: President, W. E. Moore, Pittsburgh; vice-president, P. A. E. Armstrong, St. Francis; assistant secretary, W. F. Peterson, St. Francis. Excellent progress is being made in the construction and equipment of the mill, which will be ready for operation about Nov. 15. The work is under the direction of W. E. Moore & Co., consulting engineers, Pittsburgh, as already noted in THE IRON AGE.

Steel Price Fixing Is Close at Hand

Large War Orders Awaiting the President's Decision—J. Leonard Replogle to Buy for the Government and the Allies—Japan and the Embargo

WASHINGTON, Aug. 28.—Rapid progress has been made in the past week in perfecting the organization of the War Industries Board to buy for the Government and the Allies, and as soon as President Wilson announces the basic prices to be paid for steel the placing of definite orders on an unprecedented scale will begin. The President has had before him for several days the preliminary report of the Federal Trade Commission with respect to the cost of producing steel and copper, and the problem of determining reasonable prices on these bases is receiving his almost undivided attention and is also occupying a large part of the time of the members of the War Industries Board, who are giving the President the benefit of their knowledge and experience.

Buying Commission for All Allies

Formal agreements were signed on Aug. 24 by the Secretary of the Treasury with the approval of the President on behalf of the United States and by the representatives of Great Britain, France and Russia for the creation of a commission with headquarters at Washington through which all purchases made by those governments in the United States shall proceed. According to the official announcement it is expected that similar agreements will be signed with representatives of other allied governments within a few days. The joint agreement names Bernard M. Baruch, Robert S. Lovett and Robert S. Brookings as the purchasing commission. All of these gentlemen are members of the recently created War Industries Board of the Council of National Defense, and will thereby be able to thoroughly coordinate the purchases of the United States Government with those of the allied powers. In making this announcement Secretary of the Treasury McAdoo states that "It is believed that these arrangements will result in the more effective use of the combined resources of the United States and foreign governments in the prosecution of the war."

J. Leonard Replogle to Be Buyer of Steel

Following close upon the appointment of the purchasing commission came the announcement that Alexander Legge, general manager of the International Harvester Company, had been appointed assistant to Mr. Baruch in the work of purchasing raw materials for the United States and the Allies and that associated with Mr. Legge there would be a director of steel and a director of copper, the first mentioned post to be held by J. Leonard Replogle. The copper director is Eugene Meyer, Jr., of New York. Mr. Replogle, who is president of the Wharton Steel Co., is well known here and is credited with a comprehensive knowledge of the steel industry. He was identified for many years with the Cambria Steel Co. at Johnstown, Pa., serving as vice-president and sales manager of that company, of which he ultimately secured control and sold it to the Midvale Steel & Ordnance Co. Mr. Replogle, in addition to his responsibilities in purchasing, has been appointed by Judge Lovett of the War Industries Board as adviser on questions of priority in the delivery of steel.

Same Prices to Allies, but How?

The agreement signed by representatives of the United States and of Great Britain, France and Russia for the buying of war materials contains a stipulation insisted upon by President Wilson that each allied government shall require its own producers to sell their products to all the Allies at prices no higher than those charged their respective governments. It may be taken for granted that the purchasing commission will promulgate this requirement forthwith, but it is frankly admitted at the headquarters of the Council of National Defense that no definite plan has yet been worked out for its enforcement. President Wilson is so doubtful regarding the authority conferred upon him by existing laws, including the national defense act, the naval appropriation act and the Lever food, feed and fuel control law, that he has requested the Attorney General to prepare an opinion defining the Government's power to control prices, not only of those articles specifically mentioned in the Lever act and the commandeering sections of other laws, but all forms of war material and such important commodities of general consumption as iron and steel, copper, lead, lumber, etc., etc.

A Suggestion of Coercion

The Council of National Defense is relying heavily upon the willingness of the leading producers to supply the allies at the prices made to the United States, and if serious difficulties are encountered in the enforcement of this arrangement an appeal may be made to Congress. No member of the Council is willing to express the opinion that the Government can compel producers to sell to the Allies at fixed prices in default of legislation, and there is considerable doubt as to the constitutionality of a law requiring them to do so. It is evident, however, that certain members of the commission are contemplating bringing to bear upon recalcitrant manufacturers some extraordinary influences applied in an indirect manner. There can be no doubt that the Government has ample authority to direct the distribution of coal, both hard and soft, and to fix the price thereof, and it is suggested that the preferential treatment in the matter of coal supplies of manufacturers acquiescing in the purchasing policy of the War Industries Board would speedily bring all their competitors to terms. Such a system savors too much of coercion, not to say official blackmail, to please certain members of the board, and it is not likely to be employed, except, possibly, as a last resort.

Reason for a Liberal Price Policy

A significant statement was unofficially made here to-day by a member of the Council of National Defense which indicates that certain members of the Council are counting upon the employment of a liberal policy in price-fixing to induce manufacturers to supply both the American Government and the Alies without quibble over statutory authority. It is pointed out that in the case of all the nations at war, including the United States, all manufacturing corporations are paying not only heavy corporate taxes, regardless of war profits, but in addition are turning into the treasuries of their respective governments a very large percentage of special war earnings running, in the case of Great Britain, as high as 80 per cent. Liberal prices would stimulate production and form a basis of earnings for the payment of heavy taxes and what the allied governments would be taking out of one pocket they would be putting

into another less a small percentage in the way of a bonus to the producer.

The President and the Steel Control Bill

There has been no development during the past week indicating that private consumers are to reap any advantage from the fixing by the President of the price of iron and steel except that there has been an apparent revival of interest in the Pomerene bill authorizing the Government to distribute at reasonable prices the entire output of the industry. Progress with regard to this measure is described in another column of this issue. It is now practically conceded by the Council of National Defense that the Government is wholly without authority to fix the price of steel for private consumption, and this view is said to be entertained by the President, who, as a consequence, is lending his influence to advance the parliamentary position of the Pomerene measure.

Warnings have been sent out from official sources designed to conserve the output of steel for Government use. The Secretary of the Navy has appealed to builders and contractors throughout the country to discourage the erection of skyscrapers and unnecessary bridges during the period of the war. Mr. Daniels states that the Navy "wants all the available steel in the country for the manufacture of hydroplanes and destroyers to hunt down and sink German U-boats." The Secretary's statement is not to be taken quite literally, but probably reflects his anxiety lest his newly launched program for the building of 150 additional destroyers may cut too heavily into the plans of the United States Shipping Board for a big fleet of cargo carriers aggregating some 8,000,000 tons.

Japan and the Ship Steel Embargo

The Japanese Government is employing every argument in its negotiations with the United States to secure plates and shapes for the construction of steel merchant vessels. During the past week a proposition has been made to the American Government to grant the use of Japanese shipyards for building merchant vessels to be used either in the Atlantic or Pacific trade. Viscount Ishii of the Japanese mission is putting forward this proposal in consideration of the relaxation of the steel embargo. The Japanese officials virtually admit that the shipbuilders of Japan are making great fortunes out of the war and have no special equities in the effort they are making to secure shipbuilding materials in the United States. For this reason they are proposing a definite business bargain under which the steel supplied by the United States will be used exclusively in the building of vessels employed for the transportation of troops, war supplies, or food to meet the war emergency.

No Coke Price as Yet

The bituminous coal producers will hold several meetings this week to consider the President's scale and presumably will later file protests against it on the ground that it will force many small mines to suspend operations. Dr. H. A. Garfield, fuel administrator, has been quoted as saying that in view of the war emergency the shutting down of small mines where the cost of production is high will not be regarded as an unmixed evil as the labor can easily be shifted to the more productive mines and the output substantially increased at minimum cost.

Coal operators in Virginia and West Virginia are calling attention to the fact that thus far there has been no publication of any plan of the President to fix the price of coke, and it is intimated that with run-of-mine coal at $2 a ton coal producers will do well to turn their attention to making coke, which is now quoted at prices that would represent very handsome profits as compared with selling coal at $2 f.o.b. the mine, there being idle oven capacity in the Virginias. Dr. Garfield declines to comment on this phase of the matter beyond calling attention to the fact that the President is clothed by the Lever act with the same power to fix the price of coke and petroleum as he has already exercised with respect to coal. Under the circumstances it would not seem to be a very prudent enterprise to invest any considerable amount of money in going into coke production, based on the expectation of reaping profits equal to the difference between $2 coal and $8 or $10 coke.

The Valley Iron Co. Organized

The Valley Iron Co. has been incorporated under the laws of Ohio, with a capital of $200,000 by Wade A. Taylor, C. H. Stewart, D. A. Strickland, F. L. Stewart and J. D. Blackburn, and will deal in, for its own account, pig iron, billets, slabs, sheet bars, merchant bars, plates, sheets, formed metal roofing products and tin plate. The company will have in addition to its main office, which will be located in the Mahoning Bank Building, Youngstown, Ohio, an office in New York City, which will be in charge of a man thoroughly familiar with the export trade. While there are a number of concerns engaged in similar business in Pittsburgh, there is none in the Mahoning or Shenango valleys, but those interested in this new organization feel that because of the great strides made by the iron and steel manufacturers of the above districts in the past few years, and the assurances made by some of the larger mills, such an organization will serve a very useful as well as profitable purpose. Wade A. Taylor, president of the company, has been very well known in iron and steel circles for many years, and C. H. Stewart, secretary and treasurer, was until very recently connected with the Deforest Sheet & Tin Plate Co., Niles, Ohio, as manager of sales.

Bi-Monthly Examinations

YOUNGSTOWN, Aug. 27.—To facilitate the work, the bi-monthly examinations of the sales sheets of the Western Bar Iron Association, Republic Iron & Steel Co., and Cleveland Rolling Mill Co. will be held at the close of the allotted 60 days, instead of on the tenth of the following month, as heretofore. Sale books for the examination will be closed on the twentieth of the final month. As a result of the change the bar-iron examination will not be held on the same day as the sheet and tin plate settlement. This latter examination will continue to be held on the tenth of September, November, January, March, May and July, during the remainder of this scale year.

Belated returns of sales sheets resulting from the mails being held up frequently because of congested conditions in the postoffices and on the railroads and the difficult task of the examiners of going through the mass of figures in the bar iron and sheet and tin-plate sections, caused the change.

The bar-iron examination will be held under the new plan either Wednesday or Thursday of this week in Youngstown.

India's Pig-Iron Output

The pig-iron output for India in 1916, according to the statistical report issued by the Iron, Steel and Allied Trades Federation (British), was as follows: Foundry iron, 127,324 tons; basic iron, 116,206 tons; specular iron, 1843 tons; direct castings, 780 tons; making the total 246,553 tons, against 270,027 tons in 1915 and 234,726 tons in 1914.

The new plant of the Curtiss Aeroplane & Motors Corporation, Buffalo, N. Y., will be 900 by 1300 ft., and will consist of 13 bays 100 ft. wide and 900 ft. long. The plant will employ 15,000 men. Manning, Maxwell, Moore, Inc., 119 West Fortieth Street, New York, is purchasing all equipment and supplies, Percy Brotherhood, vice-president, having special charge of this work.

Iron and Steel Markets

PRICES READJUSTING

Declines in Pig Iron and Billets

Plates Lower Also and Bars for 1918 Show Sharp Competition

Even with the Government announcement of steel prices known to be close at hand, the market has done some further readjusting on its own account. Pittsburgh has been the chief scene of activity, and the business done has been almost uniformly at the expense of prices.

In semi-finished steel, the high peaks of two months ago, reached in early delivery transactions, and which were far above the levels of contract steel, have been toppled over on very moderate business, while in steelmaking pig iron the reductions amount to $2 on Bessemer and as much as $4 on basic.

Finished material markets have shared little in the decline in Bessemer and basic iron and billets, chiefly because buying was so limited, but plates in particular are lower, 8c., Pittsburgh, being now common, representing a decline of $20 per net ton.

The trade is much at sea as to the extent to which the readjustment will go, and is not helped by conflicting advices from Washington as to prices to Allied governments and the public. In the absence of power to enforce a uniform price for the three classes of buying, the Administration is represented as turning to the Senate bill for such control of iron and steel as has been provided for food and fuel. Meanwhile, sentiment grows in favor of substantially uniform prices to the Government, Allies, and the public, provided there is the anthracite type of adjustment rather than that in bituminous coal.

If the Government adopts the proposal to pay higher prices for finished steel to high-cost mills, pig iron may escape regulation except that due to the expected reduction in coke. No action on coke has been taken, though there are tentative estimates of a $4 price at ovens.

Steel manufacturers are watching closely the working out of the export embargo policy, especially as related to British steel exports. With domestic steel capacity increasing, the mills want all the export business that is consistent with proper care of the Government's needs, and are averse to shipping war steel at low prices to Great Britain while that country is making highly profitable export shipments of commercial steel.

The status of steel makers on advisory committees at Washington still waits on the finding of the Department of Justice, and legislation may be required to clear up this situation. Meanwhile, an important conference between the general steel committee and the War Industries Board is held up.

Manufacturers of steel and munitions have made efforts to release large numbers of men from the draft, and some important plants will suffer serious reduction in output if these efforts are not successful. At the same time it is known that very large additions to the Government demands upon the country's steel capacity will come out as soon as the price-fixing problem is disposed of.

At an important meeting with tin plate manufacturers at Washington, on Aug. 24, the food administrator presented figures indicating a shortage of about 2,000,000 boxes this year, and a greater shortage in 1918. It was decided to limit further the sale of tin plate to packers of non-perishable foods, also to cut down sales to jobbers. The Government is urging the sale of tin plates to canners for a year ahead, a practice the makers long ago discontinued, and which they are averse to resuming. A further manufacturers' conference is to be held in Pittsburgh this week.

In spite of the embargo on plates there is still considerable negotiating for export material. Indications point to some adjustment with Japan that will release a good-sized tonnage for that country.

With so great a volume of orders on their books, the mills are making little effort to take business, and prices have long been so profitable that there is no reason for special efforts to maintain maximum production, even to compensate for the holding up of rollings of embargoed steel. At the same time, reports of concessions are heard, as in the case of a large tonnage of bars, delivery in the first half of next year, which was placed at $20 a ton below the recently established level.

The week's Pittsburgh transactions in Bessemer and basic iron, on which lower prices developed, included 1000 tons, 1500 tons and 2500 tons of Bessemer at $50 at Valley furnace, two lots of 1000 tons at $52 at furnace, and 5000 tons of basic iron at $48. Throughout the country the market for foundry iron has been quieter than in many months. Furnace prices are not generally lower, but where resales are made they are at concessions.

In the Pittsburgh district more billets and sheet bars are offered than the market can readily absorb, and billets have sold in 1000-ton lots at $75, while sheet bars can be had at less than $80.

Pittsburgh

PITTSBURGH, Aug. 28 (*By Wire*).

The local situation in the steel trade has possibly shown a little more activity in the past week, but lower prices prevail. There have been some fair sized sales of Bessemer iron at $50 to $52, and basic at $48 valley furnace, and also several sales of soft open hearth and Bessemer billets at $75 per gross ton, Pittsburgh. In finished steel, no new business is being placed that can possibly be held off until the Government decides what prices are to rule on steel, with the result that the finished market is extremely dull. There is a good deal of nervousness over the outlook, the opinion being pretty general that a very drastic decline in prices on all grades of steel is likely to come just

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Aug. 29. 1917.	Aug. 22, 1917.	July 25. 1917.	Aug. 30, 1916.
No. 2 X, Philadelphia...	$53.00	$53.00	$53.00	$19.50
No. 2, Valley furnace...	*52.00*	53.00	53.00	18.25
No. 2 Southern, Cin'ti...	49.90	49.90	49.90	16.90
No. 2, Birmingham, Ala.	47.00	47.00	47.00	14.00
No. 2, furnace, Chicago*	55.00	55.00	55.00	18.00
Basic, del'd, eastern Pa..	50.00	50.00	50.00	19.75
Basic, Valley furnace....	*48.00*	52.00	52.00	18.00
Bessemer, Pittsburgh ...	*51.95*	53.95	55.95	21.95
Malleable Bess., Ch'go*.	55.00	55.00	55.00	19.00
Gray forge, Pittsburgh..	46.95	46.95	46.95	18.70
L. S. charcoal, Chicago..	58.00	58.00	58.00	19.75
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	38.00	38.00	38.00	33.00
O.-h. rails, heavy, at mill	40.00	40.00	40.00	35.00
Bess. billets, Pittsburgh..	*75.00*	80.00	100.00	45.00
O.-h. billets, Pittsburgh..	*75.00*	80.00	100.00	45.00
O.-h. sheet bars, P'gh....	*80.00*	85.00	105.00	45.00
Forging billets, base, P'gh	*100.00*	115.00	125.00	69.00
O.-h. billets, Phila.....	90.00	90.00	110.00	48.00
Wire rods, Pittsburgh...	90.00	90.00	95.00	55.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	5.185	5.185	4.659	2.659
Iron bars, Pittsburgh...	4.75	4.75	4.75	2.60
Iron bars, Chicago.....	4.50	4.50	4.50	2.35
Steel bars, Pittsburgh...	4.00	4.00	4.50	2.60
Steel bars, New York...	4.695	4.695	4.669	2.769
Tank plates, Pittsburgh..	*8.00*	9.00	9.00	4.00
Tank plates, New York..	*8.945*	10.195	10.169	4.169
Beams, etc., Pittsburgh..	4.00	4.00	4.50	2.60
Beams, etc., New York..	4.695	4.695	4.669	2.769
Skelp, grooved steel, P'gh	4.00	4.00	4.00	2.35
Skelp, sheared steel, P'gh	6.00	6.00	6.00	2.45
Steel hoops, Pittsburgh..	5.75	5.75	5.25	3.00

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire,	Aug. 29, 1917.	Aug. 22, 1917.	July 25. 1917.	Aug. 30. 1916.
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh	8.50	8.50	8.50	2.90
Sheets, galv., No. 28, P'gh	10.00	10.00	10.00	4.15
Wire nails, Pittsburgh...	4.00	4.00	4.00	2.60
Cut nails Pittsburgh....	4.65	4.65	4.65	2.60
Fence wire, base, P'gh..	3.95	3.95	3.95	2.55
Barb wire, galv., P'gh..	4.85	4.85	4.85	3.45
Old Material,				
Per Gross Ton:				
Iron rails, Chicago.....	**$44.50**	$40.50	$41.50	$18.75
Iron rails, Philadelphia..	45.00	45.00	45.00	20.00
Carwheels, Chicago.....	**31.50**	29.00	32.00	11.50
Carwheels, Philadelphia..	34.00	34.00	35.00	15.50
Heavy steel scrap, P'gh..	**34.00**	31.00	36.00	16.00
Heavy steel scrap, Phila.	*32.50*	33.00	32.00	14.75
Heavy steel scrap, Ch'go	**31.00**	30.00	30.00	15.25
No. 1 cast, Pittsburgh..	30.00	30.00	32.00	14.50
No. 1 cast, Philadelphia..	33.00	33.00	35.00	16.00
No. 1 cast, Ch'go (net ton)	24.00	24.00	28.50	11.50
No. 1 RR. wrot. Phila....	45.00	45.00	48.00	20.00
No. 1 RR. wrot. Ch'go (net)	34.00	34.00	35.00	15.50
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	*$12.00*	$15.00	$11.00	$2.90
Furnace coke, future....	10.00	10.00	10.00	2.50
Foundry coke, prompt...	*13.50*	14.00	13.00	3.50
Foundry coke, future....	12.50	12.50	10.00	3.50
Metals,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.	*25.50*	26.50	26.00	27.50
Electrolytic copper, N. Y.	*25.50*	26.50	26.00	27.25
Spelter, St. Louis.....	*8.12½*	8.50	8.50	8.75
Spelter, New York.....	*8.37½*	8.75	8.75	9.00
Lead, St. Louis.....	*10.42½*	10.50	10.25	6.50
Lead, New York.....	*10.55*	10.62½	10.25	6.50
Tin, New York.....	*61.50*	61.75	62.50	39.25
Antimony (Asiatic). N. Y.	15.00	15.00	15.00	13.50
Tin plate, 100-lb. box, P'gh.	*$11.00*	$10.00	$12.00	$5.75

as soon as the Government announces what prices it will pay for its own uses and for the Allies as well. In some cases, jobbers in order to reduce their stocks are offering material at considerably less than mill prices and for prompt shipment. Most of the new business being placed is coming from the Government and at prices from $20 to $40 per ton less than are being paid on the small amount of business being placed by domestic consumers. The fixing of the price of $2 per ton for soft coal at the mine is taken to mean that probably the price of furnace coke will not be above $5 per ton, and possibly less. The steel market is simply marking time and will continue to do so until the situation has cleared up and the Government steel prices are known. The mills are still filled up on orders on practically everything for the remainder of this year, but with a heavy cut in prices, cancellations would probably come rapidly and disturb rolling schedules that are now thought to be secure over the rest of this year. It is hoped that the Government will announce its prices not later than Sept. 1, and as soon as this is done, a very quick readjustment of market values to a lower basis is pretty sure to follow.

Pig Iron.—There has been more activity in Bessemer iron in the last few days, but considerably lower prices are now quoted. At the same time, the amount of Bessemer iron available for the market is limited and efforts in the last few days to buy certain quantities at about $50 were unsuccessful, several furnaces that have a fair amount of Bessemer iron for quick shipment refusing to sell at less than $52 to $53 at furnace. We note authentic sales of Bessemer iron in the past few days as follows: 1000 tons at $50, 1500 tons at $50, 2500 tons at $50 and two lots of 1000 tons each at $52, Valley furnace, and all for September shipment except the 1500-ton lot, which is for delivery 500 tons per month starting September. We also note a sale of 5000 tons of basic iron at $48, Valley furnace, for prompt shipment. A sale of 1000 tons of malleable Bessemer iron is reported to have been made at $53, Valley furnace, but this price is now regarded as being slightly above the market. Very little is being done in foundry or mill iron, but the Westinghouse Electric & Mfg. Co. has an inquiry out for a considerable quantity of iron for prompt shipment to its foundry at Cleveland. It is figured out that, with a prospective shortage of ore this fall and winter and the tremendous output of steel being made by the mills, there will be a shortage in the supply of Bessemer and basic iron and that present prices may possibly be maintained or even higher prices rule later on. Some eastern basic iron has been sold for delivery in the Pittsburgh district at slightly less than $47 delivered. This is having the effect of depressing the price of local basic iron, as the demand is not very active. One lot of 2500 tons has been sold in which the phosphorus ran 0.50 to 0.60, the buyer applying the iron on a contract with a local consumer.

We now quote as follows: Standard Bessemer iron, $50 to $52; basic, $48; No. 2 foundry, $52; malleable Bessemer, $52 to $53; and gray forge, $46 to $47, all at Valley furnace. The freight rate for delivery in the Pittsburgh and Cleveland districts from valley furnaces is 95c. per ton.

Steel Rails.—Most of the 20,000 tons of 25-lb. rails for portable tracks to be laid in France have now been placed, and there is another order in the market for 1000 to 3000 tons of 35-lb. rails for the same railroad. New buying of light rails by domestic users is quiet and no domestic orders are being placed for standard sections. Prices on new light rails and standard sections are given on page 515.

Ferroalloys.—The new demand for ferromanganese and other ferroalloys is quiet, consumers being well covered over the remainder of this year, and some for first half of next year. It is said that a number of consumers of 50 per cent ferrosilicon have covered their needs for all of next year on the basis of $130 delivered.

This price is being charged by the leading producer at Niagara Falls. Small lots of 50 per cent ferrosilicon are being sold for prompt shipment at about $400; for first quarter of next year, $375, and for first half of next year, $350, delivered. We quote 18 to 22 per cent spiegeleisen at about $75 delivered, this price being none too firm. The new demand for Bessemer ferrosilicon and silvery iron is quiet, as consumers are covered ahead for some time.

We quote 9 per cent Bessemer ferrosilicon at $89, 10 per cent $90, 11 per cent $95, 12 per cent $100, 13 per cent $105, 14 per cent $115, 15 per cent $125, and 16 per cent $135. We now quote 7 per cent silvery iron at $84 to $89, 8 per cent $85 to $90, 9 per cent $86 to $91, 10 per cent $87 to $92, 11 and 12 per cent $88 to $93. All f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having a uniform freight rate of $2 per gross ton for delivery in the Pittsburgh district.

Structural Material.—The new inquiry is very quiet, but local fabricators are not bidding actively on new work, as they are filled up for some months ahead. The American Bridge Co. is fabricating 10,000 tons of structural steel for new steel buildings for the ship building plant to be built by the Federal Ship Building Co., at Hackensack Meadows, New Jersey. The contract of the McClintic-Marshall Co., for steel for extensions to sheet mill buildings of the Whitaker-Glessner Co. of Wheeling, W. Va., was for 1500 to 3000 tons instead of 15,000 to 20,000 tons as incorrectly given in this report last week, due to a telegraphic error. As noted last week, prices on beams and channels are easier, ranging from 4c. to 4.50c. at mill, depending on the quantity and delivery wanted.

Plates.—Of the recent order for 2997 narrow gage cars placed by the Government for shipment to France, the Pressed Steel Car Co. took 500 freight and 100 truck cars and the Standard Steel Car Co., 666 box and 165 gondolas. These will be built as fast as they can be turned out, and shipped as soon as completed. As noted last week, prices on plates are easier, and the supply available for prompt shipment over the next 60 to 90 days is larger than for some time. We now quote one quarter inch and heavier sheared plates at 8c. to 10c. at mill, and small lots from warehouse bring 12c. and higher, depending on the quantity and the sizes.

Sheets.—Very little new domestic business is being placed, but prices are holding fairly firm. Most of the sheet mills have their output sold up for the remainder of this year, and are refusing to quote on new inquiries. One mill recently turned down an order for No. 28 gage Bessemer sheets at 9c. and galvanized at 10.50c., stating it has no sheets to sell for this year. Prices on the different grades of sheets to the domestic consumers are showing signs of weakness, sales of Bessemer black, No. 28 gage, having been made as low as 8c. at mill. Prices on the different grades of sheets are given on page 515.

Billets and Sheet Bars.—Offerings of semi-finished steel in the forms of billets and sheet bars are still plentiful, and in fact more steel is being offered in the open market just now than it will absorb readily. We note two sales of 1000 tons each of 4 x 4 in. open-hearth billets at $75 per gross ton, f.o.b. Pittsburgh. It is probable also that sheet bars could readily be had at $80, Pittsburgh, or less. Prices on forging billets have declined sharply, and it is believed $100, Pittsburgh, could easily be done on ordinary carbon forging billets for prompt shipment. There is no new inquiry for forging billets and no sales have been made for some time.

We now quote soft Bessemer and open hearth billets at $75 and soft Bessemer and open hearth sheet bars at $80 or less, maker's mill, Pittsburgh or Youngstown. We quote forging billets at nominally $100 to $110 per ton for ordinary sizes and carbons, f.o.b. Pittsburgh.

Tin Plate.—An important meeting of tin plate manufacturers was held at Washington, D. C., on Friday, Aug. 24, on request of Food Administrator Hoover. Every tin plate concern in the country was represented, and the meeting was held for the purpose of defining clearly the present situation in the plate trade as regards the prospect of the tin plate makers to meet the enormous demand that will come late this year and over all of next year, for coke plate for packing perishable foods. The Government's present figures show there will be at the end of this year a shortage of about 2,000,000 base boxes of coke and terne plate. The demand for coke plate for packing perishable foods is getting larger very fast, particularly for plate for canning condensed milk. It was decided at this meeting to limit sales of tin plate to a still larger extent to packers of non-perishable foods and other products. It was further decided not to make any sales of tin plate for 1918 until October at least. The question of the tin plate makers selling their product for a year ahead was also discussed, and it is likely this custom may again be adopted, but the manufacturers do not favor it. The export inquiry for tin plate is heavy, notably from Italy. It is likely that very soon the Government will declare an embargo on tin plate for export subject to export license. It is likely the shortage in tin plate for 1918 will be larger than this year. Only one new tin plate mill is now being built, this being an 8-mill plant of the Liberty Steel Co., at Warren, Ohio, and it will not be a factor in the trade before February or March next year. Some mills report that they were working 17 turns per week, three turns per day up to and including Friday, and two turns on Saturday. As a result of this meeting, a general meeting of all tin plate manufacturers is to be held in the William Penn Hotel on Friday, August 31, for the purpose of discussing among themselves the questions that came up at the Washington meeting last week. The current demand for tin plate is quiet, and only small sales of primes from stock are being made at prices ranging all the way from $11 to $14 and $16 per base box. Some mills are supplying plate from stock on contracts. It was also decided at the Washington meeting that sales of tin plate to jobbers should be stopped, except where the jobber can show that he is going to furnish the plate to packers of perishable foods. Prices in effect on terne plate are given on page 515.

Iron and Steel Bars.—The new demand for both iron and steel bars is not nearly so active as a month ago, and mills are catching up to some extent on back orders. Jobbers are not inclined to carry large stocks, as prices are showing an easier tendency and mills are able to make more prompt deliveries than for some time. The Government is taking very large quantities of steel bars, also some iron bars on the basis of 2.50c. at mill, fixed some months ago. Specifications against contracts from implement makers are fairly heavy, but from other consumers are slow. Mill prices in carloads and larger lots on iron and steel bars to the domestic trade are given on page 515.

Hoops and Bands.—The current demand is only for small lots for prompt shipment. Large consumers are covered over the remainder of this year on contracts and specifications are fairly active. We quote steel hoops in small lots for prompt shipment at 5c. to 5.50c. and steel bands 5c. to 5.25c. Extras on the latter as per the steel bar card.

Muck Bar.—The Kittanning Steel & Iron Co., Kittanning, Pa., is the only maker of muck bar in this district. We quote best grades, made from all pig iron at $85 to $90 per gross ton, Pittsburgh.

Wire Rods.—There is a fairly active demand for wire rods in small lots, and prices are holding firm. We note recent sales of probably 400 to 500 tons of soft Bessemer open-hearth rods at $90 to $95, maker's mill, high carbon rods made from special steels, range from $110 to $115, maker's mill. We note a sale of 200 tons of 0.60 per cent carbon and higher at about $115, maker's mill. Prices on rods are given in detail on page 515.

Wire Products.—There is no change in the local situation in the wire and wire nail trades. The new demand is very dull and specifications are quiet. It is said the American Steel & Wire Co. is making quicker deliveries on wire and wire nails to the trade than for some months, and the fact that this company is selling nails and wire at $16 per ton less than the prices quoted by the other mills means that it is taking most of the new business being placed. Jobbers are inclined to carry as

low stocks of nails and wire as possible, and believe that a readjustment in the prices to a lower basis may come in the near future. It is a fact that very little business was placed in wire nails at $4 and bright basic wire at $4.05, the independent mills working largely on contracts taken some time ago on the basis of $3.50 for wire nails and $3.55 for bright basic wire. Prices quoted on wire and wire nails by the independent mills, but which are now largely nominal, prices of the American Steel & Wire Co., being $16 per ton less, are given on page 515.

Shafting.—Makers report the new demand is dull, especially from the automobile trade. The Government is placing fairly large contracts for shafting to go into light navy shells, fuses and nose pieces, and it is reliably stated that from 35 to 40 per cent of the present entire output of shafting is going to the Government either on direct or indirect orders. There is very little export business being placed and specifications are quiet. It is very evident the consuming trade is looking for lower prices on shafting in the near future. Discounts remain at 10 and 5 per cent off list, depending on the order.

Railroad Spikes and Track Bolts.—A local maker took 15,000 kegs of the recent order for 53,000 kegs of spikes placed by the Government for the American Railroad to be built in France, and another local maker took 7000 to 8000 kegs. Through the ship builders, the Government is placing heavy orders for boat spikes. These orders are placed in ship units, each unit requiring about 225 kegs of boat spikes. One local maker has taken contracts as low as two units, and as high as 10 units. The general demand for railroad spikes is dull, and specifications from the railroads on contracts placed some time ago are quiet. Several makers of boat spikes are not quoting to the general trade, but are conserving their output for Government needs. Prices on railroad spikes and track bolts are given in detail on page 515.

Nuts and Bolts.—The new demand is quiet, and specifications are only fairly active while prices are firm, it is the belief of consumers that lower prices on nuts and bolts in the near future are likely. It is stated that the Nut, Bolt and Rivet Institute, organized on April 28 last on the Eddy plan, is working out nicely. Recently quite a number of makers of nuts, bolts and rivets became members of the institute. Nothing is being done on export shipments. Discounts now in effect to the large trade are given on page 515.

Cold Rolled Strip Steel.—Specifications against contracts have fallen off a good deal and the new demand is quiet. Consumers believe that prices on cold rolled strip steel may be lower before long, as soon as the Government announces prices it will pay for steel. Manufacturers are still insistent that on any new contracts placed, specifications must be in their hands not later than Sept. 30. There have been some cancellations in contracts, due to expected lower prices.

On contracts, mills are quoting 9c. at mill, but on small current orders prices range from 10c. up to 12c. at mill. Terms are 30 days, less 2 per cent off for cash in 10 days when sold in quantities of 300 lb. or more.

Rivets.—A recent inquiry from the Government for 3500 tons of rivets for the navy department has not yet been placed, but will likely be divided among makers of rivets within the next few days. On the inquiry from the Emergency Fleet Corporation for 40,000 tons of rivets, estimated to be needed for the first 500 ships to be built all of this quantity has been placed by the ship contractors direct and the remainder is expected to be given out within a short time. It is said the price being paid by the Government for rivets is very satisfactory to the manufacturers and is close to prices being charged to domestic consumers. The current demand for rivets is fair, and specifications against contracts are reported active. We quote structural rivets at $5.25 and cone head boiler rivets at $5.35 per 100 pounds f.o.b. Pittsburgh, for delivery over the remainder of this year.

Wrought Pipe.—As yet the Manufacturers' Light & Heat Co. has not placed any part of the contract for line pipe and tubular products, details of which were given in this report last week. The Government is still a very heavy buyer of pipe and other tubular products and all its orders have preference of the mills over all others, and are shipped out within 48 to 72 hours after receipt. As noted in this report many times before, pipe mills are filled up on lap weld iron and steel pipe over the remainder of this year, and on butt weld pipe, demands for which are quite heavy, can make shipments in eight to 10 weeks from date of order. Discounts on steel pipe being quoted by most of the independent mills, the prices of the National Tube Co. being much lower and also discounts on iron pipe as adopted by leading makers on July 1 are given on page 515.

Boiler Tubes.—Mills rolling iron and steel boiler tubes are filled up from six months or a year ahead and some orders for boiler tubes for shipbuilding programs have been placed by the Government for delivery late in 1918 and early 1919. Very heavy premiums in prices are being paid for fairly prompt deliveries on iron and steel tubes, and also on oil well supplies. The high prices ruling and the scarcity of oil country goods have stopped a good deal of prospective drilling. Nominal discounts on iron and steel tubes, giving prices that are much lower than those actually ruling, are given on page 515.

Coke.—For a week, the car supply in the coke region has been close to 100 per cent of car requisition, this being due to the fact that the coke operators on account of shortage of labor are not able to produce anything like their normal output of coke. There is a great shortage of men, both at the mines and at the ovens, and some producers of coke are not making more than 60 to 70 per cent. Prices of furnace coke have eased off in the past week, and on Monday there were sales of best grades at $12.50 and on Tuesday at $12.50 per net ton at oven. To-day (Wednesday) the market is still softer and is quoted at $12. The fact that the Government has fixed the price of soft coal at $2 at mine leads to the belief that the price of blast furnace coke will be fixed by the Government at possibly $4.50, or not above $5 per net ton at oven. It is figured that it takes three tons of coal to make two tons of coke, so that the cost of the coal would be $3 and 60c. is figured on labor to put the coal into coke. A profit of 40c. per net ton on coke is figured by consumers as being eminently fair to coke producers. The Government price of coke is expected to come out next week. We now quote best grades of blast furnace coke for prompt shipment at $12 to $12.25 and on 72-hr. foundry coke at $13.50 to $14 per net ton at oven for prompt shipment. The *Connellsville Courier* gives the output of coke for the week ending Aug. 18 as 350,954 tons, an increase over the previous week of 9001 tons.

Old Material.—The local scrap market is looking better, prices on some grades being higher, notably on heavy steel melting scrap, borings and turnings. On some other grades, prices have shown no change, but the tone of the whole market is stronger. What has helped the market is the fact that the Carnegie Steel Co. last week purchased upwards of 25,000 tons of selected heavy steel scrap for which it is said to have paid close to $38 per ton for most of it, delivered at Munhall, Pa. There has also been fair buying of borings and turnings, both for open-hearth use and also for blast furnace practice. To-day heavy steel melting scrap is quoted firm at $34 to $35 for delivery in the Pittsburgh district and as high as $37 to $38 for delivery at Massillon, Ohio, and several other scrap consuming points. A sale of 500 tons of borings to apply on a contract has been made at $23, delivered, Pittsburgh. The railroad embargo is still on, but dealers who want cars for loading scrap to consumers who will take the scrap in and unload the cars promptly have very little trouble in getting cars. Dealers figure that shortage in ore this fall and winter is going to keep down the output of pig iron and keep prices high, and for this reason they expect to get better prices for their scrap than are now ruling. We note sales of 500 tons of borings at $23, 1200 tons at $22.30 and about 1500 tons of low phosphorus melting stock at $42 up to $45, delivered, the higher price having been paid for billet

and bloom shearings. Dealers now quote for delivery in the Pittsburgh and other points that take Pittsburgh freight rates per gross ton as follows:

Dealers quote for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$34.00 to $35.00
No. 1 foundry cast	30.00 to 31.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	38.00 to 40.00
Hydraulic compressed sheet scrap	25.00 to 26.00
Bundled sheet scrap, sides and ends, f.o.b. consumers' mill, Pittsburgh district	23.00 to 24.00
Bundled sheet stamping scrap	21.00 to 22.00
No. 1 railroad malleable stock	26.00 to 27.00
Railroad grate bars	18.00 to 19.00
Low phosphorus melting stock	42.00 to 45.00
Iron car axles	45.00 to 46.00
Steel car axles	45.00 to 46.00
Locomotive axles, steel	52.00 to 53.00
No. 1 busheling scrap	24.00 to 25.00
Machine-shop turnings	21.00 to 22.00
Cast iron wheels	31.00 to 32.00
Rolled steel wheels	36.00 to 37.00
*Sheet bar crop ends	41.00 to 42.00
Cast iron borings	22.00 to 23.00
No. 1 railroad wrought scrap	32.00 to 33.00
Heavy steel axle turnings	23.00 to 24.00
Heavy breakable cast scrap	24.00 to 25.00

*Shipping point.

Chicago

CHICAGO, Aug. 27.

It is admitted that the embargo on the export of plates has weakened the market in that product, especially where quick shipments are concerned, but it is not learned that less than 10c. has been done since the embargo became effective. By some steel men the embargo is regarded as the vital point in the present situation, as they want some of the export business and they believe the capacity of the country is sufficient to care for all, if the Government will indicate who should be served. They believe also that the Japanese situation can be adjusted by diplomatic means in a satisfactory manner. Some mills managed to fill their obligations up to the time the embargo became effective. The leading producer continues engaged mainly with Government orders. The Emergency Fleet Corporation has placed with a local mill 15,000 tons of plates and shapes to enter composite freight ships to be built by the Kelly-Atkinson Construction Co. The steel will be fabricated at Waukesha, Wis., and the ships assembled on the Mobile River. The question of coal supply is concerning some mills at lower Lake Michigan, relief being hoped for through priority being given to lake shipments. The general situation in iron and steel is unchanged, quiet being the rule, except for specialties. The Great Northern is seeking to buy 3000 kegs of spikes for late 1918 delivery. Government orders for shells and army supplies are a little more numerous in this section, as disclosed by the machinery trade reports. A Minnesota company has received an order for 2000 6-in. shells. The producers of pig iron are badly hampered by poor coke and insufficient quantities. Consumers have not yet resumed buying scrap in any considerable quantities, and the dealers continue the heaviest buyers to enable them to fulfil their commitments, to do which they are paying more than will melters.

Pig Iron.—So far as new business goes the market is at a standstill, except for occasional spot lots of a carload or two. In every direction prices are unchanged and there is no inquiry to report. Efforts to be bent toward getting shipments to consumers, and with the Southern producers in particular deliveries are proceeding slowly, the furnaces seemingly being unable to make good on their commitments. They lack the steady flow of supplies essential to maximum and proper operation, and to the inadequate supply of coke is added the further difficulties that come from poor coke. No further cutting of prices for resale lots is reported. It is doubtful whether buyers will become active before there is some move by the Government on the question of prices. Meanwhile melting is unquestionably going on at a liberal rate. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 1 to 4	$58.00
Lake Superior charcoal, Nos. 5 and 6, Scotch and No. 1 soft or special	60.50
Northern coke foundry, No. 1	55.50
Northern coke foundry, No. 2	55.00
Northern coke foundry, No. 3	54.50
Northern high-phosphorus foundry	55.00
Southern coke No. 1 f'dry and 1 soft	55.00
Southern coke No. 2 f'dry and 2 soft	54.00
Malleable Bessemer	55.00
Basic	55.00
Low-phosphorus	$90.00 to 93.00
Silvery, 8 per cent	82.75 to 83.00

Ferroalloys.—Since the activity reported a week ago there has been little or no activity in 80 per cent ferromanganese, the quotations for which are unchanged at $400 for delivery this year, $375 for the first quarter and $350 for the second quarter. Ten per cent Bessemer ferrosilicon is held at about $100, Jackson County, Ohio.

Plates.—It is generally admitted that the market for plates has been weakened by the export embargo on this material, especially for spot shipment, but sellers continue to quote 10c., Pittsburgh, or 10.189c., Chicago, and none admits he has sold under this level. Local producers managed to fill their obligations to Japanese buyers up to Aug. 15, when the embargo became effective but have, of course, large orders not filled. If makers were inclined to accept what are in reality options, they could fill their order books with contracts to deliver thousands of tons as soon as the embargo is lifted. The embargo is on material ⅛ in. and over, and so includes heavy sheets. A local mill has arranged with the Government, on all except price, for furnishing 15,000 tons of plates and shapes to be used by the Kelly-Atkinson Construction Co, Chicago, for the building of composite vessels in the South. The material will be fabricated at Waukesha, Wis.

For Chicago delivery out of stocks jobbers quote 10c.

Structural Material.—But little private fabricated work is coming out, and that reported is small. The Government is the chief buyer. For the small lots which some mills have to offer, they quote 6.189c., Chicago. The Government is getting figures on a second lot of 10,000 freight cars for France, but the opinion is held in some quarters that they will not be placed right away. The lot would require about 40,000 tons of steel. The Whiting Foundry & Equipment Co., has placed with a seller not reported, 112 tons of girders for delivery at Harvey, Ill. The Elgin, Joliet & Eastern Railway Co. has placed with the American Bridge Co., 405 tons of miscellaneous steel work to be erected at Joliet, Ill.

Jobbers quote 5c. for material out of Chicago warehouses. The price was erroneously reported last week as 6c.

Bars.—Mild steel bars are quoted at 4.50c. to 5c., Pittsburgh, or 4.689c. to 5.189c., Chicago, but not much is being done. It can be repeated that the agricultural implement interests would like to buy, but prefer to await assurance as to the future stability of prices. Rail carbon bars are quoted at 4.25c. to 4.50c., Chicago, and tend toward quiet. Iron bars are held at 4.50c., Chicago.

We quote prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c. to 5c.; reinforcing bars, 4.50c., base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Wire Products.—Some makers report an easier trend so far as deliveries go, and one independent maker of nails and like products is soliciting orders from jobbers and retailers. It offers nails in single keg lots to carloads at wholesale prices. The leading interest continues to fill specifications on the basis $3.20 for wire nails. While it finds some falling off in demand here or there, the aggregate is fully up to the mark, inasmuch as demand from some directions has increased. In view of the poor state of the building trade, the question is asked—Where do all the nails go? We quote as follows, on the basis of $4., Pittsburgh, for nails (the quotation of the independent makers) to jobbers, per 100 lb.:

Plain fence wire, Nos. 6 to 9, base, $4.189; wire nails, $4.189; painted barb wire, $4.339; galvanized barb wire,

$5.039; polished staples, $4.339; galvanized staples, $5.039; all Chicago, carload lots.

Sheets.—The representative of an Ohio mill is offering galvanized sheets at 10.75c., Pittsburgh, or 10.939c., Chicago. Makers of black and blue annealed, that is the few who are offering sheets, quote 8.939c. to 9.189c. for both No. 10 blue annealed and No. 28 black. They find Government inquiry heavier than at any time heretofore, sheets being wanted for stoves, ranges, baking pans, etc. Jobbers' quotations are unchanged. An Eastern mill has booked over 300 tons of black sheets at 11c. Pittsburgh.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 10c.; No. 28 black, 10c., and No. 28 galvanized, 11.50c.

Old Material.—The situation is a peculiar one for the reason that the dealers continue the chief buyers, and because they are willing to pay more than consumers, when they lack material wherewith to complete shipments against orders they took at high prices some time ago. Dealers have paid $32 for carwheels, and up to $43 for rerolling rails in the past few days. So far as the mills are concerned, the market is almost as quiet as it was two weeks ago, but the tone is undoubtedly better. Here and there a mill is short of scrap and has bought to fill in, one mill buying heavy melting steel at $32. Shipments are falling off, indicating that orders are nearing fulfillment, and it is believed a new buying movement must set in shortly. When this occurs, it will straighten out a situation that, to say the least, is confusing, but the mills will hold off as long as they can, waiting for the Government to show its hand in the matter of price fixing. At the same time, if they run short, they must buy. Lists of moderate size have been issued by the Santa Fé, C., B. & Q. and the Rock Island railroads, the last-named offering 1800 tons of rerollers. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$44.50 to $45.00
Relaying rails	50.00 to 55.00
Old carwheels	31.50 to 32.50
Old steel rails, rerolling	41.00 to 42.00
Old steel rails, less than 3 ft.	40.00 to 41.00
Heavy melting steel scrap	31.00 to 32.00
Frogs, switches and guards, cut apart	31.00 to 32.00
Shoveling steel	30.00 to 31.00
Steel axle turnings	22.00 to 23.00

Per Net Ton

Iron angles and splice bars	$38.00 to $39.00
Iron arch bars and transoms	41.00 to 42.00
Steel angle bars	31.00 to 32.00
Iron car axles	41.00 to 42.00
Steel car axles	41.00 to 42.00
No. 1 railroad wrought	34.00 to 35.00
No. 2 railroad wrought	31.00 to 32.00
Cut forge	31.00 to 32.00
Pipes and flues	22.50 to 23.50
No. 1 busheling	25.50 to 26.50
No. 2 busheling	17.50 to 18.50
Steel knuckles and couplers	35.00 to 36.00
Steel springs	37.00 to 39.00
No. 1 boilers, cut to sheets and rings	20.00 to 21.00
Boiler punchings	31.00 to 32.00
Locomotive tires, smooth	40.00 to 41.00
Machine-shop turnings	17.00 to 18.00
Cast borings	16.00 to 17.00
No. 1 cast scrap	24.00 to 25.00
Stove plate and light cast scrap	17.50 to 18.00
Grate bars	17.50 to 18.50
Brake shoes	19.00 to 19.50
Railroad malleable	30.50 to 31.50
Agricultural malleable	23.75 to 24.75
Country mixed scrap	18.00 to 19.00

Rails and Track Supplies.—Business in rails has been largely confined to the Government purchases of light rails wanted for use in France, although there also is inquiry for small lots of heavier rails for domestic industrial purposes, the last lots of which brought about $90. Light rails for industrial use are quoted at $95 to $100 by an Eastern mill. The railroads are in the market for miscellaneous lots of brake-shoe keys, knuckle pins and like material, amounting in the aggregate to a fair-sized tonnage. The Great Northern is inquiring for 3000 kegs of spikes for late 1918 delivery. The quotations of the leading producer, with the exception of tie-plates, follow, most of the prices being nominal:

Standard railroad spikes, 4.25c. base; small spikes, 4.50c., base; track bolts with square nuts, 5.25c., all in carloads, Chicago; tie plates, $70 to $90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base; open hearth, $40; light rails, 25 to 45 lb., $65; 16 to 20 lb., $66; 12 lb., $67; 8 lb., $68; angle bars, 3.25c., base.

Bolts and Nuts.—New business remains quiet. For prices and freight rates, see finished iron and steel, f.o.b. Pittsburgh, page 515. Jobbers' prices are unchanged.

Store prices are as follows: Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to ⅞ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to ⅞ x 6 in., 40-2½; larger sizes, 30-5; hot pressed nuts, square, $3, and hexagon $3 off per 100 lb.; lag screws, 50 per cent off.

Cast-Iron Pipe.—Government buying is letting up, but some is yet current. No municipal lettings are reported. Quotations are unchanged. The high level of prices is held responsible for the inactivity, but it is felt that if the present situation lasts much longer, municipalities must enter the market.

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., $68.50; 6 in. and larger, $65.50, with $1 extra for class A water pipe and gas pipe.

Philadelphia

PHILADELPHIA, Aug. 27.

Definite ideas of the scope which Government work has taken among the steel and iron plants of the eastern Pennsylvania district have been given by the Midvale Steel Co. through Henry D. Booth, general superintendent, who appeared to-day before the Second Appeal Board and requested exemption from military draft of the 3500 eligible men among the Midvale force of 11,000 workers. Mr. Booth told of the Navy Department's desire to build 150 more torpedo boat destroyers and of the plan to have Midvale concentrate largely on guns for these destroyers and for the emergency merchant vessels. It is understood that Midvale will supply 75 guns monthly beginning Oct. 1, and that beginning Jan. 1 the number per month will be increased by 50 or more. Some reports have it that approximately 90 per cent of Midvale's forging capacity is to be devoted to the Government, and it is understood that the new Tacony Ordnance Corporation will be supplied, in part at least, with forging billets from Midvale. In addition to the ordnance requirements, more mill capacity in this district has been taken by orders from the Emergency Fleet Corporation for ship materials to be used in the new yards at Hog Island and elsewhere. While the preliminary orders do not involve any large tonnage, it is understood that heavy amounts are to be placed with mills here in the near future.

Pig Iron.—Reports of a decline in the Pittsburgh market formed the feature of a colorless day here, but accounts of basic selling in Pittsburgh at very low prices brought no sympathetic action. In the absence of fuller reports, local houses were inclined to the opinion that the iron so offered was re-sale material. "We can be prepared to hear of prices like this from time to time on lots of re-sale iron," said the head of one house, "but this does not affect fundamental conditions. As long as iron continues to be used at the present rate and production is no greater than it has been, iron will remain firm, all other conditions being equal." But while iron has remained firm, it has been decidedly dull. New business has been confined almost entirely to small lots for filling in, and this trading has been confined to the foundry grades. Virginia iron has been stagnant, and the steel-making grades remain on a nominal basis, no transactions in basic or standard low phosphorus having been reported. The sole inquiry of moment reported this week is one of 6000 tons for the Lenoir Car Works, Lenoir, Tenn. Six classifications are given, each of a special analysis, and apparently the inquiry excited little interest here. Largely nominal prices on the standard brands, prompt delivery in buyers' yards, are:

Eastern Penna. No. 2 X foundry	$53.00 to $55.00
Eastern Penna. No. 2 plain	52.50 to 54.50
Virginia No. 2 X foundry	54.25 to 55.25
Virginia No. 2 plain	53.75 to 54.75
Basic	50.00 to 52.00
Standard low phosphorus	90.00

Coke.—Spot fuel was quoted to-day at $13.50 to $14.50, with supplies scanty. It is understood here that the Government contemplates coke purchases on its own account at prices said to approximate $3.50 for foundry and $3 for furnace. There was some disposition to re-

gard these figures as the probable basis of the price to be set for the general public, and there was more or less speculation as to the effect such prices would have. It was given out in the fuel markets here to-day that while $2 net at the mine, as fixed by the Government, is the price for run-of-mine bituminous, there have been no actual sales at that price, as the mines have been confining themselves to shipping tonnage against contracts.

Billets.—Semi-finished materials available for the general buyer are rare articles among the Eastern mills, their own requirements and those of established customers with contracts taking the output. On the basis of the last large sales the price of re-rolling open-hearth billets is $110, with $125 for forging billets. It is, however, significant that a small tonnage of open-hearth slabs has been sold here at $85 during the week.

Sheets.—The situation in sheets virtually duplicates that in billets, mills being unable to consider any new trade and basing all transactions on 8¾c. for No. 10 blue annealed in the case of occasional small orders accepted from old customers.

Structural Material.—Perhaps no better idea of conditions can be given than to say that inquiries for odd lots in quantities of eight or 10 tons constitute the "new business" nowadays, with anywhere from 5c. to 6c., Pittsburgh, being asked, though one interest has been getting 6.10c., mill, for anything it had to spare. There are no inquiries of moment in prospect.

Plates.—Pressure on the plate mills is still strong, though the embargo on export business has had the effect of hastening work on domestic orders, so that, in some cases, domestic lots are being rolled in August instead of in September, as the original schedule contemplated. With the large makers, the closing of the export trade has had no other effect to date than this, but a continuance of the embargo to Japan, for example, is likely to bring about easier prices for the output of small producers shut off from their expected foreign trade. At least this is a view expressed here and it has taken weight in view of the fact that there is an offering in this market of plates yet to be rolled, in quantities up to 500 tons a month, at 9½c., delivered. These plates are ¼ in., ⅜ in. and ½ in., 10 to 12 ft. long and up to 45 in. wide. Meanwhile, large makers report turning down old customers owing to inability to meet the combined demands of the Government and private buyers. One mill reports declining 6000 tons of tank for which 10c., mill, was offered for first quarter shipment, and refusing to consider an inquiry of 20,000 tons of structural plates for export. Another inquiry, just presented, is for 16,000 tons of Lloyds hull steel. The large makers maintain prices unchanged, save as affected by the recent readjustment of Pittsburgh freight rates, the bases being 10.185c., Philadelphia, for tank and 12½c., mill, for boat steel.

Iron and Steel Bars.—Satisfactory specifications on soft steel bar contracts at 4½c., Pittsburgh, are reported by one large maker, who reports no business outside of contracts. Other ideas of price run around 5c. or 5½c., with no business done. Specifications on bar iron at 4¾c., Pittsburgh, are likewise reported to be heavy this week by one interest, with another busy maker holding at 5c., Pittsburgh, for carload lots as the bottom.

Ferroalloys.—Ferromanganese is stronger, if anything, though the price remains at $400 for delivery over the remainder of the year, with $375 for first quarter and $350 for second quarter, though $375 is now being heard for the latter delivery. Spiegeleisen is holding at previously reported prices, ranging around $85, furnace.

Old Material.—Sales of heavy melting steel in Pittsburgh last week had the effect of buoying up the local market, but the revival was short-lived and the trade is again quiet, with virtually the whole price list nominal. The embargo is having the effect of delaying shipments, and some houses report being anywhere from 10 days to two weeks behind. Uncertainty over the Government price-fixing program has had the effect of removing for the present any bullish feeling there may have been, and the outlook for the immediate future indicates rather spotty business. Prices per gross ton delivered in the eastern Pennsylvania district are about as follows:

No. 1 heavy melting steel	$32.50 to $33.50
Steel rails, rerolling	43.00 to 45.00
Low phosphorus heavy melting	40.00 to 43.00
Old iron rails	45.00 to 47.50
Old carwheels	34.00 to 35.00
No. 1 railroad wrought	45.00 to 47.50
No. 1 forge fire	22.00 to 23.00
Bundled sheets	22.00 to 23.00
No. 2 busheling	16.00 to 17.00
Machine shop turnings (for blast furnace use)	19.00 to 20.00
Machine shop turnings (for rolling mill use)	21.00 to 22.00
Cast borings (for blast furnace use)	19.00 to 20.00
Cast borings (clean)	22.00 to 23.00
No. 1 cast	33.00 to 34.00
Grate bars	20.00 to 21.00
Stove plate	21.00 to 22.00
Railroad malleable	32.50 to 35.00
Wrought iron and soft steel pipe (new specifications)	29.00 to 31.00

Cleveland

CLEVELAND, Aug. 28.

Iron Ore.—The work of cutting down the iron ore requirements for the season for inland furnaces is about completed, and it is believed that by following the plan of adjusting shipments to consumers so that none will get more ore than actually needed all will be furnished with sufficient for actual needs. Lake shipments are very heavy and the August movement may break the July record. The car supply at Lake Erie docks is better, doubtless to some extent because of the preference now given by direction of the Government to coal shipments for the Northwest, making more cars available for ore. The coal movement is very heavy, shipments to the Northwest last week having amounted to 977,511 tons. We quote ore prices as follows, delivered lower Lake ports: Old range Bessemer, $5.95; Mesaba Bessemer, $5.70; old range non-Bessemer, $5.20; Mesaba non-Bessemer, $5.05.

Pig Iron.—The market continues quiet. There is not enough business coming out to test prices, and producers are disposed for the present to maintain recent quotations. Many consumers, who have not yet purchased for their first half of next year's requirements are awaiting possible action by the Government regulating prices. Lake furnaces continue to quote foundry iron at $55, at furnace, for No. 2, in spite of the fact that this grade is being offered at $53 in the Valley, and several recent orders placed by Cleveland and nearby consumers have gone to Valley furnaces because of the lower prices. A foundry near Cleveland has purchased 3000 tons of foundry iron for the last quarter and first half at about $54 for No. 2. The Westinghouse Electric & Mfg. Co. came into the market during the week for additional iron for early shipment for its Cleveland plant, and is understood to have secured at least a portion of its required tonnage from a Valley furnace. Several small lot sales of off-grade basic iron, aggregating 1400 tons, are reported at $47 and higher. Quotations on Virginia iron are unchanged at $51 for furnace, or $54.20 delivered, for No. 2, at which a small additional tonnage has been sold. Southern iron is inactive and is nominally $50, Birmingham, for No. 2 for this year's delivery, with a range from $45 to $50 for the first half. The foundry melt continues very heavy and foundries are crowding furnaces for deliveries. We quote, delivered Cleveland, as follows:

Bessemer	$50.95 to $53.95
Basic	49.95 to 52.95
Northern No. 2 foundry	53.95 to 55.30
Southern No. 2 foundry	51.00 to 54.00
Gray forge	48.95 to 50.95
Ohio silvery, 8 per cent silicon	88.62
Standard low phos. Valley furnace	85.00

Coke.—The market is inactive and weaker. Standard makes of Connellsville foundry coke are quoted at $13.50 to $14 per net ton at oven for prompt shipment. Considerable inquiry is coming from far-distant points, having freight rates that are prohibited for the shipment of Connellsville coke.

Finished Iron and Steel.—Business in finished lines is quiet, new orders and inquiries being confined almost wholly to Government requirements. The order for fabricating the portable track for use by the Government in France has been placed with the Lakewood Engineering Co., Cleveland. This represents about 23,000 tons of 25-lb. rails. These rails have been divided among a number of independent mills. It is understood that an agreement has been reached under which additional portable track will not be purchased by France until our Government's requirements are partly supplied. In semi-finished steel we note the sale of a round lot sheet bars for the fourth quarter delivery at about $90. In structural lines deliveries have eased up owing to the small amount of new building work. An inquiry has come out for 2200 tons of steel bars for a new reinforced concrete viaduct in Akron. The plate market is quiet and local prices are unchanged at 9c. to 10c., Pittsburgh. Hard steel bars are not firm, being quoted at 4c. to 4.25c. at mill. Local mills quote bar iron at 4.50c. The sheet market is not active, many buyers holding up the placing of orders, pending possible action by the Government reducing prices. A Youngstown mill, which has been out of the market for some time, is offering this week a round tonnage of sheets at 8.50c. for No. 28 black and No. 10 blue annealed, and 10.50c. for No. 28 galvanized. Warehouse prices on steel bars now range from 4.50c. to 5c. and on structural material from 5c. to 5.25c. Warehouses quote plates in narrow sizes at from 7c. to 9c., and blue annealed sheets at 9.50c.

Bolts, Nuts and Rivets.—New orders and specifications for bolts, nuts and rivets have quieted down and little new inquiry is coming out at present. Rivets are unchanged at 5.25c., Pittsburgh, for structural and 5.35c. for boiler rivets for this year's delivery. Bolt and nut discounts are as follows, round lot buyers being allowed from 5 to 10 per cent discount from these prices:

Common carriage bolts, ⅝ x 6 in., smaller or shorter, rolled thread, 35 off; cut thread, 30 and 5, larger or longer, 20. Machine bolts, with h. p. nuts, ⅝ x 4 in., smaller or shorter, rolled thread, 40; cut thread, 35; larger and longer, 25. Lag bolts, cone point, 40. Square h. p. nuts, blank, $1.90 off list; tapped, $1.70 off list. Hexagon, h. p. nuts, blank, $1.70 off; tapped, $1.50 off. C. p. c. and t. hexagon nuts, all sizes, blank, $1.25 off; tapped, $1 off. Cold pressed semi-finished hexagon nuts, 50 and 5 off.

Old Material.—The market shows more life than for several weeks and has taken on a slightly firmer tone. This is apparently due to the fact that dealers look for an improvement in the demand during September when they expect the mills to come in the market. More scrap is being offered than for some time, but dealers are not trying to force sales by concessions. Practically all trading is between dealers who are still covering on old contracts. There is a wide spread in quotations on heavy melting steel which is about $2 a ton higher than a week ago. We note the sale of a 1000-ton lot to a dealer at $36 for Canton delivery. Busheling is somewhat firmer, 400 tons having sold at $27. Sales of cast scrap have been made at the same price. Borings and turnings are 50c. a ton higher. We quote, f.o.b. Cleveland, as follows:

	Per Gross Ton	
Steel rails	$32.00 to	$33.00
Steel rails, rerolling	44.50 to	45.50
Steel rails, under 3 ft.	37.00 to	38.00
Iron rails	42.50 to	43.50
Steel car axles	26.00 to	26.50
Heavy melting steel	34.00 to	36.00
Carwheels	30.50 to	31.50
Relaying rails, 50 lb. and over	49.50 to	54.50
Agricultural malleable	23.50 to	24.50
Railroad malleable	32.00 to	33.00
Light bundled sheet scrap	23.50 to	24.50
	Per Net Ton	
Iron car axles	$46.50 to	$47.00
Cast borings	18.00 to	18.50
Iron and steel turnings and drillings	17.50 to	18.00
No. 1 busheling	27.00 to	28.00
No. 1 railroad wrought	40.50 to	41.50
No. 1 cast	27.00 to	28.00
Railroad grate bars	21.00 to	22.00
Stove plate	20.50 to	21.50

E. N. Breitung & Co., conducting a business of ore mining with offices at Marquette, Mich., and Cleveland, announces that H. L. Kaufman has withdrawn from the partnership and that the business will be continued under the same firm name by Mary Kaufman and E. N. Breitung.

Cincinnati

CINCINNATI, Aug. 27.—(*By Wire*).

Pig Iron.—Offerings of Southern foundry iron for this year's shipment are being absorbed very slowly. Consumers are sticking to the policy of buying only a few carloads as urgently needed. Rumors are circulated that resale iron has been offered below the recent minimum quotation of $47 Birmingham, without bringing in any orders of consequence. The foundrymen are puzzled over the situation, and as long as the present uncertainty exists, they are not going to make any large purchases for future shipment. A constant stream of complaints is pouring in as to the slow shipment of iron from both southern and northern furnaces on old contracts. One excuse is the car shortage, but the main reason for these delays is the scarcity of iron. Several furnaces in the south suspended operations a few days during the present month, and two have blown out for repairs. In the Ironton district, one large producer has had more than the usual amount of hot weather trouble at one of its large furnaces, and it will probably close down for an overhauling within the next few days. A Northern Ohio melter bought last week approximately 2500 tons of mixed northern and southern foundry iron for shipment through the remainder of the year and into the first half of 1918. The northern foundry iron is reported to have brought $54, Ironton, but information is lacking as to the price for the southern iron. Ironton producers are quoting $55 for this year, but are unable to take on any business of consequence. The Ohio silvery irons are in fair demand, but the price schedule has not been maintained on future contract business. An inquiry from St. Louis calls for 500 tons of low phosphorous iron for this year's shipment. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, as follows:

Southern coke, No. 1 f'dry and 1 soft.	$51.40 to $52.40
Southern coke, No. 2 f'dry and 2 soft.	49.90 to 50.90
Southern coke, No. 3 foundry	49.40 to 50.40
Southern coke, No. 4 foundry	48.90 to 49.90
Southern gray forge	48.90 to 49.90
Ohio silvery, 8 per cent silicon	87.26 to 91.26
Southern Ohio coke, No. 1	56.26 to 57.26
Southern Ohio coke, No. 2	56.26 to 57.26
Southern Ohio coke, No. 3	55.26 to 56.26
Southern Ohio malleable Bessemer	56.26 to 57.26
Basic, Northern	56.26 to 57.26
Lake Superior charcoal	56.75 to 57.75

(*By Mail*)

Finished Material.—Mill business is slow as far as bars and structural material is concerned, chiefly due to the inability of the mills to make prompt shipments. The warehouse trade is holding up well, with reinforcing concrete bars and small structural shapes leading in the demand. Cold rolled shafting is in a little better demand and is quoted from jobbers' stocks at 15 per cent plus the list. Iron and steel bars are unchanged at 5c. from stock and 5.05c. for twisted steel bars. Machine bolts ⅜ x 4-in. and smaller are quoted at 40 per cent discount; larger and longer, 30 per cent discount. Plates ¼-in. and heavier are unchanged at 10c. from stock and the store price of No. 10 blue annealed sheets is 10c. The nearby mills are quoting a nominal price of 8.65c. for No. 28 black sheets and 10.65c. for No. 28 galvanized. Some business is reported at these figures. Wire nails are slow and the jobbers' quotation is $3.90 per keg base and on barb wire 5c. a lb. The leading nail maker is quoting $3.20 per keg base, Pittsburgh, but is making no sales at this figure. Independent mills are quoting around $3.90 to $4.

Coke.—Prompt foundry coke is easing off some in all producing districts. A few carloads of Connellsville 72-hr. coke brought only $14.50 per net ton at oven, as against $15.50 to $16 two weeks ago. Very few deals have come to light, and the oven operators are not trying to take on any new business, but are devoting their energies to moving shipments on old contracts. Considerable complaint has been made by foundrymen as to the slowness in which the fuel is moved, but the producers give as an excuse the grow-

ing labor shortage, together with the inadequate car supply. Contract prices on 72-hr. coke have not been affected and from $11.50 to $12.50 at oven is quoted in the different producing districts. New River operators are asking as high as $13. No prices are out on furnace coke and the inquiry is limited to a few carloads for domestic use. A nominal contract price would be from $9 to $10 at oven.

Old Material.—Business is falling off and prices are soft. Dealers are buying sparingly, most purchases on their part now being odd lots of different kinds of scrap to fill in on contracts made some time ago. Railroad offerings show neither any decline nor increase. Mills in the Pittsburgh district are urging forward scrap bought by them before the recent advance. Frequent complaints are registered over the shortage of cars in which to move scrap material. The following are dealers' prices f.o.b. at yards Cincinnati, and Southern Ohio:

	Per Gross Ton	
Bundled sheet scrap	$20.00 to	$20.50
Old iron rails	34.00 to	34.50
Relaying rails, 50 lb. and up	45.50 to	46.00
Rerolling steel rails	37.00 to	37.50
Heavy melting steel scrap	33 00 to	33.50
Steel rails for melting	33.00 to	33.50
Old carwheels	30.00 to	30.50
Per Net Ton		
No. 1 railroad wrought	$32.00 to	$32.50
Cast borings	13.50 to	14.00
Steel turnings	13.50 to	14.00
Railroad cast	22.50 to	23.00
No. 1 machinery cast	24.50 to	25.00
Burnt scrap	14.50 to	15.00
Iron axles	44.00 to	44.50
Locomotive tires (smooth inside)	37.00 to	37.50
Pipes and flues	18.00 to	18.50
Malleable cast	24.50 to	25.00
Railroad tank and sheet	16.00 to	16.50

Birmingham

BIRMINGHAM, ALA., Aug. 28.—(*By Wire.*)

Due to the efforts of Secretary of Labor Wilson, the strike of coal miners of the United Mine Workers of America has been settled, the miners receding from their demand for the recognition of the union, while they are granted check weighman and local rights to discuss grievances. A few orders for pig iron are being received. Prices are maintained at $48 to $50 for delivery through next year.

(*By Mail*)

Pig Iron.—Quotations for pig iron are being maintained at $50, No. 2 foundry and basic for this year delivery and $40 for next year, though the lull in the buying which began four weeks ago is still pronounced. Consumers are urging prompt deliveries still on iron, orders for which were placed several months ago, indicating there is need for the product. The lull in the buying is occasioned by an expectancy that the Government is going to fix prices and also control the market. This has caused considerable apprehension among the manufacturers, an intimation of the sharp cutting of prices by the Government being shown the past week when coal prices, f.o.b. mines, were announced by President Wilson. Coal operators in the Birmingham district hastened to Washington and will enter a formal protest, claiming that if there is not a revision in the prices there will be cessation of coal mine operations. Curtailment of coal production would affect the coke and pig-iron production besides operations of foundries and machine shops. Pig-iron production for August will show an increase, it is expected, over the figures of the previous two months. The No. 2 furnace of the Shelby Iron Co. is doing well. The Trussville furnace belonging to the Birmingham Trussville Iron Co. will be blown in Sept. 8 if there are no labor troubles in the district. Iron deliveries are being speeded up some to avoid a car shortage when grain movements become heavy. Embargoes are reported again toward Ohio River gateway points, but it is believed this condition will not continue long. Prompt delivery prices obtain in the South as follows:

No. 1 foundry and soft	$50.50 to	$51.50
No. 2 foundry and soft	50.00 to	51.00
No. 3 foundry	49.50 to	50.50
No. 4 foundry	49.25 to	50.25
Gray forge	49.00 to	50.00
Basic	50.00 to	51.00
Charcoal	55.00 to	56.00

Cast-Iron Pipe.—Government rush orders for cast-iron pipe for use at cantonments have about been delivered and a number of municipal orders are still coming in. No changes in cast-iron pipe prices are noted, 4 in. at $63, 6 in. and upward $60.

Coal and Coke.—Agitation looking to a strike by the members of the United Mine Workers of America, Alabama District No. 20, upon refusal of the Alabama Coal Operators' Association to grant recognition, a wage scale and other demands, has disturbed the production of coal in this district for some little time. Secretary of Labor W. B. Wilson came to Birmingham from Washington last Thursday, remained over Sunday and held conferences with the two interests in the hope of bringing about an amicable settlement. A strike of a week's duration would hamper operations in various lines in this district. The strike was scheduled for Aug. 20 but was postponed pending the visit to the district of the Secretary of Labor. The union claims a membership of 23,000. Coke producers have been on the anxious seat for the past few weeks also as to the strike discussion. No business has been sought and no consideration given to inquiries. Spot coke could sell at $15 with ease if there was an inclination to sell. The quotations for coke are from $10 to $12.50 for foundry and $6 to $10 for furnace coke.

Old Material.—Dealers in scrap iron and steel are hopeful there will be a recovery in the immediate future. Quotations of scrap are holding up fairly well. Heavy melting steel has sold as high as $20.25 again in this district. Quotations are as follows:

Old steel axles	$32.00 to	$33.00
Old steel rails	25.00 to	26.00
No. 1 wrought	26 00 to	27.00
Heavy melting steel	19.00 to	20.25
No. 1 machinery	20.00 to	21.50
Car wheels	23.00 to	24.00
Tramcar wheels	20.00 to	21.00
Stove plate	15.00 to	16.00
Shop turnings	11.00 to	12.00

The Southern Manganese Co., at Anniston, has put in operation its seventh furnace. This concern is allied with the Anniston Ordnance Co. Theodore Swann, president of the Manganese company, announces that consideration is being given to the construction of a big manganese furnace between Birmingham and Bessemer, a few miles from Birmingham.

The American Casting Co. in Birmingham has received an order for $1,000,000 worth of iron culverts for railroad repairing and construction in France. The order was placed through the United States Government.

St. Louis

ST. LOUIS, Aug. 27.

Pig Iron.—Activity in the pig iron market is largely confined to a search for special lots to meet particular requirements, with some call for small quantities for immediate shipment at premium prices. No individual transactions were reported during the week of any size, but the prices developed were all in line with the last previous figures and were firmly held. The local furnace is so far sold ahead as to not figure in the business at present, and, incidentally, its operations have been somewhat interfered with by a strike, which is in fair way of settlement. All consumers are crowding delivery and this is particularly true of recent spot sales. Representatives are not particularly anxious for new business, as they are without supplies because of the state of the furnaces for which they act. No. 2 Southern foundry, Birmingham basis, is held at a range of from $47.50 to $50, while no Chicago or Ironton pig is at present available in this market and therefore is without quotation. During the week there were sales of 12 to 13 per cent ferrosilicon as high as $107.50 for a small lot and also a small sale of 4 per cent silicon, Birmingham basis, at $52 per ton. Some consignment iron has appeared in this market and has sold readily at market figures.

Coke.—Coke for spot delivery has been available in small lots in this market at $15 Connellsville, for best selected 72-hr. grades, while deferred shipments, Octo-

ber delivery, have been closed at about $14. By-product coke has been sold in this market from one or two outside sources at prices more favorable than the Connellsville figures, but the local producer is sold up too far ahead to cut any figure at the present time.

Finished Iron and Steel.—In finished products no new business is appearing, the attitude of mill representatives not giving consumers any encouragement. The chief activity is shown in the pressure of the consumers for material already contracted for, and there appears to be no let-up on this. For stock out of warehouse we quote as follows: Soft steel bars, 4.55c.; iron bars, 4.50c.; structural material, 5.05c.; tank plates, 10.05c.; No. 10 blue annealed sheets, 10.05c.; No. 28 black sheets, cold rolled, one pass, 10.35c.; No. 28 galvanized sheets, black sheet gage, 11.75c.

Old Material.—In scrap there has been so little activity that not sufficient transactions have taken place to establish a market. In consequence all quotations are rather estimates of value rather than definite figures. No buying is being done save in the case of dealers who have contracts to fill and who may need a little of some special material to meet the requirements of the customer. The car situation is improving and there is not so much complaint on this score. The general feeling seems to be that while the market has about reached bed rock there may still be some little recession before a really active situation develops. Dealers will neither buy nor sell, with the exception already noted, because of the inability to determine a price. Lists out during the week include one of 2000 tons from the Burlington, 3500 tons from the Great Northern, 500 tons from the Monon and some small lists from industrial concerns. We quote dealers' prices, f.o.b. customers' works St. Louis industrial district, with the qualification already noted as to the figures given:

Per Gross Ton	
Old iron rails	$39.00 to $39.50
Old steel rails, re-rolling	37.50 to 38 00
Old steel rails, less than 3 feet	37.00 to 38.00
Relaying rails, standard sections, subject to inspection	50 00 to 55.00
Old car wheels	28.00 to 28.50
No. 1 railroad heavy melting steel scrap	29.00 to 30.00
Heavy shoveling steel	27.00 to 27.50
Ordinary shoveling steel	26.00 to 26.50
Frogs, switches and guards cut apart	29.00 to 30 00
Ordinary bundled sheet scrap	18.50 to 19.00
Heavy axle and tire turnings	20.00 to 21.00
Per Net Ton	
Iron angle bars	$36.50 to $37.50
Steel angle bars	29.00 to 30.00
Iron car axles	39.00 to 40.00
Steel car axles	39.00 to 40.00
Wrought arch bars and transoms	39 00 to 39.50
No. 1 railroad wrought	33.00 to 33.50
No. 2 railroad wrought	30.00 to 30.50
Railroad springs	30.00 to 30.50
Steel couplers and knuckles	39.50 to 40.50
Locomotive tires, 42 in. and over, smooth inside	38.50 to 39.50
No. 1 dealers' forge	24.00 to 24.50
Cast iron borings	15.00 to 15.50
No. 1 busheling	24.00 to 24.50
No. 1 boilers, cut to sheets and rings	19.50 to 20 00
No. 1 railroad cast scrap	22.50 to 23.50
Stove plate and light cast scrap	16.50 to 17 00
Railroad malleable	29 00 to 30.00
Agricultural malleable	22.00 to 22.50
Pipes and flues	19.50 to 20.00
Heavy railroad sheet and tank scrap	18 00 to 18 50
Railroad grate bars	16.50 to 17.00
Machine shop turnings	15.00 to 15.50
Country mixed scrap	14.50 to 15.50

British Steel Market

Sellers of Ferromanganese Scarce—Maximum Tin-Plate Price Officially Fixed

LONDON, ENGLAND, Aug. 29—(*By Cable*).

The pig-iron market is generally firm. The output of basic iron is gradually increasing and the demand for hematite iron is intense. An official order has been issued confirming the fixed price of 30s. per basis box, net at works, for tin plates and demand has increased. American semi-finished steel is idle. Ferromanganese is strong and unchanged with sellers lacking. We quote as follows:

Tin plates, coke, 14 x 20: 112 sheets, 108 lb., f.o.b. Wales, maximum, 30s.

Ferromanganese, £45 nominal.

Ferrosilicon, 50 per cent, c.i.f., £35 upward.

On other products control prices are as quoted in THE IRON AGE, of July 19, p. 171.

Buffalo

BUFFALO, Aug. 27.

Pig Iron.—Although there is a considerable volume of inquiry coming in every day, it seems evident that a good proportion of the quotations asked for are desired simply for the purpose of sounding the market, as very few actual orders are being placed. In fact, judging by sales made, the market is in an absolutely quiet and stagnant condition. Furnacemen are not expecting much buying until the price question, which is still awaiting final action by the Government, is determined. When this question is settled, however, it is thought not unlikely the banked up demand released will be large; more than furnaces will be able to fill completely until well into next year. As furnaces are crowded with shipments on existing contracts to the end of the year, this lull is a situation welcomed by producers, as they are more concerned in getting iron shipped out on present obligations than in taking on new commitments. Among the inquiries noted for the week were one of 1000 tons of foundry grades for a New England melter and one of 2000 tons still before the market from an eastern Canadian foundry. Prices, which are largely nominal, remain unchanged from last week, and are as follows, f.o.b. furnace, Buffalo, for 1918 delivery:

High silicon irons	$55.00 to $56.00
No. 1 foundry	54.00 to 55.00
No. 2 X foundry	53.00 to 55.00
No. 2 plain	52.00 to 54.00
No. 2 foundry	51.00 to 53.00
Gray forge	51.00 to 53.00
Malleable	54.00 to 55.00
Basic	54.00 to 55.00
Lake Superior charcoal, f.o.b. Buffalo	55.00 to 60.00

Old Material.—Although the local market is not very active, inquiries are coming in from Pittsburgh and Valley districts for heavy melting steel, No. 1 busheling scrap, machine shop turnings, heavy axle turnings,, cast borings and old car wheels. As high as $36, delivered at Pittsburgh and Valley points for heavy melting steel, has been offered. Some sales have been made; but stock conditions at the present time are such that regardless of prices offered, dealers are averse to contracting, except for the quantity of material they have on hand. The Pennsylvania Railroad embargo, which is still on, preventing shipments of scrap steel to Pennsylvania delivery points, is a serious handicap to shippers having material for delivery at these points. The market is also affected in a depressing way by the delay in action by the Government on the price question for finished products, which has a reflex action in determining the prices for scrap materials. Except in the case of heavy melting steel, which has advanced $1 per ton, there has been no material change in prices for the week, same having been stationary and nominal for the past two weeks. We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$33.00 to $34.00
Low phosphorus	45.00 to 48.00
No. 1 railroad wrought	43.00 to 45.00
No. 1 railroad and machinery cast	30.00 to 31.00
Iron axles	45.00 to 50 00
Steel axles	45.00 to 50 00
Carwheels	35.00 to 36.00
Railroad malleable	33.00 to 34 00
Machine shop turnings	18.00 to 19 00
Heavy axle turnings	26.00 to 27.00
Clean cast borings	20 00 to 21.00
Iron rails	43.00 to 44.00
Locomotive grate bars	20.00 to 21.00
Stove plate	21.00 to 22 00
Wrought pipe	29.00 to 30 00
No. 1 busheling scrap	28.00 to 29.00
No. 2 busheling scrap	18 00 to 19 00
Bundled sheet stamping scrap	20.00 to 21.00

Finished Iron and Steel.—There appears to be a growing feeling among sellers that the crest of demand for purposes aside from war supplies is past for the present and such buying will not be resumed until it can be determined whether price readjustment due to Governmental action will materialize. The week has shown a dearth of business of this character; but the demand from manufacturers who have war contracts

is of good volume. Some inquiry is noted for spikes; orders taken being at $6.00 per 100 lb. for standard railroad and $7 for small railroad and boat spikes. The demand for sheets is steady at unchanged prices. The principal development in the Canadian market is the notice given by the Imperial Munitions Board that future contracts will be materially reduced; that the manufacture of certain sizes of shells is to be discontinued, and the manufacture of other sizes considerably curtailed. This has already resulted in the changing of output in some machine shops to engines and other parts of ship equipment in place of munitions, and is also necessitating the reorganization of the selling forces of Canadian steel companies, which are consequently now preparing for keener competition, many having increased their plant capacity to meet war demand, and now that war demand is apparently to be lessened, are obliged to provide other channels for taking care of output.

New York

NEW YORK, Aug. 29.

Pig Iron.—The pig iron market has flattened out and the only activity is in resale iron, of which there is not a large tonnage. The usual quotation on this resale iron is on the basis of $52 to $52.50, eastern Pennsylvania furnace for No. 2 X. Some surprise has been occasioned by the recent advance in the freight rate of pig iron from Buffalo to New England points. The old rate was $2.58 and the new one is $3.10. An illustration of the unusual methods used in shipping pig iron is furnished by the action of the Whitin Machinery Works, Whitinsville, Mass., which has chartered a boat to make two trips from Brunswick, Ga., to Providence, R. I., carrying pig iron. One trip has just been completed. We quote for tidewater deliveries in the near future as follows:

No. 1 foundry	$52.75 to $53.50
No. 2 X	52.50 to 53.00
No. 2 plain	52.00 to 52.50
Southern No. 1 foundry	52.75 to 53.75
Southern No. 2 foundry and soft	52.25 to 53.25

Structural Material.—Outside of such work as the rush requirements of the Merchants' Shipbuilding Corporation, Bristol, Pa., for which the fabricating award will probably be placed this week, the largest new offering in the East appears to be a Government central light, heat and power station at Washington, D. C., involving 2200 tons. The rest of the new work is chiefly in railroad bridges, including about 500 tons at Tonawanda, N. Y., for the New York Central, including a rolling lift section and 400 tons for approaches and 200 tons for the Pennsylvania Railroad, which has closed with the American Bridge Company for 100 tons of bridge work. An award has been made for 130 tons for the Baltimore & Ohio at Dayton, Ohio. The Central Railroad of New Jersey rejected bids recently received on a coaling pier and is now asking prices on the girder span alone. Plain material prices have not weakened in spite of general conditions, though a small tonnage to a jobber from a mill stock has been sold at 4.50c., Pittsburgh. We quote mill shipments at 4.695c. to 5.195c., New York, largely according to the urgency of shipment; while from warehouse, shipments are made at 5c. and 5.50c. per pound, New York, according to sizes desired.

Steel Plates.—The market has much the appearance of tottering. Large lots, one of no less than 5000 tons, has been offered at 8c. at mill, but business is slow of consummation owing to so much of it being considered for export ultimately and fraught with difficulties in the matter of securing licenses for shipment. What business has been done has in the main brought 8.75c. at mill, with one sale for a relatively small tonnage at 9c. for substantially immediate shipment. One unconfirmed statement is to the effect that a round tonnage for early shipment was sold to a car builder in the Central West for 6.25c., mill. Meanwhile some of the mills are still holding at 10c., with well-filled order books and less than half of the navy's plate requirements under specification and nothing of any amount yet booked for the merchant marine. At this writing awards have not yet been made for the 20,000 cars for Russia for which active inquiry for axles and specialties have been noted in the last 10 days. With a market in which each transaction is a law unto itself, we quote plates from mill at 8.945c., New York, and higher, and out of store, where assortments are broken, at 8c. and higher.

Iron and Steel Bars.—Generally speaking, the market is dull though with some inquiry for contracts. In one case this would mean in a matter of a 500-ton lot a delivery in not less than 17 months; it is believed that the buyers' inquiry represented the force of habit to insure rolling space without fully appreciating the time interval, and the transaction has not been closed. A marked concession was heard of in connection with a round tonnage for the first half of next year, but otherwise steel bars seem to be held generally at 4.50c. at mill, or 4.695c., New York, and iron bars at 4.945c. to 5.195c. From New York district warehouses steel and iron bars are sold at 5c. to 5.50c.

Cast Iron Pipe.—Business is very quiet. No important buying of public nature or by private concerns is reported. Carloads of 6-in., 8-in. and heavier are quoted at $65.50 per net ton tidewater and 4-in. at $68.50.

Old Material.—The most interesting development in the old material market has been the increase in freight rates from $2.76 to $3.20 from New York to the Pittsburgh district, with corresponding advances to other points in the Central West. In some cases, the advances have gone into effect already, while others will not be effective until Saturday. Another feature of the market has been the unusually large number of rejections and at the present time there are 60 carloads of wrought-iron pipe on track at Lebanon, Pa., which have been rejected. Dealers are complaining bitterly of the action of some buyers. The tendency of the market is downward. Most prices are about $2 lower and there is a probability that they will be still lower next week. Dealers find it necessary to spend a large amount of time in getting permits to make shipments and the movement of old material to mills is very slow. Brokers quote buying prices as follows to New York producers and dealers per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$27.50 to $29.50
Old steel rails (short lengths) or equivalent heavy steel scrap	27.00 to 29.00
Relaying rails	63.00 to 65.00
Rerolling rails	37.00 to 39.00
Iron and steel car axles	40.00 to 42.00
No. 1 railroad wrought	39.00 to 40.00
Wrought-iron track scrap	30.00 to 31.00
No. 1 yard wrought long	30.00 to 31.00
Light iron	8.00 to 10.00
Cast borings (clean)	19.00 to 20.00
Machine-shop turnings	16.00 to 18.00
Mixed borings and turnings	14.00 to 16.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long)	28.00 to 30.00

Machinery cast is extremely weak and has receded about $5 per ton. For cast-iron scrap, dealers in New York City and Brooklyn are quoting as follows to local foundries per gross ton:

No. 1 machinery cast	$30.00 to $31.00
No. 1 heavy cast (column, building material, etc.)	26.00 to 27.00
No. 2 cast (radiators, cast boilers, etc.)	26.00 to 28.00
Stove plate	18.00 to 20.00
Locomotive grate bars	18.00 to 19.00
Old carwheels	31.00 to 33.00
Malleable cast (railroad)	30.00 to 32.00

Ferroalloys.—The market for ferromanganese has stiffened slightly as a result of the fairly large buying in the past two or three weeks and the quotation for domestic alloy now stands at $375 for delivery in 1918 with $400 to $425 asked for prompt material and $400 for the last half of this year. There is very little inquiry and very few sales are reported. A few consumers, principally smaller ones, are short of material and forced to buy at the present prices. Reports from Washington mention the proposed appointment of a dictator for ferroalloys, but it is hardly probable that this would improve on the present satisfactory handling of the situation through the alloy committee of the

Council of National Defense. Official reports indicate that the imports of ferromanganese for July were not over 2500 tons—one of the lowest monthly records. Indications are, however, that the receipts for August will be considerably more. Conditions in Great Britain are hard to gage because of the discontinuance of official reports of imports into that country of manganese ore. These have not been published for the last two months. Spiegeleisen is quiet and only a few sales are reported with the quotation at $85, furnace. Ferrosilicon, 50 per cent, remains unchanged at about $200 to $225 for delivery this year and $165 for delivery in 1918.

IRON AND INDUSTRIAL STOCKS

Stock Market Depressed—Many Companies Record Losses in the Week

The stock market continued in a depressing state last week. The two depressing features were the agitation in favor of greatly increased taxation in connection with the national revenue bill pending in the Senate and the uncertainty as to the Government policy concerning iron and steel products. The announcement of prices of bituminous coal was taken as indicating a policy in favor of sharp reductions from prevailing prices, but the fixing in prices on anthracite, which virtually coincide with prevailing prices, was received with considerable satisfaction, although it left the country in doubt as to what the next move will be. On the whole, the tendency of prices of stocks was downward, but there were no violent declines.

Among the industrial stocks that registered losses during the past week were the following: Allis-Chalmers, 2; American Can, 1⅞; American Car & Foundry, 2; American Locomotive, 2½; American Steel Foundries, 2¼; Baldwin Locomotive, 3¼; Bethlehem Steel, 3; Bethlehem Steel, Class B, 3½; Colorado Fuel & Iron, ⅞; Crucible Steel, ⅜; Gulf States Steel, 6½; International Harvester, 2⅞; Lackawanna Steel, 3; Midvale Steel, 1¾; National Enameling & Stamping, 1⅛; Pressed Steel Car, 3½; Republic Iron & Steel, 2½; United States Steel, 3; United States Steel, preferred, ⅛. There were no gains recorded during the week.

The range of prices on active iron and steel stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com..	26 - 27½	Int. Har. of N. J., com.	113⅛
Allis-Chal., pref..	83 - 84½	Int. Har. Corp., com.	75 - 75¼
Am. Can, com....	41½ - 45¼	Lacka. Steel	81¼ - 88½
Am. Can, pref...	106⅝ - 108½	Lake Sup. Corp..	16¼ - 17⅜
Am. Car & Fdry., com.	69¼ - 74	Lima Loco.	56 - 57
Am. Loco., com..	62½ - 68⅛	Lukens, 1st pref.	101⅛ - 102
Am. Ship, com...	93 - 93½	Midvale Steel....	52⅞ - 57
Am. Ship, pref.....	95	Nat.-Acme	33⅞ - 34¼
Am. Steel Fdries.	63 - 68½	Nat. Enam. & Stm., com.	39 - 41⅜
Bald. Loco., com.	62¾ - 68⅝	N. Y. Air Brake..	129 - 131
Bald. Loco., pref.....	99⅞	Nova Scotia Stl..	100 - 101
Beth. Steel, com..	112 - 114½	Pressed Stl., com.	65 - 68¾
Beth. Steel, class B	107⅛ - 112⅛	Pressed Stl., pref.....	102½
Beth. Steel, pref.	113 - 115½	Ry. Steel Spring, com.	49½ - 51½
Can. Car & Fdry., com.	28½	Ry. Steel Spring, pref.	98¼ - 99
Carbon Stl., com.	96 - 97	Republic, com. ..	81½ - 88¾
Case (J. I.), pref.	83 - 84	Republic, pref. ..	102 - 103½
Central Fdry., com.	30 - 31½	Sloss, com.	50 - 53
Central Fdry., pref.	49½	Superior Steel...	40 - 43
Charcoal Iron, com.	8½ - 8⅝	Superior Steel, 1st pref.	102½
Chic. Pneu. Tool.	66½ - 67	Transue-Williams	40¼
Colo. Fuel	44½ - 47⅝	Un. Alloy Steel..	42¾ - 43¼
Cruc. Steel, com..	70⅞ - 80½	U. S. Pipe, com..	18 - 20
Cruc. Steel, pref.	99⅞ - 100¼	U. S. Pipe, pref.....	54
Deere & Co., pref.	99 - 100	U. S. Steel, com..	118½ - 123¼
Gen. Electric ...	150¾ - 152½	U. S. Steel, pref..	116¾ - 117⅜
Gt. No. Ore. Cert.	32⅜ - 36½	Va. I. Co. & Coke	63½ - 65
Gulf. States Stl..	102 - 107½	Westing. Elec. ..	45 - 47⅞

Proposed Sale of Norwich Arms Plant

The receivers of the Hopkins & Allen Arms Co., Norwich, Conn., have petitioned the United States District Court for permission to sell the property. The Marlin-Rockwell Corporation, New Haven, Conn., is preparing to buy the plant and complete an unfinished order for rifles for the Belgian government. Men from the Marlin Arms plant have already taken charge of the Hopkins & Allen plant and are operating it under the receivers.

At the time the receivers took charge of the company's affairs, only 11,392 rifles had been completed and the Belgian government had advanced $228,155.29 to the concern and also held a big mortgage on the property. The cost of completing the order for Mauser rifles, the receivers say, would not be less than $2,800,000. The outstanding mortgages amount to $3,850,000 and there are outstanding and unpaid bonds issued by the company's predecessor for $200,000 with accrued interest from April 1, 1917. The receivers represent that unless the performance of the rifle contract be assumed by some responsible manufacturer, the contracts cannot be completed and the company will be liable for large claims for damages on account of its breach of contracts.

The receivers believe that the speedy sale of the property is for the best interest of all concerned as Pierre Mali, acting for the Belgian government, represents to them that he has made an agreement with the Marlin-Rockwell Corporation and that he is making proposals to certain creditors of the Hopkins & Allen Arms Co. for the purchase of their claims and for the assumption by the Marlin-Rockwell Corporation of the unfilled contracts between Hopkins & Allen Arms Co. and other creditors. The original price for the rifles was $27 each and it is understood that the 140,000 rifles remaining on the contract will be paid for at a price of $40 each.

American Locomotive Earnings

The report of the American Locomotive Co. for the year ending June 30 last shows net profits after preferred dividends of $5,451,679, equal to $21.80 per share on the $25,000,000 common stock. We compare with previous years as follows:

	1917	1916	1915	1914
Gross	$82,213,845	$59,316,016	$9,303,298	$29,987,438
Expenses‡	72,614,654	47,450,582	10,445,900	27,425,187
Net	9,599,191	11,865,434	†1,142,602	2,562,252
Changes, etc...	192,192	301,005	349,378	486,124
Surplus	9,406,998	11,564,428	†1,491,980	2,076,127
U. S. and Canadian Taxes	2,205,319	795,000	.....	.....
Dividends	3,250,000	1,750,000	1,750,000	1,750,000
Balance	3,951,680	9,019,429	†3,241,980	326,127
Add and bett..	2,000,000	3,000,000	.....	.....
Surplus	1,951,679	6,019,429	3,241,980	326,127

†Deficit.

‡Manufacturing, maintenance and administrative expenses and depreciation. The depreciation charge for 1917 was $1,665,631, as against $1,761,682 for 1916.

Chairman Schoonmaker says in part:

A profit of $9,406,998 resulted from the year's operations, from which there has been deducted $2,205,318 for income and war taxes, leaving a balance available of $7,201,679. After payment of the dividend on the preferred of $1,750,000, four quarterly dividends on the common aggregating $1,250,000, and a special Red Cross dividend of $250,000, making a total of dividends paid for the year of $3,250,000, there remained a surplus of $3,951,679 out of which there was created a reserve of $2,000,000 for additions and betterments to the plants. The remaining profit of $1,951,679 was added to accumulated surplus.

Deduction for taxes of $2,205,318 fully provides for income and war taxes which have been or are to be levied under laws existing in the United States and Canada as of June 30, 1917, but they do not include any provision for proposed new excess profits tax, the bill for which was pending in Congress at the close of the company's fiscal year.

During the year there was expended for permanent additions and betterments to plants $1,312,966, all of which was charged against the reserve for additions and betterments created out of the previous year's earnings.

Both in Canada and the United States, selling prices on munitions were reduced to lower levels than prevailed in the preceding year and the new contracts for shells admitted, even under normal conditions, of a much smaller margin of profit than previous contracts allowed. The new contracts were for larger shells than those previously made and necessitated large additions of equipment and extensive alterations to plants, for which $3,760,561 has been included in the manufacturing cost and deducted from earnings.

Munitions work at Richmond and Montreal will be completed in August, 1917. The work of restoring these plants to locomotive production use has already been started and when completed the entire capacity of all plants will be devoted exclusively to manufacture of locomotives.

As a part of the plan of restoring the Richmond plant, and with the purpose of obtaining an immediate increase in foundry capacity of that plant for locomotive work, the company purchased on June 25, 1917, land and buildings of the Henrico Iron Works Corporation at Richmond, Va., suitable, with improvements which can be quickly installed, for making locomotive gray iron castings.

It is the purpose of the management to manufacture as much material entering in large quantities into the construction of locomotives as can be produced to economic advantage. In accordance with this policy, the company purchased on July 2, 1917, from the Penn Seaboard Steel Corporation, a modern steel casting plant, at Chester, Pa., known as the Seaboard Works.

The amount of unfilled locomotive orders on the books on June 30, 1917, was $77,620,449, as compared with $19,376,532 on June 30, 1916. The amount of munitions orders which were uncompleted on June 30, 1917, was $3,566,528.

Bethlehem Steel Financing

The plan of financing to provide $30,000,000 additional capital for the Bethlehem Steel Corporation was formally approved at a meeting of the board of directors on Tuesday afternoon. A meeting of stockholders will be called for Sept. 14 at the home office in Newark to authorize the issuance of $30,000,000 worth of 8 per cent cumulative preferred stock convertible at any time in the option of the holder into B common stock at 115 and redeemable on 90 days' notice, any time after three years from date of issue, at 115 and accrued dividends, in its entirety or in amounts of not less than $10,000 each. The stock is to be offered at par, dated Oct. 1, 1917, to holders of record of the outstanding common stock on both issues on Sept. 12, 1917, subscriptions being limited to one-half each subscriber's holdings of common stock. This new stock and the B common stock into which it is convertible carry no voting power. The Guaranty Trust Co., the Bankers' Trust Co. and J. & W. Seligman & Co. have formed a syndicate to underwrite the issue at a reported price of 96.

Following the directors meeting Charles M. Schwab issued a statement in part as follows:

The entrance of this country into the war has produced such abnormal conditions that the corporation is now confronted with the necessity of raising a very substantial additional amount of capital in order to continue its construction program and provide for the requirements of the greatly increased business resulting from the war. While this year's earnings (before deducting taxes) have thus far surpassed our estimates, having exceeded the earnings for the corresponding period last year, a very large part of the earnings which we had intended to expend upon improvements this year and next must be used for the payment of excess profits taxes and other war taxes. The orders already taken for the United States Government entail an increase of about $15,000,000 in the construction program as adopted prior to this country's entrance into the war. The increase in our orders, together with the greatly increased cost of labor and materials, calls for an unexpected increase in working capital.

Industrial Finances

Superior Steel Corporation has called for redemption, on Sept. 15, through Columbia Trust Co., $860,000 of its first preferred and $25,833 of second preferred stocks, at $107.50 a share. Amount of second preferred being redeemed is to take care of sinking fund requirements. The $860,000 first preferred to be retired, however, is largely in excess of amount required by provisions of sinking fund.

Reports are that the Westinghouse Air Brake Co., Wilmerding, Pa., during its fiscal year to July 31 last, did not equal the remarkable profits of $9,396,000 attained during the 1916 year. In that period the company handled a shell order calling for 1,250,000 shrapnel. The profit on this work was very satisfactory. At the same time, aside from 1916, the results in the fiscal year just ended were record-breaking. Net profits will finally figure out at about $6,500,000, which is $2 000,000 more than is required to pay the 16 per cent dividend on the stock, enlarged from $20,000,000 to $30,000,000 through the taking over of the Union Switch & Signal Co. The Westinghouse Air Brake Co. has on hand unfilled orders for $6,000,000 which is about four months' productive capacity.

Willett, Sears & Co., Boston, have offered to purchase the assets of the Boston Belting Co., Boston, at a net price equivalent to $132.50 a share; $82.50 in cash and $50 in preferred stock of a new Boston Belting Corporation to be formed under a Massachusetts charter. The directors of the Boston Belting Co. have called a stockholders' meeting for Sept. 14 to take action on the offer which the directors have approved. The stock of the company has been quoted from 100 to 116 in the past few years. The move is partly the result of the desire of the president, Thomas Forsyth, to retire from

Dividends

The Charcoal Iron Co. of America, quarterly, 20c. on the common, payable Oct. 1.

The Lackawanna Steel Co., quarterly, 1½ per cent on the common, payable Sept. 29.

The Moline Plow Co., quarterly, 1¾ per cent on the first preferred, payable Sept. 1.

The National Enameling & Stamping Co., quarterly, 1¾ per cent on the preferred, payable Sept. 29.

The New York Air Brake Co., quarterly, 2½ per cent and extra 2½ per cent, both payable Sept. 21.

The Railway Steel Spring Co., quarterly, 1¼ per cent on the common, payable Sept. 29, and 1¾ per cent on the preferred, payable Sept. 20.

Mark Mfg. Co. to Build Homes

The Mark Mfg. Co., which has a new steel plant near completion at East Chicago, will build on land adjacent thereto a model home community for its employees which eventually will cost several million dollars. The first group of buildings will cost about $1,000,000. The company owns 190 acres, which can be used for the purpose in view. The work will be supervised by Howard Shaw, architect, who has made a study of foreign and eastern industrial villages. There will be provision for recreation, schools, shops and club facilities. Around a square 280 x 350 ft. buildings will be erected for market purposes. There also is planned a street car line extending from East Chicago and Whiting to Indiana Harbor.

Work has been started on 200 homes, ranging in size from four to seven rooms, to cost from $2,000 to $8,000 each. They will be of tile, and known as the slow-burning type. Abundant space will be provided for home gardens. Several large boarding houses also will be constructed. The plans call for a recreation building, a motion picture theater, and a lake at one end of the tract, near which will be constructed attractive homes for the leading men of the company. Altogether the new town will have accommodations for 7000 persons. Employees will be permitted to purchase their homes on a time payment arrangement.

Manganese Ore Imports Continue Large

Manganese ore imports into the United States in June are officially reported as 62,778 gross tons, bringing the total for the fiscal year ended June 30, 1917, to 656,088 tons, as compared with 492,860 tons for the year ended June 30, 1916. The June imports are the second largest so far in 1917, the maximum having been 81,269 tons in May. The total for the first six months this year is 316,793 tons, or at the rate of 52,799 tons per month. This is also at the rate of 633,586 tons for the year, comparing with 526,525 tons in 1916 and with 656,088 tons for the fiscal year, noted above. The present imports mean a production of at least 250,000 tons of 80 per cent ferromanganese per year.

The Franklin Institute, Philadelphia, has awarded its Edward Longstreth medal of merit to Frank H. Schoenfuss and Albert Kingwald, both of Philadelphia, for the invention of the portable Brinell meter. It is manufactured and sold by Herman A. Holz, 1 Madison Avenue, New York.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 19.5c.; Philadelphia, 18.5c.; Boston, 21.5c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c.; Denver pipe, 76.1c., minimum carload, 46,000 lb.; structural steel and steel bars, 76.1c., minimum carload, 40,000 lb.; Pacific coast (by rail only), pipe, 65c.; structural steel and steel bars, 75c., minimum carload, 60,000 lb. No freight rates are being published via the Panama Canal, as the boats are being used in transatlantic trade.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in., angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 4.00c.

Wire Products

(Prices of independent mills)

Wire nails, $4 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire, $4.05 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.95; galvanized wire, $4.65; galvanized barb wire and fence staples, $4.85; painted barb wire, $4.15; polished fence staples, $4.15; cement-coated nails, $3.90 base, these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 43 per cent off list for carload lots, 42 per cent off for 1000-rod lots, and 41 per cent off for small lots, f.o.b. Pittsburgh.

Nuts and Bolts

Discounts in effect for large buyers are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days.

Carriage bolts, small, rolled thread, 40 per cent, small cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent with c. p. nuts, 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq. blank, $2.10 off list, and tapped, $1.90 off; hex., blank, $1.90 off, and tapped, $1.70 off; nuts, c. p. c. and t. sq. blank, $1.70 off, and tapped, $1.50 off; hex. blank, $1.60 off, and tapped, $1.40 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Wire Rods

Soft Bessemer and open-hearth rods to domestic consumers at $90 to $95; high-carbon rods made from ordinary open-hearth steel, $95 to $100, and special steel rods with carbons running from 0.40 to 0.60, $100 to $110 at mill; above 0.60 carbon, $115 to $120.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $7.00; ⅝ in., 7/16 in. and ½ in., $7.00 base. Boat spikes are occasionally quoted $7.00 to $8.00, all per 100 lb., f.o.b. Pittsburgh, but some makers are quoting higher. Track bolts with square nuts, 7c. to 7.50c. to railroads, and 8c. to 8.50c., in small lots, for fairly prompt shipment.

Steel Rails

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails, and on carload and smaller lots, 4c. to 4.25c. at mill. Light rails, 25 to 45 lb., $75 to $80; 16 to 20 lb., $80 to $81; 12 and 14 lb., $82 to $83; 8 and 10 lb., $83 to $84; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard Bessemer rails, $38; open-hearth, $40, per gross ton, Pittsburgh.

Tin Plate

Effective July 31, prices on all sizes of terne plate were advanced from $2 to $2.50 per package and are now as follows: 8-lb. coating, 209 lb., $16 per package; 8-lb. coating, I. C., $16.30; 12-lb. coating, I. C., $17.50; 15-lb. coating, I. C., $18.25; 20-lb. coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 4c. to 4.50c. for delivery late this year, and 4.50c. to 5c. from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c.; railroad test bars, 5.25c. in carload and larger lots f.o.b. mill.

Wrought Pipe

The following discounts on steel are to jobbers for carload lots on the Pittsburgh basing card in effect from May 1, 1917, all full weight, except for LaBelle Iron Works and Wheeling Steel & Iron Co., which quote higher prices, and National Tube Co., which adheres to card of April 1.

Steel			Iron		
		Butt Weld			
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	42	15½	⅛ and ¼	23	+4
½	46	31½	⅜	24	+3
¾ to 3	49	35½	½	28	10
			¾ to 1½	33	17
		Lap Weld			
2	42	29½	2	26	12
2½ to 6	45	32½	2½ to 6	28	15
7 to 12	42	28½	7 to 12	25	12
13 and 14	32½	..			
15	30	..			
		Butt Weld, extra strong, plain ends			
⅛, ¼ and ⅜	38	20½	⅛, ¼ and ⅜	22	5
½	43	30½	½	27	14
¾ to 1½	47	34½	¾ to 1½	33	18
2 to 3	48	35½			
		Lap Weld, extra strong, plain ends			
2	40	28½	2	27	14
2½ to 4	43	31½	2½ to 4	29	17
4 to 6	42	30½	4½ to 6	28	16
7 to 8	38	24½	7 to 8	20	8
9 to 12	33	19½	9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

Nominal discounts on less than carload lots, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes, and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap-Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in.	28	1¾ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3¼ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in.	No quotations
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths. Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net, or 2 per cent discount in 10 days.

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer

	Cents per lb.
Nos. 3 to 8	8.00 to 8.50
Nos. 9 and 10	8.25 to 8.50
Nos. 11 and 12	8.50 to 8.75
Nos. 13 and 14	8.75 to 9.00
Nos. 15 and 16	9.00 to 9.25

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	8.30 to 8.80
Nos. 22 and 24	8.35 to 8.85
Nos. 25 and 26	8.40 to 8.90
No. 27	8.45 to 8.95
No. 28	8.50 to 9.00
No. 29	8.55 to 9.05
No. 30	8.65 to 9.15

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11	9.00 to 9.50
Nos. 12 and 14	9.10 to 9.60
Nos. 15 and 16	9.25 to 9.75
Nos. 17 to 21	9.40 to 9.90
Nos. 22 and 24	9.55 to 10.05
Nos. 25 and 26	9.70 to 10.20
No. 27	9.85 to 10.35
No. 28	10.00 to 10.50
No. 29	10.25 to 10.75
No. 30	10.50 to 11.00

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	7.80 to 8.30
Nos. 17 to 21	7.85 to 8.35
Nos. 22 to 24	7.90 to 8.40
Nos. 25 to 27	7.95 to 8.45
No. 28	8.00 to 8.50
No. 29	8.05 to 8.55
No. 30	8.05 to 8.55
Nos. 30½ and 31	8.10 to 8.60

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin.	Lead		Spelter	
Aug.	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
22	26.50	26.50	61.75	10.67½	10.55	8.75	8.50
23	26.25	26.25	61.75	10.62½	10.50	8.62½	8.37½
24	26.25	26.25	61.50	10.62½	10.50	8.62½	8.37½
25	26.00	26.00	....	10.62½	10.50	8.50	8.25
27	25.75	25.75	61.37½	10.55	10.42½	8.37½	8.12½
28	25.50	25.50	61.50	10.55	10.42½	8.37½	8.12½

NEW YORK, Aug. 29

Stagnation, induced and perpetuated by uncertainties regarding Government control of markets, pervades the entire metal industry. Prices in practically all cases are nominal. Copper is lifeless and weaker. Very few transactions are reported in tin. Lead is quiet but steady. Spelter is stagnant and lower. Antimony continues dull and unchanged.

New York

Copper.—Inquiry in the trade reveals the fact that dealers are at sea regarding the actual condition of the market. Buying is at the lowest ebb in the memory of many dealers and prices are therefore entirely nominal. Quotations vary, depending on the viewpoint of the seller. They have receded in the past week, until yesterday both Lake and electrolytic were nominally quoted at about 25.50c., New York, with the last quarter at 24c. to 25c. Various rumors have been set afloat to affect the market, particularly in reference to prices the Government will pay, placing these anywhere to 20c. to 25c. per lb., but without effect. Serious strikes in certain important districts have also had an adverse effect. It is believed, however, that with the probable appointment of a dictator for copper within a short time definite prices will be announced. It is acknowledged that a large buying movement must come before long. London quotations yesterday were unchanged at £137 per ton for spot electrolytic and £133 for futures.

Tin.—The market is quiet and duller than in recent inactive weeks. Prices quoted above are more nearly nominal than usual because transactions have been so few. Buying is only mandatory and is continually repressed by general market uncertainties emanating from Washington. Spot Straits tin appears to be in light supply as well as in light demand. On Aug. 23, 50 tons were sold at 61.75c., New York, but on the following day there was no business and no inquiry. On Monday, Aug. 27, there were more sellers than buyers. Spot Banca tin on that day was sold at 58.75c., and there were fair sales of December shipments from the Straits at 56.62½c. Yesterday the market was stagnant and lifeless, with no inquiry except from those desiring to keep posted on market conditions. The London market yesterday was £244 for spot Straits. Arrivals up to Aug. 28 are reported as 2520 tons, with the quantity afloat 4215 tons. Yesterday the quotation for Straits tin, New York, was 61.50c.

Lead.—There is no improvement in the market. During last week demand grew less, if this were possible, and prices receded. There is in the mind of most consumers the Government price of 8c. per lb. paid on its recent purchases and it is naturally difficult to stimulate an interest in a market quoted at 10.55c., New York, yesterday. In spite of this the market remains fairly firm and a continuation of present dull conditions is looked for until a decision comes from the Government. Buyers are proceeding with extreme caution and demand for manufactured goods has fallen off. Sales of resale carload lots have been reported for September-October delivery as low as 10.37½c., New York. Yesterday the metal sold in carload lots at 10.55c., New York. The first mid-year report of the U. S. Geological Survey on the production of refined lead shows that the output to July 1, 1917, was 2,306,062 tons or 20,495 tons greater than one half of the 1916 production. The gain was nearly all in lead made from foreign ores and bullion, the increase being 20,086 tons.

Spelter.—The market has hardly ever been more lifeless. It is dominated by the uncertainties which have hung over it and the other markets so long. Buying is at a very low ebb and quotations are eratic and nominal depending on the parties interested. Some dealers are holding at 8.25c. to 8.50c., St. Louis, or 8.50c. to 8.75c., New York, while others quote as low as 7.75c. to 8c., St. Louis, or 8c. to 8.25c., New York, for early delivery. One dealer reports the sale of a carload at 7.75c., St. Louis. There is, however, not enough business to establish a firm quotation. It is more than four months since any export business has been done and it is hard to account for the inactivity of foreign interests. Embargoes have not relieved the situation. The trade is certain that large buying is but a matter of time.

Antimony.—Dullness continues to pervade the market with quotations unchanged at 15c. to 15.50c., New York, duty paid, for Chinese and Japanese grades.

Aluminum.—Little interest is shown in No. 1 virgin aluminum, 98 to 99 per cent pure, which is quoted at 47c. to 49c. per lb., New York.

Old Metals.—Dealers' selling prices are a little lower as follows:

	Cents per lb.
Copper, heavy and crucible	27.00 to 27.50
Copper, heavy and wire	26.00 to 26.50
Copper, light and bottoms	23.00 to 24.00
Brass, heavy	18.00 to 19.00
Brass, light	13.00 to 14.00
Heavy machine composition	24.50 to 25.00
No. 1 yellow rod brass turnings	17.00
No. 1 red brass or composition turnings	19.00 to 21.00
Lead, heavy	9.25 to 9.375
Lead, tea	7.75
Zinc	6.75

Chicago

AUG. 27.—Copper and lead have been in fair demand, mostly, however, for nearby delivery, consumers not being disposed to buy far ahead while there is uncertainty as to the future of prices. The quotations for copper, tin and spelter have been revised downward. The interest in spelter and antimony is very slight. We quote as follows: Casting copper, 26.25c.; Lake, 28c.; electrolytic, 26.50c.; tin, carloads, 62c.; small lots, 64c. to 65c.; lead, 10.50c.; spelter, 8c.; sheet zinc, 19c.; antimony, 17c. to 18.50c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 22.50c.; copper clips, 21.50c.; copper bottoms, 21c.; red brass, 21c.; yellow brass, 15c.; lead pipe, 8c.; zinc, 5.50c.; pewter, No. 1, 35c.; tinfoil, 40c.; block tin, 45c.

St. Louis

AUG. 27.—Non-ferrous metals have been rather quiet during the week with the close to-day on carload lots or larger as follows: Lead, 10c. to 10.25c., according to delivery; spelter, 8.12½c. to 8.25c. In less than carload lots the quotations are: Lead, 11.25c.; spelter, 9c.; tin, 66c.; Lake copper, 30c.; electrolytic copper, 29.50c.; Asiatic antimony, 18c. In the Joplin district zinc blende developed a stronger tone, but the quotations ranged from $65 to $75 per ton, basis of 60 per cent metal. The average for the district for the week was $70 per ton. There were some reports of prices paid as high as $77 for choicest ores, but buyers would not admit it, save that it was paid as a premium on ore above the basis grade. The turn in was the largest for several months and would have been much larger had the Oklahoma section of the district been able to get cars. Calamine was firm at $35 to $42 per ton, basis of 40 per cent metal, with the average for the week for the district $40 per ton. Lead ore was strong at $100 per ton, with the average, basis of 80 per cent metal, held at the same price. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 11c.; heavy yellow brass, 14.50c.; heavy red brass and light copper, 19.50c.; heavy copper and copper wire, 22.50c.; pewter, 25c.; tinfoil, 42c.; zinc, 5c.; tea lead, 6c.; lead, 7c.

The Syracuse Smelting Works of Brooklyn, N. Y., have just completed the installation of two additional furnaces.

The Pacific Coast Steel Co. has repaired its blast furnace at Irondale, Wash., and will blow it in about Sept. 1.

DELAYS IN RIFLE PRODUCTION

Ordnance Bureau's Wise Decision Insures Interchangeability

WASHINGTON, Aug. 28.—Concerning statements recently published to the effect that the production of rifles under the direction of the War Department has been unnecessarily delayed as the result of ill-advised official action or inaction, the correspondent of THE IRON AGE is authorized to state the facts briefly.

The Enfield rifle for the arming of the American troops is now being manufactured in three plants originally equipped to make rifles for the British army. The circumstances under which it became necessary to select the Enfield rifle because the arsenals could not produce a sufficient number of Springfields and because Congress had failed to supply funds for the equipment of private plants to make them, have heretofore been described in these columns. Immediately after it was decided to use the Enfield rifle the Secretary of War sent an urgent request to Congress for an appropriation of $9,500,000 to purchase the special equipment belonging to the British Government in the plants of the Remington and Winchester companies. Up to the present time this money has not been appropriated, but the Secretary of War, appreciating the great danger of delay, decided not to await Congressional action, and upon his own responsibility borrowed the equipment from the British Government and gave orders to have the Enfield rifles turned out as rapidly as possible.

Soon after the first deliveries were made from the three plants it was discovered that the parts of the rifles made in the different establishments were not interchangeable and that even in the case of rifles made in the same plant the degree of interchangeability was not satisfactory to the experts of the Ordnance Bureau. War Department officials cast no reflection upon the British experts or upon the manufacturers who made the Enfield rifles for the British Government. The work was done under extraordinary conditions, when special equipment in the way of gages, dies, automatics, etc., was exceedingly difficult to obtain, as the manufacturers of these devices were so loaded up with orders as to have absolutely no capacity for new work.

As the result of conferences between the ordnance officials and the Secretary of War it was decided that the improvement of the interchangeability of the Enfield rifles was imperatively necessary, even at the expense of considerable delay in their production; otherwise the Ordnance Department would be obliged to maintain at least three separate repair depots on every front on which the Enfield rifles might be used, and in the case of the disabling of a rifle it would be necessary to identify it as a product of the particular plant in which it was made in order to send it to the proper repair depot. The standardization of the equipment of the three plants was therefore ordered and has been in progress for some time. The work has not caused the entire suspension of the production of rifles, which are being turned out in quantities entirely satisfactory under the circumstances. A normal rate of production will be acquired at an early date, and the War Department will then have the satisfaction of knowing that the rifles being issued to the new army are decidedly superior to the Enfields made for the British forces, and, in fact, are the best that can be made on this particular model.

When the War Department took over the British equipment for making Enfield rifles it also authorized the retention of some 750 inspectors originally employed by the British authorities. These men are highly skilled and their retention in the service, at least until their places can be satisfactorily filled, is regarded as of the greatest possible importance; in fact any breaking up of the rifle-making organization would be little short of a calamity. During the standardization of the equipment of the plants referred to, however, there have been periods when the entire staff of inspectors have not been continuously employed, although regularly paid, and this fact has been made the basis of criticism of the Ordnance Bureau.

Summarizing the situation, it would appear that the department has met a very difficult situation as skillfully and as wisely as possible and that the slight delay in the production of rifles will be more than compensated for by the quality of the weapons placed in the hands of the American soldiers. It is stated positively that there will be an ample supply of rifles for all troops sent abroad and that any temporary shortage in arms for training soldiers in the United States can easly be met by arranging drilling periods so that two sets of men can use the same guns. W. L. C.

Pig-Iron and Steel-Ingot Output of the New Youngstown District

A separate page of the Annual Statistical Report of the American Iron and Steel Institute for 1916 is given to the production of iron and steel in what is known as the Youngstown district. By action of the institute in 1915 the Youngstown district was constituted for statistical purposes, and it was defined as taking in Mahoning and Trumbull Counties and the northern part of Columbiana County in Ohio and Mercer, Lawrence and Beaver Counties in Pennsylvania. However, in its regular statistics the institute has not changed the districts maintained for years—namely, the Mahoning Valley in Ohio and the Shenango Valley in Pennsylvania. These are historic and natural district designations and do not cross State lines as is done in the creation of the new Youngstown district, while the continuance of the Shenango Valley very properly preserves the collective iron-making activities of New Castle, Sharon and Farrell. By the creation of the Youngstown district, the identity of these three producing centers is swallowed up in Youngstown. The inclusion of Beaver County, Pa., in the Youngstown district also gives credit to Youngstown for the output of two important plants owned by Pittsburgh interests and naturally tributary to the Pittsburgh district. These are the works of the Pittsburgh Crucible Steel Co. at Midland and the Aliquippa works at Woodlawn of the Jones & Laughlin Steel Co.

The above explanation is necessary to an understanding of a compilation just made and published at Youngstown, comparing the iron and steel industry of the Youngstown district in 1916 with that of Allegheny County in the same year. The figures for pig iron, steel ingots and rolled products for the two districts are as follows:

	Youngstown District, 1916 Gross Tons	Allegheny County, 1916 Gross Tons
Pig iron	6,923,938	7,239,913
Open-hearth steel ingots	4,042,347	7,270,060
Bessemer steel ingots	3,115,184	1,956,608
Other steel ingots	25,150	46,328
Total steel ingots	7,182,681	9,272,996
Rolled products	3,765,389	7,244,405

In the Youngstown district, as defined above, there were 49 blast furnaces in 1916, against 47 in Allegheny County. The percentage of gain in pig-iron production in 1916 over 1915 was 25.5 for the Youngstown district and 22 for Allegheny County. In steel-ingot production the percentage of gain was 23.5 for the Youngstown district and 19.7 for Allegheny County.

The Carnegie Steel Co. is extending the building housing its 8-in. mill at its Youngstown, Ohio, lower Union works, for the purpose of giving more room for its straightening beds and rolls. Every indication points to the upper and lower Union bar mills in Youngstown being used as long as possible, despite rumors to the effect that these units are to be abandoned as soon as the McDonald bar mills are completed.

PERSONAL



EDWIN T. JACKMAN

Edwin T. Jackman of E. S. Jackman & Co., agents for the Firth-Sterling Steel Co., McKeesport, Pa., in Chicago, Cleveland and Pittsburgh, has received an appointment as first lieutenant in the ordnance section of the Officers' Reserve Corps, and is now on active duty.

J. E. Thomas, formerly purchasing agent of the Whitaker-Glessner Co. at its Portsmouth, Ohio, works, has resigned to become purchasing agent for the Canton Sheet Steel Co., Canton, Ohio. No successor has yet been appointed to Mr. Thomas, but his former duties are being taken care of by F. W. Knowles, assistant general superintendent, and J. L. Whatkins, assistant sales manager of the Portsmouth works.

William Maginness has been appointed general manager of the Christiana Machine Co., Christiana, Pa.

Witherbee, Sherman & Co., New York, announce that, pursuant to action of the board of directors at a meeting held Aug. 20, the officers of the company are as follows: Walter C. Witherbee, chairman of the board, Port Henry; Lewis W. Francis, president, New York; E. A. S. Clarke, vice-president, New York; George C. Foote, vice-president and general manager, Port Henry; Silas H. Witherbee, treasurer, Port Henry; Ralph E. Rogers, secretary, New York.

Jarvis Williams, Jr., manager of the commercial division, and Lewis F. Hall, manager of the military division, have been made respectively works manager and assistant works manager of the Union Metallic Cartridge plant, Bridgeport, Conn., one of the works of the Remington Arms Union Metallic Cartridge Co.

Charles E. Edwards, for many years a departmental foreman of Landers, Frary & Clark, New Britain, Conn., has been made assistant superintendent of the hardware department.

George A. Fernley, secretary and treasurer of the Metal Club of Philadelphia, has been commissioned a first lieutenant in the Ordnance Department of the United States Army, with office at Washington, D. C.

John A. Cook has been appointed superintendent of transportation at the plant of the Solvay Process Co., Solvay, N. Y.

Harry E. Harris, president of the Harris Engineering Co., Bridgeport, Conn., and William A. Viall, of the Brown & Sharpe Mfg. Co., Providence, R. I., have been appointed on a committee to act with the National Bureau of Standards in effecting gages for munition manufacture.

Gilbert L. Robinson, formerly connected with the steel department of Gaston, Williams & Wigmore, Inc., New York, has resigned to become associated with F. W. Highberger & Co., coal, coke, pig iron and steel, 30 Church Street, New York.

Henry D. Booth, formerly in charge of the munition department, Midvale Steel Co., has been appointed superintendent, succeeding George Satterthwaite, resigned. John L. Cox has been appointed as assistant, in place of Newell C. Bradley, resigned.

Arthur S. Lewis has resigned his position with the Chicago-Cleveland Car Roofing Co., to join the sales force of Flint & Chester, Inc., New York. Effective Sept. 1 Mr. Lewis, as assistant to the president, will have charge of sales to railroads and other large corporations. He succeeds W. B. Wise, who resigned to go into other business.

W. I. Ballentine, superintendent Chain Belt Co., Milwaukee, has resigned, effective Sept. 1, to assume the position of vice-president of the Advance-Rumely Co., LaPorte, Ind.

Samuel H. Squier, Jr., mechanical engineer, Milwaukee Electric Crane & Mfg. Co., Milwaukee, has enlisted as a private in Co. A, Wisconsin Home Guard, the first company to be formed in the organization of a 36-company military establishment that will take the place of the Wisconsin National Guard while it is in the federal service.

Judge James B. Kennedy, former judge of the Mahoning County common pleas bench, has been named chairman of the board of the Brier Hill Steel Co., Youngstown, Ohio, to succeed Henry H. Stambaugh, resigned. Mr. Kennedy has been a member of the Brier Hill board for about a year.

J. M. Barringer, formerly superintendent and sales manager of the American Malleables Co., Lancaster, N. Y., has become connected with the Canton, Ohio, foundry of the Timken-Detroit Axle Co., as assistant manager and efficiency engineer.

A. A. Gloetzner, Detroit factory manager for the Covert Gear Co.; J. D. Harris, McCord Mfg. Co., Detroit; A. W. Coplant, Detroit Gear & Machine Co.; K. W. Hooth, Fuller & Sons Mfg. Co., Kalamazoo, and Carl Clement, Bock Bearing Co., Toledo, are among nine engineers called to assist the Government in designing standard military trucks.

John F. Berteling, formerly representative of the Sullivan Machinery Co., Chicago, in upper Michigan, has been appointed superintendent of the company's mining properties on the Mesaba range.

C. B. Dunster, for a number of years consulting engineer with the Breitung mining interests and for the past three years manager of the mining department of Breitung & Co., New York, has succeeded H. L. Kaufman as manager of E. N. Breitung & Co. at Cleveland and as assistant general manager of the Breitung iron properties. Mr. Kaufman resigned to enter the banking business in New York. H. B. Barling, formerly chief engineer under Mr. Dunster, succeeds him in New York. E. N. Breitung is general manager of both the iron operations from Cleveland and miscellaneous mining operations of Breitung & Co., New York.

B. A. Shutts, who will go to Harrisburg, Pa., as superintendent of the Central Iron & Steel Co. plant, Sept. 1, will succeed George Shook, the present superintendent, who will leave for Port Henry, N. Y., where he will engage in private business. Mr. Shutts is superintendent of the North Cornwall furnaces, Bethlehem Steel Co., Lebanon, Pa.

W. A. Janssen, for four years the superintendent of the Bettendorf Co.'s steel foundry at Bettendorf, Iowa, has resigned, after having rounded out 10 years of continuous service for this company. Mr. Janssen has served as chemist, metallurgist, superintendent of construction, assistant superintendent, and superintendent, and has been a large factor in its building. He is a vice-president of the American Foundrymen's Association. He leaves for a larger field along the same line of endeavor. At a banquet given for him by the employees, he was tendered a handsome watch and diamond ring.

George A. Paff, superintendent for the past eight years of the rod and wire mills at the Aliquippa works of the Jones & Laughlin Steel Co., Woodlawn, Pa., has resigned to become general superintendent of the Page Woven Wire Fence Co., Monessen, Pa. Previous to engaging with the first-named company, Mr. Paff was superintendent of the rod and wire mills at the Sharon plant of the American Steel & Wire Co.

The Debevoise-Anderson Co., New York, agent for pig iron, has contributed liberally toward army and navy. Paul Debevoise is captain in the infantry branch and is now at Petersburg, Va. S. J. Meeker, a lieutenant in the navy, is stationed at Newport News.

H. Ellsworth, a sergeant in the Twenty-third Infantry, is stationed in Brooklyn. W. K. Callow has just returned from six weeks' training in the Ordnance Department, Dartmouth, and expects soon to enter active service.

J. H. McKown, who has been chief clerk to W. B. Weston, manager of sales for the Carnegie Steel Co., the Tennessee Coal, Iron & Railroad Co., and other United States Steel Corporation interests in St. Louis, has been accepted for the officers' camp at Fort Sheridan and will report for training Aug. 27.

J. C. Bryan, formerly with Manning, Maxwell & Moore, Inc., as southwestern representative of the Ashcroft Mfg. Co., Consolidated Safety Valve Co., Hayden & Derby Mfg. Co. and Hancock Inspirator Co., is now connected with the equipment department of the Walter A. Zelnicker Supply Co., St. Louis.

The directors of the recently incorporated Valley Iron Co., Youngstown, Ohio, have elected officers as follows: Wade A. Taylor of Niles, president; C. W. Martin, vice-president; C. H. Stewart, secretary and treasurer. Directors are Wade A. Taylor, C. W. Martin, C. H. Stewart, D. A. Strickland and C. C. Stewart.

F. H. Willcox has resigned his connection with the Huessener Engineering Co., Pittsburgh, and C. O. Nordennson, formerly with the Foos Gas Engine Co., Springfield, Ohio, has been appointed to succeed him.

Electric Steel Furnaces in Great Britain

Electric furnaces, built or building in 1916 in the United Kingdom, according to a recent report of the Iron, Steel and Allied Trades Federation (British) was 91 as against 45 in 1915. The following table shows the number according to types and the output so far as information was available:

Type	Number	Total Capacity, Tons
Hercuit	32	153 5
Electro-Metals (Grönwall-Dixon)	22	60.5
Greaves-Etchell	20	...
Rennerfelt	5	8.2
Snyder	4	1.5
Stassano	3	...
Stobie	2	...
Frick (since converted)	1	...
Special	2	...
Total	91	

The total compares with 88 as given in the review of the electric steel industry of the world, compiled by THE IRON AGE and published Jan. 4, 1917.

New Company to Install a Booth-Hall Electric Furnace

The Midland Electric Steel Co., recently incorporated, will put in operation early in October a 1200-kva., 3-ton, 2-phase, Booth-Hall electric steel furnace. The plant will be located at Terre Haute, Ind., in connection with the Highland Iron & Steel Co., an arrangement having been made for the latter company to roll the product, which will be forging billets 4-in. square and under. Joseph B. Moos, 116 South Michigan Avenue, Chicago, is president of the Midland Electric Steel Co. The directors are Mr. Moos, W. C. Ely, treasurer and general manager of the Highland Iron & Steel Co., and Moses E. Greenebaum, president Greenebaum Sons Bank & Trust Co., Chicago. Power for operating the furnace will be supplied by the Terre Haute, Indianapolis & Eastern Traction Co.

New Scrap Company

The Stalnaker Steel Co. has been organized to engage in the handling of iron and steel scrap of all kinds and will open offices shortly in rooms 2126-2130 Farmers' Bank Building, Pittsburgh. H. D. Stalnaker is president, H. G. Stalnaker is vice-president, and F. S. Easterly, secretary. For some years H. D. Stalnaker has represented, in the Pittsburgh district, the Ohio Iron & Metal Co., dealer in iron and steel scrap, with main offices at Chicago.

OBITUARY

WILLIAM H. PERRY, president of the Perry, Buxton, Doane Co., scrap iron dealer and active in bank and mercantile concerns, died Friday afternoon, Aug. 24, at Weirs, N. H., of acute indigestion. He was on his way home on an automobile trip through Maine and New Hampshire. Mr. Perry was the founder of the William H. Perry Co., president of the United States Robbin & Shuttle Co. and director of the United National Bank and the Providence Engineering Works. Born in London, England, Aug. 25, 1847, he went to New York with his parents when a boy and was educated in the public schools. He took up his residence in Providence about 50 years ago, starting in the scrap iron business in 1867.

JAMES E. CAMP, for many years superintendent of the cabinet department of the former Wheeler & Wilson Sewing Machine Co., which later became the Sewing Machine Cabinet Co., a subsidiary of the Singer Sewing Machine Co., died Aug. 22 at his home in Bridgeport, Conn., of pleurisy. Mr. Camp was born in Sheffield, Mass., Aug. 25, 1853, and except for a short service as a city official had been with the company from boyhood, a service of nearly 50 years.

ARTHUR KNEISEL, national treasurer for the American Association of Engineers, died in Chicago Aug. 17. He was one of the original promoters of the association and was secretary up to this year. He was born in Lexington, Ky., in 1880, and was graduated from the University of Kentucky. At the time of his death he was president of the Utilities Development & Sales Co.

MOSES W. REDSHAW, Bridgeport, Conn., general superintendent of the Bridgeport works of the Singer Sewing Machine Co., was killed Aug. 22 by a a fall through a hole in the floor of the factory, where repairs were being made. Mr. Redshaw was 65 years old and had been connected with the business for 45 years.

THOMAS G. CONNOR, age 58, and for some years credit manager of the Republic Iron & Steel Co., died at his home in Youngstown, Ohio, on Monday, Aug. 27. He had been ill for about two weeks.

Pittsburgh and Nearby Districts

The Columbia Steel & Shafting Co., Carnegie, Pa., has recently bought some additional land in Cleveland on which it will at some future time erect a large warehouse, and carry in stock a complete line of its products for supplying its trade in the Cleveland district.

The Westinghouse Air Brake Co. has recently purchased 54 acres near its works at Wilmerding, Pa., to be used for probable future extensions.

The offices of the Pittsburgh Iron & Steel Foundries Co. have been removed to rooms 314 and 315 Oliver Building, Pittsburgh.

A 2,000,000-Ton Contract for Gogebic Ore

A recent statement concerning the operations of the Charcoal Iron Co. of America contains the first public announcement of a contract the company has made with the Midvale Steel & Ordnance Co. to deliver 200,000 tons of iron ore per year for ten years from the Yale mine on the Gogebic range. The ore is of Bessemer grade. In the same connection it is stated that the Charcoal Iron Co. of America has made a sale to another steel company of 25,000 tons of ore per year for a period of five years.

The Briggs & Stratton Co., Milwaukee, manufacturer of electrical ignition specialties, is now employing more than 200 girls and young women in places formerly filled by men. The women are working at punch presses, assembling and other duties of a light nature. As rapidly as practicable the women are being uniformly dressed in overalls as a safety precaution in the operation of machinery.

Sweeping Export Order Is Issued

President Wilson Extends List of Goods and Makes Shipment More Difficult—Manufacture of Munitions in Canada Curtailed

WASHINGTON, Aug. 28.—President Wilson has delivered a body blow to Germany in the form of a proclamation making it practically impossible for American goods to be shipped to that country either directly or indirectly. Incidentally, all the neutral countries contiguous to Germany will suffer, for it is apparent that the United States is prepared to go to any lengths to prevent its products from reaching the German Empire. The President's proclamation is a revision and a very material extension of the list of goods for the exportation of which licenses must be procured and brings nearly all the important products of the country under the embargo ban.

"The purpose and effect of this proclamation," says the President in an explanatory statement given out at the White House, "is not export prohibition, but merely export control. It is not the intention to interfere unnecessarily with our foreign trade; but our own domestic needs must be adequately safeguarded and there is the added duty of meeting the necessities of all the nations at war with the Imperial German government. After those needs are met, it is our wish and intention to minister to the needs of the neutral nations as far as our resources permit. This task will be discharged without other than the very proper qualification that the liberation of our surplus products shall not be made the occasion of benefit to the enemy. either directly or indirectly.

"The two lists have been prepared in the interests of facility and expediency. The first list, applicable to the enemy and his allies, and to the neutral countries of Europe, brings under control practically all articles of commerce, while the second list, applicable to all the other countries of the world, makes only a few additions to the list of commodities controlled by the proclamation of July 9, 1917. It is obvious that a closer supervision and control of exports is necessary with respect to those European neutrals within the sphere of hostilities than is required for those countries farther removed.

"The establishment of these distinctions will simplify the administrative processes and enable us to continue our policy of minimizing the interruption of trade."

The first list, which prohibits the shipment of goods to Germany or to neutral nations the territory of which is contiguous to Germany, includes the following:

All kinds of arms, guns, ammunition and explosives, machines for their manufacture or repair, component parts thereof, materials or ingredients used in their manufacture, and all articles necessary or convenient for their use.

All contrivances for or means of transportation on land or in the water or air, machines used in their manufacture or repair, component parts thereof, materials or ingredients used in their manufacture, and all instruments, articles and animals necessary or convenient for their use.

All means of communication, tools, implements, instruments, equipment, maps, pictures, papers and other articles, machines and documents necessary or convenient for carrying on hostile operations.

Coin, bullion, currency, evidences of debt, and metal, materials, dies, plates, machinery and other articles necessary or convenient for their manufacture.

All kinds of fuel, food, foodstuffs, feed, forage and clothing and all articles and materials used in their manufacture; all chemicals.

Machinery, tools and apparatus.

All metals, minerals, mineral oils, ores, and all derivatives and manufactures thereof.

The second list, which is applicable to all the countries of the world not included in the first list, is a revision of that embraced in the President's proclamation of July 9, with some important additions in the way of steel products, machinery and machine tools, tin plate, lead, etc. This list includes the following:

Coal, coke.

Pig iron, ferro-silicon, ferro-manganese and spiegeleisen.

Steel ingots, billets, blooms, slabs and sheet bars.

Iron and steel plates, including ship, boiler, tank and all other iron and steel plates ⅛ in. thick and heavier, and wider than 6 in.

Iron and steel structural shapes, including beams, channels, angles, tees and zees of all sizes.

Fabricated structural iron and steel, including beams, channels, angles, tees, zees and plates, fabricated and shipped knocked down.

Scrap iron and scrap steel.

Tool steel, high-speed steel and alloy steels and machine tools.

Steel-hardening materials.

Aeronautical machines and instruments, their parts and accessories thereof, arms and ammunition.

All explosives.

Benzol and its derivatives, phenol (carbolic acid) and its derivatives, toluol and its derivatives.

Anti-aircraft instruments, apparatus and accessories.

All radio and wireless apparatus and its accessories, optical glass, optical instruments and reflectors.

All engines and motors operated by steam, gas, electricity or other motive power and their accessories..

Metal and woodworking machinery.

Oil well casing, oil well drilling implements and machinery and the accessories thereof.

Steam boilers, turbines, condensers, pumps and accessories thereof.

All electrical equipment.

Crucibles, emery, emery wheels, carborundum and all artificial abrasives.

Copper, including copper ingots, bars, rods, plates, sheets, tubes, wire and scrap thereof, lead and white lead; tin, tin plate, tin cans and all articles containing tin; nickel, aluminum, zinc, plumbago and platinum.

Industrial diamonds.

Radical Reorganization

The radical reorganization of the control of exports under the embargo provisions of the espionage act has been brought about as the result of an executive order signed by President Wilson Aug. 23 and made effective Aug. 27. Under this order the Exports Administrative Board, of which Vance McCormick is chairman and which heretofore has acted in an advisory capacity to the Exports Council, becomes the active controlling body with full executive authority. As the result of this change, the Exports Council, which embraces the Secretaries of State, Commerce and Agriculture and the Food Administrator, becomes a mere advisory body and under ordinary conditions will exercise no function of importance. So sweeping are the changes made by the President's order, however, that the question has been raised as to whether the administrative board has sufficient authority under existing law to discharge the duties devolving upon it and it is possible, if not probable, that Congress will be asked to make important amendments in the espionage law that will not only clothe the new administrative board with full powers but that will increase the authority of the President to direct and control export shipments.

The object of the reorganization of the control of exports, which heretofore has been administered by the Department of Commerce, is to simplify procedure in the granting of export licenses. Under the system heretofore in force, rulings of the administrative board made in pursuance of the shaping of an export policy have first been laid before the Exports Council and after approval have been sent to the President, who, after giving them his endorsement, has directed the

Secretary of Commerce to put them into force. So much red tape has operated to slow down the routine work of granting licenses and there has been considerable complaint of delay. The matter was finally taken up by the administrative board which framed the reorganization project to which the Exports Council promptly gave its approval. Hereafter the administrative board will rule upon all questions concerning applications for licenses and will formulate the general policy of export control and frame all regulations for its execution.

Important Question as to Salaries

A serious difficulty has been encountered by the administrative board in severing its relations with the Department of Commerce. Congress some time ago passed a statute forbidding a commission or board not specifically created by legislation to expend Government funds. The administrative board maintains a large staff of experts and clerical employees, but, under the letter of the statute referred to, has no authority to pay them. Heretofore these employees have been carried on the rolls of the Deparment of Commerce, which has the necessary funds to provide their compensation. As a makeshift, this department will continue to pay the compensation of the board's entire staff, but as there is a serious question as to the regularity of this procedure, some other arrangement will be perfected as soon as possible. The President has a large fund which he can expend for war purposes without making any accounting, but the drafts on this appropriation for war purchases and for services rendered in a confidential capacity are so heavy that it is improbable that any of it will be utilized to keep the administrative board going. The matter is under consideration by law officers of the Government who may hold that the embargo section of the espionage act gives the board sufficient status to justify it in disbursing funds. Otherwise Congress may be asked to pass a supplemental law meeting this difficulty and otherwise expanding the embargo provision.

Method of Procedure

The Administrative Board has promulgated the following notice regarding future procedure in applying for licenses:

Beginning with Monday, Aug. 27, applications for export licenses should be made to the Exports Administrative Board, 1435 K Street, Washington, D. C., or to the branch office at 11 Broadway, New York, or they may be filed at any of the branch offices of the Bureau of Foreign and Domestic Commerce, Department of Commerce, at Boston, Chicago, St. Louis, New Orleans, San Francisco and Seattle, where blank application forms may be obtained. Licenses will be issued at the branches of the Bureau of Foreign and Domestic Commerce in all cases possible, but in certain cases it will be necessary for applications to be forwarded to the office of the Exports Administrative Board in Washington.

Licenses will ordinarily be good for 60 days, unless revoked prior thereto, and at the expiration of that time must be renewed to be valid. In sending applications to Washington, they should be addressed to the Director of the Bureau of Export Licenses, 1435 K Street, N. W.

In case of necessity, exporters may telegraph their application to Washington, but in this event they must be careful to see that all the information required by the proper form is contained in the telegram. In order to avoid unnecessary delays, exporters should endeavor to arrange to send in their applications at least two weeks in advance of the proposed date of shipment. All regulations issued by the Exports Administrative Board will be published in the "Official Bulletin," published daily by the Committee on Public Information, and in "Commerce Reports," issued daily by the Department of Commerce, and it is suggested that shippers avail themselves of these publications to keep themselves posted on any changes which may be made from time to time.

Discontinuing Manufacturing

The recently promulgated ruling requiring exports of steel products to Canada to be licensed has been closely followed by an announcement by the Dominion Government in the form of an official statement emanating from the Imperial Munitions Board to the effect that the manufacture of munitions in the Dominion is no longer necessary and will be discontinued except in certain lines in which reduced quantities will be produced until further notice. This statement is as follows:

Toward the close of 1916, the capacity for producing munitions in Great Britain had so increased that the minister of munitions decided that it was unnecessary to continue the production of munitions in the United States for British account, except for a few special lines. The production in Canada, however, was continued as before.

The minister has now advised that it is unnecessary to continue production in Canada. He has directed that certain lines shall be discontinued, that other lines shall be produced in lessened quantities, while some lines are to be continued as at present.

The effect of this will be to stop the production of shells and components at some plants which are now producing sizes no longer required.

In other plants where shells are made of sizes of which a reduced output only is required, it will mean working during the day only, thus stopping night work. In other plants, however, where sustained production is required, operations will be continued night as well as day.

The attention of officials here has been directed to this statement by manufacturers who have been requested to supply the British Government with certain war material which it is understood they have heretofore secured in Canada, and the question has been asked as to whether the British Government is cutting down its demands on Dominion manufacturers because it expects to buy the same articles for less money in the United States. Canadian manufacturers have been permitted to make handsome profits on the goods they have furnished the Government and have in turn been subjected to heavy war profits taxes. Officials here declare there is no connection between the buying now being done in the United States for the Allies and the closing out of orders on Canadian factories. Up to the present time, practically all the purchases made for the Allies in the United States have been on contracts made before the War Industries Board was organized and in many cases these have a considerable time to run. Certain of them are subject to cancellation provisions, but the majority will be carried out in accordance with the original terms. It is also pointed out in this connection that the British Government would pursue a very short-sighted policy if it closed down Canadian munition factories in order to buy cheaply in the United States in view of the fact that it is now commanding a very large revenue in taxes on the war profits of all manufacturing concerns in the Dominion and that the present prosperity of Canada is largely based on war business. W. L. C.

Limestone for Furnace Flux in 1916

The quantity of limestone marketed for furnace flux in the United States in 1916 was largely in excess of any previous record, due to greatly increased activity in the iron and steel industry. The quantity was 23,503,508 gross tons, valued at $13,936,882. This is an increase of 4,604,785 tons or 24 per cent over that for 1915 and an increase of $4,264,535 or 44 per cent in value compared with 1915. The average price per ton, according to returns made to G. F. Loughlin of the U. S. Geological Survey, increased from 51c. to 59c. Pennsylvania, the leading state, increased its quantity from 8,625,636 tons to 10,019,046 tons. Ohio was second, increasing its quantity from 2,698,321 to 3,281,324 tons. Michigan was third, West Virginia ranked fourth, and Illinois ranked fifth in quantity and sixth in value, with Alabama sixth in quantity and fifth in value. Other states, prominent as flux producers, showed corresponding increases. Maryland, formerly a small producer of furnace flux, produced 146,276 tons. New York was the only important state to show a decrease.

Work has been started at the Lackawanna Steel Co.'s plant at Buffalo on foundations for No. 9 blast furnace. It is expected that No. 8 furnace, now under construction, will be finished before the end of the year.

Chicago Machinery and Supply Men Have Outing

An outing held by the Machinery Club of Chicago at the Chateau Desplaines, Lyons, Ill., Aug. 25, proved an enjoyable affair. Members and their families to the number of 175 were present and the various games and contests afforded honors for a great many. A leading feature was a ball game of the indoor type, but played on the lawn, in which the contestants were the machinery men, captained by F. Le Roy Peterson of the Hendey Machine Co., and the supply men, headed by Norton A. Booz of the Machinists' Supply Co., in which the victors were the machinery men, the score being 29 to 7. During the game there were one or two incipient "riots," due to a certain machinery man "rooting" for the supply men, and the alleged traitor was ejected from the diamond repeatedly by Captain Peterson. Carl E. Neubert of the Warner & Swasey Co. directed the various contests participated in by men, women and children. Numerous prizes were awarded by M. F. Crawmer of the Detroit Twist Drill Co., chairman of the committee on arrangements, including one to Franklin Hardinge, president Hardinge Bros., Inc., and Mrs. Hardinge, by reason of their having been married 23 years and 9 months—longer than anyone else at the gathering. An address was made by Clyde W. Blakeslee of the Abrasive Material Co., president of the club, in which he referred to the opening at an early date of clubrooms for the organization.

An Improved Calculating Machine

The Marchant Calculating Machine Co., Emeryville, Oakland, Cal., has developed an improved form of calculating machine for handling operations in multiplication, division, square root, percentage, interest, discounts, etc. The machine consists of a setting dial, two auxiliary ones for giving the results and proof, an operating handle and an automatic shift for the carriage. If it is desired to multiply two numbers, for example, the multiplicand is set by pulling the setting levers to correspond to the figures. The operating handle is then turned as many times as the units figure in the multiplier, this result being indicated on one of the auxiliary dials, after which the carriage is shifted and the handle turned the number of times corresponding to the figure in the tens place of the multiplier. This process is repeated as often as may be necessary to complete the operation, the product being given on the larger of the two auxiliary dials, while the multiplier shows in the smaller one and the multiplicand is on the machine. In this way a proof of the calculation is provided. In division the operation is reversed, the dividend appearing on the larger of the auxiliary dials, while the quotient appears on the smaller. Aside from an absolute check on the accuracy of the calculations, considerable saving in time is claimed.

Solit Steel Pulleys for Severe Service

As a substitute for special cast-iron pulleys for heavy duty, the American Pulley Co., Philadelphia, has developed a special split steel pulley. The diameters in which the pulley can be supplied range from 36 to 84 in. inclusive, with a bore of either 6 or 8½ in. Among the work for which these pulleys are designed is the driving of drop hammers, air compressors, centrifugal pumps, rock crushers and paper mill engines where the loads are both heavy and intermittent.

The Vulcan Steel Products Co. held a banquet at the McAlpin Hotel, New York, Aug. 17. Three members of the organization left Aug. 19 for the Far East. One of these was C. C. Irwin, manager of the Far East Division, and the others E. J. Parker, sales manager of the engineering and machinery division, who will organize a Japanese department at Yokohama, and Joseph Bayan. A. Micoli is shortly to leave New York for South America. He will travel through Argentine, Brazil and Uruguay

Electrical Engineers' Convention

The program for the eleventh annual convention of the Association of Iron and Steel Electrical Engineers at the Bellevue-Stratford Hotel, Philadelphia, Sept. 10 to 15, provides for sessions both morning and afternoon beginning Monday morning, Sept. 10, at 9 o'clock, and concluding late on the following Friday. The Monday morning session will be a business meeting for members only. In the afternoon, papers will be read by Walter Greenwood on "Safeguarding Electrical Equipment" and by Walter C. Kennedy on "Heroult Electric Furnaces." The following papers will be read at Tuesday's sessions: "Factors Relating to the Economical Generation and Use of Electric Power in the Steel Industry," by Brent Wiley; "Central Station Power Supply to Iron and Steel Industry," by Joseph McKinley and Ray L. Baker; "Electrical Reversing Blooming Mills," by Ralph D. Nye, and "Electric Drives for Reversing Rolling Mills," by D. M. Petty. On Wednesday three papers will be read as follows: "Fuel Economy by Co-operation in Establishing a Better Practice in the Operation of Stacks and Boilers," by Joseph G. Worker; "Turbo-Generators," by Richard H. Rice, and "Manufacture, Selection and Use of Carbon Brushes," by E. H. Martindale. These papers will be followed by a patriotic meeting with address by Army and Navy engineers. The annual banquet, to which ladies are especially invited, will take place Wednesday evening. On Thursday motor standardization, control standardization and crane standardization will be discussed. Discussions will be led by W. T. Snyder, F. B. Crosby, T. E. Barnum and D. M. Petty. Two papers will be read at the Friday sessions, "Grab-bucket Coal Hoists with Dynamic Braking and Regenerative Braking," by James Farrington and R. H. McLain, and "Tool Steel Gears and Pinions for Mill and Industrial Service," by E. S. Sawtelle. Friday afternoon there will be an opportunity to inspect the Cramp shipbuilding plant, the shops of the Midvale Steel Co. and the Baldwin Locomotive Works.

Members are urged to attend this convention because of the interesting papers and discussion to be presented, and they are also urged to bring their wives, as the entertainment committee has made special arrangements to provide entertainment for them. F. D. Egan, Pittsburgh Crucible Steel Co., Midland, Pa., is president, and J. F. Kelly, National Tube Co., McKeesport, Pa., is secretary. Alfred H. Swartz, 10704 Churchill Avenue, Cleveland, Ohio, is chairman of the convention committee.

Freight Rates of Pig Iron and Billets Advance

Effective Aug. 20, the freight rates of pig iron and billets in carloads from Pittsburgh to points named below were materially advanced, and are now as follows:

Pittsburgh to	Pig Iron	Billets
New York	$3.10	$3.20
Philadelphia	2.90	3.00
Rochester, N. Y.	2.20	2.30
Baltimore	2.80	2.90
Richmond, Va.	3.30	3.40
Syracuse, N. Y.	2.30	2.75
Utica, N. Y.	2.90	2.90
Boston	3.30	3.60
Albany	3.15	3.20
Portland	3.30	3.60
Richwood, Va.	3.36	3.36
Rockland, Me.	3.90	4.20

At the Farrell works of the American Sheet & Tin Plate Co., Farrell, Pa., two women are now at work roughing on the cold rolls. These women will be able to earn about $4.50 per day of eight hours after they have become sufficiently skilled to work at the prevailing piece rate. Observance of the officials at this plant leads to the belief that these women will become more efficient in a short time than the average man at this particular class of work.

Suwanee Iron Co., Grand Rivers, Ky., expects to blow in its No. 1 furnace early in September. Work will proceed at once on relining No. 2 furnace.

Machinery Markets and News of the Works

AIRPLANE PLANTS WILL BUY

Considerable Equipment Purchasing Likely

Pennsylvania Railroad Co. Places Large Orders for Government Locomotive Shop in France —Activities in All Lines

Buying of considerable equipment for airplane plants is forecasted by inquiries which have been made in the New York market during the past week. The Inter-continental Machinery Corporation, 165 Broadway, New York, has issued a list totalling about $1,000,000 worth of machine tools, and from the types of machines listed it is inferred that this is for an airplane engine plant. The Trego Motors Corporation, New Haven, Conn., is inquiring for machine tools, and will issue a formal list soon. This concern plans building five twin-six engines per day. The Standard Aero Corporation, Plainfield, N. J., has purchased the John Stephenson Co. car works of the J. G. Brill Co., and will convert it at once into an airplane factory, and through its engineers, Paine, McClellan & Campion, 25 Church Street, New York, will purchase about $300,000 worth of metal-working and wood-working machinery. The Simplex Automobile Co., New Brunswick, N. J., will close on its list of about 100 machine tools as soon as its contract with the Government is formally signed. This concern will concentrate all of its facilities and activities on airplane engine work. The Packard Motor Car Co., Detroit, will do likewise on its $16,000,000 worth of motor truck contracts, though it may take on some aviation motor work. The Pierce-Arrow Motor Car Co., Buffalo, is said to be willing to participate in airplane engine manufacture in addition to its motor truck work for the Government. The Nordyke-Marmon Co., Indianapolis, has been buying additional equipment in Chicago for airplane engine manufacture. Orders have been placed also in Detroit and Cleveland by concerns engaged in making airplane motors or parts. Foreign demand continues active, France and Russia having closed recently for additional tools for airplane engines. The Aircraft Production Board is receiving bids for machine tools to be used on Government airplane work.

The Pennsylvania Railroad Co., Philadelphia, is buying on a large scale for the United States Government locomotive shop to be built in France. Orders for 18 cranes were placed last week, in addition to steam hammers, bending rolls, etc., and machine tools.

Plate-working machinery is in demand for export. Charles Haas, 50 East Forty-second Street, New York, will close this week for a number of such machines wanted for building industrial cars in France. The F. W. Horne Co., 2 Rector Street, has bought plate shop machines for shipyards in Japan.

Gun-forging plants, which were mentioned last week, are buying equipment. Some of these orders have been placed in Cleveland. The Bullard Machine Tool Co., Bridgeport, Conn., has placed orders within the week for several hundred thousand dollars' worth of machine tools for the gun-finishing plant it will build for the Government. The Bartlett & Hayward Co., Baltimore, Md., has bought a considerable number of new machines for a munitions contract. The Jeanesville Iron Works of the Worthington Pump & Machinery Corporation, Hazleton, Pa., has received a contract from the Frankford Arsenal for shells and has been placing orders in New York and Philadelphia the past week for about 50 new machine tools. The Frankford Arsenal will soon complete a new fuse factory and will need about 200 new machines, mostly automatic screw machines and small turret lathes. The Eddystone Munitions Co., Eddystone, Pa., has about completed its Russian contract and, it is reported, will engage on an American munitions contract. It has inquired in Philadelphia for new tools. The Standard Roller Bearing Co. division of the Marlin-Rockwell Corporation has been placing orders in Philadelphia. This concern is also on a Government contract. The Rock Island Arsenal has been placing orders in Chicago. The Wagner Electric Co. plant at St. Louis is said to be well equipped for its gun carriage and caisson contract. The Hero Mfg. Co., Philadelphia, has received a Government contract for 1,074,000 gas masks.

Other miscellaneous buying has been done by the McKiernan & Terry Drill Co., Dover, N. J., and the Nathan Mfg. Co., Flushing, N. Y., which has a new plant for making brass parts for locomotives, having a contract with the Baldwin Locomotive Works, the American Locomotive Co. and the Lima Locomotive Corporation. The Electro Dynamic Co., Bayonne, N. J., has inquired for about 40 machines. The Fifth Avenue Coach Co., which will build a new plant for motor trucks in New York, is inquiring, and will issue a formal list soon. The American Car & Foundry Co., the Hughes Tool Co., Houston, Texas, and the Pan-American Motor Corporation, Decatur, Ill., have placed orders in Chicago. The Lycoming Foundry & Machine Co., Williamsport, Pa., has bought a few tools in Philadelphia. The Arguto Oilless Bearing Co. is building a new plant at Wayne Junction, Philadelphia, for making ignition systems, and will soon buy considerable equipment.

Some shipbuilding plants are going ahead regardless of delay at Washington in giving out new ship contracts, this delay being due to the need for new appropriations by Congress. The Federal Shipbuilding Co., New York, has placed large orders for plate and boiler shop equipment, and will probably issue new lists this week of cranes and equipment required for machine and forge shops. The Chester Shipbuilding Co., Philadelphia, is placing orders for its Bristol, Pa., plant, known now as the Merchants' Shipbuilding Corporation. The Pusey & Jones Co., Philadelphia, is expected to come into the market soon for tools for a new machine shop and tool house to be built at Wilmington, Del.

Crane business is still active. In addition to the 18 cranes ordered by the Pennsylvania Railroad Co. for the

Government locomotive shop in France, there recently has been placed one of the largest crane contracts in some time, the Ashland Steel Co., Ashland, Ky., having bought about $300,000 worth. The Pawling & Harnischfeger Co., Milwaukee, Wis., got the order for overhead cranes.

The Government is expected to place contracts soon for 500 storage battery electric trucks, for which makers are now preparing estimates.

The National Machine Tool Builders' Association is canvassing its membership by mail to ascertain the number of machine tools available for Government work, and subject to the commandeer process, if necessary. It is expected that within the next month large Government orders for shells and other war supplies will be distributed.

New York

NEW YORK, Aug. 28.

Developments of the past week in the machine-tool market center largely around the airplane program of the United States Government. The Inter-Continental Machinery Corporation, 165 Broadway, has issued a list aggregating about $1,000,000 worth of tools, which is believed to have been on behalf of an airplane engine concern. The Trego Motors Corporation, New Haven, Conn., is making inquiries for tools, and will issue a list soon for sufficient equipment to turn out five twin-six aviation engines per day. The Standard Aero Corporation, Plainfield, N. J., has purchased the plant of the John Stephenson Co., Elizabeth, N. J. (J. G. Brill Co.), and will convert it rapidly into an airplane factory. All of the airplane but the engine will be made in this plant, which has 175,000 sq. ft. of floor space. Metal-working and wood-working machinery, totalling about $300,000 in value, will be purchased by Paine, McClellan & Campion, engineers in charge, 25 Church Street, New York. Eventually this concern expects to make airplane motors also. Orders will be placed by the Simplex Automobile Co., New Brunswick, N. J., on its list of about 100 machines, which was mentioned last week, as soon as the contract with the Government is formally signed. The Simplex plant will be devoted exclusively to the manufacture of airplane engines, and the company will not produce pleasure cars after starting on its airplane contract. Delivery of some machines has been requested as early as October, while on others Jan. 1, 1918, is specified. The Pierce-Arrow Motor Car Co., Buffalo, is said to be ready to take on considerable airplane engine work in addition to its Government truck contract, and, it is reported, will considerably reduce its output of pleasure cars. The Packard Motor Car Co., Detroit, which, as previously reported, has motor truck contracts worth $16,000,000, will concentrate all of its facilities on this work, with the possible addition of airplane engine manufacture. The Packard company is inquiring for additional machine tools.

Not only in this country is the building of airplanes being rushed. England, France and Russia have been steadily buying machine tools here, and the demands recently from France and Russia have been exceptionally large and urgent. One concern reports that about half of the orders on its books for grinding machines are for airplane work abroad.

The Pennsylvania Railroad Co. last week closed for 18 overhead electric cranes wanted for a locomotive shop which will be built in France for the United States Government. It is said that the French plant will approximate in size and equipment the Trenton locomotive shop of the Pennsylvania Railroad. A large quantity of equipment is being purchased, including steam hammers, bending rolls, bolt and nut machines, etc., and a wide line of machine tools. It is reported that hundreds of machines will be bought, and in most instances very early deliveries are specified. The orders for cranes were placed with the understanding that deliveries would be begun in 60 days and completed in 90 days. Crane builders who could make such deliveries got the work, each company being invited to select any part of the order that it could guarantee to fill within the time specified. Twelve 5-ton, two 30-ton and four 65-ton cranes were bought.

Charles Haas, 50 East Forty-second Street, New York, has received bids for about 30 plate-working machines, including punching, shearing, drilling and bending machinery, to be shipped to France. It is understood that this equipment will be used in France for the manufacture of industrial cars. The F. W. Horne Co., Tokio, Japan, has closed during the past week through its New York office, 2 Rector Street, for a number of machines needed for shipbuilding in Japan.

The Tacony Ordnance Corporation, 50 Church Street, New York, is understood to be placing orders through the Government for equipment of its gun forging plant at Tacony, Pa. The Bullard Machine Tool Co., Bridgeport, Conn., placed orders during the week aggregating several hundred thousand dollars for its gun finishing plant at Bridgeport. The Bartlett & Hayward Co., Baltimore, Md., has bought considerable additional equipment for work on a Government munitions contract.

The McKiernan & Terry Drill Co., Dover, N. J., has been placing orders during the past two weeks for machine tools. The Electro Dynamic Co., Bayonne, N. J., a subsidiary of the Bethlehem Steel Corporation, has inquired for the following equipment: Two vertical boring mills 48 in. and 72 in., 2 tool grinders, 2 hand screw machines, 1 spot welding machine, 1 portable welding outfit, 1 press for pressing on commutator, 1 16 x 12 ft. engine lathe, 1 12 x 6 ft. engine lathe, 1 bolt cutter, 1 disk grinder, 2 surface grinders, 3 floor grinders, 1 pyrometer, 1 quenching tank, 1 grinding machine, 1 core plate drying oven, 1 oil tempering furnace, 1 alligator shear, 1 500-lb. blacksmiths power hammer 2 inclinable cutting presses, 1 counting platform scale, 2 one-spindle drill presses, 1 keyseater, 1 four-spindle drill press, 1 polishing stand, 2 armature coil taping machines, 1 commutator undercutting machine, 1 armature banding machine, 1 keyseater, 1 commutator oven, 1 26-in. turret lathe, 2 power hack saws, 1 inter-pole coil winding machine, 1 5-in. cutting off machine, motors, controllers, etc.

The Fifth Avenue Coach Co., New York, is inquiring for equipment for its new motor truck plant, and, it is reported, will issue a formal list soon.

The Nathan Mfg. Co., 416 East One Hundred and Sixth Street, New York, is completing a factory at Flushing, N. Y., where it will engage in the manufacture of brass parts for locomotives, having contracts with the American Locomotive Co., Baldwin Locomotive Works and the Lima Locomotive Corporation. The company has bought a considerable part of its equipment.

The Federal Shipbuilding Co., 54 Dey Street, New York, has closed during the past week for about 20 or more heavy machines for its plate and boiler shops, and is expected to complete its purchases for these two shops this week. New lists will be issued, probably this week, for machine shop tools, forge shop equipment, cranes, etc. Other shipbuilding companies which were expected to come into the market are being delayed by lack of definite word from the Emergency Fleet Corporation to go ahead, and matters will doubtless remain in this status until Congress passes the appropriation exceeding a billion dollars for which the United States Shipping Board now asks.

The Ashland Steel Co., Ashland, Ky., has placed crane orders aggregating $300,000. This is said to be one of the largest purchases of cranes in some time. The Pawling & Harnischfeger Co., Milwaukee, got the order for the overhead electric cranes. An order for ladle cranes is reported to have been placed with the Alliance Machine Co., Alliance, Ohio, and the Morgan Engineering Co. received the contract for the charging machine and other steel-making equipment.

The Gisholt Machine Co. has moved its New York office, R. D. Heflin, manager, from 50 Church Street to the seventeenth floor at 30 Church Street.

The Willys-Morrow plant of the Willys-Overland Co., Elmira, N. Y., which is busily engaged on airplane engine parts for the Curtiss Aeroplane & Motors Corporation, will be increased in size by the addition of three more factory buildings to cost about $300,000.

Brinsley & Marcus, York Building, Chesser Street, Adelaide, South Australia, will go into the manufacture of woodenware, toys, ice-boxes and sundry household woodenware. They will require woodworking machinery and electric motor equipment. Manufacturers are invited to send catalogs and discount sheets, quoting f.o.b. vessel at New York. Payment will be made in New York against documents.

The McCarthy Drill & Tool Corporation, Toledo, Ohio, with executive office at 30 Church Street, New York, has purchased the Toledo Drill & Tool Co., Toledo, which has just moved into a new two-story factory building. The company's products will be chiefly high-speed drills and cutters and reamers. Prompt delivery of both millimeter and inch size high-speed twist drills is offered.

The Fleischmann Vehicle Co., 518 East Eightieth Street, New York, has commenced the erection of a new two-story extension to its plant, about 75 x 90 ft., at 529-33 East Eightieth Street. Peter Damm is president.

The Triple Six Motor Corporation, New York, has been incorporated with a capital of $375,000 to manufacture aircraft. R. I. Guthmann and H. G. McClear, 115 Broadway, are the principal incorporators.

George V. Reilly, Louis H. Gunther and Samuel B. Howard, 65 Cedar Street, New York, have incorporated in Dela-

ware the Masters' Metals Corporation, with capital of $100,000, to manufacture metal products of various kinds.

The Downey Shipbuilding Corporation, 120 Broadway, New York, has been granted a mortgage of $2,505,000 by the United States Shipbuilding Board Emergency Fleet Corporation to provide for the immediate development and construction of the new plant of the company at Mariners Harbor, Staten Island. The company recently acquired the steel fabricating works of Milliken Bros. at this location and has commenced the conversion of the plant into a shipbuilding works. Following the completion of an order received from the Government, the plant will specialize in the construction of standardized steamships.

The Gem Metal Products Corporation, Brooklyn, N. Y., has been incorporated with a capital of $10,000 to manufacture metal goods of various kinds. E. Bobker and M. and I. Kleinfeld, 188 Hinsdale Street, Brooklyn, are the incorporators.

The Standard Sanitary Mfg. Co., 35 West Thirty-first Street, New York, manufacturer of steam fittings, plumbers' supplies, etc., with plant at Pittsburgh, Pa., has filed notice at Trenton, N. J., of amendment in its New Jersey charter, increasing the capital from $10,000,000 to $20,000,000 for expansion. Thomas Ahrens is president.

The Electric Welding Co., 220 West Forty-second Street, New York, has increased its capital from $24,000 to $256,000.

The Hammarlund Mfg. Co., Brooklyn, N. Y., has been incorporated with a capital of $30,000 to manufacture machinery, models and equipment of various kinds. L. A. and O. Hammarlund and H. S. Scott, 1247 Ocean Avenue, Brooklyn, are the incorporators.

The Scripps-Booth Corporation, 2 West Fifty-seventh Street, New York, manufacturer of automobiles, has called a special meeting to increase the capital from 70,000 to 120,000 shares, with active operating capital of $600,000. Clarence H. Booth is president.

H. H. Ramsay, L. C. Haggert and T. J. Ward, all of New York, have incorporated in Delaware the Automatic Straight Air Brake Co., with capital of $25,000,000, to make car brakes to be operated by compressed air.

The Pursel Resilient Wheel Co., New York, has been incorporated with a capital of $50,000 to manufacture automobile wheels, motors and engines. W. A. and H. J. Neumann and J. D. Pursel, 409 West 127th Street, are the incorporators.

Clemsen Bros., Middletown, N. Y., manufacturer of hack saws, have awarded a contract for the construction of an addition to their plant on Highland Avenue to cost about $40,000. Westinghouse Church Kerr & Co., 37 Wall Street, New York, are the contractors.

The Campbell Architectural Iron Co., Albany, N. Y., has been incorporated with a capital of $475,000 to manufacture metal windows and allied specialties. Thomas Cochrane, J. A. Stephens and H. E. Campbell, 8 West Fortieth Street, New York, are the incorporators.

The Sill Stove Works, 524 Oak Street, Rochester, N. Y., has increased its capital from $100,000 to $200,000.

The Sullivan Motor Truck Co., Rochester, N. Y., has increased its capital from $40,000 to $80,000.

The United States Hoffman Co., 329 Temple Street, Syracuse, N. Y., manufacturer of clothes-pressing machinery, has awarded a contract for the erection of a new one-story, reinforced-concrete addition to its works, about 70 x 175 ft., on Taylor Street, to cost $20,000.

The New York State Railways, Syracuse, N. Y., have had plans prepared for a new one-story shop and car barn, about 75 x 150 ft., to be erected at Burnet and Fairview Avenues. H. G. Throop is chief engineer.

The Catchpole Boiler, Foundry & Machine Co., 23 Jackson Street, Geneva, N. Y., manufacturer of boilers, castings, etc., has filed articles of incorporation under the name of the Catchpole Foundry Corporation, with capital of $30,000, to operate a general foundry and machine shop business. The company has recently had plans prepared for an extension to its plant. A. G. Lewis, W. Howard and C. W. Rice are the incorporators.

The Erie Railroad is planning for improvements in its local roundhouse and shop buildings at Salamanca, N. Y., to cost about $15,000.

The Suffolk Air Craft Co., Inc., Bayshore, L. I., has been incorporated with a capital of $75,000 to manufacture aeroplanes and other types of aircraft. A. J. Croft and J. O'Kelly, Bayshore, are the incorporators.

Fire destroyed a portion of the plant of the Donner Steel Co., Abbott Road and Abby Street, Buffalo, N. Y., with loss estimated at about $20,000.

The Buffalo Foundry & Machine Co., East Ferry Street and Fillmore Avenue, Buffalo, manufacturer of machinery and castings, has called a special meeting on Aug. 30 to increase the capital of the company from $500,000 to $1,500,000.

The Curtiss Aeroplane & Motors Corporation, Buffalo, N. Y., is making rapid progress in the construction of additions to its plant on Elmwood Avenue. About 300,000 sq. ft. of floor area are ready for operations, and it is said that the company plans for the immediate occupancy of the new extension for the manufacture of metal parts for aeroplanes. The entire plant, consisting of about 1,200,000 sq. ft., will be ready for service within 60 days, and will be devoted to the production of metal parts for aircraft. Arrangements are now being perfected for the erection of additional structures to provide about 200,000 sq. ft. of manufacturing space. The company is planning to utilize its Austin Street works for the production of flying boats. W. A. Morgan is general manager.

The M. Hoagland's Sons Co., Rockaway, N. J., manufacturer of iron castings, is completing an addition to its foundry to increase the present capacity. It is expected to place the extension in operation about Oct. 1.

The National Vitaphone Co., Plainfield, N. J., has been incorporated with a capital of $2,000,000 to manufacture talking machines. J. H. Greene, Jr., and C. B. Repp, both of Plainfield, and A. M. London, Elmira, N. Y., are the incorporators.

Walter Scott & Co., Eighth Avenue, Plainfield, N. J., manufacturers of printing presses and machinery, have awarded a contract for the construction of three one-story additions to their plant, 80 x 230 ft., 63 x 86 ft. and 20 x 43 ft., for increased capacity. It is said that a portion of the new works will be used for the manufacture of artillery carriages and anti-aircraft mounts for military service.

The Century-Plainfield Tire Co., Plainfield, N. J., has been incorporated with a capital of $10,000 to manufacture automobile tires and kindred specialties. Charles P. L. Huston, 902 North Avenue; William F. Hart and James D. Grant, all of Plainfield, are the incorporators.

The Standard Aero Corporation, North Avenue, Plainfield, N. J., manufacturer of airplanes, has acquired the former plant of the John Stephenson Co. at Elizabeth, N. J., used as car works, for a consideration of about $750,000. The establishment covers about 86 acres of property with water frontage on Staten Island Sound, and will be equipped and used by the new owners for the manufacture of aircraft and hydro-airplanes. It is said that the initial capacity will be over 200 machines a month and that 6000 hands will be employed. The company will maintain its present plant at Plainfield.

The Spicer Mfg. Co., operating a plant at South Plainfield, N. J., for the manufacture of universal joints, has recently filed notice of dissolution of the corporation with the Secretary of State. Clarence W. Spicer has been head of the company.

The Ransome Concrete Machinery Co., Dunellen, N. J., operating a plant on Second Street for the manufacture of concrete mixing machinery and allied equipment, has filed articles of incorporation with a capital of $1,000,000. George T. Allen, Nathaniel Laird, Elmer H. Koller and John P. Flaver are the principal incorporators. Headquarters of the company are at 115 Broadway, New York.

Fire destroyed the celluloid rendering plant of the Levine Company, Passaic, N. J., with loss estimated at about $35,000.

The New Process Pipe & Tube Bending Co., Elizabeth, N. J., has been incorporated with a capital of $10,000 to manufacture piping and tubing of various kinds. Herman Kistner, 596 Adams Street, Elizabeth; A. and C. Froehlich, Newark, are the incorporators.

Since the beginning of the year, the Crucible Steel Co. of America has constructed additions to its Harrison, N. J., plant costing in excess of $500,000. Erection is now under way of a new one-story extension to cost about $165,000. Fire, Aug. 23, in the hammer shop caused a damage of about $3,000.

The Wright-Martin Aircraft Corporation has been incorporated in New Jersey with a capital of $5,000,000 to manufacture airplanes, hydro-airplanes and other aircraft. John Alvord, J. F. Alvord and T. W. Allen, all of Jersey City, are the incorporators.

The Union Tool Co., Jersey City, N. J., has been organized to operate a plant at 125 Union Street for the manufacture of tools and machinery. Clarence J. Duryea, 34 Columbia Terrace, Edgewater, N. J., and Robert C. Pelkington, 1455 Atlantic Avenue, Brooklyn, N. Y., head the company.

The Safety Insulated Wire & Cable Co., First Avenue, Bayonne, N. J., has taken out a permit for a one-story extension to its plant.

The General Auto Parts Corporation, 328 Adams Street, Newark, N. J., has filed plans for the erection of a new one-story molding shop.

The W. A. K. Motor Co., Newark, N. J., has been incorporated with a capital of $50,000 to manufacture motors, engines and kindred products. William A. and V. P. Kretschmer, Plainfield, and William W. Lyons, East Orange, are the incorporators.

Louis Sacks, Newark, N. J., operating a foundry for the production of grey iron castings on Hamburg Place, has taken out a permit to build a new pattern room addition.

The Clarke Machine Co., Newark, N. J., has been incorporated with a capital of $100,000 to manufacture automobile accessories of various kinds. D. M. Litwin, 9 Clinton Street; J. Mahaffey and H. Stevenson are the incorporators.

The Coit Machine & Engineering Co., 146 Coit Street, Irvington, Newark, N. J., has awarded a contract for the erection of a new machine shop and blacksmith plant to cost about $21,000.

Contract has been awarded by the Continental Can Co. for a 52 x 250 ft., three-story addition to its plant at Syracuse.

The New York State Railroad, Syracuse, B. Tilton, general manager, has had plans prepared for a car-house, repair-shop and employees' building, 75 x 150 ft.

The U. S. Hoffman Co., Syracuse, N. Y., has awarded contract for erection of a factory 70 x 174 ft. on Temple Street. J. B. Spencer, manager, 110 Davis Street.

The John W. Danforth Co., Buffalo, has been awarded a contract by the Government to erect a concrete and steel storage building at the Naval Depot, Mellville, R. I., at a cost of $294,000.

Westinghouse Church Kerr & Co., New York, have the contract for erection of factory addition for Clemsen Bros., Middletown, N. Y., to cost $40,000.

The Diltz Machine Co., Fulton, N. Y., will construct a hydro-electric plant.

M. J. Erwin & Sons, Buffalo, have received a contract for erection of a 50 x 100 ft. factory for the Tock Screw Machine Corporation, Long Island City.

The Niagara, Lockport & Ontario Power Co. will build a power house extension 151 x 99 ft. at Lyons, N. Y.

The Remington Typewriter Co., Ilion, N. Y., has let contract for a factory addition 50 x 300 ft., four stories.

The Southwestern Graphite Co., Portland, N. Y., has been incorporated by A. B. Farnham and others, with a capitalization of $100,000, to engage in the mining, refining and dealing in graphite and graphite ores, minerals, stone, clay, etc.

The Simons Machine Co., Albany, N. Y., Charles A. Simons, president, has completed plans for plant addition to cost $12,000.

The National Electrolytic Co., Niagara Falls, N. Y., has begun construction of a heating plant on the Hydraulic Canal Basin.

The United Paper Board Co., Lockport, N. Y., has completed plans for a power plant to cost $200,000. Construction will be begun at once.

New England

BOSTON, Aug. 27.

New England factories have been in the market the past week for considerable new equipment and the flow of orders from other sections continues without interruption. The labor shortage is becoming more marked and there is an increased number of large display "want ads" appearing in the daily papers of the industrial centers for machinists of all kinds. With only one or two exceptions these advertisements are all for New England metal-working plants and a large proportion of them state that the advertiser is engaged in Government work.

The Bullard Machine Tool Co., Bridgeport, Conn., has been the most active local purchaser of machine tools as it is busy securing equipment for its gun-making plant. The contracts for its erection have been awarded. The American Steel & Wire Co. is making extensive additions to its Fair Haven, Conn., plant and the Locomobile Co., Bridgeport, and the S. A. Woods Co., Boston, are building additions. The Marlin-Rockwell Corporation, New Haven, is planning to buy the plant of the Hopkins & Allen Arms Co., Norwich, Conn., if legal tangles due to the receivership of the latter business can be cleared up, and will complete an unfinished Belgian rifle contract. The Colts Patent Fire Arms Mfg. Co., Hartford, Conn., is adding to its floor space to take care of large Government contracts.

The Bullard Machine Tool Co., Bridgeport, Conn., has awarded a contract for a new plant. The main building will be two stories, 150 x 700 ft.; an administration and storage building, 60 x 165 ft., two stories; a boiler house, 50 x 50 ft., one story; power house, 40 x 50 ft., one story; coal storage building, 20 x 50 ft. The entire cost will be about $1,000,000.

The Fore River Shipbuilding Corporation has put into operation a machine shop, 135 x 250 ft., which was built and equipped in 35 days.

The Maxim Munitions Corporation, New Haven, Conn., has taken over the title to the plant and machinery of the M. M. Seward & Sons Co. plant on Grant Street, and has filed a mortgage to the United States Mortgage & Trust Co., New York, for $500,000, covering the Seward property and the Maxim plants at Derby, Conn.

The Commercial Welding & Machine Co., Worcester, Mass., has been incorporated with capital stock of $10,000. Gustaf A. Olin is president and treasurer.

The S. A. Woods Machine Co., 27 Damrell Street, South Boston, Mass., has awarded a contract for a machine shop addition, 90 x 107 ft., one story.

The American Steel & Wire Co., New Haven, Conn., has awarded contracts for a rope mill, 88 x 363 ft., one story; a steel mill addition, 50 x 125 ft., one story; a steel plant addition, 60 x 223 ft., one story; a two-story building, 31 x 35 ft.; and a factory, 50 x 100 ft., 1½ stories.

The Locomobile Co., Bridgeport, Conn., will build a new factory, 32 x 315 ft., one story.

The American & British Mfg. Co., Providence, R. I., is building a boiler house, 24 x 38 ft., one story.

The Colts Patent Fire Arms Mfg. Co., Hartford, Conn., is building a two-story addition from private plans.

The Kilborn & Bishop Co., 194 Chapel Street, New Haven, Conn., has begun the erection of a forge shop, 50 x 124 ft.

The Coppus Engineering & Equipment Co., Worcester, Mass., has secured a permit to erect a foundry at 85 Abbott Street.

The Marlin-Rockwell Corporation, Willow and Mechanic Streets, New Haven, Conn., has started work on a new factory, 60 x 65 ft., one story.

The Hepenstall Forge Co., Bridgeport, Conn., has awarded a contract for a two-story office building.

The Clinton Wire Cloth Co., Clinton, Mass., is having plans drawn for an annealing shop, 58 x 110 ft., one story. A contract for the foundation has been let.

The Sullivan Machinery Co., 30 Church Street, New York, manufacturer of air compressors and machinery, has commenced the construction of a three-story addition at its works, Claremont, N. H.

The Bay State Saw & Tool Mfg. Co., Roxbury, Mass., is building a one-story addition to its machine shop on Lake Street, Winchester.

The Line Drive Truck & Tractor Corporation, Portland, Me., has been incorporated in Delaware with a capital of $4,000,000 to manufacture trucks and tractors of different kinds. W. S. Randall, Portland, is the principal incorporator.

The Hartford Faience Co., Faience Street, Hartford, Conn., manufacturer of electrical porcelain specialties, has commenced the erection of a new one-story addition, about 40 x 80 ft., to cost $4,500.

The Housatonic Power Co., Waterbury, Conn., will build a two-story addition to its power plant on Freight Street to cost about $25,000.

Philadelphia

PHILADELPHIA, Aug. 28.

The purchasing department of the Pennsylvania Railroad Co. is making extensive purchases of equipment for a locomotive shop in France to be built for the United States Government.

A considerable share of the business placed in this territory recently has been due to Government contracts, in which the Frankford Arsenal has played a prominent part. A new fuse factory at the Arsenal is nearing completion and will need equipment soon. It is said that 200 or more machines will be bought, principally automatic screw machines and small turret lathes.

The Jeanesville Iron Works Co., Hazleton, Pa. (Worthington Pump & Machinery Corporation), has a large shell contract from the Frankford Arsenal and will close this week on a list sent out two weeks ago of 50 or more machines, principally turret lathes, lathes, drills and radial drills. The Eddystone Munitions Co., Eddystone, Pa., has about completed a shell contract for the Russian Government, and has been buying some new equipment, and, it is said, will now work on a contract for the United States Government. The Standard Roller Bearing Co. division of the Marlin-Rockwell Corporation has been in the market for a considerable number of machines. This plant is on Government work. The Poole Engineering & Machine Co., which has recently closed another projectile contract with the Government, is said to have a well-equipped plant and may not need additional tools.

The Hero Mfg. Co., Philadelphia, manufacturer of drawn and stamped metalware, has received a contract from the United States Government for 1,074,000 gas masks for the

new National Army. This concern has been doing considerable work for the Government for some time past, principally on fuses and high explosive detonator parts.

The Lycoming Foundry & Machine Co., Williamsport, Pa., has been buying lately to provide for plant expansion, the company having closed a three-year contract to make motor parts for the Dort Automobile Co., Detroit.

Shipbuilding along the Delaware River is hampered somewhat by labor troubles and delayed delivery of material and equipment. The Chester Shipbuilding Co., E. L. Fries, purchasing agent, Finance Building, Philadelphia, is placing orders for the Bristol, Pa., plant, now known as the Merchants' Shipbuilding Corporation. The company, which has taken the contract for 12 steel shipways, has agreed, it is said, to complete the work within three months, and the shipway cranes will be delivered in four months. Inquiries are out for other equipment. The Pusey & Jones Co., Land Title Building, Philadelphia, will probably soon send out a list of its requirements for additions which will be built at its shipyard at Wilmington, Del. A new machine shop and a tool house are among the new buildings to be erected. The William Cramp & Sons Ship & Engine Building Co., Philadelphia, has bought two 5-ton cranes.

The Arguto Oilless Bearing Co. is putting up a new plant at Wayne Junction, Philadelphia, for the manufacture of an ignition system, and is making inquiries for equipment. It is said that this company will require a number of machines.

Philadelphia machinery dealers have put in bids for the equipment which will be required by the Simplex Automobile Co., New Brunswick, N. J.

Following out a new sales policy adopted some months ago, the Heald Machine Co., Worcester, Mass., grinding machines, has opened its own office in Philadelphia, in charge of S. M. Hershey, formerly with the Landis Tool Co., Waynesboro, Pa., the Hyatt Roller Bearing Co., Newark, N. J., and the Norton Co., Worcester, Mass. An office has been opened in the Commonwealth Trust Building.

The Pennsylvania Railroad, Broad Street Station, Philadelphia, has awarded a contract for the construction of a new one-story brick and reinforced-concrete shop building, about 56 x 100 ft., and power house for works operation, 50 x 50 ft., at its Girard Point plant, at a cost of $42,000. The John N. Gill Co., 1215 Filbert Street, Philadelphia, is the contractor. The company is also taking bids for the erection of a two-story brick addition to its Harrisburg shops.

The Schneider-Bowman Co., Philadelphia, operating a foundry at 1612 Vandyke Street for the production of iron and steel castings, has been incorporated with a capital of $100,000. A. W. Bowman is the principal incorporator.

The proposed new machine shop of the Midvale Steel Co., Widener Building, Philadelphia, to be erected at its Nicetown plant, will be a two-story structure, about 112 x 210 ft., and will be used as an extension of its ordnance department.

The Wood Mfg. Co., Seventh and Erie Streets, Philadelphia, has awarded contracts for the construction of a new one-story plant, about 75 x 260 ft., on Throne Street, Camden, N. J., to cost about $50,000.

The Atlantic Refining Co., 3144 Passyunk Avenue, Philadelphia, will build a new one-story power house addition, 40 x 43 ft., to its plant at Thirty-sixth and Jackson Streets, to cost about $21,100. Plans for the structure have been filed.

The Stott-Hecht Glass Works, Philadelphia, has been incorporated with a capital of $150,000 to operate a local plant. E. M. Stott is the principal incorporator.

The Thermo Service Corporation, Philadelphia, recently incorporated in Delaware with a capital of $10,000 to manufacture fireless cookers and metal goods, has filed notice of increase in its capital from $10,000 to $100,000. Wray C. Arnold and Robert C. Fender, Philadelphia, are incorporators of the company.

Isaac Dozer, 5632 Walnut Street, Philadelphia, is having plans prepared for a new one and two-story machine shop, about 90 x 92 ft., to be erected at Woodland and Yewdell Streets.

The Treen Box Co., Memphis and Tioga Streets, Philadelphia, is taking bids for the construction of a two-story and basement concrete and brick addition to its plant, about 51 x 100 ft.

F. R. Hansell, Philadelphia, and associates, have incorporated in Delaware the Conshohocken Steel & Alloy Corporation, with capital of $350,000, to manufacture iron and steel products. S. C. Seymour, Camden, N. J., is also an incorporator.

The Hamilton R. Marsh Co., 210 South Eleventh Street, Philadelphia, has been awarded a contract by the New Jersey State Purchasing Commission for machinery for the manufacture of automobile registration markers to be installed at the State Prison, at a cost of $78,375.

Henry Disston & Sons, Inc., Philadelphia, have awarded a contract for the construction of a one-story brick and concrete addition to their plant at Tacony, about 40 x 65 ft., to cost $11,000.

The Department of Public Health and Charities, Philadelphia, is taking bids up to Sept. 12 for the construction of a new one-story power plant at its institution at Thirty-fourth and Pine Streets. Philip H. Johnson, 110 South Broad Street, is architect.

Construction has been completed of the new plant of the Westinghouse Lamp Co., on Pennington Avenue, Trenton, N. J., and the installation of machinery and equipment will be commenced at once.

A. H. Wirz, Inc., Chester, Pa., operating a tin and stamped metal plant at Fourth and Palmer Streets, is taking bids for the construction of an addition.

The Sun Shipbuilding Co., Chester, Pa., is taking bids for the construction of a one-story addition to its plant, about 26 x 75 ft.

The Bowen Anchor Co., Morton, Pa., has had plans prepared for additions to its plant to comprise a one-story foundry, about 90 x 200 ft.; one-story pattern shop, about 25 x 70 ft., and two-story office building, 25 x 45 ft. The Harry C. Eisenbise Co., Pennsylvania Building, Philadelphia, is engineer.

The American Sheet & Tin Plate Co., New Castle, Pa., has awarded contracts for the construction of a new two-story addition, about 56 x 70 ft., at its Shenango works, to cost $50,000.

The L. & G. Belting Co., Reading, Pa., has been incorporated with a capital of $10,000 to operate a local plant. D. H. Gruber, West Leesport, heads the company.

The Reading Stove Works, Front and Chestnut Streets, Reading, Pa., manufacturer of stoves, heaters, etc., is planning for extensions and improvements in its plant to cost in the neighborhood of $300,000. The company has authorized a stock issue for this amount.

Casper H. Oerman, 614 West Poplar Street, York, Pa., operating a planing mill products plant, is doubling the capacity of the works by the construction of a two-story addition, 100 x 200 ft., to be used for the manufacture of steel steerage sleds.

The Lester-Jordan Machine Co., Washington Street, Norristown, Pa., manufacturer of machinery, is arranging for extensions in its plant. It is said that the capacity will be increased.

The Novelty Incandescent Lamp Co., Emporium, Pa., manufacturer of electric lighting specialties, has commenced the erection of a new one-story addition, 85 x 90 ft., to its plant at St. Marys, to cost about $10,000.

The Columbus Chain Co., Fifteenth and Cumberland Streets, Lebanon, Pa., manufacturer of chains, will make enlargements in its plant to increase the present capacity. The company is dismantling the former West End rolling mills, and will utilize the structures for the proposed extension. It is said that the company will install considerable new chain making machinery.

The Watkins Tubeless Air-Cooled Auto Tire Co., Ingram, Pa., has filed articles of incorporation in Delaware with a capital of $1,000,000 to manufacture special automobile tires. T. C. Watkins, Ingram, and Morgan Howells, Orville, Ohio, are the principal incorporators.

The United States Rubber Co has commenced the construction of a new five-story addition, about 50 x 100 ft., to its Williamsport, Pa., works, to increase the present capacity. The company is also planning for the construction of further extensions on the site of its present Factory C, which will be dismantled and a new structure, about 75 x 170 ft., erected.

The Thomas Flexible Coupling Co., Erie, Pa., has been incorporated with a capital of $60,000 to operate a local works. John Jorden, Jr., is the principal incorporator.

The Pennsylvania Railroad Co. has awarded contracts for the construction of new reinforced-concrete shops at its Irvington works, near Indianapolis, Ind. The structures will consist of a 30-stall roundhouse, machine and repair shops and power plant.

The Pittsburgh Sad Iron Works, Pittsburgh, has been incorporated with a nominal capital of $5,000 to operate a local plant. H. G. Bash is the principal incorporator.

The Pittsburgh Metal Brazing Co., Pittsburgh, operating machine repair shops at 2939 Smallman Street, has filed articles of incorporation at Harrisburg with capital of $16,000. J. H. Gray is head.

The Kutsche Machine & Foundry Co., Pittsburgh, has been incorporated in Delaware with a capital of $200,000 to manufacture iron and steel products. Oswald Kutsche, Eli Thomas and William Elik, all of Pittsburgh, are the incorporators.

F. E. Geisler & Co., Commercial Building, First Avenue, Pittsburgh, have filed articles of incorporation with a capital of $10,000 to manufacture ventilating machinery. B. A. Geier, Avalon, heads the company.

Charles E. Butler & Sons Co., Hazleton, Pa., operating the Pennsylvania Quarry Stripping & Construction Co., have acquired the interests of David Benjamin in the new machine shops and iron works erected during the past year. Extensions are being made in the plant, which will be used for the manufacture of mining and stripping cars, steam shovels and kindred products used in colliery operations.

Work has been started on the new $30,000 plant for the Fidelity Electric Co., Lancaster, Pa., by L. V. Wright, contractor.

Alterations are being made at the Jeanesville Iron Works, Hazleton, Pa., so that work can be started on five million shells. A force of about 4000 men will be employed.

The Lycoming Foundry & Machine Co., Williamsport, Pa., will erect additional buildings and increase its working force to handle a large order from the Dort Automobile Co. The contract will keep the mills working for three years.

The Berwick, Pa., plant, American Car & Foundry Co., will start work on an order for 1000 box cars for the Government. The Milton, Pa., plant will build 300 tank cars for the Government to be used in France.

Baltimore

BALTIMORE, MD., Aug. 27.

The Potomac Electric Power Co., Fourteenth Street, N.W., Washington, D. C., is planning for the construction of a new power house on Benning Road, N.E., to cost about $40,000.

The Bureau of Yards and Docks, Washington, D. C., will build a new electric power plant, about 100 x 200 ft., and distributing system at its Norfolk, Va., navy yard, to cost about $800,000.

The Mann Shipbuilding Co, Baltimore, Md., recently incorporated, has acquired about 35 acres of property on Curtis Bay for its proposed new shipbuilding works with water frontage of about 3000 ft. The plant will specialize in the manufacture of cargo ships. The Mann Yacht Building Co., Light Street, will be affiliated with the new organization. J. D. Sweet, Syracuse, N. Y., is vice-president of the company.

The Baltimore Dry Dock & Shipbuilding Co., East Fort Avenue, Baltimore, Md., will build a new one-story power plant addition to its works, about 70 x 90 ft., to cost $20,000. The structure will be known as Power House No. 7.

John C. Melville, Reisterstown, Md., has had plans prepared for a new one-story blacksmithing works.

The Burt Machine Co., 401 East Oliver Street, Baltimore, Md., a Delaware incorporation, has filed notice of increase in its capital from $50,000 to $150,000.

The High Point Machine Works, High Point, N. C., has been incorporated with a capital of $50,000 to manufacture machinery. W. L. and W. W. Smith and V. J. Melvin, High Point, are the incorporators.

The Payne Valve Corporation, Nininger Building, Roanoke, Va., is planning for the purchase of new machinery for the manufacture of valves, particularly for automobile service. The equipment to be installed will include automatic screw machines, lathes and kindred apparatus, and is estimated to cost about $25,000. T. L. West, Salem, Va., is president.

The Chesapeake & Ohio Railroad, Richmond, Va., has awarded a contract for the construction of a one-story addition to its roundhouse at Russell, Ky.

Fulton, Conway & Co., Louisville, Ky., manufacturers of blacksmithing specialties, have increased their capital from $100,000 to $150,000.

Chicago

CHICAGO, Aug. 27.

The National Machine Tool Builders' Association has addressed letters to machine-tool dealers asking them to supply the officers of the association with lists of the tools they have available for all kinds of work, the purpose being to ascertain just where the Government and private industries stand with regard to their needs for metal-working machinery. The Government, of course, is the essential consideration. It is expected that within the next month large Government orders for shells and other war supplies will be distributed, and it is predicted that the demand for lathes, and the smaller machines used for shell-making, will approximate that which swept the country at the outbreak of the war. Some dealers have large stocks of small lathes and hand screw machines.

Most of the dealers found the past week a rather quiet one, and in no direction was there a rush, although a few good sales were made, especially of rebuilt tools. Among the buyers were the American Car & Foundry Co., which purchased a number of large turret lathes, the Hughes Tool Co., Houston, Tex., which also purchased large turret lathes, the Nordyke & Marmon Co., Indianapolis; the Pan-American Motor Corporation, Decatur, Ill.; and the Rock Island Arsenal.

It is learned that the Wagner Electric Co., St. Louis, has sufficient machinery to take care of the Government order for gun carriage and caisson wheel hubs it recently received.

Contracts have been let for a two-story factory, 40 x 85 ft., at 507 and 509 East Thirty-ninth Street, Chicago, for the F. B. Williams Co., manufacturer of hardware specialties. The estimated cost is $15,000.

Work is being pushed by the General Electric Co. on the construction of a three-story building, 100 x 250 ft., at Oakley Boulevard and Harrison Street, Chicago, to cost $175,000. A unique feature of the building, which is of mill construction, lies in the placing of the staircases and stairways, as well as the elevator shafts on the outside of the building walls, to permit safe exit in case of fire. They will be inclosed. The heating and operating plant will be in another building. The building is for the occupancy of the Illinois Miniature Lamp Division of the National Lamp Works, formerly located at Cleveland.

The Patterson-Sargent Co., Cleveland, Ohio, contemplates the construction of a five-story warehouse and factory, near its present paint plant at Twentieth and Lumber streets, Chicago.

Several improvements, including the installation of additional machinery that will about double its output are planned by the Gary Screw & Bolt Works, Gary, Ind. About $100,000 will be spent, mostly for machinery, although some small buildings will be added. The company has a site of about four acres.

Nathan Himelfarb, 2429 West Adams Street, Chicago, Samuel Horwitz and others have incorporated the Commercial Bike Mfg. Co., with a capital stock of $25,000.

S. Karpen & Bros., 636 West Twenty-second Street, Chicago, manufacturers of furniture, have obtained a permit for the erection of a one-story brick factory to cost $5,000.

The American Mfg. Co., Brooklyn, N. Y., has purchased 15 acres in East St. Louis, on which, according to report, it will build a large rope and twine factory.

The Mitchell Machinery Co., Peoria, Ill., is planning to build a brick addition, 90 x 200 ft., to its plant in South Fourth Avenue, Peoria.

The Topp-Stewart Tractor Co., Clintonville, Wis., has started work on a new plant, and it expects to begin the manufacture of light tractors about Nov. 1. It has a capital stock of $500,000.

W. W. De Long & Son, Appleton, Wis., architects, have completed plans for a new factory to be erected in Appleton for the Auto Body Works. Bids will be taken in a few days.

It is announced by F. E. Burrall, president Oneida Motor Truck Co., Green Bay, Wis., that work will be started on a factory 150 x 300 ft. on land that has just been acquired. The company was organized in April.

The Roof Motor Specialty Co., Anderson, Ind., has been incorporated with a capital stock of $50,000 to manufacture motor and automobile specialties by Robert M. Roof, J. A. McMyler and W. N. Durbin.

The Parker Rust-Proof Co. of America, Detroit, of which Clark W. Parker is president, will establish a factory for the manufacture of its product in St. Louis.

The McDougall-Duluth Shipbuilding Co., Duluth, Minn., has awarded a general contract for the construction of shop buildings to cost $225,000 to McLeod & Smith, contractors.

The Schweers Hardware Co., Shawano, Wis., is having plans prepared for a two-story, L-shaped, public garage and machine shop, 70 x 102 ft. and 40 x 70 ft., to cost $25,000.

The Automatic Machine Co., Superior, Wis., has been incorporated with a capital stock of $25,000 by Gustaf Engkelbrekt, E. G. Hoglund and Fritz Henderson.

The Adams Co., Dubuque, Iowa, manufacturer of machine tools and hardware specialties, has leased the plant of the Loetscher-Ryan Co., at Dubuque, for several years, to increase its manufacturing facilities.

The Motors Specialty Corporation, Chicago, has been incorporated in Delaware with a capital of $150,000 to manufacture automobile carburetors, starters and kindred equipment. Richard James and S. J. Blumenthal, Chicago, are the incorporators.

James H. Rhodes & Co., West Austin Street, Chicago, manufacturer of metal cleaning specialties, has awarded contracts for the construction of a new four-story addition to its plant, about 100 x 125 ft., on Albany Avenue.

The Revere Motor Car Co., Chicago, a Delaware incorporation, has increased its capital from $1,000,000 to $3,500,000.

The Mueller Mfg. Co., Decatur, Ill., manufacturer of plumbers brass goods, has had plans prepared for a new one-story addition to its plant, about 50 x 150 ft., to cost $20,000.

The Bytaniz Metal Co., St. Louis, has commenced the erection of a new three-story factory, about 150 x 150 ft., to cost about $10,000.

The Hercules Spring Bed Co., Kansas City, Mo., a subsidiary of the Cleveland Wire Springs Co., Cleveland, specializing in the production of bed springs, has acquired a two-story factory, about 75 x 115 ft., on West Ninth Street, for the manufacture of wire bed springs. C. H. Minturn is manager.

Milwaukee

MILWAUKEE, Aug. 27.

Conditions in the Milwaukee machine-tool industry show little change from those existing during the last two or three months, excepting that the flood of orders for single tools and small lots continues to advance delivery dates on ordinary contracts each week. Equipment for shops engaged in Government work is the source of the greatest demand at this time, and such business, naturally, is being given preference. It is impossible to point to any other factor as being a distinct feature of the present demand, as orders come from the largest variety of sources ever known and from all sections of the country. So far as foreign business is concerned, Milwaukee milling machine makers say that their agents are taking every machine that can be spared.

A large part of the demand for lathes and other tools is said to be due to the reorganization of shops engaged in various divisions of the metal-working industry to make a place for departments in which contracts for war munitions, weapons and supplies may be executed. This transformation of industry has placed many new buyers on the books of the machine-tool trade.

The entire industry is anxiously awaiting the disposition of claims for industrial exemptions from the selective draft, which now are being entered in large numbers by employers. A large number of such claims have been denied by local boards for adjudication by district appeal boards, merely as a matter of avoiding any charges of discrimination.

The Wisconsin Condensed Milk Co., Burlington, Wis., which has been operating a small tin container manufacturing plant in connection with its main condensery at Burlington, is erecting a complete new can manufacturing unit, 150 x 200 ft., of brick and steel, with sawtooth roof. The equipment will include five lines of automatic machinery, and a force of 100 to 125 men will be employed. C. R. McCanna is general manager.

The Madison-Kipp Lubricator Co., Madison, Wis., has completed additions and extensions to its works, which will enable it to increase its capacity from 75 to 100 per cent during the coming year. The company manufactures lubricating units for gas and oil engines, tractors, marine engines, steam hammers, machine-tools, grain separators and a variety of other purposes, and last year produced more than 500,000 units. The force has been increased to 225 men. T. E. Coleman is president.

Rieboldt & Walter, shipbuilders, Sturgeon Bay, Wis., are enlarging their facilities for manufacturing wooden steamers up to 300 ft. lengths. The additions consist of one metal-working and two wood-working shops. New bolt-cutting, punching, boring and other equipment will be installed. The company is building a 265-ft. steamer for the Crosby Transportation Co., Milwaukee, which has been commandeered, together with other work under way and on the books. The present force is 125 skilled operatives.

The National Enameling & Stamping Co. Milwaukee, has awarded a contract to W. G. Williams, local, for making alterations and enlarging numerous buildings for increased efficiency at a cost of approximately $30,000.

The Pfister & Vogel Leather Co., Milwaukee, has plans for a two-story private garage and machine shop, 95 x 123 ft., of brick and concrete, at its Bay View plant, Stewart and Hilbert streets, Milwaukee. The estimated cost is $50,000 with equipment. Herman J. Esser, Camp Building, is the architect.

The Universal Manufacturing Co., Racine, Wis., maker of steering gears and other automobile parts, has changed its corporate style to Lorenz Motors Co., and amended its corporate articles to provide for its engagement in the manufacture of engines, motors, motor trucks, tractors, traction engines, passenger automobiles, ships, weapons, munitions of war, airplanes, etc.

The Keller Pneumatic Tool Co., Fond du Lac, Wis., has begun the transfer of its fixture department to the new manufacturing plant now being completed at Grand Haven, Mich. As the new plant reaches advanced stages of completion, other departments will be moved, but it is not expected that the transfer will be completed until Jan. 1. Twenty-five toolmakers and machinists have accompanied the fixture department. The total working force numbers about 100 skilled men.

Schafrin, Schmitz & Co., 3102 Cherry Street, Milwaukee, wholesale scrap metal and junk dealers, recently incorporated with $45,000 capital, will erect a three-story warehouse, 40 x 142 ft., of reinforced concrete and brick construction. The architect is L. J. Laskin, 310 Caswell Block. The estimated cost is $25,000.

The Water and Light Commission, Shawano, Wis., is closing bids today, Aug. 27, for furnishing all material and constructing approximately 4000 lin. ft. of 4 and 6 in. cast iron water mains. Julius Spearbraker is secretary.

The C. A. Shaler Co., Waupun, Wis., manufacturing vulcanizing machinery and portable vulcanizers, will erect a new warehouse and shipping building and use the space now devoted to storage to manufacturing processes.

A report from Madison, Wis., says that E. J. Haynes, of the Haynes Automobile Co., Kokomo, Ind.; Winthrop Burdick and C. E. Schinberg, Chicago, are contemplating the establishment of a plant in Madison to manufacture a convertible touring-camping motor car. It is stated that the Government already has placed an order for 500 of the units for the army. Further details are not divulged.

The United States Switch Co., a Delaware corporation, with a capital stock of $1,334,925, has been granted authority to do business in Wisconsin. The official representative is J. W. Hubbard, Eau Claire, Wis., and the local interest is stated to be valued at $200,000.

P. H. Slattery, Adell, Sheboygan County, Wis., has engaged Clare C. Hosmer, architect, Milwaukee, to design a one-story fireproof garage and repair shop, 45 x 120 ft., costing about $12,500 with equipment. Mr. Slattery is Ford dealer.

The Universal Motor Co., Oshkosh, Wis., has increased its capital stock from $25,000 to $50,000.

The Wehr Steel Co., Milwaukee, has awarded the general contract for the erection of two 80-ft. bays of steel and brick construction to the Northwestern Bridge & Iron Co., Milwaukee.

The Jaeschke Bros. Foundry Co., Milwaukee, is completing work on a large shop addition and will award contracts at once for the erection of a new sand shed, of concrete and brick, 65 x 28 ft., at Thirtieth and Locust streets. The architects are Herbst & Hufschmidt.

The Hartmann-Greiling Co., Green Bay, Wis., founder and machinist, has awarded contracts for the erection of a new machine shop and manufacturing plant costing $75,000, for occupancy by the Lawson Aircraft Corporation, Green Bay, Wis., incorporated recently with $200,000 capital, as previously noted. The company has been operating in temporary quarters for about six months. Alfred W. Lawson is general manager.

The Bensen Speed Signal Co., Madison, Wis., has been incorporated with a capital stock of $100,000 to manufacture and market signal devices for railroads, steamship, automobiles, etc. The incorporators are Louis Weidenbeck, Hal Martin and A. D. Campbell.

The Northwestern Bridge & Iron Co., 127 South Water Street, Milwaukee, is moving its machinery and equipment into its new structural plant at Hopkins Street and Lake Avenue, which will be in full operation about Sept. 1. The new plant is 100 x 200 ft., of steel and brick, and the investment is about $100,000. The force of men is being increased to 150 and later will number 175 to 200. The present works on South Water Street will be abandoned. A. Pergande is president and general manager.

The Eastern Wisconsin Electric Co., Sheboygan, Wis., has awarded the contract for erecting a new power house, 60 x 90 ft., to the Northwestern Bridge & Iron Co., Milwaukee. It will involve about 200 tons. The steam generating installation will be of 6000-kw. capacity. The Fargo Engineering Co., Jackson, Mich., is consulting engineer.

The Wisconsin Gear & Axle Co., Milwaukee, has been incorporated with a capital stock of $100,000 to engage in the manufacture of gears, transmissions, axles and other automobile, truck and tractor parts. The incorporators are Herman W. Noll, 1057 Muskego Avenue; Jacob Scharmer and Bernard A. Hoermann, all of Milwaukee. Plans will be announced later.

The Chicago Racine & Milwaukee Steamship Line, Chicago, has awarded a contract to the George W. Stiles Construction Co., 11 South LaSalle Street, Chicago, for erecting a reinforced concrete, steel and brick dock, warehouse and

manufacturing building, 150 x 156 ft., five stories and basement, on the Root River, inner harbor, Racine. The estimated cost is $350,000. The architect is A. S. Hecht, 154 West Randolph Street, Chicago.

The U. S. Auto Radiator Co., Milwaukee, has been incorporated with a capital stock of $2,500 by Joseph Kunkel, M. Resnick and Adolph H. Roethke.

The Topp-Stewart Tractor Co., Clintonville, Wis., has awarded the general contract for the erection of the first unit of its new gas tractor manufacturing plant to A. N. Carter, Clintonville. It will be 66 x 176 ft., of brick and steel, with sawtooth roof, and was designed by H. P. Schnetzky & Son, architects, Milwaukee.

The Wisconsin Welding & Cutting Co., 315 Fourth Street, Milwaukee, has engaged in the manufacture of a line of mechanical devices for garages and repairshops, consisting of jacks, "dollies," motor stands and light portable cranes and hoists. C. H. Hansen is manager.

The Silent Washing Machine Co., Clintonville, Wis., which is erecting a new plant, as already noted, will manufacture three types of washing machines, operated by electric, gasoline and hand power. The new plant, consisting of a small foundry, machine shop and wood-working shop, will be ready about Nov. 1.

A report from Racine, Wis., says that outside capital is negotiating with owners of river frontage in that city with a view of establishing a ship-building plant. Details are not divulged, but it is said that an option has been taken on the Williamson Lumber Co.'s dock property, with a frontage of 700 ft., near Mead Street bridge.

The Western Malleables Co., Beaver Dam, Wis., is installing considerable new machinery and equipment, including a 15-ton Brown hoist for general yard and shop duties. It is said that the hoist alone involved an expenditure of $18,000.

The equipment of the former plant of the West Superior Iron & Steel Co., Superior, Wis., is being scrapped under the direction of an expert from the East, and the rolls and other machinery is being cut up into melting scrap by the oxy-acetylene process. The plant has lain idle for more than 10 years and is being entirely dismantled.

The former Main Street Iron Works, Marinette, Wis., is undergoing extensive repairs and alterations to make it suitable for occupancy by the Landover Truck Co., Chicago, which will move its plant and offices to Marinette shortly after Sept. 1.

Detroit

DETROIT, Aug. 27.

Government orders which have come to many Detroit industries the last few weeks are having a decidedly strengthening effect upon the machine tool market. Many plants are being converted for the manufacture of special materials, particularly those needed in the assembling of airplane engines. Practically all plants which have accepted orders for airplane engine parts have had to refit with new machinery and tools.

Transportation facilities are excellent and the labor situation is satisfactory, with an active demand for skilled mechanics.

The Olds Motor Works, Lansing, is erecting a two-story addition to its plant, 80 x 400 ft.

The Kales-Haskel Co., Detroit, has changed its name to the Kales Stamping Co.

The Michigan Drop Forge Co., Pontiac, manufacturer of steel forgings, has elected B. F. Esgar, president. John H. French, president Michigan Stamping Co., and Robert T. Herdegen, vice-president Dominion Forge & Stamping Co., Walkerville, Ont., are directors.

The Menominee Motor Truck Co., Menominee, Mich., has purchased the plant of the Richardson Shoe Co.

C. M. Smillei & Co., Detroit, has been organized with a capital stock of $25,000 to manufacture tools and auto parts.

The Traverse City Motor Co., Traverse City, Mich., will begin operations next month with $150,000 capital.

The Parker Rust Proof Co., Detroit, has selected St. Louis as one of the 26 cities in which it will build branch plants.

The Buhl Malleable Co., Detroit, has purchased adjoining property on the river front for the expansion of its plant.

The Auto Body Co., Lansing, is floating $250,000 of treasury stock to provide for extensions.

The Lansing Screw Products Co., Lansing, has been organized with capital of $70,000. Alfred Hermsdorf, president and general manager, was formerly production manager for the Michigan Screw Co.

The Walker Universal Joint Co., Detroit, will announce its factory location Sept. 1. It will produce universal joints for motor cars.

The Hackett Motor Car Co. has purchased a five-acre site in Grand Rapids.

The McDonough Automatic Regulator Co., Detroit, has incorporated to manufacture stokers, valves, etc

The Benton Harbor Auto Machine Co., Benton Harbor, Mich., has been incorporated for $174,000 to manufacture machinery and parts.

The General Motors Corporation, Detroit, will erect a drop forge plant to cost $350,000.

Work has started on the first unit of a group of buildings for a pipe bending plant to be erected for Murray W. Sales & Co., Detroit.

The Lapeer Tractor-Truck Co. has purchased an eight-acre site at Lapeer, Mich. W. H. Tucker is president.

Buildings of the Wyant & Cannon Foundry Co., Muskegon Heights, Mich., were damaged by an acetylene explosion

Among the new Michigan corporations are the Saginaw Malleable Iron Co., Saginaw, $400,000; Riverside Machine & Plating Co., Jackson, and the Blashfield Furnace Co., Jackson.

The Riddell Mfg. Co., Louisville, Ky., has been organized to operate a local plant for the manufacture of metal and iron specialties. W. O. Riddell and H. J. Thornton, both of Louisville, are the principal incorporators.

The General Motors Co., Detroit, Mich., has completed plans for the construction of a new drop forge plant to cost about $300,000. The addition will consist of three one-story structures, 160 x 600 ft., 75 x 600 ft. and 65 x 300 ft.

The Fisher Body Corporation, Oakland Avenue, Detroit, has had plans prepared for a new one-story plant, about 90 x 550 ft., to be erected on West End Avenue, for its aeroplane department. Louis Mendelsohn is secretary

Cleveland

CLEVELAND, Aug. 28

A large volume of business has been placed in heavy tools by companies having Government contracts for gun forgings and additional inquiries are pending from the same sources. Punching and shearing machinery is in heavy demand, largely from Eastern shipyards. The Federal Shipbuilding Co. is placing orders for $75,000 to $100,000 worth of punching and shearing machines. The export demand for this class of equipment is quite active, and a Cleveland manufacturer has recently received orders from France, Russia, Japan, Norway and Sweden for small lots of machines. Inquiry for small lots of standard tools in the medium and smallest sizes is fairly plentiful, these coming largely from makers of airplane parts, motor trucks and other manufacturers engaged in Government work. There is a heavy demand from foundries for molding machines. Considerable second-hand machinery in round lots, largely automatic and screw machines, is being placed on the market by Eastern dealers.

It is understood that the Government will purchase about 500 storage battery electric trucks for use in France. Manufacturers are now preparing estimates on these.

The Friddle Motor Car Co., Cleveland, has been organized to bring out a new line of automobiles, and has purchased a small amount of machinery for development work.

The Cleveland Switchboard Co. will erect a new factory, one story, 80 x 140 ft., at 2925 East Seventy-ninth Street.

The Grabler Mfg. Co., Cleveland, has awarded a contract for a brick, steel and concrete addition to its foundry, 60 x 104 ft.

The K. C. Iron Works Co., Cleveland, has purchased a site on Sweeney Avenue on which it plans to erect a two-story factory, 75 x 125 ft.

The United States Tool Co., Cleveland, has acquired a two-acre site on West 106th Street, on which it plans to erect a new plant.

The American Can Co. has acquired a several acre site near its present Cleveland plant, where it plans the erection of a large plant extension.

The Cleveland Tractor Co., Cleveland, has placed a general contract with the Sam W. Emerson Co., Cleveland, for its plant additions, which will include a one-story building, 62 x 500 ft., and a two-story building, 80 x 100 ft. The King Bridge Co. will erect the steel.

The Grant Motor Co., Cleveland, has awarded a contract for the erection of its plant extension. This will be a two-story building, 60 x 260 ft.

The Kenney-McGreevy Foundry & Machine Co., Mansfield, Ohio, recently incorporated with a capital stock of $20,000, will establish a plant in the building formerly oc-

cupied by the Phoenix Electric Co., and will make rough brass and iron castings. H. D. Kenney is president; Joseph Paule, vice-president; Andrew Cass, second vice-president; Hugh McGreevy, secretary, and Jacob Cousins, treasurer.

The Williams Foundry & Machine Co., Akron, Ohio, plans to erect a three-story addition, 50 x 275 ft., and install some new equipment.

The Climalene Chemical Co., Akron, Ohio, will build a new plant of brick construction, 50 x 80 ft. and three stories, contract for which has been placed.

The Defiance Machine Works, Defiance, Ohio, which recently announced an increase in its capital stock to make a large plant extension, advises that it will build in addition to its present line special wood-working and metal-working tools, including tools to be used in the building of automobile motor truck and airplane engines, heavy service drills, rail drills, multiple drills, etc.

The Lau Iron Works Co., Niles, Ohio, has been incorporated with a capital stock of $350,000 by A. W. Lau and others to take over the business heretofore conducted as the Lau Iron Works Co. with A. W. Lau as proprietor. The company will erect a new plant between Girard and Youngstown, a four and one-half acre site for which it recently purchased. The company fabricates structural and decorative iron and steel work.

The Elgin Tractor Co., Piqua, Ohio, is planning to erect a two-story concrete factory building, 80 x 220 ft.

The Universal Boring Co., Lorain, Ohio, recently incorporated by H. J. Yeckley and others, will erect a factory on Eleventh Street in that city.

The Toledo Scale Co., Toledo, Ohio, has broken ground for a new plant in West Toledo.

The American Clay Machinery Co., Willoughby, Ohio, has awarded a contract for the construction of a one-story addition to its plant, 60 x 150 ft., to cost about $30,000. The Austin Co., Cleveland, is the contractor.

Indianapolis

INDIANAPOLIS, Aug. 27.

The Lowry Oil & Gas Co. has been incorporated at Dugger, Ind., with $25,000 capital stock, to drill and operate for petroleum. The directors are O. E. Dugger, Earl Robbins and Charles Lowry.

The Gary-Oklahoma Mining & Development Co. has been incorporated at Gary, Ind., with $60,000 capital stock, to mine for oil and gas. The directors are John T. Marich, Gosa Marich and Kriss L. Aleksich.

In connection with the new yards now under construction at Richmond, Ind., it is reported the Pennsylvania Railroad Co. will build, in the early future, car repair shops and other terminal equipment to cost $250,000.

The Farmers and Merchants Light & Power Co., which has been incorporated at Mongo, Ind., with $500,000 capital stock, will build electric power plants in Northern Indiana and Southern Michigan. J. L. Hawk, Mongo, is president; Hiram Himebaugh, Bronson, Mich., vice-president, and Eli Z. Hawk, Mongo, secretary-treasurer. The largest plant is planned for a site on the St. Joe River, near Colon, Mich.

The M. T. R. Mfg. Co. has been incorporated at Indianapolis, with $50,000 capital stock, to manufacture valves, internal combustion engines, etc. The directors are John L. McKenzie, William H. Truesdell and Albert Regan.

The Oakes Mfg. Co., Indianapolis, manufacturer of automobile parts and metal stampings, has increased its capital stock from $35,000 to $250,000.

The Motor Vehicle Co., Lafayette, Ind., has increased its capital stock from $25,000 to $75,000.

Cincinnati

CINCINNATI, Aug. 27.

The Government is in the market for a number of machine tools for the Aircraft Production Board. Bids will be opened to-day for 200 16-in. lathes, shaping machines, milling machines, etc. Requisitions for prices are also out on several small planing machines, precision lathes, profiling machines and other equipment. Rush orders have been placed for special boring machines for making cannon. Other business of this kind is pending

Within the past few days several local firms were somewhat surprised to receive orders for lathes and other equipment from Detroit automobile manufacturers which generally cover two or three machines.

Labor troubles at Hamilton, Ohio, have not yet been adjusted, and one large machine shop has found it necessary to curtail operations on account of its foundry being idle

The American Tool Works Co., Cincinnati, has made fast progress in removing its equipment into its new building and it now seems probable it will be able to have the new plant in full operation before Oct. 1.

The Cincinnati Frog & Switch Co., Oakley-Cincinnati, will erect an addition to its plant estimated to cost $6,000.

The P. W. Brackett & Sons Co., Cincinnati, is having plans prepared for a new plant to be erected at Winton Place. Three buildings of reinforced concrete construction have been decided on, having a total floor space of 50,000 sq. ft.

The addition to the plant of the Hamilton Machine Tool Co., Hamilton, Ohio, recently mentioned, is now well under way. The building will be 45 x 200 ft., of brick and steel.

The Columbia Machine Tool Co., Hamilton, is moving into its new plant in South Hamilton. The building is of sawtooth roof construction and will enable the company to more than double its present output of shaping machines.

The new plant of the Springfield Welding Co., Springfield, Ohio, is nearing completion, and will be occupied within the next few days.

The Monitor Motor Car Co., Columbus, Ohio, has purchased a site on Third Avenue on which it intends erecting a building with 100,000 sq. ft. of floor surface. The present plant is on Mount Vernon Avenue.

The Automatic Control Trailer Co., Columbus, intends to add to its equipment for the manufacture of automobile and auto-truck trailers.

The Miami Trailer Co., Troy, Ohio, has commenced work on a two-story addition, 60 x 65 ft., of mill construction.

The Central South

LOUISVILLE, KY., Aug. 27.

Inquiries received by local manufacturers are almost all "live." This is taken to indicate that manufacturers do not come into the market except for necessities. Time of deliveries is an important factor. Boilers are very much in demand. Kentucky oil operators are clamoring for supplies of all kinds and every field reports development work being held up because of inability to obtain supplies.

The Henry Vogt Machine Co., Louisville, Ky., has taken new contracts for 25 boilers. Eight of these are 500-hp. water tube boilers for Cosden & Co., Tulsa, Okla., while the others are all 150-hp., return tubular boilers, horizontal, of which eight have been purchased by the Government for the cantonment at Louisville; two by the Standard Engineering Co., Washington, for Fisk University, Nashville, Tenn.; two by the Rockport Coal Co., Rockport, Ky., and five by the Aetna Refining Co. for a refinery to be erected at Louisville.

J. F. Wagners' Sons, Louisville, Ky., have the contract for a large quantity of sheet metal work for the Army cantonment at Louisville, Ky., and have been offered similar contracts for other army camps. The metal used is galvanized iron, 24 gauge.

The Illinois Central Railroad will shortly begin enlargement of its shops at Jackson, Tenn., and will purchase machinery to the amount of $30,000. In addition a freight repair yard is to be established by the company at Frogmoor, Tenn.

Morris & Co., Chicago, have let a contract to Stewart & Johnson, Chattanooga, Tenn., for installation of a refrigerator plant in Chattanooga.

The Kingsport Pulp Corporation, Kingsport, Tenn., is asking for prices on two 100-ton hydraulic jacks and two 20-ton screw jacks.

Texas

AUSTIN, Aug. 25.

The drouth remains unbroken in a large area of the principal agricultural regions of the State. The poor outlook for a good yield of cotton and other crops is beginning to have a distressing effect upon the machinery and tool trade.

T. B. Atkins plans to build a factory at El Paso for the construction of concrete silo blocks under a new invention that he has patented which does away with wooden forms.

The Rio Bravo Oil Co. will lay a 6-in. pipe line from Damon Mound to Pledger, a distance of 11 miles. It will install railroad loading racks at Pledger.

The Gainesville-Red River Bridge Co., which has been incorporated at Gainesville, with a capital stock of $60,000, will build a bridge across the Red River near Gainesville. The incorporators are S. M. King, J. W. Mahan and A. C. Whaley.

The Lone Star Ship Building Co., Baltimore, Md., which

has a capital stock of $2,000,000, has been granted a permit to do business in Texas. It will build a large shipbuilding plant at Beaumont. Walter J. Crawford of Beaumont is state agent for the company.

Birmingham

BIRMINGHAM, ALA., Aug. 27.

The Hodges-Boiler Works, Mobile, Ala., is planning for additions in its plant to cost about $50 000. The extensions will include a one-story machine shop, about 50 x 140 ft.; foundry, about 30 x 60 ft., and blacksmith works, 60 x 60 ft. D. G. Hodges is president.

The Jefferson Rolling Mill Co., Birmingham, Ala., has been incorporated in Delaware with a capital of $50,000 to operate a local plant. W. B. Harper, H. H. Lind and L. R. Hanna, Birmingham, are the incorporators.

The Pacific Northwest

SEATTLE, Aug. 21.

The labor disturbances in western Washington seem to have lost their force, and more sawmills and other wood-working plans are in operation than at any time since the operatives quit to enforce demands for shorter work hours and higher wages. A number of the largest mills in Seattle, Grays Harbor country and Tacoma have resumed operations.

Fires throughout the forests of western Washington threaten damage and loss equal to the big losses of 1910. In many places fires are completely beyond control and tremenduous losses have resulted.

According to statistics recently compiled, 12 per cent of the nation's ship construction is now under way in Seattle shipyards. Twenty-one per cent of the steel ship tonnage in the United States is on the ways of Seattle plants. Thirty-eight per cent, or 603,600 tons, of all the shipbuilding industries in the United States is being handled on the Pacific coast, with 65 per cent, or 364,600 tons of the steel ship tonnage of the nation. Of this amount, 32 per cent is being constructed in Seattle. Portland leads in the wooden ship construction, with Seattle second.

Pending the outcome of the conference under way in Washington by the United States Shipping Board, with representatives of a number of the Pacific coast steel shipbuilding plants and delegates from the metal trades and shipbuilding unions, steel workers on the coast will continue working, although it has been decided that the new wage scale agreement should become effective Aug. 15. The steel shipbuilding plants are asking that the Government add 25 per cent to the contract prices for ships in order to meet the proposed advance in wages and curtailment of working hours.

All the spruce lumber the Government and its allies need can be supplied by Oregon and Washington mills, and a big drive has been started to produce this lumber. It is stated that the Allies will need 117,000,000 ft. of lumber in the next 18 months for aircraft use. The newly organized Spruce Lumber Manufacturers' Association in Portland will handle all of the spruce orders. Initial orders for airplane spruce, aggregating 1,000 000 ft. a month, have been placed by E. T. Allen, representing the Government. While 1000 ft. is required to be cut for each machine, only about 200 ft. is used, the rest being waste timber.

While there is a remarkable run of salmon in the Northwest in some districts, the expected tremendous quadrennial run has failed to materialize, and a shortage is certain. Many thousands of dollars were spent by plants in equipping their canneries for the usual fourth-year run and, in many cases, this expenditure will be a complete loss.

E. D. Gallagher, Vale, Ore., plans the construction of a large reducing plant near that city, in the development of his nitrate properties.

L. H. Gray, of the L. H. Gray Shipping Co., Seattle, has purchased a large site near Chico, Wash., on which a shipbuilding plant costing $70,000 will be erected immediately.

Plans for the proposed plant of the Schaake Machine Co., Ltd., on Industrial Island, Vancouver, B. C., have been completed, and bids will be asked for soon. The main building will be 60 x 190 ft., the foundry, 40 x 80 ft., and the pattern room 30 x 60 ft. Modern equipment will be installed.

The 240 employees of the Seattle Car & Foundry Co., Seattle, went on strike recently for increased wages and 8-hr. day. Negotiations are under way between the company officials and the strikers.

The Star Brass Works, Seattle, has recently moved into its new $10,000 home at 1309 Railroad Avenue. The capacity of the plant will be increased 50 per cent, and several new lines of brass machine products will be turned out. The company reports demands that far exceed its capacity for brass products of all kinds.

The King & Winge Shipbuilding Co., Seattle, with capitalization of $60,000, has been organized by Thomas J. King and B. Winge. The firm has operated for years under the partnership name of King & Winge.

The G. M. Standifer Construction Co., Vancouver, Wash., has opened its shipbuilding plant, and has enough contracts to keep the plant busy for several months.

The Puget Sound Art Glass Co., Seattle, has been awarded a $6,000 contract for 3000 port lights to be installed in submarine chasers and other craft building at the Puget Sound Navy Yard.

The Pacific Coast Steel Co., Seattle, has announced that it will not ask exemption for any of the 62 workers called under the draft. This plant is almost exclusively engaged on ship contracts.

The Whalen Pulp & Paper Co., Vancouver, B. C., has entered the shipbuilding business. Two keels will be laid down at one time, and company will continue building ships for export trade. A 7000-kw. unit and a 750-kw. unit will be installed in the power house to be constructed.

Libby, McNeil & Libby, packers, North Yakima, Wash., will install special fruit-canning machinery. The company reports the biggest season since 1910.

The Port of Astoria, Ore., Commission has received bids for machinery to equip the new workhouse to be built to accommodate the new million-bushel grain storage bins. The Astoria Iron Works and Scow Bay Iron Works both submitted bids for frames and covers.

Canada

TORONTO, Aug. 27.

The McClavey Mfg. Co., London, Ont., has taken over the plant of the Canada Malleable Steel Range Co., Oshawa, Ont., which went into voluntary liquidation some months ago. Jong Lang will be superintendent and operations will commence immediately.

T. R. McMackon, Shedden, Ont., is in the market for a drag sawing machine.

W. E. Hawes, Port Stanley, Ont., is in the market for a 1-hp. motor, 25 cycle, single phase, also a 30-volt generator.

John A. Moody, London, Ont., is in the market for a 50-in. waterwheel and a Fitzgibbon marine boiler.

Damage to the extent of $10,000 was caused to the plant of the Polson Iron Works, Toronto, by an electric storm. Two large electric cranes were destroyed, one falling against a 125-ft. steel stack, demolishing it completely. Considerable damage was also done to the machine shop.

Kingsville, Ont., is asking for prices and information on waterworks pumps. George Pearce is clerk.

K. A. Reeder, town clerk, Rosthern, Sask., is receiving bids until Sept. 1 for the construction of an electric light plant, also for oil engine or engines, and electrical machinery and switchboard, completely installed.

Bids are being received by K. Bethune for the erection of an addition to the plant of the American Can Co., Emerald Street North, Hamilton, Ont., to cost $125,000.

Bids are being received by the architect, R. C. Clark, care Armour & Co., Chicago, for the erection of a four-story brick addition to the company's factory on Wentworth Street North, Hamilton, Ont., to cost $30,000.

Bids will be called shortly by L. H. Bacque, care Hotel Dufresne, Three Rivers, Que., for the erection of a brick plant for the Three Rivers Lime, Sand & Brick Co., to cost $100,000.

The Normandy Tire & Rubber Co., Ltd., St. Catharines, Ont., has been incorporated with a capital stock of $1,000,000 by E. Moir, D. L. McDonald, W. J. McCoy, and others, to manufacture rubber tires, rubber goods, etc.

The General Devices & Fittings Co., Ltd., Toronto, has been incorporated with a capital stock of $45,000 by John I. Sutcliffe, Hugh A. Munro, Edward J. Swift, and others, to manufacture electrical and mechanical appliances, machinery, etc.

A number of prominent Montreal business men, together with the Atlas Construction Co., Montreal, purpose to establish a plant for the manufacture of concrete steamships. It is claimed that these vessels can be constructed more readily than steel vessels and at less cost. The necessary capital has been secured. Plans for the first vessel have been prepared, which will be 200 ft. in length, and the thickness of the hull will be from 3 to 5 in. The cost is estimated at something less than $100 000. The venture is largely experimental and should it prove successful a number of companies are ready to enter upon this line of business.

THE IRON AGE

New York, September 6, 1917

ESTABLISHED 1855 VOL. 100: No. 10

Results of Rolling from Green Ingots

Premature Charging Into Hot Reheating Furnace and the Large Internal Steel Structure Produced of Brittle Character

BY GEORGE W. DRESS

It has often been asked what difference may be found in the physical properties of steel according to the condition of the ingot when charged into a hot reheating furnace for subsequent rolling and forging. The general rolling-mill practice is to put ingots into the furnaces while hot soon after the metal has solidified, yet at the same time irregularities and abnormal conditions exist which necessitate the charging of cold ingots; then again it frequently occurs, perhaps through carelessness, that ingots are charged before the central portions have been solidified.

In the charging of cold ingots and especially those of high carbon, there is much danger of shattering the structure because of the unequal expansion of the metal. We agree that the surface of a cold ingot charged into a hot reheating furnace expands very rapidly, producing tension on the structure in the central portion of the ingot to which the heat has not had sufficient time to penetrate. Not to discuss the theory of expansion of metals and the transformations which then take place, suffice to say that the power of expansion is unlimited and we need not wonder that shattering takes place. To reheat cold ingots and to avoid the shattering it is essential that the ingots be heated very slowly.

The term green ingot is applied to one in which when charged the interior or central portion has not had sufficient time to solidify. The temperature of the reheating furnace is generally high enough to keep the metal fluid within the ingot; in fact, the central portion of the larger ingots will remain fluid for several hours.

The original surface grain of the solidified portion of a green ingot while being rolled is reduced in size. The large structure of steel in the cast condition is broken up and the grain represents normal rolling. The central portion being still fluid and in motion during the rolling will show on cooling a very large grain structure, similar to that of an ingot which had not received any work—in other words, the structure will compare favorably with a casting cooled slowly and undisturbedly in the mold.



Fig. 1



Fig. 2

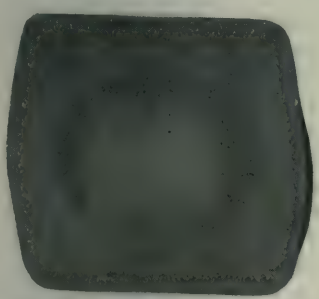


Fig. 5



Fig. 6

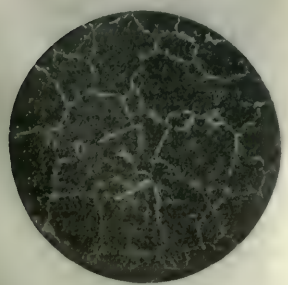


Fig. 3

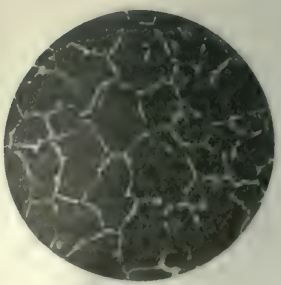


Fig. 4

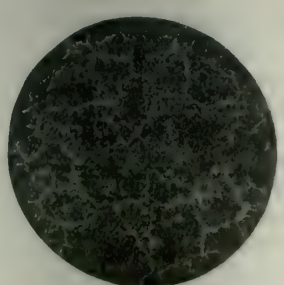


Fig. 7

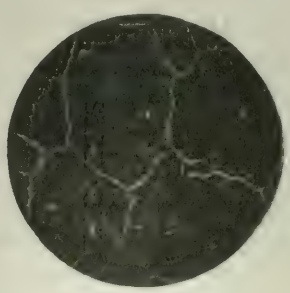


Fig. 8

The photographs may be compared in pairs. Figs. 2 and 5 are of blooms, from ingots properly solidified before rolling and green, respectively. Figs. 1 and 6 show rails rolled from corresponding blooms. Figs. 3 and 4 represent structure at surface and center of head of rail respectively in the one case and Figs. 7 and 8 represent structure at surface and rail head center in the other case.

If a green ingot, say 22 in. square and approximately 3 tons in weight, is rolled into blooms 8 in. square, an etching of the cross-section will show that the central portion of the bloom has a different appearance as to color from that of the outside portion. On the contrary, an ingot charged into a reheating furnace soon after the metal has been solidified and then rolled, or an ingot allowed to become cold and then charged and rolled, will show a uniform surface on etching, so far as grain size is concerned and provided the steel has no segregation. This difference of appearance in color in the resulting product of a green ingot will be manifest regardless of the etching medium. The explanation is briefly the wide difference in grain size. The small grain of the outside portion, reduced in the rolling, will be light, whereas the large and irregular grain of the central portion will be dark.

Again, provided the steel is not segregated, the chemical analysis of the surface and central portion of the bloom rolled from a green ingot will be practically the same; but as already stated there will be a vast difference under the microscope and a corresponding difference in the physical properties. As the charging of green ingots produces the unequal structure and as a large-grained structure is, other things being equal, weak, we have the first cause of many failures in certain finished products. No better example may be cited than finished rails, as no heat treatment is given the rails after having left the rolls.

The usual method to ascertain the first cause of trouble in a brittle rail is to have the rail analyzed for segregation, and if decided segregation is found, a conclusion is formed. If the chemical analysis shows no segregation, then a cross-section of the rail is polished and etched to determine soundness of the metal. Micro-sections are taken from the surface and center of the head. A comparison of grain size and grain structure of surface and center of head is carefully noted. In brittle rails, the structure in the center of the head is abnormally large, whereas the structure at the surface may be normal. The first cause of this irregular structure is generally attributed to initial reheating temperatures, soaking too long at high temperatures, or finishing temperature much too high. Aside from the large and irregular grain structure, the surface of the head frequently shows an outer carbonless band which is indicative of too long soaking at rolling temperatures. While the conditions mentioned have an influence on grain size and the outer carbonless band promotes excessive flowing of the metal on the surface regardless of the carbon content, it is equally true that the influence of charging green ingots is seldom considered and the first cause of much brittleness in steel is overlooked.

It is comforting to know that thorough annealing will refine the large and irregular grain structures and will make the structure homogeneous and hence eliminate much of the brittleness. In the case of rails annealing is not done and only rails sufficiently strong to meet the drop test are put into service, but they have structures unfit to withstand the alternating stresses to which the rails are subjected.

The accompanying prepared photographs serve to show the influence of normal and abnormal charging of ingots on the structures in finished rails. Fig. 1 is an etched cross-section of an 8-in. square bloom rolled from an ingot soon after the metal was solidified and represents normal charging. It is to be noted that the etched surface shows a uniformity of structure with no indication of segregation or unsoundness. Fig. 2 is an etched cross-section of a rail rolled from a bloom which showed a uniform structure with no indication of segregation or unsoundness. Figs. 3 and 4 represent structures at surface and center of head of rail respectively. Very little difference in grain size is to be noted. The photomicrographs represent structures at a magnification of 50 diameters. The grain is pearlite surrounded by a net work or cell wall of ferrite. The chemical composition of steel in this series of photographs is as follows: Carbon by combustion, 0.574 per cent; sulphur, 0.062 per cent; phosphorus, 0.058 per cent; manganese, 0.85 per cent.

Fig. 5 is an etched cross-section of an 8-in. square bloom rolled from a green ingot. The contrast in color previously referred to is clearly defined. Fig. 6 is an etched cross-section of a rail rolled from such a bloom. Here again may be seen the contrast in color. Figs. 7 and 8 represent structures at the surface and the center of the head of the rail respectively. The difference in grain size is readily seen. The photomicrographs represent structures at a magnification of 50 diameters. The chemical composition of steel in this series of photographs is as follows: Carbon by combustion, 0.635 per cent; sulphur, 0.069 per cent; phosphorus, 0.072 per cent; manganese, 0.91 per cent.

TO MAKE OWN INGOTS FOR GUNS

Tacony Ordnance Corporation Will Install Two Open Hearth Furnaces

The Tacony Ordnance Corporation, which was recently incorporated with $100,000 capital stock, to construct a gun-forging plant at Tacony, Pa., near the plant of the Tacony Steel Co., with which it is affiliated, has closed contracts for the purchase of a 22-acre site and will commence construction of buildings very soon. Two 50-ton open hearth oil-burning acid furnaces will be built in addition to a forge shop and a machine shop. The capacity of the plant will be two gun sets per day. Rough machining only will be done. The concern will make exclusively forgings with 9.5-in. bore, having received the largest contract the United States Government has yet awarded for gun forgings. It will take four to five months to complete the plant ready for operations. Equipment will be purchased within the next two weeks. Twenty-one cranes, including a 60-ton ladle crane and a special crane for dipping forgings into an oil bath, will be required, as well as about 50 machines for the rough machining. George Satterthwaite, formerly general superintendent of the Midvale Steel & Ordnance Corporation, has joined the Tacony Ordnance Corporation as vice-president and general manager. J. B. Warren is president of the company. A New York office is maintained at 50 Church Street.

The statement in THE IRON AGE that the Standard Steel Castings Co., Cleveland, would forge guns for the Government should have read Standard Steel Works Co. The latter concern is completing additions to its plant at Burnham, Pa., and will forge 6-in. howitzers and also do the rough machining. New equipment has been purchased.

The Taylor-Wharton Iron & Steel Co., High Bridge, N. J., has purchased equipment for its Tioga plant, Philadelphia, where gun forgings will be made and rough machined.

Thus far five concerns have been given contracts by the Government for gun forgings. In addition to the three above mentioned are the Heppenstall Forge & Knife Co., Pittsburgh, and the Buckeye Steel Castings Co., Columbus, Ohio.

Several new projects are under consideration for the finishing of these guns. It is understood that some rough-bored forgings will be sent to France for machining in plants in that country.

Improved Elevating Industrial Truck

A new type of elevating platform storage battery truck for use in manufacturing plants, having various refinements and improved features in its mechanical design, has been brought out by the Elwell-Parker Electric Co., Cleveland, Ohio. In the place of the double reduction spur gear drive used on previous types for propelling, the driving motor is directly connected to a single worm reduction on a four-pinion bevel differential, eliminating loss in the power transmission. The driving axle is of the full floating type. For the chain drive, previously employed to elevate the platform, a simple worm and screw lifting device is provided.

The lifting mechanism is operated by a separate motor located close to the platform. The lift of the platform has been increased to 4½ in. Attention is called to the importance of this feature, as the higher lift puts the load up above floor obstructions and proves an advantage in crossing door sills, rails and uneven floors or yards. The lifting mechanism runs at slow speed in oil and is said to need attention only once or twice a year. The entire elevating mechanism can be taken out if desired. In lifting, a switch is closed by hand, after the truck is driven beneath the separate loading platform, the motor starts and the platform moves upward. When the platform reaches its upper or lower limit a tripping device opens the motor switch, stopping the motor. Another improvement in the lifting mechanism is that the upper or downward movement of the platform may be stopped at any point. This feature is provided to prevent damage, should the platform or its contents catch an obstruction while being raised or lowered.

The propelling and elevating motors are specially designed to perform their respective functions, and both are inclosed. The storage battery is carried in a covered compartment on top, close to the controller and above the propelling motor. A spring brake is located between the motor and axle, being operated by the driver releasing his weight on one pedal forming half of the operating platform. It is stated that the brake is capable of stopping the truck in its own length under all conditions of load and speed. The circuit breaker or connection between the controller and battery is actuated by the weight of the operator on a second pedal. The circuit breaker is interlocked with the controller, and will not close except when the latter is in off position. Therefore, no fuse is required and the motor will take the full battery power. The brake and circuit breaker are operated independently so that the truck can be started on the incline without fully releasing the brake. The controller returns to the neutral position when the handle is released, affording the operator complete protection under both normal conditions and in emergencies.

The truck is steered through the four wheels by a lever which is adjustable for the operator's height. The steering tierods and knuckles are located so that the difference in wheel angularity is compensated for, giving concentric steering when turning to the right or left. The levers are bushed and the pins are hardened and ground and held rigid in steering links. The steering knuckles are located over the tire center lines to make the steering easy. The front axle supports the frame and mechanism on heavy coil springs, and the driving shafts carry no weight and are removable.

The truck is made in two heights to meet requirements. The lower one has wheels with 3½ x 21½-in. demountable rubber tires in front, and 5 x 10½-in. rubber tires in the rear. The higher truck has larger wheels and is designed for yard work. The width of the truck has been reduced 2 in. as compared with former models, making it more convenient for operation around corners and in narrow aisles and in elevators. It can be used as a tractor as well as a truck. A push button bell alarm or a mechanical horn is provided. All parts are of steel and interchangeable. Lead or nickel steel batteries of standard types are furnished with a capacity to perform a day's work when traveling 10 to 20 miles.



Worm Gearing Has Replaced Spur Gearing and the Chain Drive for Truck Propulsion and Platform Elevation in a New Storage Battery Vehicle for Use in Industrial Establishments

Table of Tap Drill Sizes

The Lufkin Rule Co., Saginaw, Mich., has brought out a reference table of tap drills for machine screw taps. It is a piece of flexible spring steel, 1 7/32 in. wide and 6¾ in. long. On one side are given the machine screw tap sizes, followed by the tap drill size number and its decimal equivalent and the corresponding body drill size number and its equivalent. A complete set of decimal equivalents of 64ths of an inch is given on the other side and at the bottom is an inch graduated into 64ths.

The Metal Products Co., maker of twist drills, taps, and reamers and brass, copper and aluminum products, has removed from the Kinney Building, Newark, N. J., to 32 Broadway, New York.

Child Labor Law a Radical Departure

Federal Judge Declared It Unconstitutional, but New Act Is in Force in All Other Districts— Federal Officials Believe It Will Be Sustained

WASHINGTON, Sept. 4.—Very careful examination should be given by manufacturers and dealers in all parts of the country to the statute which became effective on the first instant "to prevent interstate commerce in the products of child labor" and to the regulations thereunder which have just been promulgated by a board consisting of the Attorney General, the Secretary of Commerce and the Secretary of Labor. The new law is an extraordinary statute which seeks in a manner never heretofore attempted to utilize the power of Congress to regulate interstate commerce for the purpose of exerting a form of police control over a subject which heretofore has been regarded as wholly within the jurisdiction of the several States.

The constitutionality of the new law has been seriously questioned by some of the ablest lawyers in and out of Congress, and last Friday at Greensboro, N. C., Federal Judge James E. Boyd of the western district of North Carolina held the act unconstitutional, enjoining the United States district attorney from enforcing its provisions in that district. The decision was in a case brought to restrain a cotton mill company from discharging two minors. Judge Boyd held that Congress had exceeded its power in attempting the regulation of local conditions. Congress, he said, could regulate trade among the states but not the internal conditions of labor. The case will, of course, be taken to the Supreme Court of the United States and unless other courts should take similar action, the statute will continue in force in all districts except the western district of North Carolina. The Federal officials at Washington regard the decision merely as a vehicle for getting the law before the Supreme Court and they are entirely confident that the action of Congress will be sustained.

Provisions of the Law

The new statute, known as the Keating-Owen act, provides that "no producer, manufacturer, or dealer shall ship or deliver for shipment in interstate or foreign commerce any article or commodity the product of any mine or quarry, situated in the United States, in which within 30 days prior to the time of the removal of such product therefrom, children under the age of 16 years have been employed or permitted to work, or any article or commodity the product of any mill, cannery, workshop, factory, or manufacturing establishment, situated in the United States, in which within 30 days prior to the removal of such product therefrom children under the age of 14 years have been employed or permitted to work, or children between the ages of 14 years and 16 years have been employed or permitted to work more than eight hours in any day, or more than six days in any week, or after the hours of seven o'clock postmeridian, or before the hour of six o'clock antemeridian." For the purpose of securing the enforcement of the act the Secretary of Labor or anyone duly appointed by him is authorized to enter and inspect at any time mines, quarries, mills, workshops, factories, manufacturing establishments and other places in which goods are produced or held for interstate commerce, and it is made the duty of each district attorney to whom the Secretary of Labor shall report any violation of the act to cause appropriate proceedings to be commenced and prosecuted in the United States courts. Anyone violating the provisions of the act is liable to a fine upon first conviction of not more than $200, which is increased for each subsequent offense to not more than $1,000, or to imprisonment for not more than three months, or both.

Guaranty Required

Inasmuch as the letter of the law renders a dealer equally liable with the manufacturer for the interstate shipment of goods made by child labor, the framers of the statute have provided for the protection of the former by stipulating that he shall procure from the producer a guaranty "issued by the person by whom the goods are delivered for shipment or transportation were manufactured or produced, resident in the United States, to the effect that such goods were produced or manufactured in a mine or quarry in which within 30 days prior to their removal therefrom no children under the age of 16 years were employed or permitted to work, or in a mill, cannery, workshop, factory, or manufacturing establishment, in which within 30 days prior to the removal of such goods therefrom no children under the age of 14 years were employed or permitted to work, nor children between the ages of 14 and 16 years employed or permitted to work more than eight hours in any day or more than six days in any week or after the hour of seven o'clock postmeridian or before the hour of six o'clock antemeridian; and in such event, if the guaranty contains any false statement of a material fact, the guarantor shall be amenable to prosecution and to the fine or imprisonment provided by this section for violation of the provisions of this act." The guaranty provision of the new law has already been fully tested in connection with the pure food and drug statute which contains a similar proviso for the protection of wholesalers and retailers.

Troublesome Feature

In view of the broad scope of the new law, which covers every possible line of production or manufacture, it is probable that at the outset there will be a very general demand on the part of dealers for guarantees covering goods produced in mines or factories in which minors are employed in any capacity, whether within the prohibition of the statute or not. In this connection a vexatious feature of the regulations for the enforcement of the act provides that the guaranty to protect the dealer from prosecution "shall be specific, covering the particular goods shipped or delivered for shipment or transportation, and shall not be a general guaranty covering all goods manufactured or produced or to be manufactured or produced by the guarantor." The guaranty may be incorporated in or attached to or stamped or printed on the bill of sale, bill of lading or other schedule that contains a list of the goods which the manufacturer or producer intends to guarantee. Under the pure food and drug law, manufacturers are permitted to file with the Secretary of Agriculture a single general guaranty under which all dealers are automatically protected against prosecution, but for some unknown reason the departmental board which has drafted the regulations has rejected this plan in favor of the drastic regulation of a special guaranty to accompany each lot of goods. This will make it necessary for the complete protection of the dealer that he shall preserve indefinitely a large volume of bills of lading, invoices or separate guaranties received by him from producers.

Form of Guaranty

As the law does not require manufacturers to furnish guaranties but imposes upon dealers the duty of procuring them for their own protection, it has been deemed advisable by the departmental board to provide forms which comply with the requirements of the act, as follows:

For products of mines or quarries:

(I or we), the undersigned, do hereby guarantee that the articles or commodities listed herein (or specify the same) were produced by (me or us) in a mine or quarry in which within 30 days prior to removal of such product therefrom no children under the age of 16 years were employed or permitted to work.

(Name and place of business of producer or manufacturer.)

(Date of removal.)

For products of a mill, cannery, workshop, factory or manufacturing establishment:

(I or we), the undersigned, do hereby guarantee that the articles or commodities listed herein (or specify the same) were produced or manufactured by (me or us) in a (mill, cannery, workshop, factory, or manufacturing establishment) in which within 30 days prior to the removal of such product therefrom no children under the age of 14 years were employed or permitted to work, nor children between the ages of 14 years and 16 years were employed or permitted to work more than eight hours in any day or more than six days in any week, or after the hour of 7 o'clock p. m. or before the hour of 6 o'clock a. m.

(Name and place of business of producer or manufacturer.)
(Date of removal.)

Producers and manufacturers may protect themselves by requiring minor employees to produce certificates of age. In States having child labor laws requiring employment, age or working certificates or permits to be issued, such documents given under State authority will be recognized as meeting the requirements of the new Federal statute. In other States, Federal age certificates must be procured from officials hereafter to be designated by the departmental board for children between 16 and 17 years of age when employment in mine or quarry is contemplated and for children between 14 and 16 years of age when the employment is to be in mill, workshop, factory or manufacturing establishment.

Manufacturers are required to keep time records showing the hours of employment for all children between 14 and 16 years of age, whether employed on a time or a piece-rate basis. Children of the ages covered by the statute may not be employed for more than six consecutive days.

W. L. C.

Dead Front Type of Plug Switch

Safety in making or breaking circuits carrying small currents at comparatively high voltage is the feature emphasized by the General Electric Co., Schenectady, N. Y., for a line of dead front plug switches which it has brought out. The switches are an improvement on the older design. In the new type of switch the current carrying leads are attached to the outer ends of the receptacle and the parts accessible from the front of the panel are dead when the plug is not in place, a feature of design which gives the switches their name. In the older type the line connections ran to the inner end of the receptacle and the parts protruding through the panel were alive.

The change in design is supplemented by the use of more insulation and a larger handle on the plug. Until the switch has opened sufficiently to break the circuit, there is only a slight chance of touching parts of the switch which carry current. In general the double plug switch follows the design of the single-plug one as regards the use of tube installation and metal parts, etc., but each complete switch consists of two tubular receptacles and a two-plug double-break switch per pole. These switches also have thick, wide cross bars which are designed to act as a guard and afford additional protection. Both single and double break types can be supplied, the special fields for which they are used being on both the primary and secondary sides of constant current transformers in connection with series lighting circuits and occasionally on small capacity feeder circuits where the voltage does not exceed 2500 volts.

The Swedish Crucible Steel Co., Detroit, Mich., announces that it will shortly begin an addition to its foundry that will more than double its present capacity. A new 2-ton converter will be installed. The company has other extensions well under way, including an addition to its machine department and a new finishing and cleaning department.

The Superior Tool Co., Dayton, Ohio, recently granted a charter, with a capital of $10,000 will engage in the manufacture of tools and special machinery. H. W. Miller is president and general manager, and W. E. Watson is secretary and treasurer.

REQUIREMENTS OF SILICA BRICK

Strength and Spalling Losses Related to Size of Ganister—Causes of Failure

The influence on the physical properties of silicon bricks of pressure and degree of fineness of material used in their manufacture was studied by C. E. Nesbitt and M. L. Bell. The results of this study and of related tests were described in a paper presented before the American Society for Testing Materials at Atlantic City, June 26, of which the following is a summary:

Two very important properties of first-class silica brick are mechanical strength and resistance to spalling. The strength as indicated by impact tests is greatest when finely ground ganister is used while the loss by spalling increases with fineness of mesh. Hence a mesh must be selected at the expense of one of these properties. As more is gained by a coarse mesh a coarsely ground material is advocated.

The average spalling loss for hand-made silica brick is about 30 per cent. Power-pressed silica bricks were made with the same spalling loss from 4-mesh material pressed at 1500 lb. per square inch. These bricks were true to shape, sharp-cornered, dense and had smooth, marble-like surfaces. Molding defects such as soft corners, sponginess, improper slicking and lack of cohesion were all eliminated. The prospect of the adoption of power pressing as a step towards better and more uniform silica brick was clearly brought out. The idea of power pressing is not entirely new, yet little has been done in a commercial way. One of the large concerns is now manufacturing brick this way on a commercial basis. The average spalling loss of these bricks is 25 per cent.

In actual service, although well guarded as far as practice and construction will permit, silica brick fail from three primary causes: spalling, crushing, and slagging. These cannot be entirely eliminated, but by a deeper study of the manufacturing of brick they can be reduced to a minimum. An ideal brick must be well molded, true to shape, thoroughly bonded, and of good mechanical strength.

A visual inspection of almost any shipment will show at least 20 per cent of defective brick. Six shipments of brick of different brands brought out the fact that 60 per cent of the defects were due to molding, 30 per cent to fire cracks, and 10 per cent to improper setting and irregular shapes. These defects can be largely overcome in the present method of manufacture by careful inspection and rejection of the improperly made bricks at certain points in the manufacture.

The ganister must be carefully selected, and sorted, all rock that is soft or which carries considerable iron, clay, sandstone or other foreign matter should be rejected. The ganister selected should be ground to just pass a 4-mesh screen, care being taken to avoid an excessive amount of finely ground material. To insure uniformity, frequent sieve tests of the mud should be made. To secure a sufficient bond, 1.75 to 2 per cent of lime should be used. To avoid irregular shapes and molding defects, 9 to 11 per cent of water should be used for hand-made bricks and the material should be pounded into the mold. The bricks should be thoroughly dried so as to avoid fire cracks when placed in the kiln. Great care should be used when heating, especially during the first part of the burn, to prevent fire cracking. This applies also to the cooling. The bricks as they are removed from the kiln should be carefully inspected, and all bricks showing molding defects, fire cracks and irregular shapes should be rejected.

The consumer should be allowed to inspect the bricks before they are loaded on the car and a place should be provided for storage of such brick as he may desire to test.

The Thew Automatic Shovel Co., Lorain, Ohio, is filling war orders for shovels and unloading cranes for the French and British Governments.

Boiler Design for Gas-Fuel Economy

Multiple Bunsen Burners and Special Baffling Insure Complete Combustion and High Operating Efficiencies

IN a paper which he read before the Engineers' Society of Western Pennsylvania, and which is summarized below, J. C. Hobbs, assistant to the superintendent of power stations, Duquesne Light Co., Pittsburgh, described salient features of a boiler plant using gas fuel. He claims high efficiencies which he attributes to a burner giving correct mixtures of air and gas under all conditions of operation and to baffling to reduce the draft loss through the damper and to provide a long path for the gases.

The plant, which is designed for heating purposes, is located under the William Penn Hotel, Pittsburgh, and has a capacity of 4000 to 5000 boiler horsepower. Service is maintained 24 hr. of the day and 12 months of the year to take care of buildings which, in addition to heat, require hot water or have ice machines. The load factor, or ratio of the average demand to the maximum demand, is 25 per cent for heating service only.

Horizontal and Vertical Baffles

The first two boilers installed were of the longitudinal type and were baffled with a special vertical baffle built of a high temperature cement. The economy obtained was good at first, but it was soon found that the cement was falling out and the stack temperatures were going up.

The reason that the standard three-pass baffling was not used is that with gas fuel a very small intensity in the furnace is required. Instead of reducing the draft intensity by damper regulation, it was decided to draw the gas over a longer path and to impinge it against the tubes at a higher velocity so more heat would be extracted from the products of combustion, and a higher efficiency obtained.

Later two boilers of the cross-drum type with horizontal baffles were installed. On account of the chances of forming a dirt pocket at the rear of the second pass their settings are not recommended for coal, but horizontal baffling has been used quite successfully with and without the addition of some device or arrangement for the removal of dust from the pockets. The simplicity and ease of installation and renewals make this type particularly attractive.

Burner Design for Economy

The design of the furnace for gas was determined almost entirely by the conditions present in this particular installation. The burner being most important to combustion, most of the investigation was spent on it. Pittsburgh designs were entirely discarded and only the basic principle of the burner design found in West Virginia was used. The reasons why the commercial burners now on the market were not used are:

The air and gas could not be easily controlled with any degree of certainty.

At low ratings or with low gas pressure, trouble from "burning back" is experienced.

When the burner is shut off, all of the air cannot be shut off, most of the burners having a secondary supply of air to prevent the end of the burner from being burned.

The secondary air principle is wrong, and tests of the mixing feature of the burners themselves, by the use of smoke and bridge wall temperatures, showed that the air through the center of the burner was really a cold core and the stream lines were not broken up.

The initial cost of the commercial types is prohibitive and the cost of renewals is high.

In the design an endeavor was made to overcome all of the above objections and, up to date, the results have shown that it is a success. The points on which stress was laid were the control of gas and air and the thoroughness of their mixing before entering the furnace without allowing the flame to flare back. Both the air and gas are under the operator's control, and though the gas and air are kept separate to within a few inches of the furnace an intimate mixture is obtained.

Control of Combustion Mixture

No attempt was made to make the gas and air control entirely automatic, for it has been found that the time required for gas and air adjustments is small and it is believed the advantage of simplicity is sufficient to offset the cost of hand operation.

The adjustments for the correct ratio of gas and air are determined by use of a single "U" tube. This is connected to the gas chamber between the control valve and the mixing nozzles. The correct position of the air damper has been determined by special and operating tests and for the sake of simplicity the damper is marked so its position is indicated by the same figure which represents the gas pressure. The air supply is determined by the position of the air damper, as the drop in pressure from the boiler room to the furnace is maintained constant at 0.10 in. of water. This figure was a compromise between a high draft loss through the burner with the disadvantage of increased leakage loss through the setting, and a very low draft loss which changing slightly would cause excessive changes in the air supply.

The Combustion Chamber

The brick work is simple. The side walls are plain, but contain insulating brick between the fire brick and the red brick and no checker work is used. With vertical baffles the bridge wall, which was pushed back to give more combustion space, was reinforced by a series of V-shaped pilasters, giving more contact surface to the flame and assisting the mixture of gases. With the horizontal baffling a medium height bridge wall slightly raised in front of each burner is used.

It would seem with gas fuel that usual figures of cubic feet of combustion space per horsepower for complete combustion are all too high, and it is doubtful whether the question of volume is very important. The two controlling factors of combustion are temperature and mixture. Mixture is the one which must be given most consideration. If a gas pipe two or three inches in diameter were opened directly into the furnace, it is likely that the flame would extend almost entirely through the different passes of the setting, because the mixing would be very poor. If, on the other hand, the whole front of the furnace were composed of Bunsen burners, it is likely that the combustion would be completed within a few inches and certainly within two or three feet of the burners. These are extremes, but illustrate the principle. The burner adopted is in reality a multiple Bunsen burner.

Economy of Operation

The plant is not very old, but regular operating performance has proved there is merit in the installation. The average monthly efficiency obtained in actual operation from October, 1916, to and including April, 1917, follow. These data are in one sense the result of a continuous test. A statement is made up every eight hours showing the essential facts for that period. Every pound of water to the boilers is weighed, every pound of water blown or allowed to leak through the blow-down is weighed and deducted, and every cubic foot of gas is metered. Even the radiation from the pipe lines within the plant is charged to the boilers and every pound of this is deducted from the output.

Months	*Average efficiency Per cent*	*Months*	*Average efficiency Per cent*
October, 1916	78.9	February	83.5
November	77.2	March	78.0
December	78.4	April	78.2
January, 1917	85.2		

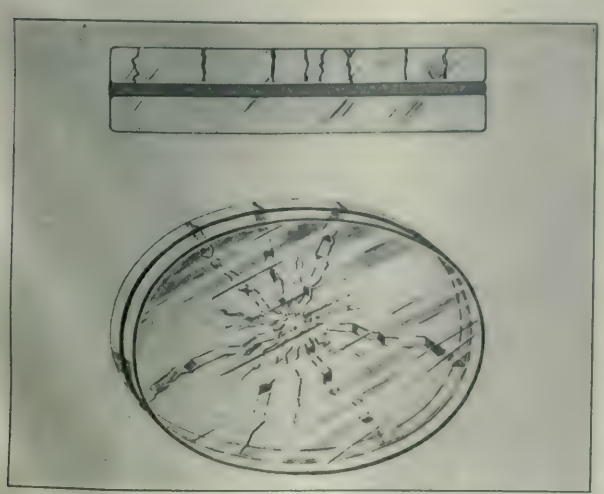
Gas analyses are not made continuously or even periodically because with the positive burner arrangement they do not seem necessary. In tests to determine the best burner arrangement the analysis was: CO_2, 11.4 per cent; CO, 0.0 per cent; O_2, 0.9 per cent; N, 87.7 per cent. When an attempt was made to further reduce the air CO began to form. The percentage of CO_2 seems low but the theoretical maximum is only a little over 12 per cent.

During the months of October to April, inclusive, the average monthly efficiencies were never lower than 77 per cent and some times as high as 85 per cent. These efficiencies do not appear very high when compared with guarantee figures for coal (which allow for ash pit losses) of 73, 75 or 76 per cent at the most economical load, but neither do they represent a few hours or even a day but are the averages covering a whole month. They are what has actually been accomplished by the regular operators who attend to other matters beside economy.

A Safety Goggle with Special Lenses

A special form of crystal which can be cracked but, it is emphasized, will not splinter, is a special feature of a safety goggle that has been placed on the market by Strauss & Buegeleisen, 37 Warren Street, New York. The goggles are designed for use by machinists, welders and other artisans, and a number of orders have been placed for crystals for use in aviation goggles for the army and also for military gas masks. Aside from the non-splintering feature, clouding up due to moisture condensation is claimed to be eliminated.

The lenses used in the goggles are made up of two layers of optical glass with an interposed layer of celluloid, all of which is welded into a solid mass. In this way, it is claimed, the crystal possesses the virtues of ordinary glass with none of the drawbacks, while at the same time it has the strength and safety features of the celluloid goggles, in addition to being rigid and fireproof. The celluloid layer provides a heat insulating medium which serves to prevent the clouding up due to moisture condensation. It is stated that even though the lens may be broken by a hammer blow, there is no flying of splinters to jeopardize the eyesight of the wearer and the crystal remains perfectly gas and water tight.

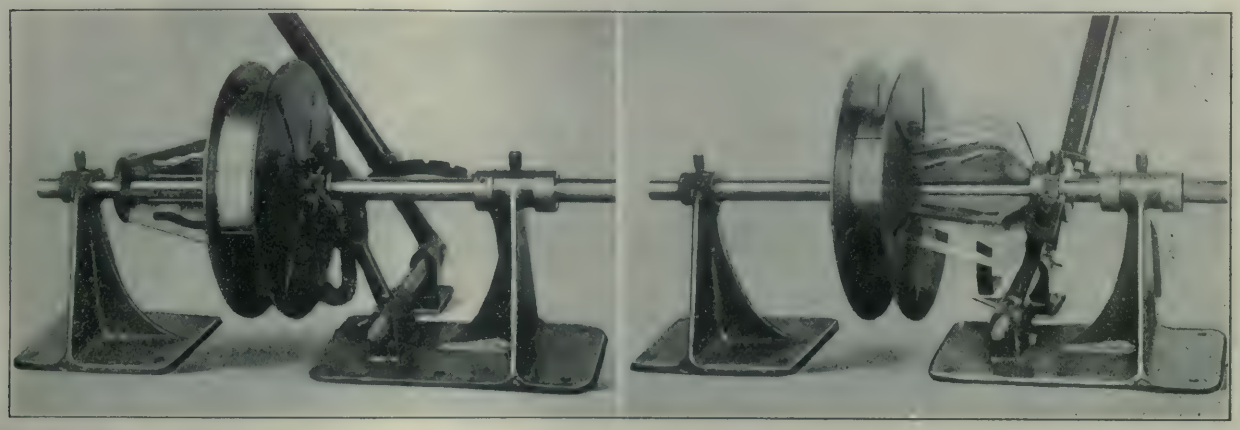


The Lenses of a Recently Developed Safety Goggle Consist of Two Pieces of Glass with a Strip of Celluloid Interposed, the Whole Being Welded into a Solid Mass Which Can Be Cracked but Will Not Break

A New Type of Variable Speed Pulley

A variable speed pulley in which gearing has been eliminated has been developed by W. B. Dunbar, Sydney, Australia, and Charles M. Terry, Inc., 25 Broad Street, New York, is acting as the American representative. Among the advantages claimed for the pulley are a reduction in the number of parts employed to provide the speed variation and the adaptability of the pulley for governing the speed of a heavy stamping press or delicate mechanisms. It is also possible to vary the velocity ratios between the driving and driven shafts at will without interrupting the transmission of power. A flat belt is employed, which fact is also emphasized.

The pulley consists essentially of a pair of flanges, a set of segments and six notched vanes. The segments are of two types, one which is known as the spring segments forming the first or smaller diameter, with the master segments located underneath. The latter work between fixed flanges, the vanes sliding through them. The vanes have guide slots in which a roller engaging in the body of the segments travels to produce the expansion or contraction. In this way, it is pointed out, the pulley retains a true circumference at any diameter. While the vanes in the pulley illustrated have notches in the slots these can be dispensed with and the slots given a perfectly straight outline, thus providing for minute variations in speed where such are desirable. At the same time, the notches enable definite changes to be secured readily.



Increasing or Decreasing the Diameter of the Pulley over Which a Flat Belt Runs by Moving the Vanes In or Out Changes the Speed of the Shaft

While the pulley illustrated is operated by a lever and notched quadrant, other operating arrangements can be provided, such as a handwheel or a short lever. In one installation that has been made in Australia a chain running over a set of sprocket wheels is the means employed.

The National Safety Council, which will hold its annual meeting in New York in the week of Sept. 10, has had, according to W. H. Cameron, general manager, an increase in membership of 68 per cent in the past year. There are now 3293 members, with 15,400 representatives and 4,500,000 workmen. Starting four years ago with one salaried official, it now has a staff of 20. Over 5,000,000 bulletins on safety subjects were mailed in the year. There have now been established 33 State and local organizations.

NEEDS ARE STUPENDOUS

Estimates of Appropriations Rapidly Increasing—The Liberty Loans

WASHINGTON, Sept. 4.—New estimates raising the cost of the war and the maintenance of the Government for the current fiscal year to the stupendous total of $21,000,000,000, the framing of a new bond and certificate bill authorizing new issues aggregating $11,538,000,000, the announcement of a new $3,000,000,000 liberty loan, the recasting on a much higher scale of the excess profits tax by the Senate Finance Committee in deference to sentiment aroused by the radical wing of the Senate, and the serving of notice on behalf of a large contingent of House members that a last ditch fight will be made to secure the authorization of a joint committee to supervise the colossal current expenditures, have been the salient developments of the past week in the financing of the war. Taken together they foreshadow a practically continuous session of Congress far into next summer with a possible short recess of a few weeks beginning early in the coming November.

The new estimates of expenditures for the year ending June 30, next, as presented by Secretary McAdoo to the Ways and Means Committee, have been accepted without a question notwithstanding the fact that they are several billion dollars in excess of figures laid before the committee less than a fortnight ago. The extent to which the Treasury is planning to finance the Allies is disclosed in Mr. McAdoo's memorandum, showing loans past and prospective for the current year aggregating $7,000,000,000, a full third of the nation's total expenditures. Disbursements on account of the war are figured at $10,750,000,000, current maintenance of the Government at $1,300,000,000, and margin of safety to meet unforseen emergencies, $2,000,000,000. Treasury officials and Congressional leaders agree that this margin of safety is none too great and point to such enormous unexpected supplemental estimates as $1,000,000,000 for the Shipping Board, $640,000,000 for airplanes, and $350,000,000 for additional destroyers, all of which have been presented to Congress without warning during the past 60 days.

The project of the House leaders, who are closely following the suggestions of the Treasury Department, contemplates the raising of the revenue to meet these fabulous disbursements from the following sources: Sale of bonds for the Allies, $7,000,000,000; pending war revenue bill, $3,000,000,000; war certificates $4,000,000,000; war savings certificates, $2,000,000,000; bonds for domestic purposes already authorized, $2,000,000,000, and regular revenue receipts, $1,300,000,000. It will be noted that the estimate of the revenue producing capacity of the war revenue measure is increased $1,000,000,000 above the House draft and a substantially larger amount above the original Finance Committee draft, but changes recently made in the Senate are counted upon to close the gap and produce not far from $3,000,000,000.

The Ways and Means Committee has promptly framed and reported the war bond and certificate bill recommended by the Treasury Department and carrying $11,538,000,000. The bonds authorized by this measure are to bear 4 per cent interest and together with certificates of indebtedness and war savings certificates are to be subject at least to income supertaxes but not to normal income or war profits tax. The interest rates on the certificates of indebtedness and war savings certificates are to be fixed by the Secretary of the Treasury and are likely to fluctuate in accordance with the money market. The Treasury Department is prohibited from selling foreign bonds taken in exchange for loans at less than their purchase price and the Secretary of the Treasury is required to exact interest from banks in which deposits are made of moneys accruing from the sale of bonds or certificates. Approximately $20,000,000 will be allowed the Treasury Department to be expended in floating all bonds and certificates authorized by the new measure.

The decision to increase the interest rate on the new bonds, which will include the forthcoming second "Liberty" loan, and to subject them to income surtaxes has been reached as the result of an exhaustive investigation made by Treasury experts to determine the extent to which the first issue of bonds has been utilized by wealthy individuals and by corporations to escape taxation. It is said to have been discovered that a number of large corporations having a part of their surplus invested in municipal, public utility, railroad and other bonds sold those securities and purchased large blocks of "Liberty" bonds and that many individuals of large wealth disposed of preferred stocks and other investments paying as high as 7 per cent and purchased bonds with the proceeds, one person investing in this manner as much as $60,000,000. As the income tax schedule of the war revenue bill as passed by the House and accepted by the Senate imposes a tax of 45 per cent on incomes in excess of $1,000,000, it is obvious that a 3½ per cent bond, free of all taxation, is a more attractive proposition than a 7 per cent preferred stock subject to the 45 per cent income tax and to personal taxes in the various States ranging from 1¼ to 2 per cent.

Under the new plan adopted by the Treasury Department the first "Liberty" loan of $2,000,000,000, paying 3½ per cent, will be retired and replaced by 4 per cent bonds subject to income supertaxes. In the hands of persons having moderate incomes the new bonds will be free of tax and this fact will no doubt materially assist in giving them a wide distribution, although it will make them less attractive to large investors and financial institutions. The second "Liberty" loan will be launched about October 1, but it is said that its flotation will be accompanied by less spectacular features than marked the first bond sale.

The radical element in the Senate led by LaFollette, of Wisconsin, Johnson, of California, and Norris, of Nebraska, has developed such strength that the Finance Committee has been completely stampeded and has been forced to abandon certain important features of its excess profits tax plan in favor of higher rates and more drastic requirements. It is true the Senate rejected Senator LaFollette's proposition for a maximum tax of 80 per cent, but on the other hand Chairman Simmons has been forced to bring in a comprehensive amendment fixing a maximum of 60 per cent, accompanied by an entirely new provision designed to tax a great many corporations with large earnings which would pay no excess profits taxes under the original Senate bill.

How Railroad Spikes Are Made

Track spikes, according to Charles E. Slyke, superintendent bolt and rivet department, Inland Steel Company, in one of that company's safety bulletins, are made from basic open-hearth steel containing from 0.15 to 0.24 per cent carbon; 0.45 to 0.50 per cent manganese; 0.05 per cent phosphorus and 0.06 per cent sulphur, which resists the weather better than Bessemer steel, and containing less phosphorus is less liable to crystalization.

Spikes, he explains, are made from square bars, cut in 23½-ft. lengths, the rough size being 1/64 in. larger than the shank diameter of the finished spike to meet the reduction in forging. These bars, though heated to a higher temperature than rivet and track bolt bars, are charged into similar continuous heating furnaces. As the bars are heated they are pushed through the furnace by the charger to the feeder, who grasps them with a pair of tongs and feeds them into the rolls of the automatic machine which shears, points and heads the spike. The spike is then dropped upon an endless conveyor and carried to the cooling bins.

The essential features of a good spike as outlined by Mr. Slyke are: A short, square point; freedom of fins, especially large ones; full, well-formed heads concentric with the shank of the spike, and the proper angle under the heads to conform to the number of degrees outlined in the specifications and blue prints so that the spike will fit the flange of the rail. The spikes must also be true to size.

Planning Department in Modern Shops*

Duties of the Four Different Managerial and the Four Production Heads and the Qualifications Essential

BY COOPER

The original planning department as developed by Dr. Frederick Winslow Taylor is composed of eight main functions, with the work equally divided between the shop and the management. The four managerial functions are

1. Routing
2. Instruction
3. Time and cost records; and
4. Discipline;

while the shop or productive division supports

1. The gang boss
2. The machine speed boss
3. The repair boss; and
4. The inspector.

Routing

The function of routing embraces (1) the production clerk; (2) the route clerk; (3) the order-of-work clerk, and (4) the recording clerk. The routing function or division determines the "when," the "who" and "where" and the "sequence" of the work.

Production Clerk.—The production clerk determines the "when" of an order in point of time. It is his duty to act as the mediary between the production division and the sales division. He is the "program maker" in that he determines the relative importance of the various jobs on hand, and decides the order in which the various orders shall be finished. From the production clerk the sales department receives its promises of delivery, and from him the order-of-work clerk receives his general order of work; more properly, perhaps, the sequence of orders. The production clerk is usually the head of the planning department, and his function is almost entirely one of control.

Route Clerk.—The route clerk determines the "where" of the work in the shop. It is the route clerk who analyzes the work, prepares the route charts, the route sheets, the operation tickets, inspection tickets, bulletin-board cards, tool lists, etc. It is the route clerk who determines where in the shop—at what machine or workplace—the work shall be done. It is the route clerk who has at hand the capacities of all the various equipment and their operating rates, and who is, therefore, best able to lay out the routing of the work in such a manner that it may be done in the most economical way possible. The route clerk's function is very largely one of preparation.

Order-of-work Clerk.—The order-of-work clerk is responsible for maintaining the schedule supplied him by the production clerk. He is the "train dispatcher" of the organization. It is his duty to keep some sort of a record of the work ahead of each employee and see to it that no employee gets out of a job. It is the order-of-work clerk who determines the sequence of the work and who shall do it. The bulletin-board shows him the work in process on the machines and the work ahead of each machine, and with his records of work ahead of each employee, he has the pulse of the shop constantly between his fingers. The order-of-work clerk's function is clearly one of control.

Recording Clerk.—The recording clerk, as his title implies, keeps track of the record of the progress of the work in process. Provided with route sheets and progress charts, he keeps a running record of the progress of work on individual parts and on the complete orders. It is the recording clerk who usually issues and receives the operation tickets, inspection tickets, move tickets, store issues, etc. It would seem almost obvious that the function of the recording clerk is that of records, but inasmuch as these records are more especially for the purpose of controlling the work than they are permanent records of performance, it must be conceded that his function is more properly relegated to control.

Instruction

Constituting the function of instruction, we find (1) the instruction-card man; (2) the time and motion-study man, and (3) the development man.

Instruction-card Man.—It is the instruction-card man that determines the "how." He is the superintendent of method. It is he who studies all the possible methods of performing an operation, analyzes them and finally determines the standard. It is he who has at hand a complete inventory of tools, jigs and fixtures, and prepares the tool lists. His function is purely one of teaching; it is his job to supply the workman with written detailed instructions, tool lists, photographs, models, etc., and to lend him whatever assistance he can to enable him to perform the work in the quickest and best way possible with the minimum of waste of energy, time and materials. His function is clearly one which belongs under the head of preparation.

Time and Motion-Study Man.—The time-study man, the motion-study man, or the rate setter is first of all the analyst of method. It is he who makes a careful study, a detailed analysis of the different operations, records the time required for each, and, by synthesizing the best units, sets the standard of performance. The investigations of this function put it clearly under records.

It may be well noted at this point that a difference exists between time study and rate setting as commonly practised, and motion study in its true significance. Time study is especially concerned with an analysis of the operation from the point of view of the time required. Rate setting is nearly synonymous with time study and is the process of making up the task from the time-study analysis and setting the rate for the work. Motion study, as its name suggests, is primarily an analysis of the operation from the point of view of the motions required to perform the operation, the muscles required to execute those motions, and the nervous energy necessary to operate those muscles. The time element in motion study, while obviously important, is more or less incidental. Motion study is a thoroughly scientific investigation of methods; the act of timing them is the measurement of result. It must be conceded, too, that the motion-study analysis is far more dependable and accurate than the time-study analysis, and as a means of standardizing methods is a very important aid to the function of instruction.

The Development Man.—There might arise some question as to the logic of placing the division of development—the development engineer—under the instruction-card function, but be it remembered that every development affects, to a greater or lesser extent, the method of operation. Development, be it in machine design, tool design, buildings, motive power, or routine, affects the "how" of the operation, and it would seem that it might well be classified as a sub-function of the instruction division as a factor in preparation.

Time and Cost

The time and cost function can only be classed as record. It comprises the timekeeper, the cost clerk and the record clerk or statistician.

The Timekeeper.—The function of the timekeeper is plain. It is his duty to receive the time of all workmen. Receiving this time from the operation tickets of the workmen, he is able, simply by assorting the tickets by

*From an address before the Providence Engineering Society.

(*Continued on page* 584)

Some Unusual Structures of Wrought Iron*

Non-Homogeneous Distribution of Phosphorus the Cause of Failures in Service—Behavior When Annealed

BY HENRY S. RAWDON*

THE structure of wrought iron as usually described is that of a fairly pure iron. Impurities, if present, are usually considered as being in solid solution in the crystals of the ferrite matrix or as forming part of the ever-present "slag streaks." One type of these dissolved impurities is here discussed. Attention is called to the detection of such impurities, particularly in low-grade irons, and to their possible influence on the physical properties of the metal.

The attention of the Bureau of Standards was first directed to wrought iron of the peculiar and unusual characteristics described later, in material which had failed in service and was submitted for test. The examination was extended to other grades of wrought iron, to see whether such features are of common occurrence in this class of material.

The structure of a sample of Swedish iron illustrates well the matrix of ferrite crystals in which are embedded the slag threads so characteristic of the puddling process and the subsequent working of the material. The usual commercial product contains varying amounts of the impurities commonly associated with iron and steel, such as manganese, phosphorus, silicon and sulphur together with small amounts of carbon. Of these, the larger part of the phosphorus and some of the silicon present are held in solid solution in the ferrite while most of the remaining impurities, other than carbon, exist in the inclosures of slag. Aside from the discontinuities introduced by the slag streaks the ferrite matrix has the microstructure and appearance of a pure metal. No definite orientation of the various crystals or grains is apparent; deep etching of the specimens reveals no intracrystalline features (within the grains) other than those noted in pure metals in general (etching pits).

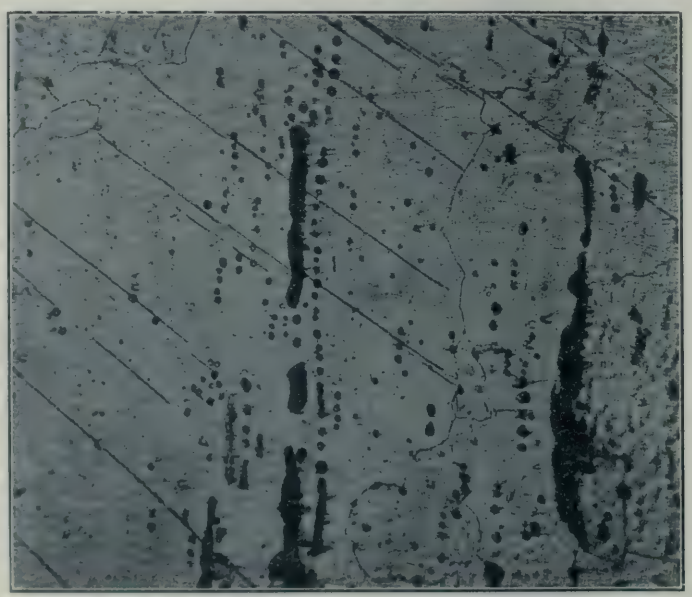


Fig. 1—The Dark Lines, Parallel Within Any Single Grain, Are the Neumann Lines. The mottled appearance of the corner grains indicates the non-homogeneity of the ferrite due to the unequal distribution of the phosphorus. Specimen: W1, longitudinal section. Etching, 10 per cent alcoholic nitric acid

The unusual features may be best illustrated by a description of the structure of the specimen in which they were first observed in abundance. This piece was a wrought iron eye-bar, a tension member of a railway bridge which after about 30 years' service was modified to suit the increased traffic. After this modification the member referred to above failed. The microscopic examination of the metal revealed, in addition to the usual structure of wrought iron, several structural features so striking as to mark the sample at once as a wrought iron of very unusual properties and composition.

The ferrite crystals presented a peculiar mottled appearance, particularly after prolonged etching with an acid reagent. This etch pattern was not found over the entire surface of the specimen but was restricted to certain streaks throughout the metal. Particularly was it found associated with crystals unusually large in size (Fig. 3).

The etch pattern referred to is illustrated in Figs. 1, 2 and 3. By using the copper chloride etching reagent, referred to later, these patterns may be developed in a very striking manner. They sometimes consist of broad parallel bands, as seen in cross-section, extending across the elongated crystals (Fig. 2) and bearing some resemblance to twinned crystals. More often they present an indefinite mottled appearance of light and dark areas very similar to the shadows cast by the sunlight streaming through between the leaves of a tree (Figs. 1 and 3). The crystals of ordinary wrought iron will not exhibit such etch patterns even after very prolonged etching.

The examination of the metal close up to the fracture, which occurred during the service of the material, shows that the break occurred through the crystals and parallel to the markings constituting the mottled etch-pattern at that point (Fig. 6). Many of the crystals close to the face of the fracture show another variety of intracrystalline markings. On casual examination these may be mistaken for scratches left by poor polishing of the material (Fig. 1). Closer inspection, however, shows that these markings are parallel to one another within any one crystal and terminate very abruptly at the crystal boundaries. If a slag enclosure lies in the course of one of these markings, the line ends abruptly, reappearing on the other side of the "slag" thus indicating clearly that it is not a scratch.

The obvious conclusion is that the non-homogeneity of the individual crystals as indicated by the mottled etch-pattern is to be attributed to some impurity dissolved in the iron but not uniformly diffused throughout the crystal. Robin has called attention to the fact that in ferrite containing considerable phosphorus, 1 per cent, such a non-homogeneity may exist.

The Materials Examined

The variations from the usual microstructure of wrought iron, first noted in the wrought-iron bridge member which failed in service, appeared so striking and unusual in character and have been so meagerly described in the literature on the subject that the examination was continued to other grades of iron. From the accumulated series of wrought-iron specimens which have been submitted to the Bureau of Standards from time to time for examination, some 35 samples were chosen for detailed microscopic examination. Much of this material had been submitted as unsatisfactory and one of the purposes of the examination was to see

*From a paper to be presented at the St. Louis meeting of the American Institute of Mining Engineers in October, 1917.

The author is associate physicist (metallography), U. S. Bureau of Standards.



Fig. 2—Specimen Showing the Mottled Etch-Pattern Occurring as Parallel Transverse Bands Within the Grains. Etching, 10 per cent nitric acid in alcohol. × 100

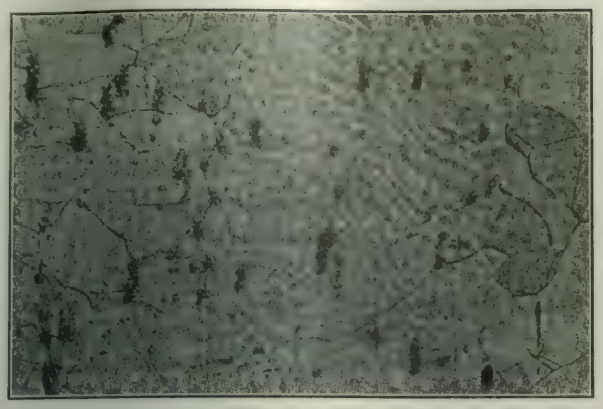


Fig. 3—The Streaks Exhibiting the Unusual Etch Pattern Are Very Often Composed of Grains That Are Much Larger Than the Average for the Piece. Etching, 10 per cent nitric acid. Same material as Fig. 2. × 100

whether such material is characterized by microstructural features similar to those noted above.

The examination was made by means of Stead's method of etching, making use of an alcoholic cupric-chloride solution acidulated with hydrochloric acid, by which the segregation of phosphorus is shown by the differential precipitation of copper on the surface of the metal. The precipitation of copper on the areas relatively low in phosphorus is much heavier than on the portions of higher phosphorus content, so that the approximate distribution of this element is rendered visible to microscopic examination.

The results of the examination indicate that the unusual microstructure noted in the failed eye-bar, while not to be regarded as a common feature of wrought iron or always associated with iron of inferior grade, is not unique for the single specimen in which it was first observed. It was noted, however, that such features were found only in material, or portions of material, that according to Stead are to be regarded as relatively high in phosphorus.

The comparison of the structure of the iron-phosphorus alloys (from a series specially prepared by the Bureau and described in the paper) with that observed in the wrought irons examined is instructive and very suggestive as to the nature of the markings there seen. The brown or dark bands and spots forming the mottled etch-patterns are the portions of the ferrite rich in phosphorus and each individual crystal in the streaks of the metal showing such mottled appearance is to be regarded not as a simple entity but as a rather complex aggregate. That the different portions of a single ferrite crystal in such portions vary considerably in their properties is to be inferred from the marked variation in composition.

The analyses for phosphorus of many of the materials listed show that, though such unusual features of structure as have been described are invariably associated with irons which are rather high in phosphorus, one cannot predict with certainty their presence from a knowledge of the average phosphorus content alone. Some of the samples, though comparable in respect to the phosphorus content, showed no traces of these unusual features.

Upon continued polishing of the specimens before etching, a faint trace of the markings may be seen and recognized by one after becoming familiar with this type of iron. By acid etching, preferably using a 5 or even a 10 per cent alcoholic solution of nitric acid, the etch pattern may be satisfactorily developed. The specimen shows to the eye the brown and purple oxide tints similar to those which are often observed when hardened and tempered steels are etched with an acid reagent. By using the cupric chloride solution described by Stead the heterogeneous structure may be developed much more strikingly than with acid alone. Though the amount of copper precipitated is very slight, the decided increase of contrast in the etched specimen when the acid copper-chloride reagent is used over that obtained with acid alone warrants the conclusion that it is to the copper that the more rapid etching action and the striking contrast produced is to be largely attributed. The areas constituting the mottled etch-pattern which are darkened are those relatively high in phosphorus, as is plainly indicated in Fig. 4.

Behavior upon Heating

The persistence of the unusual intracrystalline structural features upon heating is remarkable. Fig. 5 (left) shows the appearance of a specimen of the wrought-iron eye-bar previously described after heating for 3 hr. at approximately 600 deg. C. (585-625 deg.) and then allowed to cool in the furnace. No appreciable changes have resulted by this treatment. A second sample (Fig. 6, right), heated for about 1½ hr. at approximately 725 deg. C. (718-735 deg.) and furnace-cooled, still shows faint traces remaining of the former condition. The eutectic disappeared by solution of the compound, Fe_3P, in the ferrite but the non-homogeneity of structure as shown by the dendritic pattern still persists. This illustrates well the remarkably slow rate of diffusion within the ferrite matrix by which

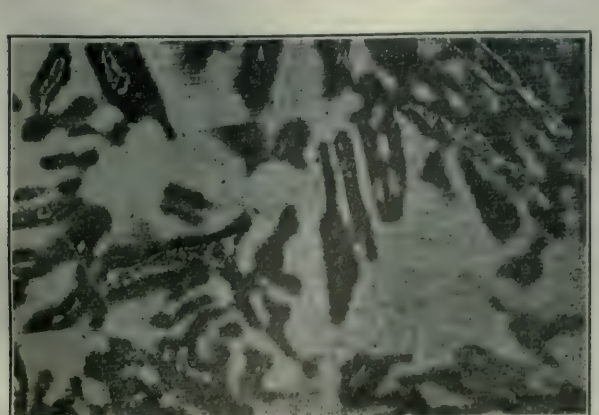


Fig. 4—The Dark Areas Are Portions of the Ferrite High in Phosphorus and Shows Some of the Eutectic as Islands in the Midst of the Dark Areas. × 100. Etching, alcoholic copper chloride with hydrochloric acid

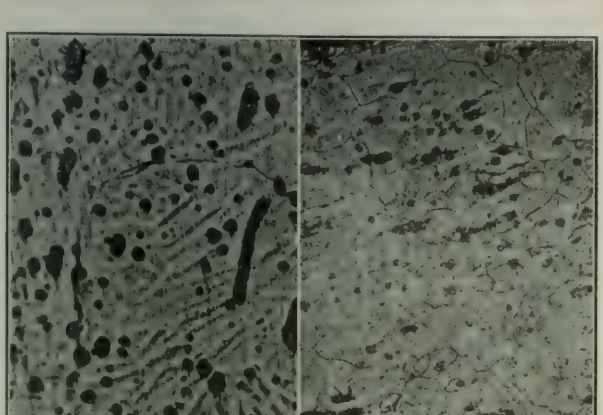


Fig. 5 (Left)—Effect of Annealing. Material of Fig. 2 heated for 3 hr. at 600 deg. C. Etching, 10 per cent nitric acid. × 100. Fig. 6 (Right)—Same material as Fig. 5, heated for 1½ hr. at 725 deg. C. Etching, 10 per cent nitric acid. × 100

equilibrium is finally attained. The presence of the compound Fe_3P which had separated out from the matrix most probably accounts for the much slower rate of diffusion in this latter case than was observed in the case of the first wrought-iron samples that were annealed.

The slow rate of diffusion of phosphorus in ferrite has often been remarked and it is undoubtedly due to this cause that the mottled structure persists and is not wiped out during the manufacture of the wrought iron, that is, during the heating, rolling and forging necessary before the wrought iron reaches the finished condition.

Significance of the Unusual Features

The significance of these unusual features of microstructure and their possible relation to the service behavior of such material may be suggested. The occurrence of material of this type in two of the samples examined, both of which failed in service and which have the appearance of having failed under the action of alternations or repetitions of stress suggests a possible relation between this type of structure and the failure of such material.

The method by which fatigue breaks occur in metals by the action of repeated stresses has been clearly and conclusively set forth by metallurgists. The minute back-and-forth slip along certain planes occurring within the crystals if repeated a sufficient number of times becomes a permanent displacement, thus initiating



Fig. 7.—Relation of Structural Features to the Service Behavior of the Material. Longitudinal section of wrought iron which failed in service. The edge of the fracture is parallel to the bands which constitute the etch-pattern here. Etching, 10 per cent nitric acid. × 100

an incipient fracture within the crystal. The combined effect of this action within a number of neighboring crystals at some portion of the specimen will be sufficient to cause a real fracture to start at that point if the application of the stresses is continued.

The brittle character of ferrite containing considerable phosphorus is well known. Crystals which show the heterogeneity caused by high and low-phosphorus bands in juxtaposition should be much more easily fatigued by repeated stresses and show a permanent slip much more quickly than crystals which are more uniform throughout in their structure. In particular, this should be true if the bands are transverse to the direction of the stresses acting. The observations upon the fracture of the broken eye-bar appear to confirm this.

The fact that the face of the fracture followed and its course apparently was determined by the bands within the ferrite crystals has already been referred to. Fig. 7 shows that the break occurred parallel to the bands of high-phosphorus ferrite which give rise to the peculiar etch-pattern. Examination of the metal immediately back of the face of the fracture reveals further evidence.

H. H. Campbell quotes the statement that phosphorus up to 0.20 per cent is not injurious in wrought iron. This should be taken, however, as referring to an average content of this amount, uniformly diffused throughout the metal. The microsegregation of this element may result in the amount in certain streaks being considerably in excess of this quantity, while within the individual crystals of such streaks the non-homogeneity with respect to phosphorus is still further accentuated. In the material of Fig. 4 the ferrite immediately surrounding the eutectic has a phosphorus content of approximately 1.7 per cent, or nearly five times the average percentage of phosphorus of the sample. It appears very probable then that in such non-homogeneous crystals as are shown, the phosphorus content of the bands may be as much as four or five times the average of the whole. In exceptional cases portions of a sample high in phosphorus may show traces of iron phosphide that has crystallized out directly from the melt. The metal at such points has a phosphorus content not far below 1.7 per cent.

The straight lines, resembling polished scratches, shown by some of the crystals near the fracture (Fig. 1), are the well-known Neumann lines. Such markings are usually considered to be "mechanical" twin crystals, i.e., the twinned position of the metal within each of the narrow zones having been brought about by mechanical causes alone. They, in all probability, are the result of shock which finally caused the fracture of the bar. A comparison of these lines with the long narrow bands which often constitute the mottled etch-pattern shows immediately that such etch bands cannot be attributed to twinning or a similar cause.

A Summary

1. Wrought irons high in phosphorus sometimes show a peculiar mottled or banded intracrystalline pattern, which by comparison with alloys of pure iron and phosphorus is shown to be due to a non-homogeneous diffusion of the phosphorus.

2. The examination of a wrought-iron member exhibiting such an unusual structure showed that the break which occurred in service bore a definite relation to such banded markings and apparently was largely determined by them.

3. By the non-homogeneity in the distribution of phosphorus throughout the ferrite crystals, the ill effects of phosphorus may be much enhanced.

4. The examination of a series of wrought irons showed that such features are not to be regarded as common. Many poor grades of iron may be unsuitable for other reasons.

5. A second type of markings is described and illustrated—the well-known Neumann lines—and shown to bear no apparent relation to the other variations in structure described.

Inspection of Brass and Bronze

In a paper by Alfred D. Flinn and Ernst Jonson of the Board of Water Supply, New York, read before the recent Atlantic City meeting of the American Society for Testing Materials, the authors discussed the question of failures of brass and bronze in cast, as well as in wrought metal, which had fulfilled the requirements of standard specifications. The facts, they hold, indicate that the standard specifications are inadequate. Their views are in brief as follows:

The service strength of brass and bronze is dependent, not on the ultimate strength, but on the yield point. The true yield point should therefore be specified and a method should be devised for determining the yield point more accurately than can be done by the current method. A test in which the load is applied in increments every 5 min. is recommended.

If brass or bronze contains initial stress, the service strength is no longer indicated by the yield point, but by the difference between the initial stress and the yield point. Initial stress must therefore be limited by specifications and suitable methods provided for measuring the initial stress.

It is common practice to "burn-in" defects in brass castings. When a "burn-in" cools it may leave initial stress of such magnitude that the casting will fail locally. Specifications for brass and bronze castings should therefore provide for annealing of all castings which have been repaired by "burning-in."

Molten copper is very susceptible to oxidation. Oxidized brass or bronze is of low strength and gives low elongation. It is recommended therefore that a tensile test with a suitable elongation requirement be incorporated in every specification for cast brass or bronze.

Horse Power Pull of Belts

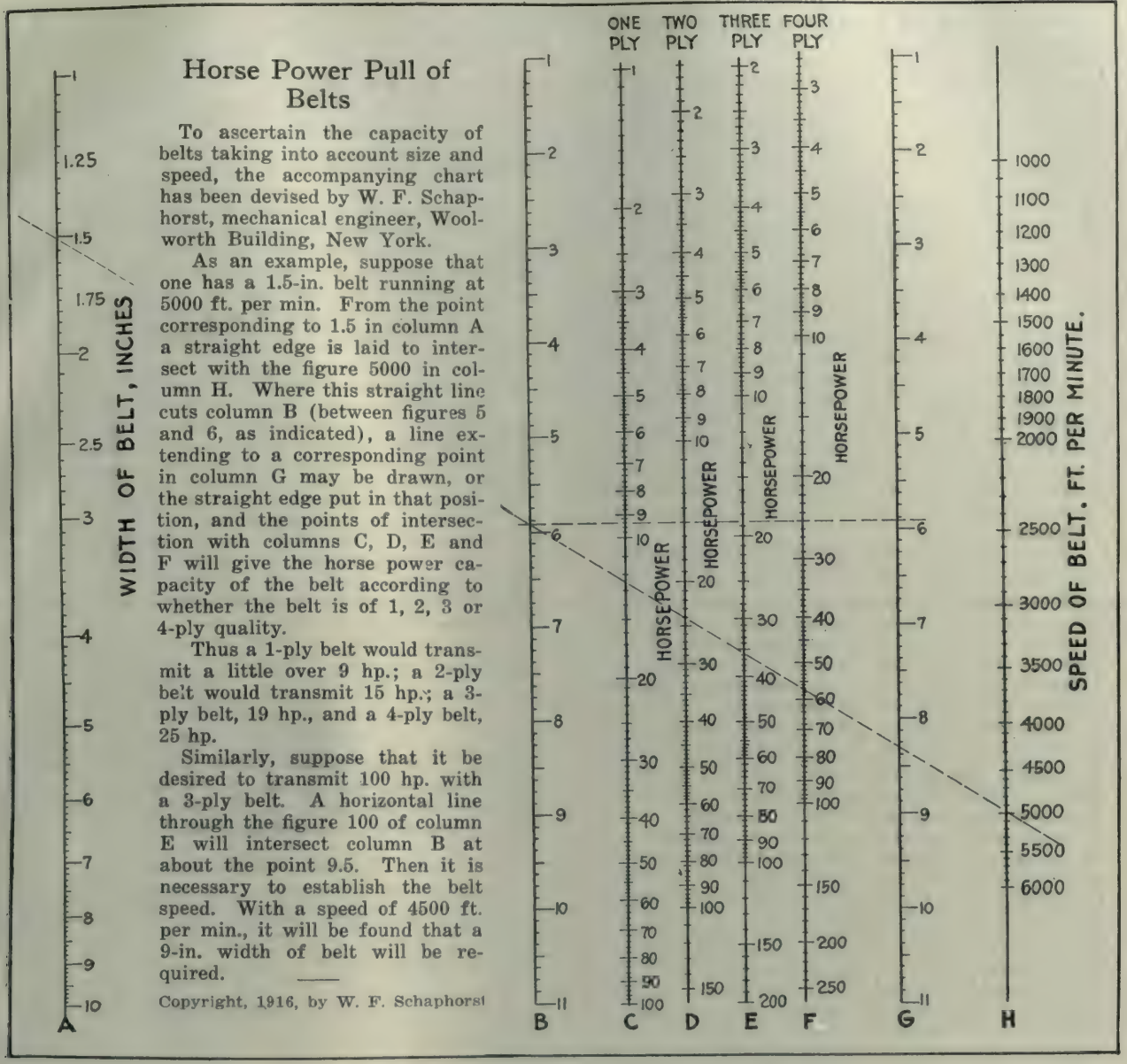
To ascertain the capacity of belts taking into account size and speed, the accompanying chart has been devised by W. F. Schaphorst, mechanical engineer, Woolworth Building, New York.

As an example, suppose that one has a 1.5-in. belt running at 5000 ft. per min. From the point corresponding to 1.5 in column A a straight edge is laid to intersect with the figure 5000 in column H. Where this straight line cuts column B (between figures 5 and 6, as indicated), a line extending to a corresponding point in column G may be drawn, or the straight edge put in that position, and the points of intersection with columns C, D, E and F will give the horse power capacity of the belt according to whether the belt is of 1, 2, 3 or 4-ply quality.

Thus a 1-ply belt would transmit a little over 9 hp.; a 2-ply belt would transmit 15 hp.; a 3-ply belt, 19 hp., and a 4-ply belt, 25 hp.

Similarly, suppose that it be desired to transmit 100 hp. with a 3-ply belt. A horizontal line through the figure 100 of column E will intersect column B at about the point 9.5. Then it is necessary to establish the belt speed. With a speed of 4500 ft. per min., it will be found that a 9-in. width of belt will be required.

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Urgent Needs of the Ordnance Department of the Army

The United States Civil Service Commission announces the following open competitive examinations for positions in the several ordnance establishments of the War Department or in or under the office of the Chief of Ordnance, War Department, Washington, D. C. The salaries named are for entrance.

Mechanical engineer, artillery ammunition, $3,000 to $3,600 year.

Mechanical engineer, experimental work, $2,500 to $3,000 year.

Mechanical draftsman, $1,000 to $1,400 year.

Apprentice draftsman, $480 year.

Inspector of artillery ammunition, $1,500 to $2,400 year.

Inspector of field artillery ammunition steel, $1,500 to $2,400 year.

Assistant inspector of field artillery ammunition steel, $3.50 to $5 day.

Inspector of ammunition packing boxes, $3.52 day to $1,800 year.

Inspector and assistant inspector of powder and explosives, $1,400 to $2,400 year.

Inspector of ordnance equipment, $1,500 to $2 400 year.

Assistant inspector of cloth equipment, $80 to $125 month.

Assistant inspector of leather, $100 to $125 month.

Assistant inspector of small hardware, $80 to $125 month.

Assistant inspector of textiles, $80 to $125 month.

Assistant inspector of leather equipment, $100 to $125 month.

Clerk qualified in business administration, $1,200 to $1,500 year.

Index and catalog clerk, $1,000 to $1,200 year.

The examination for index and catalog clerk is open to both men and women; the other examinations are open only to men.

The Government urgently needs men for the work above indicated, and qualified persons are urged, as a patriotic duty, to apply for examination. Until further notice applications for the positions named will be received at any time by the United States Civil Service Commission, Washington. Papers will be rated promptly. Applicants will not be required to appear at any place for examination, but will be rated principally upon the elements of education, training, and experience, as shown by their applications and by corroborative evidence.

Full information concerning examinations, application blanks, etc., may be obtained by calling in person upon the secretary of the local board of civil service examiners at the post office in any city in which city delivery of mail has been established, or by communicating with the United States Civil Service Commission, Washington.

The Lincoln Motor Co., Detroit, Mich., recently organized by H. M. Leland and others to manufacture autoplane motors, has acquired the old Lozier automobile plant in Detroit, and the plant of the Rand Mfg. Co. The plants will be placed in operation shortly and it is expected that they will be running at about full capacity in November. It is understood that it is the plan of the company to manufacture engines for automobile and motor boats after the Government requirements for airplane engines are filled.

Turbo Units versus Gas Engines

Comparative Data on Cost of Installation and Operation—Influence of Turbo Blowers on Blast-Furnace Operation

IN a paper presented some months ago before the Engineers' Society of Western Pennsylvania, Richard H. Rice, engineer, General Electric Co., and Sanford A. Moss, engineer turbine research department of that company, sought to show that turbo units for generating electric power and blowing the blast furnace are more economical than gas-engine units when total operating costs, including fixed charges, are considered. To this end they compared estimates of total first costs and total operating costs of two steel-mill plants each having four 550-ton blast furnaces; one plant using turbo blowers and generators and the other using gas engines as prime movers. Cost data on which these estimates were based, they explained, were obtained from operating plants and were adjusted to prices ruling November, 1916.

The discussion which followed the presentation of this paper appeared to indicate an interest in the comparison of power-generating costs segregated from those applicable to the blowing room. At a meeting of the American Iron and Steel Institute in New York, May 25, Mr. Rice, discussing "Recent Installations of Large Turbo Generators," reviewed the points emphasized in the paper before the Engineers' Society of Western Pennsylvania, gave substantially all the data contained in it, and also compared segregated power-generating costs as estimated for each of the two plants. As the second paper supplements the first, the two have been combined in the following review.

Both power plants are taken of sufficient size to supply the blast furnace demands for water, air, steam and electricity, and in addition 5000 kw. per furnace and 4450 gal. of water per min. per furnace for steel mills. The turbo-generator station is provided with three 12,000-kw. units, one as a spare, and is considered as operating on 235 lb. per sq. in. steam pressure with 200 deg. superheat and 28.5 in. vacuum. An instance of a plant operating on 150 lb. pressure and 28 in. vacuum also is cited as giving favorable results. The coke consumption in the blast furnaces is considered as 1800 lb. per ton of iron produced.

Proper Fixed Charges

A striking fact brought out by the comparison covers the cost of installation. In the past additions to operating costs have not been made for charges on the capital invested in new installations of prime movers, but it is important that this be done to arrive at proper fixed charges. The latest types of steam turbines permit a steam plant to operate with the same output of electric power to the mill, as plants containing gas engines, by the use of a reasonable amount of make-up coal, while leaving sufficient gas for blowing purposes. Therefore, the cost of fuel is one of the smaller considerations in judging the merits of the two types of installations and proper comparison should be based on the addition of fixed charges and running charges to the cost of the excess coal used in the turbine plant.

For gas-engine plants fixed charges are properly taken as 13 per cent and for turbo electric stations as 11 per cent. In the comparison to avoid discrimination which would appear favorable to the turbine plant, the figure 13 per cent is used throughout, subdivided as follows:

Subdivision of Fixed Charges of Power Plants

Interest (on bonds or capital invested)	5 per cent
Taxes	1 per cent
Insurance	1 per cent
Depreciation	6 per cent

Running charges include operating charges and also charges for maintenance and repairs. The cost of coal is $2 per long ton delivered at the fireroom door, of 13,500 B.t.u. per lb. calorific value.

The tabulation of costs on page 543 indicates that the gas engine plant will cost to install nearly $4,500,000 in excess of the steam turbine plant, or 260 per cent of the turbine plant. The operating costs of the gas plant will be $550,500 per year, or $2.95 per ton of pig iron more than that of the turbine plant, or a ratio of operating costs of 1.91 to 1.

Heat balances of the furnace gas during average week day working hours are as follows:

Gas Engine Plant

	Million B.t.u. Per Hour	Per Cent
Boilers	62	5.8
Electric station	*380*	*35.3*
Blowing station	88	8.2
Stoves	323	30.0
Margin	223	20.7
	1,076	100.0

Turbine Plant

	Million B.t.u. Per Hour	Per Cent
Pumps and miscellaneous	81	7.5
Turbo generators	*420*	*39.0*
Turbo blowers	*148*	*13.8*
Stoves	322	30.0
Margin	223	20.7
	1,195	111.0
Deduct heat from coal	119	11.0
Heat from gas	1,076	100.0

The heat balance for the turbine plant is proportionate to the steam consumption, allowing 70 per cent boiler efficiency, and is nearly, but not exactly, comparable with the gas plant, the internal gas washing, electric and steam distribution being different.

Electric Station Costs

To show that all the saving in total charges is not realized in the electric station, the following table was prepared showing the first cost and charges of the electric station by itself.

Segregated Electric Stations
First Cost:

	Gas Engine	Steam Turbine
Primary washers	$46,400	$46,400
Secondary washing station	244,000	.....
Gas pipe from boiler house	172,000	.....
Boilers and piping	128,440	483,900
Boiler house	33,500	85,000
Electric station apparatus	*3,250,000*	*745,600*
Electric station house	*250,000*	*69,200*
Pumping station, standpipe, conduits	180,000	127,750
	$4,304,340	$1,557,850

Charges—Dollars Per Year
Running Charges

	Gas Engine	Steam Turbine
Primary gas washers	$740	$740
Secondary gas washers	34,150	.....
Boilers	9,750	36,200
Electric station	*90,000*	*68,250*
Pumping station	1,400	1,830
Running charges, total	$136,040	$107,020
Fixed charges at 13 per cent	560,000	202,000
Total charges	$696,040	$309,020

Thermal Efficiencies of a Complete Station

	Per Cent
Best gas engine, as used in this paper	17.40
Good gas engine	16.25
Turbo-generator plant of paper	17.75
Largest turbo-generator plant	20.80

With variable loads the thermal efficiency of the turbine plant will hold up closely to these figures, and that of the gas engine plant will fall off considerably.

Flexibility of Turbo-Blower

Experience with centrifugal compressors on blast furnaces demonstrates that variations in blast are undesirable, and that the use of centrifugal compressors results in an improved output, less dust and a general steadying up of conditions. A part of this improvement is due to the steadiness of the blast and a part is due to the more accurate control of the rate of

blowing made possible by a constant volume governor in the intake which corrects the blast for changes in barometer and atmospheric humidity and temperature. Also turbo blowers are manufactured in such sizes that a single blower may be used to a furnace, allowing correct adjustment to exact furnace conditions.

Discussion

The following summaries are of discussions which followed the presentation of these papers. Those by Dr. D. S. Jacobus and Alex Dow were given before the American Iron and Steel Institute; the others before the Engineers' Society of Western Pennsylvania.

Alex. L. Hoerr, chief engineer, National Works, National Tube Co., McKeesport, Pa., questioned some of the statements made regarding the advantage in an operating sense, of the turbo blower over the reciprocating engine. In an engine driven plant the pulsations are almost eliminated by the large volume of the blast lines and stoves. At one plant where a furnace was blown alternately by engines and blowers, it was found that the amount of dust made did not depend on the type of blowing machinery used, but was up and down with both types, apparently governed by other than blast variations.

Frederic Ottesen, chief engineer, gas engine department, Mesta Machine Co., Pittsburgh, called attention to previous papers presented before the American Iron and Steel Institute by H. J. Freyn and Arthur West. Mr. Freyn, he said, stated that coal of 10,500 B.t.u. per lb. would have to cost only 42 cents per gross ton at Gary to reduce to nothing the saving due to the installation of gas engines, and make the steam-turbine installation commercially equivalent to the existing gas-engine installation. Mr. West stated that previous to the installation of gas engines at the Lehigh plant of the Bethlehem Steel Co. the coal bill was more than $1,000,000 a year, while after the installation of gas engines this bill was entirely wiped out.

Mr. Freyn places the gas engine installation cost as 50 per cent more than the steam turbine installation, whereas the authors place this cost at 260 per cent of the steam-turbine plant. The authors have chosen the most expensive way of selecting the gas-blowing units and one which does not conform with present-day practice. Also the efficiency of the turbo blower will fall with a change of pressure, and the pulsations due to reciprocating engine blowers is likely to benefit rather than impair the blast furnace operation, especially regarding hanging.

When modern installations are made two single tandem gas blowing engines are used for blowing a 500-ton furnace and one single tandem engine as spare for every two furnaces. The four-furnace plant would, on this basis, be equipped with ten single tandem gas blowers instead of eight twins. In other words, there would be only 16 gas cylinders and eight air cylinders in operation under normal conditions, as against 24 gas cylinders and 12 air cylinders in the case which Mr. Rice refers to.

It is now possible, and the time will come soon, when there will be on the market 5000-kw. blast-furnace gas engines instead of 2500 to 3000 kw., as is now the case. This will simplify and cheapen the installation materially, and make gas power still more desirable.

A. N. Diehl, assistant general superintendent, Duquesne Works, Carnegie Steel Co., said that his company had installed a 15,000-kw. turbo generator and boilers to develop steam at 250 lb. pressure and 150 deg. superheat in preference to gas engines for generating power, and believes that taking into consideration first cost of equipment and cost of operation, the company was justified in doing so.

P. M. Lincoln, commercial engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, differentiated between the present-day large units for generating power and the former small units. As long as the steam turbine units required were under 3000 hp. the gas engine may have had a place, but now that single units run to 60,000 and even 70,000 kw. with economy as low as 10 and 10½ lb. of steam per kw.-hr., the gas engine cannot compete.

B. R. Shover, consulting electrical engineer, Pittsburgh, who was formerly general manager of the Tata Iron & Steel Co., Sakchi, India, which plant, he said, has only turbo blowers and turbo generators, answered a question as to the unfairness of including a machine shop with the cost of the gas-engine station and not including one with the turbo station. Experience would tend to show that a machine shop was a necessary part of the equipment of a large gas engine station, while after five years continuous service at Sakchi the only repair on either blower or generator outfits was the changing of a set of diffusion vanes on one of the blowers.

Only about five-eighths of the pig iron produced at that plant was converted into steel, but there was ample steam raised from surplus gas, with the use of coal only as pilot fires, to operate the entire works. Not a single white man is regularly employed in operating the station and, in fact, none of the Indians there ever even saw similar apparatus previous to employment at that works.

Bryant Bannister, engineer, National Tube Co., Pittsburgh, stated that he has made a complete comparison of costs of turbo and gas-engine blowers for blast furnace service, including fixed charges, operating costs,

Comparative Costs for Typical Four-Furnace Plants

First Costs:

	Gas Engine	*Steam Turbine*
Primary washers	$131,250	$131,250
Secondary washing station	300,000	.....
Gas pipe from boiler house	212,500	.....
Boiler and piping	167,500	609,200
Boiler house	41,250	123,750
Electric station apparatus	*3,250,000*	*745,600*
Electric station house	*250,000*	*69,200*
Blowers, etc.	*1,812,500*	*726,416*
Blowing station house	*237,500*	*69,200*
Pumping station, standpipe, conduits	787,500	293,484
	$7,190,000	$2,768,100

Charges—Dollars Per Year:

Running Charges	*Gas Engine*	*Steam Turbine*
Primary gas washers	$2,100	$2,100
Secondary gas washers	42,000	.....
Boilers	12,000	52,750
Electric station	*90,000*	*68,250*
Blowing station	*49,500*	*42,000*
Pumping station	6,000	4,000
Running charges, total	$201,600	$169,100
Fixed charges at 13 per cent	934,500	359,800
Coal	21,652	78,352
Total charges	$1,157,752	$607,252

etc., and that this comparison showed that the only item favoring the gas-engine blowers was that of fuel economy. When fixed charges were considered the turbo blowers were considerably ahead in ultimate economy. He cited a plant using turbo blowers which during a period of 3½ years was not forced to make use of its spare on short notice, and also a turbo blower which had been in operation 6 months without shutdown.

Prof. Willibald Trinks, professor, mechanical engineering, Carnegie Institute of Technology, Pittsburgh, suggested that a plant with turbo generators for power development and gas-engine blowers would be the most economical. The steam turbine is more economical than the gas engine for producing power where coal is moderately priced, but the gas-engine blower shows better economy than the turbo-blower. Also, the correction by the automatic governor is not automatic. Some person must measure the temperature, the pressure and the moisture, and the latter is not a very simple process. After making these measurements the number of revolutions which the blower engines should maintain may be determined by slide-rule calculation.

Dr. D. S. Jacobus, advisory engineer, Babcock & Wilcox Co., stated that by using the most modern equipment of boilers, superheaters and economizers, with gas which is passed through primary washers, a boiler efficiency of 81 per cent can be obtained with the best sort of operation for a continuous load.

To obtain the best efficiencies with blast-furnace gas there must be a sufficient furnace volume so disposed that there will be a proper path of travel for the

(*Continued on page* 583)

RUSH BUILDING DESTROYERS

President Wilson Approves Plan Proposed by Secretary Daniels

WASHINGTON, Sept. 4.—President Wilson has given his formal approval to a comprehensive and altogether novel program of naval construction involving the expenditure of $350,000,000 in the building of 160 torpedo boat destroyers. The estimates have been forwarded to Congress and the entire influence of the Administration will be exerted to secure the necessary appropriation at the earliest possible moment, certainly before the adjournment of the present special session. Both the President and the Secretary of the Navy appreciate the fact that to carry out this plan of destroyer construction will interfere more or less with the work of the United States Shipping Board in hastening the building of the giant fleet of cargo vessels, but the superior efficiency of the torpedo boat destroyer in campaigning against the submarine is regarded as justifying any slowing down that may result to the plans of the Emergency Fleet Corporation.

The plans of the Navy Department to obtain a large additional fleet of destroyers have been worked up along lines similar to those adopted by the Shipping Board at the instance of General Goethals. The managers of the leading shipyards of the country, in which the destroyers authorized by the last naval appropriation act and those subsequently ordered under the President's emergency fund are being built, have declared very positively that it is impossible to build any more destroyers with existing facilities. They have added, however, that if the Government will supply the money and guarantee deliveries of the necessary materials, especially structural steel and ship plates, the proposed fleet can be constructed and delivered in its entirety within 18 months. To accomplish this, however, it is probable that three distinct classes of establishments will have to be created or commandeered and devoted exclusively to the work. It will be necessary, in the first place, to condemn considerable tracts of land in the vicinity of five or six of the largest shipbuilding plants and to provide a large number of shipways designed especially for the building of destroyers. The majority of these new yards or extensions will be located on the Atlantic coast.

Fabricating Plants

The second step will probably be the establishment of one or more fabricating plants for the fitting of shapes and plates for the destroyers. It is probable that the entire 160 vessels will be built on not to exceed three sets of plans and this standardization will facilitate the use of material fabricated on a comparatively large scale; thus, as in the case of the building of cargo ships for the Emergency Fleet Corporation, the work in the yards at tidewater will be chiefly that of assembling, and therefore the amount of labor necessarily employed will be reduced to a minimum.

The third step in preparing for the building of the destroyers will be the construction or commandeering of several large plants in which will be built the power units, which will be standardized as closely as practicable. It is understood that all the engines are to be oil-burning, and while well-known types will be built, the demand for 160 sets, in addition to those now being constructed for destroyers and other warships heretofore ordered cannot be met without providing extensive new facilities from the ground up. Experts of the department have surveyed several automobile plants having capacity for a large output of small gas engines. While such facilities with certain modifications can be employed in building motors for airplanes, very comprehensive changes will be necessary to fit them up to build oil engines for destroyers. The engine problem is a serious one and will probably be solved by placing a large number of orders for small numbers of oil-engines in individual plants throughout the country and having the remainder of the power units built in specially constructed plants.

At Interior Points

With the exception of the yards where the destroyers will be assembled and launched, it is the purpoes of the Navy Department to locate all the building facilities at interior points. This is not with a view to protecting the plants from attack (as has been suggested, but rather for the purpose of utilizing the labor of which the department is informed there is a larger supply now available in the vicinity of inland manufacturing centers than on the coast. If one or more fabricating plants are utilized in fitting up shapes and plates for the destroyers, they will be located with reference to the steel works from which these materials will be procured.

The financing of this big project will mark an innovation in Government work. As in the case of the fabricated steel cargo ships to be built for the Emergency Fleet Corporation, the destroyers will be constructed on a cost-plus-profit basis. The Government will provide the steel, which it will purchase in accordance with the terms of the President's ruling with respect to prices. The yard extensions will be obtained on leases where practicable, but in case condemnation is necessary the Government will take title and will subsequently dispose of the land in such manner as may seem advantageous when the war needs have been met. The fabricating plants will probably be constructed by the Government and it may also be necessary to build special plants for the manufacture of the power units and other equipment. If possible, however, arrangements will be made with engine building concerns to enlarge their works, the Government furnishing the funds or providing in the contracts for adequate amortization.

Vital Military Necessity

Concerning the new destroyer program and the method of its execution the Navy Department has made a brief official statement in part as follows:

The General Board of the Navy, the Chief of Operations of the Navy, and a special board on the submarine menace, recently ordered to consider and report upon the whole subject, are agreed in believing that, at present, the construction of a maximum number of destroyers is the most desirable material development for the Navy and a vital military necessity, and have so reported to Secretary Daniels.

Arrangements have already been made to accelerate to the utmost extent practicable the construction of all destroyers under contract at the beginning of the war and ordered since. The large orders for additional destroyers under the naval emergency fund in the last naval bill and the pending deficiency in this fund absorb all the present facilities for destroyer construction in the country which give promise of prompt delivery.

In order to undertake, with reasonable assurance of early completion, the large number of additional destroyers which the military situation renders desirable, it will be necessary to provide entirely new facilities for building the hulls and machinery and their appurtenances. The Navy Department has been in conference with various shipbuilders and machinery builders of experience in destroyer work, and is assured that it is physically possible to provide these additional facilities. It will be desirable to locate those which are not necessarily on the seaboard in the interior of the country, in order to facilitate obtaining the necessary labor, which is in scant supply in shipbuilding trades at present.

It is evident that if the new destroyer program is carried out as above outlined, the Government will find itself at the end of the war in possession of numerous plants and facilities for which it will then have no use. The present tendency of the Navy Department is to acquire facilities of this kind and to plan for their utilization after the war is over, in accordance with the policy calling for a constantly increasing percentage of Government construction and manufacture. The lesson of the war has been pretty thoroughly digested by the War Department, the activities of which have been almost paralyzed because private manufacturers have had no adequate facilities for co-operating with the

Government in supplying small arms, artillery ammunition, etc., for the new national army. The Navy Department, however, is apparently still obsessed with the idea that the Government should undertake the largest possible proportion of whatever construction or manufacturing may be necessary, notwithstanding the obvious fact that when the war is over it will have very little use for the facilities it is now so eager to acquire.

Busy in the Mahoning Valley

All of the 25 blast furnaces in the Mahoning Valley, which embraces the Youngstown district, were in blast on Sept. 1. The largest single producer in the Youngstown district is the Carnegie Steel Co., which has six blast furnaces at the Ohio works, making about 3,000 tons or more of metal per day. The next largest is the Youngstown Sheet & Tube Co., with six blast furnaces, making nearly 3,000 tons per day, and the Republic Iron & Steel Co. comes next with five blast furnaces, making about 2,000 tons of metal per day. The latest new stack of the Republic Company was blown in recently, and will average about 550 tons per day. The company also owns Hall furnace at Sharon, and Atlantic furnace at New Castle, Pa. The Brier Hill Steel Co. owns two stacks making 800 to 900 tons per day, the Girard Iron Co., one stack, 300 tons per day, Ohio Iron & Steel Co., one stack, 350 tons per day, McKeefrey Iron Co., one stack, 300 tons per day, the Struthers Furnace Co., one stack, making about 450 tons per day.

For some time the demands made upon the manufacturers of steel furniture for their products have been extremely heavy, and they promise to continue very large for some time to come. In order to meet its fast growing trade in Allsteel, the General Fire Proofing Co., of Youngstown, Ohio, has recently greatly enlarged its plant, adding about 30 per cent more floor space, and installing a large amount of new machinery.

The Brier Hill Steel Co., Youngstown, recently bought considerable ground adjacent to the plant of A. M. Byers Co., Girard, Ohio, which adjoins property already owned by the Brier Hill Steel Co. This purchase gave rise to the report that the Brier Hill Steel Co. might take over the A. M. Byers Co., which is incorrect.

American International Corporation in the Steel Business

The American International Corporation has organized a new subsidiary, the American International Steel Corporation, to engage in the export of steel and steel products. The new company intends to develop a foreign selling organization, and of course will have the financial and shipping connections of the American International Corporation.

Edward M. Hagar, for many years president of the Universal Portland Cement Co., the subsidiary of the United States Steel Corporation engaged in making cement from blast-furnace slag, is president. Morris Metcalf, identified in 1896 with the Illinois Steel Co. at the time of the early slag cement making experiments and for years assistant to Mr. Hagar, is vice-president, and J. W. Hook, of the Allied Machinery Co., a subsidiary of the American International Corporation, is also a vice-president of the new company. Offices have been established in London and Buenos Aires and the general offices of the company are in the Equitable Building, 120 Broadway, New York.

The A. Leschen & Sons Wire Rope Co. has completed and formally opened a new office and headquarters building adjoining its plant at St. Louis at a cost of $140,000. Included in the structure, in addition to complete provision for the general offices in commodious quarters handsomely finished and furnished, are dining, rest and shower rooms for the employees, while adjoining the building arrangements have been made for the laying out of a tennis court and also a golf course. The building is three stories, with the dining rooms and kitchens on the top floor. The structure, fireproof, is of the most complete daylight character.

HIGHEST WAGES EVER PAID

New Record for Puddlers and for Mill Workers—Patriotic Appeal

YOUNGSTOWN, Sept. 4.—The bi-monthly examination of the sales sheets of the Western Bar Iron Association, Republic Iron & Steel Co., and Cleveland Rolling Mill Co. to determine the price to be paid puddlers and bar mill workers for the months of September and October was held in this city Friday, Aug. 31, when the average selling price was established on a 2.75 card basis, an advance of two points. This fixes another new mark in the history of the trade. Therefore the the months of September and October the rate for puddlers will be $13.30 a ton. This is 50 cents a ton above the rates paid in July and August. Bar mill workers receive an increase of about 5 per cent. James H. Nutt, secretary of the Western Bar Iron Association, stated Friday that he did not look for any decline in the wages paid puddlers and bar mill workers during this year. Boiling prices may even advance another point or two.

The 60 days' examination of the sales sheets of the steel sheet and tinplate mills operating under the wage scale of the Amalgamated Association will be held here as usual on Sept. 10.

A. M. Byers Co., operating a large puddling plant at Girard, Ohio, and the Youngstown Sheet & Tube Co., operating a puddling plant at East Youngstown, Ohio, do not sign the Amalgamated scale, but always pay the Amalgamated rate, or higher.

A Patriotic Appeal to Employees

J. B. Rider, vice-president and general manager of the McKees Rocks plant of the Pressed Steel Car Co., Pittsburgh, has issued a personal appeal to the thousands of employees of that company in a circular letter that has been printed in 29 languages, and reads as follows:

To Every Worker of the McKees Rocks Plant:

This plant is engaged on important work for the United States government.

Our country—the United States of America—is in a big and serious war, the greatest of all wars. Every item of material being gotten out at this plant is needed by the railroads and the government to help win the war and quickly bring peace to the whole world. Each one of you can have a part in this—

By staying at your job every day and avoid losing time.

By willingly, when you are able, working extra hours upon being asked by your foreman to do so, or by telling your foreman you are willing to work extra hours.

By speeding up the job you are working at to get more done in a day's time.

By showing your fellow workers that you are anxious to do "your bit" for the flag that protects yourself, home, and family.

Our country needs us now. This is the time to show your loyalty. Are you one of us?

British Pig-Iron Output Increasing

The British output of pig iron is increasing rapidly. According to the quarterly blast-furnace report of the London *Iron and Coal Trades Review*, the average number of furnaces in blast per quarter, omitting fractions, is as follows:

	1916	1917
First quarter	288	315
Second quarter	292	322
Third quarter	297	...
Fourth quarter	306	...

Eight blast furnaces were in course of construction on June 30. The average number operating in 1916 was 296, while the average for the second quarter of 1917 was 322. The number in blast on June 30 was 324, or an increase of nearly 10 per cent over the average for last year.

The Bethlehem Steel Co. is making improvements and extensions at its Lebanon, Pa., furnaces to increase the capacity of the plant.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

Owned by the United Publishers Corporation, 243 West 39th Street, New York. H. M. Swetland, *Pres.* Chas. G. Phillips, *Vice-Pres.* W. H. Taylor, *Treas.* A. C. Pearson, *Secy.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: Equitable Building. Philadelphia: Real Estate Trust Building. Cleveland: Guardian Building. Cincinnati: Mercantile Library Building.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year.

Entered as second class matter, June 18, 1873, at the Post Office at New York, New York, under the Act of March 3, 1879.

War Taxes and New Construction

While there has been a pronounced majority against the most drastic of the war tax proposals in the Senate in the past week, it is apparent that the cost of putting excessive burdens upon industry in the first year of this country's participation in the war has not been carefully counted. When the first estimates of the year's war appropriations came out, in figures that were but a fraction of those indicated in the latest revisions, there was evident recognition of the wisdom of carrying forward a large part of the war's financial burdens in the form of bond issues. But as the initial figures have grown, and we have almost over night fresh billions added, the idea is advanced that so-called war profits must be put under heavier tribute.

It has been decided in the votes already taken in the Senate that the Government levy will not be 80 per cent or 70 per cent of such profits, but the percentage in any event will be a large one. And it is certain that in whatever form these profits exist, whether represented in enhanced inventories at the high prices of to-day or in a larger volume of bills and accounts receivable, or in added real estate or plant, the Government at the time appointed must have its share in cash. The process is therefore the taking from industry, nine or ten months hence, of hundreds of millions of dollars and its transfer to the Government. Preparatory to the handing over of these immense sums, business must husband its resources and convert paper profits into cash, every activity being subordinate to the one operation of getting a large part of its assets into liquid form to turn over to the Government.

Some idea of the scale of such withdrawals is given in the statement of Senator Simmons in Monday's debate, that with profits in 1917 estimated at $480,000,000, the Steel Corporation under the Finance Committee's amendment would be subject on a large part of its profits to a tax of 60 per cent and would have to pay to the Government $183,734,000. Steel manufacturers are asking what is to become, in such a situation, of the extensions which are now under way in the industry and all of which have been considered necessary to meet the imperative and increasing demand for steel for the carrying on of the war. The Bethlehem Steel Corporation financing just announced suggests that the phenomenon of large war profits may also be accompanied by the necessity of providing at high cost for vast capital requirements, where new work is under way on a large scale. But not all companies could be as successful as Bethlehem in commanding money for construction at double the normal outlay for new plant and for carrying on business on to-day's unparalleled values, while at the same time hoarding cash against the day of settlement with the Government. In many cases the alternative would be that with which the railroads have long been acquainted—the putting off of new work and the limiting of operations to what can be done without mortgaging the future.

The steel industry in the past three years has made free use of profits in adding to capacity and many plans for further extensions are now in the middle stage. To-day there is grave doubt of the carrying out of such plans if the voice of those who would bind upon industry an inordinate share of the cost of the war in a single year is allowed to prevail.

No War After the War

President Wilson's letter to the Pope has sounded the death knell of the war-after-the-war plan of the Entente Powers, agreed upon at the Paris economical conference, for the punishment of Germany after the conclusion of peace. The President's statement that "no peace can rest securely upon political or economical restrictions meant to benefit some nations and cripple or embarrass others," is clearly a declaration against any such plan as that which was adopted at Paris. He states very positively that the wrongs done by Germany in this war ought to be repaired, but that "punitive damages, the dismemberment of empires, the establishment of selfish and exclusive economic leagues would, in the end, be worse than futile, no proper basis for a peace of any kind." The President establishes the basis of settlement on a very high plane, and it was a courageous act to show very positively that one part of the program of England, France and Russia would not be participated in by the United States.

When it was first announced that plans were being laid for an economic war after the present bloody conflict, the people of this country naturally recoiled from being a party to any such conduct of warfare, but at that time the United States was not a belligerent and there was no immediate danger that it would be called upon to engage in commercial warfare. When in due time a state of war was declared, there was no announcement as to what the United States would do in regard to trading with the Central Powers after the establishment of peace, and it was well for the President in his letter to Pope Benedict to set at rest any doubt on this subject. It is gratifying to note that the press of foreign nations does not take exception to his position. Naturally, after the war, nations which have been associated in a common cause will prefer to trade with each other; but to a large extent, business will seek its natural channels, and this is as it should be. To attempt to carry on commercial war would be to keep alive the animosities of the present world catastrophe and help in bringing about an even greater world conflict at some future time.

Destroyers or Shipping?

After the delays in the carrying out of the merchant shipping program due to the Goethals-Denman controversy there has arisen a feeling of impatience in the past week over the proposal of the Secretary of the Navy to place under construction 150 additional destroyers, when it is admitted that the carrying out of the program will retard the building of merchant ships.

It may be granted, no doubt, that the 150 destroyer program is undertaken upon the advice of Admiral Sims, who is right on the spot and knows the value of destroyers, but it is a case of every man to his trade, and the warrior naturally wants to fight. Ships are also a good thing, and what is needed is the temperate judgment of one who is not committed to either method of winning the war, but one who can dispassionately weigh the relative value of the different measures proposed to help win the war, in terms of human life, of time, and of the expenditure of money. The new destroyer program has one thing to commend it, for there is the well-tried adage that "An ounce of prevention is worth a pound of cure."

Quite incidentally, when so much is at stake, is the point that the destroyer program would decrease somewhat the consumption of steel plates, as compared with expectations hitherto entertained, for the amount of time and work involved in proportion to the plate tonnage consumed, is very much greater with destroyers than with merchant ships. Perhaps this is one of the various influences that have lately been developing a rather easier tone in the plate market, though it cannot be more than a minor influence.

The Labor Department in Washington recently has been flooded with inquiries from manufacturers in regard to the new Federal child labor law, and a summary of the new statute and regulations for its enforcement is published elsewhere in this issue of THE IRON AGE. The law was fought bitterly by some of the cotton mill operators of the South, and the decision rendered in North Carolina last week, declaring it unconstitutional, does not cause any surprise. It merely paves the way for a final decision by the United States Supreme Court. In recent years, particularly in the Northern States, the employment of minors has rapidly diminished, and it is not probable that if the new law is sustained it will have any important effect on plants manufacturing iron and steel, but in some metal-working operations large numbers of minors have been discharged within a few days.

War and Wealth

The *Wall Street Journal* recently estimated the cost of the war to all the belligerents up to Aug. 1 at $90,000,000,000. The Manchester *Guardian* has since published an estimate setting the total at $107,500,000,000. The discrepancy is a minor one, in the circumstances, and one may adopt one hundred billion as a safe working estimate.

That is many times the amount that it was thought before the war would bring any war to a conclusion. It was thought that a first-class country could not stand an expense of more than a very few billion. As soon as the war was well under way, however, comparisons began to be made between the war expenditures of a country and its total wealth, and the idea gradually developed that a country could afford, and if necessary would afford, to spend in war what would amount to a large proportion of its wealth. It is impossible to present any close approximation to the material wealth of the European belligerents; but it may be noted that the hundred billion they have spent is not very far short of the estimated total wealth of the United States. Our own expenditures are not included in the estimates quoted above, as they were inconsequential up to Aug. 1; but Secretary McAdoo appears to be thinking in terms of twenty billions for our part, a considerable portion of this, of course, to figure as future expenditures of our Allies.

The return for this expenditure is to be future happiness and safety. At the end of the war there will be very little indeed of material things to show for the expenditure. There will be some factory equipment left that will be of certain or uncertain value, but representing at best only an extremely small part of the expenditure.

We have been considering only the expenditure of money. In its simplest aspect it really represents eventually the payment of wages, and wages would be paid in any event, if the times were prosperous. Very little material wealth has been taken directly. The expenditure has been chiefly for things that have been made during the war, and for services that have been rendered. On the other hand, some wealth that existed at the beginning of the war has been destroyed. There has been a great deterioration in railroad and manufacturing equipment, as well as in shipping, all due to very hard driving, while on the other side of the ledger there have been such additions as can be properly employed after the war. Instead of considering the expenditures of the governments, expressed in money, a clearer view of the material wealth of the belligerent countries is to be obtained by con-

sidering the nature of their activities in war and in peace. In prosperous peace times nearly everybody is working, and the net result usually is a great increase in material wealth year by year, to which most economists would add the "unearned increment." In war, however, the work of all at the front, as well as of those who serve them by transporting to them food, munitions and other things, is entirely lost. The work of those at home engaged in making the necessities of war is also lost, because there is no contribution to the material wealth. When, as in France and England, practically the entire man and woman power is engaged in furthering the prosecution of the war, the usual increment in wealth does not occur, but on the other hand there is great deterioration.

So it will necessarily be in our own case, when the expenditures run into many billions of dollars a year, only a small part of the expenditure being appraisable as material wealth at the close of the war. We shall, it is hoped, have many of our ships, if we ever build them, and we shall have some railroad equipment in France, together with a few other things. But when we think of these many billions it is well to apply the measure that the total capitalization of our whole steam railroad system is only about twenty-one billions, and there are some who think that is more than they are worth.

There are two practical conclusions: that every one should endeavor to work harder than in peace times, that the loss in wealth may be kept down, and that no class of individuals should make inordinate additions to their own wealth. Nor, as a corollary, should there be a dissipation of current earnings by extravagances, whether of the wealthy or of the workmen. Against such restraint as it is incumbent upon all to exercise now, there is the promise that in the new conditions that will follow the war there will be magnificent opportunites for a rapid increase in the material wealth of the world.

A Record in Manganese Products

The war has given the United States the lead in another branch of the world's steel industry. Manganese ore imports for the fiscal year ended June 30, 1917, at 656,088 gross tons, exceed the records of Great Britain in some of the best years of the industry in that country. Great Britain's receipts in 1913 were 601,177 gross tons and have been much less since, as they were also before that year. The importance to the steel industry of this remarkable import movement has been dwelt on before, but the facts have not been generally appreciated.

With 80,000 tons as the estimated domestic output of high grade ore in 1917, there will be available in the United States for conversion into ferromanganese this year over 700,000 tons of ore. This means a theoretical production of 270,000 to 280,000 tons of 80 per cent alloy. The blast-furnace reports of THE IRON AGE show a production this year of 143,302 tons to Aug. 1, or at the rate of 245,652 tons for the year, with the output increasing each month. Imports from Great Britain are declining, with indications now pointing to a total for the year of not over 50,000 tons. It is thus evident that the entire available supply, if the domestic output is 270,000 tons, will not be seriously short of the Alloy Committee's estimate of 336,000 tons as the present yearly consumption. The shortage will probably be made up by a more efficient use of spiegeleisen.

Before the war Great Britain led as a manufacturer and exporter of ferromanganese. To-day the United States outranks that country as a producer, though not as an exporter, for the entire domestic product is needed at home.

Manufacturing concerns engaged in work which contributes directly or indirectly to the successful prosecution of the war—and their name is legion—have been very properly described as fighting industries, but they will not be able to fight very effectively unless labor is loyal and enthusiastic. The 7000 men in the Philadelphia navy yards struck the nail squarely on the head when they pledged their loyal support to their country's cause and said: "We desire by our example to stimulate all others to the fullest performance of their duty to the country at this time." In other directions the labor situation is improved and the action of the mine workers of Alabama in withdrawing their demand for recognition of the union is one of the latest and most gratifying developments.

What before the war would have been regarded as an exceedingly high price in itself has lately represented the spread between tank and hull quality plates. For weeks this difference has been 2 cents per pound or $40 per ton, and must largely be reckoned as covering inspection or mill expense in halts in the rolling process to determine quality and in rejections of a commodity in urgent demand. With plate prices tottering, as at present, much of this spread is likely to disappear. But the condition has not been confined to plates. Shapes subject to mill inspection have been sold at $20 per ton above ruling levels, a demand made by the mill as a measure of protection at a time when run of mill output without inspection would have meant a much desired increase in output.

CORRESPONDENCE

Centennial of the First Rolling Mill in the United States

To the Editor:—You may be aware of it, but doubtless many of your readers are ignorant of the fact that previous to Sept. 15, 1817, all the bar and plate iron made in the United States was *forged* into dimensions. On that date the first *rolled* bar of iron was turned out at Plumpsack (or Plumsock), Middletown, Pa., about midway between Connellsville and Brownsville, in Fayette County.

Col. Isaac Meason of Connellsville furnished the money to erect and to run the first iron rolling mill in the United States. Thomas Cotton Lewis, Sr., master mechanic, a Welsh immigrant, was the designer, constructor, engineer and superintendent of this mill. His brother, George Lewis, was the "roller and turner"; Samuel Lewis, a second brother, was the heater; James Lewis, the youngest brother, was the "catcher"; Henry Wenman Lewis, another brother, was the bookkeeper

and "clerk"; Samuel Cotton Lewis and Thomas Cotton Lewis, Jr., his sons, "pulled up" for the puddler, David Adams, and for the "refiner," James Pratt.

From this small acorn of a mill there has grown within a century a forest. Rolling mills have been built all over the country, North and South, East and West—the Carnegie Steel Co., Illinois Steel Co., Cambria Iron Co., Colorado Fuel & Iron Co., the Tennessee Coal, Iron & Railroad Co., the Youngstown companies, and hundreds of others—every company that rolls iron or steel.

Sept. 15, 1917, is the centennial of this epochal step in the iron industry of our country. Middletown is the spot for a monument. Col. Isaac Meason, Thomas Cotton Lewis, Sr., and his brothers are the men to be honored in history as pioneers in our great rolling mill development. RICHARD GREGG LEWIS.

Dayton, Ohio, Aug. 30, 1917.

[Swank's "Iron In All Ages" says that the first rolling mill erected in the United States to puddle iron and roll iron bars was built by Isaac Meason in 1816 and 1817 at Plumsock on Redstone Creek, in Fayette County, on the site of the rolling and slitting mill built by Jeremiah Pears before 1804. The mill was built "for making bars of all sizes and hoops for cutting into nails. The iron was refined by blast and then puddled." The mill contained two puddling furnaces, one refinery, one heating furnace and one tilt hammer. Raw coal was used in the puddling and heating furnaces and coke in the refinery. The rolls were cast at Dunbar furnace and the lathe for turning the rolls was put up at the mill. The mill went into operation on Sept. 15, 1817. A flood in the Redstone caused its partial destruction in 1831. The machinery was subsequently taken to Brownsville.—EDITOR THE IRON AGE.]

Contract Foundry Iron Less Than Half Current Market Prices

Consumers of Southern foundry iron who have been under the necessity of buying iron for early delivery will probably be surprised to learn that the average of monthly invoice prices of iron shipped this year up to Aug. 1 is between one-third and one-half the market quotations of the past few months. As is well known, contract shipments have made up most of the iron that has been moving from furnaces, and these contracts were largely made before the market began its sensational advance.

The following table shows in round figures the monthly averages of invoice prices on all grades of Southern foundry iron for the first seven months of the year, the data being compiled from the books of a large Southern iron merchant:

January	$15.30
February	16.90
March	16.35
April	16.90
May	18.80
June	19.95
July	21.50

The above prices are all f.o.b. Birmingham, Ala. The average of the seven monthly averages is $17.96. Southern No. 2 foundry iron has sold for some weeks at $47 to $50, Birmingham. It is probable that August invoices for contract iron averaged slightly less than half the price of prompt iron in that month.

Hon. Frank Cochrane, Minister of Railways, states that it is the intention of the Canadian Government to spend $25,000,000 on the purchase of locomotives and rolling stock for the Government railways and freight cars to supply the shortage on other railroads. In all, 6,000 freight cars are being purchased, 4,000 from the Canada Car Co.; 1,000 from the Eastern Car Co.; 1,000 from the National Car Co.

The T. P. Walls Tool & Supply Co., 75-77 Walker Street, New York, has been incorporated with a capital stock of $50,000. T. P. Walls is president.

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OUTPUT STILL FALLING

August Pig-Iron Production 3,247,947 Tons

Five New Steel Works Furnaces Started, but Coke Shortage Still Dominates

The country's production of pig iron in August fell off considerably from that in July, in spite of the fact that five new modern furnaces were blown in last month and that there was a net gain of six in the number of furnaces in blast. Coke scarcity is still the controlling factor and there was also in the early part of the month the drawback of heat and humidity. The total output of coke and anthracite furnaces was 3,247,947 gross tons or 104,772 tons a day as against 3,342,438 tons in July or 107,820 tons a day. The falling off in the production of steel works furnaces was about 5000 tons a day while the output of merchant furnaces increased about 2000 tons a day, making a net decrease of about 3000 tons per day. On Sept. 1 the estimated capacity in blast was 110,165 tons a day, reckoning on the basis of the performance of the furnaces in the few months preceding August, the expectation being that with cooler weather in September output will increase.

The new furnaces started in August were one Donner at Buffalo, the new B furnace of the Bethlehem Steel Co. in the Lehigh Valley, No. 3 Worth at Coatesville, Pa., No. 5 Haselton in the Mahoning Valley and the new furnace of the Whitaker-Glessner Co. at Portsmouth, Ohio. Most of these furnaces were blown in in the latter part of the month and therefore were no large figure in the August returns.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from August, 1916, is as follows:

Daily Rate of Pig-Iron Production by Months—Gross Tons

1916	Steel Works	Merchant	Total
August	74,617	28,729	103,346
September	76,990	29,755	106,745
October	81,639	31,550	113 189
November	80,141	30,253	110,394
December	74,264	28,273	102,537
January, 1917	72,394	29,249	101,643
February	65,280	29,193	94,473
March	73,731	31,132	104,863
April	79,031	32 134	111,165
May	77,561	32,677	110,238
June	76,805	32,197	109,002
July	76,440	31,380	107,820
August	71.436	33,336	104,772

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces in August and the three months preceding:

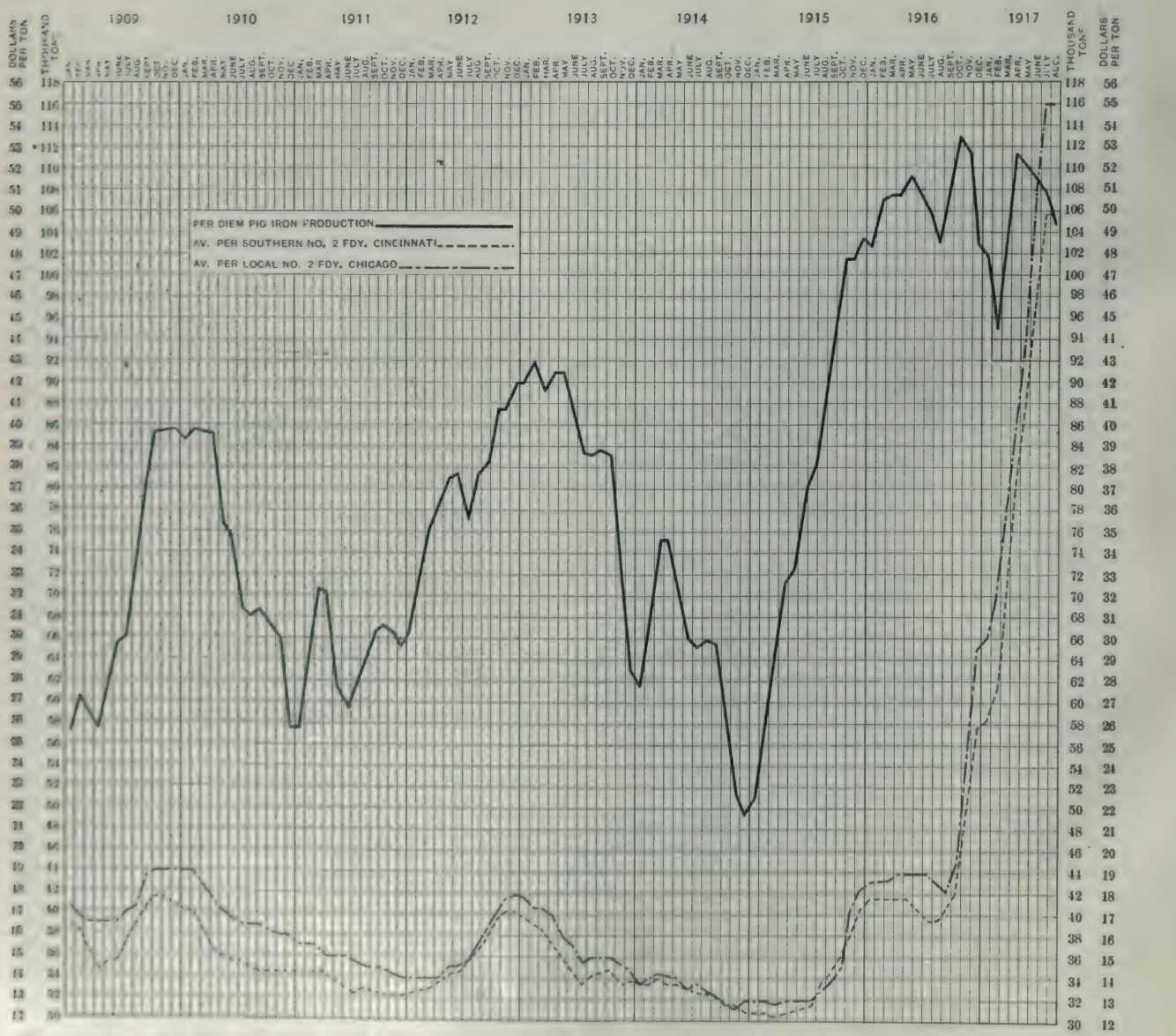


Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from Jan. 1, 1908, to Sept. 1, 1917, Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron at Chicago District Furnace

Monthly Pig-Iron Production—Gross Tons

	May (31 days)	June (30 days)	July (31 days)	Aug. (31 days)
New York	198,111	193,198	194,255	178,841
New Jersey	9,485	14,340	18,990	21,315
Lehigh Valley	117,584	114,465	116,432	111,583
Schuylkill Valley	100,531	94,097	94,578	91,236
Lower Susquehanna and Lebanon Valley	83,985	79,989	84,540	88,295
Pittsburgh district	690 919	651,768	664,456	664,141
Shenango Valley	176,200	171,074	174,614	164,709
Western Pennsylvania.	211,621	202,145	215,192	213,731
Maryland, Virginia and Kentucky	106,768	99,238	89,603	83,233
Wheeling district	129,169	125,403	129,689	124,627
Mahoning Valley	335,797	307,829	322,165	300,740
Central and Northern Ohio	276,712	278,396	299,458	272,109
Hock. Val., Hang. Rk. & S. W. Ohio	55,544	60,866	55,186	59,577
Chicago district	506,297	489,780	503,946	503,723
Mich., Minn., Mo., Wis. and Col.	122.312	118,109	114,952	105,486
Alabama	260 969	234,259	231,738	232,355
Tennessee and Ga.	35,336	35,099	32,644	32,246
Total	3,417,340	3,270,055	3,342,438	3,247,947

Capacity in Blast Sept. 1 and Aug. 1

The following table shows the daily capacity in gross tons of furnaces in blast Sept. 1 and Aug. 1 by districts:

Coke and Anthracite Furnaces in Blast

Location of furnaces	Total number of stacks	Sept. 1 Number in blast	Sept. 1 Capacity per day	Aug. 1 Number in blast	Aug. 1 Capacity per day
New York:					
Buffalo	18	18	5,885	17	5,705
Ferro	1	1	50	1	50
Other New York	5	2	405	3	665
New Jersey	4	4	855	3	605
Ferro	1	1	50	0	0
Pennsylvania:					
Lehigh Valley	21	15	3,755	14	3,542
Spiegel	2	2	205	2	214
Schuylkill Val.	13	11	3,155	10	2,960
Spiegel	1	1	90	1	95
Lower Susquehanna	8	7	1,720	6	1,577
Ferro	1	1	50	0	0
Lebanon Valley:	8	8	1,060	8	1,055
Ferro and Spiegel	3	2	100	2	105
Pittsburgh Dist.	53	50	22,740	48	22,020
Ferro and Spiegel	4	4	440	4	555
Shenango Val.	19	17	5,250	18	5,645
Western Pennsylvania	25	23	6,853	23	6,885
Ferro and Spiegel	3	2	125	1	84
Maryland	3	3	916	3	952
Ferro	1	1	100	1	95
Wheeling District	14	12	4,220	12	4,183
Ohio:					
Mahoning Val.	26	26	10,690	25	10,392
Central and Northern	26	24	9,255	25	9,661
Hocking Val., Hang. Rk. and S. W. Ohio	17	16	2,175	15	1,858
Illinois and Ind.	36	33	16,180	33	16,145
Ferro	1	1	65	1	66
Michigan, Wis. & Minn.	12	10	2,355	10	2,472
Colo. and Mo.	6	4	1,052	4	1,084
Ferro	1	1	98	1	86
The South:					
Virginia	18	12	1,324	12	1 376
Kentucky	5	3	375	4	558
Alabama	37	31	7,457	31	7,410
Ferro	1	1	70	1	68
Tenn. and Ga.	16	11	1,045	12	1,080
Total	410	357	110,165	351	109,248

Production of Steel Companies

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies show the following totals of steel-making iron month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons

	Pig, total production 1915	1916	1917	Spiegeleisen and ferromanganese 1915	1916	1917
Jan.	1,115,944	2,251,035	2,244,203	18,041	24,866	38,792
Feb.	1,237,380	2,183,845	1,829,846	13.319	23,877	32.137
Mar.	1,551,082	2 365,116	2,285.430	12,274	29,388	36,563
Apr.	1,584,111	2,316,768	2,370.937	12,337	31,862	39,595
May	1,694.290	2,408,890	2.404 380	13.440	35,844	37.701
June	1,770,657	2,295,784	2,304,155	19.200	38,597	30.829
July	1,949,750	2.306,303	2,369 630	17.854	31,353	43,884
Aug.	2,101,818	2,313.122	2,214,513	27.463	33,338	39.492
Sept.	2,129,322	2,309,710	.....	23.159	29,451	.....
Oct.	2,281,456	2,530,806	.....	23.992	34,566	.....
Nov.	2,198.459	2.404,210	.....	28,741	44 975	.....
Dec.	2,283,047	2,294,620	.....	25,004	43,470	.....

Among furnaces blown in in August were one Donner at Buffalo, Nos. 1 and 2 Wharton in New Jersey, one Lock Ridge in the Lehigh Valley, one Worth in the Schuylkill Valley, Lochiel and Vesta in the lower Susquehanna Valley, one Eliza and one Monongahela in the Pittsburgh district, Marshall in western Pennsylvania, one Haselton in the Mahoning Valley, Portsmouth in southern Ohio, and one Vanderbilt in Alabama.

Among furnaces blown out were Genesee in New York, one Farrell in the Shenango Valley, Oriskany in Virginia, one Ashland in Kentucky, one Lorain (banked) in northern Ohio, one Oxmoor in Alabama and Napier in Tennessee.

The Record of Production

Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1913—Gross Tons

	1913	1914	1915	1916	1917
Jan.	2,795,331	1,885,054	1,601,421	3,185,121	3,150,938
Feb.	2,586,337	1,888,670	1,674,771	3,087,212	2,645,247
Mar.	2,763.563	2,347,867	2,063,834	3 337,691	3,251,352
Apr.	2,752,761	2,269,655	2,116,494	3,227,768	3,334,960
May	2 822,217	2,092,686	2,263,470	3,361,073	3,417,340
June	2,628,565	1,917,783	2,380,827	3,211,588	3,270,055
July	2,560,646	1,957,645	2,563.420	3 224,513	3,342,438
Aug.	2,545,763	1,995,261	2,779,647	3 203,713	3,247,947
8 mo.	21,455,183	16,354,621	17,443,884	25,838,679	25,660,277
Sept.	2,505,927	1,882,577	2,852,561	3,202,366	.....
Oct.	2,546,261	1,778,186	3,125,491	3,508,849	.....
Nov.	2,233,123	1,518,316	3,037,308	3,311,811	.....
Dec.	1,983,607	1,515,752	3,203,322	3,178,651	.....
Total, yr.	30,724,101	23,049,752	29,662,566	39,039,356	.....

The figures for daily average production, beginning January, 1910, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1910—Gross Tons

	1910	1911	1912	1913	1914	1915	1916	1917
Jan.	84,148	56,752	66,384	90,172	60,808	51,659	102,746	101,643
Feb.	85,616	64,090	72,442	92.369	67,453	59,813	106,456	94,473
Mar.	84,459	70,036	77,591	89.147	75,738	66,575	107,667	104,882
Apr.	82,792	68,836	79,181	91,759	75,665	70,550	107,592	111,165
May	77.102	61,079	81,051	91,039	67,506	73,015	108,422	110,238
June	75.516	59,585	81,358	87,619	63,916	79,361	107,053	109,002
July	69,305	57,841	77,738	82,601	63,150	82,691	104,017	107,820
Aug.	67,963	62 150	81 046	82,057	64,363	89,666	103,346	104,772
Sept.	68,476	65,903	82,128	83 531	62,753	95,085	106,745	.....
Oct.	67.520	67,811	86,722	82,133	57 361	100,822	113,189	.....
Nov.	63,659	66,648	87,697	74,453	50,611	101,244	110,394	.....
Dec.	57,349	65,912	89.766	63,987	48,896	103,333	102,537	.....

Diagram of Pig-Iron Production and Prices

The fluctuations in pig-iron production from January, 1909, to the present time are shown in the accompanying chart. The figures represented by the heavy lines are those of daily average production by months of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron at furnace at Chicago. They are based on the weekly market quotations of THE IRON AGE.

Heavier Pig-Iron Loading

The official bulletin of the Railroads' War Board dated Aug. 30, in telling how shippers are co-operating in the effort of the railroads to increase freight service without increasing equipment, says that an iron company in New York State that formerly loaded pig iron to 90 per cent of the marked capacity of its cars, increased its loading to 107.2 per cent during the period July 15 to July 31 inclusive.

Open-hearth furnaces in operation in Great Britain in 1916 were 502, of which 349 were acid and 153 basic. The total furnaces in existence in 1916 were 611, of which 432 were acid and 179 basic, making 82 acid and 26 basic furnaces idle.

The Rossville Silk Mills, New Berlin, N. Y., has let contract for mill addition 56 x 150 ft., 1 story, to cost $22,000. W. T. Hawe, manager, 356 Fourth Avenue, New York.

Rathbone, Sard & Co., Grange Sard, president, North Ferry Street, Albany, are having plans prepared for rebuilding a factory 200 x 250 ft., 4 stories.

Iron and Steel Markets

SOME EASING IN PRICES

Little Light on Coming Adjustments

Plates and Bars Lower and Semi-Finished Steel Is Weaker

The magnitude of the Government's task in fixing steel prices is shown in repeated postponement of action. In the past week, prominent producers have been called upon for additional data, and there is still no appointment for the expected meeting of the War Industries Board and the general committee of steel manufacturers.

The markets for pig iron, semi-finished steel and rolled products continue to drift. Indications of coming readjustments are chiefly those given by resale transactions, which are but meager basis for conclusions. At Pittsburgh there has been no duplication of the sales in steel-making pig iron, which in the last week of August showed a softening market, but offers of resale billets and slabs at $70, as against $100 in July, are ample comment on the disappearance of competitive buying of shell steel for Europe.

The August pig-iron statistics emphasize again the little success of blast-furnace operators in the face of coke scarcity. The output was 3,247,947 tons, or 104,772 tons a day, against 3,342,438 tons in July, or 107,820 tons a day. New modern blast furnaces were started last month at five steel plants —Midvale, Bethlehem, Donner, Republic and Whitaker-Glessner—yet with all this reinforcement production declines. Many furnaces were banked for days at a time for lack of coke.

On Sept. 1 357 furnaces were in blast, with daily capacity of 110,165 tons, while 351 furnaces with daily capacity of 109,248 tons were active on Aug. 1. The situation is well indicated by the fact that 25,660,000 tons of pig iron was produced in the first eight months of the year, or 175,000 tons less than in the first eight months of 1916, and yet 38 more furnaces were in blast at the opening of this month than on Sept. 1, 1916.

The course of the market in the interval of waiting for the heavy requisitions of ship steel for the Government is the immediate concern of makers and buyers. Some of the 400,000 tons of plates bought for Japan are available for home consumption, and sales at 8c., Pittsburgh, indicate the change that has already come. From mills having 10c. plate contracts there is complaint in some instances of the failure of buyers to specify.

The bar market has been attracting attention also. Contract sales of steel bars have been made at 4c., Pittsburgh, for delivery in the fourth quarter, and some deliveries at that price have been as good from the buyer's standpoint as have been secured only recently on a 5c. basis. At the same time, when round lots of bars have been sought for Japan, with no embargo in effect, only fractional parts have been accepted at 4.50c.

A large meeting of tin-plate manufacturers at Pittsburgh, Aug. 31, considered the request from the food administrator that contracts with canners be made for a full year instead of six months. The question of sheet bar contracts for an entire year is involved, and negotiations with the steel mills on that matter must first be taken up. The draft of tin-plate workers for war service figures in calculations for the coming year's output, and there is the possibility of cutting off one turn at some mills in view of labor shortage.

Wire rods have shown consistent strength. On 6000 tons for shipment abroad through this month, October, and into November, $95 was done for soft and $115 for high-carbon stock.

Some light is thrown on the proposal at Washington that the Entente Allies be given the same prices on American steel as the Government, by British market prices on hematite pig iron. Recently the British maximum home trade price was 122s. 6d., while the export price for France was 137s. 6d., f.o.b., and for Italy, 142s. 6d. Our cable advice this week is that the export price for the Allies is believed to have been fixed at 141s. No publication has been made by Great Britain thus far of the prices charged her allies for finished steel, but in justice to steel makers in this country who are asked to make preferential prices to Europe these figures should be forthcoming.

The market for foundry pig iron is uniformly easier, due to constant offerings of resale iron, but the concessions are not great, nor is the business considerable. Some foundrymen bought more iron for 1917 than they will need; others are pressing the furnaces for deliveries. In the East, $50 No. 2 foundry iron is now offered, as against a recent furnace price of $52.

A new high level for manganese ore was reached in recent sales of ore from India at $1.25 to $1.30 per unit, at Atlantic seaboard. The freight from India, at £6 per ton, represents nearly half the cost of the ore.

The Lake Superior iron-ore movement in August was 10,146,786 tons, or slightly less than in July. To Sept. 1, shipments were 36,523,554, or 2,692,310 tons less than to Sept. 1 last year. That the 1916 total will not be reached is quite certain, but even so there is likely to be more ore than there will be coke to smelt.

Pittsburgh

PITTSBURGH, Sept. 4.

The local steel market is still marking time, waiting for the Government to announce its prices for steel, which it is now hoped will be done within a very short time. In the meantime, consumers are not buying a pound of material that is not absolutely needed, and in a few cases requests have been made to hold up shipments on contracts, at least in part, until the situation is more clearly defined. It is now conceded that the crest in prices has been reached, and that lower values on steel products of all kinds are certain to come in the near future. The heaviest declines in prices so far have been in semi-finished steel, soft Bessemer and open hearth, billets and slabs having been offered as low as

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Sept. 5, 1917.	Aug. 29, 1917.	Aug. 8, 1917.	Sept. 6, 1916.
No. 2 X, Philadelphia....	$53.00	$53.00	$53.00	$19.50
No. 2, Valley furnace...	52.00	52.00	53.00	18.25
No. 2 Southern, Cin'ti...	49.90	49.90	49.90	16.90
No. 2, Birmingham, Ala.	47.00	47.00	47.00	14.00
No. 2, furnace, Chicago*.	55.00	55.00	55.00	18.50
Basic, del'd, eastern Pa.	50.00	50.00	50.00	19.75
Basic, Valley furnace...	48.00	48.00	52.00	18.00
Bessemer, Pittsburgh....	51.95	51.95	55.95	21.95
Malleable Bess, Ch'go*..	55.00	55.00	55.00	19.00
Gray forge, Pittsburgh..	46.95	46.95	46.95	18.70
L. S. charcoal, Chicago..	58.00	58.00	58.00	19.75
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	38.00	38.00	38.00	33.00
O.-h. rails, heavy, at mill	40.00	40.00	40.00	35.00
Bess. billets, Pittsburgh..	75.00	75.00	90.00	45.00
O.-h. billets, Pittsburgh..	75.00	75.00	90.00	45.00
O.-h. sheet bars, P'gh....	80.00	80.00	90.00	45.00
Forging billets, base, P'gh	100.00	100.00	125.00	69.00
O.h. billets, Phila.....	90.00	90.00	100.00	48.00
Wire rods, Pittsburgh....	90.00	90.00	95.00	55.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia..	5.185	5.185	4.659	2.659
Iron bars, Pittsburgh....	4.75	4.75	4.75	2.60
Iron bars, Chicago.....	4.50	4.50	4.50	2.35
Steel bars, Pittsburgh...	4.00	4.00	4.50	2.60
Steel bars, New York....	*4.195*	4.695	4.669	2.769
Tank plates, Pittsburgh.	8.00	8.00	9.00	4.00
Tank plates, New York..	8.945	8.945	10.169	4.169
Beams, etc., Pittsburgh..	4.00	4.00	4.50	2.60
Beams, etc., New York..	*4.445*	4.695	4.669	2.769
Skelp, grooved steel, P'gh	4.00	4.00	4.00	2.35
Skelp, sheared steel, P'gh.	6.00	6.00	6.00	2.45
Steel hoops, Pittsburgh..	5.75	5.75	5.75	3.00

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire,	Sept. 5, 1917.	Aug. 29, 1917.	Aug. 8, 1917.	Sept. 6, 1916.
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	8.50	8.50	8.50	2.90
Sheets, galv., No. 28, P'gh	10.00	10.00	10.00	4.15
Wire nails, Pittsburgh...	4.00	4.00	4.00	2.60
Cut nails, Pittsburgh....	4.65	4.65	4.65	2.60
Fence wire, base, P'gh..	3.95	3.95	3.95	2.55
Barb wire, galv., P'gh...	4.85	4.85	4.85	3.45
Old Material,				
Per Gross Ton:				
Iron rails, Chicago.....	$44.50	$44.50	$40.50	$18.75
Iron rails, Philadelphia..	45.00	45.00	45.00	20.00
Carwheels, Chicago.....	31.50	31.50	30.50	11.50
Carwheels, Philadelphia..	34.00	34.00	35.00	15.50
Heavy steel scrap, P'gh..	34.00	34.00	33.00	16.00
Heavy steel scrap, Phila.	*31.00*	32.50	31.00	14.75
Heavy steel scrap, Ch'go.	31.00	31.00	29.00	15.75
No. 1 cast, Pittsburgh...	30.00	30.00	34.00	14.50
No. 1 cast, Philadelphia.	*32.00*	33 00	34.00	16.00
No. 1 cast, Ch'go (net ton)	24.00	24.00	23.00	12.00
No. 1 RR. wrot, Phila....	45.00	45.00	45.00	20 00
No. 1 RR. wrot, Ch'go (net)	**36.00**	34.00	33.50	16.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	$13.50	$12.00	$13.00	$3.00
Furnace coke, future....	10 00	10.00	10.00	2.50
Foundry coke, prompt...	**14.50**	13.50	14.00	3.50
Foundry coke, future....	12.50	12.50	10.00	3.50
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York.	*25.25*	25.50	28.00	28.00
Electrolytic copper, N. Y.	*25.25*	25.50	28 00	28.00
Spelter, St. Louis.....	*8.00*	8.12½	8.50	8.50
Spelter, New York.....	*8.25*	8.37½	8.75	8.75
Lead, St. Louis.....	*10.12½*	10.42½	10.75	6.60
Lead, New York.....	*10.25*	10.55	10 87½	6.75
Tin, New York.....	*61.00*	61.50	63 62½	38.87½
Antimony (As'atic), N. Y.	*14.50*	15 00	15.00	12.00
Tin plate, 100-lb. box, P'gh	**$12.00**	$11.00	$12.00	$5.75

$70 Pittsburgh, this being resale steel. From the highest point reached, this price shows a decline of $30 to $35 per ton in soft Bessemer and open hearth billets and sheet bars, which sold several months ago at $100 and even $105 at maker's mill. Prices on pig iron are holding fairly firm, and most of the resale Bessemer iron is under option, and likely to be applied on the recent inquiry from the Government for 40,000 tons of Bessemer iron for shipment to Italy. It is figured there will be a shortage in pig iron this winter and that prices may hold up to very near their present levels. The Government is still placing orders for all kinds of steel products, notably plates, sheets, spike rivets and other grades of finished materials. It has also been a frequent buyer of pig iron at somewhat lower prices than quoted to domestic consumers. It is believed that when the Government attitude as to steel prices is definitely known, there may be a general buying movement, as for more than a month consumers have not been buying a pound of material of any kind they could possibly do without. The market has held fairly steady during the almost practical suspension of new buying, and the mills still have orders on their books for the greater part of all the material they can turn out this year. W. P. Snyder & Co. report the average of Bessemer iron in August to have been $53.22 and of basic $49.42, both based on sales of 1000 tons or more in gross tons, f.o.b. Valley furnace. Compared with July, the average price on Bessemer iron shows a decline of $3.28 and on basic of $3.426. This is the first time in many months that average prices on Bessemer and basic iron as compiled by W. P. Snyder & Co. have shown a decline. Prices on both Bessemer and basic iron had shown an advance each month over the preceding month for several years.

Pig Iron.—The local pig iron market is extremely dull, there being no new inquiry, and no sales are being made. The only lot of Bessemer iron under negotiation is 5000 tons for shipment to Canada, on which $52 per gross ton at Valley furnace has been quoted, subject to ability of the seller to get license to ship on into Canada, which is regarded as being doubtful. On the recent inquiry for 40,000 tons of Bessemer iron for shipment to Italy, it is understood that about 25,000 tons has been gathered up in small lots from different furnaces, but as yet the remaining 15,000 tons has not been secured. The local pig iron market seems to be fairly strong, and while no new buying is going on, there is strong feeling that there will be this fall and winter a steady demand for all the Bessemer and basic iron that is turned out and that prices will rule high. One stack at Sharpsville, Pa., will likely go out this month for relining. There is no inquiry for malleable Bessemer or foundry iron, but furnaces report that consumers are taking in iron promptly, and the resale Bessemer and foundry iron seems to have been pretty well cleaned up.

We now quote as follows: Standard Bessemer iron, $50 to $52; basic, $48; No. 2 foundry, $52; malleable Bessemer, $52 to $53; and gray forge, $46 to $47, all at Valley furnace. The freight rate for delivery in the Pittsburgh and Cleveland districts from Valley furnaces is 95c. per ton.

Billets and Sheet Bars.—Offerings of billets, sheet bars and slabs for resale are still being made freely and, in fact, about all the semi-finished steel that has been sold in this market for some time has been resale steel. Buyers to whom it was shipped seem to be able to spare it and are trying to dispose of it in the open market. It is said that one mill that has sold considerable steel lately has offered for resale billets and slabs as low as $70 per ton, Pittsburgh. Steel mills which are shipping out steel on contracts are not sellers of steel on the open market, stating they need their entire supply for their regular customers who are taking in steel about as fast as it is being shipped. At the same time, it is a fact that about all the sales of

billets and sheet bars made in this market for some time have been resale steel, the steel producers holding aloof. While we do not quote soft Bessemer and open hearth billets below $75, it is a fact they have been offered as low as $70, but we are not advised as yet of any actual sales at that price.

We now quote soft Bessemer and open-hearth billets at $75, and soft Bessemer and open-hearth sheet bars at $80 or less, makers' mill, Pittsburgh or Youngstown. We quote forging billets at nominally $100 to $110 per ton for ordinary sizes and carbons, f.o.b. Pittsburgh.

Steel Rails.—Local mills are busy rolling standard sections and light rails to apply on Government contracts for shipment to France, these contracts taking preference over all other orders on the books of the mills. There is very little new domestic buying of either light rails or standard sections, but it is understood that the Carnegie Steel Co. and Cambria Steel Co. are sold up on all the light rails and standard sections the two concerns can turn out over the next year. Prices on new light rails and standard sections are given on page 565.

Ferroalloys.—The local market on ferroalloys of all kinds is very quiet, consumers evidently having their wants covered for some time ahead. There is a feeling, too, that probably prices on ferroalloys may be readjusted by the Government to a lower basis, and while consumers are taking in material promptly on contracts, they are not buying a pound of material on new orders they can possibly avoid. We quote 80 per cent domestic ferromanganese for prompt shipment at about $400, but on a firm offer this might be shaded. For first quarter of next year, $375 is quoted and for first half $350, but these prices are not very firm. We quote 18 to 22 per cent spiegeleisen at $70 to $75, delivered. Consumers of ferrosilicon and silvery iron are covered over the remainder of this year, and some for first half of 1918, and new buying is very quiet.

We quote 9 per cent Bessemer ferrosilicon at $89, 10 per cent $90, 11 per cent $95, 12 per cent $100, 13 per cent $105, 14 per cent $115, 15 per cent $125, and 16 per cent $135. We now quote 7 per cent silvery iron at $84 to $89. 8 per cent $85 to $90, 9 per cent $86 to $91, 10 per cent $87 to $92, 11 and 12 per cent $88 to $93. All f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having a uniform freight rate of $2 per gross ton for delivery in the Pittsburgh district.

Structural Material.—The local market is extremely dull, no contracts of moment having been placed here for some little time. Local fabricators say they are filled up for the remainder of this year, and are not actively bidding on new domestic work that is coming up, but are conserving a good part of their future output to meet expected demands of the Government. The American Bridge Co. is furnishing very large quantities of fabricated steel to the Government and also to the Federal Shipbuilding Co., for its new plant, also to Government cantonments and other war buildings, in which a good deal of structural steel is being used. We quote beams and channels up to 15 in. at 4c. to 4.50c., the lower price for delivery of last quarter, and the higher price for small lots for fairly prompt shipment.

Plates.—The Government embargo on plates destined to Japan has released considerable quantities of plates for domestic consumers, which mills are now offering for resale, and this has eased up the market to some extent for fairly prompt deliveries. One local mill has about closed for 26,000 tons of ship plates, to go into Government ships to be built on the Pacific Coast. The Carnegie Steel Co. is furnishing enormous quantities of plates to the Government, and also the Jones & Laughlin Steel Co. New inquiry for plate is not so active and domestic consumers are not having so much trouble as sometime ago in finding plates for fairly prompt delivery. We now have ¼ in. and heavier sheared plates at 8c. to 10c. at mill for delivery over the remainder of this year, while small lots bring 11c. to 12c. and higher from warehouse, prices depending upon the quantity and sizes.

Sheets.—The domestic demand for sheets is quiet, consumers buying only such quantities as their needs demand, believing that soon there will be a readjustment of prices to a lower basis. At the same time, it is true that four or five of the leading makers of sheets have their output sold up for this year, and are not actively quoting in the open market. The Government is still placing orders for sheets freely, mills having taken a contract recently for about 12,000 tons of galvanized sheets for prompt shipment. Prices on sheets to the domestic trade are not as firm as they were a month ago or six weeks ago, and sheets for fairly prompt shipment are easier to obtain. Prices on the different grades of sheets, which are none too strong, are given on page 565.

Tin Plate.—A very largely attended meeting of tin plate manufacturers was held in the William Penn Hotel, this city, on Friday, Aug. 31, to discuss matters that came up at the previous meeting of tin plate manufacturers held in Washington, D. C., on Friday, Aug. 24, on request of Food Administrator Hoover. Every tin plate maker of any prominence was represented at the Pittsburgh meeting, Aug. 31. E. T. Weir, president of the Phillips Sheet & Tin Plate Co., acted as chairman. The principal question discussed was the request made by Food Administrator Hoover that manufacturers agree to sell consumers of tin plate over the entire year of 1918, this to be regarded largely as a war measure, and to prevail only until the war ends. The manufacturers did not take kindly to this request, having only last year succeeded in putting the tin plate business on a basis of making contracts for only six months ahead. If the tin plate makers are to sell their product over all of 1918, they insist they must be covered with sheet bars for the entire year, and this matter of securing steel, and also to take up other questions, was put in the hands of a committee consisting of J. I. Andrews of the American Sheet & Tin Plate Co.; E. T. Weir of the Phillips Sheet & Tin Plate Co.; E. R. Crawford of the McKeesport Tin Plate Co., and Philips Schaefer of the Jones & Laughlin Steel Co., the last named being an added member. This committee, it is understood, will take up with the steel makers the matter of securing a supply of sheet bars over all of next year in case the tin plate makers agree to sell their product for that period. At the meeting in Washington, Food Administrator Hoover asked that no sales of tin plate for next year delivery be made prior to Oct. 1, and this was agreed to. The above named committee will gather as much information as soon as it can, and very shortly another meeting of tin plate makers will be held to discuss the important pending questions. Recently Food Administrator Hoover took over to his Food Administration Department the committee on conservation of tin plate. This committee consists of Henry Burden, president of the National Canners Association, who is chairman; Theodore F. Whitmarsh, president of the National Wholesale Grocers' Association; Dr. Carl Alsberg, of the Department of Agriculture; Henry W. Phelps, vice-president of the American Can Co.; Charles Bently, aide to Mr. Hoover of the food administration, and J. I. Andrews, general sales agent of the American Sheet & Tin Plate Co. Dr. E. E. Pratt resigned from this committee some time ago, and his place has not been filled. By reason of the action of Mr. Hoover in taking over this committee, Mr. Andrews and the others will be able to render the same efficient service as before, with complete immunity on account of other present business connections. Splendid service is being given the Government by all the tin plate makers in conserving their output to the manufacturers of bright plate for containers for perishable foods, and while there may be a shortage in supply it is believed the requirement of the country in bright plate for packing perishable foods will be well taken care of. It has been pointed out that very little increase in output of tin plate in 1918 over this year can be expected on account of the heavy draft of men for war service made on all the tin plate plants. It is even somewhat doubtful whether during the greater part of next year it may not be necessary to cut off one turn from operations on account of this shortage of labor. While tin plate was not mentioned in the recent embargo, it was probably meant to include it, and no doubt mills making foreign shipments of tin plate will be required very soon to secure Government permits. The export demand for tin plate is

still fairly heavy, but few sales have been made for some time. The current demand for small lots from stock is fairly active, and on primes mills are able to get anywhere from $12 to $15 per base box at mill. All the mills are now refusing to make sales of tin plate to jobbers, except where the latter can show that the tin plate is intended for packing perishable foods. Prices in effect on terne plate are given on page 565.

Iron and Steel Bars.—Mills report the new demand for iron and steel bars as only fairly active. Customers who are not covered on low priced contracts are not making any new purchases they can avoid, in the belief that prices on iron and steel bars will be on a lower basis in the near future. The Government is a very heavy consumer of steel bars at the price of 2.50c. agreed upon some months ago, and two of the local steel bar mills are making heavy shipments of steel bars to various plants making Government equipment. Implement makers and wagon builders are specifying freely against contracts. The demand for reinforcing steel bars is fairly heavy and prices are lower than for some time. Mill prices in carloads and larger lots on iron and steel bars on domestic orders are given on page 565.

Hoops and Bands.—Consumers are well covered over the remainder of this year, and new buying is light, being only for small lots for prompt shipment to cover current needs. Consumers believe prices will be lower soon, and will not buy any hoops or bands they can do without. We quote steel hoops in small lots for prompt shipment at 5c. to 5.50c. and bands 5c. to 5.25c. at mills. Extras on the latter as per the steel bar card.

Muck Bar.—The new demand is quiet and best grades of muck bar, made from all pig iron, are held at $85 to $90 per gross ton, Pittsburgh. Wages of puddlers for September and October will be 50c. per ton higher than in the two previous months.

Wire Rods.—The domestic demand is active, while the foreign inquiry is very heavy from Canada, England, the Orient and other countries. Recently a leading mill sold about 15,000 tons of soft open-hearth wire rods for shipment to Italy at $85 per gross ton at mill. Another mill took 4000 to 5000 tons of soft open-hearth rods for export shipment at $90 at mill. Small domestic sales of soft open-hearth Bessemer rods are being made at $90 to $95 at mill. Prices on rods are given in detail on page 565.

Wire Products.—The situation in the wire trade is unchanged. As yet none of the independent mills shows any inclination to reduce prices to the level of those of the American Steel & Wire Co., but it is certain that in the near future the independent mills will have to reduce prices or the leading interest will have to advance its price, but the latter is not likely. With its enormous capacity for output, the leading interest can come very close to taking care of the entire needs of the country in nails and wire, and for some time has been getting the bulk of the new business being placed. This condition will not be allowed to continue indefinitely. The new demand for wire and wire nails is quiet and specifications against contracts are dull. Jobbers say they cannot compete and pay $16 more per ton for nails and wire than their competitors are paying. However, very few wire nails and wire were sold at the $4 price for nails and $4.05 price for wire. Jobbers are inclined to keep stocks down as low as possible in view of the expected readjustment in prices on both nails and wire to a lower basis. Prices on nails and wire by the independent mills, which are largely nominal, prices of the American Steel & Wire Co., being $16 per ton lower, are given on page 565.

Shafting.—Several makers report that last week specifications on contracts for shafting for the automobile trade were larger than in any one week for some time. The Willys-Overland Co. specified recently for a large quantity of shafting and other automobile builders have done likewise. The Government is still the leading new buyer of shafting, taking from 35 to 40 per cent of the output on direct and indirect orders. One leading maker is just starting to take contracts for shafting for last quarter of the year delivery and reports having closed some contracts on the basis of 5 per cent off list. Discounts on shafting remain at 10 and 5 per cent off list, depending on the order.

Railroad Spikes and Track Bolts.—New buying by the railroads is reported dull and specifications on contracts for railroad spikes are not very active. The Government is still buying freely, and three local makers are running their plants largely on Government orders for quick shipment. The demand for boat spikes is very heavy, one leading maker conserving its entire output for the Government. Prices for railroad spikes and track bolts are firm and are given on page 565.

Nuts and Bolts.—The new demand is quiet, consumers evidently believing that prices are likely to be lower in the near future and are buying only such quantities of nuts and bolts as they absolutely need. Discounts now in effect by the large trade are given on page 565.

Cold Rolled Strip Steel.—The new demand is quiet and specifications against contracts are only fairly active. It is said that some consumers of cold-rolled strip steel have asked the mills to hold up shipments, at least in part, until the definite course to be taken on steel prices is more clearly defined. So far there have been very few cancellations on contracts and prices are reported as holding firm.

On contracts, mills are quoting 9c. at mill, but on small current orders prices range from 10c. up to 12c. at mill. Terms are 30 days, less 2 per cent off for cash in 10 days when sold in quantities of 300 lb. or more.

Rivets.—Local makers are working actively on heavy contracts for rivets placed recently by the Government for the first 500 ships to be built by the Emergency Fleet Corporation, which are to be delivered as promptly as the makers can turn them out. The domestic demand for rivets is dull, consumers believing that lower prices will come in the near future, and they are buying only such quantities as they must have for current work in their shops. We quote structural rivets at $5.25 and cone head boiler rivets at $5.35, per 100 lb. f.o.b. Pittsburgh, for delivery over the remainder of this year.

Wrought Pipe.—The domestic demand for both butt and lap weld iron and steel pipe has fallen off a good deal, but stocks held by jobbers are heavy, and mills are filled up for the remainder of this year on lap weld pipe, but are in position to make deliveries on butt weld pipe in eight to 10 weeks or less. No Government orders for steel pipe have lately been placed. There are numerous inquiries for line pipe for gas and oil projects, but pipe mills are filled up so far ahead that these inquiries are being turned down. Discounts on steel pipe being quoted by most of the independent mills are given on page 565. Prices quoted by the National Tube Co. to its trade are somewhat lower.

Boiler Tubes.—Makers of iron steel tubes are filled up for a year or more ahead, but a good part of their present output is being applied on Government orders which are being shipped as fast as the mills can turn the tubing out. Prices on oil country goods are ruling high, heavy premiums being paid where a mill or jobber is in position to make prompt delivery. Actual prices ruling for iron and steel tubes are very much higher than those given in the nominal discounts on page 865.

Coke.—The continued shortage in cars and also in labor is serving to keep up prices on high grade blast furnace coke for prompt shipment. Last week the car supply, based on actual output of coke, did not run more than 60 per cent, and the outlook for this week is no better. On Tuesday, Sept. 4, there were fairly large sales of high grade furnace coke for spot shipment at $13 and $13.50 per net ton at oven. One leading maker of high grade furnace coke that has been furnishing its coke to several consumers, on a day-to-day price, fixed the average price for the month of August at $13.50 per net ton at oven. We quote best grades of furnace coke for prompt shipment at $13 to $13.50 per net ton at oven and 72-hr. foundry coke at $14 to $14.50 per net ton at oven. *The Connellsville Courier* gives the output of coke in the upper and lower Connellsville regions for the week ending Aug. 25, as 358,504 tons, an increase over the previous week of 7550 tons. It is believed that within a week or 10 days the Government will name a price on furnace coke, which it is thought will not be above $5 per net ton at oven.

Old Material.—Following the recent purchases of heavy steel melting scrap, and also borings and turnings by the Carnegie Steel Co., the local scrap market has again quieted down and very little is doing. A local consumer recently closed for upward of 1500 tons of low phosphorus melting stock at prices ranging from $42 to $45 per gross ton, delivered, the higher price having been paid for billet and bloom ends and also for plate shearings. The railroad embargoes are still on, but dealers say they can get cars fairly promptly, if they can show that the parties to whom the scrap is to be shipped will take it in and unload the cars promptly. Leading consumers are not interested in the scrap market at present, and are evidently looking for lower prices. Dealers quote for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$34.00 to $35.00
No. 1 foundry cast	30.00 to 31.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	38.00 to 40.00
Hydraulic compressed sheet scrap	25.00 to 26.00
Bundled sheet scrap, sides and ends, f.o.b. consumers' mill, Pittsburgh district	23.00 to 24.00
Bundled sheet stamping scrap	21.00 to 22.00
No. 1 railroad malleable stock	26.00 to 27.00
Railroad grate bars	18.00 to 19.00
Low phosphorus melting stock	42.00 to 45.00
Iron car axles	45.00 to 46.00
Steel car axles	45.00 to 46 00
Locomotive axles, steel	52.00 to 53.00
No. 1 busheling scrap	24.00 to 25.00
Machine-shop turnings	21.00 to 22.00
Cast iron wheels	31.00 to 32.00
Rolled steel wheels	36.00 to 37.00
*Sheet bar crop ends	41.00 to 42.00
Cast iron borings	22.00 to 23.00
No. 1 railroad wrought scrap	32.00 to 33.00
Heavy steel axle turnings	23.00 to 24.00
Heavy braekable cast scrap	24.00 to 25.00

*Shipping point.

Chicago

CHICAGO, Sept. 4.

Plates within a limited range of sizes have sold at 8c., Pittsburgh, and jobbers have bought at 8.50c., Pittsburgh, although the business done at these prices is not large in the aggregate. The weakness indicated is attributed entirely to the embargo on exports. The Government continues the one big buyer with prices indeterminate, having placed in this territory about 10,000 tons of material for portable railway construction in France, about 1000 tons of rivet rods for navy yard delivery, shipbuilding material, etc. The order placed with the leading local independent mill for shipbuilding plates and shapes totals 18,000 tons, instead of 15,000, it having been determined to build the bulkheads and deckhouses of composite ships of steel instead of wood. In a general way, the entire steel trade is enveloped in a haze of uncertainty. Meanwhile Government orders upset rolling schedules. Consumers are drawing nearer the end of their material contracts and must soon replenish, but at what prices no one knows. Doubt on all sides is conducive to quiet and the only buying is that forced by urgent necessity. Business in pig iron is extremely quiet, likewise that in old material.

Ferroalloys.—No change is reported, the quotations for 80 per cent ferromanganese being $400 for delivery this year, $375 for the first quarter and $350 for the second quarter. For 10 per cent Bessemer ferrosilicon, $100, Jackson County, is asked. The market is quiet.

Pig Iron.—Except for an occasional transaction involving a carload or two, the market is inactive at unchanged prices. Northern makers ask $55, furnace, for No. 2 foundry, delivery up to next July. The Southern producers quote $50, furnace, or $54, Chicago, for this year, and $48 for next year for No. 2. Little of this year's product is unsold, where standard iron is concerned, but high and low grades are not so difficult to find. Silvery running 4 to 5 per cent silicon is quoted at $52, Birmingham. The lack of standard grades is due to the irregularity of furnace operations resultant from insufficient coke. Deliveries show little or no improvement. The only evidence of easier prices is the offering now and then of a car of resale iron, but there is not enough of this to have any effect on the general market, and producers' quotations are firm. Consumers are filled with doubt as to the future and inclined to wait. The price table is unchanged. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 1 to 4	$58.00
Lake Superior charocal, Nos. 5 and 6, Scotch and No. 1 soft or special	60.50
Northern coke foundry, No. 1	55.50
Northern coke foundry, No. 2	55.00
Northern coke foundry, No. 3	54.50
Northern high-phosphorus foundry	55.00
Southern coke No. 1 f'dry and 1 soft	55.00
Southern coke No. 2 f'dry and 2 soft	54.00
Malleable Bessemer	55.00
Basic	55 00
Low-phosphorus	$90.00 to 93.00
Silvery, 8 per cent	82.75 to 83.00

Plates.—The strict embargo on the exporting of plates has had the expected effect, and the market is easier, although not all sellers are willing to leave the 10c. basis. In limited sizes, sales have been made at 8c., Pittsburgh, while jobbers have taken a broader range of sizes at 8.50c., Pittsburgh, all of the business, however, not being important. Consumers and not a few sellers regard 8c. as still too high to stir buyers to activity. The Government demand for ship plates is immense, despite the fact that its program is not under full headway so far as buying is concerned. For delivery out of their stocks, jobbers quote 10c.

Structural Material.—An Eastern producer adheres to 6c., Pittsburgh, for shapes, but the opinion is given by a Western maker that 4.50c., Pittsburgh, can be done for delivery this year. Some business is still being done for export but the new restrictions make the obtaining of licenses a long and uncertain task. No car orders are reported. The American Bridge Co. will supply 210 tons for the Waukegan plant of the American Steel & Wire Co. Unknown bidders will supply 125 tons to the Great Western Smelters' Corporation at Mayer, Ariz., and 128 tons for the American Smelting & Refining Co. at Durango, Col. The Minneapolis Steel & Machinery Co., Minneapolis, will supply 764 tons to the Utah Copper Co., Magna, Utah. The Illinois Steel Bridge Co. will supply 119 tons to Spokane County, Washington, for bridge spans, and Dyer Brothers will supply 200 tons for the Y. M. C. A. building at San Francisco. Jobbers continue to quote 5c.

Bars.—For delivery this year, steel bars are quoted at 4.50c., Pittsburgh. Business is not active, but it is felt that something must be done in the near future for the agricultural implement makers and other consumers. As said heretofore, assurance as to future stability of prices is the lacking factor. For rail carbon or concrete reinforcing bars, demand is somewhat more active with quotations ranging from 4.25c. to 4.50c., Chicago. Iron bars are unchanged at 4.50c. to 5c. Chicago. Jobbers' prices are unchanged.

Wire Products.—Jobbers have been buying and the stocks of some are well replenished. Otherwise the only news is that poultry netting is now sold on a new basis. Instead of list prices for square feet, there are now lists for bales at 150 linear feet. All quotations are unchanged, the independents still quoting 4c. for nails.

Sheets.—A tendency toward more reasonable prices is shown. Both No. 28 black sheets and No. 10. blue annealed range from 8.75c. to 9c., Pittsburgh, although one or two makers ask over 9c. for blue annealed. Galvanized is a little easier at 10.50c., Pittsburgh. Sheets are still being exported to the far East, especially Japan. Jobbers' prices are unchanged.

Cast Iron Pipe—No municipal lettings or inquiries can be reported. The jobbing demand is holding up reasonably well. Prices are without change.

Rails and Track Supplies.—The Government continues active in placing light rails and track supplies for the construction of portable railroads in France, about 10,000 tons having been placed in this territory in the past week. It is estimated that at least 30,000 tons was placed altogether. The domestic railroads are

doing much patching where they ordinarily would be laying new track. They are getting deliveries from the leading interest where failure to supply them would entail dangerous conditions. Prices are unchanged.

Bolts and Nuts.—Prices and conditions are unchanged. For prices and freight rates, see finished iron and steel, Pittsburgh, page 565.

Old Material.—The market is irregular, with buying confined to odd lots for which needy consumers have paid premiums. Such sales, however, are not numerous enough to establish the market. Users of scrap are actuated by uncertainty over probable governmental influence on prices as much as are any others. In the absence of general buying, quotations are dependent on individual requirements, with consequent lack of uniformity in prices. The Northwestern Railroad has issued a list of several thousand tons, and smaller lists have come from the Soo Lines, Pennsylvania Lines West, Chicago & Great Western and the Erie. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$44.50 to $45.00
Relaying rails	50.00 to 55.00
Old carwheels	31.50 to 32.50
Old steel rails, rerolling	40 00 to 41.00
Old steel rails, less than 3 ft.	40.00 to 41.00
Heavy melting steel scrap	31.00 to 32.00
Frogs, switches and guards, cut apart	31 00 to 32.00
Shoveling steel	30.00 to 31.00
Steel axle turnings	22.00 to 23.00

Per Net Ton

Iron angles and splice bars	$40.00 to $41.00
Iron arch bars and transoms	43.00 to 44.00
Steel angle bars	35.00 to 36.00
Iron car axles	41.00 to 42.00
Steel car axles	41 00 to 42.00
No. 1 railroad wrought	36.00 to 37.00
No. 2 railroad wrought	33 00 to 34.00
Cut forge	32 00 to 33.00
Pipes and flues	22.50 to 23.50
No. 1 busheling	25.50 to 26 50
No. 2 busheling	17.50 to 18.50
Steel knuckles and couplers	37.00 to 38 00
Steel springs	37.00 to 39.00
No. 1 boilers, cut to sheets and rings	20.00 to 21 00
Boiler punchings	35.00 to 36.00
Locomotive tires, smooth	40.00 to 41.00
Machine-shop turnings	17.00 to 18.00
Cast borings	16.00 to 17.00
No. 1 cast scrap	24.00 to 25 00
Stove plate and light cast scrap	17.50 to 18 00
Grate bars	17.50 to 18 50
Brake shoes	19 00 to 19.50
Railroad malleable	31.50 to 32.50
Agricultural malleable	24.75 to 25.75
Country mixed scrap	18.00 to 19.00

Philadelphia

PHILADELPHIA, Sept. 4.

August was a dull month, fewer orders being recorded in all lines than in any preceding month for some time. There is a belief that considerable business will be placed as soon as the Government price-fixing program is determined, but until then conditions must remain very much as they have been reported for several weeks past. The question of what quantities of steel the Government will require is just as disturbing to future business as price-fixing as steel mills are unable to name definite dates of delivery until the Government makes its wants fully known. This will hold back some business even after the price question is settled. For example, there are building projects in contemplation that would soon be settled if it were possible for the mills to promise fixed dates of delivery for the structural steel. Efforts have been made to ascertain from the Emergency Fleet Corporation just what requisitions for plates and shapes will be made during the coming year, but apparently the officials of that organization are still lacking in positive knowledge of their future requirements. Specifications are coming to the mills regularly in tonnages about equal to present output. The pig-iron market is almost featureless and transactions are few and small.

Pig Iron.—A number of small tonnages were sold during the week. August was extremely dull and September started out without promise of immediate betterment. The only sales of importance have been 500 tons of Virginia No. 2 X foundry at $51, furnace, and 1000 tons of standard low phosphorus iron at $90. New inquiries are light, the Southern Railway Co. having sent out the only one of any moment, that being for four different lots of foundry iron aggregating about 400 tons. This iron is for the Lenoir Car Works, which was reported a week ago as inquiring for 6000 tons. The Italian Commission, through a committee of the American Iron and Steel Institute in Washington, has been endeavoring to obtain several thousand tons of 0.05 low phosphorus iron, but apparently without success so far. This inquiry at first called for Bessemer iron, but was changed later to the low phosphorus grade. Two of the three furnaces making copper-bearing low phosphorus iron in this district will be blown out soon. None of this iron is being offered for delivery this year, and prices for the first half of 1918 are quoted at $80 to $85, furnace. Prices remain largely nominal on the following standard brands, prompt delivery in buyers' yards:

Eastern Penna. No. 2 X foundry	$53.00 to $55.00
Eastern Penna. No. 2 plain	52.50 to 54.50
Virginia No. 2 X foundry	53.75 to 54.75
Virginia No. 2 plain	53.25 to 54.25
Basic	50.00 to 52.00
Standard low phosphorus	90.00

Coke.—A sale of two cars of Connellsville foundry coke at $13 was made last week. Some handlers are asking up to $14.50 at oven for prompt shipment.

Billets.—Billets are weaker. Sales of open hearth re-rolling billets have been made during the past week at $100, while occasionally $90 is heard. Forging billets range from $115 to $125. Little business is being done and buyers will undoubtedly not take much interest until the price question is settled by the Government.

Sheets.—Quotations on sheets continue as follows: No. 10 blue annealed, 8.50c.; No. 28 black, 8.50c. to 9c., and No. 28 galvanized, 10.50c. to 11c., Pittsburgh. A Middle West mill is accepting orders at these prices for delivery within four to six weeks.

Structural Material.—Architects are making inquiries to "feel out" the situation in structural material, and it is considered likely that new building projects will be launched as soon as the Government has made known its total requirements in such form as to make it possible for mills to quote definite deliveries to private consumers. Under present conditions no one is courageous enough to engage in building operations which would necessarily drag along indefinitely because of uncertain delivery of material. It looks now as if the Philadelphia subway contracts would go through, and the steel for this work, involving more than 20,000 tons, will probably soon be placed. Prices on the small lots which are being sold range from 5c. to 6c., Pittsburgh.

Plates.—Mills are receiving specifications regularly from the Government and from private consumers who hold contracts. It is estimated that the tonnage covered by these is about equal to the output of the mills. On pending inquiries the price generally quoted is 10.185c., base, Philadelphia, in carloads, on tank steel, with the usual extras for higher grades. An agreement is made with each buyer that shipment in the time specified depends on the requirements of the Government. Producers are little disturbed by reports from other markets of prices as low as 8c. on plates, and continue strong in their views. A firm offer of 8c. for a good sized order might find takers in this market, but as there has been no one to try the experiment the price remains nominally at 10c., Pittsburgh. Re-sale lots possibly have been sold at 8c., but as these are for small tonnages they cannot be taken as an indication of any marked weakness. No large lots of boat steel have been sold during the week. The nominal price is 12.50c., Pittsburgh.

Iron and Steel Bars.—Specifications continue at a good rate on steel bars, but new business is scarce. The price generally asked is 4.50c., Pittsburgh, though some ideas as to price are as high as 5c. and 5.50c. It is intimated that a few small lots have been sold as low as 4.25c. Not enough business is being done to fix prices very definitely. Bar iron is firm at 5c., with one producer still offering at 4.75c., but with deliveries so far off that they do not interest the average buyer.

Ferroalloys.—Ferromanganese is stronger, though

without change of price, which is $400 for delivery over the remainder of this year, $375 for first quarter of next year and $350 for second quarter. Supplies are fairly plentiful at the present time, with no immediate danger of scarcity. Looking farther into the future producers view with some apprehension the withdrawal of steamers from Brazilian routes for transport service and also point to scarcity of labor and equipment at the Brazilian mines. In view of figures on imports of manganese ore, published on page 514 of the Aug. 30 issue of THE IRON AGE, showing a great increase for the first six months of the year compared with the same period last year, this apprehension need not be shared by buyers, at least for the present. Spiegeleisen is holding at $85, furnace, as reported last week.

Old Material.—The holiday period and a general absence of buying interest combined to make the past week one of the dullest on record this year. A couple of sales of about 200 tons each were the only events of the week, and these would not under normal conditions be worth reporting. Recent activity in No. 1 heavy melting steel was short-lived, and the price has now receded to $31 to $32. Other slight downward revisions of price are made this week, notably on No. 1 cast, which is $1 lower. In spite of the lack of business and generally adverse conditions, especially the railroad embargo, the market is holding up fairly well. Dealers are obtaining licenses for shipments, but the many restrictions make transactions exceedingly difficult and the speculative factor is being largely eliminated. Prices per gross ton delivered in the Pennsylvania district are about as follows:

No. 1 heavy melting steel	$31.00 to $32.00
Steel rails, rerolling	43.00 to 45.00
Low phosphorus heavy melting	40.00 to 43.00
Old iron rails	45.00 to 47.50
Old carwheels	34.00 to 35.00
No. 1 railroad wrought	45.00 to 47.50
No. 1 forge fire	22.00 to 23.00
Bundled sheets	22.00 to 23.00
No. 2 busheling	16.00 to 17.00
Machine shop turnings (for blast furnace use)	18.00 to 20.00
Machine shop turnings (for rolling mill use)	21.50 to 22.50
Cast borings (for blast furnace use)	19.00 to 20.00
Cast borings (clean)	22.00 to 23.00
No. 1 cast	32.00 to 33.00
Grate bars	21.00 to 22.00
Stove plate	21.00 to 22.00
Railroad malleable	32.50 to 35.00
Wrought iron and soft steel pipe (new specifications)	29.00 to 31.00
Pipes and tubes (wrought iron and soft steel)	31.00 to 32.00

Cleveland

CLEVELAND, Sept. 4.

Iron Ore.—Shipments in August amounted to 10,146,786 gross tons as compared with 10,241,603 tons in July and with 9,850,140 tons in August, 1916. Total Lake shipments for the season to Sept 1 were 36,523,554 tons as compared with 39,215,864 tons for the same period a year ago. Although a gain of approximately 300,000 tons was made in the August shipments, the total this year is 2,692,310 tons behind that up to the same date a year ago. It is doubtful whether there will be sufficient increase in the shipments during the remainder of the season to make up for the loss caused during the early part of the season by the late opening of navigation. We quote ore prices as follows, delivered lower Lake ports: Old range Bessemer, $5.95; Mesaba Bessemer, $5.70; old range non-Bessemer, $5.20; Mesaba non-Bessemer, $5.05.

Coke.—There is a slight improvement in the demand for prompt shipment foundry coke and a few small lot sales are reported at $13.25 per net ton at oven for standard Connellsville makes. Producers are asking around $10 for contracts for the first half of next year.

Pig Iron.—The market is inactive and prices on foundry grades are slightly easier. We note the sale of 600 tons of high sulphur basic iron at $45, but no other sales of steel making iron or new inquiries are reported since prices were established at lower levels by recent sales in the Pittsburgh territory. The only demand for foundry iron is in small lots for early shipment, but no Cleveland made iron is available for this year's delivery. Virginia foundry iron has declined $1 per ton in several sales, ranging from car lots to 200 tons, made at $50, furnace, or $53.20, delivered, Cleveland. Valley quotations on foundry iron range from $52 to $54. Some resale Southern iron is being offered at $48, Birmingham, for No. 2 for early shipment. Ohio silvery is slightly easier. We quote, delivered, Cleveland, as follows:

Bessemer	$50.95 to $51.95
Basic	48.95
Northern No. 2 foundry	52.95 to 53.95
Southern No. 2 foundry	51.00 to 54.00
Gray forge	48.95 to 50.95
Ohio silvery, 8 per cent silicon	86.62 to 88.62
Standard low phos. Valley furnace	85.00

Finished Iron and Steel.—Buyers are withholding orders as much as possible until Government prices are fixed and are buying only to supply their immediate needs. Consumers and jobbers are reducing stocks because of the expectation of lower prices, and the bulk of the new business is for Government work. Plates rolled for export but not shipped because of the embargo are being offered at 8.50c., Pittsburgh, and some resale boiler plates are offered by purchasers at 9.50c., but local mills continue to quote 10c. for early shipment. Mills that have 10c. plate contracts complain that they are not getting specifications. Warehouse prices have eased off somewhat, jobbers who have been quoting the maximum prices having reduced these prices in some cases. Some new inquiry for sheet bar and billet contracts has come out, but quotations made by a local mill are considerably higher than the ruling prices. Bar iron is unchanged at 4.50c. Sheet prices remain at 8.50c. to 9c. for No. 28 black and No. 10 blue annealed and 10.50c. for No. 28 galvanized. Warehouse prices are 4.50c. to 5c. for steel bars and 5c. to 5.25c. for structural material.

Old Material.—The market is only moderately active. A fair volume of sales were made in the week, but mostly in small lots. A Cleveland mill has taken 2000 tons of heavy melting steel scrap at a reported price of $34.50 to $35. This grade is slightly easier and some transactions have been made between dealers at $34. Dealers claim that mills are getting their stocks well cleaned up and will have to come in the market for round lots soon, and they are inclined to hold firmly to prices, believing that the mills will soon have to pay somewhat better prices than they are willing to pay at the present time. The demand for cast scrap has improved and sales are being made at $27 and slightly higher. Busheling is inactive. Dealers are asking $27 to $28 for this grade, and the best price reported offered by a mill is $26. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton

Steel rails	$32.00 to $33.00
Steel rails, rerolling	44.50 to 45.50
Steel rails, under 3 ft	37.00 to 38.00
Iron rails	42.50 to 43.50
Steel car axles	26.00 to 26.50
Heavy melting steel	34.00 to 35.00
Carwheels	30.50 to 31.50
Relaying rails, 50 lb. and over	49.50 to 54.50
Agricultural malleable	23.50 to 24.50
Railroad malleable	32.00 to 33.00
Light bundled sheet scrap	23.50 to 24.50

Per Net Ton

Iron car axles	$46.50 to $47.00
Cast borings	18.00 to 18.50
Iron and steel turnings and drillings	17.50 to 18.00
No. 1 busheling	27.00 to 28.00
No. 1 railroad wrought	40.50 to 41.50
No. 1 cast	27.00 to 28.00
Railroad grate bars	21.00 to 22.00
Stove plate	20.50 to 21.50

Bolts, Nuts and Rivets.—Bolt and nut specifications are coming out in good volume, but new business is only moderate. Bids were received this week by the Navy Department for about 4000 tons of rivets. While it is stated that no definite understanding has been reached as to prices, makers are assured that prices will be satisfactory although quotations are subject to revision later. We quote rivets at 5.25c., Pittsburgh, for structural and 5.35c. for boiler rivets. Bolt and nut discounts are as follows, round lot buyers being allowed 5 to 10 per cent discount from these prices:

Common carriage bolts, ¾ x 6 in., smaller or shorter, rolled thread, 35 off; cut thread, 30 and 5, larger or longer, 20. Machine bolts, with h. p. nuts, ⅝ x 4 in., smaller or shorter, rolled thread, 40; cut thread, 35; larger and longer,

25. Lag bolts, cone point, 40. Square h. p. nuts, blank, $1.90 off list; tapped, $1.70 off list. Hexagon, h. p. nuts, blank, $1.70 off; tapped, $1.50 off. C. p. c. and t. hexagon nuts, all sizes, blank, $1.25 off; tapped, $1 off. Cold pressed semi-finished hexagon nuts, 50 and 5 off.

Cincinnati

CINCINNATI, Sept. 4—(*By Wire*).

Pig Iron.—The market has made no move in the past few days that would indicate anything certain as to any impending change in prices. The limited inquiry for first half shipment is not taken as a serious indication on the part of melters to cover for that period. Iron sold now is to the foundries and is for shipment this year. The minimum of $47, Birmingham basis, is not being shaded by the furnaces, and holders of resale iron are a little more firm in quoting this week. High silicon irons are wanted more than any other kind, and a few small sales of Southern foundry running around 4 per cent in silicon have brought over $51, Birmingham. There does not seem to be any call at all for gray forge and other low grades, although the small orders for prompt iron now placed include a fair percentage of No. 3 foundry. Northern iron is getting scarcer and deliveries are running behind on many urgent contracts, due principally to the curtailed production in the Ironton district. No. 2 foundry is unchanged at $55, Ironton, for this year, with no authentic quotations out for the first half of next year. It is generally understood that a great deal of foundry iron business is being accumulated and that when any degree of certainty exists as to approximate prices for the future, the buying movement will be one of large volume. Basic and malleable iron melters are in better shape as to the future, but the same condition to a certain degree exists with them. Ohio silvery irons are quoted around $80, furnace, for an 8 per cent analysis and a few carloads are being sold at this figure. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, as follows:

Southern coke, No. 1 f'dry and 1 soft	$51.40 to $52.40
Southern coke, No. 2 f'dry and 2 soft	49.90 to 50.90
Southern coke, No. 3 foundry	49.40 to 50.40
Southern coke, No. 4 foundry	48.90 to 49.90
Southern gray forge	48.90 to 49.90
Ohio silvery, 8 per cent silicon	87.26 to 91.26
Southern Ohio coke, No. 1	56.26 to 57.26
Southern Ohio coke, No. 2	56.26 to 57.26
Southern Ohio coke, No. 3	55.26 to 56.26
Southern Ohio malleable Bessemer	56.26 to 57.26
Basic, Northern	56.26 to 57.26
Lake Superior charcoal	56.75 to 57.75

(*By Mail*)

Coke.—Spot foundry coke prices are easing down, but have not yet reached the level of contract quotations. For instance, Connellsville 72-hr. coke is bringing from $13 to $14 for prompt shipment, but can be bought for future delivery at $12 to $13. Wise County and Pocahontas prices are on the same level, but the supply of spot foundry coke in those districts is limited. New River operators are able to hold out for higher prices and spot foundry coke is quoted around $15, while contract business is being taken at $14 to $15 per net ton at oven. Business in all districts is light, and the amount of furnace coke changing hands is almost negligible. Furnace coke contract prices in the Connellsville field are from $9 to $10 at oven.

Finished Material.—Business is slowing down perceptibly, especially as far as structural shapes are concerned. However, the warehouses report a fair demand for reinforcing concrete rods, most of the orders being placed by contractors to finish jobs already under way. Iron and steel bars are quoted at 5c. from stock, and twisted steel bars at 5.05c. Plates, ¼-in. and heavier remain at 10c. and No. 10 blue annealed sheets at 10c. base. The mill price on No. 28 black sheets is unchanged at 8.65c. and on No. 28 galvanized 10.65c. f.o.b., Cincinnati or Newport, Ky. Orders are being booked daily on this basis, but the nearby mills have few sheets to offer outside customers, and are still devoting every effort to take care of old customers. The warehouse price of wire nails is $3.90 and on barb wire 5c. a lb. Very little business is reported. Mill supply houses report a little improvement for the latter part of last week, but on account of the holiday, they do not expect the present week's business to come up to the general average generally maintained during the past ten weeks, or more.

Old Material.—Transactions of every character are few and cover only very limited tonnages of any kind of scrap material. Prices are unsteady and have a downward tendency, although no changes have been reported. Offerings are light and dealers are indifferent about adding to their stocks at the present time. The following are dealers' prices f.o.b. at yards Cincinnati, and Southern Ohio:

Per Gross Ton	
Bundled sheet scrap	$20.00 to $20.50
Old iron rails	34.00 to 34.50
Relaying rails, 50 lb. and up	45.50 to 46.00
Rerolling steel rails	37.00 to 37.50
Heavy melting steel scrap	33.00 to 33.50
Steel rails for melting	33.00 to 33.50
Old carwheels	30.00 to 30.50
Per Net Ton	
No. 1 railroad wrought	$32.00 to $32.50
Cast borings	13.50 to 14.00
Steel turnings	13.50 to 14.00
Railroad cast	22.00 to 22.50
No. 1 machinery cast	24.50 to 25.00
Burnt scrap	14.50 to 15.00
Iron axles	44.00 to 44.50
Locomotive tires (smooth inside)	37.00 to 37.50
Pipes and flues	18.00 to 18.50
Malleable cast	24.50 to 25.00
Railroad tank and sheet	16.00 to 16.50

Birmingham

BIRMINGHAM, ALA., Sept. 5—(*By Wire*).

The furnaces are maintaining $50 on No. 2 foundry and basic for this year's delivery and $48 for next year. Uncertainty in the coal mining district is causing apprehension in iron making and foundry circles. Iron sales are few and light.

(*By Mail*)

Southern pig iron manufacturers apparently are still more interested in what the Government control policy will amount to than in anything else. The strength of the market is noticed but little, and while only a few sales of iron are being recorded, the prices have not changed any, $50 being asked for No. 2 foundry and basic for this year's delivery and $48 for next year's. Order books are so well supplied that it will be necessary to keep the production at maximum. Some hesitancy is noted in the make in this State by reason of unsteadiness in raw material supplies. Inquiries are in for small amounts of iron and consumers are still urging delivery. Railroad facilities are sufficient to meet some of these demands, but there is complaint on the part of consumers of delay. Further reduction of accumulated stocks of iron is noted in this section. The make can be increased at once, the Trussville furnace of the Birmingham Trussville Iron Co. being ready for the torch, but because of the uncertainty in the coal mining district here again, no attempt will be made to start for a while. This furnace will have a daily capacity of more than 200 tons. No verification of resale iron in quantity is to be given in this territory, but reports of some resales are still to be heard. Prompt delivery prices obtain in the South as follows:

No. 1 foundry and soft	$48.50 to $50.00
No. 2 foundry and soft	48.00 to 50.00
No. 3 foundry	47.50 to 48.00
No. 4 foundry	47.00 to 47.50
Gray forge	46.00 to 46.50
Basic	48.00 to 50.00
Charcoal	55.00 to 60.00

Coal and Coke.—There is so much unrest in the coal mining district around Birmingham since the suggestions of an agreement between the operators and union miners by Secretary of Labor Wilson were adopted by officials of the two sides that the production of coal has been materially affected. A convention of the union has been called for Wednesday of this week and there is much doubt whether the action of the officials will be ratified. In the meantime, mines are idle in various parts of the district and hundreds of men are not working. The idea of a strike is rampant throughout the district again and there is no telling what will happen. As a consequence of the curtailment of coal production, the coke make has been reduced some and this is being felt seriously.

Foundries and Machine Shops.—There is continued activity at the cast-iron pipe plants in the Birmingham district, with several small orders from municipalities

again reported. Prices range between $60 and $63, from the 4-in. pipe up. Commercial foundries have much work in hand, no mean part of it being Government contracts with but little being said of the nature of the work. The melt of pig iron and steel in this section has increased greatly in the past few months.

Old Material.—A slight improvement in the old material market is noted in the Birmingham district. Heavy melting steel is selling again above $20.25 and some of the larger consumers are asking for delivery on contracts. Dealers in scrap have yards well stocked and are able to meet all demands. A carload of brass scrap was shipped the past week from this section into the Cleveland territory, a high price being obtained, around 23c. Difficulty in getting cars prevents any business with other districts. Inquiry has been received here as No. 1 cast machinery, a difference in grading, in comparison with Philadelphia, being noted. In this section agricultural machinery is included, hence a difference in the quotations. Quotations are as follows:

Old steel axles	$32.00 to $33.00
Old steel rails	24.00 to 25.00
No. 1 wrought	26.00 to 27.00
Heavy melting steel	20.00 to 20.50
No. 1 machinery	24.00 to 25.00
Car wheels	23.00 to 24.00
Tramcar wheels	20.00 to 21.00
Stove plate	17.00 to 18.00
Shop turnings	11.00 to 12.00

St. Louis

ST. LOUIS, Sept. 4.

Pig Iron.—The call for pig iron has shown its greatest activity during the past week in a demand for immediate or near-by delivery or for special analyses, all, however, in small lots, the largest sale for the week not being over 100 tons and the aggregate probably not in excess of 1500 tons. There has been some selling of pig iron not coming up to grade specifications, as, for instance, some lots of malleable high in sulphur, etc. Even this latter has commanded firm prices and the melters have seemed willing to pay for material whatever has been asked within reason, provided deliveries could be made. Evidence is accumulating that more pig iron has been melted than the foundrymen expected, and there is every reason to believe that with a settlement of the uncertainty as to prices, some considerable buying for forward deliveries would be made a feature of the market here. The sales of No. 2 Southern foundry made during the week included some small lots for immediate shipment at $48 Birmingham, while the high sulphur malleable referred to brought about $51 per ton. No. 2X Chicago and No. 2 Northern, Ironton basis, are held at $55, but with no transactions of consequence. Melters are becoming very much more urgent as to the pig iron they have under contract and are pressing furnace representatives hard for their iron.

Coke.—Sales of coke have been made during the past week at $14 for best selected 72-hour, Connellsville basis, but no large contracts have been made either for immediate or future delivery, while contracts in effect have been the subject of very active pressure on the part of melters. By-product coke has not been at all active either as to local supply or near-by ovens. The local plant is covered by extended contracts ahead and therefore does not figure in the market.

Finished Iron and Steel.—Finished products have been quiet save for the pressure to obtain material which has been contracted for, and mill representatives have been unable to satisfy customers with the deliveries given or promised. We quote for material out of warehouse as follows: Soft steel bars, 4.55c.; iron bars, 4.50c.; structural material, 5.05c.; tank plates, 10.05c.; No. 10 blue annealed sheets, 10.50c.; No. 28 black sheets, cold rolled, one pass, 10.35c.; No. 28 galvanized sheets, black sheet gage, 11.75c.

Old Material.—The scrap market has shown no decided increase in activity, though there has been some buying by dealers to meet delivery requirements on contracts existing before the present inactivity of the market developed. Not enough buying, however, has been done to establish any prices very definitely and quotations continue to be estimates of value rather than anything else. Evidence is accumulating that consumers who have been operating steadily are approaching a period of need of additional material in order to keep up their pace, for their yards supplies and contracts for deliveries are becoming depleted seriously. No lists have appeared for the month's opening, due to the interference of the holiday. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton

Old iron rails	$39.00 to $39.50
Old steel rails, re-rolling	37.50 to 38.00
Old steel rails, less than 3 ft.	37.00 to 38.00
Relaying rails, standard section, subject to inspection	50.00 to 55.00
Old car wheels	28.00 to 28.50
No. 1 railroad heavy melting steel scrap	29 00 to 30.00
Heavy shoveling steel	27.00 to 27.50
Ordinary shoveling steel	26.00 to 26.50
Frogs, switches and guards cut apart	29.00 to 30 00
Ordinary bundled sheet scrap	18.50 to 19 00
Heavy axle and tire turnings	20.00 to 21.00

Per Net Ton

Iron angle bars	$36.50 to $37.50
Steel angle bars	29.00 to 30.00
Iron car axles	39 00 to 40.00
Steel car axles	39.00 to 40 00
Wrought arch bars and transoms	39.00 to 39.50
No. 1 railroad wrought	33.00 to 33.50
No. 2 railroad wrought	30 00 to 30.50
Railroad springs	30.00 to 30.50
Steel couplers and knuckles	39.50 to 40.50
Locomotive tires 42 in. and over, smooth inside	38.50 to 39.50
No. 1 dealers' forge	24 00 to 24.50
Cast-iron borings	15.00 to 15.50
No. 1 busheling	24.00 to 24.50
No. 1 boilers, cut to sheets and rings	19 50 to 20 50
No. 1 railroad cast scrap	22.50 to 23.50
Stove plate and light cast scrap	16.50 to 17 00
Railroad malleable	29 00 to 30.00
Agricultural malleable	22 00 to 22.50
Pipes and flues	19.50 to 20 00
Heavy railroad sheet and tank scrap	18.00 to 18.50
Railroad grate bars	16.50 to 17 00
Machine shop turnings	15.00 to 15.50
Country mixed scrap	14.50 to 15.00

San Francisco

SAN FRANCISCO, Sept. 1.

More difficulties are being experienced in obtaining supplies of materials from Eastern mills than was the case earlier in the month. Local mills find nearly all their capacity engaged in filling Government orders, and frankly state their inability to attend to other requirements not already contracted for. Generally, buyers are not displaying eagerness in placing orders, either in this market or in the East. They seem indifferent and inclined to hold off, sensing a strong possibility that there will be Government regulation of the iron and steel industries, with a consequent impairment of prices. Some of the trade here are of the opinion that the outcome will be scarcer material and easier prices. Excepting the shipyards and urgent necessities of the Government, the demand from the oil fields provides the only active phase of this market. Much depends on the Government's interpretation of the embargo proclamation, and the result of negotiations between the Japanese commissioners and our Federal authorities at Washington.

Bars.—Local mills quote steel bars at a 5.60c. base, but their quotations are merely perfunctory, as the only orders taken are those applying on contracts. Jobbers quote, out of stock, coast sizes, at a base price of 6.50c. The former heavy demand for reinforcing bars has not kept pace with the advancing season.

Structural Materials.—There is not much activity in erecting new buildings at present, and demand for structural material of all kinds is sagging. There is, however, a large bascule bridge authorized to be built, at a cost of $1,800,000, across the Oakland harbor, which will require a considerable quantity of structural steel. Jobbers' quotations, out of stock, are given at 7.75c., which shows an advance in the last two weeks, although there is a weakened demand.

Plates.—All stocks of tank plates held by local jobbers are very much depleted by the heavy shipments to Japan before the embargo took effect. Every plate

visible in this market, regardless of size, was eagerly bought up by Japanese agents. Tank plates, ¼ in. or over, are quoted at a base price of 10.50c., with no guarantee of delivery. The sparse supplies of plates received by the shipbuilding plants on this coast are a source of anxiety to them, and promised relief at the hands of the Government is hoped to develop shortly.

Sheets.—The bareness of the market here has induced small advances on certain sizes; others remaining without change. Jobbers are quoting, net for cash, blue annealed sheets No. 10 at a base price of 11.10c., black No. 28 at 11.28c. and galvanized No. 28 at 13.03c. Demand in this market continues very insistent, and it has been difficult to satisfy customers. During the last two weeks there have been received telegraphic offerings of odd lots of sheets, small in quantity, running from 100 to 200 tons each. This shows that some mills have a little surplus to dispose of at prevailing prices. It may prove an indication of some easing of the situation that has oppressed this market for several months.

Wrought Pipe.—Owing to the more lenient view taken by the Government, lately, of the oil producers' claims, and the patent fact that remedial measures must be taken immediately, to provide against a most serious oil shortage, great activity is pending in the oil fields of California. Orders for pipe are being received at the mills in such quantities that they are unable to take care of them. Some mills have orders for a year ahead. Black ¾-in. pipe is quoted at a base price of $8 60 per 100 ft.; ¾-in. galvanized, $11.00; 1½-in. black pipe, $20.55; 1½-in. galvanized, $26.30.

Cast Iron Pipe.—Tonnage has been light for some time, and at the present there is little business offering. There are a few scattering orders for light pipe, but no municipal contracts are in sight, and there seems to be a general slacking up in corporation work, involving the use of cast iron pipe.

Pig Iron.—Export demand is steady and orders are of large tonnage. Owing to the uncertainty of Government action, it has been impossible to fill them. Some dealers have applied for export licenses but are without response from Washington. The local situation is quiet, as nearly all consumers have their requirements already covered. No weakening in prices of pig iron may be expected, as a year's business is booked at nearly all the furnaces.

Coke.—Coke is still very scarce and hard to obtain, with $23.00 asked. Demand is very steady and some buyers desire to make contracts for the first half of 1918. Their suggestions do not meet with response from producers, who are not willing to book so far ahead without definite knowledge of tonnage offered.

Old Materials.—The market on old materials has again stiffened. Holders have recovered from their trepidation over the embargo on shipments to the Orient, finding that domestic needs are sufficient to absorb stocks. Good country scrap is now quotable at $25, and old rails at $29. The hulk of the wrecked steamer Progreso, which has been lying on the mudflats for years, is being broken up for scrap. It is confirmed that a large quantity of old material is lying at Seattle awaiting a chance for shipment to Japan. If no export license can be obtained this lot will be available for the domestic market.

British Steel Market

Export Pig-Iron Price Fixed for the Allies—Business in Ferromanganese Difficult

(*By Cable*)

LONDON, ENGLAND, Sept. 5.

Cleveland pig iron is more active and the demand for hematite iron exceeds the supply. The export price for the Allies, f.o.b. East Coast, is believed to have been fixed at 141s. Tin plates are firm and makers are reticent. American wire rods have sold at £29 c.i.f. Liverpool. Ferromanganese is firm, but business is difficult. From $375 to $400 c.i.f. is asked for delivery at American Atlantic ports. We quote as follows:

Tin plates, coke, 14 x 20; 112 sheets, 108 lb., f.o.b. Wales, maximum, 30s.

Ferromanganese, £45 nominal.

Ferrosilicon, 50 per cent, c.i.f., £35 upward.

On other products control prices are as quoted in THE IRON AGE, of July 19, p. 171.

Pig Iron and Finished Steel Strong—American Billets Scarce—Ferromanganese Nominal

(*By Mail*)

LONDON, ENGLAND, Aug. 14, 1917.—National requirements are as big as ever, especially for war and structural stock. Quantities of crude iron continue to be requisitioned for allied countries. Demand in general keeps ahead of the supply. This month has seen temporary interruptions incidental to the holidays, but strenuous efforts are being made to catch up with arrears against old contracts.

There has been greater activity in pig iron generally, the feature being the increased demand from Scotland. The huge outlet for home consumption more than makes up for the relatively curtailed export movement compared with pre-war times. As anticipated, the allotments of Cleveland iron have been on a larger scale this month. There has been a more insistent demand from the Allies, which has been met more generously, while the attempts of neutrals to secure supplies have proved fruitless. Deliveries of East Coast hematite iron against export contracts are kept down, although fair quantities were despatched recently to Italy.

There is a heavy demand for foreign ore, but sellers are hampered by lack of freight. The fuel supply leaves nothing to be desired. The total shipments from the Tees last month were 52,733 tons, showing a decrease of about 8000 tons against June. In the Midlands more furnaces have been put on basic iron, under government pressure, the supply of this description not being sufficient. The output of foundry grades may thus be curtailed.

No Offers of American Billets

Semi-finished steel has not improved, allocations being closely controlled. Little is available after making full provision for essential government work. Shell discard material is quickly absorbed at prices about equal to the official prices for sheet bars and billets. In spite of easier cable advices, no offers of American billets are heard of here, while the receipts of such material against old orders have virtually dried up. Some little business has been done lately in wire rods as £28 c.i.f. shipment last quarter, and at £29 and upward for parcels afloat, but consumers seem fairly well covered.

Demand for finished iron and steel is as conspicuous as ever. Mills as a rule are fully booked for months to come, so that there is a constant curtailment of supplies for the merchant trade. Maximum prices are easily obtainable for controlled material and the strain on plants accentuates the stringency in the uncontrolled branches. A large proportion of the production, especially of the bar mills, consists of special material not covered by the official standards. It is very difficult to place orders for steel for nearby delivery, makers having hardly anything to sell, and as much as £19 net was recently paid for mild steel bars for the home trade, although quotations now vary from about £17 10s. to £18 10s. net, according to delivery, and the position of the works. Iron and steel hoops range from £18 to £19 net.

The position of labor is becoming more difficult, while an additional war bonus has been granted to the men, this making the total increase conceded since the war began 15s. a week.

In tinplates a concession has been made as regards stock lots free from permits until Aug. 31 inclusive, for which a free open market has been restored up to that date, so that the fixed maximum basis price of 30s. net at works, recently introduced, does not apply in this case. This concession, made in response to strong complaints by merchants, has done much to remove the

serious difficulties and confusion which had arisen recently through the various interpretations of the vague circulars issued previously, while merchants have thus been given a more reasonable opportunity to liquidate stock acquired at prices ranging well upward to 40s. per box basis. Sales of free lots have, since the concession has been made, been sold up to about 46s., and there is but little left. After Aug. 31 all contracts will be subject to permits and be based on the fixed maximum price of 30s. Business under permits on this basis, however, is still held up pending the issue of the full schedule giving extras, allowances, etc.

High Prices for Manganese Ore

There is no alteration in ferromanganese, which is chiefly a nominal market with a strong undertone. Only a few transactions have been heard of lately at about £80 f.o.b. for loose to Continental ports subject to licenses, which are very hard to get hold of. There are still sellers at £400 c.i.f. for first half of 1918 to North American Atlantic ports, while orders can no longer be placed for next quarter. Home consumers are being accommodated to a fair extent at the fixed price of £25. A fair business was put through recently in Indian manganese ores for United Kingdom ports at about 3s. 4½d. c.i.f. per unit, but freightage is difficult and orders are hard to get through for the present.

Buffalo

BUFFALO, Sept. 4.

Pig Iron.—Almost the same conditions prevail that were noted last week. Inquiries continue to come in for various tonnages, and principally for 1918 delivery, but only a few result in orders. There is very little, if any, resale iron offering in this district and the expected lowering of prices based on such sales reported in other markets lack any foundation here. So far there is no surface evidence of price decline and prices for such sales as are made continue to be at about the same range as for the past two or three weeks—$53 to $55 for average foundry grades—but the market has not really been tested. We continue last week's price schedule for 1918 delivery, which is as follows, f.o.b. furnace, Buffalo:

High silicon irons	$55.00 to $56.00
No. 1 foundry	54.00 to 55.00
No. 2 X foundry	53.00 to 55.00
No. 2 plain	52.00 to 54.00
No. 2 foundry	51.00 to 53.00
Gray forge	51.00 to 53.00
Malleable	54.00 to 55.00
Basic	54.00 to 55.00
Lake Superior charcoal, f.o.b. Buffalo	55.00 to 60.00

Finished Iron and Steel.—The week has been extremely quiet both as to inquiry and orders. Even war order material has not been actively in the market, although there has been a little local inquiry for this class of material, and rumor of one large tonnage to be negotiated soon, also some inquiry from Canada. Prices remain nominal: bars, 4 to 4½c.; shapes, 4¼ to 4½c., and plates 8 to 10c. Tin plate waster accumulations are showing larger margin in quoted prices than for some time past, mills making prices according to their desire to move material. The Government has modified its embargo ruling on shipments to Canada so that structural material can be shipped without license, the same as bars, cold rolled steel and skelp. Plates still require Government license and also evidence that the material is required either for shipbuilding or for war purposes.

Old Material.—Most dealers report a more quiet market, with only moderate inquiry. Uncertainty as to prices which will be established by Governmental action is causing hesitation on the part of buyers. The bulk of material moving now is on old orders. Dealers are making every effort to complete their high-priced contracts, as they fear cancellation. Car shortage is becoming marked and is likely to grow more acute as Government requirement material takes increasing precedence over other shipments. There is no question that consumption of scrap material remains heavy and that stocks are low and no large tonnage available for prompt delivery. No changes in prices are noted for the week. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$33.00 to $34.00
Low phosphorus	45.00 to 48.00
No. 1 railroad wrought	43.00 to 45.00
No. 1 railroad and machinery cast	30.00 to 31.00
Iron axles	45.00 to 50.00
Steel axles	45.00 to 50.00
Carwheels	35.00 to 36.00
Railroad malleable	33.00 to 34.00
Machine shop turnings	18.00 to 19.00
Heavy axle turnings	26.00 to 27.00
Clean cast borings	20.00 to 21.00
Iron rails	43.00 to 44.00
Locomotive grate bars	20.00 to 21.00
Stove plate	21.00 to 22.00
Wrought pipe	29.00 to 30.00
No. 1 busheling scrap	28.00 to 29.00
No. 2 busheling scrap	18.00 to 19.00
Bundled sheet stamping scrap	20.00 to 21.00

New York

NEW YORK, Sept. 5.

Pig Iron.—Resale iron continues to be the one active product in the pig iron market and prices have receded to as low as about $50 furnace on this iron. The furnaces are holding pretty firmly, but concessions are sometimes made by furnaces having iron for prompt delivery for sale. On the whole, the market is extremely dull, but deliveries are being called for with considerable insistence. We quote for tidewater deliveries in the near future as follows:

No. 1 foundry	$51.25 to $53.25
No. 2 X	50.75 to 52.75
No. 2 plain	50.25 to 52.25
Southern No. 1 foundry	52.75 to 53.75
Southern No. 2 foundry and soft	52.25 to 53.25

Ferroalloys.—The ferromanganese market is extremely dull. Inquiries are very few and sales are meager for delivery either this year or in 1918. Reports from four of the five Atlantic ports through which ferromanganese comes from Great Britain show the receipts in July to have been only 2037 tons. It is probable that the missing figures would not bring the total above 2300 to 2400 tons. August receipts are not believed to have been much larger than those for July but present indications point to a better showing being made in September. New high records have been made in prices paid for manganese ore. From $1.25 to $1.30 per unit, seaboard, is reported to have been recently paid for a fair amount of Indian ore for importation into the United States. Receipts of Indian ore are said to have been fairly large so far this year. It is interesting to note that, according to our British correspondent, prices recently paid in Great Britain for Indian ore have been about 81c. per unit. Freight rates to this country on such ore are stated to have been recently as high as £6 per ton. The spiegeleisen market is quiet with inquiries for small lots for early delivery the only business reported, the quotation still being about $85, furnace. Ferrosilicon, 50 per cent, is unchanged at $200 to $225 for this year's delivery with $165 the quotation for contracts for next year. Ferrotungsten is quoted at $2.30 to $2.50 per lb. of contained tungsten, New York, with the ore concentrates selling at between $22 and $26 per unit. Ferrovanadium ranges from $4 to $5, Pittsburgh, per lb. of contained vanadium. Ferrocarbon-titanium is selling at 8c. per lb. in carload lots, 10c. per lb. in ton lots and 12½c. per lb. in lots less than a ton.

Structural Material.—Pronounced dullness marks the movement of plain material, proposals for new structures and closures of bids under contract. Nothing involving more than 200 tons was learned of. One mill in connection with business in finished steel offered for export incorporates in the contract a stipulation that in the event of embargoes the material must be taken and paid for, clearly requiring the buyer to put the material into storage. It seems likely that plain material may be obtainable in the fourth quarter for 4.25c., Pittsburgh, at deliveries as good as may be obtained at 4.50c., Pittsburgh, but with other mills as high as 5c., Pittsburgh is still asked, these being in the nature of premiums for comparatively small lots. We accordingly quote mill shipments, but without knowledge of specific transactions, at 4.445c. to 5.195c., New York,

while from warehouses shipments are made at 5c. to 5.50c. per lb., New York.

Steel Plates.—Extreme quietness prevails. No sizeable transactions since the last report are noted. Offerings of round lots of plates believed to be for resale because held up by embargoes have been numerous, but 10c. per lb. is asked. As to railroad cars, it is believed that the recent inquiries for axles and car accessories for 20,000 cars cover 10,000 for Russia and 10,000 for the Government's French railroad but early consummation of this business is not at present expected. We quote plates at 8.945c. and higher and out of store at 8c. and higher.

Iron and Steel Bars.—Japan has been making some active inquiries for lots of 1000 and even 2000 tons of steel bars, but in spite of the fact that the business is not restricted by license requirements mills are consenting to take only a portion. On this 4.50c. is commonly asked, but for fourth quarter business to domestic consumers 4c. has been done. Another mill appears willing to sell under desirable conditions at 4.25c. for fourth quarter, but for delivery in September and perhaps early October, where the steel is obtainable, 4.50c., Pittsburgh basis is quoted. Based on the few recent transactions we quote steel bars in say two or three months' delivery at 4.195c. to 4.695c., New York. In iron bars increased activity is noted in specifications and interest is being shown in fourth quarter transactions. We quote iron bars at 4.945c. to 5.195c. From New York district warehouses steel and iron bars are sold at 5c. to 5.50c.

Old Material.—The troubles of the scrap dealers are many, especially with the railroads, and it is so extremely difficult to make deliveries, that business is very light. Many permits have been issued to move cars on Government business, but anyone having scrap to move not on Government business has a very slim chance of being able to do so. Prices are to a very large extent nominal, but brokers quote prices about as follows to New York producers and dealers per gross ton New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$27.50 to $29.50
Old steel rails (short lengths) or equivalent heavy steel scrap	27.00 to 29.00
Relaying rails	63.00 to 65.00
Rerolling rails	37.00 to 39.00
Iron and steel car axles	40.00 to 42.00
No. 1 railroad wrought	39.00 to 40.00
Wrought-iron track scrap	30.00 to 31.00
No. 1 yard wrought long	30.00 to 31.00
Light iron	8.00 to 10.00
Cast borings (clean)	18.50 to 19.50
Machine-shop turnings	18.50 to 19.50
Mixed borings and turnings	15.00 to 16.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long)	27.00 to 28.00

Machinery cast is somewhat more active than other lines and slightly higher prices are being paid in some cases. For cast iron scrap dealers in New York City and Brooklyn are quoting as follows to local foundries per gross ton:

No. 1 machinery cast	$31.00 to $32.00
No. 1 heavy cast (column, building material, etc.	27.00 to 28.00
No. 2 cast (radiators, cast boilers, etc.)	26.00 to 28.00
Stove plate	18.00 to 20.00
Locomotive grate bars	18.00 to 19.00
Old carwheels	31.00 to 33.00
Malleable cast (railroad)	27.00 to 28.00

Cast Iron Pipe.—It develops that at the Government camp at Tenafly, N. J., very little cast iron pipe will be used, as wooden pipe is being utilized almost exclusively. There is fair business in private lettings, but no public business of importance has developed. Carloads of 6-in., 8-in. and heavier are quoted at $65.50 per net ton tidewater and 4-in. at $68.50.

The Canadian Car & Foundry Co., Montreal, is negotiating with the Russian authorities for a large portion of the big Russian order which will shortly be distributed to the Canadian companies, totalling, it is reported, 10,000 freight cars. The Canadian Car Co. is now working on an order for 2,000 freight cars for the Russian Government, which will be ready for delivery by October. These new orders will be a great help in keeping up the present working capacity of the Canadian car plants.

IRON AND INDUSTRIAL STOCKS

Very Serious Depression—Preparing to Pay War Taxes

The past week was one of very serious depression in the stock market. Some 70 issues in the stock exchange made new low records for the year and the break in the bond market was as great as that in stocks. Although one session was reduced to two hours and the stock exchange was closed on Saturday, the total sales were heavy. The depression was attributed to the rapid increase in estimates of the cost of the war and to the predominance of the radical element in the Senate in demanding higher and still higher taxation. Undoubtedly many business concerns are putting aside reserves with which to meet their obligations in paying taxes which will be called for under the new taxation measure now pending in the Senate. Whether the new issue of Liberty bonds will be subscribed for as rapidly as the first one is problematical.

Among the industrial stocks that registered losses during the past week were the following: Allis-Chalmers, 2⅜; American Can, 4½; American Car & Foundry, 4¾; American Locomotive, 6¼; American Steel Foundries, 5¼; Baldwin Locomotive, 8¼; Bethlehem Steel, 3½; Bethlehem Steel, Class B, 6¼; Colorado Fuel & Iron, 3¾; Crucible Steel, 11½; Gulf States Steel, 4½; International Harvester, 1⅞; Lackawanna Steel, 6; Midvale Steel, 2¾; National Enameling & Stamping, 3⅜; Pressed Steel Car, 7½; Republic Iron & Steel, 7⅜; United States Steel, 7¾; United States Steel preferred, ⅝. There were no gains recorded during the week in iron and steel stocks.

The range of prices on active iron and steel stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com..	23¼- 25½	Lacka. Steel.....	77½- 82⅛
Allis-Chal., pref..	82½- 83	Lake Sup. Corp..	15⅞- 17⅞
Am. Can, com...	38 - 42	Midvale Steel....	51½- 54
Am. Can, pref....	106 -108	Nat.-Acme	32⅝- 33⅞
Am. Car & Fdry., com.	66¼- 70¾	Nat. En. & Stm., com.	36½- 40½
Am. Loco., com..	57½- 63¼	N. Y. Air Brake.....	125¼
Am. Loco., pref....	102.-104½	Nova Scotia Steel	94 -100½
Am. Ship, com.....	93	Pressed Stl., com.	60 - 62¼
Am. Steel Fdries.	61 - 64⅜	Pressed Stl., pref.....	102
Bald. Loco., com.	55 - 63¼	Ry. Steel Spring, com.	44½- 48¾
Bald. Loco., pref.	99¾- 99⅞	Ry. Steel Spring, pref.	99
Beth. Steel, com.	107 -112	Republic, com. ..	77 - 83
Beth. Steel, class B	102⅝-109½	Republic, pref....	101⅝-102½
Beth. Steel, pref.	103 -107	Sloss, com.	45 - 48½
Case (J. I.), pref.....	84	Superior Steel...	37½- 39¾
Charcoal Iron, com.	8½- 8⅝	Transue-Williams.	40 - 40¼
Chic. Pneu. Tool..	65 - 67¼	Un. Alloy Steel..	42½- 44
Colo. Fuel	43 - 45	U. S. Pipe, com..	16¾- 18
Cruc. Steel, com..	63¼- 71¾	U. S. Pipe, pref.....	52
Cruc. Steel, pref..	99¼- 99¾	U. S. Steel, com..	104¼-119⅞
Gen. Electric....	145½-150⅝	U. S. Steel, pref..	116⅝-117
Gt. No. Ore Cert.	32⅝- 34⅞	Va. I. C & Coke.	55 - 63
Gulf States Steel	96 -104	Warwick	9
Int. Har. of N. J., com.	108¾-112	Westing. Electric.	43½- 45⅞
Int. Har. of N. J., pref.	113⅛-113¼		

The Breitung Ore Properties

DETROIT, Sept. 4.—Legal obstacles involved in one of the largest iron mining mergers ever authorized in Michigan have been removed by the Michigan Securities Commission, which has issued a tentative order permitting the new $20,000,000 Breitung Iron Co. to sell $1,500,000 of notes in this State. The order was issued under the provision that the company make certain amendments to leases now held by subsidiary companies and have them approved by the attorney general.

Edward N. Breitung, New York, head of the new combination, who is now in Detroit, stated that these conditions will be met in every particular. The Breitung Iron Co. has been capitalized at $18,000,000, of which $15,000,000 is in common stock, $3,000,000 in preferred, and, in addition, there is $3,000,000 in notes, half of which amount it is intended to dispose of on the market. The other stock is all closely held. The merger combines all the Breitung iron ore properties in the Upper Michigan, Wisconsin and Minnesota.

Mr. Breitung has estimated the values of the various properties, including a steamboat line, at $20,000,000.. The chief mines in the combination are

the Mary Charlotte Mining Co., Negaunee, Mich.; Loon Lake Iron Co., Sault Ste. Marie, Ont.; Clifford Extension Mining Co., Iron Mountain, Mich.; Lucky Star Mining Co., Negaunee; Breitung Hematite Ore Co., Negaunee; Washington Iron Co., Humboldt, Wis., and several smaller companies. It is estimated the mines will have a production of 500,000 tons this year, 700,000 in 1918, and eventually will be worked up to an annual production of 1,000,000 tons of various grades.

Industrial Finances

With respect to the proposed redemption of $2,000,000 first preferred stock of the Gulf States Steel Co., the voting trustees announce that the consent of the holders of the requisite amount of the second preferred and common stock not having been obtained, the plan had been abandoned.

Net earnings of the Lake Superior Corporation for the fiscal year ended June 30, 1917, according to the annual report, amounted to $5,323,005, compared with $3,503,471 in the year preceding. The surplus balance after allowing for interest charges, depreciation, sinking fund, etc., totalled $429,258, an increase of $70,540.

The Sullivan Machinery Co., Chicago, reports for year ended Dec. 31 net $1,313,906 against $540,207 previous year, and surplus after all charges and dividends $603,558 for 1916, against $197,179 for 1915.

President George M. Verity, American Rolling Mill Co., Middletown, Ohio, has issued a general letter to the company's stockholders recommending that its common stock carry a par value of $25 instead of $100 as at present. Under the plan, common stockholders would receive four shares with a par value of $25 for each $100 share surrendered. The proposition outlined is the third step in the completion of the merger of the Columbus Iron & Steel Co. into the American company, and the refinancing incident thereto.

The Domhoff & Joyce Co., pig iron and coke merchant, with head offices in Cincinnati, has increased its capital stock from $50,000 to $500,000. This increase was decided on to take care of the large increase in the company's business during the past few years. The company maintains branch offices in Chicago, Cleveland, Indianapolis and other cities. John Sergeant is president and treasurer and Chas. A. Sergeant secretary and assistant treasurer.

The Beaver Dam Manufacturing Co., Beaver Dam, Wis., maker of agricultural machinery, tools, implements, etc., has filed a voluntary petition in bankruptcy. The liabilities are scheduled at $249,746 and the assets at $269,936. Unsecured claims are listed at $129,569.

Dividends

The Dominion Iron & Steel Co., Ltd., 3½ per cent on the preferred, payable Oct. 1.

The Dominion Steel Corporation, Ltd., quarterly, 1 per cent on the common, payable Oct. 1.

The General Fireproofing Co., quarterly, 1¾ per cent on both the common and preferred, payable Oct. 1.

The La Belle Iron Works, quarterly, 3 per cent on the common and 2 per cent on the preferred, both payable Sept. 29.

The Moline Plow Co., quarterly, 1½ per cent on the second preferred, payable Sept. 1.

The Packard Motor Car Co., quarterly, 1¾ per cent on the preferred, payable Sept. 15.

The Wheeling Steel & Iron Co., quarterly, 2 per cent and extra 2 per cent, payable Oct. 1.

Women have been employed in the stores department of the Standard Steel Works Co., Lewistown, Pa. About 50 girl clerks have taken the places of men called to the colors. The company reports it has no trouble in securing young women as employees and has a waiting list of 150.

South Africa's steel output in 1916 as represented by the United Steel Corporation, was 9152 tons made up as follows: Ingots, 4650 tons; light rails, 1635 tons; structural steel, 450 tons, and general merchant steel, 2417 tons. Extensions to the plant will insure a large output in 1917.

OBITUARY

ALBERT S. SMITH, president of the Smith & Mills Co., Cincinnati, died suddenly of heart disease at his home Sept. 3, aged 59. He was a native of Ohio and went to Cincinnati at the age of 17, entering the employ of the John Steptoe Co. In 1885 he formed a partnership with the late James Mills, establishing the company which he headed at the time of his death. He was a prominent Mason, a member of the Business Men's Club and other social and business organizations.

ALBERT S. FEARS, treasurer of Reed, Fears & Miller, Inc., Boston, dealers in pig iron and coke, died Aug. 29.

Pittsburgh and Nearby Districts

At a meeting of the executive committee of the Pittsburgh Coal Co., held in that city, Aug. 30, a revised contract with the United States Steel Corporation for a large tonnage of coal running over a number of years, effective on and after Feb. 15, 1917, was approved and authorized to be executed. Under the revision of this contract the coal company secures a better price for its coal than under the old contract.

The LaBelle Iron Works, Steubenville, Ohio, is reported to have purchased recently about 2500 acres of coal lands in Ohio and Brooke counties, West Virginia.

The A. T. Nye & Son Co., Marietta, Ohio, stove and range manufacturer, has sold its works to the Government for the establishment of a marine supply plant at that place. As a result, the company is now looking for another location to build a stove and range plant, and would like to locate where there are some buildings already available. The concern has been in business since 1828, and has been located where it is now for 50 years, having made but one change in location in the 89 years that it has been in business. The Government will use the plant, which will be turned over to the Government in about eight months, as a distributing point for all the supplies used by the Government fleet in the Wheeling (W. Va.) district.

Marietta furnace of E. J. Lavino at Marietta, Pa., went in blast on Aug. 21 on ferromanganese.

Defective Ammunition

WASHINGTON, Sept. 4.—The announcement that practically one-third of the small-arms ammunition sent to France for General Pershing's troops has been found defective from chemical reaction set up in the primers after manufacture at the Frankford Arsenal has been followed by immediate steps looking to thorough investigation by the military committees of both houses and by a special board of army officers to be appointed by the Secretary of War.

Immediately after the publication of this statement General William Crozier, Chief of the Ordnance Bureau, addressed a letter to Adj. Gen. McCain recommending that a board of investigation be appointed. The Senate and House are investigating.

The Swedish Ironmasters' Association in 1915 appointed a committee to study the whole question of future supplies of charcoal, as according to careful estimates the country's stock of timber will have to be husbanded so as to allow for a complete replacement in 30 years. With a view of saving timber the three systems of burning in use (in charring heaps, kilns and using up waste in saw-mills) and the question of the more extensive use of electric furnaces, are receiving closer attention. Late statistics put the annual consumption of charcoal in Sweden at about 700,000 tons.

The Tungsten ore output of the Federated Malay States, according to the report of the Senior Warden of Mines, was 515 tons in 1916 against 292 tons in 1915. Of the 1915 production 235 tons was wolfram and 57 tons was scheelite. Most of the 1916 output was low grade concentrate.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 19.5c.; Philadelphia, 18.5c.; Boston, 21.5c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c.; Denver pipe, 76.1c.; minimum carload, 46,000 lb.; structural steel and steel bars, 76.1c., minimum carload, 40,000 lb.; Pacific coast (by rail only), pipe, 65c.; structural steel and steel bars, 75c., minimum carload, 60,000 lb. No freight rates are being published via the Panama Canal, as the boats are being used in transatlantic trade.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in., angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 4.00c.

Wire Products

(Prices of independent mills)

Wire nails, $4 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire, $4.05 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.95; galvanized wire, $4.65; galvanized barb wire and fence staples, $4.85; painted barb wire, $4.15; polished fence staples, $4.15; cement-coated nails, $3.90 base, these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 43 per cent off list for carload lots, 42 per cent off for 1000-rod lots, and 41 per cent off for small lots, f.o.b. Pittsburgh.

Nuts and Bolts

Discounts in effect for large buyers are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days.

Carriage bolts, small, rolled thread, 40 per cent, small cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent with c. p. nuts, 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq. blank, $2.10 off list, and tapped, $1.90 off; hex., blank, $1.90 off, and tapped, $1.70 off; nuts, c. p. c. and t. sq. blank $1.70 off, and tapped, $1.50 off; hex. blank, $1.60 off, and tapped, $1.40 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Wire Rods

Soft Bessemer and open-hearth rods to domestic consumers at $90 to $95; high-carbon rods made from ordinary open-hearth steel. $95 to $100, and special steel rods with carbons running from 0.40 to 0.60, $100 to $110 at mill; above 0.60 carbon, $115 to $120.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $7.00; ⅝ in., 7/16 in. and ½ in., $7.00 base. Boat spikes are occasionally quoted $7.00 to $8.00, all per 100 lb., f.o.b. Pittsburgh, but some makers are quoting higher. Track bolts with square nuts, 7c. to 7.50c. to railroads, and 8c. to 8.50c., in small lots, for fairly prompt shipment.

Steel Rails

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails, and on carload and smaller lots, 4c. to 4.25c. at mill. Light rails, 25 to 45 lb., $75 to $80; 16 to 20 lb., $80 to $81; 12 and 14 lb., $82 to $83; 8 and 10 lb., $83 to $84; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard Bessemer rails, $38; open-hearth, $40, per gross ton, Pittsburgh.

Tin Plate

Effective July 31, prices on all sizes of terne plate were advanced from $2 to $2.50 per package and are now as follows: 8-lb coating, 200 lb., $16 per package; 8-lb. coating, I. C., $16.30; 12-lb. coating, I. C., $17.50; 15-lb. coating, I. C., $18.25; 20-lb. coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 4c. to 4.50c. for delivery late this year, and 4.50c. to 5c. from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c.; railroad test bars, 5.25c. in carload and larger lots f.o.b. mill.

Wrought Pipe

The following discounts on steel are to jobbers for carload lots on the Pittsburgh basing card in effect from May 1, 1917, all full weight, except for LaBelle Iron Works and Wheeling Steel & Iron Co., which quote higher prices, and National Tube Co., which adheres to card of April 1.

Steel			Iron		
Butt Weld					
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	42	15½	⅛ and ¼	23	+4
½	46	31½	⅜	24	+3
¾ to 3	49	35½	½	28	10
			¾ to 1½	33	17
Lap Weld					
2	42	29½	2	26	12
2½ to 6	45	32½	2½ to 6	28	15
7 to 12	42	28½	7 to 12	25	12
13 and 14	32½	..			
15	30	..			
Butt Weld, extra strong, plain ends					
⅛, ¼ and ⅜	38	20½	⅛, ¼ and ⅜	22	5
½	43	30½	½	27	14
¾ to 1½	47	34½	¾ to 1½	33	18
2 to 3	48	35½			
Lap Weld, extra strong, plain ends					
2	40	28½	2	27	14
2½ to 4	43	31½	2½ to 4	29	17
4 to 6	42	30½	4½ to 6	28	16
7 to 8	38	24½	7 to 8	20	8
9 to 12	33	19½	9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

Nominal discounts on less than carload lots, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes, and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap-Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in.	28	1¾ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3¼ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in.	No quotations
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths. Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net or 2 per cent discount in 10 days.

[Open-hearth stock, $5 per ton above these prices.]

	Cents per lb.
Blue Annealed—Bessemer	
Nos. 3 to 8	8.00 to 8.50
Nos. 9 and 10	8.25 to 8.50
Nos. 11 and 12	8.50 to 8.75
Nos. 13 and 14	8.75 to 9.00
Nos. 15 and 16	9.00 to 9.25
Box Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21	8.30 to 8.80
Nos. 22 and 24	8.35 to 8.85
Nos. 25 and 26	8.40 to 8.90
No. 27	8.45 to 8.95
No. 28	8.50 to 9.00
No. 29	8.55 to 9.05
No. 30	8.65 to 9.15
Galvanized Black Sheet Gage—Bessemer	
Nos. 10 and 11	9.00 to 9.50
Nos. 12 and 14	9.10 to 9.60
Nos. 15 and 16	9.25 to 9.75
Nos. 17 to 21	9.40 to 9.90
Nos. 22 and 24	9.55 to 10.05
Nos. 25 and 26	9.70 to 10.20
No. 27	9.85 to 10.35
No. 28	10.00 to 10.50
No. 29	10.25 to 10.75
No. 30	10.50 to 11.00
Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16	7.80 to 8.30
Nos. 17 to 21	7.85 to 8.35
Nos. 22 to 24	7.90 to 8.40
Nos. 25 to 27	7.95 to 8.45
No. 28	8.00 to 8.50
No. 29	8.05 to 8.55
No. 30	8.05 to 8.55
Nos. 30½ and 31	8.10 to 8.60

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
		Electro-	New	New	St.	New	St.
Aug.	Lake	lytic	York	York	Louis	York	Louis
29	25.50	25.50	61.50	10.50	10.37½	8.37½	8.12½
30	25.50	25.50	61.75	10.45	10.32½	8.25	8.00
31	25.25	25.25	61.75	10.37½	10.25	8.25	8.00
Sept.							
1	25.25	25.25	....	10.37½	10.25	8.25	8.00
4	25.25	25.25	61.00	10.25	10.12½	8.25	8.00

NEW YORK, Sept. 5.

The markets are dull and featureless. Prices are lower in all cases and mostly nominal. Copper is lifeless. Tin is quiet and steady. Lead is dull and weaker. Spelter is stagnant and slowly sagging. Antimony is lifeless and lower.

New York

Copper.—The air is full of baseless rumors regarding the price which the Government and the Allies will pay for their purchases. No definite information is ascertainable nor is it even known yet what prices will be paid for the 60,000,000 lb. which the Government purchased some months ago. This potent uncertainty, together with labor and other troubles, continues to keep the market in a state of near paralysis. As a result buying is only from hand to mouth with not enough to establish a market and prices are entirely nominal. Yesterday both Lake and electrolytic were nominally quoted at about 25.25c., New York, with quotations varying on either side of this about ¾c., depending upon the relations of buyer and seller. For the last quarter the general quotation seems to be 24c. to 25c., New York. Consumption is proceeding at a rapid rate, but production is being considerably interfered with by labor troubles in the West. These facts, together with the certainty that sooner or later extensive buying must materialize, are the only bright spots in the market. The London market is unchanged at £137 for spot electrolytic and £133 for futures.

Copper Averages.—The average price of both Lake and electrolytic copper for the month of August, according to daily quotations in THE IRON AGE, was 27.24c.

Tin.—The market continues featureless with activity only spasmodic. On Aug. 29 there was considerable inquiry with sales of about 250 tons of Straits tin reported. On the same day there were sales of tin, ex-steamer to arrive soon, at 60.87½c., New York, also of December shipment from the Straits at 57.12½c., and of metal due from the Straits in September at 60.50c. After that demand declined and inquiries were few until Aug. 31, on which day there developed a fair demand for futures, but no sales were reported. Thursday, Aug. 30, was practically a holiday in honor of the New York National Guard and the market was neglected, but metal was offered at 61.75c. with few buyers. Yesterday after another holiday there was a little inquiry, developing into sales of 100 to 125 tons, mostly spot. The quotation yesterday was 61c., New York. Arrivals this month, including yesterday's, were 325 tons, with the quantity afloat 4015 tons. The London market yesterday was £243 10s. for spot Straits, a decline of 10s. from last week.

Lead.—The feature in the lead market the past week was the reduction by the American Smelting & Refining Co. of its price by ½c. per lb., to 10.50c., New York. An unusual statement in connection with this is to the effect that the company is willing to book orders at the new price without any conditions stipulated. This is regarded as a great change in policy and as indicating an increase in the supply of lead. In general, conditions remain unaltered with buyers still holding off. Sellers and buyers seem as far apart as ever and there has been no purchasing on a large scale. Prices in the outside market have also receded, metal being offered at 10.37½c. on Friday and Saturday, with October delivery offered at 10.25c., St. Louis, and November at 10c., St. Louis. Yesterday the outside market broke to 10.25c., New York, at which price it is reported a 100-ton lot changed hands. Active buying is not looked for until confidence in business conditions is renewed.

Spelter.—Pronounced dullness continues in the spelter market and quotations are a little lower but largely nominal, actual transactions being confined to very small lots coming from sellers anxious to do a little business or from resale sources. The general nominal quotation yesterday was about 8c., St. Louis, or 8.25c., New York, for prime Western. Last quarter is from ⅛c. to ¼c. higher. Under present conditions there is no incentive to buy and no inclination to sell with the metal so near the cost-of-production basis. The only ray of hope is the accumulating demand which must express itself sooner or later from both domestic and foreign sources.

Antimony.—In view of continued lack of demand the market is lower. Chinese and Japanese grades are quoted at 14.50c., New York, duty paid.

Aluminum.—No. 1 virgin metal, 98 to 99 per cent pure, is unchanged at 47c. to 49c. per lb., New York.

Old Metals.—The market is weaker. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible	26.50 to 27.00
Copper, heavy and wire	25.50 to 26.00
Copper, light and bottoms	22.50 to 23 50
Brass, heavy	17.50 to 18.50
Brass, light	13 00 to 14.00
Heavy machine composition	24.50 to 25.00
No. 1 yellow rod brass turnings	16.75
No. 1 red brass or composition turnings	19.00 to 21.00
Lead, heavy	9.25 to 9.375
Lead, tea	7.75
Zinc	6.50

Chicago

CHICAGO, Sept. 4.—Quiet is the rule throughout the market. There is no scarcity of anything, but consumers are marking time, pending some shaping of the market in regard to prices. We quote as follows: Casting copper, 25c.; Lake, 27.50c.; electrolytic, 26c.; tin, carloads, 62c.; small lots, 64c. to 65c.; lead, 10.25c.; spelter, 8c.; sheet zinc, 19c.; antimony, 17c. to 18.50c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 22.50c.; copper clips, 21.50c.; copper bottoms, 21c.; red brass, 21c.; yellow brass, 15c.; lead pipe, 8c.; zinc, 5.50c.; pewter, No. 1, 35c.; tinfoil, 40c.; block tin, 45c.

St. Louis

ST. LOUIS, Sept. 4—Non-ferrous metals have shown very little feature in this market, being generally easier, if anything. The close to-day on Missouri product, carload lots, was: Lead, 10c.; spelter, 8c. to 8.25c. In less than carload lots the quotations to-day were: Lead, 11c.; spelter, 9c.; tin, 66c.; lake copper, 30c.; electrolytic copper, 29.50c.; Asiatic antimony, 18c. In the Joplin district there was very little change apparent in the prices, the out-turn or the tone of the market. Zinc blende ranged from $65 to $75 per ton, basis of 60 per cent metal, with the average for the district for the week at $69 per ton. Calamine was quiet at $35 to $42 per ton, basis of 40 per cent metal, with the week's average for the district at $39.50 per ton. Lead was rather easier, but the top quotation was held up to $100 per ton and the average for the week for the district was $99 per ton. The turn-in continues to be very heavy, and this in conjunction with the inability to get cars and the rather slow demand is holding prices down. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 11c.; heavy yellow brass, 14.50c.; heavy red brass and light copper, 19.50c.; heavy copper and copper wire, 22.50c.; pewter, 25c.; tinfoil, 42c.; lead, 7c.; tea lead, 6c.; zinc, 5c.

The Albert E. Baxter Engineering Co., Ellicott Square Building, Buffalo, has completed plans for a cereal mill and warehouse 112 x 120 ft., 3 stories, to be erected at New Brighton, S. I., by the Tanner Gross Co., Inc., 25 Beaver Street, New York, to cost $125,000.

The T. Tolhurst Machine Co., 648 Fulton Street, Troy, N. Y., has let a contract for wood working building 60 x 220 ft. and 40 x 60 ft., 1 story, at Green Island, N. Y.

CONTRACTS FOR SHIPS

Steel Given Preference—No More Contracts for Wooden Vessels

WASHINGTON, Sept. 4.—The long pending contracts with the Submarine Boat Corporation, the American International Corporation, and the Merchants' Shipbuilding Corporation for the construction in Government financed yards of fabricated steel ships have been completed and it is officially stated will be formally executed on Sept. 6. The three concerns have been notified to begin active work without further delay and the Emergency Fleet Corporation has been assured in return that the first ship will be delivered in eight months and thereafter one vessel will be completed every two days until all are finished.

Owing to the fact that Congress has not yet acted upon the urgent recommendation of the Shipping Board for an additional appropriation of approximately $915,000,000, the entire program of fabricated steel ships will not be ordered at the outset. Initial orders for 50 ships each will be placed with the Submarine Boat and Merchants' Shipbuilding corporations and for 60 ships with the American International Corporation. Ultimately upwards of 300 fabricated steel ships will be ordered and the total may possibly reach 400, if Congress will supply the necessary funds.

Government Furnishes Steel

Under the terms of the contracts, the Government will furnish the steel for the fabricated ships and on the basis of the informal orders already placed, arrangements are being made to secure 458,000 tons of steel plates and shapes. The vessels ordered will be chiefly of 5000 and 7500 tons each, but a few 9000-ton ships will probably be built. As the Shipping Board desires to procure a maximum of tonnage at the earliest practicable date, its preference is for two 5000-ton ships, which can be built in eight months rather than one 9000-ton vessel requiring considerably longer for its construction.

The terms upon which the fabricated steel ships are to be built are necessarily somewhat complicated. They are based upon the cost to the Government of about $150 per ton, which includes the cost of the steel which the Government furnishes. The contractors, however, are guaranteed a certain profit per ton over and above all expenses including reasonable overhead charges. As the Government will finance the shipbuilding plants, it will have the option to take them over at the end of the war. If it decides not to do so, it is understood that some form of amortization allowance will be made.

Aside from the orders for fabricated steel ships the Emergency Fleet Corporation has made contracts for 570 vessels of which 429 are wooden, 58 composite and 83 steel. The bulk of these contracts were placed by General Goethals while serving as manager of the Emergency Fleet Corporation. The wooden ships are embraced in 62 contracts ranging from two to 20 ships each, the contracting yards being located at almost every available point on the Atlantic and Pacific coasts.

May Stop Building

Formal announcement has been made by the Shipping Board that no more contracts will be placed for wooden ships. In fact, it is a serious question whether all the wooden ships already ordered will be built. In the early days of the Emergency Fleet Corporation, when the wooden ship was being strongly urged as the key to the problem of defeating the submarine campaign, orders were placed right and left with shipbuilding concerns whose yards either existed wholly on paper or required considerable financing before the actual work of construction could begin. When these builders undertook to buy lumber to carry out their contracts, they encountered other obstacles. The pine mills of the South and those producing fir in the Northwest had promised lumber at certain prices, but as the market had risen substantially they were reluctant to recognize anything except written contracts. This situation has been remedied to some extent and the Government is prepared to go to any lengths to compel deliveries of any desired material.

The value of the wooden ship for foreign service, however, has come to be very seriously questioned by experts and it is more than probable that the bulk of those ordered will be operated in coastwise traffic for the purpose of releasing other ships better suited to the foreign trade. Even this makeshift will prove disappointing, it is feared, chiefly for the reason that coastwise vessels are not calculated to meet the existing conditions of the submarine campaign. It has been amply demonstrated that swift vessels are necessary for this work and ample statistics prove that an overwhelming percentage of the vessels sunk are of less than 14 knots speed. Vessels capable of making 15 or 16 knots are able to outrun the undersea boats.

Watertight Compartments

Another difficulty about utilizing coastwise vessels in the transatlantic service is the fact that they are not constructed with watertight compartments. This method of construction has been found to be very effective and it is believed that ships built in accordance with the approved plans of the Emergency Fleet Corporation will remain afloat even after being fairly hit by two torpedoes. A combination of speed with numerous watertight bulkheads, therefore, is believed to render vessels almost immune. These two features are being kept constantly in view in the revision of the plans of the vessels now in course of construction in American shipyards, which have been commandeered by the Shipping Board.

Information received here through official sources indicates that all the important nations of the world are bending their energies to merchant ship construction. Even the Allies are no longer giving their first thought to the building of warships, but are constructing cargo vessels as rapidly as possible for the double purpose of combating the submarine and of being in position when the war is over to extend their foreign trade. England's ship tonnage losses are said to have been so heavy that she feels she must forego warship building in favor of merchant vessels in order to hold her position in the commerce of the world. Lloyds Register shows the addition of 63 vessels of large tonnage to the British merchant marine between June 8 and July 17. Germany's shipyards are reported as busy night and day with cargo vessels ranging from 5000 tons up to the Bismarck, a giant liner of 56,000 tons, the largest merchant ship in the world, which is to be launched after the war.

The United States Shipbuilding Labor Adjustment Board has been completed by the appointment of Edward F. Carry of Chicago, president of the Haskell-Barker Car Co., which has its plant at Michigan City, Ind. The board is now equipped to adjust labor disputes in American shipyards where the United States Shipping Board or the Emergency Fleet Corporation has ships under construction or repair. W. L. C.

The Youngstown Sheet & Tube Co. has given the Unit Construction Co., contracting engineers, Title Guaranty Building, St. Louis, the work of designing and constructing 100 group houses of reinforced concrete for industrial workers, together with the layout of streets, sewers and water lines in colony plan, at Youngstown, Ohio. The cost of initial development is estimated at $500,000.

At the meeting of American Gear Manufacturers' Association to be held at the Edgewater Beach Hotel, Chicago, Sept. 14 and 15, papers are to be presented as follows: Heat treating and hardening of gears; inspection of gearing; spur gearing by the rotary or disk cutting process, and spur gears by the shaper method.

The American Brake Shoe & Foundry Co., Erie, Pa., will make extensions in its machine works to handle a contract for Government work recently received.

PERSONAL



W. H. CUNNINGHAM

Wilfred H. Cunningham has been elected president of Lake Superior Corporation at Sault Ste. Marie, Ont. He is a member of the Philadelphia banking house of Kurtz Bros. and his election is understood to be a recognition of the large Philadelphia interest in the corporation's securities, which has expanded greatly within the last two years.

Three important changes in the firm of M. A. Hanna & Co., Cleveland, took place Sept. 1, when Robert L. Ireland retired from membership and L. C. Hanna, Jr., and James D. Ireland became members of the firm, which now includes in addition to the two new members, L. C. Hanna, Sr., Mathew Andrews, H. M. Hanna, Jr., F. B. Richards, William Collins and R. F. Grant. L. C. Hanna, Jr., after graduating from Yale University, was associated with the Republic Iron & Steel Co. for a year and spent some time in the Birmingham, Ala., district. Since then he has been in various departments of the offices of M. A. Hanna & Co. James D. Ireland has also been associated with the firm for a number of years. He has been in charge of the Duluth offices, and general manager in charge of ore properties in the Northwest. He is a graduate of Yale and of the Massachusetts Institute of Technology. R. L. Ireland, the retiring member, is prominently identified with Cleveland industries. He was formerly actively associated with the American Shipbuilding Co., of which he is still a director, and has other extensive interests.

Edward Worcester, first vice-president of the National Tube Co., Pittsburgh, has returned from a vacation spent in Maine.

Alfred G. Place, for some time chief electrician of the Youngstown Sheet & Tube Co., Youngstown, Ohio, has been named consulting electrical engineer and has been succeeded as chief electrician by L. J. Hess. Mr. Hess is from the Joliet plant of the Illinois Steel Co. He will assume his new duties at once.

E. B. Blandy, for the past seven years connected with Pilling & Crane, New York, has resigned to become secretary of the Northern Ore Co. of New York, which some months ago acquired the Keystone blast furnace, Island Park, near Easton, Pa., formerly owned by the Thomas Iron Co.

Charles E. Hathaway, assistant treasurer Fore River Shipbuilding Corporation, Quincy, Mass., has resigned owing to ill health and has been succeeded by John F. Hanley, head bookkeeper. H. Edgeworth Frick, assistant superintendent of the hull department, has resigned after 13 years' service to accept a position on the inspection staff of the United States Shipping Board and has been assigned to duty in Delaware.

Irving V. Thomas, formerly factory manager of the old Lozier Motor Co., Detroit, now is production manager for the Hercules Motor Mfg. Co., Canton, Ohio.

R. G. Taylor, sales representative for the American Car & Foundry Co.'s Detroit plant, has been commissioned a captain in the ordnance officers' reserve corps.

John W. Boehne, former mayor of Evansville, Ind., and former representative in the Congress, has been elected president of the Indiana Stove Works at Evansville to succeed the late Jacob Fischer.

Howard C. Mull has been promoted from sales representative to sales agent in charge of the Chicago office of the Verona Tool Works of Pittsburgh.

Dr. E. E. Pratt, formerly chief of the Bureau of Foreign and Domestic Commerce at Washington, is now connected with the Pacific Commercial Co., 11 Broadway, New York. The company's head office is at Manila, and it carries on a large business in the Philippines and the Far East. It is closely associated with Andersen, Meyer & Co. and with the Hartmann Brothers, importers, New York.

J. P. Bennett, who recently resigned as assistant superintendent of the rolling mills at the plant of the Bethlehem Steel Co., Steelton, Pa., was presented a diamond ring by employees of his department, Aug. 24, with presentation speech by R. C. Parsons, superintendent of the structural and rail mills. Mr. Bennett will become assistant superintendent at the plant of the Keystone Steel & Wire Co., Peoria, Ill.

William Stampleman, formerly associated with the Universal Tool & Die Works, New York, has recently been appointed secretary of the Ever Ready Machine & Tool Works, 180 Worth Street, New York.

George D. Kirkham, sales agent, who has been in charge of the St. Paul office of the American Steel & Wire Co., has returned to the Chicago office. H. S. Durant has returned from Washington, D. C., to resume his duties at the St. Paul office.

H. J. Woodward has been made general sales manager of the Republic Rubber Co., Youngstown, Ohio. Mr. Woodward formerly held a similar position with the Knight Tire & Rubber Co., Canton, Ohio, which was recently taken over by the Republic company, and will now act as sales manager of both concerns.

Dudely R. Kennedy, assistant to J. A. Campbell, president of the Youngstown Sheet & Tube Co., Youngstown, Ohio, spoke at the annual convention of the International Association of Industrial Accident Boards and Commissions in Boston, Aug. 23.

F. G. Schulz, formerly with the New York Central railroad, has accepted a position as assistant to Horton Penrose, Pittsburgh manager of Shimer & Co., Philadelphia, producer of pig iron, ferromanganese and allied products.

Charles E. Satler, secretary of the United Engineering & Foundry Co., Pittsburgh, has returned from an extended vacation spent at Nantucket, Mass.

Louis C. Witkowski has been elected sales manager of the American and Foreign Sales Corporation, Munsey Building, Washington, D. C. For a number of years he was Washington representative for the Joseph Dixon Crucible Co. and for manufacturers of metal goods and machinery. The American and Foreign Sales Corporation was organized to represent manufacturers in negotiations with various branches of the United States Government.

R. A. Lewis, general superintendent of the Lehigh plant of the Bethlehem Steel Co., has been appointed general superintendent of the Bethlehem plants, including Lehigh, Saucon and Northampton plants. L. W. Adams, superintendent of the Saucon plant, has resigned and has been succeeded by Timothy Burns, who has been transferred from the Maryland plant of the company. The Northampton plant is the name now given to what was previously known as the Lehigh coke plant.

John A. Stevens, engaged in consulting engineering, with steam power plants as a specialty, at 8 Merrimack Street, Lowell, Mass., has organized a department to cover the design and superintendence of construction of factory buildings.

W. E. Firth, safety engineer for a number of years with the Midvale Steel Co., Nicetown, Philadelphia, has resigned to take a vacation.

Paul Caldwell of the Pittsburgh office of the General Electric Co. has accepted a position with the Cleveland Crane & Engineering Co. in the sales department and will take charge of its New York office about Oct. 1.

C. A. Crowe, formerly manager Grand Rapids office of the Asbestos Protected Metal Co., Pittsburgh, has been placed in charge of the Detroit office, located in the Penobscot Building. N. W. Taber, formerly the Detroit manager, has been appointed factory manager.

J. E. McAllister has been appointed vice-president and general manager of the National Steel Car Co.,

Hamilton, Ont., succeeding Basil Magor, who has held the position for several years.

A. T. Perrin, assistant chief draftsman of the Dominion Bridge Co., Lachine, Que., has resigned to become manager of the Rapid Tool & Machine Co.'s plant at Iberville, Que., the head office of which is located at Lachine, Que.

W. J. Longmore, general purchasing agent of the Westinghouse Electric & Mfg. Co., Pittsburgh, is spending his vacation at Muskoka Lake, Canada.

Charles L. Taylor, president of the Carnegie Hero Fund Commission, Pittsburgh, has become affiliated with the Loughead Aircraft Mfg. Co., Santa Barbara, Cal., the management of which has asked for authorization to increase its capital stock from $40,000 to $1,000,000. The concern has selected a site in Santa Barbara and expects to begin making deliveries of various types of airplanes to the Government within 90 days.

J. E. Johnson, Jr., New York, has gone to the Pacific coast on a professional trip which will require six or seven weeks.

Legal Aspects of Transportation

BY A. L. H. STREET

Time for Filing Freight Loss Claims.—Plaintiff is not entitled to recover against defendant railway company on account of loss of castings in transit under an interstate shipment, where no notice of the loss was given within four months after a reasonable time for delivery had elapsed, as required by the conditions stated in the bill of lading. It is beyond the power of the railway company to waive compliance with this condition, since such waiver would amount to an unjust discrimination in plaintiff's favor, in violation of the Interstate Commerce Act. (Massachusetts Supreme Judicial Court, May 29, 1917. Metz Co. vs. Boston & Maine Railroad, 116 Northeastern Reporter, 475.)

Carrier's Liability for Disregarding Routing.—Where goods are delivered to a railway company for transportation over its road and connecting lines, under stipulation in the bill of lading directing delivery to a given carrier at a certain point, the company renders itself liable for loss sustained by the shipper through failure to observe the routing directed. (Kansas Supreme Court, May 12, 1917. Bennett vs. Missouri Pacific Railway Co., 164 Pacific Reporter, 1084.)

Liability for Freight Charges—When Seller Is Not Responsible for Transit Delays.—The fact that a salesman who took an order for four engines represented to the buyer that if the four were shipped together the freight charges would not exceed a certain amount did not render the seller liable for higher proportionate freight charges on two engines which were shipped instead of the four ordered, the buyer having accepted the two with knowledge of all the pertinent facts, including knowledge as to the freight rates applicable. Where goods are shipped under bill of lading attached to draft drawn on the buyer and he takes up the bill of lading while the goods are in transit, he instantly becomes the owner and must look to the carrier for any delay in transportation subsequently occurring. (Texas Court of Civil Appeals, May 2, 1917. J. I. Case Threshing Machine Co. vs. Lochridge & Denny, 195 Southwestern Reporter, 266.)

Samuel Swett, 149 Broadway, New York, has been appointed the exclusive agent in the United States for George Craddock & Company, Ltd., Wakefield, England, whose steel works, rolling mills, wire drawing mills and wire rope works are located at that place.

The Cleveland & Pittsburgh Railroad is said to have bought recently close to 1,000 acres four or five miles south of Steubenville, O., on which it is reported the buyer will erect large railroad machine shops, using most of the ground for yards.

Sweden's pig iron output in 1916 is reported by the British Consul General in Sweden, H. W. Harris, as 737,000 tons as compared with 730,000 tons in 1913.

WAR CONVENTION OF BUSINESS

Government Control of Prices and Other Questions to Be Considered

WASHINGTON, Sept. 4.—To give the business men of the country an opportunity to consider and discuss some of the most serious war problems which have recently developed, a special war meeting of the Chamber of Commerce of the United States will be held at Atlantic City beginning Sept. 18 and lasting four days. It is believed the attendance will surpass that of any gathering even at this famous seashore convention city. The Government control of prices, the establishment of priority in requirements of the Government and of individuals for materials and products, the supply of which is limited, will be the leading topics, but there will also be discussed the general industrial relations of business to the nation during the war and how the Government can best procure the supplies of materials most needed and handle the great business problems which are daily arising. Officials of the National Chamber emphasize the opportunity which the coming convention will give of demonstrating to the country that business is not only backing up the President, but is now coming forward to consider further how it may render a greater service in winning the war.

"The convention will give representatives of business the opportunity of expressing their deep sentiments of loyalty and patriotism," says Waddill Catchings, chairman of the National Chamber program, in a statement issued here, "and will give them the opportunity of making constructive suggestions to the Government. The ultimate result of crystallizing the thought of large numbers of business men and sending these men home in a spirit to be helpful to the Government must result in a leadership throughout the country which will make more effective our national energy in the prosecution of the war.

"And here is another phase of the meeting: It is frequently said business is on trial. The manner in which business acts to-day will determine the attitude of Government toward business for years to come. If business really is on trial, it should be heard. There should be a voice speaking for business, otherwise business is apt to be judged by those men who come forward because they are hurt by some action which is taken in Washington or because they desire to secure a contract. In the absence of some general gathering of business men to give expression to the broad thoughts and feelings of business men, business is apt to be judged solely from its selfish standpoint."

The important subject of the Government control of prices will be exhaustively discussed at the meeting, which will consider the propriety of requiring manufacturers to supply the Allies and the public at the same prices that are made to the Government. Business men throughout the country are manifesting the liveliest interest in this issue and the session set apart for its consideration will probably be the most notable of the convention. W. L. C.

The H. W. Johns-Manville Co., producing and distributing asbestos products, insulating materials, boiler coverings, electric supplies, power plant products, etc., has leased new quarters in St. Louis for its branch offices and will occupy a six-story building at Eleventh and Olive streets which will be remodeled at a cost of about $30,000 before occupancy. An engineering construction department will be maintained in the new offices.

The Berkeley-Jefferson Railroad Co., Martinsburg, W. Va., proposes to build about 35 miles of line to develop clay, limestone and iron lands.

Will Try Again to Adjust Pig Iron Rates

Many Complications Arise in Cases Before the Interstate Commerce Commission—Result of Attempt to Be Made in November Is a Subject of Speculation

WASHINGTON, Sept. 4.—The railroads, on or before Nov. 1, will make another effort to adjust rates on pig iron from the Birmingham district to New England, on routes by rail to South Atlantic ports, thence by water to Boston or Providence, and thence by rail to interior New England points. In a third supplemental report in the Sloss-Sheffield case, the Interstate Commerce Commission has changed its mind as to what would be a proper rail-and-water rate from Birmingham to Boston, using that port as a typical point. In its second supplemental report the commission said that $4.25 per ton would be a reasonable charge. In its latest report, just made public, it comes to the conclusion that the increased cost of living warrants an addition of 25 cents per ton to the rate of $4.25 which, under the order issued in connection with the second supplemental report, was to have become operative on Aug. 15.

But that is not all the commission has ordered. It has devised a scheme for making rail-water-and-rail rates from the Alabama furnaces to New England foundries. It decrees that the $4 50 per ton rate from Birmingham to Boston or Providence shall be the base. To construct the through charge to the interior foundry, 40 cents is added to cover the transfer from the boat to the railroad and for the rail haul from the port to the destination the New England carrier may add three-fourths of its local rate—if there is such a thing from the port to the furnace point. If not, then it is presumed that three-fourths of the sixth class will be taken for calculating the part of the rate for the rail haul away from the delivery port, pig iron being classed as a sixth rate commodity. Usually, however, it takes a specific rate something less than sixth class.

A Matter of Speculation

How much of a dislocation in the iron and steel industry this third attempt to adjust these rates will cause is a matter for speculation. The pig iron rate structure, throughout the territory east of the Mississippi and north of the Ohio and Potomac rivers, has been subjected to repeated shocks ever since the first ruling of the commission in the Sloss-Sheffield case, issued in the summer of 1914. Whatever disturbance results, however, will come on the heels of commotion caused by the commission's decisions in the 15 per cent and the export steel cases, followed by a supplement known as the Pollak Iron & Steel Co. complaint against the Baltimore & Ohio.

By reason of the decisions in the two cases and the supplement mentioned, the industry recently has been paying higher rates. On Aug. 20 there was a readjustment of the iron and steel rates from Buffalo, Pittsburgh and Erie groups to New England, with Boston as a typical point. The pig iron rate went up from $2.58 to $3.10 without any particular discussion and without specific notice to the trade generally. The traffic and tariff sharps knew the advance would be made when they had assimilated the commission's decision in the 15 per cent case.

History of Readjustment

The readjustment that has been going on since Aug. 20 is being made under special permission from the Interstate Commerce Commission issued Aug. 4, authorizing the advances to be made on five days' notice instead of the 30-day requirement established by the statute, but which may be modified by the commission "for good cause shown."

Authorizations in the 15 per cent case and requirements in the export steel (Pollak supplement) case constitute the "good cause" for the five-day permit. In the 15 per cent case the commission authorized the eastern railroads to advance their class rates by substantially 15 per cent. Specifically they were given permission to advance the New York-Chicago class rate scale. The first-class rate in that scale between the points mentioned is always used as the yard stick for measuring class rates and commodity rates based on class rates in the eastern territory. The authorization was to increase that yard stick rate from 78.8 cents per 100 lb. to 90 cents and every other rate made on that scale or basing thereon in the same degree.

But the commissioners personally know little about the intricacies of the tariffs in which are stated the rates affected by their decisions; hence many perplexities shared by shippers in all lines. In their 15 per cent decision they sharply told the railroads that their proposal to add 15 per cent to commodity rates was so obnoxious, because it would break long established relationships, that it could not be tolerated.

Chicago on a Plateau

They made that declaration, apparently oblivious of the fact that the class scale governs rates on iron and steel from Chicago to the East, while rates from Pittsburgh, Buffalo and Erie are published as specifics. The effect of their decision, therefore, was to put Chicago on a high plateau and to break the long-established relationship between Chicago and Pittsburgh and points in Ohio in the Youngstown district. The Ohio points of production, in order to compete with Pittsburgh, had to be made arbitraries of two or three cents over Pittsburgh, instead of specified percentages of the New York-Chicago scale.

Hence there was great satisfaction in Pittsburgh and Ohio when the commission said commodity rates should not be touched. It was short lived, because the commission came to the conclusion that it would not do to disrupt relationships simply because of the difference in method of stating rates. It decided, therefore, that the relationship between Chicago on the one hand and Pittsburgh, Buffalo, Erie and the Ohio points carrying arbitraries over Pittsburgh should be re-established.

That decision, in turn, was forced by the commission's determination in the Pollak complaint supplement to the export steel case. When carriers just a year ago decided there was no reason why export rates on iron and steel should be 33 per cent less than domestic rates, they appeared to have forgotten that years ago they had put Buffalo, Pittsburgh and Erie on a parity by giving them commodity rates to the east equal to the class rate from Erie to Philadelphia and that that caused a disruption of the domestic rates from Cincinnati and other producing points in southern and southwestern Ohio.

Pollak Steel Co. Objects

The Pollak Steel Co., however, had not forgotten. Therefore, at the hearings on the proposal of the railroads to bring export rates up to the domestic level, it objected on the ground that such equalization would put it relatively at as great a disadvantage on export shipments as it had been for years on domestic traffic. The big operators in the iron and steel industry made no objection to bringing the export rates up to the domestic level. They did object, however, to the Pollak people injecting the question of the relationship of domestic rates into the export case. Thereupon the Pollak company filed a formal complaint. The commission after careful deliberation decided that the point made by the complainants was well taken. In its decision in the export rate case it said the railroads might advance the export rates on condition that they would at the same time bring the rates from Pittsburgh up to the basis of 60 per cent of the New York-Chicago rate and give

Cincinnati rates 87 per cent of the New York-Chicago class rate scale.

The practical result, therefore, of the consent of the big operators to an advance in export rates was to remove the advantage which Pittsburgh, insofar as the New York-Chicago percentage system of stating rates is concerned, had over Cincinnati.

Advance in Export Rates

The commission's consent to advance the export rates was given last spring. Before the new tariff could be made effective the railroads began their demand for a 15 per cent increase to which the big iron and steel interests also consented, and the readjustment under the export case decision was delayed until after the railroads tried to put into effect the commission's authorization in the 15 per cent case. The permit of Aug. 4 to make the tariffs effective on five days' notice, was issued because the commission, prior to that time, had decided that it could not afford to disrupt relationships such as would result from a literal compliance with its report in the 15 per cent case.

It will be noticed that the advance on pig iron from Buffalo to Boston is more than 15 per cent. The excess over 15 per cent is the accretion to the rate resulting from the Pollak supplement to the export case. Accretions of that kind attach to rates from all the producing points which were the beneficiaries of the demand of the Pittsburgh steel interests, made about 1901, that they be given as low rates as Buffalo, which, being about equidistant from New York, Philadelphia and Baltimore, was given treatment by the New York Central equal to that given Erie by the Pennsylvania. Pittsburgh demanded rates as low as Buffalo—and got them, thereby being taken out of the percentage of the class scale system of making rates on iron and steel, which is now being restored because the Pollak people objected to a longer continuance of the preference to Pittsburgh and related points.

Effect of Various Cases

As showing the effect of the two cases and one supplement, it may be pointed out that the old rate on billets and blooms from Chicago to New York was $5.26 per gross ton; the new rate is $6, or something less than 15 per cent, which is in exact accord with the increase in the first-class rate from 78.8 cents to 90 cents per 100 lb. The old rate from Pittsburgh to New York on billets and blooms was $2.76 per gross ton; the new one is $3.20, or something more than 15 per cent. A straight 15 per cent advance would have produced a rate of $3.174 per ton. By removing the preference Pittsburgh had in the old adjustment the new rate runs up to $3.20 and conforms to the New York-Chicago class scale, which furnishes the yard stick, as hereinbefore mentioned.

Contrary to published statements, the adjustment was not caused by the amendment to the interstate commerce law, signed on Aug. 9. That amendment requires a railroad, before it files an advance, to explain what it is trying to do and to obtain permission from the commission to file the tariffs. No one has ever discovered any reason for such an amendment. Under the new rule the commission, after being notified by a railroad that it desires to file an increased rate, tells it to send in an explanation and it will receive permission, almost pro forma. W. L. C.

The Cleveland Cliffs Iron Co., Ishpeming, Mich., has awarded a contract to O. W. Rosenthal & Co., 80 East Jackson Boulevard, Chicago, for the erection of a hospital and infirmary building costing about $100,000 complete, at Ishpeming. The building will be of reinforced concrete and brick, 55 x 145 ft., four stories and basement, and contain about 100 beds. Plans were prepared by M. J. Sturm, architect, 116 South Michigan Avenue, Chicago. Previously noted.

The Graham Iron Furnace, Graham, Va., has been acquired by John B. Guernsey & Co., Roanoke. The new owners plan to remodel and improve the plant, effecting a daily capacity of 150 tons.

UNION NOT RECOGNIZED

Conditions of Settlement of Labor Dispute in Alabama Mines

WASHINGTON, Sept. 4.—The adjustment of several labor disputes recently brought about by Secretary of Labor Wilson reflects the position which the Government is taking in these controversies and furnishes a reasonably sound basis for negotiations between manufacturers handling Government work and their employees. The Secretary of Labor has devoted much time of late to the settlement of labor troubles and has borne a more or less active part in the adjustment of disputes in the Pennsylvania coal mines, affecting some 80,000 miners. He has also assisted in composing the so-called southeastern shopmen's dispute, affecting 42,000 mechanics, and within the past few days he has effected a settlement between the Alabama coal operators and 25,000 miners employed in that district, thereby averting a strike that would have had serious consequences. The secretary has also assisted in the effort to bring about an agreement between the Atlantic coast shipyard managers and their men and expresses confidence that the threatened general strike will be averted.

In bringing about an agreement between the Alabama coal operators and the miners, Secretary Wilson prepared an agreement which has just been accepted by both sides in which the attitude of the Labor Department with respect to the rights of both employers and employees during the war period is outlined. The keynote of this agreement is non-interference by the employers with the work of the unions in organizing their men, upon condition that there shall be no demand for the recognition of the unions. In view of the importance of this agreement as establishing a precedent for future official action, its text is here reproduced as follows:

1. That the miners recede from their demand for recognition of the union.

That the coal operators of Alabama recognize the rights of employees to join any union, labor organization, or society they may choose, and agree that they shall not be discriminated against in the distribution of work for having joined such organization, provided always that in their affiliation and in the conduct of the organization nothing is done to disturb the relation existing between employer and employee, by methods of intimidation or coercion, and provided that employees joining any organization recognize the right of each employee to join or not as he may individually decide, and also recognize the right of the company to insist that no employee shall use the company's time for any purpose other than that for which he is paid, and that he must not interfere with the operation of the mine, or knowingly do that which will reduce the output.

That they will upon application through the usual channels for employment, re-employ any man who has been discharged, if there be any, solely for joining the union, but will not obligate themselves to re-employ any man who has made unlawful threats or committed unlawful acts, unless the employer is satisfied that the same acts will not again be committed by the applicant.

2. That the right of the miners to place check weighmen on the tipples, to see that their coal is properly weighed and credited, should be fully recognized. The same to be elected and paid for by the miners without any interference, as per the laws of the State. All coal to be weighed and paid for as per standard weights, at all mines equipped with scales.

3. That semi-monthly pays should be established where they do not exist.

4. That the managers receive committees of their own workmen selected at meetings called for the purpose not oftener than every three months, to present any grievance that they may have to submit, which shall not include any matter herein waived or postponed. If they fail to arrive at a satisfactory adjustment of the grievance or grievances complained of, the same to be submitted to the Department of Labor for final adjustment. It being understood that a decision will be made within 30 days after submission.

It is further understood that any grievances arising must first be taken up by the individual or individuals affected with the foreman or officials having authority over such dispute and, they failing to agree, it shall be taken up through the committee as above provided.

5. The consideration of the hours of labor, relative prices of differentials, machine operations, local inequalities and uni-

formities, and the abolition of the contract system be indefinitely postponed.

This agreement was promptly accepted by both miners and operators, the latter stipulating merely that they would "abide by and observe said suggestions during the war or so long as their employees observed and abide by the above suggestions relating to them." It is understood that all the coal operators of Alabama, including those not involved in this dispute, will ratify this agreement during the present week.

News of Labor World

Members of the four local unions at Bridgeport, Conn., of the International Association of Machinists, at a meeting held Aug. 31, voted to approve a general strike to enforce demands for a new minimum wage scale. No time was set for the calling of a strike. The national officers of the organization were present and approved the plans of the local unions.

A strike of 25 pieceworkers at the Naugatuck Malleable Iron Works, Naugatuck, Conn., for increased wages has caused a shutdown of the plant for an indefinite period. The men have been receiving about 40 cents an hour and the new demands are equivalent to about 50 cents an hour.

The strike of the machinists at the Baush Machine Tool Co., Springfield, Mass., remains unsettled, and it is reported that trouble may occur in other local plants.

The child labor law is having a marked effect in many metal-working industries which have been taking on minors between 14 and 16 years old to replace the young men lost by the draft. In Bridgeport, Conn., nearly 1000 minors are without employment, as the manufacturers will not change their working hours to comply with the eight-hour requirement of the new law. Agent Charles N. Hall, Connecticut State Board of Education, is quoted as expressing the belief that the continuance of the war and the further drafting of young men will have a strong effect toward an increase of the eight-hour standard in factories, as the necessity for employing minors will become more of a factor in industry.

The Taft-Pierce Mfg. Co., Woonsocket, R. I., manufacturer of tools, gages and special machinery, has announced the inauguration of an eight-hour work day basis with time and one-half for overtime. There will be no change in rates or in the present working schedule, but minors between 14 and 16 years will not be allowed to work more than eight hours a day in compliance with the new Federal law. The company employs about 1000 hands.

More than 3000 members of the Federated Trades employed in the shops of the Boston & Maine Railroad are on strike following the refusal of a demand for an increase of 8 cents an hour. A proffer of 2 cents an hour increase made by the company was refused by the men and all attempts by Federal and State mediators to bring about a settlement have been futile. About 1300 men are out at Billerica, Mass., 600 at Concord, N. H., 75 at Springfield, Mass., 65 at Greenfield, Mass., 50 at Worcester, Mass., and many groups at Dover, N. H., and other points.

The Indianapolis branch of the National Metal Trades Association and the Associated Employers of Indianapolis have joined in promoting an extensive advertising campaign in the Central States for the purpose of obtaining labor for Indianapolis factories, particularly those engaged in Government work.

The Gorham & Goddard Tool Co., 45 W. Congress street, Detroit, Mich., will shortly begin the manufacture of milling cutters, in addition to its present line of salvage work in milling cutters.

The nickel ore output of New Caledonia in 1916 was 30,679 metric tons, according to the *Echo des Mines*. The output in 1915 was 48,576 tons, and in 1914 it was 94,154 tons.

The McIntosh, Seymour Co., A. C. Baldwin, manager, Auburn, N. Y., is having plans prepared for a factory and erecting building.

Book Reviews

Modern Machine Shop Construction, Equipment and Management. By Oscar E. Perrigo. Pages, 384, 6¾ x 9½ in.; illustrations, 219. Published by Norman W. Henley Publishing Co., New York, and for sale by THE IRON AGE book department. Price, $5.

The first edition of this book appeared in 1905, and gave a good and comprehensive account of shop methods of that time. Since that date there have been great advances in machine shop practice, and the author has added four new chapters to bring the book up to date. The headings of these chapters are: Increasing the Efficiency of Machines; Increasing the Efficiency of Men; Relation of the Overhead Burden to the Flat Cost; Manufacturing Cost Systems. These chapters deal largely with the problems that have arisen from intensive production in connection with scientific management and outline in a general way the methods of time study, routing, cost finding, etc., that have been developed under it.

The book as a whole is divided into three sections, dealing respectively with shop construction, shop equipment and shop management. The treatment is mainly descriptive, examples of the various problems which must be solved being given throughout the book. Apparently these have been drawn from the author's own engineering practice, and his method of solution in each case is worked out in considerable detail. The impression that one receives is that the book is intensely practical. In fact, one criticism that might be made of it is that it is too practical, as there is little or no underlying theory given showing the reason for the adoption of any particular method. The book, however, is a good one, as it outlines procedure which has succeeded, and its pages will contain many hints leading to the solution of shop problems that are not directly discussed in its pages. It is particularly good for the young engineer and student.

An outline of the several sections follows: Part one contains data on building construction, roofs, foundations, chimneys, floors, heating and ventilating, lighting and power transmission. Part two deals with the planning of shop buildings and the arrangement of buildings and equipment. It takes up the machine shop, tool room, store room, drafting room, pattern shop, foundry forge shop and the transportation equipment. Part three is devoted to management, cost systems, mutual aid societies and general efficiency.

The Unwritten History of Braddock's Field. Edited by George H. Lamb. Pages, 336, 7½ x 10¼ in.; illustrated.

This book has been written by the history committee appointed by the business men of Braddock, Pa., in connection with the celebration next year of the golden jubilee of Braddock, the silver jubilee of Rankin and the 175th anniversary of the first white settlement west of the Alleghenies. It gives a sketch of the early history of Braddock's field, seven miles from Pittsburgh, which was the farthest point west reached by the English army on its march toward Fort Duquesne. There it was attacked July 9, 1755, by the French and Indians, and driven back across the Monongahela River. George Washington, then 23 years old, fought in the battle as a subordinate under General Edward Braddock, who was wounded and died a few days later. A survey of industrial Braddock, including a history of the Edgar Thomson Steel Works, is contributed by Hugh P. Meese. The history of the great plant is traced through the administrations of Capt. William R. Jones, 1873 to 1889; Charles M. Schwab, 1889 to 1892; James Gayley, 1892 to 1895; Thomas Morrison, 1895 to 1903 and Charles E. Dinkey, 1903 to date. Some intimate inside stories are told of Captain Jones and other men prominent in the steel business at Braddock. Numerous half tone engravings of prominent citizens of the town and places of historic interest and of plants are included. Among those who obtained their early training in Braddock industries are James A. Farrell, president, and D. G. Kerr, vice-president United States Steel Corporation.

Machinery Markets and News of the Works

MORE PLANTS TO MAKE GUNS

Government to Enlarge Ordnance Program

General Vehicle Co. Issues Big List of Tools Needed for Airplane Engine Work—New Shipbuilding to Start Soon

Reports from various quarters indicate that the Government will expand its ordnance program to provide for the manufacture of a large number of guns, ranging from 3 in. to 9.5 in. Several new manufacturing projects, as yet rather indefinite, are under consideration. Meanwhile, concerns with which arrangements have already been made are actively preparing. The Tacony Ordnance Corporation has issued lists of 21 cranes and about 50 machine tools for its gun-forging and machining plant at Tacony, Pa. The Taylor-Wharton Iron & Steel Co. has purchased about $300,000 worth of machine tools and five cranes for gun-forging and rough machining at its Tioga plant, Philadelphia. The Standard Steel Works Co., Philadelphia, with plant at Burnham, Pa., is equipping additions to provide capacity for forging and rough machining 6-in. howitzers. Other gun-forging plants are also buying equipment. The Poole Engineering & Machine Co., Baltimore, is inquiring for equipment in anticipation of receiving a Government contract to turn out 4-in. guns. Another concern in Baltimore is considering a similar proposition. The destroyer program of the Navy Department will necessitate enlargement of shipbuilding plants, provision for the building of marine engines and other work that will doubtless involve purchases of machine tools.

Preparations of the Aircraft Production Board to build an immense airplane fleet are coming to light through the inquiries and purchases made by concerns which will build the engines. The General Vehicle Co., Long Island City, N. Y., last week sent out a list of about 900 machines, which will be bought as quickly as possible. The Trego Motors Corporation, New Haven, Conn, is buying a number of machine tools to provide for turning out five engines a day. The Simplex Automobile Co. list is still pending, but orders will be placed as soon as definite arrangements for manufacturing are made with the Government. The Fageol Co., Oakland, Cal., sent a representative to New York to sound out the machine-tool market, but whether orders will be placed soon has not developed. This company is busy on tractor and truck work, but may make aviation engines also. The Standard Aero Corporation, which bought a new plant at Elizabeth, N. J., is inquiring and will place orders for machine tools soon. The Duesenberg Motors Corporation has bought a few machines for its plant in Newark, N. J. The Willys-Overland Co. has been making additional purchases for its plant at Elyria, Ohio. The same company is equipping a plant in Canada.

It is expected that the American International Corporation and the Submarine Boat Corporation will soon place orders for equipment for ship-assembling yards, the Emergency Fleet Corporation having authorized them to go ahead on plants at Hog Island, near Philadelphia, and on the Newark Meadows. The Lackawanna Bridge Co. will co-operate with the Submarine Boat Corporation. The Merchants Shipbuilding Corporation, Philadelphia, has awarded a contract to the Edward F. Terry Mfg. Co., New York, for 24 overhead electric traveling cranes of 15-ton capacity for its yard at Bristol, Pa. The order aggregates about $1,125,000. The Federal Shipbuilding Co. is expected to issue additional lists this week covering cranes and other shop equipment it will buy for its new plant on the Hackensack Meadows. The Newport News Shipbuilding & Dry Dock Co., with offices in the Woolworth Building, New York, has issued another list of machine tools for its plant at Norfolk, Va. The Lake Torpedo Boat Co., Bridgeport, Conn., is buying for a project in which Simon Lake, the submarine inventor, is interested.

Other miscellaneous business in Eastern markets includes purchases for a large addition to the plant of the American Chain Co. at York, Pa., which are being made by A. C. Campbell, Inc., Waterbury, Conn. The W. J. Crouch Co., 253 Broadway, New York, is in the market for a list of machine tools for export. Walter Scott & Co., Plainfield, N. J., are still making purchases on their list issued a few weeks ago. This concern will make gun carriages for the Government. R. Hoe & Co., New York, are buying considerable new equipment.

The Pennsylvania Railroad Co. has about completed purchases for the Government locomotive shop to be built in France. Prompt delivery was required and many bidders were eliminated through inability to make early shipments. The entire crane order went to the Cleveland Crane & Engineering Co., Cleveland, Ohio. This company agreed to deliver the 18 cranes in 90 days. Shipment of the first cranes will be made 25 days after receipt of the order.

Government orders continue to feature buying in the Middle West. The Hampton Roads Shipbuilding & Dry Dock Co. has been organized in Cleveland and will shortly buy machines and cranes for a shipbuilding plant at Norfolk, Va. The Erie Forge Co., Erie, Pa., is inquiring in Cleveland for additional equipment for gun-forging work. The Defiance Machine Works, Defiance, Ohio, which is building plant additions, has bought about 20 machines. A concern in Erie, Pa., which will build airplane engines, is inquiring for machine tools. The Norfolk & Western Railroad Co. has placed orders with Cincinnati dealers for a number of lathes and other machine tools.

Reports from Canada indicate a decided falling off in the munitions industry there. Some plants have been dismantled and second-hand machinery has been thrown on the market. The Dominion Bridge Co., Montreal, Que., will go into the manufacture of marine engines on a very large scale in the near future.

New York

NEW YORK, Sept. 4.

Buying and prospective buying for airplane engine plants continued to feature the New York machine-tool market during the past week. The General Vehicle Co., Long Island City, N. Y., which has been working on Gnome engines for the British Government, startled the trade by issuing the biggest list that has yet come from any airplane concern, totaling about 900 machines. It is said that the purchases on this list, which are to be begun this week, will approximate $1,500,000 to $2,000,000. Deliveries by Nov. 1 are asked for in most instances. The Trego Motors Corporation, New Haven, Conn., has closed during the week for a number of machines and is preparing to turn out five engines a day. The Simplex Automobile Co. list is still pending, though it is said that buying may be begun at any moment. The list issued by the Inter-Continental Machinery Corporation, 165 Broadway, New York, which was mentioned last week, is understood to be partly in behalf of the General Vehicle Co. The Standard Aero Corporation, which will speedily equip its new plant at Elizabeth, N. J., is also inquiring and will place orders soon. A representative of the Fageol Motors Co., Oakland, Cal., has recently spent some time in New York and conferred with machine-tool dealers regarding equipment for that concern's plant, additions to which are being built. The Fageol company is busy on tractor and truck manufacturing, but, it is reported, may also make airplane engines. This company has been manufacturing the highest-priced pleasure automobile on the market, but is now devoting its energies almost entirely to other work. The Duesenberg Motors Corporation, 120 Broadway, New York, which is completing a new plant in Newark for the manufacture of airplane and marine engines, has been buying a few machines. The Willys-Overland Co. has placed orders for considerable equipment for its plant at Elyria, Ohio.

Walter Scott & Co., Plainfield, N. J., which has a gun-carriage contract, is still placing orders on its recent list of about 200 machines. The General Electric Co., Schenectady, N. Y., is still buying. R. Hoe & Co., New York, are placing orders and are believed to have a Government contract.

The W. J. Crouch Co., 253 Broadway, is in the market for a considerable quantity of machinery and machine tools for export.

The Newport News Shipbuilding & Dry Dock Co., with New York office in the Woolworth Building, has issued a new list of machine tools. The Lake Torpedo Boat Co., Bridgeport, Conn., is buying equipment for another project in which Simon Lake, the submarine boat inventor, is interested.

The Federal Shipbuilding Co. is expected to issue new lists at any time of equipment it will purchase for its shops at its new shipbuilding plant. A large number of cranes will be bought. The Submarine Boat Corporation is reported to have closed with the Emergency Fleet Corporation to build 28 ships on the Newark Meadows, and will have the co-operation of the Lackawanna Bridge Co. in this undertaking. The American International Corporation will build 200 ships at Hog Island, Delaware River, and the Chester Shipbuilding Co. and the Merchants' Shipbuilding Corporation together have a contract for 40 ships.

The Stamford Rolling Mills Co., 25 Broad Street, New York, operating plants at Stamford and Springdale, Conn., for the production of rolled plate and cast brass and copper, has increased its capital from $2,835,000 to $3,625,000.

The Concrete Fabricating Co., New York, has been incorporated with a capital of $60,000 to build steel and concrete barges and boats. W. S. Sawyer, J. T. Brady, and C. F. Bailey, 308 West Fifteenth Street, are the incorporators.

The Blacklock-Posner Tire Co., New York, has been incorporation with a capital of $15,000 to manufacture rubber and composition automobile tires. C. A. Weldon, H. H. Jacobson, and S. Bernheim, 35 Nassau Street, are the incorporators.

The Remington Typewriter Co., 374 Broadway, New York, has awarded a contract for the construction of a four-story addition, about 50 x 300 ft., to its works at Ilion, to cost about $30,000.

The T. P. Walls Tool & Supply Co., Inc., New York, has been incorporated with a capital of $50,000 to manufacture machinery, tools, etc. W. H. Lenk, A. Quinn, and T. P. Walls, 75 Walker Street, are the incorporators.

The Main Rate Ties Co., Inc., New York, has been incorporated with a capital of $25,000 to manufacture wire for binder service. The incorporators are V. G. Azzi, A. Ragone, and J. P. Gaccione, 1569 East Thirteenth Street, Brooklyn.

The Long Island Railroad Co., Pennsylvania Terminal, New York, is planning for extensions and improvements in its shops on Atlantic Avenue, Morris Park, Long Island, to cost about $6,000.

The Lang Propeller Co. of America, Inc., New York, has been incorporated with a capital of $45,000 to manufacture aeroplanes, propellers, and other aircraft apparatus. L. L. Montant, A. A. G. Land, and B. N. Busch, 30 East Forty-second Street, are the incorporators.

The Davidson Pipe & Iron Corporation, Brooklyn, N. Y., has been incorporated with a capital of $10,000 to manufacture pipe, tubing and foundry supplies. E. Davidson, and C. and P. Devine, 66 Penn Street, Brooklyn, are the incorporators.

The Charles Ross & Son Co., 148 Classon Avenue, Brooklyn, N. Y., manufacturer of mixing and grinding machinery, has awarded a contract for the construction of a one-story brick addition, 50 x 85 ft., on Emerson Place, to cost about $8,000.

Corley, Williams & Dolan, Inc., New York, has been incorporated with a capital of $500 000 to manufacture machinery. D. J. Dolan, R. A. Corley, and H. D. Merchant, 149 Broadway, are the incorporators.

W. F. O'Keefe, E. E. Wright, and George G. Steigler, New York, have incorporated in Delaware the Sante Fe Motor Car Co., with capital of $1,000,000 to manufacture automobiles.

The W. F. Darby Co., Inc., New York, has been incorporated with a nominal capital of $5,000 to manufacture typewriters and writing machines E. K., J. F., and W. F Darby, Glendale, are the incorporators.

The Gore Aerocraft Corporation, Brooklyn, N. Y., has increased its capital from $250,000 to $3,000,000.

The Badgley & McCrary Co., New York, has been incorporated with an active capital of $10,000 to manufacture refrigerating and ice-making machinery. O. K. and T. J Badgley, and L. H. Miller, 61 Broadway, are the incorporators.

Arthur W. Britton, 65 Cedar Street, New York, and associates, have incorporated in Delaware the Continental Shipbuilding Corporation with capital of $1,200,000. John A. Moore, New York, is also interested.

The Bureau of Yards and Docks, Washington, D. C., is having plans prepared for the construction of new hydraulic plant additions to the structural and machine shops at the Navy Yard, Brooklyn, N. Y., to cost about $75,000.

The Multi-Life Tube & Rubber Co., Inc., New York, has been incorporated with a capital of $90,000 to manufacture rubber tires and tubes. C. B. Quick, C. W. Blanford, and I. D. Hamilton, 452 Fifty-sixth Street, Brooklyn, are the incorporators.

The Caledonia Bean Harvester Co., North Street, Caledonia, N. Y., manufacturer of harvesting machinery, has awarded a contract for improvements and extensions in its works, including a one-story assembling shop, about 30 x 114 ft., and the remodeling of its one-story foundry.

The Dilts Machine Co., 59-69 North First Street, Fulton, N. Y., manufacturer of paper and gate hoisting machinery, has had plans prepared for the construction of a new one-story hydroelectric power plant, about 20 x 35 ft., to cost $15,000. Frank Dilts is president.

The Tolhurst Machine Co., Sixth Avenue and Fulton Street, Troy, N. Y., manufacturer of machinery, has awarded a contract for the construction of a new one-story reinforced-concrete pattern shop and works building, about 40 x 60 ft., and 60 x 220 ft., respectively, at Green Island. C. H. Foster is president.

Fire, Aug. 30, destroyed the finishing plant of the Dovert Mfg. Co., Fifth Avenue and Sixteenth Street, Watervliet, N. Y., manufacturer of saddlery, hardware, etc., with loss estimated at about $55,000. The plant will be immediately rebuilt.

The Lockport & Ontario Power Co., Buffalo, will build an addition to its power plant, about 100 x 150 ft., at Lyons. R. A. Dyer is engineer.

The Curtiss Aeroplane Co., Churchill Street, Buffalo, has awarded a contract for the construction of new experimental works at Mineola, Long Island. The J. W. Cowper Co., Inc., Fidelity Building, Buffalo, is the contractor.

The school board, Buffalo, is arranging an appropriation of $27,000 for the installation of new machinery at the city vocational schools, including extensions required for the new equipment. At the Black Rock school, a new machine shop will be provided, including three engine lathes, drill press, tool grinders, and other machinery; new engine lathes will be installed at the Seneca school, as well as at the Elm vocational school. At this latter shop, new welding apparatus will be provided. A new machine shop and wood-working department will be arranged for School No. 17. Considerable equipment has been ordered. Edward D. Emerson is chairman of the board.

The American Ammunition Co., 25 Broad Street, New

York, will build a one-story brick addition to its works at Paulsboro, N. J., about 80 x 160 ft. Contract has been awarded.

The Standard Fuse Corporation, Paulsboro, N. J., has commenced the installation of new machinery at its works for the manufacture of cannon primers. The company is also planning for the erection of additions for the production of aeroplane parts.

The Eastern Tire & Equipment Co., Rutherford, N. J., has been organized to manufacture automobile tires. Rudolph H. Balzer, 22 Union Avenue, heads the company.

William Hauser, Bloomfield, N. J., and associates have incorporated in Delaware the Steelcrete Railroad Tie Co., with capital of $1,000,000 to manufacture steel and concrete railroad ties. George A. LeFevre, Richmond Hill, N. Y., is also an incorporator.

The Hyatt Roller Bearing Co., Middlesex Street, Harrison, N. J., has acquired a foundry building, about 100 x 175 ft., on Somerset Street, near Fourth Street, formerly occupied by Reuther Brothers, iron founders. It will be used as a works extension.

The F. & L. Mfg. Co., West Orange, N. J., has been organized to manufacture ash sifters, etc. Nathan Freedman, 588 Orange Street, Newark, heads the company.

The Pennsylvania Railroad Co., Pennsylvania Terminal, New York, has awarded a contract for the construction of new shop buildings at its Greenville Yards, Jersey City, N. J.

The Manhattan Electrical Supply Co., 45 Morris Street, Jersey City, N. J., manufacturer of electrical specialties, will make improvements and extensions in its plant to cost about $18,000.

The American Can Co., 120 Broadway, New York, has acquired a concrete factory building on Communipaw Avenue, Jersey City, N. J., fronting on the Lafayette Railroad, for a new plant.

The Asher Mfg. Co., Willimantic, Conn., manufacturer of laundry machinery, will erect a one-story plant, 60 x 208 ft., at 212 Coit Street, Irvington, Newark, N. J., to cost about $25,000.

The Oxford Mfg. Co., Newark, N. J., has been organized to operate a plant at 86 Frelinghuysen Avenue, for the production of automobile parts. William W. Schofield, 424 Belmont Avenue, heads the company.

The Gamon Meter Co., 282 South Street, Newark, manufacturer of water meters, will erect a two-story addition, about 31 x 85 ft., to cost $8,400.

The Crocker-Wheeler Co., Ampere, N. J., manufacturer of motors, generators and other electrical equipment, will erect a new five-story, reinforced-concrete plant, 100 x 200 ft., at Fourth Avenue and Twelfth Street, to cost about $163,000. The company has also acquired the plant of Edward Maher's Sons, iron founders, at 216 Berlin Street, Newark, and plans to improve and extend the works to increase the present capacity.

Bride & Tinckler, Newark, jewelry manufacturers, have filed notice of organization to operate their plant at 336 Mulberry Street. Charles C. Tinckler, 76 Maplewood Avenue, Maplewood, heads the company.

The Curtiss Aeroplane & Motors Corporation, Buffalo, is equipping its branch plant on the Niagara River for the manufacture of hydroplanes.

The Transcontinental Motor Truck Corporation, Buffalo, has been incorporated, with a capital stock of $1,250,000, by E. S. Stengel, R. A. Schmidt and P. J. Bloxham, to manufacture trucks, engines, motor boats, etc.

Ellis E. Lawton, Inc., Syracuse, has been organized with a capital stock of $25,000, to manufacture auto batteries and electrical and automobile supplies. E. E. Lawton, G. H. Beebe and L. S. Chapman, Syracuse, are the incorporators.

The American Brass Co. advises that it has no intention at present of building an addition to its Buffalo branch.

The Ross & Gade Co., Inc., 206 Canal Street, New York, has completed a new foundry and is specializing on work for pumps, valves, water filters, and brass and bronze fittings.

The Ericsson Mfg. Co., Buffalo, manufacturer of shop telephones, magnetos and other electric apparatus, has broken ground for an addition to its plant to increase its facilities for manufacturing the Berling magneto, for which a large demand has grown up for use on aeroplanes, automobiles and motor cycles.

The Pullman Co., Buffalo, has commenced work on additions to be made to its manufacturing and repair shops, at Broadway and the New York Central Railroad.

H. J. Gorke, Inc., Syracuse, has been incorporated with a capital stock of $50,000, to manufacture electrical goods, supplies, equipment, etc. H. J., K. S. and D. Gorke are the incorporators.

The Presto Machine Works, Inc., has taken new quarters at 124 and 130 Pearl Street, Brooklyn, N. Y., where it will have double its previous capacity for the production of gages and other tool room and contract work.

New England

BOSTON, Sept. 3.

The present record of plant additions and the formation of new corporations in New England is in marked contrast to that of one and two years ago when expansion was the rule in all the metal-working centers. The drop in new construction is not due, however, to a decline in the volume of business, for manufacturers in this section are working at the greatest capacity possible under the labor and transportation conditions. The draft has made itself felt among the skilled workers in many cities and will be a real factor in the production of munitions in Connecticut; so much so that the Connecticut Council of Defense has sent another protest to Washington, pointing out that the Government must quickly decide whether it most wants munitions or men from that State. A compilation of the results in 30 representative factories in Bridgeport and Fairfield County indicates that they will lose an average of 23 per cent of their skilled mechanics by the draft. This is due largely to the fact that the skilled men who rushed into this district last year and the year before, in response to the high wages offered, were the younger men who had no families to tie them to other places. The less skilled workers are for the most part aliens, which throws the burden of the draft upon the skilled element in the plants. A further increase in wages will be necessary to attract enough skilled men to replace those taken away, and this will probably cause a further demoralization of wage schedules in other sections, as was the case when the big Connecticut munitions plants were scouring the Eastern states for help in 1915 and 1916.

Changes in commodity rates on the Eastern railroads which have just been allowed will add to the cost of castings used in machine construction and the embargoes which have been such a drag upon industry for nearly two years are still a prominent factor in transportation of basic materials. The new rates affect aluminum, coal, coke, iron ore, pig iron, and iron and steel articles. The new rates on Southern iron from the Birmingham district are $4.60 per gross ton to Boston and Providence. To Springfield and Lowell, Mass., and Portland, Me., the rate is $4.50 per gross ton plus 40 cents per ton for handling at ports and 75 per cent of the present rate from the ports to the cities named. This amounts to an advance of about 25 cents per ton to Springfield or a total rate of $5.50 per ton. It is estimated that the advance will cost the Springfield foundries about $100 a day on the present volume of business.

There are a few strikes now on in machine tool plants, and meetings are being held in various cities that promise to lead to further demands that are almost sure to be resisted by manufacturers. About 3000 machinists, boilermakers and blacksmiths are on strike in the shops of the Boston & Maine Railroad and labor unrest is markedly on the increase generally.

The Worcester Machine Screw Co., Worcester, Mass., a branch of the Standard Screw Co., finding that it would take two years to secure equipment for the new factory which it proposed to build on land recently acquired on West Boylston Street, has decided to rush additions to its plant on Beacon Street. It will build a machine shop, 51 x 115 ft., three stories; a machine shop, 60 x 75 ft., one story; and a storage building, 42 x 45 ft., one story; all to be completed within 10 weeks. Additional equipment will be installed.

The Trumbull Electric Co., Plainville, Conn., electrical supplies, is building an addition, 50 x 100 ft., four stories, which will give it a total floor space of 110,000 sq. ft.

The Mystic Wire & Brass Works, Inc., 7 Water Street, Boston, has been incorporated with capital stock of $3,000 to succeed the Mystic Wire Works. The company has a factory at 135 Pierce Street, Malden, Mass. William H. Bibbey is president and Carl E. Nordblom, treasurer.

The additions under way at the Colt Patent Fire Arms Mfg. Co., Hartford, Conn., consist of two additional stories to a four-story building, 60 x 500 ft., and an additional story to a four-story building, 60 x 200 ft., with an ell, 23 x 50 ft.

The Spencer Specialties Co, Worcester, Mass., has been incorporated with capital stock of $50,000 by interests connected with the Spencer Wire Co., to manufacture metal products for use in musical instruments. George M. Thompson is president; Frank Kilmer, Worcester, treasurer; and Harry W. Goddard, president of the Spencer Wire Co., is a director.

The New Britain Tool Co., New Britain, Conn., is asking estimates on a factory, 50 x 100 ft., one story, which it contemplates building in the near future.

The Merrill Process Co., Boston, has been incorporated with authorized capital stock of $500,000 as machinery manufacturer and general contractor. The directors are Francis H. Swift, president; Fisher H. Nesmith, 84 State Street, Boston, treasurer; and A. G. Grant.

The Sullivan Machinery Co., Claremont, N. H., has awarded a contract for a factory, 80 x 121 ft., three stories, and for a three-story and a five-story addition to existing buildings.

The Colonial Brass Co., Middleboro, Mass., has been incorporated with authorized capital stock of $150,000 by John J. McCarthy, president; William B. Crossley, treasurer; and Gerard F. Shaw.

The Fuller Iron Works, West Exchange and Sabine Streets, Providence, R. I., is having plans drawn for an addition, 20 x 50 ft., one story, to be used as an annealing room.

The Wyman-Gordon Co., Worcester, Mass., has awarded a contract for a building, 36 x 40 ft., one story.

The H. & B. American Machine Co., Pawtucket, R. I., is to build a pattern storage building, 76 x 100 ft., two stories.

The Terry Steam Turbine Co., Windsor Street, Hartford, Conn., is planning to build an addition, 100 x 108 ft., one story, and an addition, 20 x 50 ft., two stories, to its office.

The Bullard Machine Tool Co., Bridgeport, Conn., has issued additional shares of stock to the amount of $110,000, making outstanding stock of $850,000.

The United Smelting & Aluminum Co., New Haven, Conn., has increased its capital stock to $400,000.

The American Chain Co., Bridgeport, Conn., is said to be planning for the establishment of a branch manufacturing plant near Norfolk, Va.

A two-story power house addition will be erected at the Northampton plant of the Nonotuck Silk Co., Florence, Mass.

The Standard Electric Time Co., Springfield, Mass., will build a three-story addition to its plant at 89 Logan Street, to cost about $25,000. H. V. Patterson, 187 Dunmoreland Avenue, is engineer.

Philadelphia

PHILADELPHIA, Sept. 4.

There are prospects of important industrial expansion in the Philadelphia territory as the result of efforts of the United States Government to increase ordnance production. A number of projects, as yet rather indefinite, are under consideration. The proposal of Secretary of the Navy Daniels to build 150 torpedo boat destroyers is of great interest to the machine-tool trade here, because it appears that many of these ships and their equipment of guns will be built at plants near by. Some of the guns will be shipped rough-bored to France and machined in plants in that country.

The Taylor-Wharton Iron & Steel Co. has purchased about $300,000 worth of equipment for forging and rough machining of guns at its Tioga plant, Philadelphia. The new equipment consists mainly of gun-boring and gun-turning lathes. Five cranes, two 10-ton, one 15-ton and two 20-ton, have been purchased from the Milwaukee Electric Crane & Mfg. Co. The Standard Steel Works Co., Philadelphia, has completed purchases of cranes and gun-boring and gun-turning lathes and planing machines for its plant at Burnham, Pa., where extensive additions are being completed to forge and rough-bore 6-in. howitzers.

The Tacony Ordnance Corporation has acquired a 22-acre site for its plant at Tacony, near Philadelphia, and has issued lists of about 50 machines and 21 cranes, which will be bought soon for turning out 9.5-in. guns. This company has the largest contract yet awarded by the Government for gun forgings, and will build its own open hearth furnaces. Purchases of hydraulic equipment will be concluded soon.

The Poole Engineering & Machine Co., Baltimore, is inquiring for equipment in anticipation of receiving a contract from the Government to machine 4-in. guns. This company only recently closed a contract with the Government for 700,000 1-lb. projectiles, as previously mentioned. Another Baltimore concern is also said to be expecting a similar gun contract.

The Pennsylvania Railroad Co.'s purchasing department is said to have closed for practically all of the equipment required for locomotive shops in France to be built for the United States Government. Quick deliveries were required, and many concerns were eliminated in the bidding, through inability to furnish machines within the time specified unless tools needed for other equally important Government work were commandeered. It is understood that the Niles-Bement Pond Co., Manning, Maxwell, Moore, Inc., the Gisholt Machine Co. and the Warner & Swasey Co. received a large share of the orders. It is now learned that the entire crane order went to the Cleveland Crane & Engineering Co., Cleveland, which agreed to complete the contract for 18 cranes in approximately 90 days. Shipment of the first cranes will be made Sept. 15, or 25 days after receipt of the order. Several of the cranes are of 65-ton capacity and 80-ft. span. In view of the congested condition of the raw material market, the Cleveland company will achieve a remarkable record in delivering these cranes within the time specified.

Shipbuilding will shortly take on a boom in the Philadelphia territory, the American International Corporation now having formally completed its contract with the Emergency Fleet Corporation to build 200 ships on Hog Island. It is said that 50 shipways will be built, and the corporation is expected to come into the market at once for cranes and other equipment. The Merchants' Shipbuilding Corporation, Bristol, Pa., which is an affiliation of the Chester Shipbuilding Co., with offices in the Finance Building, Philadelphia, has closed with the Edward F. Terry Mfg. Co., Grand Central Terminal, New York, for 24 overhead electric cranes of 15-ton capacity. The order amounts to about $1,125,000, which is a record size crane order. This concern will build 40 ships for the Government. Deliveries will be made within four months. The New Jersey Shipbuilding Co., associated with the Pennsylvania Shipbuilding Co. and the Pusey & Jones Co., with offices in the Land Title Building, has been making purchases for its new plant at Gloucester, N. J. The extent of the destroyer-building program of the Navy Department is indicated by the fact that the William Cramp & Sons Ship & Engine Building Co., Philadelphia, has contracts for 23 of these vessels and construction work will be rushed. The Cramp shipyard is in the market for five cranes to assist in this work.

The American Chain Co. will more than double the capacity of its York, Pa., plant. A new building, 70 x 420 ft., is being erected. Purchases of equipment are being made by A. C. Campbell, Inc., Waterbury, Conn. F. C. Yeates, 1325 Chestnut Street, Philadelphia, is purchasing for the new machine shop which the Midvale Steel Co. will build at Nicetown, Pa. The Standard Fuse Corporation at Paulsboro, N. J., will resume operations, it is reported, and several additional buildings will be erected. The concern will make airplane parts, a contract having been already received, according to report. The Frankford Arsenal will build a new shell plant, as well as the fuse plant, mention of which was made last week, though matters are said to be still in a rather indefinite state. The Westinghouse Electric & Mfg. Co. is installing new equipment in its new plant at Lester, Pa., and is reported to be still buying. This plant will make turbines for the United States Government. The De Laval Steam Turbine Co. is building an addition at its Trenton, N. J., plant and will need additional equipment. The Autocar Co., Ardmore, Pa., will buy some new machine tools for additions to its plant.

The Merchant Shipbuilding Corporation, Finance Building, Philadelphia, operated by the same interests conducting the Chester Shipbuilding Co., Chester, Pa., is making rapid progress in the construction of its new shipbuilding plant at Bristol, Pa., heretofore announced as being built under the direction of the Chester company. The plant will be equipped to construct 40 fabricated steel freighters, each of 9000 tons capacity, contract for which has been received. Extensions are under way at the Chester works to provide for increased capacity to handle recent orders. W. T. Thomas is general manager; Charles P. M. Jack is consulting engineer.

The Tacony Steel Co., Milnor and Bleigh Streets, Philadelphia, has had plans prepared for an addition to its plant for the manufacture of munitions. The company is said to be planning for the immediate construction of the proposed new forging plant to be operated by its subsidiary, the Tacony Ordnance Corporation, recently organized.

The Pearce-Arrow Tire & Rubber Co., 932 North Broad Street, Philadelphia, a Delaware incorporation, has increased its capital from $500,000 to $1,000,000. Notice has also been

filed of the change of name to the Pearce Rubber Corporation. The company is having plans prepared for the erection of a new two-story plant at Twenty-first and Lippincott streets, to cost about $150,000. J. Osborn Hunt, 114 Montgomery Street, Trenton, N. J., is architect.

F. R. Hansell, Philadelphia, and associates, have recently incorporated in Delaware the Talking Machine Sales Corporation with capital of $50,000 to manufacture talking machines, etc. S. C. Seymour, Camden, N. J., is also an incorporator.

The Philadelphia Drying Machine Co., Philadelphia, will build a new one-story power house addition to its plant at Stokely Street.

The General Pressed Metal Co., American and Diamond streets, Philadelphia, manufacturer of stamped metal specialties, has acquired a new factory at 1524-28 North Hancock Street, as an addition to its plant.

The American Steel & Wire Co., Hamilton Avenue, Trenton, N. J., has awarded a contract for the construction of its proposed new machine shop and wire rope mill on South Broad Street, at a cost of about $50,000. The structures will be 50 x 70 ft., and 100 x 310 ft., respectively. The J. H. Morris Co., Trenton, is the contractor.

The Department of Public Property, Camden, N. J., has awarded a contract for the construction of a one-story machine shop, about 38 x 110 ft., at Fifth and Arch streets, for municipal work.

The Stanton & Lewis Forge Co., Camden, N. J., will build a one-story brick addition to its foundry at German and Everett streets.

The Sun Shipbuilding Co., Chester, Pa., has awarded a contract to Barclay White & Co., 1530 Chestnut Street, Philadelphia, for the erection of two one-story additions to its plant, about 50 x 95 ft., and 26 x 83 ft., to cost $10,000.

The American Car & Foundry Co., Milton, Pa., is planning for the construction of additions to its local plant, including the installation of new machinery. Improvements will also be made in working conditions, including drinking fountains, lockers, etc., to cost about $30,000. The company is making rapid progress in the erection of an addition to its works at Berwick to provide for the installation of new machinery.

The Danville Structural Tube Co., 603 East Market Street, Danville, Pa., manufacturer of rolled pipes, tubing, etc., has completed the installation of a new machine shop. The company has also installed a new tube rolling single turn system, employing three furnaces instead of two as heretofore.

W. H. Nicholson & Co., 12 Oregon Street, Wilkes-Barre, Pa., manufacturer of machine tools, etc., has awarded a contract for the construction of a new one-story machine shop, about 50 x 120 ft., to cost about $15,000.

The La Lance & Grosjean Mfg. Co., Division Street, Harrisburg, Pa., manufacturer galvanized and enameled ware products, is said to be planning for the operation of an additional mill to increase its capacity.

Baltimore

BALTIMORE, MD., Sept. 4.

The Hall Steamship Co., Washington, has been incorporated in Delaware with a capital of $500,000 to operate a shipbuilding works. Madison Hall, C. N. Riker and S. W. Harrington, Washington, are the incorporators.

The Bureau of Yards & Docks, Washington, is preparing plans for a new five-story pattern shop, six-story machine shop, steel forging works and brass foundry, with other structures, to be erected at the Navy Yards on the Atlantic Coast. F. R. Harris is chief of the bureau.

The Baltimore Buggy Top Co., 107 Mount Royal Avenue, Baltimore, is arranging revised plans for its proposed new two-story reinforced-concrete plant, about 75 x 120 ft. Clyde N. Friz, Munsey Building, is the architect.

The Safety Sales Co., Lexington Street Building, Baltimore, is planning for the establishment of a new tin and metal-working plant near Lingo City, N. C. It will specialize in the production of cans and allied products.

The Bethlehem Steel Co., Bethlehem, Pa., is having plans prepared for a one-story addition, 60 x 250 ft., to its works at Sparrows Point, Md.

The American Shipbuilding Co., Richmond, Va., is said to be planning for the construction of a steel fabricating works for ship construction in connection with its proposed new shipbuilding plant. The headquarters of the company are at 11 Broadway, New York. S. H. Brown is president.

The Naul Shipbuilding Co., Wilmington, N. C., recently incorporated with a capital of $125,000, has acquired a site on the Northeast River for its proposed new shipbuilding works. A. P. S. Naul heads the company.

Chicago

CHICAGO, Sept. 4.

Small tools have begun to move in good volume in this territory, the bulk of the deliveries being to miscellaneous industries. The Government is more active in its purchases made through Washington, although up to the present time it has been calling chiefly for small tools, such as drilling and hand-milling machines, etc. Within the next few weeks a rush of war buying is expected which will put activity here more in line with that prevailing in the East. Existing plants now on war work have been adding to their equipment. Representatives of Ohio tool builders have been shipping some of their stock to Eastern points to facilitate deliveries. Despite the absence of orders, which are sensational in point of size, some of the local dealers, in the month just closed, did the best business in their history.

The Minneapolis Steel & Machinery Co., Minneapolis, Minn., has taken a Government order for 2000 6-in. shells, but will not be in the market for many tools as it finished a similar order for British shells last spring. Since that time it has converted its munitions shop into an assembly room for its tractors, and it will therefore build a shop, 132 x 432 ft., to cost $15,000 in which it will machine shells to fill the order. It also has contracts for steam hoists for ships, and expects more as the Government shipbuilding program advances.

The Government is purchasing a vast amount of army supplies such as foodstuffs, wearing apparel, etc., in Chicago and the Central West, all of which will have an indirect bearing on the demand for metal-working machines. When this indirect demand fully develops it will have to be cared for largely with second-hand machines, for the reason that manufacturers of guns and shells will be given priority; in fact, that is being done at present. The War Department will expend between $200,000 and $300,000 in the construction of warehouses at what formerly was the Hawthorne race track, Chicago. It is understood that three long brick buildings will be erected.

L. G. Hallberg & Co., architects, 116 South Michigan Avenue, Chicago, are preparing plans for a three-story reinforced concrete factory, 50 x 320 ft., for the Wall & Rentschler Tractor Co., Hamilton, Ohio.

The Union Special Machine Co., H. A. North, president, 300 West Kinzie Street, Chicago, is having plans prepared for an eight-story reinforced concrete factory, 100 x 100 ft., to cost about $125,000.

Bids have been taken on a one-story foundry, 60 x 120 ft., for the Monighan Foundry Co., 2123 Carroll Avenue, Chicago, to be of mill construction with steel trusses.

It is announced that the Rustler Mfg. Co., Piqua, Ohio, maker of sugar beet harvesting machinery, will locate in Freeport, Ill., occupying a building formerly used by the Stover Motor Car Co.

The Harrington & King Perforating Co., 616 North Union Avenue, Chicago, will build a one and two-story building, 400 ft. in length, for factory purposes, and to cost about $100,000 on the half block between West Taylor and Arlington Streets, and South Campbell Street and the B. & O. Railroad tracks, Chicago. The land has just been purchased from the Hurley Machine Co., which bought the site for building purposes, but decided to build elsewhere.

It is reported that the extensions to be made by the Gary Screw & Bolt Co., Gary, Ind., will cost more than $250,000, instead of $100,000, as previously reported. Several new buildings will be erected.

The Illinois Silo & Tractor Co., Bloomington, Ill., has started the construction of a one and two-story factory, 120 x 220 ft., the one-story portion having a roof of saw-tooth construction. A tractor cultivator will be manufactured.

The Galesburg Machine Works, Galesburg, Ill., will occupy space in a two-story and basement garage, 115 x 132 ft., to be constructed in that city by Peterson Brothers at a cost of $55,000. The building will also be used for a taxicab service and automobile salesroom.

The Landover Auto Truck Co., 343 South Dearborn Street, Chicago, is raising a fund of $25,000 for the manufacture of the Landover truck. A preliminary fund of $250,000 has already been raised.

The Albert Lea Sprayer Co., 309 West Main Street, Minneapolis, Minn., manufacturer of sprayers, bucket and barrel pumps, whitewashing machines, etc., has purchased a site and will erect a three-story and basement factory, 54 x 110 ft.

The Waterloo Gas Engine Co., Waterloo, Iowa, contemplates building a new foundry, 150 x 600 ft., and making other improvements which will cost about $200,000. Grading operations are in progress, and work will be started this fall if possible.

The Iowa Can Co., Davenport, Iowa, has been incorporated with a capital stock of $100,000 to manufacture cans and containers of metal and other materials. C. M. Rich is president, Charles Shuler, treasurer, and D. R. Lane, secretary.

Sales of the Howe detachable tongue truck reported in the last few weeks by the Abell-Howe Co., Chicago, aggregate some 250 trucks. The orders were largely for the complete equipment of plants, including those of the Saginaw Malleable Iron Co., Chicago Malleable Iron Co., American Radiator Co., Buffalo plant, and the Rockford Malleable Iron Co.

The Torcrete Shipbuilding Co., Chicago, recently organized, is said to be negotiating for a site near Detroit, Mich., for a new shipbuilding plant to specialize in the construction of cargo steamships.

The Union Special Machine Co., West Kinzie Street, Chicago, is having plans prepared for a new eight-story plant. H. A. North is president.

The Peoria Malleable Casting Co., Peoria, Ill., has awarded a contract for the erection of a one-story addition to its plant, about 500 x 1200 ft. L. E. Robey is president.

Milwaukee

MILWAUKEE, WIS., Sept. 3.

Industrial expansion continues at an unprecedented rate in all metal-working centers in Wisconsin. While some of the new work is due to demands from private sources, the bulk is for the enormous requirements of the Government. Various industries are undergoing a rapid readjustment from a private to a war supply business, and a great demand has arisen for machine-tools. Local tool builders continue to book orders at a rate that never before was known, in spite of the fact that on ordinary machines delivery cannot be made for eight to nine months, excepting on bookings where Government orders have priority.

The scrap metal business in this State has grown to enormous proportions the past six months, and not only are dealers building large warehouse and shipping facilities, but many new companies are entering the field. The entire northwestern territory is being combed by these dealers, and middle western foundries are being supplied in large volume. The search for scrap extends to the farms, where every piece of metal that has been accumulating for years is being gathered for remelting.

The Cruiser Motor Car Co., Madison, Wis., incorporated under the laws of Maine with a capital stock of $250,000 will erect a plant for the manufacture of an automobile which may be converted from a roadster or touring car into a complete outing or camping outfit. The officers are: President, W. D. Curtis, Madison; vice-president and general manager, Winthrop J. Burdick, Chicago; secretary, Dwight S. Bobb, Chicago; treasurer, George C. Riley, Madison. Mr. Burdick was formerly treasurer and sales manager of the New Era Engineering Co., and Mr. Bobb is a member of Adams, Crews, Bobb & Westcott, financial and corporation lawyers. The directorate includes C. A. Schimberg and E. J. Haines, Chicago, who will be sales managers. About $100,000 will be invested in buildings and equipment.

The Racine Auto Tire Co., Racine, Wis., has purchased the group of factory buildings at State and Marquette streets, formerly occupied by the Fish Brothers Wagon Company, and is remodeling the plant into a tire and rubber goods factory, which will employ between 500 and 600 operatives and afford an area of 250,000 sq. ft. The company last fall purchased about 14 acres, and had completed plans for the erection of a new plant costing $150,000 or more, when it was enabled to purchase the Fish wagon works from the present owner at a price said to be $200,000. So far as can be learned the new construction scheme will now be postponed indefinitely. L. J. Elliott is president and general manager.

The Jorgensen Mfg. Co., Waupaca, Wis., has been incorporated with a capital stock of $75,000 to manufacture machinery, tools, etc. The incorporators are P. J. Jorgensen, A. K. Jorgensen and C. H. Jorgensen.

The Hayes Machine Co., Oshkosh, Wis., which decided to devote most of its attention to the production of automobile axles, gears, transmissions, etc., several months ago, is reported to be preparing to move its plant and offices to Grand Rapids, Mich. It is stated that the company is being reorganized under the name of the E. B. Hayes Axle Co., with a capital stock of $500,000 and that a plant is now being completed for occupancy.

The Globe Seamless Steel Tubes Co., Milwaukee, has awarded the general contract for the erection of a brick and steel shop addition, 50 x 500 ft., one story. This is part of the enlargement scheme which will increase the capacity of the plant from 40 to 50 per cent. F. J. O'Brien is general manager.

The Milwaukee Motor & Supply Co., 720 Merchants & Manufacturers' Bank Building, Milwaukee, will remodel the building on Second Avenue, near Canal Street, into a factory and office building.

The West Bend, Wis., Aluminum Co., West Bend, Wis., has awarded contracts for the erection of a three-story ell-shaped addition, 72 x 190 ft., and a one-story auxiliary building, 50 x 60 ft., to the Federal Engineering Co., 218 Stephenson Building, Milwaukee. The additional facilities will enable the company to increase its production 75 to 100 per cent.

The Challoner Co., Oshkosh, Wis., manufacturer of sawmill machinery and general mill and factory equipment, is dismantling its foundry and turning it into a plant for the manufacture of anti-skid devices. Henceforth the company will devote most of its attention to horseshoe and anti-skid tire chains. George S. Evefhart is vice-president and general manager.

The Steiner Mfg. Co., Plymouth, Wis., manufacturer of stationary and portable gasoline and oil engines, has been reorganized as the Plymouth Motor Mfg. Co. and the number of directors increased from five to seven. Its production will be enlarged at once.

The Townsend Mfg. Co., Janesville, Wis., has been incorporated with a capital stock of $125,000 to succeed to the business of Townsend Brothers, who established a plant about 18 months ago for the manufacture of tractors, farm implements and power agricultural tools and machinery. The incorporators are R. C., G. E. and R. B. Townsend.

The Burlington, Wis., Motor Truck Co., Burlington, Wis., organized recently with a capital stock of $50,000, has leased manufacturing quarters and will build 600 commercial car units for attachment to Ford chassis by Jan. 1, 1918. The design employs the Torbensen internal gear drive rear axle. A Chicago office has been opened at 160 West Jackson Boulevard.

The Hydro-Hoist Co., Milwaukee, has been incorporated with a capital stock of $25,000 by Frank A. Tuschen, Cornelius Wolf and Albert Heinemann to manufacture hydraulic hoists.

The Arrow Fuse & Mfg. Co., 2416 North Avenue, Milwaukee, has changed its corporate style to Trisco Fuse & Mfg. Co., and increased its capital stock from $35,000 to $45,000.

M. E. Vierheilig, architect, 764 Thirty-second Avenue, Milwaukee, has plans in process for a two-story factory costing about $25,000. The owner and location are withheld for the present.

The Northern Furniture Co., Sheboygan, Wis., is taking bids until Sept. 15 for the construction of a six-story addition, of brick and reinforced concrete, costing about $75,000. W. C. Weeks is the architect.

The Davis Mfg. Co., Milwaukee, manufacturer of gasoline and oil engines, has awarded a contract for the erection of a new core building, 92 x 100 ft., of reinforced concrete and brick.

The board of industrial education, Fond du Lac, Wis., has purchased a building which it will remodel into a central continuation school. Manual training equipment will be purchased.

The Universal Motor Co., Oshkosh, Wis., has increased its capital stock from $25,000 to $50,000 and intends to double its output of electric lighting units designed especially for army field service. Louis J. Monahan is president.

The Benson Speed Signal Co., Madison, Wis., has been incorporated with a capital stock of $100,000 to manufacture signal devices for automobiles, motor boats, railroads, vessels, etc. The incorporators are Hal Martin, A. D. Campbell and Louis Weidenback.

Detroit

DETROIT, Sept. 3.

Conditions in the machine-tool market remain about stationary with the expansion of the aeroplane motor industry holding the center of attention. Government orders for motor trucks have given unusual stimulus to the motor car trade in general.

The Chalmers Motor Corporation, Detroit, has leased its plant to the Maxwell Motor Co. for five years to enable the working off of a large supply of materials. The Chalmers company proposes to issue $3,150,000 first mortgage notes to meet old obligations.

The Olds Motor Works, Lansing, Mich., is increasing its floor space four acres by the erection of new buildings costing $400,000.

Alterations are being made to the plant of the Saginaw Auto Body Co.

Manager Charles F. Drozeski announced that the Saginaw Malleable Iron Co. will be ready for operation the first week in September. Shipments of materials have held back operations.

The Riverside Machine & Plating Co., Jackson, Mich., has changed its name to the Riverside Machine Co.

The Valley City Machine Co., Grand Rapids, has purchased the plant of the Sintz Gas Engine Co.

A six-acre factory site on the Detroit Terminal Railroad has been purchased by the Gray Motor Co., manufacturer of gas engines. Three buildings are being erected, of which the machine shop, 64 by 256, is now nearing completion. Machinery is being purchased for a production of 50 engines a day.

The Anderson Forge & Machine Co., Detroit, is making alterations to its plant.

The Marshall Blow Pipe Co., Detroit, manufacturer of dust-collecting machinery, is erecting a new plant.

The Manistee Shipbuilding Co., Manistee, Mich., will begin operations Oct. 1. An order for $60,000 worth of machinery has been placed for delivery this month.

The Lakey Foundry & Machine Co., Muskegon, is building an addition to its plant to triple its capacity.

Novo Engine Co., Lansing, has increased its capital from $112,000 to $675,000.

The Gas Oil Stove Co., Detroit, has increased its capital from $100,000 to $200,000.

The Valley City Machine Works, Grand Rapids, Mich., is building a two-story addition to cost $2,000.

The Air-O-Flex Automobile Corporation has been incorporated for $2,500,000 to manufacture trucks equipped with suspension cylinders in place of springs. G. M. Walker is president.

The Muskegon Engine Co., Muskegon, Mich., will begin the production of 2-ton trucks Oct. 1.

The Victor Wire Wheel Co., Kalamazoo, Mich., has been organized with a capital of $500,000 to manufacture motor car parts and aeroplanes.

Organization of the Lincoln Motor Co., Detroit, with capital stock of $500,000, to manufacture aeroplane engines for the Government has been completed by Henry M. and Wilfred C. Leland, former president and general manager, respectively, of the Cadillac Motor Car Co., Detroit. The company has acquired several acres embracing the buildings formerly occupied by the Rands Mfg. Co., to which additions are being made. Machinery is being installed and 100 men will be employed with the prospect of this number being increased to 2000. Production will start with 20 engines and gradually work up to 100. The completed machines will be shipped to France as fast as turned out.

Associated with the company are W. H. Murphy, Joseph Boyer, John Trix, George H. Layng, W. Rex Johnston, A. U Widman, Ernest E. Sweet, Le Roi J. Williams, D. T. Randall, J. Wilbur Brown, M. W. H. Wilson and other motor car engineering experts.

Plans are being prepared for a machine-shop extension, 65 x 75 ft. for the Duplex Motor Co., Lansing, Mich.

The Benton Harbor Auto Machine Co., Benton Harbor, Mich., has been incorporated with a capital stock of $175,000 to take over the business of the Morrill & Morley Mfg. Co., and the Electric Specialties Mfg. Co. J. M. Klock is president, and R. C. Eisley, manager.

The Muskegon Engine Co., Muskegon, Mich., has let the contract for a factory, 75 x 160 ft., to cost $25,000, for the manufacture of a 2-ton commercial truck, and by Oct. 1 it expects to be producing at the rate of 25 trucks a month. The company has a capital stock of $150,000.

The C. R. Wilson Body Co., Detroit, Mich., has partially completed a new wood-working plant at Bay City, Mich., for the manufacture of automobile bodies. It will be at full operation Sept. 15 and will largely increase the capacity of the company's assembly plants.

Cleveland

CLEVELAND, Sept. 4.

Business in machine tools was heavy the past week, although no large new lists came out. Buying is almost wholly for Government work, the greater part at present being for shell and gun work. Some machine tool builders are unable to give preference any longer to orders for machines for Government work, as early deliveries on one machine would set back the shipment on a machine going to another customer with a Government order. On inquiry for two milling machines, an eastern manufacturer was unable to promise shipments until next June. A large amount of inquiry is pending for machines for making airplanes and airplane parts, but the placing of orders is held up until Government airplane contracts are placed. The Defiance Machine Works, Defiance, Ohio, which is building a large addition to its plant, placed orders the past week for 20 to 30 machines. The Hampton Roads Shipbuilding & Dry Dock Co., Citizens Building, Cleveland, will shortly purchase about 40 machines for shipbuilding and a number of cranes for a large plant to be erected at Norfolk, Va. The Erie Forge Co., which recently purchased considerable equipment for plant extensions and which has orders for a large amount of gun forging work, is planning further extensions to its plant and is inquiring for additional machinery.

The demand for turret lathes has so far not been greatly stimulated by Government requirements, owing doubtless to the large number of lathes used in the manufacture of shells for the Allies, contracts for which were mostly completed about the time our Government entered the war. Very few boring or turning machines have been purchased for work on 3-in. shells for the Government. A large amount of second-hand machinery is being thrown on the market by Canadian plants, presumably by companies that have not secured additional munition contracts.

The Hampton Roads Shipbuilding & Dry Dock Co., Norfolk, Va., has been organized by Cleveland men, with a capital stock of $1,000,000, to erect a shipbuilding plant at Norfolk. Gaylord W. Feaga is president, J. D. Carey, vice-president, and J. T. Sweeney, secretary and treasurer. The company is at present working on the details for its plant, which it is stated will be of large capacity. It will shortly be in the market for shipbuilding equipment, including machine tools and cranes. The present headquarters are at the offices of the Gaylord W. Feaga Co., Citizens Building, Cleveland.

The Glenn L. Martin Co., Cleveland, has been organized with a capital stock of $2,000,000 to build a plant to manufacture airplanes. G. L. Martin, formerly vice-president of the Wright & Martin Aircraft Co., New York, will be general manager and vice-president. Charles E. Thompson, president Steel Products Co., Cleveland, is president.

The Cleveland Switchboard Co. will erect a new factory, one-story, 80 x 140 ft., at 2925 East Seventy-ninth Street, Cleveland.

The Burdett Oxygen Co. has leased a building at Lakeside Avenue and East Thirty-third Street, Cleveland, in which it will establish a plant for the production of oxygen for factory purposes.

The United States Tool Co., which recently acquired a site for a plant at 3140 West 106th Street, Cleveland, will build a brick factory, 60 x 200 ft.

The Fulton Foundry & Machine Co., Cleveland, has increased its capital stock from $50,000 to $200,000.

The Barger Sheet Metal Co., Cleveland, has been incorporated with a capital stock of $10,000 by Sterling Parks and others.

The Grabler Mfg. Co., Cleveland, maker of pipe fittings and other products, will erect an addition, 66 x 104 ft.

The Benoist Airplane Co., Canton, Ohio, which has been incorporated with a capital stock of $500,000, has an option on a factory site for the erection of a plant. It is reported that the company has not definitely decided whether to erect its plant in Canton or in Sandusky, Ohio, where it is now located in the plant of the Roberts Motor Co. It is stated that plans are being considered for the erection of two steel buildings, each 100 x 300 ft.

The Sunbury Mfg. Co., Sunbury, Ohio, maker of handling equipment, will build a new one-story factory, 70 x 120 ft. Some additional equipment is being purchased.

The Wapakoneta Mfg. Co., Wapakoneta, Ohio, recently organized to manufacture automobile accessories, plans the erection of a plant, 50 x 75 ft.

The White Motor Co., Cleveland, has nearly completed a machine shop addition, 120 x 500 ft., at a cost of $300,000.

The Defiance Machine Works, Defiance, Ohio, is expanding to twice its present size and is advertising for 200 to 300 skilled mechanics. In addition to being rushed with orders for their regular line of tools the company has been awarded a large Government contract which necessitates the erection of additional buildings. It has purchased two adjoining blocks of land and construction work is under way.

The Turnbull Wagon Co., Defiance, has been taken over by a new organization, headed by W. O. Allen, Fostoria, Ohio, with a capital of $1,000,000. Motor trucks will be manufactured.

The Defiance Screw Machine Products Co., Defiance, has started operations on an extension that will double its capacity, and employ more men.

Indianapolis

INDIANAPOLIS, Sept. 3.

The Marsh Mfg. Co., Vincennes, Ind., has been incorporated with $25,000 capital stock to manufacture metal and wood products. The directors are Harry B., E. L. and John R. Marsh. The company has a $1,000,000 Government contract and is completing the equipment of a plant.

The Luther Roller-Shovel Co., Indianapolis, has been incorporated with $25,000 capital stock to manufacture shovels and machinery. The directors are Clevia J. Luther, Wasson, Ill.; Louis N. Parish and Robert Hargis, Harrisburg, Ill.

The Stout Furniture Co., Brazil, Ind., has been incorporated with $30,000 capital stock to manufacture furniture. The directors are Arthur L. Stout, Charles C. Rhetts and Samuel E. Stout.

The Jenkins Vulcan Spring Co., St. Louis, is to move its plant to Richmond, Ind., where factory buildings will be erected, following the taking of $100,000 of stock in the company by Richmond investors.

The Lexington Motor Co., Connersville, Ind., manufacturer of motor-driven and other vehicles, has incorporated with $1,800,000 capital stock. The directors are Andrew H. Rieman, Benjamin F. Thiebaud, Charles Cassel, E. Ralph Himelick and Allen Wiles.

The Weidely Motor Co., Indianapolis, has entered into a contract with the Cleveland Tractor Co., Cleveland, amounting to $3,000,000, to manufacture tractor motors for a period of three years. The Weidely company manufactures automobile and aeroplane motors. Edward Showers is president and G. A. Weidely is vice-president.

The Peerless Wire Goods Co., Lafayette, Ind., suffered a loss of $25,000 by fire Aug. 30.

The Butler Mfg. Co., which moved to Indianapolis from Knightstown, Ind., over a year ago, has increased its capacity 70 per cent, and will add to its equipment in the immediate future. It makes and grinds pistons and cylinders.

Cincinnati

CINCINNATI, Sept. 3.

Government orders have been placed quietly with a number of local manufacturing firms, but this does not represent all of the business that has recently been booked by machine tool builders. The Norfolk & Western Railroad Co. has been in the market, mostly through dealers, for a number of lathes and other machine tools. Prospective business from aeroplane manufacturers is large, and orders exceed the public's estimates. A firm in Erie, Pa., having a contract for aeroplane motors, is in the market for machine tools, including several lathes. Shapers are not in very good demand, but orders now in hand will carry makers over the remainder of the year.

The Cincinnati Building Commissioner's report for the month of August shows that the total building improvements figured over $300,000 below the corresponding month of 1916. The total cost for improvements, however, for the first eight months of 1917 is nearly $1,000,000 in excess of last year's estimate for the same period. The total for the eight months of 1917 is $8,374,820 and for 1916 $7,387,445.

The Carlton Machine Tool Co., Cincinnati, has finished the removal of its equipment from its plant in West End to its new building on Spring Grove Avenue.

The Reliance Engineering Co., Cincinnati, has awarded contract to the M. Marcus Building Co. for a three-story structure, 75 x 100 ft. Part of the building will be used as a garage, and a repair shop will be operated in connection.

The Monitor Stove & Range Co., Cincinnati, has let contract to the City & Suburban Building Co., for a one-story addition, 80 x 325 ft. This building will constitute the second addition to the Monitor plant made this year.

The proposed addition to the foundry of the Bauer Brothers Co., Springfield, Ohio, will be 80 x 150 ft., of steel and concrete.

The Kelly-Springfield Motor Truck Co., Springfield, Ohio, has plans under way for an addition to its plant that will enable it to greatly increase its output of motor trucks. The company recently received a Government order for 1200 trucks.

The Automatic Control Trailer Co., Columbus, Ohio, will add to its manufacturing facilities.

The Ebinger Sanitary Mfg. Co., Columbus, Ohio, is moving equipment into its new foundry and expects to have it in full operation within 10 days.

A report from the Long & Allstatter Co., Hamilton, Ohio, pioneer maker of punching and shearing machinery, shows that the demand is very good. The plant is working on full time and with a full force. Tentative plans are under way for building an addition.

The Columbus Steel Products Co., Columbus, Ohio, has been incorporated with $50,000 capital stock by S. A. Webb and others. Nothing is yet known as to the company's manufacturing plans.

A large repair shop will be fitted up in connection with the plant of the Ortman Motor Co., Washington Courthouse, Ohio, now nearing completion.

The new electric light and power plant at London, Ohio, will soon be in operation. It is reported that a number of small manufacturing plants in that city will be operated by electric motors in the future.

The Central Machine Shop, Urbana, Ohio, is a new partnership composed of William Foth, R. G. Jacobson and F. C. Berry. A shop will be installed to do repair work.

The Stowers Lumber & Mfg. Co., Harriman, Tenn., is inquiring for one 25 hp., 60 cycle, three-phase motor to operate at 900 r.p.m., and one 15 hp. motor to operate at 650 r.p.m., both for alternating current.

The Standard Stamping Co., formerly of Marysville, Ohio, is sending out notices of removal to a new location in Huntington, W. Va. The building is 110 x 200 ft., two stories, of day-light construction, equipped with every convenience for manufacturing. The location is three acres in extent, situated on the main line of the C. & O. Railroad in the heart of the city of Huntington.

The Bauer Brothers Co., Springfield, Ohio, maker of sugar and crushing machinery, will make an addition to its plant that will be 80 x 150 ft., one story, and of concrete and steel construction.

The Buckeye Steel Castings Co., Columbus, Ohio, is making extensions at its plant to handle an order recently received from the War Department.

The Central South

LOUISVILLE, KY., Sept. 3.

Business in this immediate locality is rather slow, but local houses are booking liberal orders from outside territories. Mill supplies and machinery lines are in good demand. A dearth of competent labor continues.

The Roy C. Whayne Supply Co., Louisville, is in the market for a 3-drum steam hoisting engine, 8 x 10 in. or larger, and is asking prices on a belt-driven air compressor with a capacity of 200 to 350 cu. ft. per minute.

The American Metallic Packing Co., Lexington, Ky., is in the market for a second-hand locomotive crane, specifications not stated.

The John G. Duncan Co., Knoxville, Tenn., is asking for dealers' prices on a second-hand, 6 to 8-hp., stationary horizontal or vertical engine.

Edith W. Cooper, 148 Fourth Avenue, Nashville, Tenn., is in the market for a ball or tube mill, 4 ft. in diameter and 6 to 8 ft. long.

The Standard Welding Co., Louisville, Ky., has been organized to operate a local plant. Christine G. Cottell heads the company.

St. Louis

ST. LOUIS, Sept. 3, 1917.

The local machine tool market, except for the urgent presssure of delivery of tools contracted for, is almost at a standstill, chiefly due to uncertainties as to the future and the inability to get equipment that might be needed. Plants which have taken over Government munitions contracts are equipped to handle them without adding to their machinery. The financial situation is very good, with money plentiful and comparatively easy.

T. S. Reed and others, DeRidder, La., will rebuild their electric light and power plant destroyed by fire, with a loss on machinery of $15,000.

The Yazoo & Mississippi Valley Railroad, Greenwood, Miss., A. H. Egan, Memphis, Tenn., general superintendent, will build a power house and machine shop.

The Glover Machine Works, Marietta, Ga., is arranging for the construction of its new steel foundry and forge shop, to include a new electric furnace installation.

The Lake Charles Iron Works, Lake Charles, La., is planning for the construction of additions to its plant to cost about $25,000. The structures will include a one-story machine shop, about 60 x 100 ft.; blacksmith shop, 50 x 90 ft.; foundry, about 50 x 100 ft.; and locomotive repair shop, 30 x 50 ft. Frank Warren is general manager.

The Williams Mill Mfg. Co., Texarkana, Ark., has been incorporated with a capital stock of $100,000 by James Sedberry, H. M. Barney, and others, to build a foundry and machine plant.

The Geronimo Motor Co., Enid, Okla., will install a foundry for making malleable castings, utilizing gas heat.

The People's Refining Co., Ringling, Okla., E. D. Smith, Insurance Building., Oklahoma City, Okla., manager, will equip an oil refinery with four boiler stills, one steam still, two 125-hp. boilers, steam pumps, power house, etc., at a cost of about $65,000 for machinery.

The Fort Smith Metal Products Co., Fort Smith, Ark., has increased its capital from $50,000 to $100,000, and will install additional metal-working equipment.

The Tupelo Elevator Co., Tupelo, Miss., is receiving bids for elevator and grist mill machinery, as well as power plant equipment for a daily capacity of 40,000 bu.

The Sun Light Carbon Co., Ardmore, Okla., will equip a plant to manufacture carbon projectors, increasing its capital from $75,000 to $225,000.

The Uttz Mfg. Co., Kansas City, Mo., will equip a plant at Sapulpa, Okla., for the manufacture of automobile accessories and mechanical novelties.

Altus, Okla., will equip a waterworks pumping station and distributing plant at a cost of about $400,000.

Lafayette, La., F. E. Girard, mayor, is receiving bids for a sewage disposal plant including settling tank, contact beds, sludge bed, emergency pumping station, etc.

The Unit Contruction Co., contracting engineer, Title Guaranty Building, St. Louis, has been awarded contract for the design and construction of a reinforced concrete trestle and ore bins for the St. Joseph Lead Co.'s smelter at Herculaneum, Mo., to cost approximately $150,000.

Texas

AUSTIN, Tex., Sept. 1.

The machinery and tool trades show improvement over what they have been for the last two or three years.

H. Wagner & Sons, San Antonio, have been incorporated with a capital stock of $15,000 to manufacture doors and sashes, etc. R. L. Evans, San Antonio, is a stockholder.

The Stone Tractor Mfg. Co., Quincy, Ill., which has a capital stock of $100,000, has opened offices at Texarkana preparatory to starting construction work on its proposed plant for the manufacture of tractor and farm machinery.

S. Sinsheimer, general manager of the Holly Sugar Co., Holly, Col., and other officials, have finished an investigation of the Rio Grande valley around Las Cruces, N. M., with a view of selecting a site for a beet sugar factory to cost upward of $1,000,000. The proposed plant will be ready for operation in time for next season's crop.

The Fulshear-Simonton Gin Co., Fulshear, will construct a cotton gin to cost about $36,000. W. P. Winner is a stockholder.

The Universal Shipbuilding Co., Wilmington, Del., which has a capital stock of $400,000, has opened offices at Houston preliminary to constructing a shipbuilding plant upon the Houston ship channel.

Tom Ditte and B. B. Struance, Fort Worth, who recently purchased the flour mill and elevator of the Amarillo Mill & Elevator Co., Amarillo, will install new machinery and enlarge the capacity.

California

LOS ANGELES, Aug. 28.

The Llewellyn Iron Works, Main and Redondo Streets, Los Angeles, specializing in the manufacture of elevators, tanks, structural steel, etc., will erect a new one-story pattern shop, about 100 x 100 ft., at 1312-16 Magdalena Street.

The California Shipbuilding Co., Long Beach, operating the former Craig ship works, has secured options for the purchase of property, about 600 x 800 ft., in the vicinity of its present plant, and is said to be planning for the construction of extensions. A contract has been secured from the Government for three steel freighters, each of 6000 tons rating, and about 345 ft. long, at a price of $930,000 each. George H. Bixby is president.

The Atchison, Topeka & Santa Fe Railroad Co., Kerckhoff Building, Los Angeles, has awarded contracts for the construction of new repair shops and sheds at San Bernardino, to cost about $47,000. The Cresmer Mfg. Co., Riverside, is the contractor.

The Fontana Power Co., Fontana, Cal., will build a new hydroelectric power plant in Lytle Creek Canyon, near Rialto, with an initial capacity of about 15,000 kw. McKeen & Miller, Monadnock Block, Chicago, are the engineers.

Benjamin F. Graham, Title Guarantee Building, Los Angeles, is organizing a company to construct a shipbuilding plant at San Diego. An option for a lease of about 6 acres of tidelands, near Twenty-eighth Street, has been secured.

A portion of the plant of the Hanford Mfg. Co., Hanford, Cal., manufacturer of pumping equipment, etc., was recently destroyed by fire with loss of about $30,000.

The Southern Sierras Power Co., Riverside, Cal., has secured a 50 year franchise at Blythe, and plans for the construction of a new electric power plant.

The Pacific Northwest

SEATTLE, Aug. 28.

The threatened strike in Seattle shipbuilding plants again seems probable. More than 16,000 men are included in the unions and it is now believed only Government action will prevent the walkout. One of the large plants and two or three smaller shipbuilding yards and foundries have met the demands of the men.

With production 42 per cent of normal, and sufficient to meet requirements of the market, Washington lumber mills now closed will not resume operations until after Jan. 1, unless the Government places further orders for wooden ships. This decision is due to a sudden reversal in demand almost without parallel in the industry.

The usual difficulty in securing machinery and equipment is being felt by manufacturers in this section. Several large shipbuilding plants, to escape the long delays attendant upon securing necessary machinery, have purchased foundries and iron works, and consolidated them with the ship plants. Notwithstanding labor troubles in the lumbering industry, a lively demand has sprung up for planing mill and logging machinery. There is a very active demand for second-hand lumber machinery, and numerous old mills are being dismantled, partly for scrap and partly for repair and use. The demand from the shipyards is now largely for small wood-working tools.

The Pacific Power & Light Co., Portland, Ore., will build a new central switching station, to cost about $100,000, at Pasco, Wash., for a 66,000 volt system.

Plans have been completed for the plant to be built by the Northport Mfg. Co., Northport, Wash., to cost $30,000, for the manufacture of keyhole saws.

The Patterson-McDonald Shipbuilding Co., Seattle, has completed plans for its machine shop, 80 x 280 ft., to be built at a cost of $15,000. Plans for other buildings are under way.

The Puget Sound Traction, Light & Power Co., Seattle, contemplates the expenditure of between $400,000 and $500,000 in enlarging its plants and converting them from oil to coal burners. Plans have been completed for the construction of a five-story addition to its power plant at Western Avenue and University Street, to cost $200,000. The machinery will cost $150,000.

The Erickson Engineering Co., Seattle, has been organized by C. J. Erickson, Downs Block, C. E. Erickson and Charles M. Burnett, with capital stock of $2,100,000, to build ships at its plant established on the Duwamish River.

H. M. Rothweiler, Seattle, will be at the head of a firm which contemplates the construction of a one-story screw, nut and bolt factory, 40 x 135 ft. Plans have been prepared.

The Foundation Co., New York, has announced its intention of establishing a shipbuilding plant at Portland and at Vancouver, Wash., to build wooden ships for the Government.

The Salem Iron Works, Salem, Ore., operated by Shand & Marcus, has been sold to Patterson & McDonald, shipbuilders, Seattle, who will transfer the mechanical equipment.

Waitsburg, Wash., will construct a municipal water system to cost $50,000.

The Pacific Lifeboat Co., Portland, has contracts on hand which will keep its force of 50 men busy for two months. It will add a plant for the construction of ventilator equipment.

The foundry of the Monarch Iron Works, Spokane, Wash., was destroyed by fire recently, with loss of $5,000. Hubert C. Smith and Martin Goodwin, owners, state it will be rebuilt.

The Puget Sound Pulp & Power Co., Seattle, organized with a capital stock of $16,000,000, contemplates the construction of a paper mill and power plant in the Puget Sound district.

The Idaho-Portland Cement Co., Pocatello, Idaho, contemplates the immediate construction of a cement plant. D. C. Eccles, Ogden, Utah, is chairman of board of directors.

The Hawley Pulp & Paper Co., Oregon City, Ore., contemplates building operations to cost $750,000, which will provide for further enlargement of its plant.

The sawmill of the Appendorff Lumber Co., Sherwood,

Ore., was recently completely destroyed by fire, with a loss of more than $50,000.

Plans have been completed by the Wilson Shipbuilding Co. for its plant at West Lander and Twenty-sixth Avenue, which include a one-story building, 26 x 40 ft.; compressor shed and sawmill, costing about $15,000.

The Thermit Welding & Modern Torch Co., Seattle, has recently been organized by Portland and Seattle capitalists, and has established a factory and salesroom at 413 Railroad Avenue, South, under the management of Thomas A. Errett. It will manufacture welding and cutting equipment, torches, etc.

The Elliott Bay Yacht & Engine Co., Seattle, is building two new sets of marine ways, which will enable it to go into repair work on an extensive scale.

The Foundation Co., New York, has acquired a 50-acre tract on the tideflats in Tacoma, on which will be erected a plant for the construction of ships for the French Government. Ten to 12 ships will be built at a time.

The Columbian Bronze Corporation, Seattle, Wash., with which the Columbian Brass Foundry was recently merged, is building an addition to the plant and has authorized the construction of another. The company is working on underwater fittings and propellers for submarine chasers for the Government and also has contracts for work for the Allies.

The Western Canada Shipyards, Ltd., Vancouver, B. C., will erect a shipbuilding plant.

The Vancouver Shipyards & Engine Works, Ltd., Vancouver, B. C., announces plans for the erection of a shipyard and machine shop.

The Denine Air Craft Co., Inc., Spokane, Wash., has erected a plant at Yardley, near Spokane, for the construction of J. N. 4 Curtiss tractor type biplanes.

The Buehner Lumber Co., North Bend, Ore., will install two fast feed planers, two moderate speed planers, a timber sizer for handling shipbuilding material and a large traveling crane.

Canada

TORONTO, Sept. 1

A decided falling off in activity in the munitions industry in Canada is noted. Fewer contracts for shells are being placed, and the output has declined. Various munitions factories have responded to the order of the Imperial Munitions Board to cut their output in two and as a result have laid off many employees. The only persons assured of steady employment in this line are the skilled mechanics and the highly efficient workmen. Many plants have laid off or given some other form of employment to their shell and fuse makers, and machine shops in a number of cases are turning their attention to other classes of work. The building of marine engines and auxiliary equipment for ships is developing rapidly and promises to form an important industry. There is a general feeling that the shutting down of munitions orders in the Dominion has been done partly to release money that could be expended on shipbuilding, which will mean an extensive enlargement of the previous activities of the Imperial Munitions Board. This work will create a new demand, not only for nuts and bolts used in hull construction, but auxiliary equipment, such as engines. In this connection it is stated that the Dominion Bridge Co., Montreal, proposes to go into the construction of marine engines on a very large scale in the near future. The feature of the machine tool market is an increasing demand for tools for general purposes, which is replacing the former activity in equipment for munitions. A large Toronto machinery house reports a big demand for tractors and farm oil engines, due largely to the scarcity of labor. The Willys-Overland Co., Toronto, is equipping a factory for building aeroplane motors, and has purchased a number of machine tools.

The Three Rivers Shipyard Co., Three Rivers, Que., plans to spend $125,000 on a new shipyard, and is in the market for a 15-ton electric crane; 15 to 75-hp electric motor; large B.C. fir lumber band saw working at angle; 16-in. planer; air compressor or blocking.

The Normandy Tire & Rubber Co., Ltd., 413 Canadian Pacific Railroad Building, Toronto, will build a plant at St. Catharines, Ont.

Fred F. Ferguson, care the Canada Iron Foundry, St. Thomas, Ont., has secured premises at Walkerville, Ont., where he will install equipment for the manufacture of castings, etc.

George Reid, 262 Central Avenue, London, Ont., is interested in a company which has been organized for the manufacture of rubber tires, etc. It is the intention to erect a plant at London.

The Steel Company of Canada, Hamilton, Ont., proposes to install a department for the manufacture of steel plates for ships and to build a sheet metal plant.

Grant Smith & Co., Victoria, B. C., are contemplating the erection of a shipbuilding plant at Victoria.

The Town Council of Portage la Prairie, Man., will install a 100 h.p. boiler with mechanical stoker in its electric station at a cost of $5,000.

The Canadian National Carbon Co., Toronto, will build a power house.

The Murray Engines, Ltd., Vancouver, B. C., has been incorporated with a capital stock of $25,000 to manufacture machinery, tools, etc.

The Merchants Shipbuilding Corporation, Ltd., has been incorporated with a capital stock of $500,000, and will establish a shipbuilding plant at Vancouver, B. C.

Plans are being prepared by J. M. Smith, Montreal, engineer for the St. John Shipbuilding Co., which will build a plant at St. John, N. B. It is reported that plans will be completed and tenders called for the erection of building in a few weeks.

The Globe Engineering Co. has been incorporated with a capital stock of $100,000 and will take over the assets and liabilities of the Globe Electric Machine Co., Hamilton.

The plant of the Winnipeg Foundry Co., 115 Robinson Street, Winnipeg, Man., damaged by fire some months ago with a loss of $50,000, will be rebuilt. New equipment will be purchased.

The Vancouver Shipyards & Engine Works, Vancouver, B. C., recently incorporated with a capital stock of $750,000, will establish a shipbuilding plant near the Second Narrows on the Vancouver side of the harbor, and employ 500 men at the start. Contracts for the preliminary work have been let. It has secured orders for a number of wooden vessels and will also build steel ships. S. Matheson, Roges Block, Vancouver, is interested.

The North Shore Iron Works, North Vancouver, B. C., has started work on extensive additions to its plant. New equipment will be installed.

The Chicoutimi Pulp Co., Chicoutimi, Que., will build an addition to its plant, including the erection of a machine shop.

The Cluff Ammunition Co., Sterling Road, Toronto, whose plant was destroyed by fire several months ago with a loss of $150,000 will rebuild.

The Toronto Coal & Dock Co., Ltd., Montreal, has been incorporated with a capital stock of $100,000 by William K. McKeown, Leopold Choquette, George E. Chart and others to build ships, docks, etc.

The Canadian Hession Tillers & Tractors, Ltd., Toronto, has been incorporated with a capital stock of $5,000,000 by Henry D. Petrie, Alexander M. Snyder, Adam H. Hope and others to manufacture tractors, farm implements, tools, etc.

The Fruit Machinery Co., Ltd., Belleville, Ont., has been incorporated with a capital stock of $40,000 by Robert J. Graham, Sidney, Ont.; Frank B. Foley, Ingersoll, Ont.; George K. Graham and others, Belleville, Ont., to manufacture machinery, tools, implements, etc.

The Midland Shipbuilding Co., Ltd., Midland, Ont., has been incorporated with a capital stock of $1,000,000 by Norman L. Playfair, Marcus Smith, Thomas C. Luke and others to build ships and manufacture machinery, etc.

Powell-Kelly, Ltd., Toronto, have been incorporated with a capital stock of $150,000 by Walter C. Powell, Thomas R. Kelly, John P. Standish and others to manufacture leather goods, trunks, etc.

The Smith Motor Truck Corporation, organized under the laws of the State of Virginia, with a capital stock of $40,000 has been granted permission to manufacture motor trucks, automobiles, vehicles, etc., in Ontario. M. A. Stratton, Toronto, Ont., is the attorney.

The Canadian Linderman Co., Ltd., Woodstock, Ont., is in the market for a 10 hp., three phase, 25 cycle, 750 r.p.m., 550 volt motor.

The St. Mary's Wood Specialty Co., Ltd., St. Mary's, Ont., is in the market for Robb-Corliss engine, about 75 hp., also shafting, hangers, etc.

The Unit Construction Co., contracting engineers, Title Guaranty Building, St. Louis, will design and construct an addition 600 x 130 x 70 ft. to the power house of the Cedars Rapids hydro-electric development, at Cedars, Que. The construction will be of structural steel and reinforced concrete, and will cost approximately $250,000.

The Dominion Carriage Co. has obtained a charter with capital of $500,000 to manufacture carriages, automobiles, etc., with headquarters in Montreal, where a factory is now under construction. The promoters are P. T. Legaré and J. H. Fortier, Quebec, of P. T. Legaré, Ltd., jobber of carriages and agricultural implements. The managing director will be Fred Arthur, Montreal, who was general manager of the Heney Carriage & Harness Co.

Turbo Units Versus Gas Engines

(*Continued from page* 543)

flames, and the gas burners must be arranged to give the proper proportions of air and gas and the proper mingling of the air and gas. Recent developments with burners arranged to bring the pressure of the gas up to the outlet and designed to give an intimate mixture of air and gas before entering the furnace have shown that higher furnace temperatures can be maintained than in the older practice and that the gas can be burned with a shorter flame than in certain of the older forms of gas burners. Higher furnace temperatures and the ability to burn the gas within a given furnace volume and the proper design of the boiler and its economizer make it possible to obtain this efficiency.

In the gas engine high efficiencies are obtained at the high temperature end of the cycle, but not at the low temperature end, while in the steam turbine with the modern condensing apparatus the low temperature end of the cycle is utilized to the fullest extent. It would appear, therefore, that there are great possibilities in combining the two. On working out an actual case it will be found that the work of the steam turbine would be comparatively small, amounting to say 10 per cent of that of the gas engine, and the large amount of additional expense and complication involved would offset the saving in the cost of fuel unless the fuel is comparatively expensive.

Alex Dow, president Detroit Edison Co., confirmed the statement that sustained boiler house efficiencies of 81 to 82 per cent are possible, economizers being used. The Detroit Edison Co. has a boiler house efficiency of 76 per cent, all losses by banked fires included, etc., without economizers. Low turbine efficiency is often caused by badly designed and badly managed boiler houses, by poor condenser practice and by neglect of station heat balance, the usual fault of heat balance being an excessive or careless use of steam auxiliaries; the less frequent fault being making a fad of electric auxiliaries.

The following are operating cost figures for the Connors Creek Station, which has three 20,000-kw. turbines. The difference between the July to June costs and the January to December costs is due to the disturbance of coal supplies and costs in the last weeks of 1916. The same cause, together with the increased use of heat in the buildings during the winter months, has affected the three months' costs, January to March, 1917.

Connors Creek Power House Production Expense

Twelve Months Ending June 30, 1916	
Kw.-hr. output	125,158,800
Maximum demand (30 min.), kw	35,000
Average load, kw	14,300
Load factor	.409
Coal per kw.-hr.—lb	1.44
B.t.u. per kw.-hr.	19,700
Operating expense per kw.-hr	.248c
Twelve Months Ending Dec. 31, 1916	
Kw.-hr. output	162,117,600
Maximum demand (30 min.), kw	36,000
Average load, kw	18,500
Load factor	.514
Coal per kw.-hr.—lb	1.45
B.t.u. per kw.-hr.	19,300
Operating expense per kw.-hr	.262c
Three Months Ending March 31, 1917	
Kw.-hr. output	54,654,900
Maximum demand (30 min.)	45,000
Average load, kw	25,300
Load factor	.562
Coal per kw.-hr.—lb	1.56
B.t.u. per kw.-hr	20,300
Operating expense per kw.-hr	.360c

The figures are for current actually metered out at the transmission voltage of 23,000 to 25,000 volts. They should not be compared with figures of current generated, whereof part is used for station purposes.

They represent a design of the years 1913 and 1914, and a balance between investment costs and operating costs based upon fuel of 13,500 heat units costing $2.40 per net ton. For fuel at $5, which seems to be the probability, the company would buy turbines which would require about 9 per cent less steam than the Connors Creek turbines, and which would be nearly as reliable. It would install economizers, and thereby bring the maintained boiler room efficiency up from 76 per cent to 81 per cent, and would make certain other refinements in its heat balance which might save 1 per cent of the total fuel. The result of these changes would be a reduction from a normal use of 19,700 heat units per kw. hr. to something like 17,000 per kw. hr. of net output.

Domestic Lead Output in 1917

The U. S. Geological Survey has just completed a mid-year canvass of lead production. According to the compiler, C. E. Siebenthal, the output of domestic desilverized lead, excluding desilverized soft lead, was 152,231 net tons for the first half of 1917 against 158,235 tons for the same period in 1916. The output of domestic soft lead, including desilverized soft lead, was 124,292 tons and the output of lead produced from foreign ores and bullion was 29,539 tons to July 1, 1917, as compared with 117,879 tons and 9453 tons respectively for the same period in 1916.

In view of the scarcity of lead, the increase in lead of foreign origin is regarded as encouraging. The greater part came from Mexico. According to the records of the Bureau of Domestic and Foreign Commerce, the total lead imported in the first six months of 1917 was 30,620 tons (17,665), of which 22,507 tons came from Mexico (12,099), and 4569 tons came from Canada (3153), the figures in parenthesis being those for the same period in 1916. The exports of domestic lead amounted to 29,241 tons (50,283) and of foreign lead 6066 tons (4940). The total exports of lead were 38,577 tons (57,808). Disregarding stocks, the apparent consumption of lead in this country in the six months was 268,952 tons (230,587).

The production of new antimonial lead was 7822 tons (12,019), and of secondary antimonial lead 1959 tons (2065). The output of secondary pig lead by regular ore smelters was 7578 tons (5548). The average outside spot price of lead during the six months' period was 9.9 cents a pound, as against 6.9 cents in 1916.

Converter Explosions in German Steel Foundries

Small explosions in German converter steel foundries are referred to by a writer in *Stahl und Eisen*, as reported in a recent issue of the London *Iron and Coal Trades Review*. These explosions generally occur with over-blown charges. The writer mentions a recent case in his own experience. A charge was finished in about eight minutes, but as the metal was too sluggish for teeming, the shop manager decided to continue the blowing. The after-blow having lasted four minutes, the characteristically green flame, with small illuminating power, made its appearance and small pellets of slag began to spatter out. The converter was then turned down and the finishing iron added, when in about 15 seconds the charge began to burst into flames, at first slowly, then more rapidly, and a series of small explosions took place, which scattered lumps of slag to a distance of over 30 yards. The explosions, according to the writer, are the more violent the more the charge has been over-blown, and he thinks the behavior of the metal is due to the well-known reaction of the ferrosoferric oxide in the slag upon the carbon in the finishing iron.

Plans have been filed with the Canadian Government by a law firm of Windsor, Ont., acting for the Canadian Steel Corporation, for docks at Ojibway, Ont., to cost $250,000. The plans include a marine slip, harbor, docks, wharves.

The Hyatt Roller Bearing Co., Newark, N. J., has opened a branch office in Pittsburgh at 1273 Frick Annex Building. E. E. Eby and J. M. Kelly will represent the company in that territory.

Planning Department in Modern Shops

(*Continued from page* 537)

the workman's number, to furnish the payroll department with the total time spent in the shop, from which the payroll is made up, and by reassorting the tickets by charge symbol, it is an easy matter to get the total time spent on the job, from which the cost clerk makes up his cost card.

The Cost Clerk.—The cost department is the fulcrum of the operation of the function of record. It is the work of the cost department to collect, classify, analyze and compare all the operation costs in the plant. A comparison of the unit costs furnishes a measure of the progressive efficiency of the manufacturing departments. An analysis of the unit material costs is an accurate index of the effect of the fluctuating cost of materials on the units of manufacture; an analysis and comparison of the total individual costs supply a scientific basis for the fixing of selling prices. The function of the cost department is that of the balance wheel. When actual costs exceed the estimate or standard, it is the cost department that discovers the fact and sounds the warning. It is the cost department that keeps the overhead under surveillance and analyzes, each period, the departmental charges and keeps them at the minimum.

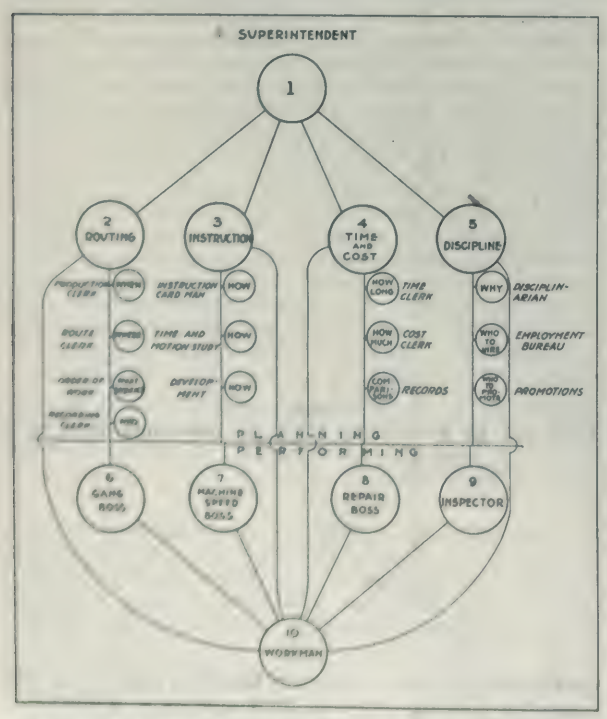
Statistician.—A number of large, complex organizations have found it to their advantage to institute the office of statistician. His duties cover a wide range, and the results of his studies are very valuable data in determining general questions of policy. His function is clearly that of record.

The Function of Discipline

The disciplinarian, the employment bureau and the supervisor of promotion constitute the function of discipline.

Disciplinarian.—The disciplinarian, instead of being a shop policeman keeping tabs on the workmen, as one might infer from his title, is, in reality, the workmen's best friend. He is the maintainer of the square deal—the impartial court of appeal to whom all disputes between the individual workmen, and between the workmen and the executive division, may be referred for a just and equable decision.

The Employment Bureau.—The function of the employment bureau under scientific management is one of the cardinal features of the science. Not merely to hire a man, but to place him in a position for which he is fitted, is the obligation of the employment bureau. The employment bureau is the purchasing department of human power, and it should be realized that the same general principles govern both the purchasing department of materials and the purchasing department of labor. The purchasing department of materials buys to fill certain definite specifications, which in turn are determined by the use to which the material is to be put. The employment bureau has at hand very similar specifications as a guide to the solution of efficient employment. There are certain definite characteristics of every job which require certain definite qualities in the workman to properly fill it. The human factor in management is a big psychological study, the depths of which have not yet been sounded, and the importance of this function, unfortunately, has not yet been fully recognized. No single function is of greater importance than the placing of the round pegs in the round holes, the efficient distribution of the labor in the plant.



The Four Managerial and the Four Shop Functions Under Scientific Management

The Supervisor of Promotion and Welfare Manager.—The supervisor of promotion, the director of personnel—whatever you may choose to call him—is the recorder of the activity of the individual workman. It is he who determines the line of advancement according to the qualifications of the individual. It is he who indicates when promotion and increased pay is justifiable. It is he who has charge of the apprentices and arranges their course of study and their program of work. It is he who has charge of the corporation school and acts as adviser to the men who wish to take advantage of the opportunities it offers. It is he who co-operates with the public school system and arranges the part-time work. It is he who has charge of all welfare work and serves as the agent of the management in arranging the various social, educational and athletic activities.

Taken as a whole, the function of discipline, as we shall call it for the sake of maintaining a uniformity of terms, is the function of humanizing industry, the co-ordination of the purely industrial factors with the social, educational and athletic factors—the attempt, at least, to realize some of the better of the socialist ideals, a step in the direction of a true state of co-operation, of co-partnership between the management and the men. While the function of discipline borders on the division of control, in essence it is purely that of record.

Shop or Productive Division

The Gang Boss.—The first of the main shop functions is that of the gang boss. Very similar to the traditional foreman, the gang boss is the agent of the planning department in the shop. It is his duty to maintain the schedule as determined by the route clerk, the production clerk and order-of-work clerk. It is his duty to see that the workman is supplied with the proper materials, tools, drawings, instructions, etc., and that the work is lined up ready for the workman before he is ready to start. He is the traditional foreman with certain of his duties minimized and certain phases of his work emphasized. His function is largely that of preparation but contains also an element of control.

The Machine Speed Boss.—The machine speed boss might well be characterized as the inspector of method. It is he who checks the speeds and feeds used, against those called for on the instruction card, and thereby maintains the planning department standards. It is he who acts as assistant and teacher in the event of a workman's not understanding how to do the work, and in this capacity he is the planning department's demonstrator. From the point of view of maintaining standards, the function of the speed boss is that of control.

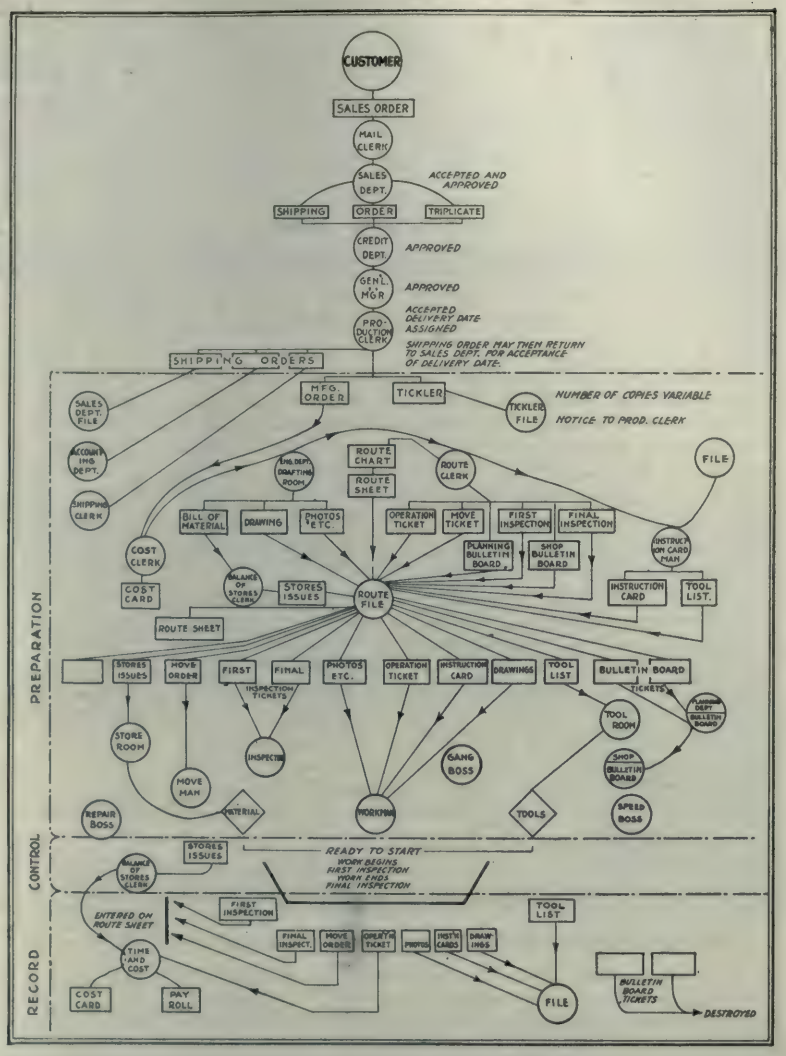
The Repair Boss.—The repair boss is the exponent of the philosophy that "an ounce of prevention is worth a pound of cure." Not so much to repair in the event of a breakdown as by frequent inspections and minor repairs to prevent breakdowns, it is the function of the repair boss to maintain the equipment at its maximum efficiency, thereby greatly increasing the possibility of executing the shop schedule as planned. The function of the repair boss is indeed universal preparedness and

as such can only be classified under the division of preparation.

The Inspector.—The inspector serves a two-fold purpose. He performs the traditional final inspection of quality, and, in addition, makes a first inspection of method. In this first inspection, a development accredited to A. R. Shipley, he is also an exponent of prevention. The first inspection consists of the inspection of the first few pieces done by the workman, to be certain that the method is clearly understood and that the first few pieces are properly done. The importance of this function of first inspection cannot be overestimated, as it is a vital factor in the prevention of poor work, thereby reducing the amount of waste material, and in the elimination of disputes based on the ground that the workman did not understand his instructions. It is not an obvious classification, but it would seem that the first inspection might best be relegated to the division of control, while the final inspection is without doubt a subdivision of record.

Sub-Functional Divisions in Operation

The sub-functional divisions as treated in this paper are more or less arbitrary. It must be realized that the divisions are extremely flexible and easily adapt themselves to the requirements of the individual shop. For example, it is very easy to conceive of a shop where the entire function of routing could easily be handled by one man, while on the other hand there are many plants where it would require the services of one man to fill each of the sub-functions of production clerk, order-of-work clerk, and recording clerk. In one plant, a single cost clerk might suffice, while in another a department of fifty or a hundred clerks and assistants might be necessary. Each function does not mean a separate official, nor is it to be understood that every man performs, necessarily, only a single function. One might perform several functions, while it is equally obvious that a single function might require the work of several men.



Handling an Order Under Scientific Management

The Requirements of Functional Foremen

The proper selection of the functional foreman in the planning department is of great importance to assure the maximum results from its institution. It is a difficult thing to lay down any hard and fast rules governing the qualifications the various foremen should possess, but it may be well to outline, briefly, the education and training which, in a general way, the incumbents of the main functions should possess.

The Production Clerk.—The production clerk need not necessarily be a factory-man. He is not concerned particularly with technical manufacturing problems nor does he come in direct contact with the workmen. He might, if need be, be an outside man and should be of the executive type, since it is he who has charge of the planning department and determines the order of the work.

The Route Clerk.—The function of route clerk is essentially one which demands a rather comprehensive factory training and experience with the individual manufacturing problems of the factory in which he is working. He must be particularly conversant with the plant layout and the available equipment, in order to intelligently determine the routing of the work.

Order-of-Work Clerk and Recording Clerk.—The functions of the order-of-work clerk and the recording clerk are largely clerical, and while a short experience in the shop would be of undoubted value, it is not a necessity and it is possible for a boy in his teens to be trained satisfactorily for the job.

Instruction-Card Man.—The function of instruction like that of routing demands practical factory experience and training, and the instruction-card man should be chosen from among the shop's most experienced foremen or workmen, with particular regard for his ability to analyze methods of operation. The functions of routing and instruction are the two demanding the largest amount of technical factory experience and should be chosen with a great deal of care. It has well been said that the route clerk and the instruction-card man should be big enough men to be chosen superintendents. Above all, they should be chosen because of striking characteristics in their temperaments conducive to the efficient execution of their functions.

Time Man and Motion-Study Man.—At the outset of the installation of scientific management, it is without question the safest course to secure the services of the best man. Time study is essentially a technical question, and motion study is a science in itself. It is a question whether or not it is economical to attempt to train a motion-study man from the ranks, and it would almost seem better to retain the services of an expert, even after the work of installation is well under way. It is not so difficult to train a time-study man or a rate-setter, and in many cases this has been very satisfactorily done. It is a question of measurement to determine the best course to pursue—the main factors being (1) the man available for such training; (2) the amount of work to be done.

Time and Cost Clerk.—The work of the time and cost department is purely clerical and demands primarily a knowledge of the essentials of factory costs and their use. There is little or no demand for factory experience, and it is possible to utilize a man from outside, if a suitable one is not to be found in the existing organization.

Disciplinarian.—The primary requisites of the function of disciplinarian are (1) a judicial point of view; (2) the strength of purpose to execute fearlessly his conception of right determined by a keen sense of justice; (3) an inherent sympathy, born of a true understanding of the workman and his point of view; and (4) a man who naturally and without studied effort, commands the respect, the good will and confidence of the men. The function of disciplinarian is not an easy one to fill, and perhaps that fact, partly at least, may account for the rather limited use, thus far, of that function. Very seldom is it wise to take a man from the existing organization. He is unconsciously prejudiced by tradition.

Employment Bureau.—The scientific selection and training of the workmen is one of Taylor's cardinal principles of the science of management. So large a question it is we can do no more than outline its fundamentals in passing. The selection and training of the workmen under scientific management is very nearly a science in itself, and in its many ramifications embraces a well-founded knowledge of psychology, anatomy and pedagogy. It, too, is a function to be filled by an expert who has made a long study of the question. Very large salaries are to-day being paid and some excellent work is being done along this line by several large organizations, and the indications are clear for a wider and a more comprehensive extension of the movement in the very near future.

To fill the four main functions in the shop, the gang boss, the speed boss, repair boss and inspector, every effort should be made to utilize men from the existing organization. Each one of these functions demands in a varying degree, practical experience in the particular shop in question, and usually little or no trouble is experienced in finding satisfactory men for the places.

Path of a Manufacturing Order

The sales order from the customer is accepted by the sales department, passed by the credit department, approved by the general manager or officer designated by him, and is then transferred to a manufacturing order form if the goods are to be manufactured. This order is then approved by the production clerk, accepted, placed on the manufacturing schedule and assigned a date of delivery. It may then return to the sales department for their acceptance of the shipping date, but not necessarily so.

The next step takes the order to the engineering department and drafting room, where the drawings are prepared and the bill of material drawn up. The order itself remains long enough with each division only to allow the head of the department to make a note of it and is then filed for the reference of the whole organization.

Leaving the drafting room, the order proceeds to the instruction division. Here the instruction cards are prepared, the rates set and the tool list made out while the order has passed to the routing division. And here are prepared the route charts, the route sheets, the operation tickets or job cards, the bulletin-board tickets, the inspection tickets, the move tickets, stores issues, etc.

From the drafting room are received the drawings, photographs and the bill of material, which in the meantime have passed through the other divisions for inspection and for aid in making up the remainder of the form. The bill of material has formed the basis for the preparation of the stores issues, by means of which, in turn, the materials in stores have been apportioned or reserved for the order, and special materials, not carried in stock, have been ordered by the purchasing department from the outside.

The instruction cards and tool lists passed on to the route clerk have served as a basis for the preparation of the various tickets. In fact, the work of each function is carefully tied up with the work of every other.

Up to this point, the work has been purely that of preparation. The next step is that of the control and direction of the work while in process. The route file division is the point of convergence of all of the factors. To the route file, awaiting their issuance, come all of the drawings, lists, tickets, etc., as they are prepared by the different functional foremen, so that finally we have centralized in one folder or group of folders in the route file, indexed under the manufacturing order number, all of the data relating to that order, and we are ready to start the production factors moving in the shop.

In the meantime, perhaps, in anticipation of its actual entry into the shop, as a sort of advance notice to prepare the way, the bulletin-board tickets have been placed on the bulletin-board, on the lower or third set of books—work to be done ultimately at that machine but not yet completely prepared. When the order-of-work schedule releases the order, a stores issue slip is sent out with a move order, and the material or materials are issued by the storeroom and sent by the move man to the machine or workplace where the work is to be done. At the same time the tool list goes to the tool room and the tools are issued and the drawings, photos, etc., are sent direct to the machine. Everything is ready to begin work. The bulletin-board tickets are separated, the shop copy going to the shop bulletin-board, and the planning department copy moved to the middle or second set of hooks, for jobs ready to start.

We are now all ready and waiting for the workman. When he finishes the job on which he has been working and stamps in his ticket, he is ready for us and he then receives his new job ticket, stamped "out" or "issued." At the machine are his tools, materials, drawings, instructions, etc. In the meantime, the first inspection ticket has gone out to the inspector, the gang boss has the bulletin-board ticket notification and has checked materials, tools, etc., the job is ready and the workman, with the gang boss and inspector, starts the work. The first inspection over, the workman proceeds, unhesitatingly confident in the assurance that he thoroughly understands the specifications and supported by the knowledge that he has a corps of expert advisers to call upon in the event of any unforeseen condition developing during the process. One by one all of the different operations are controlled and directed in this manner, until finally the order is completed ready for shipment, and with the end of the processing comes the end of the division of control.

The work finished, we immediately become interested in the score. Have we won or lost? And this takes us into the division of records. The stores issue slips returning as filled are deducted from the stores on hand by the balance of stores clerks and go to the cost department for record. The operation tickets, move tickets, etc., every record of production time, return to the time and cost department for record, while the drawings, lists, photos, etc., return and are filed as a record for future reference. The cycle is complete and with the man's pay made up we have a record of his work measured by his having made or lost his task, and with the complete cost of the order we have the final score—the actual cost against the estimated cost and the margin of profit.

The J. R. Stone Tool & Supply Co., Detroit, distributers for the Manufacturers Equipment Co., Chicago, and the Nelson-Blanck Mfg. Co., Detroit, have opened an office at 30 Church Street, New York, under the direct management of J. R. Stone, president of the company. The Manufacturers Equipment Co., Chicago, makes air chucks and the Nelson-Blanck Mfg. Co., Detroit, manufactures multiple spindle drill heads and drill presses. Several salesmen will travel from this office throughout the eastern states.

The Capital City Iron Works, Olympia, Wash., according to H. H. Piper, manager, will be in operation by Oct. 1. A 3-story building, 60x130 ft., is under construction, and an electric steel furnace will be installed early in October. Steel castings will be furnished to the shipyards of Tacoma, as well as the Sloan Shipyards of Olympia, which own the plant.

The new blast furnace of the Whitaker-Glessner Co. at Portsmouth, Ohio, has been put in blast, and will make from 500 to 550 tons of metal per day.

THE IRON AGE

New York, September 13, 1917

ESTABLISHED 1855 VOL. 100: No. 11



Towing Ore on Upper Mississippi





EDWARD F. GOLTRA

TOWING iron ore on a large scale in the upper Mississippi River was begun a few days ago at St. Paul. Important not merely because it represents a case of increased utilization of water transportation, the fact also emphasizes a likely movement to secure efficient utilization of river craft, as the barges taking iron ore away arrived at St. Paul from St. Louis with coal. The lower of the accompanying pictures shows six steel barges carrying 3000 tons of coal, said to be the largest cargo ever hauled to the head of navigation on the Mississippi. The upper picture shows a tow of 10 barges containing 3600 tons of iron ore consigned to the Mississippi Valley Iron Co., at St. Louis, of which Edward F. Goltra is president. It is understood that this is the first iron ore to leave Minnesota, at least in any volume, for points south by the Mississippi River route. The Mississippi Valley Iron Co. rehabilitated in 1916 the Missouri furnace at St. Louis, and while it had ore properties in southeastern and southwestern Missouri, and its principal supply of ore lay in the vicinity of Waukon, Iowa, it had as a reserve about 100,000 tons in the Baraboo and Mesaba ranges.

National Labor Conditions Considered

Conference of Manufacturers and Secretary Baker Aims to Prevent Strikes—Powers of Present Commission May Be Enlarged

WASHINGTON, Sept. 11.—A conference on the national labor situation of far-reaching importance to the industries of the country and especially to those engaged in the production of war munitions, was held here on Sept. 6 at the headquarters of the Council of National Defense, the participants being the Secretary of War, as chairman of the council; several officials of the Advisory Commission, and a committee of five appointed by the National Industrial Conference Board composed of L. A. Osborne, vice-president Westinghouse Electric & Mfg. Co., New York; W. H. Barr, president Lumen Bearing Co., Buffalo; W. H. Van Dervoort, president Root & Van Dervoort Engine Co., East Moline, Ill.; C. A. Crocker, president Crocker-McElwain Co., Holyoke, Mass., and E. A. Smythe, president Pelzer Mfg. Co., Greenville, S. C. The object of the conference, which was sought by the committee of the National Industrial Conference Board, was to lay before the Council of National Defense certain facts in connection with the present disturbed labor situation and to urge that steps be taken to secure a better understanding with the national labor organizations for the purpose of bringing about a definite, practical and assured method of securing an uninterrupted maximum output so essential to the successful conduct of the war.

The National Industrial Conference Board is a cooperative and advisory body of representative manufacturers constituted through the selection of two members of each of the following national associations: National Founders' Association, National Metal Trades Association, National Erectors' Association, National Association of Manufacturers, National Automobile Chamber of Commerce, American Cotton Manufacturers' Association, National Association of Cotton Manufacturers, National Association of Wool Manufacturers, American Paper and Pulp Association, Electrical Manufacturers' Club, Manufacturing Chemists' Association of the United States, National Boot and Shoe Manufacturers' Association, Rubber Association of America, Silk Association of America, United Typothetae and Franklin Clubs of America, and the National Council for Industrial Defense.

Would Maintain the Status Quo

In the statement presented to the Council of National Defense, the committee quoted the declarations of the council's Committee on Labor, substantially directed and controlled by representatives of the largest national unions, emphasizing the statement so widely promulgated that "neither employers nor employees shall endeavor to take advantage of the country's necessities to change existing standards." In spite of these declarations, the committee declared, the country is now entering the fifth month of the war faced with unprecedented demands for war production, seriously interrupted and delayed by numerous strikes and threats of strikes in every part of the country, some of which are likely to assume the proportions of a national interruption of essential service in our factories and shipyards.

"Let it be clearly understood," said Chairman Osborne in addressing the council, "that we, without equivocation, endorse the maintenance of every necessary regulation for safety and health and the fair adjustment of wages in accordance with the American standard of living and the increasing cost of its maintenance.

"We also submit that the Naval Consulting Board, reporting upon its preliminary investigation of manufacturing establishments capable of munition work, found the total number to be 18,654, and that of these 16,787, or 89 per cent, were 'open' shops. Of 1,950 establishments usable for the manufacture of ammunition, powder and explosives, guns and gun material, gun carriages, limbers and accessories, personal military equipment, tools, gages and punches, machine tools and aeroplanes, all but 73 are 'open' shops.

"With respect to wages, a great body of munition production for the government proceeds under a contract wage law, assuring at least time and a half for all overtime in excess of eight hours, so that for like tasks industrial wages for war work are universally increased by the operation of statute in every plant whose contracts come within its scope. Antecedent to our entrance into the war general wage increases in large amounts had been voluntarily given throughout the generally prosperous industries, so that it may be fairly said that our wage scale on the average was, actually as well as nominally, greatly superior to that of any belligerent country. But despite this condition and the increase by statute of wages for the subject matter of our own war production, it is inevitable that wage differences will continue to arise. The vital thing is that such disputes shall be adjusted without interruption of production necessary to national defense. To this end we believe that manufacturers are ready and anxious to co-operate in the establishment of a representative and equitable system of adjustment *for the period of the war.*

Strikes Threatened

"There are, however, other 'standards' of employment than those relating to hours and wages which are of critical importance, not merely to efficient production, but to the institutions of a free people. Strikes are threatened and are occurring in increasing numbers to compel the exclusive employment of union men. This, we emphatically urge, is contrary to any fair interpretation of the spirit and letter of the fundamental policy declared by the council *'that employers and employees in private industries should not attempt to change the standards which they were unable to change under normal conditions.'*

"Can there be any doubt that to undertake to open a 'closed' shop or close an 'open' shop under the exigencies of war is an evident attempt to *'change the standard which they were unable to change under normal conditions'?"*

Continuing, Mr. Osborne emphasized the fact that today there is a labor shortage which necessarily will be intensified by withdrawing from industry the personnel of its contribution to our armed forces. "In this crisis," he said, "America needs the service of every citizen. We can no more depend upon one class to operate our factories than to fill the ranks of our armies. Therefore it is inconceivable that the Government can tolerate much less approve, any proposal which makes membership in a private organization a prerequisite to a citizen securing employment in production for the war.

"To win this war we can sacrifice everything but the principles of the Republic and the fundamental rights of citizenship it was founded to protect. The right to pursue a lawful calling and to live free from annoyance and molestation is the primary, if not the greatest, privilege which society is founded to sustain.

"The British policy expressed in its munition acts is that all labor, whether it be that of the employer or the employee, of men or women, of union or non-union, of the skilled or unskilled, shall be employed to the best advantage to the country. Neither restriction nor discrimination, nor, in 'controlled shops,' strikes or lockouts are permitted."

Needs of War Times

Summarizing its conclusions, the committee urged that, as a basis of mutual understanding, employer and

employee recognize and agree that now and for the period of the war continuous efficient production can alone equip and sustain our military forces; that the council adopt the fundamental doctrine authoritatively stated by the Anthracite Coal Strike Commission, with the approval of representatives of both employers and unions, "that no person shall be refused employment or in any way discriminated against on account of membership or non-membership in any labor organization; and that there shall be no discrimination against, or interference with, any employee who is not a member of any labor organization by members of such organization." To this end the committee laid before the council the following definite recommendations:

(a) That applied to existing statutory regulations intended to promote safety and health, it shall be agreed that for the period of the war there shall be no suspension or modification of such provisions, except upon recommendation of the Council of National Defense after due investigation by its agencies and when, in its judgment, required by the exigencies of war;

(b) Applied to wages, demands shall be tested by the prevailing local standard of the establishment in effect at the beginning of the war with such modification as may be shown to be necessary to meet any demonstrated advance in the cost of living.

(c) Applied to hours, the standard shall be those established by statute or prevailing in the establishment at the beginning of the war subject to change only when in the opinion of the Council of Defense it is necessary to meet the requirements of the Government.

(d) Applied to what are commonly known as "open" or "closed" shop conditions, it shall be understood and agreed that every employer entering the period of the war with a union shop shall not by a lockout or other means undertake to alter such conditions for the duration of the war, nor shall any combination of workmen undertake during the like period to "close" an "open" shop.

Proposed Federal Board

Adopting these standards as the basis of its operations, the committee recommended the creation of a federal board to adjust labor disputes for the duration of the war, its activities to be confined to disagreements growing out of employment on the subject matter of war production for the government. The board would be constituted equally of representatives of employees, employers and the government, the representatives of the latter to have a deciding voice in the event of an equal division of opinion. Pending decisions of the board, no interruption of production by strike, lockout or other means will be permitted.

The committee pledged the acceptance of its program by the great body of representative associations and individual manufacturers of the country and urged that a conference of representative national and international officers of American trade unions be called on behalf of the workers of the country to join in the pledge.

Secretary Baker, in his capacity as chairman of the Council of National Defense, gave close attention to the statement presented by the committee and promised that it should have very careful consideration. It is pointed out by the council that it will be practicable to meet the suggestions presented by the committee with respect to the establishment of a joint adjustment commission by enlarging somewhat the functions of the commission which the council recently decided to create to handle all labor disputes arising in establishments doing war work for the government. W. L. C.

Analyzing Ferrosilicon Without a Platinum Crucible

It is possible to dispense with expensive platinum crucibles in analyzing ferrosilicon, according to Dr. Herwig in an article in *Stahl und Eisen.* According to a translation in the London *Iron and Coal Trades Review,* iron crucibles can be used if instead of the usual carbonate of soda and potash method sodium dioxide is used in the ignition mixture. Great care must be taken to reduce the ferrosilicon to as fine a powder as possible, to remove all coarse particles and to mix the powdered silicon thoroughly and very uniformly with the dioxide, as otherwise dangerous ebullition might take place, which would nearly empty the crucible and the spattering endanger the analyst's eyes. The author gives a comparative list of 22 analyses made, one-half of these by the sulphate, the other half by the dioxide method, of ferrosilicons, ranging in silicon content between 10.75 and 90.78 per cent. The differences in the results obtained by the two methods range only between, say, plus 0.05 and minus 0.13 per cent.

A New Tractor

A new tractor, for which the impetus of war requirements is undoubtedly to be given the credit, has been built by the Cleveland Tractor Co., Cleveland, from the designs of R. H. White, of the White motor truck industry. An idea of its proportions and construction may be gained from the accompanying reproduction of a photograph showing the tractor making tests for officers of the Ohio regiment of engineers. The tractor develops 20 hp. at the pulley, shown at the front, and 12 hp. at the draw bar. It is not over 50 in. in width and is 52 in. high and weighs 2750 lb. Its traction surface measures 600 sq. in., a fact which, it is emphasized, allows it to travel over practically any surface without slipping.



Cleveland Tractor Hauling a 5700-lb. Gross Load Across a Creek Bottom

Broader Scope for Vocational Training

Larger Activities of the National Association of Corporation Schools in Behalf of Less Skilled Employees

BY PAUL KREUZPOINTNER

The increasing demand from our industries for not only a more intense but a more adequate form of elementary, high school and vocational education and the discussion of the subject in various trade journals are significant and encouraging. The conviction is growing that the purely mechanical dexterity training in the manipulation of tools as a means for speeding up and increasing output is no longer sufficient for the skilled mechanic.

As a matter of fact, in the haste for output and in the desire to meet competition, too much emphasis was laid upon the training of those habits and inclinations, like inventive expression and manual dexterity, which are already more or less secondary habits with our people and largely cultivated faculties, the development of other valuable faculties which were dormant was neglected and their value lost to the pupil, to industry and to the community.

Our pioneer life demanded mechanical ingenuity and manual dexterity as an asset to national development, producing the "jack of all trades" who still flourished largely during the sixties and whose inherited capacities formed a valuable basis for the phenomenally successful development of our mechanical industries. With the liberal application of technology to our machine industry in the seventies and its extension into mining, manufacture, transportation, agriculture and household activities came the demand for its recognition in the schools, with their traditional emphasis on the cultural aspect of education.

Industrial Viewpoint too Narrow

The craze for the cultivation of manual dexterity for the sake of output reacted adversely upon the industries in several directions. It alienated educators from the efforts of industrialism to maintain that standard of civilization conceived to be essential to secure the continued prosperity of the industries and commerce. Thus antagonism and distrust were engendered between two powerful social forces, each misunderstanding the point of view of the other, where cooperation of all social forces was essential to progress in the material and ethical life of the nation.

The mass of workers in shop, store and office are citizens and voters, and through sheer force of numbers they shape the destiny of communities and the nation. In their over-emphasis of purely manual dexterity and the manipulation of tools, together with the effects of scientific management, there was danger of losing that mental vision and grasp of civic and social life and its responsibility without which orderly government cannot be carried on for any length of time. We cannot divorce the industrial worker and his vocational duties from the man and citizen and his moral and civic duties.

If the worker does not comprehend why he should be a good citizen, he will likewise be unable to comprehend why he should do good and faithful work for the money paid him, or why he should work at all. But if the employee is reduced to a mere machine-tending automaton by his specialized work, or by a scientific management which develops only one useful faculty at the expense of the others, or by an autocratic business regime which leaves no room for initiative, then the inevitable reaction stimulated by our free institutions will produce unrest, misuse of liberty and an exaggerated, undefined worship of human rights with a minimum of responsibility.

Welfare Work to Bridge the Gap

Within the shop gate or the office the employee is necessarily subject to a regimen in respect to his mental and physical powers, and often his sense of loyalty to his employer restrains the exercise of his will even outside of the shop gate or office. What wonder if there is a mental reaction resulting in an intense desire for unrestrained liberty of action outside the shop, encouraged by democratic institutions in the shaping of which the employee as a citizen has much to say. It is obvious that these conditions are liable to produce antagonism, which is tempered only by the necessity of earning a living. The problem is complicated by the shifting of conditions in the industries, requiring new methods of management and increased efficiency, as well as by social, economic and political changes of national extent.

Of late numerous attempts have been made by individual industries to minimize these antagonisms by welfare arrangements, often of a very elaborate kind, and by pension systems. These are well meaning and praiseworthy, and sometimes react favorably upon the ethical life of the community. Sometimes, if the method of carrying on this welfare work is not well chosen, it assumes a paternalistic character, arouses suspicion, creates an undercurrent of ill will and does more harm than good in the long run, not only to the particular concern, but to the community as well.

Broader Policy in Industrial Causes

It is encouraging to see the growth among industrial and commercial corporations of the conviction that the man working for a living, the moral man who seeks to do his work right, and the conscientious citizen who must support the institutions which hold society together and vouchsafe industrial and commercial stability, are one and the same person in daily life. In recognition of this fact and with commendable foresight, the National Association of Corporation Schools has broadened its apprentice school training by the addition of such subjects as will develop right economic views and a sense of civic responsibility, enlarging its work by adding a department of continuation schools for the semi-skilled and unskilled. The satisfactory results attained thus far in trade schools for skilled mechanics as well as in corporation and public continuation schools would indicate that it not only pays from the commercial standpoint, but also tends to raise the civic standard of the community. The reason is not far to seek. How can we maintain our institutions and our industrial progress if we allow millions of the population to sink into the mental slough of machine-tending automatons whose only means of reviving their drooping spirits is in demoralizing recreation?

The next question is, What can the industries do, for their own good, to minimize or counteract these deteriorating social forces? An elementary treatment of natural science subjects as related to the technical side of industrial or commercial occupations, or of the problems of municipal management, state and national government, offers a field for educational extension in various directions. The extent, location and characteristics of the raw materials forming the basis of the industry in which the employees are engaged would form an interesting field of study in the shop apprentice schools as well as in the shop continuation schools for the unskilled and semi-skilled. The means of transportation of these raw materials, the processes of their conversion and the properties and uses of the resulting product would open another large field not only for occupational study but for recreation and even entertainment if these subjects are linked up with history, geography and travel in narrative form. The shop apprentice and shop continuation schools have the advantage over the technical high school and the public

continuation or part time school, of direct application of the subjects taught. Such courses would make plain to apprentices the reason for the insistent emphasis on economy of time and material in daily operation, reducing the need of supervision and coercion and removing a great source of antagonism and misunderstanding between employer and employee.

Community Aspects

Most of the wasteful, slipshod, unbusinesslike management of municipal affairs can be traced directly to lack of training of the average taxpayer in technical and economic subjects. Problems of municipal government are largely engineering problems nowadays, requiring expert knowledge for their economic solution. Where every citizen has the right to decide what is best for the city and for the country, he assumes that this right also enables him to judge what is best, and the average taxpayer therefore has no use for the expert.

Those who have had the opportunity to watch the technical and economic growth of our industries during the past fifty years have also observed the growth of differences between employer and employee. The conclusion is inevitable that the financial and technical demands upon industry have grown much faster than the supply of knowledge on the economic and social significance of industrial developments. It was assumed that there was no relation between the shop life of the workman and his civic life outside the shop, and in vocational education the emphasis was all directed to purely manual dexterity training and quantity of output. Much can be done in broadening vocational training, where shop schools and shop continuation schools have already been established, and by establishing such schools in industrial concerns where there are none as yet.

Co-operation With Public Schools

To raise the standard of vocational education in the shop as well as in the public vocational and continuation schools, it is desirable for the industries to cooperate with the public school system, but not to try to dominate the latter or push it to one side. Civics, natural resources, history and geography ought to be correlated with technical-mechanical subjects with great advantage to the employee, the employer and the community. Every large concern should have a museum of raw, semi-finished and finished materials, or if this is not feasible there should be such a museum connected with the public schools or the public library. A well selected library, stereopticon slides, moving pictures and lectures on special trade and industrial topics, and entertainments can be made valuable auxiliaries of trade and continuation schools in the shop or outside of it.

In all vocational education the inductive and objective method of teaching is preferable. It develops judgment, interest, reasoning, economic scrutiny, accuracy, and a sense of responsibility and is cultural, while directly appealing to the personal interests of the pupil. The industries will need this form of vocational education even more after the war than now.

Analysis of Aluminum and Its Alloys

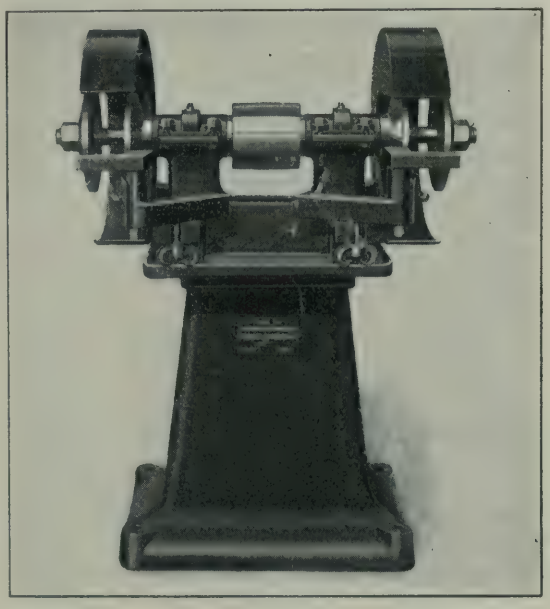
The importance of the analysis of aluminum and its alloys has been enhanced decidedly because of the rapid increase in their use, according to J. H. Stausbie of the Birmingham (England) Technical School in a paper on the "Analysis of Aluminum Alloys" read before the Society of Chemical Industry (British). For works purposes the methods of the investigator take up too much time, and shorter though less accurate ones must be used. An analysis which gives the content of a constituent to within 0.1 per cent, or even less in some cases, is sufficiently accurate for the manufacturer, as he could not hope to get within closer limits in making an alloy from a given formula. If the alloy is supplied in bulk, samples obtained by means of a moderately fine metal saw give good results. Turnings, drillings or borings are not so convenient. The author gave various methods of analysis, including one for the determination of nickel in aluminum alloys, which is giving very fair results.

Double-Spindle 18-in. Grinding Machine

A line of double-spindle grinding machines equipped with self-oiling, babbitted bearings has been developed by the S. B. Patch & Sons Co., Streator, Ill. The machines are built in three sizes for mounting wheels having diameters of 10, 14 and 18 in. respectively. The general design of the three sizes is the same as the largest which is illustrated herewith.

The spindles are of steel which is finished by turning and grinding and are interchangeable for the same size of machine. The diameter, it is emphasized, is larger than usual to avoid any likelihood of spring. The bearings are babbitted and are reamed for alignment. They are self-oiling and the caps are milled to lock on the boxes and thus provide a uniform bearing. With a view to preventing dust from entering the bearings, liners are placed between the bearings and the caps, this arrangement also being relied upon to permit adjustments for wear.

Wheel flanges and cast-iron wheel guards are employed to insure safety if a wheel should by any chance burst in use. The rest supports and the rest holders



A Slightly Different Arrangement of Rest Supports and Holders Is Employed in a Recent Double Spindle Grinding Machine Mounting Wheels 18 In. in Diameter with a 3-In. Face

are finished by milling, as well as the bottom of the head and the plate where they come in contact. This has been done in an effort to make the machine as chatter-proof as possible. This finishing of the parts has been supplemented by providing a heavy base which covers a large amount of floor space.

The wheels used by the machine illustrated are 18 in. in diameter with a 3-in. face, and the distance between them is 24 in. The spindle is 1½ in. in diameter where it passes through the wheel and 1¾ in. in the bearings, which are 6 in. long. The center of the spindle is 35 in. from the floor and 11 in. above the machine table. The weight of a complete machine is 500 lb. and the speed of operation is 500 r.p.m. If desired, special safety flanges 10 in. in diameter can be supplied in place of the wheel flanges that are regularly furnished.

The LaBelle Iron Works, Steubenville, Ohio, which recently bought about 2500 acres of coal lands in Ohio and Brooke County, W. Va., states that the property is intended as a steam coal reserve, and that it has no plans at present for the development of this field.

An illustrated pamphlet on hitches and slings, covering the use of ropes, cables and chains, has been issued by the National Safety Council, Chicago, as No. 6 of its series of pamphlets on "Safe Practices."

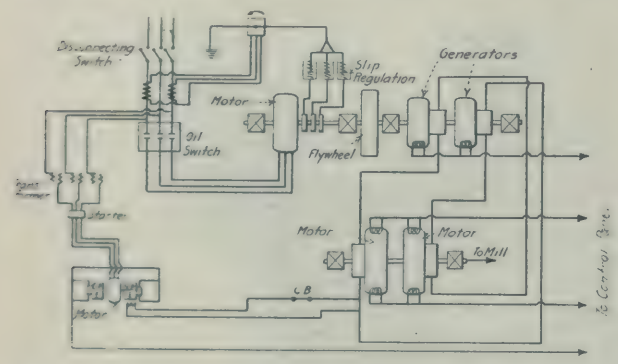
Means to Economy from Motor-Driven Mills

Elements in the Design of a Reversing Rolling Mill Which Make for Reliability and Efficiency and Lower Operating Costs

BY D. M. PETTY*

POSSIBLE improvements in the electric drive of reversing rolling mills and means of keeping at a minimum the cost of rolling steel using this drive are of immediate interest. Three items, cost of equipment, efficiency and reliability enter into the cost of rolling and are affected by the drive.

An excellent means of reducing the cost of the equipment per ton of steel rolled is to increase production, but mechanisms that do not in some way decrease the cost per ton of steel rolled should not be installed. Refinements which make the drive more efficient and do not hinder operation will reduce the number of kilo-



The flywheel of the motor-generator set in the Ilgner system is usually placed between the induction motor and the direct-current generator. When two generators are used, the maximum potential to ground may be kept equal to that of one generator by connecting them in series as shown

watt hours per ton and also the size, and hence the cost of the drive. They will also reduce the capacity required in the power station. Delays keep the rolling costs up as much as any other factor in mill operation, and so all machinery entering into a mill drive should be thoroughly reliable. It must be designed so that trouble can be easily found and quickly repaired. This means it must be as simple as possible.

A study of the drive by following the flow of energy from the power mains to the mill as shown in the illustration will indicate the elements of reliability, efficiency and cost of each part.

The Motor-Generator Set

Passing from the disconnecting switches to the oil switch and primary windings of the motor, there is little in this link that needs comment, except as to reliability. It is a grave mistake to install any apparatus in this link that is not fully up to the standards of the rest of the equipment. The oil switch should be of sufficient capacity to handle a short circuit without throwing oil over other parts of the equipment.

The primary windings of the driving motor, which is assumed to be a high voltage induction motor, should not only be liberally rated to keep up its efficiency, but its insulation should withstand high temperatures and moisture. The bearings and shaft should be liberally rated and designed for ring oiling, but gravity oil feed should be provided to insure against letting the rotor down on the stator iron.

It is common practice in this country to locate the flywheel between the driving motor and the generators, letting the flywheel bearings serve as one bearing for the motor and one for the generator. If the flywheel is located on the opposite end of the generators from the motor and is carried in a separate pair of bearings with a flexible coupling, wear of the flywheel bearings will not affect the operation of either the generators or the motor. This would be an especially good arrangement if two motors and two sets of generators were used in connection with one flywheel. The flywheel should be designed with a high factor of safety, machined to insure good balance and the rim should be protected with a shield to reduce air friction.

The Direct-Current Generators

The direct-current generators are usually built for 600 volts or more and are not only equipped with interpoles, but also with compensating windings in the main pole faces. The commutators should be very liberally designed and have extra wearing depth of bars. Extra length of creepage distance should be provided on each end of the commutators to prevent flashover to ground. The commutators of the generators are one of the weakest points in the entire system and too much care cannot be taken to make them right. The brushes should be of the highest quality and contain no abrasive material and the mica should be kept undercut. The current density in the brushes should be kept low and shunts should have ample current carrying capacity. What is true of the generator commutators is also true of the mill motors.

The motors must be ventilated by a forced draft. The air should be washed unless it is taken from outside the mill and is free from the usual dust and gases of a rolling mill. Also it must be properly distributed through the motors to avoid hot spots in the windings.

When two or more generators are used they should be connected in series as shown in the illustration, as this connection keeps the voltage to ground equal to that of one generator.

Compound versus Shunt Wound Motors

There is some question as to whether the motors should be compound or shunt wound. A compound winding on the motor gives it somewhat of a cushion against severe overloads and to a certain extent protects not only the motor but also the machinery of the mill. It also tends to increase the torque of the mill motor for a given armature current, but this is not very much at slow speeds where maximum torque is needed. The shunt field windings are then at their maximum excitation and additional excitation produced by the series windings does not produce a proportionate amount of field flux. When the field has been weakened to give high speeds the compounding will be more effective but then the motor should not slow down, for high speeds are desired. A compound wound motor can have a lower horsepower rating to handle a given peak load but it does this at the expense of production. A shunt wound motor to handle the same peak loads would be larger than the compound wound motor and will give greater production. The generators for the shunt motor will be larger than for the compound wound motor which further increases the cost of the equipment over that of the compound motor.

The compounding of the mill motor is usually accomplished by having a variable potential exciter for the field current the voltage of which varies with the load current of the mill motor. This arrangement is necessary because the series field of the motor must be in the same direction for both directions of rotation and since the load current reverses each time the motor reverses, the connections of variable potential exciter to the motor fields must be reversed with each reversal of the mill. This can and is easily taken care

*From a paper read before the Association of Iron and Steel Electrical Engineers at Philadelphia, Sept. 11. The author is superintendent electrical department Bethlehem Steel Co., South Bethlehem, Pa.

of in the master controller. Omitting the compound field, however, tends to simplify the master controller and this is a desirable feature as simplicity insures continuity of operation. It would seem therefore that a shunt wound motor should be used unless the mill is to be a slow one or one subject to severe peak loads at frequent intervals. The time of reversal of the motor has been brought up in comparing it with the steam engine and it is admitted that the engine can reverse quicker, but this is not the most important point to be considered in selecting the drive for a mill. Steel must be entered in the rolls at low speed and the motor must be capable of accelerating quickly with the piece in the rolls.

Mill-Motor Bearings

The bearings of the motor must be provided with constant oil feed because the rings will not carry oil when running on a shaft which changes its direction of rotation often. The bearing pedestal next to the mill must be designed to stand the thrust of a broken spindle and provided with a thrust bearing. These bearings are also provided with cooling coils but if possible the mill should run without this feature.

The exciter set is a small item in the first cost but a necessary link in the chain, and must therefore be liberally rated. A spare should be provided if the mill is laid out for continuous operation.

The coal contactors should be designed for hard service and installed so as to facilitate repairs. The controller by which the engineer operates the mill should be made as fool proof and simple as possible, and too much care cannot be used in the makeup and design of this piece of apparatus. Terminal boards plainly marked should be used at both ends of all control circuits. This is especially good practice when the wires are grouped together in one conduit.

Mill of Bethlehem Steel Co.

The following is the data of the drive in the No. 2 mill of Bethlehem Steel Co., South Bethlehem:

35-in. blooming mill.
Speed full motor field, 40 r.p.m.
Speed weakened motor field—120 r.p.m.
Voltage across each armature—600.
Maximum operating torque—1,550,000 lb. ft.
Maximum motor hp.—12,000.
Rated capacity of motor generator set—2000 kw.
Weight of flywheel—100,000 lb.
Synchronous speed of motor generator set—375 r.p.m.
Average for one month—21.3 kw-hr. per ton.
(Rolling equal quantities of 4 in. x 4 in. and 9 in. x 9 in. blooms from 23 in. x 27 in. ingots, 0.40 to 0.50 per cent carbon.)
Best record, 12 hr.—19.41 kw-hr. per ton.
(Rolling 8 in. x 8 in. from 23 in. x 27 in. ingot, 0.32 to 0.36 per cent carbon.)

The average tonnage is 17,180 tons per month. The fact that much more than this could be rolled if other mill conditions did not prevent, shows that less than 19 kilowatt hours per ton would be reached if the mill should run at maximum capacity.

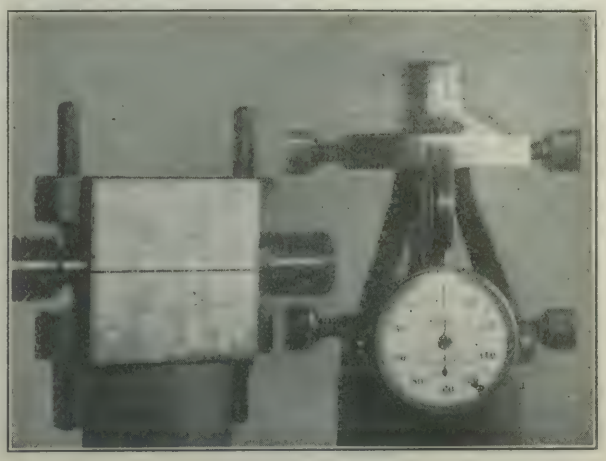
Strike Is Postponed

SEATTLE, WASH., Sept. 8.—A strike of 12,000 workers in Seattle shipyards and plants engaged in fabricating shipbuilding materials, to enforce long-pending demands for wage increases, which had been set for Sept. 5, has been postponed by the Seattle Metal Trades Council, pending the conference of a delegation of labor representatives sent to Washington at request of the United States Shipping Board. The strike, if carried out, would affect every shipbuilding plant in the city, with the exception of the Skinner & Eddy plant and several smaller plants which have agreed to the employees' demands. The presidents of the three of the largest plants in Seattle were also requested by the United States Shipping Board to return to Washington for another conference in order that the settlement of the wage question in the shipyards may be settled without a strike. All of the plants involved hold government contracts.

The Spicer Mfg. Corporation, South Plainfield, N. J., has succeeded to the business of the Spicer Mfg. Co., and will conduct the business on an enlarged scale.

New Extensometer for Determining Elastic Limit

A new extensometer, for measuring the elastic limit of steel, has been brought out by the Riehle Bros. Testing Machine Co., Philadelphia. A feature not heretofore provided is the provision to attach it to opposite sides of the bar and indicate the actual mean stretch



The Dial Extensometer

between the two sides. This is accomplished by mounting the lower points of attachment in a frame which can swivel about its center and thus accommodate itself to unequal stretch in the opposite sides.

With the apparatus a block is supplied with which a specimen is center punched 2 in. apart on opposite ends of a diameter. The extensometer is then taken in hand with the forefinger through the hole shown under the top frame, and the thumb resting on the clip above the top frame. The hardened contact points are thus brought about 2 in. apart. The instrument is put up to the bar and with the other hand the screws are set in the marks which have been previously made as stated above. The specimen is then gripped in the testing machine in the usual way. The dial of the indicator can be rotated with the fingers so that when the specimen with the extensometer attached is in the machine ready for testing, the dial is moved until the pointer stands over zero and test is begun.

As load is applied the pointer moves slowly around the dial at first, indicating the elongation of the bar in ten-thousandths of an inch, but when the elastic limit is passed the pointer moves much faster (sometimes giving a distinct jump) making it possible to see the elastic limit with the eye.

There are no electrical contacts, no adjustment of a micrometer screw and no reading of a micrometer dial. Readings can be taken for a stress strain curve at equal increments of load while the testing machine is running. The instrument has sufficient motion to carry the test well beyond the elastic limit before it must be removed.

Cleveland Plant Taken Over

The plant and business of the Cleveland Machine Tool Works, Cleveland, maker of horizontal boring mills, has been sold by J. G. Bellinger to interests that control the Cleveland Milling Machine Co. The plant will be operated under the name of the Cleveland Machine Tool Co., which has been incorporated with a capital stock of $200,000. The officers are Frank S. Shields, president; John A. Camm, vice-president, and L. M. Richards, secretary, all of whom are officers of the Cleveland Milling Machine Co., and James H. Whitelaw, treasurer. It is the intention of the company to about triple the output of the present plant.

The New York School of Heating and Ventilating announces the opening of its fifth annual season, Monday and Wednesday evenings, at room 512, World Building, New York. The school is conducted by Chas. A. Fuller, 101 Park Ave., New York.

The Rôle of Nickel in Making Steel*

Comparative Physical Results From Adding Various Amounts — Effect on the Structure and the Reasons Therefor

BY R. R. ABBOTT

IN its most simple and fundamental form steel is a more or less rigid mechanical mixture of pearlite and iron, the pearlite itself being a much finer mechanical mixture of cementite (Fe_3C) and iron. In common with such mechanical mixtures the physical properties of this alloy bear some ratio to the percentage of its constituents. For various reasons the ratios of these physical properties are not straight-line functions of the carbon contents. One of these reasons is the fact that, practically, we do not have a perfect mechanical mixture, but the iron always carries some carbide solution, the amount of which increases with the carbon content of the alloy. Another reason is the changing ratio between the areas of the boundaries between the iron and the cementite, and the amount of these two constituents as the carbon content varies.

It is very evident that in order to make a change in the physical properties of any individual alloy the pure carbon-alloy series, we could proceed in one of three ways: To change the nature of the pearlite; to change the nature of the iron; and to change the nature of both the pearlite and the iron. The second cannot be entirely distinct from the first procedure, because of the iron in the pearlite.

In practice the physical properties of this simple iron-pearlite alloy is changed by three methods:

1. Addition of various elements to it:
2. Changing the relative amount of free iron present: and
3. A combination of both methods 1 and 2.

Under method No. 1, if more than the normal amount of any element present in a simple carbon steel is added, the steel is known as an alloy steel. Under method No. 2 come the various processes of heat treatment.

When nickel is added to the iron-pearlite alloy it dissolves entirely in the iron, and the physical properties of the alloy are changed approximately to the extent we should expect, when we consider that it is a solid solution of nickel and iron for one element and a pearlite with this solution for one of its constituents for the other.

Effect of Adding Nickel

The effect of alloying nickel with pure iron is to increase the elastic limit, tensile strength and reduction of area, but to decrease the percentage of elongation. This effect is the same when carbon is present, and it is found that a given amount of nickel produces about the same change in physical properties, irrespective of the percentage of carbon. The average effect of nickel up to 8 per cent upon an iron-carbon alloy is as follows:

0.01 per cent of nickel increases elastic limit 40 lb. per sq. in.
0.01 per cent of nickel increases tensile strength 42 lb. per sq. in.
0.01 per cent of nickel increases reduction of area 0.005 per cent.
0.01 per cent of nickel decreases elongation 0.010 per cent.

Expressing this for a 3.5-per-cent nickel steel, which is the most common commercial alloy, such a nickel steel should have 14,000 lb. per square inch higher elastic limit, 14,700 lb. per square inch higher tensile strength, 1.5 per cent greater reduction of area, 3.5 per cent less percentage of elongation than a steel of the same analysis, but without the nickel.

(By the percentage of reduction of area and elongation, is meant the actual number of units of change. For example: A steel with no nickel has a reduction of area of 53 per cent and an elongation of 26 per cent; the same steel with 3.5 per cent nickel would have a reduction of area of 54.5 per cent and an elongation of 22.5 per cent.)

The elastic limit and tensile strength are then increased by nickel due to the increased properties of the solid solution of the nickel in the iron. The reduction is practically altered but little, but the elongation is quite appreciably decreased.

When a plain carbon-iron alloy is heated above the upper critical point (Ac3), the cementite is dissolved in the iron of the pearlite at the passage through the lower critical point (Ac1) and this solution progressively dissolves the remaining iron during the heating up to the Ac3 point, at which point it is all dissolved and the solution is homogeneous. Upon cooling, the reverse action takes place, but when nickel is present this separation of the cementite from the iron-nickel solution does not progress as completely nor as easily as from a plain iron solution, and therefore the pearlite areas in a nickel steel are larger and much more poorly defined than would be the case in the same steel without nickel. This effect becomes more marked, the more rapid the cooling, and since the pearlite areas are much stronger than the iron areas we find that in practice a nickel steel, compared to one without nickel, when air cooled, will have a higher increase in tensile strength than that given above, which represents perfectly annealed alloy.

When steel is broken down too rapidly in rolling it frequently shows a decided segregation of the pearlite areas along lines parallel to the rolling direction. Nickel apparently tends to intensify this effect and occasionally under even normal rolling this condition is encountered in nickel steel.

The lower and upper absorption (critical) points of nickel steel upon heating, as well as the magnetic critical point, are all lowered by the addition of nickel. The amount of the lowering is given approximately by the following, with reference to a diagram of the critical temperatures of a pure iron-pearlite hyperentectoid alloy:

0.01 per cent of nickel lowers *GO*	0°.235 C
0.01 per cent of nickel lowers *OS*	0°.180 C.
0.01 per cent of nickel lowers *MO*	about 0°.087 C.
0.01 per cent of nickel lowers *PS*	0°.103 C.

In working with the Ac_2 point these figures are not based upon as accurate an investigation as for the Ac1 and Ac3 points. As the nickel contents are increased and the critical temperature progressively lowered, it is evident that finally the upper absorption point will reach the temperature of the atmosphere (20 deg. C.) and we will have an austenitic alloy; the greater the amount of carbon the less nickel it takes to reach this condition.

When a piece of steel is quenched from above the upper absorption point rapidly enough the result will be the complete absence of iron as a constituent of the alloy. This process is the basis of most heat treatments.

The martensite which is thus produced has physical properties entirely different from the mechanical mixture with which we started. A martensite containing nickel has a higher elastic limit and maximum strength, but a slightly lower reduction and elongation than a similar one without the nickel.

A heat-treated nickel steel, while having a lower reduction and elongation than a correspondingly heat-treated steel without nickel, has more than enough increase in strength to make up for it; in other words, with a given strength the nickel steel will have a

*From a paper presented at the twentieth annual meeting of the American Society for Testing Materials, Atlantic City, N. J., June 27, 1917. The author is metallurgical engineer, Peerless Motor Car Co., Cleveland.

greater degree of toughness. Likewise, as we increase the strength of an alloy (either heat-treated or not) by means of nickel, the loss in reduction of area and percentage elongation is far below the loss secured when the strength is increased by increasing the carbon content. In other words, nickel as a strength-giving element is not accompanied by such a loss in toughness as is carbon.

The effect of nickel upon the elastic limit and tensile strength of heat-treated steel varies with the amount of "draw" or temperature of reheat after quenching.

The following formulas represent the effect of 0.01 per cent of nickel upon a ¾-in. bar of steel; in these formulas T is the temperature of draw in degrees Centigrade and the results represent the increase in pounds per square inch:

Elastic limit .....287 — 0.174 *T*
Tensile strength .....294 — 0.214 *T*

The reduction of area and percentage of elongation are reduced approximately the same amount, and this amount is not affected greatly by the temperature of draw; 0.01 per cent of nickel lowers the reduction of area and percentage of elongation about 0.0073 per cent in heated-treated steels. This slight amount is practically negligible for commercial nickel steel.

Nickel decreases the rate at which steel will absorb carbon in the carbonizing process. The amount of this is approximately 0.04 per cent for each 0.01 per cent of nickel.

All Given Square Deal

WASHINGTON, Sept. 11.—Notice is being sent to a long list of manufacturers in position to supply material for the Navy that the Bureau of Supplies and Accounts will hereafter insist upon doing business with producers wherever possible. Manufacturers are also being advised to bid direct with the bureau and not through the medium of so-called manufacturers' agents or representatives. All bidders are assured of fair and equitable treatment, and it is stated that the purchasing officers will zealously look out for the interests of absent bidders whose proposals reach the department by mail and that no advantage will be obtained by bidders who personally attend the openings or who are represented by agents.

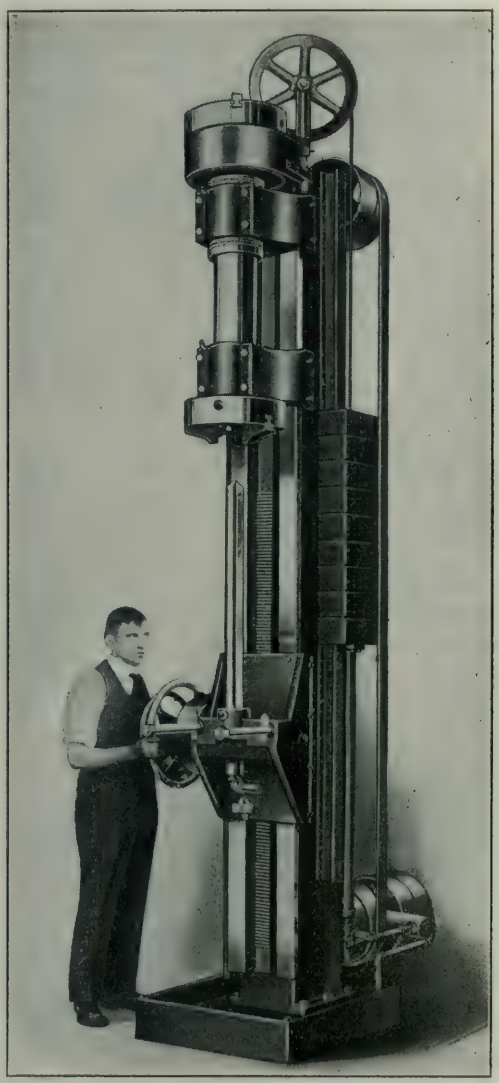
The Navy Department has been induced to send out this notification as a result of the operations of a large number of more or less reputable persons who have sought to take advantage of the enormous amount of war business now being placed by the Bureau of Supplies and Accounts. Some of these agents have long represented here well-known manufacturers and have employed none but legitimate methods. In view of the expansion of the Government's business they are now seeking to add to their clients, and the Department has no reason to believe they are doing anything improper in this connection. There are many others, however, who are seeking to make connections with manufacturers and supply houses by representing that they have special facilities for bringing goods to the attention of the department officials and special influence with which to secure contracts. As the department is making its purchases on a strictly competitive basis and is showing no favoritism, even to contractors who have a long record of excellent service to the Government, there is absolutely no basis for the representations being made by these agents and the department desires, as far as possible, to prevent manufacturers from being misled by these false pretences.

President T. J. Bray of the Republic Iron & Steel Co. states that work is progressing as fast as possible on the two new 80-ton open-hearth furnaces and also on the two 4-hole soaking pits being built by that company. Other minor additions are under way, the total cost being estimated at about $1,000,000. When the two new furnaces are completed, the Republic company will have a total of 14 80-ton open-hearth furnaces, making it the largest producer of open-hearth steel in the Youngstown district.

Drilling Machine for Recoil Cylinders

A line of machines for drilling holes in recoil cylinders has been brought out by the Charles Stecher Co., 1574 Crossing Street, Chicago. This machine is a development of the company's line for drilling holes in lathe spindles and work of similar character and two units are built, one for doing the first or rough boring operation, while the other is for finishing. The drill is mounted in a vertical position and is fed upward into the work, an arrangement relied upon to prevent the chips from clogging the drill. The machine is designed for boring a hole 3¾ in. in diameter and 63 in. long.

The spindle has a chuck at the lower end in which the piece to be drilled is mounted and the maximum

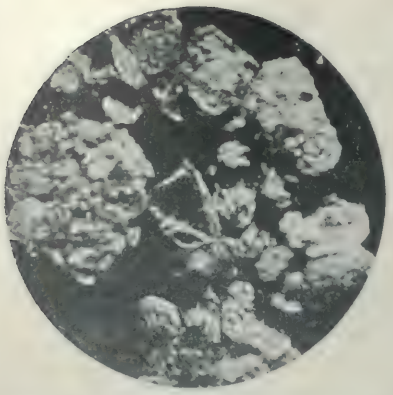


A Hole Approximately 64 In. Long Can Be Drilled in a Forging Intended for Use as a Recoil Cylinder, the Drill Being Fed Upward into the Work

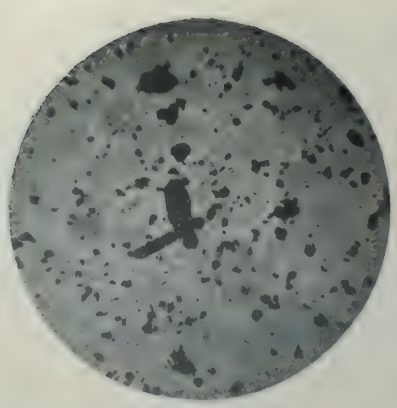
diameter of work that can be handled by the machine is 5 in. The drill is fed by a handwheel which controls the movement of the sliding head along the rack cut in the face of the column. The feeding mechanism is arranged to provide for different rates by the use of a pair of removable gears. Belt drive from an overhead countershaft is employed.

In addition to the drilling machine illustrated, a smaller size for handling stock up to 5 in. in diameter and about 3 ft. in length is built. This is intended for use by manufacturers of lathes, airplanes, automobiles and locomotives.

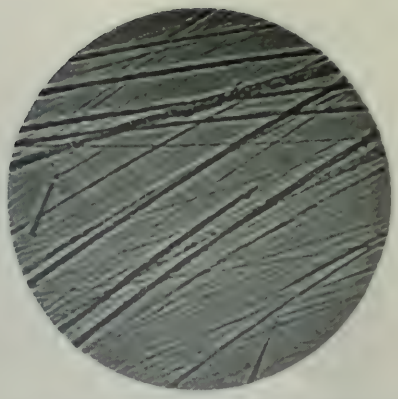
The Detroit Pressed Steel Co., Detroit, has awarded a contract to the Heinle Co., metal-rolling engineer, Pittsburgh, for the development of a machine to roll steel wheels for automobiles.



Abrasive Impurities in a High Grade Micaceous Graphite—120 Diameters



The Central Crystal Is Silicon Carbide in Artificial Graphite—120 Diameters



Glass Surface Abraded by Crystals of Silicon Carbide—120 Diameters

GRAPHITE LUBRICATION

Abrasive Properties of Impurities—Emulsion in Oil and Effect of Size

EARLY in his experience with bearing and lubricating problems, Christopher H. Bierbaum, vice-president, Lumen Bearing Co., Buffalo, was convinced that the results obtained from the use of graphite as a lubricant were unsatisfactory and this, he says, led him to an investigation of its use. In a paper presented some months ago before the Buffalo section of the American Society of Mechanical Engineers, of which the following is a review, he discussed some undesirable properties of graphites used for lubrication, and, more especially, the abrasive effect of impurities on lubricated surfaces.

Impurities are found in both natural and artificial graphites. Impurities found in natural graphites are usually earthy admixtures and in artificial graphites the impurity usually is silicon-carbide, which next to the diamond is the hardest known abrasive substance. Micaceous graphite also may contain layers of mica which make their use on bearings undesirable. The presence of these impurities in the graphites studied was revealed by the aid of photomicrographs and their abrasive properties were determined as follows. A small soft wood block was placed on the end of a small fan-motor shaft. The impurities mixed with oil were applied to the end of this wooden block, and a microscopic slide was then held against it while it revolved rapidly. After this a photomicrograph of the microscopic slide, using oblique illumination, showed the abrasive effect of the impurities. Only those particles which were hard enough to cut glass were brought into consideration. A photomicrograph of a glass surface abraded in this manner by using artificial graphite which was marketed in the dry form is shown in an illustration. The sharp cuts shown in this view are characteristic of a high-class abrasive.

An artificial graphite compound marketed in the form of a graphite grease also caused abrasion. In an amorphous natural graphite the impurities were somewhat clotted together, though sharp and distinct crystals were discernible. The crystals were more or less rounded, and abraded the surface in a manner resembling that of sea sand. It is argued that the impurities of graphite can be counteracted by increasing the amount of graphite used, but this cannot be done, for any abrasive impurity present in the graphite will have a destructive effect upon the bearing surfaces. This was demonstrated by the abrasion of a bronze gear tooth of a rotary pressure pump by the mixture of equal parts of water and fine air-floated graphite which it pumped through a burr mill for grinding. Two photomicrographs of this tooth are shown, one being that of its surface before use and the other that of this surface after the tooth had been in service 30 days. When a graphite from which the impurities had been removed by the Bierbaum process was tested there was no abrasion.

One of the illustrations shows a fungus growth in a graphite compound purchased on the market and evidences the fact that a vegetable or animal oil was used, at least in part, in its preparation. Graphite compounds using animal or vegetable oils should be thoroughly sterilized before they are sealed in their containers.

The suspension of graphite in oil to facilitate lubrication does not appear difficult since there is a film tension of oil around each particle of graphite, and the oil has a positive capillary affinity with the surface of the graphite. Also by the fine subdivision of the graphite its aggregate surface is increased enormously and microscopic observations seem to indicate that particles 1/200,000 in. in diameter are beyond the reach of the action of gravity. However, when the particles of graphite are fine enough to defy the force of gravity, they are subject to another force known as the Brownian movements. This approaches perpetual motion of the graphite particles. It is not a continued movement in one direction, but a zigzag course, caused by the free electrons striking the particles of graphite. During these erratic movements the particles of graphite collide with each other and as a result adhere. In this manner there is gradually built up a mass of adhering particles which is subject to the action of gravity and settles out.

The value of a permanent suspension of graphite in





Original and Abraded Surfaces of a Bronze Gear Tooth Showing How Impurities in Air-Floated Graphite May Injure Bearings—100 Diameters



Fungus Growth in Graphite Compound Prepared with Oil—900 Diameters

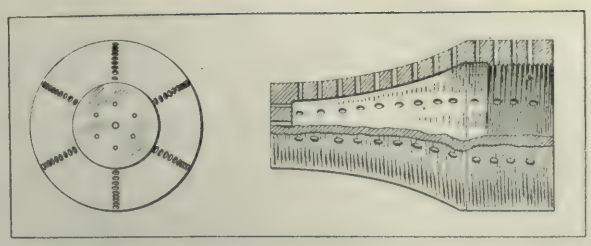
oil is more fanciful than real. In all such attempts the graphite is ground until its fineness mitigates against its usefulness. In a bearing properly constructed, lubricated and in operation the bearing surfaces are completely separated by the oil film and the extremely fine particles of graphite simply float in the oil, exerting no appreciable effect either beneficial or otherwise. However, when the oil between the bearing surfaces is squeezed out the graphite remaining serves as a solid lubricant, being crushed and imbedded in the grain and pores of the surfaces. The smaller the particles of graphite the more will be carried away with the oil and the less will be intercepted between the bearing surfaces. Therefore, a given amount of graphite is most efficient if it exists in particles of the largest possible size.

The carbon content of graphite is not an indication of its lubricating value or its purity, as the percentage of amorphous carbon in some varieties is comparatively high. Amorphous carbon, or carbon not completely graphitized, can best be classed as an inert impurity. Its presence always shows extreme blackness. The same is true of another common impurity, hydrogen, or a hydrocarbon, which is also black. Pure graphite is a dark, steel gray when mixed with clear white oil. The chemical laboratory can only give valuable information on the subject of the graphites when the work is done by an expert.

COOLING SHELL FORGINGS

Apparatus Using Compressed Air, Saving Time and Improving the Product

A method of air cooling 9.2-in. forgings for shells, indicated in the accompanying drawing, has been obtained from J. W. Dunphy, engineer, Canada Cement Co., Ltd., Montreal, Que., who generously contributes the information together with some comments on the performance of the apparatus. The decided success ascribed to it will make it of interest to manufacturers of shell steel.



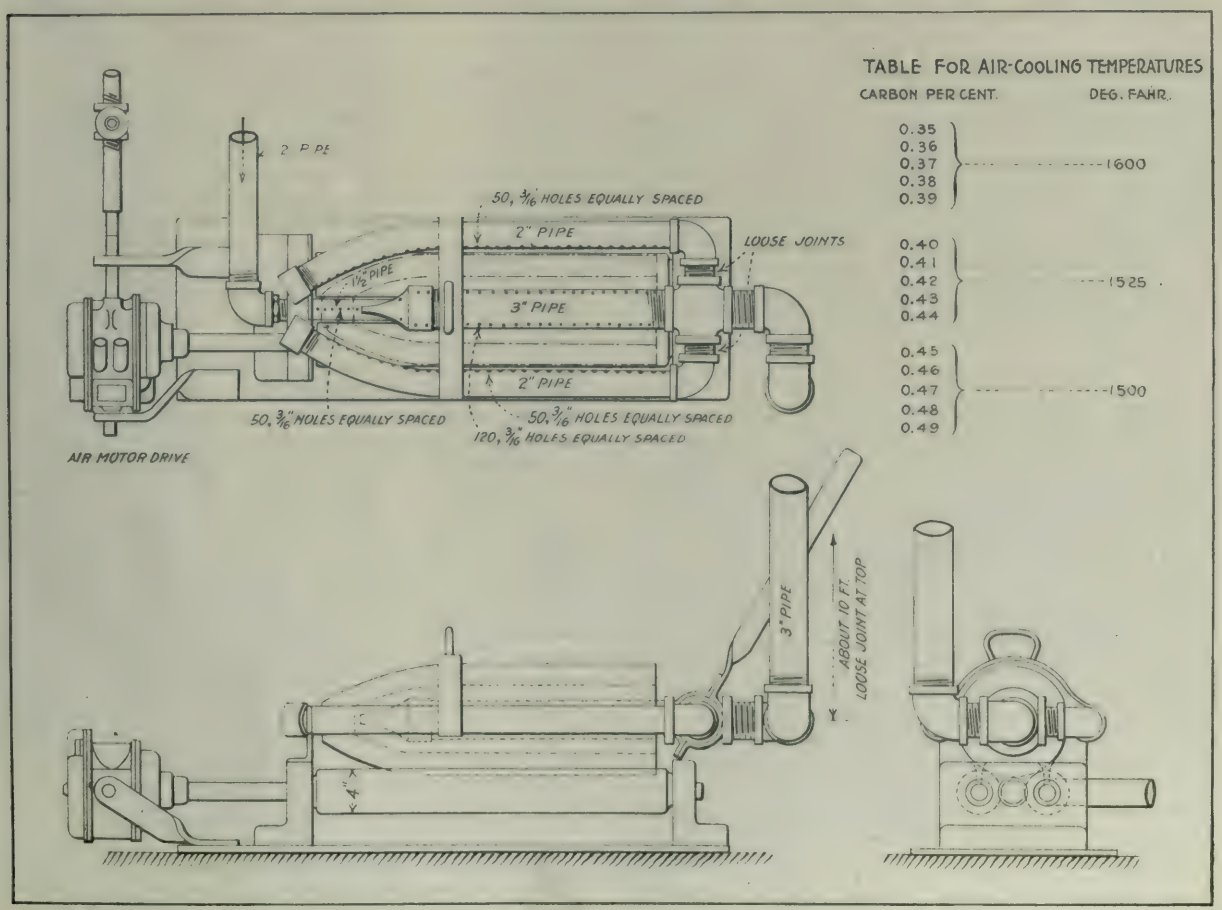
The End of the Internal Air Delivery Pipe Serves Also for Centering the Forging

For example: With steel having the following chemical analysis: Carbon, 0.42 per cent; silicon, 0.063 per cent; sulphur, 0.034; phosphorus, 0.025; manganese, 0.48, the physical results after proper heat treatment and cooling under ordinary atmospheric conditions gave a yield point of 40,300 lb. per sq. in., a tensile strength of 80,600 and an elongation of 27 per cent. The results with cooling with the apparatus shown gave a yield point of 49,300 lb.; a tensile strength of 94,000 lb. and an elongation of 25 per cent.

The air consumption is 2100 cu. ft. per min. and it takes approximately 5 min. to cool the forging from the temperature on coming from the furnace to 800 deg. Fahr. The air is supplied at 80 lb. per sq. in. The drawing indicates how the air pipes are lifted and swung away to remove the one and place in position the next forging. A compressed air motor is employed to rotate one of two rollers on which the forging is supported, the other acting as an idler so that the forging is rotated while the forging is cooled.

One of the illustrations shows the special nozzle on the end of the internal air pipe. This service as a centering device and is drilled as indicated to cool the nose of the forging.

The matter of belts and belt guards has been made the subject of No. 7 of the series of bulletins on "Safe Practices" being prepared by the National Safety Council, Chicago. This bulletin covers illustrations of various forms of guards for belts and includes a specification used for leather belting.



Compressed Air at 80 Lb. Pressure Is Discharged Against Inside and Outside of Hot Shell as It Is Revolved

The Manufacture of Oxide of Zinc*

Details of the Process and the Plant of the New Jersey Zinc Co.—Composition of the Ores, the Product and Its Uses

BY GEORGE C. STONE

THE method of making oxide of zinc direct from the ore was invented and developed at the works of The New Jersey Zinc Co. at Newark in the middle of the last century. The process was invented by Burrows, who had not the ability, financial or technical, to work out the details necessary to make it of commercial value. This was done by Col. Wetherill, whose name is commonly attached to this process. The grate bars used are also frequently called Wetherill grates, which is a misnomer because they were in common use for boiler firing at the time and he never claimed their invention.

The invention of the process was due to the efforts of The New Jersey Zinc Co. to find a profitable means of working the ores from Franklin and Sterling Hill, N. J. These are a mixture of franklinite, willemite and zincite, containing about 20 per cent of zinc. The first attempts were to make spelter, which were not successful, owing to the low grade of the ore and the fusibility of the residue. Failing in this, the next attempt was to make oxide in large muffles and reverberatory furnaces. This succeeded, although the cost of operation was high, the recovery low, and the quality of the product uncertain. In 1855 the new process was patented and has been in successful operation ever since.

Essentially the process is to spread a mixture of coal and ore on a body of burning coal on a perforated grate and blow an excess of air through the grate. The zinc is reduced in contact with the coal, volatilized and burned by the excess of air in the upper part of the furnace and in the flues. It is then carried to the bag rooms by the excess air and products of combustion which are forced through the flues by fans. In its main features, the process is the same to-day as at the time of its invention, but the details have been so modified that it would hardly be recognized by its originators.

The Ores, Fuel and Fluxes

The process is applicable to all the oxidized ores of zinc and to roasted sulphides, provided the gangue is not so fusible as to leave a residue that is impervious to the blast. In many cases the ores contain impurities that make it impossible to produce an oxide of a good enough color to be available as a pigment. These impurities are any volatile metals that form colored oxides or sulphides. Cadmium is one of the worst. Lead, which is one of the commonest impurities in zinc ores, also injures the color. It is often objectionable, particularly when the oxide is to be used for the manufacture of rubber goods. Sulphur as sulphides or as sulphurous anhydrides are objectionable.

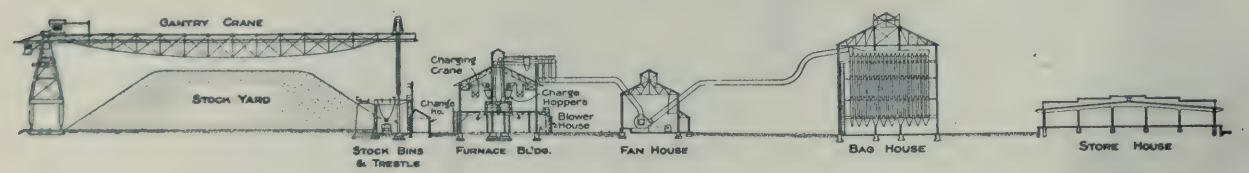
The fuel used must be one that does not give a black smoke which would ruin the color of the oxide. Anthracite is the most satisfactory and the one generally used. In the West, where anthracite is expensive, semi-bituminous coals, low in volatile qualities, are substituted for it in whole or in part, but they are never as good. Coke alone does not work well, as it causes a very intense local heat that makes the residue impervious to the blast. It is occasionally used as a part of the charge fuel.

With siliceous ores, limestone is sometimes added, but in general it does more harm than good, owing to its tendency to make the residue too fusible.

Preparation of the Charge

The ores and coal are usually received at the works in fine enough condition for use without further crushing. Nearly all the ores are either concentrates or roasted products and are inevitably finer than is necessary. As the small sizes of coal are suitable for the purpose and are cheaper than the large, they are invariably used. If fluxes are used they are crushed to about the size of the ore and coal. There should not be a great difference in the size of the different materials, or it will be impossible to mix them properly.

The Palmerton plants, the West and the East, of The New Jersey Zinc Co. (of Pennsylvania), are the largest and best-equipped oxide plants in the world. They are similar, but the East plant has fewer and larger bag rooms and differs somewhat in details. At both plants the raw materials are delivered on the trestle at the south of the plant and are either placed in bins or stocked in piles. The ore and coal are taken from the bins to the mix-house by larries. The mixed charges are delivered to the bins above the furnaces and distributed by traveling cranes. Each block of furnaces is a separate unit, having its own blower, exhaust fan and bag room. The oxide is trucked from the bag rooms to the packing room and the final packages skidded or trucked to the storehouses.



Longitudinal Section of the East Plant of the New Jersey Zinc Co.'s Zinc Oxide Works

The ore and coal at the East plant are delivered on the double track, steel and concrete trestle, 22 ft. (6.7 m.) high with Brown tangential bins below the track next the furnace room. Materials for current use are dumped directly into the bins and the surplus is stocked back of the trestle by a bridge crane of 233 ft. 9 in. (71.25 m.) span equipped with a 10-ton Brown grab-bucket. This equipment also returns materials from the stock piles to the bins when necessary. The charges are drawn from the bins to a weighing larry which has two hoppers, each containing a furnace charge. These are carried to Ransome concrete mixers placed at one end of the furnace room. The mixed charges are elevated by a pair of counterbalanced skips to bins above the furnaces. From the bins the mixed charge is taken to the furnaces by cranes each having three hoppers holding one-third of a furnace charge each. Each hopper is placed on a scale so that the charge is equally divided between the three.

The Furnaces and Operation

The furnace rooms at the two plants are quite similar, the main differences are that at the West plant the furnaces are carried on a concrete foundation

*From a paper to be presented at the St. Louis meeting of the American Institute of Mining Engineers in October, 1917. The author is metallurgist, New Jersey Zinc Co., New York.

and at the East plant, on the floor. In both cases the furnaces are elevated sufficiently to allow the residue to be dropped into hoppers below the floor and then into cars. The West plant furnace room contains 34 blocks of furnaces and the East plant 26. All the blocks are alike, consisting of four furnaces 19 ft. 6½ in. by 5 ft. 11½ in. (5.96 by 1.82 m.). Each furnace has independent blast and flue connections and three charge openings in the roof surmounted by hoppers. Each furnace works three charges in 24 hr. The different furnaces of the block are charged alternately at 2-hr. intervals in regular order. Charging in this way, there is always one furnace starting, one nearly finishing, and two working strongly, and the volume and temperatures of the gases to be handled are nearly uniform at all times.

When the furnace is worked off the dampers in the flues are closed, cutting it off from the bag room. The blast is shut off and the working doors taken down. Three men work on the furnace at once, each having a separate door. The loose material on top of the charge is raked off and dropped on the floor close to the furnace. The clinker is then broken up by heavy slice bars and raked into hoppers under the floor. The furnacemen then thoroughly clean the side and back walls from any clinker that has fused to them.

When all of the old charge has been removed and the furnace cleaned, the grate is covered as rapidly as possible with a thin layer of coal, the doors closed and a light blast turned on. The coal is lighted by the radiation from the hot arch and it is important that it should light quickly and evenly. When the bed coal is burning brightly, the charge from the hopper is dropped on to it and leveled. The doors are now closed, the blast turned on, and the furnace left to itself with occasional inspection to stop any blow holes that may form. With the large charges that are now worked, it is considerable time before any zinc vapor appears. When it does, the dampers in the flues are reversed, sending the gases and oxide to the bag room.

The blowers for the oxide furnaces are direct-connected to motors, the wheels of the blower being placed on extensions of the motor shaft. They are located in small houses outside the furnace room, two in each house.

Each furnace has two outlet pipes, usually 20 to 22 in. (0.5 to 0.56 m.) in diameter which lead up to the drum pipe overhead. The drum has an outlet in the middle of its length leading to the exhaust fans. The exhaust fans are extra heavy plate fans with special Hyatt roller bearings and water-cooled shafts, belted to motors. For convenience in attendance a number are placed in one building. The West plant has four fan rooms, three containing eight fans each and one containing ten fans. At the East plant there are two with 10 fans each and one with six. From the exhaust fans to the bag rooms, in each case, run round pipes 3 ft. (0.92 m.) in diameter, made of No. 16 sheet iron and provided with numerous clean-out openings. In all cases the pipes are arranged to give as nearly as possible the same length from furnaces to bag rooms, to equalize the friction in the different lines, but mainly to secure proper cooling of the gases before reaching the bag room.

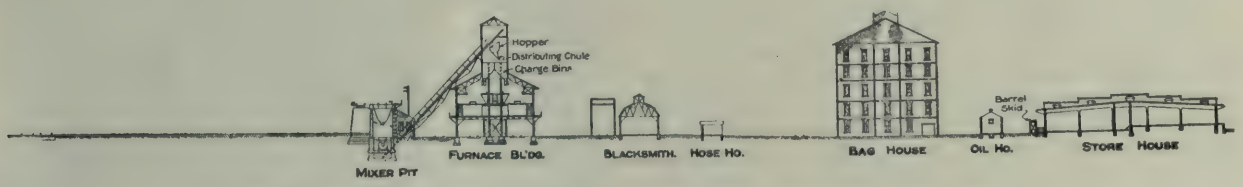
The Bag Rooms

The method of collecting oxide in bags was first patented by S. T. Jones in 1852 and has been patented by others many times since. The bag rooms at Palmerton vary considerably in size; the first two built holding bags enough for four blocks, while the latest contains the bags for twenty. The larger rooms are more economical in labor and do not cause any inconvenience, provided the ventilation is equally efficient. The bags used are all of heavy, closely woven cotton sheeting 22 in. (0.56 m.) in diameter and about 40 ft. (12 m.) long. In the majority of cases the gases enter a header at the top of the room and from there pass to a series of parallel pipes from the bottom of which the bags are connected to hoppers, four bags to each, with a single collecting bag tied to an outlet at the bottom of each hopper.

At intervals the gases are shut off from the two lines of pipe connecting with a single line of hoppers and the bags shaken. This pair of pipes is again connected to the main header and the next two lines shut off and shaken. The frequency with which the bags are shaken depends upon the relative area of grate and bags, and the amount and quality of the oxide being made. The proper ratio of grate surface to bag surface has been a subject of much discussion. It varies in practice between 1:80 and 11:30. The amount actually necessary depends mainly on the efficiency of the ventilation of the buildings and the frequency of shaking.

The collecting bags are removed from the hoppers every 24 hr., or oftener if necessary, and taken to the packing room. This is done by a trucking gang that removes the filled bags and replaces them with fresh ones, trucking them by hand to one side of the bag room where they are coupled together and the train drawn to the packing room by a motor.

The packing room is a four-story building of mill construction. The cooperage is at the East plant, next to the packing room, and has a capacity of about 2000 bbl. a day. The storehouses are all one-story mill-construction buildings with the floor elevated to the level of a box car. Power for both plants is supplied from a central station at the West plant between the oxide and the spiegel furnaces. The boiler room is equipped with Edgemoor boilers of 536 hp. each, which can be fired with coal or with the waste gases of the spiegel furnaces. The engine room parallels the boiler room and contains three horizontal cross-compound blowing engines for the spiegel furnaces; four direct-current generators, each direct-connected to a horizontal cross-compound Corliss engine; three Allis Chalmers turbo-generators, 6600 volts, and three phases, and two motor-generator sets.



Cross Section of the East Plant of the New Jersey Zinc Co.'s Oxide Works

The Ores Used

The ores used at Palmerton are almost entirely concentrates from the company's mines at Franklin Furnace and at Sterling Hill, N. J. Three of these products are smelted for oxide, franklinite, half/half and dust. The composition of these is about as follows:

	Franklinite, Per Cent	Half/half, Per Cent	Dust, Per Cent
Zn	18.2	18.4	17.6
Fe	35.0	15.2	20.1
Mn	12.8	12.2	8.9
Si_2O	3.6	12.6	7.2

The franklinite is worked by itself and the residue smelted in blast furnaces for the production of spiegel. The half/half and dust are mixed and the residue wasted, as it contains too little Fe and Mn and too much SiO_2 to be a profitable smelting material.

Franklinite is the easiest of these ores to work and gives the best product. The half/half and fines are mixed and worked together. The charges per furnace average in tons:

	Ore	Coal
Franklinite	2.62	1.62
Half/half and fines	1.95	1.36

The Product and Its Uses

The product is divided into five grades, two for the use of paint manufacturers, two for rubber, and an off-grade that is reworked either for oxide or spelter. For the paint trade the grading is entirely by color. For the rubber trade, slight variations in color do not make so much difference. The variation in composition of the different grades is very slight, the range of composition of all being nearly the same. The material as shipped, uniformly contains 99 per cent or over ZnO, the principal impurities being: SO_3, 0.25 to 0.33 per cent; H_2O, 0.10 to 0.50 per cent, and PbO, 0.05 to 0.30 per cent.

The principal use of zinc oxide is as a paint pigment and for this purpose its purity of color and freedom from discoloration by gases and atmospheric conditions, fineness and uniformity make it particularly useful. As a pigment it has the disadvantage of slow drying and a tendency to become unduly hard in time.

In the manufacture of rubber goods zinc oxide is used for two purposes: As a pigment to produce white goods, and also to greatly increase the tensile strength of the resulting material. A mixture of pure rubber and sulphur vulcanized has a tensil strength of about 2000 lb. per square foot and an elongation of 960 per cent of its original length. Adding zinc oxide increases the tensile strength but diminishes the elongation. No other material tested has this effect.

As the supply of lead-free ores is limited and the demand for ZnO is increasing, much more leaded oxide is being made. The process is the same but the charges are usually lighter and the recoveries lower. In most cases the furnaces used are double ended with one or two working doors at each of the opposite ends.

The Production of Oxide

It is impossible to give the production of oxide of zinc, as the statistics are not published by the Government. Such figures as have been made public are not comparable, because the grouping of the different products is not always the same. The increase has been very rapid, especially within the last 3 or 4 years.

Inspectors of Ordnance Equipment Wanted

The Chief of Ordnance, War Department, 1330 F St., N. W., Washington, reports a need for inspectors of ordnance equipment. An examination for such inspectors has been announced by the Civil Service Commission. One class of this examination is for inspectors of hardware and metal equipment, comprising such articles as buckles, rings, fasteners, hand axes, wire cutters, intrenching tools, canteens, cups, meat cans, cutlery and other small articles of brass, iron, steel or aluminum.

Men who have had a high school or equivalent education and in addition have had four years' experience in a manufacturing plant making such articles as those described above will qualify for one class of inspectors. Another class of inspectors requires men over 25 years of age who are graduates from a college or university of recognized standing and who have had one year's experience in a manufacturing plant, on the practical end of the work.

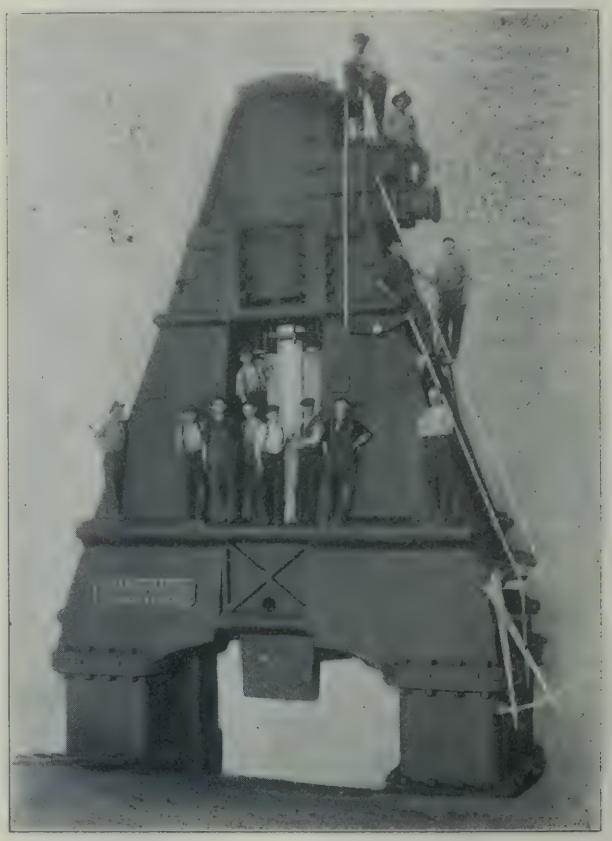
The duties of inspectors will consist in the organization and supervision of the inspection work in plants where equipment is being manufactured. They will also be responsible for the preparation of the necessary reports covering the inspection, shipment and payment for the articles described. The positions will be civil service appointments and the salaries will range from $1,200 to $2,400 per year, with additional allowance for travelling expenses.

Those who are interested can obtain additional information from the Equipment Division, Inspection Section, 1330 F Street, N. W., Washington, or from any office of the United States Civil Service Commission.

Double-Acting Steam Forging Hammer of Record Size

The Chambersburg Engineering Co., Chambersburg, Pa., has recently built and shipped to the Washington Steel & Ordnance Co., Washington, D. C., a double-acting steam forging hammer, which is said to be the largest of its type ever produced in the United States. It required 14 railroad cars to ship the hammer in sections.

The hammer is described as a 40-ton, double frame, double acting, steam forging hammer, with cylinder of 40-in. bore and 96-in. stroke. The main steam pipe is 10 in. in diameter, the exhaust pipe 14 in. and the



Double-Acting Steam Hammer Built by the Chambersburg Engineering Company for the Washington Steel & Ordnance Company, Said to Be Largest of Its Type Ever Built

diameter of the large piston rod is 15 in. The ram proper is 51 in. wide, 66 in. front to back and 72 in. high. The ram is notched to handle a steel die 72 in. long, front to back, 41 in. wide and 28 in. high. The approximate weight of the die is 10 tons. The total weight of falling parts is approximately 80,000 lb.

The hammer was built for use with steam pressure of from 100 to 150 lb. per sq. in., and with full steam pressure is capable of delivering a blow of 8000 tons. The anvil, steel anvil cap and steel die weigh 350 tons. The total weight of the hammer is 600 tons.

The main cylinder is lined with cast-iron bushing of special mixture. The cylinder proper is mounted between the two main frames in machined fits and thoroughly bolted with body-bound bolts, the frames being shrunk together with four large rods or bolts, making the upper works of the hammer one rigid piece. This whole superstructure is mounted on four massive pedestals and fitted to them with large steel body-bound bolts. Underneath the four pedestals and securely fastened to them are the two heavy base plates, which are spaced apart with cast-iron distance pieces and shrunk together with two heavy steel tie bars.

The hammer was built to drawings, jigs and fixtures and all parts were machined accurately and independent of assembly. The erection of the hammer took but a few days in the Chambersburg shops. After arrival at the plant of the Washington Steel & Ordnance Co. it was set up and was in operation within one week.

Engineering Revision Lessens Accidents

Records in Steel Plants and Rolling Mills Show That Structural and Operation Improvements Prevent Loss of Time

IN a paper read before the fourth annual meeting of the International Association of Industrial Accident Boards and Commissions, held in the State House, Boston, Aug. 21 to 25, Lucian W. Chaney, special agent United States Bureau of Labor Statistics, discussed the accident rates in the iron and steel industry and advanced the argument that improvement in physical conditions and operating methods through the wise use of money upon engineering problems under the direction of the best engineering skill would result in an enormous saving in compensation costs. The speaker pointed out how safety organizations had reduced the frequency of accidents, but showed by his figures that the great cause of lost time—fatal or serious accidents—depended upon the work of the engineer for its elimination. A digest of some of the more striking statements in his paper follows:

Time Loss Due Chiefly to Few Serious Cases

A careful analysis of the accident experience of the iron and steel industry pointedly suggests that the current belief that it is hopeless to think of anything like the elimination of accidents, at least within a measurable time, may be erroneous—that it may be possible to make industry so safe that fatal or serious accidents will be of exceptional occurrence. Until within a short time emphasis has been placed upon the frequency of accidents rather than upon their severity. The vast majority of accidents in the iron and steel industry are of minor character, more than 50 per cent causing disabilities terminating in less than one week. From the standpoint of time lost the small percentage of serious injuries is of much greater importance than the great percentage of minor injuries. The fatal accidents—only about 1.5 per cent of the total number of accidents—caused a total loss of time amounting to 65 per cent of the total time lost because of accidental injuries.

This figure is based upon an assumption that a fatal injury (assuming the employee killed of an average age of 30 years) is equivalent to the loss of 30 years' work time or 9000 days and that total disability is equivalent to 35 years because of the greater burden placed upon relatives and the community. Similarly 2196 days are allowed for the loss of a hand, 1845 days for the loss of a foot, etc.*

Stress Mainly on Reducing Accident Frequency

Carelessness and ignorance of the worker are responsible chiefly for accidents of minor character only and the safety movement has stressed too little the importance of safe tools, machines, practices and construction. The belief has taken root that the great success of the safety organization methods in reducing accident frequency is also responsible for the decrease in fatal and serious accidents. If personal carelessness could be entirely eliminated, it may be said that it would have little effect upon the number of fatal or serious accidents as long as the structural engineering and organization defects are unchanged.

Real progress lies in the direction of engineering revision of structure and practice, for it appears from the present study that serious accidents are primarily due to fundamental engineering or structural defects in which the workman has no part. Much more than "mechanical safeguarding" is meant by the term "engineering revision of structure and practice." The latter expression is intended to suggest the widest application of engineering skill to industrial plants in the design and location of buildings, the arrangement of the transportation facilities, the means of access to every point where a worker must go, the introduction of adequate lighting, the guarding or replacement of dangerous machines and, in general, the removal of hazardous conditions.

The results of mechanical safeguarding, the first step of the safety movement, were rather disappointing and the system known as "safety organization" came into being. This appealed strongly to the human factor and its success in reducing accident frequency was immediate and extraordinary. As a result the engineering factor was pushed somewhat into the background. The following analyses of accident causes in several departments of the steel and iron industry seem to indicate that reliance must be upon adequate engineering revision and not upon the appeal to the human factor alone.

Blast Furnace Accidents

Examination of the course of accident rates in blast furnaces from 1905 to 1914 indicates that the major part of the reduction in severity rates was due to structural and mechanical improvements. Hot metal "breakouts" contributed far more than any other cause to the severity rate, but the danger from gas has been controlled by structural improvements such as carrying the gas mains high in the air, providing more effective control by improved valves and by the introduction of oxygen helmets and resuscitation apparatus. Between 1906 and 1913 a reduction was made of 58.9 days (from 60.8 to 1.9 days) lost from injuries due to hot substances and a reduction of 10 days (from 15.4 to 5.4 days) lost from injuries due to asphyxiating gas. In contrast with these records, falls of workmen, which may be regarded as influenced by personal care, were decreased in severity rate by 1.9 days (from 7.5 to 5.6 days). Personal care also enters largely into injuries due to handling tools and the decrease in the same period was only 7.3 days, of relatively small importance when compared with the reduction in severity rate of injuries due to hot substances and gas. A considerable part of this decrease of 7.3 days must be credited to the greater care of the shop management in furnishing better and safer tools and in keeping them in proper condition.

Open-Hearth Furnaces

In the earlier years, particularly in 1907, injuries in the open-hearth department showing a high severity rate were caused by cranes and hoists, due largely to structural defects then present, such as absence of footwalks, poor access to the crane cage, overhung gears and others. By 1911 these defects had been largely overcome and from then on the severity rate dropped markedly and consistently. The main cause of the early high severity rate were explosions, other than ingot, of hot substances. The individual workman can do little to prevent such explosions and almost inevitably some workmen are killed or severely injured, as there is rarely any warning to permit the men to escape. The severity rate of recent years has dropped mainly through the revisions in structure and method of operation which were primarily introduced to favor production. The severity rate for injuries due to power vehicles has also decreased and this must in a large measure be attributed to improved transportation facilities and improved methods of operation.

The severity rate of these three groups of causes of injury declined from 47.5 days per 300-day worker in 1907 to 8.3 days in 1913, a reduction of 83 per cent. In handling tools, in which the personal factor is prominent, the rate actually increased 17 per cent. While making this increase in the severity rate, the same accident cause was making a decline of .53 per cent in

*A strong movement is in progress to secure uniformity of this so-called "weighting" of losses through accidental injury in the reports of the industrial accident boards of the various states in order to make the results comparable

frequency, from 195.5 cases per one thousand 300-day workers in 1907 to 92.3 cases in 1912. On the other hand, the first three groups, cranes, explosions and power vehicles, which were dependent upon engineering improvements, not only showed a decrease in the severity rate but also a decline in the frequency rate of 45 per cent, from 117.8 cases per one-thousand 300-day workers in 1907 to 64.5 cases in 1912.

Accidents in Rolling Mills

Cranes and hoists furnish the only causes of injury in heavy rolling mills about which it is possible to make a positive statement. Better cranes, better chains and improved methods of operation have brought about a great reduction in the severity rates. In tube mill operations the lessened severity rates may properly be attributed to increased personal care and the occurrence of fatality is so rare that no definite data can be found to warrant a definite conclusion.

In operations in plate and sheet mills, in the mechanical department and in the fabricating shops, personal care and engineering revision have about equal importance, since many of the operations are of a manual nature. Fatalities seem to be almost invariably the result of some structural defect admitting of remedy even when due allowance is made for the importance of personal care.

Injuries caused by hot substances in the yard departments show a remarkable decline in severity rates, nearly all of which can be attributed to improved methods of transporting hot metal. The introduction of structural and operating improvements has influenced the severity rates at least as much and probably more than increased personal care.

Importance of Organization

The contention that reduced frequency rates follow improvement in personal care and that reduction in the severity rate follows engineering revision is well sustained by this review. It does not diminish the importance of organization, for without organization and the interest it evokes the discovery and remedy of structural defects would never have occurred. Both the safety organization and the most intensive engineering study should be vigorously directed to the discovery and remedy of the less obvious structural faults.

Analysis of Causes of Fatal Injuries

From fatalities occurring in plants having a total exposure of 247,038 300-day workers, data for 372 cases of death in the years 1910 to 1914 are available for an examination of the causes with a view of placing the responsibility for their occurrence. The fatality rate in this group of plants was 1.51 per one thousand 300-day workers, and the fact that the fatality rate for the whole industry for the years 1910 to 1914 was 1.20 cases per one thousand 300-day workers shows that these plants were in no way exceptional. In interpreting these death cases certain principles are necessary.

1. It is assumed that it is the primary duty of the safety man to make conditions safe rather than to educate the men to avoid unsafe conditions over which they have no control, and no amount of so-called contributory negligence on the part of the man is considered sufficient to transfer the responsibility to him if some fault of construction or arrangement could have been remedied to prevent the injury.

2. The fact that apparatus can be used with entire safety by the exercise of special care is not regarded as excusing the failure to provide safer apparatus.

3. The cost of remedying structural defects, even to the extent of entirely reconstructing a mill, should not bar its consideration. It is the contention in this discussion that if the element of cost is entirely disregarded serious and fatal injury can be very largely eliminated and if an industry or plant can be made safe only by prohibitive expenditure in reconstruction, it is a question whether that industry or plant should be permitted to continue maiming and killing workmen in order that profits may continue. The condition urged is ideal but not unattainable.

Engines and motors caused three deaths. Two of these could have been avoided by the guarding or removal of projections on the moving parts.

Transmission gear caused three deaths. Two of these were due to projecting set screws on shafts.

Nine out of seventeen deaths in working machines were due to mechanical or other conditions which should have been remedied and over which the operator had little or no control.

Forty-three out of seventy-seven cases in the operation of cranes and hoists could have been prevented by better design in the crane and by such operating methods as now prevail. Unsafe practice or imperfect structure for whose presence workers were not responsible and which no education of them could remove, may be strongly suspected to have entered not infrequently into the other thirty-four cases.

Hot substances caused 76 fatalities. Of 16 cases of electric burns 13 were preventable by the kind of construction now in common use in electrical installation. Of 12 deaths due to explosions 7 could scarcely occur with improved modern practice. Of 15 deaths due to hot metal 14 were caused by bad method or imperfect structure, at least in part, and for each condition under which these 14 cases occurred an effective remedy has been found. Of 25 deaths due to hot metal flying, 18 would probably not have occurred under the latest improved practice. Not less, therefore, than 52 out of 76 deaths due to hot substances have presented problems of revision of structure and method.

Appropriate structural changes would have prevented 29 out of 50 deaths due to falling objects. Better structural provisions would have prevented 22 out of 45 deaths caused by the fall of workmen.

Asphyxia caused 19 deaths, all of which were related to imperfect conditions involving changes in apparatus.

Summary

To summarize this examination 212 out of 372 deaths or 57 per cent could have been prevented by some engineering revision and this can be said without qualification. It cannot be said that all of the other 43 per cent would have been amenable to educational methods in response to which caution would insure safety. It can be said positively that in only about 10 per cent of these deaths does the men's own carelessness clearly appear as the major factor. The remainder present a mixture of contributory negligence with possible structural imperfection impossible to untangle.

In a group of plants the figures for the year 1916, a year of extraordinary activity in industry, show a fatality rate of 0.86 cases per 1000 workers as against a rate of 1.51 for the preceding group for the years 1910 to 1914. In the group for the year 1916, 72 deaths occurred among 85,305 300-day workers. This distinct improvement is probably the result of extensive structural revision, but in spite of this improvement an analysis of the 72 death cases indicates that at least 58 per cent of them involved elements of structural defect or improper operative methods.

A study of the nature of the injury causing death in the entire industry in the years 1905 to 1914 was available in 956 cases and in a large proportion of these cases some structural improvement lessening the danyer has been made subsequent to the accident. In this group of 956 cases, 24 cases of traumatic dismemberment are presented, which afford a startling climax to this presentation. These are cases in which arms, legs or heads were burned, sheared or forcibly torn from the body. Of 9 cases of legs lost one leg was burned off by a hot rod in a rod mill. The feet lost were ground off in exposed gearing of the transfer tables of rolling mills. Of the four decapitations recorded two were due to being caught by the hot rod loop in the rod mills and the other two were the result of power vehicle accidents.

It is but just to say that a large proportion of the striking cases of these 956 belong to the earlier portion included in this survey and that in many cases efforts have been made with small regard to cost to remedy the conditions which made these accidents possible and that usually such efforts have been successful.

The constant presence of human fault must not be permitted to obscure the fundamental causes which

can only be reached by the reformation of wrong conditions. In such obscurity, rules may multiply and men still die. The wide prevalence of the view which attributes the accident largely to the worker when he is at best but a contributing cause is illustrated in numerous safety manuals and safety directions. The remedy was thought to be entirely obvious. Make more stringent rules and spur up the foreman regarding their enforcement. This is useful but superficial. In many cases cited in safety manuals there is an obvious engineering remedy.

If, as is to be indicated by this study, the severity of accidents is influenced much more by engineering perfection than by human perfection, the problem of cutting down the severity is quite different and much more solvable. It is not a question of possible attainment but one of thought, time and money. It is possible to conceive industry conducted under conditions so safe that the occurrence of serious injury will excite the same surprise that its absence now does.

The argument advanced has an important bearing on accident compensation. If it is true that serious accidents may be practically eliminated at a sufficient expenditure of thought and money, there will result an enormous saving in the cost of compensation and the most liberal expenditure will be justified on strictly financial grounds entirely aside from the question of human suffering.

New Hardness Tester—The Waldo

A new instrument for measuring the hardness of metals has been devised by Leonard Waldo, consulting engineer, New York. It is now obtainable from the Palo Co., 90 Maiden Lane, New York. It is known as the Waldo hardness tester and is patented.

The instrument is especially intended for use under conditions of service in that it is easily portable and its indications are uniform over definite periods of time. It is also easy to calibrate. The essential feature is a plummet weighing 0.1 lb. and falling 1 ft. to the surface of the material whose hardness is to be measured. This plummet *P*, shown in illustration, has a conical, replaceable, chill-tempered, 60-deg. steel point *G*, of which several are furnished with each instrument. Tied to its upper extremity is a very thin silk thread which bends over a funnel-shaped end piece *A*, *B*, *C*, into which, at *A* and *B*, slotted holes are cut with burnished edges so that the silk thread passes through them with practically no friction loss. The funnel, *A*, *B*, *C*, turns with a slight friction in the end of the jointed supporting brass tube, *I*, *C*. The silk thread is attached to a small burnished ring at its lower end, and the ring in turn is caught in a little trigger at *K*, which can be released by the thumbscrew *H* without jarring the instrument. The silk thread then passes from the release catch *K* through the hole *A*, through *B*, through an adjustable third hole at *E*, which is clamped in place by the thumbscrew *D* so that the plummet point *G* is exactly over the aperature *O* in the base of the instrument. The base is supported on three points, two of which are controlled by a leveling screw *J*. Small cross-levels indicate the verticality of the supporting rod, *I*, *C*.



The Waldo Hardness Tester

In use the instrument is set on the surface of the material whose hardness is to be tested, so that the aperature in its base *O* is concentric with the exact spot to be tested. The plummet is then hung as shown and lowered by holding the silk thread by its ring between the fingers so that the exact position of the clamp *D*, *E*, may be found for insuring the vertical fall of the plummet. This being determined, with the instrument leveled, the thread ring is placed in its releasing trigger *K*, and with the plummet in its position *F*, *G*, the funnel support *A*, *B*, is gently turned until the distance from the conical point *G* to the surface of the material to be tested *O*, is exactly 1 ft. The instrument is now ready for use.

A convenient way of stopping any slight swinging motion of the conical point *G* is to touch it gently with a small camel's hair brush or a piece of cotton wool. The instant the plummet is still, the trigger is released by the thrumb-screw *H*, and the plummet falls, making a uniform circular indentation in the material tested. The object in releasing the plummet from the bottom of the apparatus is to avoid any disturbance in its upper support. The entire operation consumes but a few seconds after a slight experience with the instrument.

Large Production of Chrome Ore

Chrome ore or chromite production in the United States in 1916 exceeded all previous records. More than 47,000 tons was mined and sold, against only 255 tons in 1915, according to the U. S. Geological Survey. In the Pacific Coast States, particularly California, the increased output has been remarkable. In Oregon the production was more than 3000 tons last year, while in California it was nearly 44,000 tons. It is evident that for some time to come California will furnish the chief domestic supply with the output from some deposits expected to exceed this year that of 1916. The chief sources of supply for the United States in the last few years have been Rhodesia, New Caledonia, Turkey and Greece. The imports in 1916 were 114,655 gross tons. Chromite is important as a war material in making armor plate, armor-piercing projectiles, high-speed tools and other special steels.

An interesting feature of future chrome production lies in the fact that T. W. Gruetter has recently established at Kerby, Ore., a custom plant for concentrating black sand to win its gold and platinum. The black sand of the Klamath Mountains usually contains a considerable amount of chromite, and it is believed that by adding magnetic separators to Gruetter's plant to remove the other minerals from the tailings sufficient chromite may be obtained from the black sand in areas of chromiferous serpentine to make the operation financially successful. The process will evidently yield a high grade of chrome ore, which may be suitable for special uses.

There is considerable chromite in Cuba, but scarcely anything is known of its occurrence in Mexico or Central and South America.

Ferrochromium, the alloy used in making chrome steel, is now manufactured in the United States by electro-metallurgical methods, almost wholly in the East, at the plants of the Electro Metallurgical Co. at Niagara Falls and elsewhere. It is reported, however, that the Noble Electric Steel Co. has three furnaces at Heroult, Cal., operating to their full capacity in producing ferromanganese and ferrochromium. There is reason to believe that the domestic output of chromite could be so increased as to go far toward supplying the domestic demand if our imports, except those from Canada, were cut off.

Varying Prices for Steel Are Favored

Final Decision Will Be Made by the President—Question of Power to Secure Same Prices for Allies

WASHINGTON, Sept. 11.—The problem of fixing steel prices has proved far more complicated than the President or any of his advisers anticipated. Lack of knowledge of the ramifications of the industry and of the effect of geographical distribution and transportation conditions encouraged the belief at the outset that it would be a comparatively simple matter to fix a basic scale of flat prices that would apply equitably to all producers. The fallacy of this belief is now fully demonstrated to the President and to the Federal Trade Commission. Still further complicating the situation, however, looms the question of the power of the Government to compel American manufacturers to accept controlled prices for sales to the Allies. This factor in the equation possibly may not be solved without the aid of Congress and important developments in this connection are looked for at an early date.

Unexpected Variations in Cost

When the President instructed the Federal Trade Commission to investigate and report on the cost of producing steel he was under the impression that practically all manufacturers with fairly equipped establishments were able to produce semi-finished steel products at a substantially uniform cost. He had a vague impression that the Steel Corporation, because of its size, was in somewhat better position in this respect than its competitors, but he thought the margin was so small as to be easily taken care of in any "reasonable profit" that might be decided upon.

The preliminary report of the Trade Commission, however, has changed the President's views and has presented a new problem. Costs are found to vary greatly in different districts and under various conditions of manufacture that prevail throughout the industry. Well integrated concerns naturally show lower costs than those which are obliged to purchase their ore, coal, coke, etc., or which buy semi-finished steel for further manufacture. If the Government were planning to buy a certain amount of steel at the lowest possible price without regard to other considerations the problem would be a simple one, as all calculations could be based upon the costs of the Steel Corporation or those of two or three of its largest competitors. The President is determined, however, that there shall be the widest possible distribution of Government orders; whether because he regards the business as desirable or undesirable from the producers' standpoint is immaterial.

Different Prices for Different Plants

After studying the reports of the Federal Trade Commission the President turned them over to the War Industries Board which has since been devoting much time to working out a method of fixing prices that shall be as equitable as possible and that will permit of the execution of the President's plan for the widest possible distribution of orders. While the board does not include in its membership any one with a wide experience in steel making, yet Chairman Scott has an excellent knowledge of the industry and he is in position to obtain the advice of the Steel Committee of the Advisory Commission and other experts in the trade and it is understood that he has conferred with some of the best informed men in the business. At this writing the board appears to lean toward a price scheme based upon actual cost of production plus a reasonable profit in place of a scale of flat prices. It is conceded the flat price system would be much easier to enforce, but both the President and the board feel that it would be less fair to the smaller manufacturers, who would be called upon to supply material at smaller margins of profit than would be secured by their big rivals.

After careful consideration the board has presented to the President the practical advantages of the two systems and has left it for him to decide which plan shall be adopted. It is probable that the President will confer further with the members of the Federal Trade Commission before announcing his policy, as it goes without saying that should the cost plus profit method of price fixing be adopted the commission would be called upon to undertake an herculean task in supervising the cost records of the numerous manufacturers to whom Government business will be allotted.

How Can Allies Get Government Prices?

The situation with respect to purchases for the Allies at controlled prices is daily becoming more acute and it is among the possibilities that no price fixing program will be announced until this issue is determined. Reports to the contrary notwithstanding, domestic producers of iron and steel are not selling to the Allies subject to the controlled prices to be determined hereafter. Chairman Scott of the War Industries Board recently stated that "no specific instances of refusal to sell" to the Allies at prices to be paid by the United States Government have occurred, but he apparently framed this answer to a question with unusual care and he declined to elaborate it further. This statement is regarded by those who are familiar with the facts as a diplomatic one quite justifiable under the circumstances. It is probably true that there have been no "refusals" for the reason that the War Industries Board has been very careful not to put the issue squarely up to the producers at this time. It is also true, however, that in many cases manufacturers have failed to comply with the "suggestions" of the purchasing commission to supply material to the Allies at the controlled prices in prospect and that the commission has not seen fit to push the matter.

No Power to Enforce Sales to Allies at Low Prices

At the present time the war legislation of the past year is being carefully reviewed by certain legal authorities for the purpose of determining just what powers the President possesses to enforce sales to the Allies on a parity with those made to the United States. There is a large body of these statutes, including the national defense act, the naval appropriation laws of the past Congress, the act creating the Shipping Board, etc., etc., and in addition there are numerous statutes enacted during the past fifty years which deal with the right of the government to buy and sell. All these must be examined with minute care. It is understood that up to the present time no formal request has been made of the Attorney General for an official opinion for promulgation, but it is known that the President has personally consulted with Mr. Gregory and it may be assumed that the officials of the Department of Justice are assisting in the search now on.

Experienced lawyers familiar with the transactions of the Federal Government in the acquisition and disposal of property are almost unanimously of the opinion

that the United States cannot buy iron and steel or other war material and sell it to the Allies without further legislation, and doubt is also expressed as to whether Congress has the constitutional power to compel producers to sell to the United States Government at controlled prices goods which it is well known in advance are to be resold or transferred to a foreign government. The fact is recalled that whenever the Government has had occasion to sell material the disposal of which is not specifically authorized by law it has gone to Congress for legislative authorization. A notable instance is the sale to Greece of two battleships a few years ago which could not be effected until Congress had passed an enabling act. Current sales of used material by the departments are based upon specific statutes passed many years ago.

The delay in the signing of the contracts, which were to have been executed on Sept. 6, for the building of fabricated ships in Government-owned yards has been attributed to the uncertainty regarding the price of steel, for although the Government is to supply the shapes and plates for these vessels, the method of compensating the builders which has been adopted is such as to render it a matter of interest to the contractors to ascertain at least the method of fixing steel prices. The Shipping Board has taken the position, however, that this information is not so essential that the execution of the contracts should be delayed until it is available.

The Pomerene Bill for Control of Iron and Steel

The complications regarding sales to the Allies have served greatly to improve the prospects for the consideration of the Pomerene bill authorizing the Government to regulate the distribution and prices of iron and steel not only to the Allies but to private consumers in the United States. If this measure is constitutional, as is vigorously claimed by Senator Pomerene, it would provide all the necessary authority to carry out the plans outlined in the President's address to the producers of the country, issued a few weeks ago, in which he declared that private consumers as well as the Government were entitled during the war to prices representing no more than a reasonable profit to the producer. The attention of the Senate leaders has been concentrated during the past month upon the war revenue bill, in which Senator Pomerene has been specially interested, and it has not been found practicable to give the steel measure any consideration.

"I have not felt like urging upon the Interstate Commerce Committee my request for early hearings on my bill," said Senator Pomerene to the correspondent of THE IRON AGE, "because every member of the committee was required to be in daily attendance upon the sessions of the Senate which have been convened at 11 A. M., running until 6 P. M. without recess. It would not be practicable with so important a measure pending in the Senate to authorize our committee to sit during the legislative sessions, and obviously very little could be accomplished if the committee had but an hour to meet in the morning before the sessions. Now that the revenue bill is out of the way, however, we shall have time to consider this important question of regulating the steel industry, and I hope that hearings will be undertaken at a very early date. It is not my purpose to insist upon protracted hearings, as I think we can get at the salient facts in a few sessions. The points of information which I especially desire to have brought out can be supplied by a few witnesses and with the co-operation of the Federal Trade Commission, which already has a vast amount of material on the subject, I am sure we can make an early report to the Senate as the basis for prompt action on the bill.

W. L. C.

Electric Smelting of Iron Ores in Northern Sweden

A proposition to install electric furnaces in the north of Sweden for smelting iron ore was put forward in March, 1916, by the committee appointed by the administration of the Association of Swedish Technologists. The committee recommended the installation of four plants with six furnaces in all, to produce 65,000 to 70,000 tons of pig iron per year, using from 110,000 to 120,000 tons of ore and about 25,000 tons of charcoal. J. A. Leffler recently made a report on this proposal which the *Jern-Kontoret's Annaler* published in an abridged form. An abstract follows:

In his investigation the author makes the assumption that to smelt one metric ton of pig iron from the Luleä or Gellivare ores, 1.6 tons of ore and 0.4 ton of charcoal are required and 0.272 kw.-year of electric current. As explained by him in detail, such a low consumption of current can only be attained by installing four furnaces of a total of 9000 kw., one as a stand-by and three working continuously, as this would make it possible to utilize 92 per cent of the purchased power while with one furnace only the useful percentage would only be 83 per cent., which is the average result attained during the three years working in 1913-1915 at the experiemntal plant at Trollhättan. There must be, however, a misprint in the figure given for the output of this plant for 1915; it should be 7502 tons instead of 7052 tons to make the author's calculations correct. The capital outlay at Luleä would be about £85,833 for the plant itself and about £20,833 for dwellings for officials and workmen, while for Gellivare the corresponding figures would be £94,444 and £23,333 respectively. There would be six officials and 75 workmen with their foremen, and the assumed output at each place would be 30,000 metric tons per annum. For the cost of production of one metric ton of electric pig iron the author submits the following estimates:

Estimate of Cost of Producing One Ton of Pig Iron by Electricity

	At Gellivare			At Luleä		
	£	s	d	£	s	d
1.6 metric tons of ore*	0	18	3	1	1	7
Limestone	0	0	8	0	0	5
0.4 metric tons of charcoal	1	0	10	0	18	1
0.2 2 kw.-year	0	14	5	1	0	4
Electrodes	0	1	10	0	1	8
Repairs and upkeep	0	3	8	0	3	4
Wages	0	6	6	0	5	5
Management and sundries	0	2	3	0	1	11
Royalty	0	1	5	0	1	5
Sinking fund	0	3	7	0	3	3
Rents	0	5	9	0	5	5
Carriage to Luleä	0	4	10	..	..	..
	4	4	0	4	2	10

*50 per cent of ore and 50 per cent briquettes.

The freight from Luleä to Gävle and unloading the iron into railway cars would cost another 4kr., or 4s. 6d. per ton. It will thus be seen that the northern pig iron would cost at Gävle about £4 8s. per ton and therefore could not compete with the pig iron obtainable there from the blast furnaces at 65 to 70kr. (about 72s. to 77s. 6d.) per ton for basic, and at 70 to 75kr. (about 77s. 6d. to 83s. per ton for acid open-hearth pig iron.

The Raccoon Gas Co., operating at Salem, Harrison County, W. Va., has filed an application with the public service commission for permission to increase its domestic rates from 17c. to 22c. per 1000 cu. ft., rates to religious and educational institutions from 12c. to 17c., and its manufacturing rates from 4c. to 5c. on old contracts and 15c. and 10c. on new contracts to 13c. for all gas used for manufacturing purposes.

The Southern Pacific Railroad Co. has arranged for the immediate building of 10 locomotives at its shops at Roseville, Cal., and has ordered 55 to be constructed in the East.

To Make $250,000,000 Worth of Artillery

Colossal Task of Ordnance Bureau Includes Equipment of Some 12 New Establishments, Involving $30,000,000, for Forging and Machining Guns

WASHINGTON, Sept. 11.—How to secure the manufacture of $250,000,000 worth of artillery within the coming eighteen months in plants only part of which are now in existence is the colossal task to which the Ordnance Bureau is now addressing itself. Sixteen thousand guns ranging from 3-in. field guns to 9.5-in. howitzers must be shipped to the American forces in Europe as rapidly as possible and the shipments must be completed by March 1, 1919. The money for this enormous undertaking has not yet been provided by Congress, but it is included in the huge budget bill, the details of which are set forth in another column.

At least a score of plants well equipped to manufacture forgings or to machine and assemble guns must be kept continuously at work on this tremendous task. Counting the army gun foundry at Watervliet, N. Y., and the naval gun factory in Washington, there are less than half that number of plants in the United States equipped to do any important part of this work, and on the very threshold of the undertaking precious time must be spent in bringing about the extension of old plants and the establishment of new ones.

In preparing for war there are many tasks that can be accomplished in a few weeks, others that take months, and still others, like the manufacture of heavy ordnance, which consume years. It is estimated that if Congress, two years ago, had adopted recommendations made by the ordnance experts, not less than a dozen well equipped private establishments would today be in position to turn out all forms of light and heavy artillery as rapidly as transportation could be found for the guns. As it is, the officers of the bureau are straining every nerve to interest manufacturers in providing this absolutely essential material and are forced to meet the competition of the shipyards, the aeroplane factories, the motor truck builders, the railroads and the great mass of private consumers of iron and steel.

At Least 20 Companies to Make Guns

The specific task which the Ordnance Bureau has undertaken is the mobilization of not less than twenty high-grade organizations for the production of gun forgings and machining and assembling of guns. The plants that have any experience in this work can be quickly enumerated. They include the Bethlehem Co., the Midvale Steel & Ordnance Co., the Driggs-Seabury Co. (now the Savage Arms Corporation), the General Ordnance Co., the American & British Mfg. Co., the Erie Forge Co., and the Crucible Steel Co.

The Bethlehem and Midvale companies have forged machined and assembled guns of all sizes and have supplied forgings for the other manufacturers. The Erie Forge Co. and the Crucible Steel Co. have also made gun forgings on a relatively small scale. The work of the other concerns mentioned has been limited to machining and assembling. These concerns taken together, ordnance experts declare, can produce but a small part of the mobile artillery required for the national army, and it therefore becomes necessary to induce other manufacturers to take up the work and to construct a number of forging and machining plants as large or larger than any now in existence. Thousands of men will be required to operate these establishments, and supervisory organizations embracing some of the best manufacturing talent in the country must be gotten together to direct the work.

As an initial step in this big development, the facilities of the Government for machining and assembling guns at the Watervliet, N. Y., arsenal will be more than doubled, but no attempt will be made at this establishment to produce forgings, which, as heretofore, will be procured from the Bethlehem and Midvale companies. Even more comprehensive changes will be made at the Watertown, Mass., arsenal, which heretofore has been confined chiefly to the building of gun carriages. At this arsenal extensive equipment will be installed for the making of forgings ranging in size up to 9.5-in. howitzers, which will be rough machined and heat treated. The final machining and assembling of the guns produced at Watertown will be accomplished in several private plants, and thus the facilities of this arsenal will be concentrated upon the production of forgings.

$30,000,000 to Equip 12 New Establishments

The program of the Ordnance Bureau for the development of private plants not heretofore engaged in gun making includes the equipment of twelve new establishments, six of which will be devoted to making forgings, while the other six will be fitted up for machining and assembling. Of the allotment of $250,000,000 for the production of the artillery included in this project, $30,000,000 will be used to provide increased plant facilities at the twelve establishments referred to, approximately $5,000,000 being devoted to new buildings and $25,000,000 for machine tools. It is estimated that of the $30,000,000 spent on extensions and equipment, about one-half will be devoted to forging facilities and the remainder to equipment for machining and assembling.

A Cost-Plus-Profit Basis

All contracts for the manufacture of guns in private plants under this project will be made on a cost-plus-profit basis. All the equipment the purchase of which is financed by the Government will remain the property of the United States, and it is assumed that when the war is over steps will be taken for its preservation to meet any possible emergency in the future. The new buildings will be constructed on standardized plans and will be made as nearly portable as the heavy requirements of the service will permit.

Three problems of overshadowing importance confront the Ordnance Bureau in this connection. One is the procurement of an adequate quantity of gun forgings; another is the manufacture of the necessary gages; while the third is the procurement of $25,000,000 worth of machine tools specially designed for the finishing of gun forgings. Each of these branches of the work presents serious problems, for the productive capacity of all manufacturers of these articles has been engaged for many months to come.

To secure a sufficient supply of gun forgings is proving a task of great magnitude and exceeding difficulty. Special steel of the most exacting requirements is needed, and all concerns capable of providing it are working on foreign orders in addition to their current output for the Ordnance Bureau. None of the six plants which are to be enlarged for this purpose has ever made gun forgings, although they all have excellent organizations, and with the necessary technical assistance will undoubtedly be able to produce forgings equal in all respects to the Ordnance Bureau requirements.

The Gage and Jig Problem

The gage problem presents peculiar difficulties. As is well known, the War Department for many years has sought to secure Congressional authorization to procure sufficient gages, dies, jigs, etc., for installation in private plants to equip them to meet just such an emergency as has arisen, but without success. When Congress somewhat tardily provided a small sum for the manufacture of gages for the production of the Springfield rifle, it was found that the gage makers

had their hands full with other business, including foreign orders. Because of lack of equipment to manufacture the Springfield rifle in private plants as well as in the arsenals, the Bureau was forced to adopt the British Lee-Enfield rifle. It has long been a cherished project of the Ordnance Bureau to purchase and store gages for all the standard types of artillery used by the army, but Congress failed to provide the money, and now, with a small army on foreign soil, the War Department is making a desperate attempt to recover ground all but irretrievably lost.

The niggardly policy of Congress with respect to ordnance equipment in general has produced a startling result. When the United States was forced into the European war the entire equipment of the army in 3-in. guns, of which the greatest number are used in field operations, was less than 10 per cent of the standard requirements, while the number of mobile guns of larger caliber was practically negligible.

$25,000,000 Worth of Machine Tools Needed

The Ordnance Bureau realizes that it has no small task to go into the market to-day and secure early deliveries on $25,000,000 worth of machine tools. Yet these tools must be had and they must be ready for delivery the moment the enlarged plants are in shape to receive them. Experts now serving the Bureau who have had wide outside experience are confident that this equipment will be forthcoming and base their confidence upon a careful canvass of manufacturers which has been in progress for some time.

The appeals of the War Department to the manufacturers of the country for aid in meeting this great crisis have received a patriotic response. On every hand the Ordnance Bureau is receiving hearty cooperation, and requisitions for material are promised preference over all other work. The Priority Committee of the War Industries Board will assist the Bureau and preference will be given all private manufacturers engaged in producing ordnance in the way of shipments of steel, coal and other materials. The Bureau, however, has so perfected its own organization as to be in close touch with all branches of the steel trade and is in a position to secure preferential treatment without the interposition of the War Industries Board.

Even with the large measure of co-operation already obtained it will be at least six months before the plants now being equipped can begin deliveries, which, at the outset, will necessarily be confined to small caliber guns. It may be a year before production will be at a maximum, and until that point is attained and a large number of the heaviest guns are in place on the western battlefront the height of the efficiency of the American army in France will not be reached.

Many Munition Workers Discharged

TORONTO, Sept. 9.—It is now clear in Canada that the munitions industry is reaching its close and business must readjust itself to conditions which will arise. The shell-making industry has been tapering off for some time past, but recent developments have upset most calculations, and the present outlook cannot be viewed without some degree of apprehension. The manufacturers have felt evidences of the gradual closure in shell orders and have been reducing their staffs. One of the largest Canadian plants has already dispensed with 1200 men. It is now definite, in many lines at least, that there are no new orders to be had, and the probability is that the number of workers to be released this fall will be very great. It is not possible to make a clear cut statement on the shell situation of Canada, as the Imperial Munitions Board at Ottawa has refused so far to make any official announcement. It is affirmed, however, that contracts are not being renewed in a large number of cases. Some manufacturers have recently received new orders, and are in a position to keep their plants operating indefinitely, but they are engaged in the manufacture of the larger shells. It has been reported that the manufacture of these shells only is to be continued. The ostensible reason is that there are large supplies ahead which have not been shipped overseas.

The Concentration of Low-Grade Manganese Ores

The question of the commercial concentration of low-grade manganese ores so as to produce a high percentage ore for conversion into manganese-iron alloys is thus discussed editorially in the *Mining and Scientific Press* of San Francisco:

"In many places the common wet methods of concentration have been successfully applied. The log washer has been used in the Atlantic States, and jigging also has been employed with considerable success. Magnetic separation has long been used in the concentration of franklinite, and it may have been applied elsewhere. It would seem to offer an opportunity for helping to provide an increased output of desirable manganese ores from a number of relatively low-grade deposits. It would be easy to determine experimentally with a large average sample from any particular deposit precisely what amount of merchantable manganese concentrate could be recovered. The minerals highest in iron would be removable by developing a magnetic field of low intensity and subsequent concentration by fields of greater intensity would give products of decreasing iron content with a correspondingly higher percentage of manganese. Such plants, of course, would not be practicable without having large quantities of ore developed, but we have reason to believe that suitable deposits exist, both in Eastern and Western States. Fortunately the construction of magnetic separators is relatively simple, so that it would not be necessary to await the delivery of machines from manufacturers. Greater delay would probably be experienced in securing the needed crushing and sizing equipment. With 40 per cent ore selling at 90c. per unit, or $40.32 per gross ton, f.o.b., Chicago or Pittsburgh, it is evident that an ore with a concentration-ratio as low as 4:1 should prove profitable in almost any part of the country.

"While the chief demand originates in the East it must not be overlooked that 14 open-hearth furnaces are now in operation on the Pacific Coast, and that a great iron and steel plant is being erected in Washington. The continuance of the steel industry in the West now seems assured. The Noble Electric Steel Co. has responded to the call for ferromanganese by producing nine tons per day with a single furnace in its works at Heroult, Cal., and it has transformer capacity for making 25 tons of alloy daily. It is only the difficulty of securing electrodes from the East that limits the expansion of these operations. The demand for manganese is becoming more insistent on both sides of the continent, and he who contributes in any detail to the solution of the problem is doing a patriotic service to his country. In California psilomelane is found abundantly in the foothill counties from Tuolumne to Nevada, some of the deposits offering much promise."

Wisconsin's New Law

The modified Wisconsin workmen's compensation act, passed by the 1917 Legislature, went into effect on Sept. 1, and applies to all industrial accidents occurring in Wisconsin after that date. The benefits to injured workmen are increased on an average of 10 per cent. The schedule of fixed benefits is changed so that periods of disability for all specific injuries involving amputations are materially lengthened. Indemnity for total disability, heretofore limited to six times the annual wage, has been increased. Maximum indemnity now allowed to workmen under 32 years of age who are totally disabled, is equal to a fraction less than 10 times the annual wage. Where death results from an accident the employer now is liable for the payment of burial expenses not to exceed $100.

The Pulverized Fire Clay Co., Nelsonville, O., has been incorporated with $10,000 capital stock to mine and market fire clay. H. A. Hall is president and general manager. The company has acquired about 125 acres of fire clay lands. It expects to prepare its product chiefly for the use of the steel industry.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

Owned by the United Publishers Corporation, 243 West 39th Street, New York. H. M. Swetland, *Pres.* Chas. G. Phillips, *Vice-Pres.* W. H. Taylor, *Treas.* A. C. Pearson, *Secy.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: Equitable Building. Philadelphia: Real Estate Trust Building. Cleveland: Guardian Building. Cincinnati: Mercantile Library Building.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

Business After Peace

It has become a truism that war stimulates men's minds. Their vision is broadened, their courage is increased and they become more ambitious. That has been true of all wars; but it must prove vastly more so with this war, because it is largely a war of machinery and transportation. Other wars have involved fighting and strategy chiefly, while war is one of industry.

The world, in other words, is learning a great deal more about what can be done with materials. Railroad lines are built with a facility never dreamed of before. The "tanks," formerly a curiosity, have shown what they can do on rough country and will undoubtedly find much employment after the war. In a multitude of ways the war has forced the development of new implements and new ways of doing things, providing means by which the world can make vastly more rapid industrial progress.

It will not be fully appreciated until peace comes again how greatly man has increased his ability to conquer the forces of nature by the things that this war has developed. Coupled with these added facilities that are being furnished, there is the factor that the world is to be made safe for capital as well as for democracy. A period of unexampled world development will necessarily follow.

To the steel industry this outlook is of particular importance, for the demand for steel comes chiefly from development. The amount of steel that disappears in so-called "consumption" is small compared with the amount that is put into more or less permanent use, for the purpose of developing natural resources. The amount of steel now in employment in railroads of the United States, for instance, greatly exceeds the amount of iron and steel that has passed through the railroad use and has disappeared entirely or has been worked up again from the form of scrap. A census of all the iron and steel in the United States now performing a useful function would undoubtedly show more than one-half as much tonnage as has been produced altogether. The total amount of iron and steel in use in the United States to-day is undoubtedly more than three tons per capita, and it may be in excess of four tons. In many regions with natural resources that should be developed the amount is but a few pounds per capita.

For development, capital must be found, of course, but if the habits of economy and industry that are forced by the war continue, the capital will arise when the world has been made safe for capital. There is vastly less danger that there will not be great industrial activity after the war than there is that eventually it will overshoot the mark and produce a great industrial depression. It is a reasonable theory that industrial depressions are caused by the locking up of too much capital in investments that do not earn sufficient money in their early years. It will be one of the problems, in the years following the war, to develop means whereby the lesson of past experiences may be put to use and the expansion be kept within proper bounds.

Investment of capital in permanent structures does not occur when the tendency of prices is clearly downward. For the steel industry it will be necessary to develop prices in which investors will have confidence. Until recent months the common view was that the entire readjustment of iron and steel prices would occur after the war. Now it is clear that a part at least of the readjustment is to occur before the war ends, and that is a very good thing. The broad as well as the patriotic view is that profits after the war must be considered more than profits during the war.

Loyalty of Free Workingmen

The patriotic attitude of industrial workers which prevails to such a large extent during the present war in spite of the efforts of a few malcontents, may be impressively contrasted with the repression of wage earners during the Napoleonic struggle. Then the governing, manufacturing and farming classes fought Napoleon with one hand and dragooned the masses of their fellow countrymen with the other; patriotism was a class perquisite, bringing wealth to the few, and it was assumed that the working people would revolt if given an opportunity. In a volume entitled "The Town Laborer," by J. L. and Barbara Hammond, just published in England, the distressing conditions of the so-called working people in the period from 1760 to 1832 are described.

The *Economist* of London, in reviewing the book, says that one shrinks from using lightly the

word slave, but that no one can study the industrial period covered by this book and question the appropriateness of that word to describe the status of the workers. Then religious organizations found it their mission to offer to the downtrodden people the prospects of happiness in the next world as ample compensation for misery here. The abuse of children was one of the worst features of the industrial system of the time, and even Lord Melbourne, who was noted for acts of kindness to the young Queen Victoria, worked children in his mines from 6 o'clock in the morning until 8 at night. The English Government was in the hands of men who regarded the idea of citizenship of workmen as a challenge to their religion and their civilization. Law and order, according to their notion, were impossible unless the working classes could be kept in ignorance and in permanent subjection.

The *Economist* declares that among the lessons of the war, one has stood out every day during the past three years: that if the working classes of England had not, at a great price, won freedom for themselves, that country would speedily have collapsed under the stress of war. In this country, there has been little about which to complain concerning the attitude of workingmen toward the war and the enthusiastic patriotism of such organizations as the American Alliance for Labor and Democracy, which met in Minneapolis last week, is one of many evidences of the loyalty of the toilers and of the certainty that such organizations as the I. W. W. will not be allowed to continue their malicious and treasonable conduct. The fact remains, however, that nothing should be left undone to prevent interruption of manufacturing plants during the war period and the statement made by the National Industrial Conference Board at the meeting with Secretary Baker and other officials in Washington last week points the way for promoting complete harmony of all employers and employees who really are actuated by patriotic motives. If the recommendations made by the board, as summarized elsewhere in this issue of THE IRON AGE, are approved by representatives of the workingmen, industrial peace will be almost certain. The plan to prevent employees as well as employers from taking advantage of the existing abnormal conditions to change the standards which they were unable to change under normal conditions probably could be carried out without any more machinery, apart from strengthening the powers of the commission recently appointed to act under the Council of National Defense.

Playing into Enemy Hands

The length to which advocates of the metric system will go in order to advance their propaganda is instanced by the following extract from a recent editorial in a New York newspaper:

> Dr. George F. Kunz, president of the American organization which is seeking to have the metric system introduced in American weights and measures, just as the corresponding decimal system has been introduced in American currency, has asked Secretary Baker to take a timely step in the direction of reform. He has invited the head of the War Department to have the new guns and other weapons of war made in accordance with the metric system. Dr. Kunz points out that nine of the ten countries of the entente manufacture their rifles and ordnance on the millimeter basis, and that American manufacturers and American soldiers, if called for service for or in France, would encounter grave difficulties because of this lack of a unified system of measurement.
>
> Dr. Kunz is right. It is high time America aligned itself with the nations that use the metric system. It is high time the archaic, cumbersome means of measurement gave place to the simple, orderly, almost automatic metric principle which has worked so admirably wherever it has been adopted.

Only those who have no conception of munitions manufacture could make such a suggestion as that quoted. Perhaps it should not be given serious attention. It is a safe guess that like many other metric enthusiasts, Dr. Kunz has no realization of even the present difficulty of securing adequate and accurate equipment of jigs, gages and fixtures. The metric advocates seem to care nothing about the main obstacle to the fulfilling of our manufacturers' contracts with the Allies. They apparently do not know that in the manufacture of rifles alone, not to consider the long list of other products, all of five years would doubtless be required for the complete change to the metric system in factory equipment and instruments, assuming the change to be desirable.

Certainly no news from the United States could give much greater joy in Berlin than that this country had decided to use from now on nothing but the metric system in manufacturing its military equipment. Probably the suggestion shows nothing more than ignorance of the complexities of manufacturing and ignorance of the disastrous effects of a wholesale change in shop standards. Its serious side is that it represents the readiness of groups of faddists to seize on the nation's necessity to promote private ends.

Government Expenditures for Steel

That the prices the Government is to pay for steel constitute a very important question for the steel trade goes without saying, but the amount of discussion of it in the daily press dispatches from Washington suggests that the matter is a much more important item in the conduct of the war than is really the case. Secretary McAdoo's estimate is that the Government will require for the war for this fiscal year $10,750,000,000, plus $2,000,000,000 for contingencies, making a total of $12,750,000,000, apart from the money that has been loaned or is to be loaned to our Allies, set at $7,000,000,000.

The steel industry is operating at a rate of about 44,000,000 gross tons of ingots a year, which means about 33,000,000 gross tons of finished rolled steel. If the Government should absorb 15 per cent of this tonnage at an average price of three cents a pound the purchases would represent $330,000,000, or only 2.6 per cent of the total war expenditures. At 20 per cent of the output and four cents a pound the purchases would be $590,000,000, or 4.6 per cent of the total. Obviously the latter estimate is quite too high. The daily press has given the subject a prominence it hardly deserves in the economics of the war. The excess profits taxes the steel industry will pay the Government will certainly not come out of the Government's steel orders to any appreciable extent.

It is of especial interest to the steel and machinery trades, and particularly reassuring to the country as one of the Allies, that the United States, though entering on the extensive gun making pro-

gram mentioned in this and in several issues preceding, is buying from British and French gun makers. The important point is that these ordnance builders have supplied far beyond the number of field pieces which can be used in the lines now occupied on the west battle front and the American contracts allow them to maintain their organizations. The situation speaks for the impregnability of the fighting lines while our own forging and machine shops are being built and extended to swell the supply.

A New York daily paper tells of the "soldiering" of workmen employed at $7.50 a day as carpenters at an army cantonment on Long Island. On a 20 x 50-ft. shack 40 men were found to be tacking down tar paper roofing. As the work seemed in danger of running out, the 40 kept on driving nails until the roof became actually armor-clad. The article quotes the reply of one of the slackers to a foreman's remonstrance, "Are you paying me or is the Government? What do you care?" Machine shops could be named where Government work is carried on with the same degree of patriotic interest on the part of many workmen. The contractors' cost plus arrangement with the Government has had to cover repeated advances to labor, after the word had been passed around that the Government was footing the bill. Also in cases of which details are known the diminution in the output per man has outdone all the performances in this line which were commonly recounted in the heyday of high-priced contracts for the Allies nearly two years ago.

The War Convention of Business at Atlantic City

Men who have been foremost in carrying out the war program of the Government will address the war convention of the Chamber of Commerce of the United States to be held at Atlantic City, Sept. 18 to 21. It is expected to be the most important and most largely attended convention of American business men ever held. Secretary of War Baker will tell what the Government further expects of business men in connection with the war, and Secretary of the Interior Lane will deliver one of the main addresses. Frank A. Scott, chairman of the War Industries Board, will explain the relation of the board to the industries of the country in providing supplies for the army and navy. Other addresses will be by Herbert C. Hoover, food administrator; A. C. Bedford, president Standard Oil Co.; George M. Reynolds, president Continental Commercial National Bank, Chicago; Boris Bakhmeteff, ambassador from Russia to the United States, and Lord Northcliffe, chairman of the British Mission.

A feature of the convention will be its division for part of the time into groups for the consideration of questions applying to different lines of manufacture and trade. Prominence will be given in the discussions to the adjustment of business in wartime to conditions produced by the war, also to readjustments after the war for which business must prepare. Questions of price control and priority will have attention, also industrial relations and employment problems and foreign trade, banking and credit in wartime. A special meeting of the national council of the Chamber of Commerce will be held at Atlantic City on Monday, Sept. 17, the day preceding the opening of the convention.

Slump in Foreign Commerce

WASHINGTON, Sept. 11.—A heavy slump in both imports and exports was recorded during the month of July, according to the official statistics of the Department of Commerce. The embargo enforced by the Exports Council is undoubtedly responsible to a material extent for the decline in exports, and the details of iron and steel shipments for the month will be awaited with unusual interest.

The imports of merchandise for July, 1917, were valued at $226,000,000, a decrease of $81,000,000 compared with June, the high record month, but a gain of $43,000,000 over July, 1916. The imports for seven months ending July, 1917, were $1,779,000,000, against $1,469,000,000 in 1916. Free imports in July, 1917, were $158,000,000, and dutiable imports were $1,259,000,000. For 12 months ending July, 1917, the imports amounted to $2,703,000,000, against $1,915,000,000 in 1914. Exports of merchandise in July, 1917, reached the lowest record since February, 1916. For the month of July the exports of merchandise amounted to $374,000,000, against $575,000,000 in June, 1917, and $445,000,000 in July, 1916. For seven months ending July, 1916, exports amounted to $3,664,000,000, against $1,201,000,000 in 1914. The total exports for the 12 months ending July, 1917, were valued at $6,221,000,000, the high record for any 12-month period, against $2,358,000,000 in 1914, the 12 months preceding the breaking out of the war.

Steel Company's Proposed Additions

The Eddystone Steel Co., Crum Lynne, Pa., is contemplating making important additions to its plant. It is understood that new melting capacity is to be added, including one or two additional open-hearth furnaces, an electric furnace and tools. The equipment at present consists of one open-hearth furnace, one hammer, one 22-in. billet or bar mill and two 60-in. plate mills.

Several months ago, John E. Sullivan, who had been for some years a director and general sales manager of the Carpenter Steel Co., Reading, Pa., purchased the plant formerly operated by the Crum Lynne Iron & Steel Co., Crum Lynne, Pa., a suburb of Philadelphia, and adjoining the plants of the Baldwin Locomotive Works and the Remington Arms Co. at Eddystone, Pa., and has been operating it under the name of the Eddystone Steel Co.

It is now announced that Newell C. Bradley has been elected vice-president and works manager of the company. Mr. Bradley has been connected with the Midvale Steel Co. for 18 years, serving in many capacities and departments. At the time he severed his connection, he was assistant superintendent of the Nicetown plant.

Orders for Locomotives

Fewer orders for locomotives for domestic use appeared in August than in any month in some time, railroads ordering only six, of which five were electric. There was, however, heavy buying for export, principally by the United States Government, which ordered 764 locomotives from the Baldwin Locomotive Works. These locomotives are for service with the forces in France and are to be given preference over all other work. They are in addition to 300 ordered for the same purpose in July. Of the 764 locomotives 380 are to be of the 80-ton consolidation type. Total orders in August are estimated at 775, which, with the 448 in July bring the total for the first eight months of this year to 4751. Of these 1600 were for export, not including the 1164 ordered by the Government for use in France. Orders in 1916 were 5750, and in 1915 only 2300. Orders already placed in September include 65 locomotives for the Southern Pacific, 10 of which will be built in the company's own shops. Inquiries before the market amount to 55, of which the Minneapolis & St. Louis is negotiating for 25, the New York, New Haven & Hartford for 15, the Maine Central for 10 and the Chicago & Alton for 5.

SHIPBUILDING ACTIVE

Many Vessels Are Under Contract at Canadian Ports

TORONTO, Sept. 9.—Shipbuilding in British Columbia, which was started on a modern scale a few months ago, is now an important industry, and a number of contracts for the construction of ships have been received, the aggregate value of which is $27,000,000. These comprise steel steamers and wooden auxiliary vessels and will be constructed in the yards at Vancouver, Victoria, Port Coquitlam, New Westminster and Quatsino in the province of British Columbia.

Six steel steamers of 8,800 tons dead weight are to be built by J. Coughlan & Sons, Vancouver, three of which are already under construction. Five are for British account and one for Norwegian. The vessels will cost $1,250,000 each.

The original program at the Wallace shipyards, North Vancouver, was for six auxiliary power schooners, valued at $150,000 each. Four of these have been completed. In addition, one steel ship has been built and a second started while a third is to be built. These ships will represent an outlay of $650,000 each. The No. 2 yards of this company have been taken over by the Lyall interests of Montreal, Que., which will build six steamers for the Imperial Munitions Board at a cost of $350,000 each.

The Western Canada Shipyards on False Creek will build six wooden steamers for the Imperial Munitions Board, two having already been started. The aggregate value of these will be $4,500,000.

The British Pacific Engineering Co., Vancouver, has a ship construction program of about $1,500,000. The Taylor Engineering Co., Vancouver, has taken up the designing of ships and is building small ships of a total value of $300,000.

The Vancouver Shipyard & Engineering Works has located a yard on Burrard Inlet and will build ships for sale instead of on contract. The Whalen Pulp & Paper Co., with offices in Vancouver and pulp plant at Mill Bay on Howe Sound, Swanson Bay and Quatsino, west coast Vancouver Island, will build ships for its own use at Quatsino, and will lay two keels immediately. The Cameron Genoa Mills, Shipbuilders, Lt., Victoria, have launched four wooden auxiliary power schooners and will build two more to cost $150,000 each. They will also build four wooden steamers for the Imperial Munitions Board of a total value of $1,400,000.

The Foundation Co. has leased Turpel's shipyards at Victoria, and is constructing five ships for the Imperial Munitions Board at an aggregate cost of $1,750,000. Yarrows, Ltd., Victoria, is building four shallow draft vessels for river navigation in India.

The British Columbia Construction & Engineering Co. is establishing yards on Poplar Island, New Westminster, and will build four steamers for the Imperial Munitions Board to cost $1,400,000.

The Pacific Construction Co. has taken over the yards of the Coquitlam Shipbuilding Co., at Port Coquitlam, and will build two steamers for the Imperial Munitions Board to cost $700,000.

Harrison & Lamond, South Vancouver, have a contract to build an auxiliary schooner for the Dominion government for trade between the Pacific and the Atlantic to cost $150,000.

Other concerns having shipbuilding plans are the British Columbia Marine, The Sound Construction Co., the Victoria Machinery Depot and the Westminster Marine Ways.

Frank Dallett, C. C. Bland and F. A. Dutton have recently incorporated under the name of the Warwick Steel & Iron Breaking Co., with main offices in the Harrison Building, Philadelphia, and a plant at Warwick, Pa. The company will deal in scrap material and has facilities for breaking large pieces of iron and steel. Frank Dallett of Dallett & Co., Philadelphia, has been engaged in the equipment trade for more than 30 years.

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TAKES IMPORTANT STEP

Shipping Board Will Require All Charters to Be Approved

WASHINGTON, Sept. 11.—The United States Shipping Board has taken the first important step looking to the assumption of complete control over the ocean-going merchant marine of the country by announcing that it will at once appoint a general chartering board to which all charters must be submitted for approval and intimating that existing ocean rates will be reduced by from 50 to 75 per cent. The board's action will be based upon the sweeping authority delegated to it by the act of Sept. 7, 1916, as amended by the Alexander law. The announcement of the board has created consternation among shipowners whose current charters have been made at rates from three to five times normal charges, and has been followed by a slump in steamship shares. Vessel owners are protesting vigorously in person and through their Senators and Representatives, but there is no reason to believe that the policy marked out by the Shipping Board will be in any way modified.

The chartering board will probably consist of three members and will sit in New York. To effectively control transatlantic shipping under the American flag, the board will probably formally requisition the great majority of merchant vessels, but after commandeering them, will return them to their owners for operation under a series of rules and regulations soon to be prepared and promulgated by the Shipping Board. In order that the supervision of transatlantic shipping may be as effective and as comprehensive as possible, the President has determined that a member of the Shipping Board or a designated representative of that body shall be added to the exports council. The co-ordination of these two bodies is of importance, as it will bring into close harmony the policy and general operations of both cargo and tonnage control. Especially, it will give the exports council a check upon the ocean-going carriers and enable it to determine readily whether its decrees are being closely observed.

It is probable that the drastic cuts in ocean freight rates to be made by the chartering board will be tentative and subject to readjustment from time to time. It is not intended to cripple steamship lines, but rather to stimulate them into the greatest possible activity. At the same time, in view of the comprehensive authority which Congress has voted the executive branch of the Government, the Shipping Board will be in position to secure a maximum of service from the entire American merchant marine quite irrespective of the profits allowed vessel owners. There is, however, no desire to render the business of owning and operating merchant ships unprofitable, and the board is fully alive to the fact that more can be done for the commerce of the country with the hearty co-operation of the vessel owners than under any system of commandeering and Governmental operation that could be devised. According to the information of the Shipping Board, transatlantic freight rates are now in the neighborhood of $17 or $18 per ton, and it is said that a maximum of about $13 will be fixed with a general average of not more than half that figure.

Small Imports of Ferromanganese in July

Ferromanganese imports into the United States in July according to data furnished THE IRON AGE were only 2037 gross tons. The distribution was as follows: Through the port of Philadelphia, 887 tons; Baltimore, 400 tons; New Orleans, 750 tons, with New York and Norfolk reporting none imported. The July receipts are the lowest for any month this year, the next lowest having been May, with 2187 tons. The total to Aug. 1, 1917, is now 32,801 tons or 4686 tons per month. The average imports for the first four months of this year was 6190 tons per month, with the average in 1916 at 7577 tons per month. This is a falling off since April of 25 per cent in our imports.

GRANTED WAGE INCREASE

Sheet and Tin-Plate Workers Now Far Above the Scale

YOUNGSTOWN, OHIO, Sept. 10.—Examination of sales sheets completed here Tuesday shows black sheets selling on a 5c. card, an increase from 4.45c., thus advancing wages of sheet workers 16½ per cent. Tin plate during the last 60 days was selling on an average $7.75 a box, the prices advancing from $6.85. Wages were, therefore, increased 16 per cent. Both sheet and tin plate workers' wages now are about 85 per cent above the base.

A Peculiar Strike

One of the most peculiar strikes that has ever been noted in New England occurred last week in the plant of the Collins Co., Collinsville, Conn. About 125 men employed in the grinding room of that company went on strike after a request that the company buy coal and sell it to the men was refused because the company could not obtain it. The trouble was adjusted by granting an increase to the men which will pay for the winter's supply of coal, even at the prevailing prices, and by the assurance of the company that if the local dealers failed to supply the amount of coal necessary, the company would take steps to get it. At the present time, most of the Polish workmen employed in the grinding department are earning between $25 and $30 a week. This strike indicates the seriousness of the coal situation in many of the smaller places in New England.

News of Labor World

At a meeting of the minimum wage committee of the Bridgeport, Conn., machinists, held Sept. 7, it was decided to put into effect at once a demand on certain factories for an increase in wages. The local unions are maintaining much secrecy in regard to their plans, and it is understood that many meetings of shop crews are to be held this week. The four local union lodges have voted to pay strike benefits to the non-union machinists who are participating in the strike at the Lake Torpedo Boat Co.

The Pratt & Whitney Co., Hartford, Conn., a subsidiary of the Niles-Bement-Pond Co., has announced a monthly bonus of 12½ per cent above the regular wages, to be paid to its 3000 employees. More than one day's absence a month except in case of serious illness will debar a workman from participating in the bonus. As the present weekly payroll is about $60,000, the bonus payments will amount to about $30,000 a month.

The striking shopmen of the Boston & Maine Railroad are voting on the acceptance of an offer of the company to pay an advance of five cents an hour immediately and to submit the question of a further advance of three cents an hour to the decision of Henry B. Endicott, chairman of the Massachusetts Public Safety Commission, as arbitrator. The original demand of the men was for eight cents an hour increase, but it is believed that the present offer will be accepted and the men return to work. Nearly 4000 employees are involved.

New Mill Placed in Operation

The Youngstown Sheet & Tube Co. started last week its new 12-in. mill built by the Morgan Engineering Co., Worcester, Mass. The mill started off very satisfactorily, and is designed to take steel billets up to 30 ft. in length from 1¾ x ¾ to 3 x 3 in. and reduce them to rounds, squares, flats and angles. The new mill is contained in a steel building 100 ft. wide by 401 ft. in length, and has a capacity of about 10,000 tons per month. On Feb. 5, this year, the Youngstown Sheet & Tube Co. put in operation a 9-in. Morgan bar mill designed to roll rounds, squares, flats and angles, with a capacity under normal operation of 6000 tons per month of average sections. An illustrated description of this mill appeared in THE IRON AGE of April 5, 1917.

British Steel Exports and Imports Still of Fair Volume

British steel exports in June were 220,304 gross tons, excluding iron ore and including scrap. This compares with 199,418 tons in May of this year and 310,625 tons in June, 1916. The June exports are second in tonnage for the first six months of this year, the average to July 1 having been 206,164 tons per month as compared with 279,819 tons per month in 1916.

Pig-iron exports in June were 76,235 tons, against 60,644 tons last May and 66,150 tons in June, 1916. Ferroalloy exports in June, almost entirely ferromanganese, were 10,558 tons. The monthly average to July 1 has been 9,273 tons, as compared with 11,273 tons per month in the same period in 1916.

Rail exports in June were only 2,460 tons and were 11,943 tons less to July 1, 1917, than to July 1, 1916. Steel bar exports, which have been chiefly to France, continue to decline. In June they were 25,650 tons as compared with 19,537 tons in May, this year, and 59,188 tons in June, 1916. The total to July 1, 1917, or 170,619 tons is less than 50 per cent of the exports to July 1, 1916.

Imports of steel in June, excluding iron ore and including scrap, were 33,489 tons, an amount exceeded in but one month (May) since unrestricted submarine warfare started. The lowest month this year was March, with an importation of only 25,990 tons. Total imports to July 1 this year have been 202,176 tons against 401,281 tons to July 1, 1916. The monthly average to July 1, 1917, is 33,696 tons.

Imports of steel blooms, billets and slabs are rapidly declining. In June they were only 873 tons as contrasted with 11,223 tons in June, 1916. The total to July 1, 1917, has been only 20,614 tons as compared with 75,996 tons to July 1, 1916. Imports of steel ingots to July 1 this year were 3,089 tons; to July 1, 1916, they were 12,874 tons. Manganese ore and iron-ore import statistics have not been included in the official data for several months.

The extent of the war decline in imports can be appreciated by a comparison with those for 1913, when the average for the year was 195,264 tons per month.

National Safety Congress in New York This Week

The National Safety Council is holding its sixth annual congress at the Hotel Astor, New York, this week. A general round table discussion was held on Tuesday afternoon, but the regular general sessions began on Wednesday with sectional meetings scheduled for the morning and afternoon of Wednesday, Thursday and Friday. The foundry section is to hold a meeting on Thursday morning and the iron and steel section on Thursday and Friday afternoons, as well as Wednesday afternoon. A session on safety matters in connection with automobile manufacturing is covered also by a special session with meetings on Friday morning and afternoon and the other sessions include three for the health and industrial relations division. In all the program includes 157 speakers.

Of the twenty-five directors elected to serve three years, G. L. Avery, secretary, Avery Co., Peoria, Ill.; J. M. Eaton, manager welfare department, Cadillac Motor Car Co., Detroit, and Earl B. Morgan, safety engineer, Norton Co., Worcester, Mass., were among those renominated, and the following were among those elected on the basis of fresh nominations: W. L. Chandler, Dodge Sales & Engineering Co., Mishawaka, Ind.; B. F. Tillson, superintendent, New Jersey Zinc Co., Franklin, N. J.; Charles R. Hook, vice-president, operating division, American Rolling Mill Co., Middletown, Ohio.

At the same time as the Safety Congress, in other words, throughout the week of Sept. 10, a Safety and Sanitation Exposition will be held at the Grand Central Palace, New York, under the joint auspices of the National Safety Council and the American Museum of Safety.

At the general meeting on Sept. 11, Lew R. Palmer, deputy commissioner of labor of Pennsylvania, Harrisburg, delivered his address as president of the National Safety Council. He emphasized the safety movement as "the entering wedge whereby a better understanding can be developed between the employer and the employee. With it," he said, "comes a frank admission of one vital problem, the solution of which works for their mutual benefit." Suggesting that the co-operative plan works for the good of all in this one instance, he holds it reasonable that the circle of application will grow. He deplored the fact that organized labor as a whole is still unorganized for safety, and one is short-sighted, he said, not to recognize in this field alone a work worth a lifetime of devotion. He referred to the remarkable increase in membership, 68 per cent in the year, in spite of the extraordinary conditions, and paid a tribute to W. H. Cameron, elevated a year ago from the position of secretary to general manager, and to R. W. Campbell, president for the first years of the council, and Arthur Morey, Mr. Palmer's predecessor.

Installations of the Greaves-Etchells Electric Furnace

The Electric Furnace Construction Co. of Philadelphia announces the sale of the following Greaves-Etchells electric furnaces:

The American Radiator Co., Buffalo, N. Y., will install one 6-ton furnace.

The Singer Mfg. Co., New York, will install one 6-ton furnace.

The installation of these two furnaces makes a total of five of this type operating or contracted for in the United States.

Foreign orders for this furnace recently contracted for in England include a second order for a 6-ton furnace for the Stewart & Lloyd Co., Glasgow, Scotland; two 10-ton and one 6-ton furnace for Vickers, Ltd., of Sheffield for installation in Spain and one furnace for Hobson, Houghton & Co., Sheffield, for making tool steel.

Steel Corporation's Orders Again Decline

The monthly statement of the United States Steel Corporation, showing unfilled orders on its books on Aug. 31, reveals a total of 10,407,049 tons. This is a decrease from the previous month of 437,115, the total on July 31 having been 10,844,164 tons. This is the fourth consecutive decrease since the record total of 12,183,083 tons on April 30, and is the smallest since last October. A year ago the unfilled orders were 9,660,357 tons and they were less than half the present total two years ago. The following table gives the unfilled tonnage of the United States Steel Corporation at the close of each month since January, 1914:

	1917	1916	1915	1914
January	11,474,054	7,922,767	4,248,571	4,613,680
February	11,576,697	8,568,966	4,345,371	5,026,440
March	11,711,644	9,331,001	4,255,749	4,653,825
April	12,183,083	9,829,551	4,162,244	4,277,068
May	11,886,591	9,937,798	4,264,598	3,998,160
June	11,383,287	9,640,458	4,678,196	4,032,857
July	10,844,164	9,593,592	4,928,540	4,158,589
August	10,407,049	9,660,357	4,908,445	4,213,331
September		9,522,584	5,317,618	2,787,667
October		10,015,260	6,165,452	3,461,097
November		11,058,542	7,189,489	3,324,592
December		11,547,286	7,806,220	3,836,643

British Prices for Iron and Steel Scrap

Maximum prices for scrap steel in Great Britain were changed by the Minister of Munitions on Aug. 28, according to a cablegram from the American Consul General at London. The new order, cancelling previous orders, reads: Heavy steel melting scrap, £5 5s.; steel turnings and borings, £3½; steel turnings and borings mixed with wrought iron, £2½; all other classes of steel scrap mixed or not with wrought iron or other material, £5 5s. The following maximum prices were fixed for iron scrap: Wrought iron scrap, £5 5s.; wrought iron turnings and borings mixed with steel or other materials, £2½.

Iron and Steel Markets

GOVERNMENT BUYING

Large Requirements Later in Shell Steel

Billets Yield Further and Some Finished Products Are Easier

Readjustment in iron and steel values is slow-paced and the Government situation is more complicated if anything. A significant fact is that representatives of some of the Entente Allies are again actively negotiating on their own behalf, indicating the suspension, for the time at least, of efforts to get steel for them through the War Industries Board at the prices to be fixed later for the Washington Government.

The Attorney General has given an opinion that manufacturer members of advisory committees may continue their activities at Washington, by declaring their interest in each Government contract that may be taken by their companies. The steel committee has not resumed its functions, however, as the opinion is considered vague on some points and machinery is lacking for complying with the conditions imposed.

There is a steady run of Government buying while the major war program is being worked out; Government purchases, in fact, make up the bulk of current business. Individual consumers, in the general belief that the market will continue to decline, are doing no buying that can be put off.

By the latest survey of Army and Navy needs, the mills will be called on to supply the Government far more shell steel than has been talked of in the great prominence given to ship plates. It develops also that some large shipments on shell steel contracts are yet to be made to Great Britain and that that country will buy a considerable additional amount of such steel from the United States.

Though a new plate mill at Pittsburgh is to start early in October and further new capacity will come in by Jan. 1, the tonnage of plates that will be required for Government ships, when projected yards begin building, will leave little or nothing for Japan. Meanwhile some of the Japanese plates may be taken from the mills and stored in the hope of getting them released.

Large requirements of fabricated steel for American operations in France are indicated by the placing of 100 steel buildings with the Blaw Steel Construction Co., Pittsburgh, calling for 11,000 tons. Thirty-two other buildings also for France, to be used as Army store houses, are pending. There is in addition $5,000,000 worth of steel buildings for the new gun making plants of private manufacturers in this country.

Italy is in the market for billets and various finished products and has offered $60 at mill for open-hearth steel. For eight vessels for Italy the American International Steel Corporation has asked for 15,200 tons of plates, 5600 tons of shapes and 800 tons of bars.

Recent Government purchases have included 4000 tons of rivets and some large bolt contracts are pending, one calling for twenty million bolts. The Government has added 14,000 kegs of nails at $3.20 to its recent purchases, these being for aviation camps.

There has been a further settling of prices for semi-finished steel. A sale of 4 x 4-in. open-hearth billets has been made at Pittsburgh at $65 and one of 2000 tons of open-hearth ingots at $60, delivered, netting $58 at mill. Sheet bars and slabs, however, have not been quoted below $75.

The tendency to lower prices is seen in bars as well as in plates in the Central West and to some extent in sheets. Sales of several lots of steel bars for delivery in the first half of 1918 have been made at 3.50c., Pittsburgh, and jobbers have bought for the last quarter of this year at 4c. Makers of agricultural implements have asked for prices for the first half of next year but mills have held off.

Pig iron resales are more frequent. Unconfirmed rumors have been widespread of the fixing of lower Government prices on pig iron and these may have prompted consumers' sales in the expectation that the iron could be replaced later on a lower basis. Generally pig iron prices have yielded $1 to $2 a ton. There have been $47 No. 2 Birmingham iron and $50 iron in the Middle West, and generally resale lots have been offered at about $2 under furnace prices.

The Government purchases of 15,000 tons of coke at $3.50 for foundry and $3 for furnace grades were made in July, though generally made public only in the past week. No indication of the price the Government will fix on blast furnace coke has been given. Prompt coke has sold in the past week at $13 to $13.50 at oven, and if a $3.50 or $4 price is to be fixed by the Government the pig iron market might be affected materially.

The buying of 77,000,000 lb. of copper for the Allies at 25 cents has been taken as pointing to the same price on the much larger contracts for the Government. Negotiations were not concluded on Tuesday as expected, in view of the reported contention made for a 2½-cent concession from the price to the Allies, a rather surprising abandonment of the one-price-for-all principle.

Pittsburgh

PITTSBURGH, Sept. 11 (*By Wire*).

The steel trade is still waiting on the Government to announce its prices on steel, and the whole situation is about as quiet as it could possibly get. As time goes by, consumers seem more determined than ever not to buy a pound of material not positively necessary, but so far specifications against contracts are reported as being received at a fair rate. It is really remarkable how well prices have held up in the absence of practically any new buying. Pig iron has held steady in the past week, but there are still lower prices being named on soft Bessemer and open hearth billets, $65, Pittsburgh, having been done. A sale of 2000 tons of open-hearth ingots for September-October delivery at $60 per gross ton is reported. Prices on finished iron and

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Sept. 12, 1917.	Sept. 5, 1917.	Aug. 15, 1917.	Sept. 13, 1916.
No. 2 X, Philadelphia...	*$52.00*	$53.00	$53.00	$19.50
No. 2, Valley furnace...	52.00	52.00	53.00	18.50
No. 2 Southern, Cin'ti...	49.90	49.90	49.90	17.40
No. 2, Birmingham, Ala.	47.00	47.00	47.00	14.50
No. 2, furnace, Chicago*.	55.00	55.00	55.00	18.00
Basic, del'd, eastern Pa..	50.00	50.00	50.00	19.75
Basic, Valley furnace....	48.00	48.00	52.00	18.00
Bessemer, Pittsburgh....	51.95	51.95	55.95	21.95
Malleable Bess., Ch'go*..	55.00	55.00	55.00	19.00
Gray forge, Pittsburgh....	46.95	46.95	46.95	18.70
L. S. charcoal, Chicago..	58.00	58.00	58.00	19.75

Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	38.00	38.00	38.00	33.00
O.-h. rails, heavy, at mill	40.00	40.00	40.00	35.00
Bess. billets, Pittsburgh.	*65.00*	75.00	85.00	45.00
O.-h. billets, Pittsburgh.	*65.00*	75.00	85.00	45.00
O.-h. sheet bars, P'gh...	*75.00*	80.00	85.00	45.00
Forging billets, base, P'gh	100.00	100.00	125.00	69.00
O.-h. billets, Phila.....	*85.00*	90.00	100.00	48.00
Wire rods, Pittsburgh...	90.00	90.00	90.00	55.00

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	*4.935*	5.185	5.159	2.659
Iron bars, Pittsburgh....	4.75	4.75	4.75	2.60
Iron bars, Chicago.....	4.50	4.50	4.50	2.35
Steel bars, Pittsburgh...	4.00	4.00	4.50	2.60
Steel bars, New York....	4.195	4.195	4.669	2.769
Tank plates, Pittsburgh..	8.00	8.00	9.00	4.00
Tank plates, New York..	*8.195*	8.945	10.169	4.169
Beams, etc., Pittsburgh..	4.00	4.00	4.50	2.60
Beams, etc., New York..	4.445	4.445	4.669	2.769
Steel hoops, Pittsburgh..	5.75	5.75	5.75	3.00

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Sept. 12, 1917. Cents.	Sept. 5, 1917. Cents.	Aug. 15, 1917. Cents.	Sept. 13, 1916. Cents.
Sheets, black, No. 28, P'gh	8.50	8.50	8.50	2.90
Sheets, galv., No. 28, P'gh	10.00	10.00	10.00	4.15
Wire nails, Pittsburgh..	4.00	4.00	4.00	2.60
Cut nails, Pittsburgh....	4.65	4.65	4.65	2.60
Fence wire, base, P'gh..	3.95	3.95	3.95	2.55
Barb wire, galv., P'gh....	4.85	4.85	4.85	3.45

Old Material, Per Gross Ton:				
Iron rails, Chicago.....	$44.50	$44.50	$40.50	$18.75
Iron rails, Philadelphia..	45.00	45.00	45.00	20.00
Carwheels, Chicago.....	**33.50**	31.50	30.50	11.75
Carwheels, Philadelphia..	*32.00*	34.00	35.00	15.50
Heavy steel scrap, P'gh.	*33.00*	34.00	31.00	16.00
Heavy steel scrap, Phila.	*30.00*	31.00	31.00	14.75
Heavy steel scrap, Ch'go.	**33.00**	31.00	29.00	16.00
No. 1 cast, Pittsburgh....	30.00	30.00	30.00	14.50
No. 1 cast, Philadelphia..	32.00	32.00	33.00	16.00
No. 1 cast, Ch'go(net ton)	24.00	24.00	23.00	12.00
No. 1 RR. wrot, Phila....	45.00	45.00	45.00	20.00
No. 1 RR. wrot, Ch'go(net)	36.00	36.00	33.50	16.50

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	*$13.00*	$13.50	$16.00	$2.90
Furnace coke, future....	10.00	10.00	10.00	2.50
Foundry coke, prompt...	*14.00*	14.50	14.00	3.25
Foundry coke, future....	12.50	12.50	10.00	3.50

Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.	**25.50**	25.25	28.00	28.00
Electrolytic copper, N. Y.	**25.50**	25.25	28.00	28.12½
Spelter, St. Louis.....	8.00	8.00	8.50	9.00
Spelter, New York.....	8.25	8.25	8.75	9.25
Lead, St. Louis.....	*9.50*	10.12½	10.75	6.60
Lead, New York.....	*9.70*	10.25	10.87½	6.75
Tin, New York.....	**61.37½**	61.00	62.25	38.25
Antimony (Asiatic), N. Y.	14.50	14.50	15.00	11.00
Tin plate, 100-lb. box, P'gh.	$12.00	$12.00	$12.00	$5.75

steel are fairly strong, but there has not been enough new buying for the past month to test them out. It is known that stocks are running pretty low, and it is believed that just as soon as the Government announces its prices on steel, a fairly heavy buying movement may come very quickly. If reports are true that the Government intends to pay 25 cents for copper, this might indicate that prices on steel will not be fixed as low as some in the trade anticipate. About the only activity going is in blast furnace coke for prompt shipment, which is selling freely at $13 and $13.50 per net ton at oven. Some large Government orders for shafting, railroad spikes, rivets, sheets and other finished steel are about to be placed. In fact, Government buying has dominated the market for more than a month past, the amount of new buying from other consumers being almost negligible.

Pig Iron.—The local pig iron market is almost stagnant, the only sale reported in the past week being one of 400 tons of Bessemer, 100 tons a month for last four months of this year at the reported price of $51, Valley furnace. Nothing has been done on the Government inquiry that came out about a month ago for 40,000 tons of Bessemer iron for shipment to Italy, and this may fall through. It is said about 25,000 tons for this inquiry was gathered up, but the prices quoted were not satisfactory, and the negotiations were dropped. There is no new inquiry and prices are unchanged in the absence of sales. E. W. Mudge & Co. have blown out Claire furnace at Sharpsville, Pa., for relining and repairs.

We now quote as follows: Standard Bessemer iron, $50 to $52; basic, $48; No. 2 foundry, $52; malleable Bessemer, $52 to $53; and gray forge, $46 to $47, all at Valley furnace. The freight rate for delivery in the Pittsburgh and Cleveland districts from Valley furnaces is 95c. per ton.

Billets and Sheet Bars.—Prices on soft Bessemer and open hearth billets continue to decline, and more re-sale steel is being offered than the market will absorb. We note one sale of 1000 tons of 4 x 4-in. soft open-hearth billets at $65, Pittsburgh, and additional steel has been offered at this price or less. Reports are that a Chicago interest has offered Bessemer ingots on the basis of about $52, Chicago, or about $55, delivered Youngstown; but the concern credited with having sold this steel denies having done so. Reports are also current here that the Italian Commission with headquarters in New York City has been endeavoring to buy soft Bessemer and open hearth billets on the basis of $60, Pittsburgh, for shipment to Italy, but has not succeeded. There has not been as much decline in prices of sheet bars and large slabs as in billets, the differential now existing between billets and sheet bars and slabs being about $10 per ton. There is very little new demand for steel, as consumers are holding off, waiting for lower prices. We now quote soft Bessemer and open hearth billets at $65, Pittsburgh, and sheet bars and large slabs at $75, Pittsburgh. We quote forging billets at nominally $100 per ton for ordinary sizes and carbons, f.o.b. Pittsburgh, but there is no buying.

Steel Rails.—The Carnegie Steel Co. has not been a seller of either standard sections or light rails for more than a month, and a good part of the new business coming up in light rails is being taken by the re-rolling mills. However, the Carnegie company and also the Cambria Steel Co. are sold up on light rails and heavy sections for a good many months to come. Prices on new light rails and standard sections are given on page 627.

Ferroalloys.—It developed that the Electro-Metallurgical Co. of Niagara Falls, N. Y., the leading producer of 50 per cent ferrosilicon, has not yet fixed its prices for 1918 delivery, but is being strongly importuned by its customers to do so. The new demand for ferroalloys is not very active, consumers being covered over the remainder of this year. There was a recent sale of

250 tons of 80 per cent domestic ferromanganese at $350, delivered, for first quarter. We quote 80 per cent domestic ferromanganese at $375 to $400 for prompt shipment, and $350 delivered, for first half of 1918. We quote 18 to 22 per cent ferrosilicon at $80 to $82.50 per gross ton, delivered.

We quote 9 per cent Bessemer ferrosilicon at $89, 10 per cent $90, 11 per cent $95, 12 per cent $100, 13 per cent $105, 14 per cent $115, 15 per cent $125, and 16 per cent $135. We now quote 7 per cent silvery iron at $84 to $89, 8 per cent $85 to $90, 9 per cent $86 to $91, 10 per cent $87 to $92, 11 and 12 per cent $88 to $93. All f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having a uniform freight rate of $2 per gross ton for delivery in the Pittsburgh district.

Structural Material.—No new work is being given out in this district and local fabricators report they are sold up on on all the steel they can fabricate for the remainder of this year and are not actively bidding on new work. Mills are making better deliveries than for some time. We quote beams and channels up to 15 in. at 4c. to 4.50c., the lower price for last quarter on large contracts and the higher price on small lots for fairly prompt delivery. These are mill prices, while small lots from warehouse bring 5c. to 6c., depending on the order.

Plates.—Of the total orders for cars placed by the Government, the Pressed Steel Car Co. has taken 1800 composite steel gondolas, having wooden floors and sides, while its western interest, the Western Steel Car & Foundry Co., Chicago, has taken a Government order for 500 narrow gage cars. Steel car builders report that deliveries of plates and small shapes by the mills are very little better. The Pennsylvania Tank Car Co., Petroleum, Pa., has taken 100 steel tank cars for the Procter & Gamble Co., Cincinnati, and the Standard Steel Car Co. has taken 45 steel gondolas and 400 wooden box cars for the Government. A leading mill has taken 27,000 tons of sheared plates for shipment to the Pacific coast to be used by a boat builder for boats for the Government. We quote ¼ in. and heavier sheared plates at 8c. to 9c. for delivery over the remainder of this year. Small lots from warehouse bring 11c. to 12c., prices depending on sizes and the quantity wanted.

Sheets.—While prices on sheets remain fairly strong, consumers are having much less trouble in getting prompt delivery. Some mills that a month or more ago were refusing to quote are now seeking orders for all grades of sheets and promising deliveries in 60 to 90 days. There has been no actual decline in prices, except on galvanized, which are $2 to $3 a ton less than a month ago. Consumers of sheets are expecting a readjustment in prices to a much lower basis and are holding off from buying as much as they possibly can. The Navy Department recently placed about 7000 tons of Bessemer and open hearth black sheets at the tentative price of 5c. for No. 28 gage, subject to later adjustment. There has not been enough new buying in sheets for a month or more to actually test new prices. Prices on the different grades of sheets, which are only fairly firm, are given on page 627.

Tin Plate.—The committee appointed by the tin plate makers at the meeting held in Pittsburgh on Friday, Aug. 31, has sent out a general inquiry to tin plate manufacturers asking them to submit figures as to how much tin plate they expect to turn out in 1918, and how much will be available for packers of perishable foods and also non-perishable foods. It is assumed the committee desires this information to be used in a further conference to be held with Food Administrator Hoover, and also to get a general line as to the probable output of tin plate next year. As stated before, it is not believed the output of tin plate in 1918 will be much larger than this year, owing to the scarcity in labor and the fact that at present no new tin plate mills are being built. Packers of perishable foods are being furnished tin plate quite promptly, and it is not believed they will suffer very much for lack of plate for packing foods. Some former makers of terne plate have put in tinning pots and largely increased their output of bright plate. The Government's proposal to tin plate makers that they agree to sell their output for all of next year is not likely to be carried out. There is a good deal of hazard in doing this, and in previous years tin plate makers have met disaster in selling owing to sharp advances in steel, also in pig tin, and trouble in getting deliveries. No other makers of finished steel products sell for a year ahead, and tin plate makers say they should not be expected to do so. There is some export inquiry for tin plate ranging from 2000 up to 8000 and 10,000 boxes lots, but makers are not quoting, as they do not have the tin plate to spare. Several leading makers of tin plate have their entire output sold up into April, 1918. The new domestic inquiry is light, small lots of primes from stock selling at $12 up to $15 per base box. No sales of tin plate are being made to jobbers, except where they can show it is intended for packing perishable foods. Prices on terne plate are given on page 627.

Iron and Steel Bars.—It would seem that the market on both iron and steel bars is somewhat softer. Recently there have been sales of fairly large lots of steel bars for delivery over first half of next year at 3.50c., Pittsburgh. Sales also have been made to jobbers for last quarter of this year on the basis of 4c. at mill, and one leading producer of steel bars has covered its regular trade for last quarter of this year at 3.50c. at mill. Other makers are quoting for last quarter as high as 4.50c. at mill. The large consumers of iron and steel bars are well covered for the remainder of this year, but whether there will be a general desire to contract for first half of next year until the Government steel prices are settled is a question. The Government has been buying for months its steel bars at 2.50c. at mill. and is hardly likely to fix its price as high as 3.50c. Specifications against contracts are reported to be fairly active. The new demand for reinforcing bars is not very active, owing to the large falling off in building operations everywhere. The general market on steel bars is 4c. to 4.50c. at mill. Mill prices on carloads and larger lots on iron and steel bars on domestic orders are given on page 627.

Hoops and Bands.—The new demand is dull and only for small lots, consumers being covered over the remainder of this year, but specifications are not so heavy as some time ago. Prices on hoops and bands are likely to be lower, and consumers are buying very conservatively. Steel hoops in small lots for prompt shipment range from 5c. to 5.50c. and bands 5c. to 5.25c. at mill, extras on the latter as per the steel bar card.

Wire Rods.—The new demand is still active and there is also a good deal of export inquiry. One lot of 2000 tons of soft open-hearth rods for shipment to Denmark is about closed, the price netting the seller about $90, Pittsburgh. Small lots of soft Bessemer and open-hearth rods to domestic consumers are selling at $90 to $95 at mill. There is a fairly good demand for high carbon rods made from special steels, one lot of upward of 2000 tons being sold at $115, maker's mill. Prices on rods are given in detail on page 627.

Wire Products.—The domestic demand is dull and specifications against contracts are light. The consuming trade is not taking in any more nails and wire than is absolutely needed, owing to the uncertainty as to prices in the near future. It is not believed the present difference of $16 per ton in nails and wire can be maintained indefinitely, and the likely solution is that the independent makers will reduce their prices. There is considerable export demand for wire nails and wire for shipment to South America and other neutral countries. Recently about 4000 kegs of wire nails for shipment to South America was sold by a local maker netting about $5.10, New York. Jobbers are cutting down stocks as much as possible, in view of expected lower prices. The independent mills are running largely on contracts for wire nails on the $3.50 price and on bright basic wire on the $3.55 price. Very few nails have been sold at $4 or wire at the $4.05 basis. Prices on nails and wire of the independent mills, the American Steel & Wire Co. price being $16 per ton lower, are given on page 627.

Shafting.—Government demands for shafting are still heavy, and are likely to be very much larger in the near future. It is said the Government will shortly place orders with the makers for many thousands of tons of shafting, to be used in shells, nose pieces, adaptors

and for other purposes. The Government is now using very large quantities of adaptors in the inside of shells instead of detonators that were formerly used. So far it has paid market prices for all the shafting it has bought, but on the large lots yet to be purchased nothing is known as to what prices it will pay. The domestic demand for shafting is dull, and specifications are quiet. Consumers and jobbers believe prices of shafting will be lower when the Government announces its steel prices, and are buying very conservatively, trying to keep stocks as low as they possibly can. However, a few contracts have lately been placed for delivery in last quarter at 10 and 5 per cent off list. We quote discounts on shafting at 10 and 5 per cent off list, while occasionally very small lots are sold at list.

Railroad Spikes and Track Bolts.—New buying of spikes by the railroads is light, but they are specifying very freely against contracts placed some time ago. The Government has not been a large buyer of spikes since it placed its order some time ago for 53,000 kegs, but it is now in the market for about 3000 kegs of spikes and 1,000,000 or more tire plates for military use, presumably for shipment to France. The Jones & Laughlin Steel Co. will not move its spike plant to the South Side as originally intended, and is again making spikes. The new demand for boat spikes is very heavy. The Government allows the individual boat builders to place the orders for the spikes they will need for boats they are building for it. On these orders a slightly lower price is made than for other domestic business. The new demand for track bolts and spikes from railroads on former orders are heavy. Prices on railroad spikes and track bolts are reported firm and are given on page 627.

Nuts and Bolts.—The new demand is active due largely to direct buying by the Government, and also indirect orders that are coming from concerns doing Government work. It is expected that within a short time the Government will place several large orders, one being for about 20,000,000 bolts, and another for a smaller quantity. These orders are now being figured on with the Government, and will be divided among the larger manufacturers, who can get the material out and make prompt shipment. There is an embargo on nuts and bolts for export and nothing is being done. Prices are reported fair, and discounts that went into effect in April last are still being quoted, and are given on page 627.

Cold Rolled Strip Steel.—Makers report the new demand quiet, but specifications against contracts are coming in freely. Some Government orders are being placed, but these are not very heavy. Makers of cold rolled steel are quoting only for delivery to Oct. 31 next. It is said that while shipments on some contracts are being held up, there have been very few cancellations.

On contracts, mills are quoting 9c. at mill, but on small current orders prices range from 10c. up to 12c. at mill. Terms are 30 days, less 2 per cent off for cash in 10 days when sold in quantities of 300 lb. or more.

Rivets.—There is no new buying in rivets, but makers report that specifications are coming in actively. Government orders have been fairly heavy, and one recent order calling for 4000 tons for prompt shipment was divided among a number of the larger makers. Consumers believe that prices of rivets may be lower in the near future, and are buying very conservatively. Prices are reported firm, and we quote structural rivets at $5.25, and cone head boiler rivets at $5.35 per 100 lbs. f.o.b. Pittsburgh, for delivery over remainder of this year.

Wrought Pipe.—The current domestic demand is quiet, but mills are filled up for many months ahead. One leading maker of lapweld steel pipe is filled up for about 70 weeks, and other makers for six months or more. The demand for oil country goods is enormously heavy, but output is only fairly large, mills having to keep furnaces of butt and lapweld pipe to fill pressing orders. The subcommittee on tubular products has up to this time purchased about 20,000 tons of pipe for the Government, which has been distributed pro rata among the different manufacturers and shipments have been made with great promptness in all cases. The pipe manufacturers are responding splendidly and their cooperation has been of great advantage to the Government.

Boiler Tubes.—Conditions in the trade are unchanged, and makers of iron and steel tubes are filled up for eight months to a year ahead, and heavy premiums in prices are readily paid for either iron or steel tubes for prompt shipment. On seamless steel tubes, one leading maker is filled up for fully 18 months, and another maker for a year or more. There are no regular prices on iron and steel tubes, these depending entirely on the quantity involved and the delivery. Nominal discounts are given on page 627.

Coke.—Recently the Government came in to the market and bought 15,000 to 16,000 tons of furnace and foundry coke for delivery to different points all over the country. On part of this coke, shipping directions have been furnished and some of it has gone to West Virginia, Colorado and Illinois. The price paid by the Government was $3 for furnace and $3.50 on the foundry coke, per net ton at oven, the Government order having been divided among five or six of the larger operators. The new demand for blast furnace coke for prompt shipment is active and prices are holding up and are very firm. On Monday, sales of high grade blast furnace coke were made at $13 to $13.50 and there seems to be an active demand for all the prompt blast furnace coke that can be shipped. Other districts including Hanging Rock and Portsmouth, Ohio, have lately been buying coke in this market. There is still a shortage of labor and cars. When there is enough labor to get out a large quantity of coke, a car shortage develops, and when there are plenty of cars, usually there is a shortage in labor. None of these coke plants in the Connellsville region are operating for more than 75 per cent, and some at a less rate. We quote best makes of blast furnace coke for prompt shipment at $13 to $13.50 per net ton at oven, and 72-hr. foundry coke at $13.50 to $14 at oven. We note a contract for 1000 tons per month of foundry coke running up to July next year at $8 per net ton at oven. This is not strictly high grade coke, running somewhat high in sulphur. *The Connellsville Courier* gives the output of coke in the upper and lower Connellsville regions for the week ending Sept. 1, as 336,170 tons, a decrease over the previous week of 22,334 tons, due largely to the shortage in labor.

Old Material.—The local scrap market is almost stagnant, not enough material being sold by dealers to consumers to test prices. In fact, large consumers seem to be pretty well covered, and while agreeing that prices on scrap are low, they are not willing to buy. Dealers say there would be little trouble in getting cars if they could make sales of scrap, but they are unable to do so. Sales of about 300 tons of heavy steel melting scrap are reported on the basis of about $33, Pittsburgh. Dealers quote for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$33.00 to $34.00
No. 1 foundry cast	30.00 to 31.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	38.00 to 40.00
Hydraulic compressed sheet scrap	25.00 to 26.00
Bundled sheet scrap, sides and ends, f.o.b. consumers' mill, Pittsburgh district	23.00 to 24.00
Bundled sheet stamping scrap	21.00 to 22.00
No. 1 railroad malleable stock	26.00 to 27.00
Railroad grate bars	18.00 to 19.00
Low phosphorus melting stock	42.00 to 45.00
Iron car axles	45.00 to 46.00
Steel car axles	45.00 to 46.00
Locomotive axles, steel	52.00 to 53.00
No. 1 busheling scrap	24.00 to 25.00
Machine-shop turnings	21.00 to 22.00
Cast iron wheels	31.00 to 32.00
Rolled steel wheels	36.00 to 37.00
*Sheet bar crop ends	41.00 to 42.00
Cast iron borings	22.00 to 23.00
No. 1 railroad wrought scrap	32.00 to 33.00
Heavy steel axle turnings	23.00 to 24.00
Heavy breakable cast scrap	24.00 to 25.00

*Shipping point.

Chicago

CHICAGO, Sept. 10.

With the leading producer, specifications and new business, the latter including the requirements of the Government, have been lighter in the past week than in some time, and the most interesting feature of the market is presented by pig iron. The quotations for plates continue to range from 8c. to 10c., Pittsburgh, with deliveries somewhat easier to obtain. Local fabricators are doing very little and no structural lettings are reported. Shapes for delivery at mill convenience this year can be had at 4.50c., Pittsburgh, the price quoted for steel bars by independent producers, although one Eastern mill still quotes 6c., Pittsburgh, for shapes. For 1000 tons of special analysis bars, over 5c. was paid. Sheets show an easier tendency. Many consumers of pig iron appear to be banking strongly on the prospect that the Government will take steps to lower prices, inasmuch as they are offering iron for resale. As practically spot material, it is generally commanding the full market price, and some handsome profits have been made, one seller clearing about $40 per ton. Labor trouble, over-buying and other influences also have prompted the reselling. The only concessions offered by furnaces have been on off iron, of which they have lately been making excessive quantities, but some resellers have been willing to accept $47, Birmingham, for prompt No. 2 Southern iron. Where Southern makers have had any to sell for this year, they have asked $50, Birmingham. The Government has purchased 10,000 tons of foundry iron at well below the established market. Except for some buying of heavy melting steel and car wheels, in one or two directions, the old material market has been quiet.

Ferroalloys.—A sale of 100 tons of 80 per cent ferromanganese at $400, delivered, is reported. Quotations are unchanged at $400 for delivery this year, $375 for the first quarter and $350 for the second quarter. In some cases $400 has been cut to secure an order, but on the other hand some makers not only will not give concessions, but hold to the belief that the outlook is for greater strength, their opinion being based on the manganese ore situation.

Pig Iron.—The furnaces, fully engrossed with making deliveries against old contracts, are inactive so far as sales of standard iron are concerned, but resales, embracing practically every grade of iron, are going on at a lively rate. Labor troubles, overbuying, the attractive profits to be realized, and a belief that the Government may put iron prices at a much lower level than now prevail, have combined to cause consumers to place iron in the hands of brokers, and in this manner all grades have come on the market, including low phosphorus and charcoal. Inasmuch as these offerings are for prompt delivery, they have usually met with a ready acceptance at full market prices, although some Southern No. 2 soft has been let go at $47, Birmingham, or $51, Chicago. The makers have been asking $50, furnace, for this year, and $48 for first half. What inquiries have come to the trade have involved mostly deliveries within six weeks, indicating that melters are running close. The furnaces, both North and South, are making an abnormal amount of off iron, because of the inadequate supply of coke that comes to them and the poor quality of much they do receive. On off iron, the furnaces are showing a readier tendency to make concessions in price. Many of the Southern furnaces, in particular, are far behind in their deliveries. Makers of charcoal iron are not quoting except to regular customers, and if the present consumption continues, they expect a shortage. Western low phosphorus is obtainable at about $85, furnace, although about 200 tons of Lebanon low phosphorus brought nearly $90, delivered. Jackson County silveries range from $75 to $80, furnace. One of the largest inquiries in recent weeks for foundry iron is for 1000 tons, all of which is wanted quickly. It is learned that the Government recently distributed orders amounting to 10,000 tons to be supplied by producers in this district. The price was not given for publication, but it was below the level usually quoted, as might be expected. The Northern makers adhere to $55, furnace, for No. 2 foundry, basic and malleable Bessemer. The makers of steel castings are being offered more business than they can handle. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 1 to 4	$58.00
Lake Superior charcoal, Nos. 5 and 6, Scotch and No. 1 soft or special	60.50
Northern coke foundry, No. 1	55.50
Northern coke foundry, No. 2	55.00
Northern coke foundry, No. 3	54.50
Northern high-phosphorus foundry	55.00
Southern coke No. 1 f'dry and 1 soft	55.00
Southern coke No. 2 f'dry and 2 soft	54.00
Malleable Bessemer	55.00
Basic	55.00
Low-phosphorus	$85.00 to 90.00
Silvery, 8 per cent	77.75 to 82.75

Plates.—It is confirmed that business at 8c. has been done, but in a general way it cannot be said that the price situation is a great deal easier, as an Eastern mill continues to quote 10c., Pittsburgh, or 10.189c., Chicago. The mill in question, however, can make better deliveries of tank plates to domestic consumers as a result of the embargo on exports. The domestic demand is ample to absorb all that is offered, and many exporters are willing to take a chance on their ability to ship in the near future, but of the latter business the mills are chary.

For Chicago delivery out of stock jobbers quote 10c.

Structural Material.—No structural lettings are reported this week. Fabricators in Chicago are doing very little, but conditions no further away than Milwaukee are reported to be on a better basis because of several new plants and additions to factories. A local producer suggests 4.50c. to 5c., Pittsburgh, or 4.689c., Chicago, minimum, as the price for delivery some time this year, but the quotation of an Eastern maker is unchanged at 6.189c., Chicago. No cars are reported to have been placed, although the builders are figuring on Government inquiries on cars to be used in France. Jobbers quote 5c. for material out of stock.

Bars.—Some irregularity is to be found in steel bars, but it is certain that they are easily obtainable at 4.50c., Pittsburgh, or 4.689c., Chicago. For 1000 tons of special analysis bars placed in this district, over 5c. was paid. The agricultural implement interests are not yet active and doubtless will continue to hold off until price uncertainties are settled. For concrete reinforcing bars there has been more active inquiry. The quotations for rail carbon bars range from 4.25c. to 4.50c., Chicago, and iron bars from 4.50c. to 5c., Chicago. Jobbers' prices are unchanged.

We quote prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c. to 5c.; reinforcing bars, 4.50c., base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Wire Products.—Deliveries are slightly improved, and business has been a little heavier. The leading interest continues to quote on the basis of $3.20 for nails, with the independents still taking business at $4. We quote on the latter basis, per 100 lb. to jobbers:

Plain fence wire, Nos. 6 to 9, base, $4.189; wire nails, $4.189; painted barb wire, $4.339; galvanized barb wire, $5.039; polished staples, $4.339; galvanized staples, $5.039; all Chicago, carload lots.

Sheets.—Blue annealed are a little easier at 8.50c. to 8.75c., Pittsburgh, or 8.689c. to 8.939c., Chicago, for No. 10 gage, while No. 28 black range from 8.75c. to 9c., Pittsburgh, or 8.939c. to 9.189c., Chicago. No. 28 galvanized are about 10.25c. to 10.50c., Pittsburgh, or 10.439c. to 10.689c., Chicago. Specifications are good and some of the mills are getting to the point where they will need more business.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 10c.; No. 28 black, 10c., and No. 28 galvanized, 11.50c.

Rails and Track Supplies.—Small lots of standard section rails from stock have been sold at $95, Eastern mill. The quotation of the leading interest for stand-

ard railroad spikes is 4.25c., base, but it is well understood that this price is nominal, 5c. to 5.25c. being nearer the market. The following quotations are those of the principal producer, except in tie plates and spikes. Inasmuch as light rails are quoted at $30 and upward it is apparent how much out of line the nominal prices are. If they have any use to-day it is merely to indicate differentials.

Standard railroad spikes, 5c. to 5.25c. base; small spikes, 5.25c. to 5.50c. base; track bolts with square nuts, 5.25c., all in carloads, Chicago; tie plates, $40 to $90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base; open hearth, $40; light rails, 25 to 45 lb., $65; 16 to 20 lb., $66; 12 lb., $67; 8 lb., $68; angle bars, 3.25c., base.

Bolts and Nuts.—Reports from the East indicate that bolt and nut makers on the Atlantic seaboard are doing an overwhelming business, but the West is admittedly quiet in regard to new business. For prices and freight rates, see finished iron and steel, f.o.b. Pittsburgh, page 627. Jobbers have advanced their quotation 50c. on nuts.

Store prices are as follows: Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to ⅞ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to ⅞ x 6 in., 40-2½; larger sizes, 30-5; hot pressed nuts, square, $2.50, and hexagon $2.50 off per 100 lb.; lag screws, 50 per cent off.

Cast-Iron Pipe.—No municipal lettings can be reported, business in that direction being at a standstill. Odd lots amounting to a few hundred tons have been placed at unchanged prices.

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., $68.50; 6 in. and larger, $65.50, with $1 extra for class A water pipe and gas pipe.

Old Material.—Except for some buying of heavy melting steel and carwheels the market has been quiet. Both sellers and consumers are inclined to view with conservatism the present uncertainties emanating from the probabilities of Government price fixing. Here and there, as demand for specific materials has developed, more strength is seen, but the advances are not radical. The B. & O. Railroad to-day is offering 2500 tons of old rails. Lists of moderate size are offered by the St. Paul, Wabash and C., St. P., M. & O. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Old iron rails	$44.50 to $45.00
Relaying rails	50.00 to 55.00
Old carwheels	33.50 to 34.50
Old steel rails, rerolling	40.00 to 41.00
Old steel rails, less than 3 ft.	40.00 to 41.00
Heavy melting steel scrap	33.00 to 34.00
Frogs switches and guards, cut apart	33.00 to 34.00
Shoveling steel	30.50 to 31.50
Steel axle turnings	23.00 to 24.00

Per Net Ton	
Iron angles and splice bars	$44.00 to $45.00
Iron arch bars and transoms	45.00 to 46.00
Steel angle bars	32.00 to 33.00
Iron car axles	45.00 to 46.00
Steel car axles	41.00 to 42.00
No. 1 railroad wrought	36.00 to 37.00
No. 2 railroad wrought	33.00 to 34.00
Cut forge	32.00 to 33.00
Pipes and flues	23.00 to 24.00
No. 1 busheling	25.50 to 26.50
No. 2 busheling	17.50 to 18.50
Steel knuckles and couplers	37.00 to 38.00
Steel springs	40.00 to 41.00
No. 1 boilers, cut to sheets and rings	20.00 to 21.00
Boiler punchings	35.00 to 36.00
Locomotive tires, smooth	40.00 to 41.00
Machine-shop turnings	17.50 to 18.00
Cast borings	16.50 to 17.00
No. 1 cast scrap	24.00 to 25.00
Stove plate and light cast scrap	18.00 to 18.50
Grate bars	17.50 to 18.50
Brake shoes	19.00 to 19.50
Railroad malleable	31.50 to 32.50
Agricultural malleable	25.50 to 26.50
Country mixed scrap	18.00 to 19.00

Philadelphia

PHILADELPHIA, Sept. 11.

Unless the Government or the coal operators act quickly, some of the mills in this district will face a serious coal shortage, with probabilities of shut-downs. A warning to this effect has been sent to Washington by manufacturers engaged on Government work. By Government order about 26,000,000 tons of gas coal have been diverted to the Northwest, and the Navy Department is taking large quantities for its own use. These factors and the shortage of cars are making it almost impossible for mills to get required quantities of fuel. It has been a common practice for many companies in this district to contract for from 50 to 75 per cent of their coal requirements, buying the remainder in the open market. It is now almost impossible to buy coal in the open market except in small quantities, as the coal companies are shipping every available ton to customers who have contracts. Very little bituminous has been sold at the $2 per ton price for run of mine fixed by the Government for this district. After several weeks of inaction, licenses for export of shapes to Japan are being issued, several shipments having gone forward during the past week. The placing of orders by the Government for fabricated material for building army storehouses in France was the most interesting development of the week in the finished steel market. Large orders for plates have been received by mills from the Emergency Fleet Corporation, and one mill, at least, has received sufficient business to keep going on Government work alone for two months. Eastern Pennsylvania foundry pig iron is slightly easier and No. 2 X can be obtained at $51, furnace. Small resale lots have been offered at about $2 per ton under the furnace prices.

Pig Iron.—Eastern Pennsylvania foundry iron is slightly weaker and No. 2 X can be had at $51 furnace, and No. 2 plain at about $50.25. Resale lots of Pennsylvania and Alabama foundry iron have been sold during the past week at about $2 under the prices quoted by furnaces. There is practically no demand for basic or Bessemer iron. A Western inquiry for 1500 to 2000 tons of standard low phosphorus iron for next year did not excite much interest. The same was true of a Pennsylvania inquiry for 500 tons of malleable iron. A fair tonnage of No. 2 Alabama iron was sold yesterday at $49, Birmingham, for nearby delivery. There is very little business, and what there is is confined largely to carload lots from large consumers for filling in, or from small users who seldom buy more than a carload at a time. Those who have contracts are urging deliveries and even asking furnaces to anticipate deliveries. As illustrating the general condition, it is stated that an inquiry of, say, 2000 tons would find furnaces willing to sell Pennsylvania No. 2 X foundry at $48, but in the absence of any buyers for such large tonnages, the furnaces have no difficulty in getting $51 for the small lots sold. Prices are as follows for these standard brands, prompt delivery in buyers' yards:

Eastern Penna. No. 2 X foundry	$52.00 to $53.00
Eastern Penna. No. 2 plain	51.25 to 52.25
Virginia No. 2 X foundry	53.75 to 54.75
Virginia No. 2 plain	53.25 to 54.25
Basic	50.00
Standard low phosphorus	90.00

Coke.—Sales of first-class foundry coke have been made during the past week at $13 to $14, ovens, for prompt delivery. Few, if any, contracts for foundry coke are being made. Furnace coke brings $13 for spot and $8.50 to $10 on contract.

Billets, Etc.—Billets, blooms and slabs show marked weakness. Though some mills have none to offer at any price, re-sale lots of open-hearth re-rolling billets are reported to have been offered at $85, and in some instances even lower. Mills quote $90 to $100, with $110 to $125 as the range on forging billets.

Sheets.—The demand in this market for sheets is not large, but specifications continue to come in for Government work at a good rate. Prices are weaker but unchanged on the basis of 8.50c. for No. 10 blue annealed, 8.50c. to 9c. for No. 28 black and 10.50c. to 11c. for No. 28 galvanized, Pittsburgh. Deliveries are easier. In some instances, almost prompt shipments can be made.

Structural Material.—There was considerable interest in the inquiry of the United States Government for approximately 27,000 tons of fabricated material for prompt shipment to France, there to be used in the construction of storage buildings for the Army. Bids were asked for steel for 32 buildings, each requiring 500 tons, and 110 buildings, each requiring 110 tons in a convenient run of sizes. Contracts for the 100 buildings,

totalling about 11,000 tons, were placed with several companies, the Blaw Steel Construction Co., Pittsburgh, taking a large share, but the 16,000 tons for the 32 buildings had not been let up to to-day. Licenses for shipments of shapes to Japan were obtained during the past week after several weeks of inaction. It is understood that Government officials maintain that there never has been an embargo on shapes to Japan, but exporters declare that they had been refused licenses up to last week. Japanese shipbuilding companies are said to be anxious to place further orders, but the disposition of the mills having sales offices here is to decline such business until the United States Government requirements are fully decided. The indecision at Washington is holding back several building projects which are now in architects' hands, as nothing will be done on building contracts until definite dates of delivery for steel can be ascertained. Plain material is weak at 5c., with 4.50c. being quoted for deliveries at mill convenience, which generally means next year.

Plates.—Plate mills in this district are facing a shut down because of lack of coal. Due to an order issued at Washington, nearly all of the gas coal has been going to the Northwest, where 26,000,000 tons are needed before the closing of navigation. Warning is said to have been sent to Washington by mills engaged on Government work that the coal shortage is serious and immediate relief must be afforded. The Emergency Fleet Corporation has sent out unusually heavy specifications for ship plates and a leading mill in this district received an order for sufficient rollings to keep it exclusively engaged on Government work for two months. A rumor that the embargo on export of plates to Japan would soon be raised was traced to the fact that the Japanese are depositing funds to obtain tonnages, which are to be stored until the question of shipment is determined. There is no softening of prices so far as mills are concerned, but reports of small resale lots are heard. A lot of 200 tons at 9c., with deliveries started in 60 days, was offered for resale last week. A mill refused a fair tonnage for export which it was offered at 9c. We continue to quote 10.185c. base, Philadelphia, for tank steel.

Iron and Steel Bars.—It is reported that a leading producer of steel bars has accepted contracts for 1918 on the basis of 3.50c., Philadelphia. A majority of mills ask 4.50c. for nearby delivery. Considerable business has been booked by one maker for fourth quarter delivery at 4.25c. The Government continues to take a generous part of the output of large sizes suitable for munitions, but on the smaller sizes, ¾ in. to 2 in., at least one producer can offer deliveries in about 30 days. The iron bar market is unchanged, the minimum quotation being 4.75c., Pittsburgh, while for small orders or for fairly prompt delivery 5c. is asked. Many jobbers have not placed their orders for fourth quarter.

Ferroalloys.—Ferromanganese continues firm, with $400 quoted for September delivery. Some ask this price for all of this year, but $375 can be done for fourth quarter. For the first half of 1918, quotations range from $350 to $375. A Cleveland concern is in the market for 4000 tons of spiegeleisen for delivery at the rate of 1000 tons a month over the remaining four months of this year. Quotations for spiegeleisen are $83 to $85, furnace.

Old Material.—Complaint has been made to the Pennsylvania Railroad Co. that its embargo on shipments of scrap material works an injustice to dealers as it reveals to consumers the names of producers from whom the dealers make their purchases. It is said that a number of small mills have gone direct to producers for their scrap, thus eliminating the scrap dealer or broker. Some dealers maintain, however, that diversion of trade in this manner is negligible and that it has always been possible for consumers to learn who the producers were by examining the freight bills, especially when material was sold while in transit. The market has been dull during the past week, and prices are lower. No. 1 heavy melting steel has declined $1; old car wheels $1 to $2; machine shop turnings from $1.50 to $2, and cast borings (for blast furnace use) $2. Prices per gross ton delivered in the Pennsylvania district are about as follows:

No. 1 heavy melting steel	$30.00 to $31.00
Steel rails, rerolling	43.00 to 45.00
Low phosphorus heavy melting	40.00 to 43.00
Old iron rails	45.00 to 47.50
Old carwheels	32.00 to 34.00
No. 1 railroad wrought	45.00 to 47.50
No. 1 forge fire	22.00 to 23.00
Bundled sheets	22.00 to 23.00
No. 2 busheling	16.00 to 17.00
Machine shop turnings (for blast furnace use)	16.00 to 18.00
Machine shop turnings (for rolling mill use)	20.00 to 21.00
Cast borings (for blast furnace use)	17.00 to 19.00
Cast borings (clean)	22.00 to 23.00
No. 1 cast	32.00 to 33.00
Grate bars	21.00 to 22.00
Stove plate	21.00 to 22.00
Railroad malleable	32.50 to 35.00
Wrought iron and soft steel pipes and tubes (new specifications)	30.00 to 32.00

Cleveland

CLEVELAND, Sept. 11.

Iron Ore.—A large amount of ore was placed on Lake Erie docks during August. The docks on Sept. 1 held 6,705,672 gross tons as compared with 5,845,228 tons on the same date a year ago. Lake Erie docks received during August 7,898,816 tons of ore, as compared with 8,051,827 tons in August a year ago. Receipts for the season to Sept. 1 were 27,237,669 tons as compared with 30,274,731 tons during the same period last year. The receipts at Detroit, Lake Michigan and Canadian ports in August aggregated 2,289,434 tons, against 1,804,677 tons in August, 1916. Shipments from Lake Erie docks to interior furnaces in August amounted to 5,222,214 tons as compared with 5,391,692 tons in August, 1916. The total shipments from these docks up to Sept. 1 were 21,969,248 tons against 23,042,827 tons in the corresponding period last year. At a meeting of the Lake Carriers' Association held in Cleveland Sept. 10, which was attended by John H. Barnes, New York, director of the grain division of the Government's Food Commission, the rate of grain from ports at the head of Lake Superior to Buffalo was fixed at 4½c. for wheat for the regular season of navigation, which ends Nov. 30. The rate for December loading and storage will be fixed at a later meeting. The carrying charge agreed upon by Mr. Barnes and the vessel men is not as high as was paid last fall and is not quite equal to the wild rate that is being paid on ore. The present wild rate on ore is $1.60 a ton, gross. Grain shipments will be directed by the Government, but the brokers will handle the tonnage and will look after the loading of vessels as heretofore. The business which will be pooled will be handled by the Duluth Grain Chartering Corporation. We quote ore prices, delivered lower Lake ports, as follows: Old range Bessemer, $5.95; Mesaba Bessemer, $5.70; old range non-Bessemer, $5.20; Mesaba non-Bessemer, $5.05.

Coke.—Foundry coke is somewhat easier and there is more of a disposition among producers to take on contracts at the prevailing high prices. For a long time many producers refused to name a contract price. It is possible that the willingness to take on contracts has been stimulated by the expectation of lower prices that may follow Government regulation. Standard Connellsville foundry coke is quoted as low as $12.50 per net ton at oven for prompt shipment, but some producers are asking $14. The contract price ranges from $10 for the first half to $12 for delivery during the last quarter and first half, and $12.50 for the remainder of this year. Standard makes of furnace coke are quoted at around $13 for prompt shipment.

Pig Iron.—The market is unusually dull. The only demand is for small lots of foundry iron for early shipment. This is coming from consumers who either need a little more iron or who are not getting deliveries from the furnaces as needed. Shipping orders are heavy and some of the furnaces are behind on deliveries. This is attributed, at least partly, to the decreased production and the making of more off-grade iron than usual because of poor coke. Northern iron for early shipment is scarce, but a small quantity of resale Valley iron is being offered at $53, and Virginia iron is still to be had

for prompt shipment; carload lot sales of the latter are being made at $50, at furnace, or $53.20 delivered Cleveland, for early shipment. Some resale Southern iron is being offered in this market for early shipment at $47, Birmingham, for No. 2. This iron is being placed on the market by consumers in the Cincinnati territory who overbought at low prices. Southern furnaces continue to quote foundry iron at $50 for prompt shipment, and $45 to $50 for the first half. We quote, delivered Cleveland, as follows:

Bessemer	$50.95 to $51.95
Basic	48.95
Northern No. 2 foundry	52.95 to 53.95
Southern No. 2 foundry	51.00 to 54.00
Gray forge	47.95 to 49.95
Ohio silvery, 8 per cent silicon	86.62 to 88.62
Standard low phos. Valley furnace	85.00

Finished Iron and Steel.—New inquiry in finished lines is quiet and the tendency toward an easing in prices is more apparent. Buyers generally are looking for lower prices and are placing orders only for immediate requirements. Implement manufacturers are inquiring for steel bar prices for the first half but are being held off. The delivery situation has become more serious than it has been at any time in respect to the regular trade, owing to the fact that the Government is taking so much of the output of the mills. One mill agency has closed fourth quarter contracts with its trade at 4c. for steel bars, 4.50c. for structural material and 8c. for plates. For early shipment steel bars are quoted at 4.25c. to 4.50c., Pittsburgh. Plates are easy, with quotations ranging from 8c. to 9c. by mills that are looking for business. On an early shipment inquiry for 2000 tons a Cleveland mill quoted the latter price. One inquiry has come out for 1500 to 2000 tons of structural material for an addition to the municipal electric lighting plant, Cleveland, and another for about the same tonnage of reinforcing bars for a terminal warehouse to be built in Cleveland by the Baltimore & Ohio Railroad. Bar iron prices are easier, and quotations now range from 4.25c. to 4.50c., Cleveland. Hard steel bars are quoted at 4c. to 4.25c. at mill. There is a heavy inquiry for sheets, but consumers generally are refraining from buying with the expectation that prices will be lower shortly and the market is weak. Quotations as low as 7.75c. are reported for No. 28 black sheets. Blue annealed sheets are quoted at 8.50c. for No. 10, and galvanized at 10c. to 10.50c. for No. 28. Additional Government business is being placed at 6.50c. for No. 28 black sheets. Warehouse prices on sheets are lower, owing to the fact that at least one local jobbing warehouse, apparently expecting lower prices and wishing to unload its stock, is quoting black and blue annealed sheets at 8.50c., and galvanized at 10.50c. Warehouse prices are 4.50c. and 5c. for steel bars and 5c. to 5.25c. for structural material.

Bolts, Nuts and Rivets.—New demand for bolts and nuts which has been quiet has improved, and some round lot business has been placed for Government work. Specifications on contracts are heavy. Makers are having great difficulty in getting their raw material from the mills. The Government opened bids yesterday for 4000 tons of rivets for the Navy Department. The rivet market has quieted down somewhat, no large inquiries having come out during the week. We quote rivets at 5.25c., Pittsburgh, for structural and 5.35c. for boiler rivets. Bolt and nut discounts are as follows, round lot buyers being allowed 5 to 10 per cent discount from these prices:

Common carriage bolts, ¾ x 6 in., smaller or shorter, rolled thread, 35 off; cut thread, 30 and 5, larger or longer, 20. Machine bolts, with h. p. nuts, ⅜ x 4 in., smaller or shorter, rolled thread, 40; cut thread, 35; larger and longer, 25. Lag bolts, cone point, 40. Square h. p. nuts, blank, $1.90 off list; tapped, $1.70 off list. Hexagon, h. p. nuts, blank, $1.70 off; tapped, $1.50 off. C. p. c. and t. hexagon nuts, all sizes, blank, $1.25 off; tapped, $1 off. Cold pressed semi-finished hexagon nuts, 50 and 5 off.

Old Material.—The market is very dull and weak. Mills are not buying and dealers are well covered on short sales. Scrap is being offered in increasing quantities and producers are making price concessions to move it. Heavy steel scrap is fully $1 a ton lower than a week ago and quotations on several other grades have been reduced. Heavy melting steel in Cleveland has been sold by a producer as low as $31.50, and has brought as high as $34 during the week. Difficulties in moving scrap have been added to by the issuing of an order by the New York Central lines to the effect that no cars shall be loaded for shipment until a special permit is secured for each car. We quote prices, f.o.b. Cleveland, as follows:

Per Gross Ton	
Steel rails	$31.00 to $32.00
Steel rails, rerolling	44.50 to 45.50
Steel rails, under 3 ft	34.00 to 35.00
Iron rails	42.50 to 43.50
Steel car axles	26.00 to 26.50
Heavy melting steel	32.50 to 33.50
Carwheels	30.50 to 31.50
Relaying rails, 50 lb. and over	49.50 to 54.50
Agricultural malleable	23.50 to 24.50
Railroad malleable	31.00 to 32.00
Light bundled sheet scrap	23.50 to 24.50

Per Net Ton	
Iron car axles	$46.50 to $47.00
Cast borings	17.50 to 18.00
Iron and steel turnings and drillings	17.00 to 17.50
No. 1 busheling	26.00 to 27.00
No. 1 railroad wrought	40.50 to 41.50
No. 1 cast	26.00 to 27.00
Railroad grate bars	21.00 to 22.00
Stove plate	20.00 to 21.00

Cincinnati

CINCINNATI, Sept. 11—(*By Wire*).

Pig Iron.—Hanging Rock furnaces have not formally opened their books again for next year, but recently a number of quotations have been put out on first half iron. Some figures on malleable and basic run as low as $51, Ironton, but foundry iron is held at a higher price on account of its scarcity. The top price named for the delivery mentioned is $54, furnace. Very little iron of any kind has been sold lately for first half shipment, but Northern furnaces as well as those in the South booked a substantial tonnage before the present dull period commenced some two months ago. An Indiana melter is inquiring for 600 tons of malleable for first half movement and there are a few inquiries out for foundry iron, but involving small tonnages only. Southern iron is moving slowly on contracts due to car and furnace troubles. A scarcity of the metal, together with the low production, is a difficulty that will become more serious if threatened labor disputes develop into a general strike of coal miners. Southern No. 2 foundry is sold in small lots for prompt shipment at $48, Birmingham, and higher. Some resale iron can be had at $47. It is also possible to buy some warrants below this figure, but the uncertainty of delivery does not make purchases of this kind attractive to the average melter. Some Virginia foundry has lately been sold near here, the average price being $45, furnace, for No. 2 X. The Ohio silvery irons are only in fair demand, with quotations unchanged. Standard Southern charcoal $54 to $55, Birmingham. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, as follows:

Southern coke, No. 1 f'dry and 1 soft	$51.40 to $52.40
Southern coke, No. 2 f'dry and 2 soft	49.90 to 50.90
Southern coke, No. 3 foundry	49.40 to 50.40
Southern coke, No. 4 foundry	48.90 to 49.90
Southern gray forge	48.90 to 49.90
Oh o silvery, 8 per cent silicon	87.26 to 91.26
Southern Ohio coke, No. 1	55.76 to 56.26
Southern Ohio coke, No. 2	55.76 to 56.26
Southern Ohio coke, No. 3	54.76 to 55.26
Southern Ohio malleable Bessemer	55.26 to 56.26
Basic, Northern	56.26 to 57.26
Standard Southern charcoal	56.90 to 57.90

Finished Material.—Buyers of structural material is mostly of the hand-to-mouth variety, although the warehouses had a little spurt last week that made the total for the week show up better than for any week within a month. Iron and steel bars are unchanged at 5c., twisted steel bars 5.05c. Plates, ¼ in. and heavier are quoted at 10c. and No. 10 blue annealed sheets at 10c., base. The warehouse price on wire nails is $3.90 per keg, base, and on barb wire 5c. a pound. The mill price on No. 28, galvanized sheets is 10.65c., Cincinnati or Newport, Ky., and on No. 28 black 8.65c. The mills are devoting their attention to shipping on old contracts and are making few new contracts. The mill supply business is holding its own very well. The demand for high

speed tool steel is good and no changes have been made in prices that have prevailed for the past year.

Coke.—The situation is somewhat complicated. Reports as to Government regulation of prices do not appear to have any foundation, but their circulation has tended to further disturb the market. In the Connellsville field, prompt foundry coke is quoted all the way from $13 to $15, and for future shipment around $11 to $12.50. These figures by no means represent the reduction that was looked for after the adjustment of coal prices. The Wise County and Pocahontas operators are holding out for the same prices as now prevail in the Connellsville district. New River prices range from 50c. to $1 a ton higher. Shipments are still badly delayed, but a little improvement was noted last week. Furnace coke is very quiet and is obtainable around $9 to $10 per net ton at oven for future shipment.

Old Material.—Business is still very light, and prices have been reduced on a great many different grades of scrap. Foundry operators are melting more scrap than heretofore, but are making their purchases in carload lots only. Railroad offerings are on the increase. Delays are reported on shipments east of the Ohio River. The following are dealers' prices f.o.b. at yards Cincinnati and southern Ohio:

Per Gross Ton

Bundled sheet scrap	$19.50 to $20.00
Old iron rails	33.50 to 34.00
Relaying rails, 50 lb. and up	45.50 to 46.00
Rerolling steel rails	36.00 to 36.50
Heavy melting steel scrap	31.00 to 31.50
Steel rails for melting	32.00 to 32.50
Old carwheels	29.00 to 29.50

Per Net Ton

No. 1 railroad wrought	$31.00 to $31.50
Cast borings	13.50 to 14.00
Steel turnings	13.50 to 14.00
Railroad cast	21.50 to 22.00
No. 1 machinery cast	25.00 to 25.50
Burnt scrap	14.50 to 15.00
Iron axles	44.00 to 44.50
Locomotive tires (smooth inside)	37.00 to 37.50
Pipes and flues	17.50 to 18.00
Malleable cast	22.50 to 23.00
Railroad tank and sheet	16.00 to 16.50

Birmingham

BIRMINGHAM, ALA., Sept. 11 (*By Wire*).

The Southern pig iron market, while still weak, shows no inclination to make concessions on prices, sales still being recorded in small lots on the $50 basis for No. 2 foundry, this year delivery, and $48 for next year. A buying movement is not expected until the Government prices are fixed.

(*By Mail*)

Weakness of the pig iron market in the South is still admitted. A few sales of high silicon iron sold recently, in small lots, as high as $53 per ton, while some sales of special brand and special analysis irons brought $51 and $52 per ton, delivery during the rest of this year. Reports as to some iron having been sold in the South under $47 per ton, No. 2 foundry basis, were verified as to about 12,000 tons, and the statement is made that this iron was a resale of iron proposed for export, some of it to have gone to Sweden, but stopped by the Government. Apprehensions on the part of the iron manufacturers in the Southern territory because of threatened labor troubles in the coal mining section have been allayed for the time being. It is not believed that the miners will renew demands so positively in the near future and that all operations will now continue as before. Deliveries of iron have been so steady that one of the companies in Birmingham announces a reduction of its accumulation from 120,000 to a little more than 60,000 tons during this year. Production of iron in August showed a little above 500 tons more than in July. Usual quotations by furnaces for prompt delivery are as follows:

No. 1 foundry and soft	$50.50 to $51.50
No. 2 foundry and soft	50.00 to 51.00
No. 3 foundry	49.50 to 50.50
No. 4 foundry	49.25 to 50.00
Gray forge	49.00 to 50.00
Basic	50.00 to 51.00
Charcoal	55.00 to 56.00

Cast Iron Pipe.—Steady melting is going on at cast iron pipe plants in this district, municipal orders in the main requiring attention. The United States Cast Iron Pipe & Foundry Co. has still much of the Argentina order to fill, transportation facilities not being up to all expectations on the business. Prices are unchanged, net ton, f.o.b. yards, $63 for 4-in., $60 for 6-in. and upwards.

Coal and Coke.—Production of coal is again about normal following the stormy sessions of a convention of the United Mine Workers of America, Alabama District No. 20, at which repudiation, practically, of the agreement made on the suggestion of Secretary of Labor Wilson took place and a delegation was sent to Washington to seek Government assistance in getting some relief under the demands of the miners and mine workers. All men were instructed to return to work and there has been obedience to the order. The coke production will be normal again in the next few days, but producers will not consider any new contracts until all contentions are of the past. Coke prices are around $12.50 per ton, foundry coke, and $8 to $10 on furnace coke.

Old Material.—Dealers in scrap note some improvement in conditions, but do not expect for a while the same conditions as prevailed a couple of months since. Several increases in prices are noted in the last week or so. Heavy melting steel, one of the popular products, has taken on an advance of $1 and stove plate a $2 advance. Quotations, f.o.b. dealers' yards, are given as follows:

Old steel axles	$32.00 to $33.00
Old steel rails	24.00 to 25.00
No. 1 wrought	27.00 to 28.00
Heavy melting steel	21.00 to 22.00
No. 1 machinery	24.00 to 25.00
Car wheels	23.00 to 24.00
Tramcar wheels	20.00 to 21.00
Stove plate	19.00 to 20.00
Shop turnings	11.00 to 12.00

St. Louis

ST. LOUIS, Sept. 10.

Pig Iron.—A good many melters are finding that they are not fully covered for the last few months of the year, and these are the ones now making the purchases at spot prices. The aggregate sales for the week will probably run 2000 tons, all in 100-ton lots and less, and include a number of special analysis sales made on offers to melters. Ferromanganese has been sold in carload lots at $400 per ton for quick shipment. No. 2 Southern foundry for spot delivery is hanging around $50 with last quarter delivery at $48 per ton, Birmingham basis.

Coke.—In coke the business is all of a spot character and the price prevailing during the past week has been about $13.50, Connellsville, for best selected 72-hr. coke. No deferred contracts have been made. On 48-hr. coke the price is held at approximately the same figure as 72-hr. and practically none is being sold, the contracts already made covering this division of the business for this section. By-product coke continues in a sold-up condition.

Finished Iron and Steel.—In finished products, no new business has appeared, the mills practically declining to take it. The consumers, however, are pressing for deliveries on their contracts and are not getting all the satisfaction they would like. Light rails are selling in small quantities to the coal companies at $70 per ton base, but the lumber companies are taking nothing. Structural material is out of the market for the present from the practical standpoint, with deliveries extended to the late second quarter of 1918. No standard section steel rails are being sought under new contracts, but the railroads are urging forward without much success the rails they have already ordered. Track fastenings are in long deferred delivery, even to the last half of 1918. Stock out of warehouse is being moved up to capacity. For stock out of warehouse we quote as follows: Soft steel bars, 4.55c.; iron bars, 4.50c.; structural material, 5.05c.; tank plates, 10.05c.; No. 10 blue annealed sheets, 10.05c.; No. 28 black sheets, cold rolled, one pass, 10.35c.; No. 28 galvanized sheets, black sheet gage, 11.75c.

Old Material.—In scrap the feeling is better and the dealers are trading among themselves to some extent to meet their requirements on contracts already made with consumers, but there is not as yet any definite buying movement in the market. The feeling of the dealers is that a better market is coming, and in consequence none is willing to make any sales save on stock immediately available on which they can take a profit. They are not desirous of committing themselves ahead. Lists out during the week included one from the Wabash of 2000 tons and one from the Union Pacific of 1200 tons. The other roads in this market are peddling out their old material in small lots as they pick it up or get it under shipping control. These transactions are largely by telephone and do not assume the importance of list bids. We quote dealers' prices, f.o.b. customers' works, St. Louis, industrial district, as follows:

	Per Gross Ton	
Old iron rails	$40.25 to	$40.75
Old steel rails, re-rolling	38.00 to	38.50
Old steel rails, less than 3 ft.	37.00 to	38.00
Relaying rails, standard section, subject to inspection	50.00 to	55.00
Old car wheels	30.00 to	30.50
No. 1 railroad heavy melting steel scrap	29.00 to	30.00
Heavy shoveling steel	29.50 to	30.00
Ordinary shoveling steel	26.00 to	26.50
Frogs, switches and guards cut apart	29.00 to	30.00
Ordinary bundled sheet scrap	18.50 to	19.00
Heavy axle and tire turnings	20.00 to	21.00
Per Net Ton		
Iron angle bars	$38.50 to	$39.00
Steel angle bars	29.00 to	30.00
Iron car axles	41.00 to	41.50
Steel car axles	40.00 to	40.50
Wrought arch bars and transoms	41.50 to	42.00
No. 1 railroad wrought	35.50 to	36.00
No. 2 railroad wrought	33.50 to	34.00
Railroad springs	31.50 to	32.00
Steel couplers and knuckles	37.50 to	38.00
Locomotive tires, 42 in. and over, smooth inside	39.00 to	39.50
No. 1 dealers' forge	26.50 to	27.00
Cast iron borings	16.50 to	17.00
No. 1 busheling	25.00 to	25.50
No. 1 boilers, cut to sheets and rings	19.50 to	20.50
No. 1 railroad cast scrap	21.00 to	21.50
Stove plate and light cast scrap	16.00 to	16.50
Railroad malleable	29.00 to	30.00
Agricultural malleable	24.00 to	24.50
Pipes and flues	22.50 to	23.00
Heavy railroad sheet and tank scrap	18.00 to	18.50
Railroad grate bars	18.50 to	19.00
Machine shop turnings	17.50 to	18.00
Country mixed scrap	16.50 to	17.00

British Steel Market

Allied Demand for Tin Plate Is Strong—America Asking for Ferromanganese

(*By Cable*)

LONDON, ENGLAND, Sept. 12.

Cleveland pig iron is quieter but hematite iron is in strong demand. Tin plates are firm and there is a constant Allied demand with offers limited. American semi-finished steel is idle. Ferromanganese is nominal with America still inquiring and sellers lacking. We quote as follows:

Tin plates, coke, 14 x 20; 112 sheets, 108 lb., f.o.b. Wales, maximum, 30s.

Ferromanganese, £45 nominal.

Ferrosilicon, 50 per cent, c.i.f., £35 upward.

On other products control prices are as quoted in THE IRON AGE, of July 19, p. 171.

Buffalo

BUFFALO, Sept. 10.

Pig Iron.—Shortage of coke and the inferior quality of much of the supply of that commodity now being received are causing some apprehension among furnacemen that full furnace output will be jeopardized unless improvement in coke receipts is soon brought about, and that if the present situation continues, shipments on contracts will have to be curtailed, although demand is urgent, as there will not be sufficient iron to go around. Apparently coke cannot be obtained in sufficient quantities, even at $13.50 per ton. The tonnage of new business being placed is almost nil, furnaces not caring to take on future commitments and buyers having stopped ordering, awaiting Governmental price adjustment. Prices on such business as is transacted are maintained on the basis current for the past few weeks. The Government has distributed several additional orders of moderate tonnages among the furnaces of the district, for Navy Yard use, at prices to be determined later. The new furnace of the Donner Steel Co., Buffalo, went into blast on Aug. 22, and both of the Buffalo furnaces of that company are now running on basic iron. Prices are more or less nominal, in the absence of new business in any volume, and are quoted unchanged from last week's report, as follows, for last quarter and first half delivery, f.o.b. furnace, Buffalo:

High silicon irons	$55.00 to $56.00
No. 1 foundry	54.00 to 55.00
No. 2 X foundry	53.00 to 55.00
No. 2 plain	52.00 to 54.00
No. 2 foundry	51.00 to 53.00
Gray forge	51.00 to 53.00
Malleable	54.00 to 55.00
Basic	54.00 to 55.00
Lake Superior charcoal, f.o.b. Buffalo	55.00 to 60.00

Old Material.—Only a small total of business was transacted during the week and a lack of demand has caused prices of some grades to sag. Consumers are still waiting for Governmental action, and holding off purchases until it is determined how price regulation of steel will actually affect scrap materials. Some dealers express the belief that after a buying movement develops, prices cannot be controlled, as owing to the pronounced scarcity it will be a case of consumers competing against each other and the law of supply and demand will control the situation. Great difficulty is being experienced in forwarding shipments on contracts owing to the many embargoes in force. A hampering feature militating against prompt shipment is the new regulation requiring special permit from the railroads for consignments to all embargoed points. The price for low phosphorus has dropped to $41 and $42 per ton, and prices for heavy melting steel, iron axles, steel axles, railroad malleable and wrought pipe have been lowered $1 to $2 per ton. We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$31.50 to $32.00
Low phosphorus	41.00 to 42.00
No. 1 railroad wrought	43.00 to 44.00
No. 1 railroad and machinery cast	30.00 to 31.00
Iron axles	45.00 to 47.00
Steel axles	45.00 to 47.00
Carwheels	35.00 to 36.00
Railroad malleable	32.00 to 33.00
Machine shop turnings	18.00 to 19.00
Heavy axle turnings	26.00 to 27.00
Clean cast borings	20.00 to 21.00
Iron rails	43.00 to 44.00
Locomotive grate bars	20.00 to 21.00
Stove plate	21.00 to 22.00
Wrought pipe	28.00 to 29.00
No. 1 busheling scrap	28.00 to 29.00
No. 2 busheling scrap	18.00 to 19.00
Bundled sheet stamping scrap	20.00 to 21.00

Finished Iron and Steel.—Inquiry from the general commercial trade is still largely in abeyance in expectancy of price readjustment, with Government requirement business receiving priority attention in all lines, but conditions seem to be shaping for a buying movement by the general trade within a month or two and there appears to be a growing feeling that prices to be established by the Government are to be on a somewhat better level than has been expected. It is also becoming apparent that mill operating departments are going to be restricted in the output of steel through inability to obtain adequate supplies of coke promptly, and because of labor shortage. It is reported that one of the leading steel producing interests estimates that this condition will lead to a curtailment of approximately 20 per cent of its total output during the first half of 1918. This impending lessening of output, together with the Governmental requirements, now estimated at approximately 25 per cent of product for the first half of the year, will leave a relatively small proportion of the normal total of steel production to meet general commercial requirements. With this in mind, buyers are likely to abandon their hesitancy and go ahead and do business. Canadian car companies are making inquiry for round tonnages of bars, plates and shapes approximating 60,000 tons, the material to be used in connection with contracts placed by the Dominion Government for cars to be used on Canadian railroads. The Ferguson Steel &

Iron Co., Buffalo, has the contract for the steel for additional buildings for the Sizer Forge Co., Buffalo, a heat treatment building and an office building, taking 150 tons.

New York

NEW YORK, Sept. 12.

Pig-Iron.—The effect of continued offering of iron for resale is being more clearly shown and several hundred tons of Pennsylvania No. 2X have been sold in New England territory as low as $47, furnace, but after sales at this very low figure were made other sales followed around $50, furnace. The resale iron comes largely from foundries which have bought liberally and feel that they are well able to dispose of some of the iron which they have on hand. Traveling men who have been in New England recently report that many foundries are well supplied not only with pig-iron but also with coke and are showing no disposition to buy at the present time. Owing to the uncertainty as to obtaining licenses to ship foreign iron, very little attention is being paid to that branch of the business. On the whole, the pig-iron market may be said to be weak with a tendency toward lower quotations. We quote for tidewater delivery in the near future as follows:

No. 1 foundry	$49.25 to $51.25
No. 2 X	48.75 to 50.75
No. 2 plain	48.25 to 50.25
Southern No. 1 foundry	50.75 to 51.75
Southern No. 2 foundry and soft	50.25 to 51.25

Structural Material.—Although prices for several weeks' shipment are on a lower level, as noted last week, fabricators do not find that deliveries are any better, price readjustment having thus occurred before irregularities in mill shipments have been reduced. Meanwhile new propositions continue to be for government work. As an example, tentative inquiries have been made for 100 structures, 50 x 200 ft., in plan, probably requiring all told 10,000 tons of steel, but plans are clearly as yet indefinite and it is not known whether this includes any of the considerable structural material which will undoubtedly be required for government railroads in France. The $5,000,000 which is to be spent for buildings for the enlarged program of making field guns will undoubtedly shortly take definite form in proposals. Some 5600 tons of structural material, not including bars, are covered in an inquiry for eight ships for Italy. The awards of the week include 600 tons for the Willys-Morrow plant, Elmira, N. Y.; 500 tons for a piershed in Brooklyn for W. R. Grace & Co., the steel to be supplied by the Bethlehem Steel Co.; 200 tons for the United States Cast Iron Pipe & Foundry Co., Burlington, N. J., and a 90-ton bridge for the Boston & Albany. This to be erected by the Boston Bridge Works. We quote mill shipments at 4.445c. to 5.195c., New York, while from warehouses shipments are made at 5c. to 5.50c per lb., New York.

Steel Plates.—The American International Steel Corporation is asking prices for eight ships for Italy, involving all told 14,400 tons of hull plates, 800 tons of boiler steel and 800 tons of bars, in addition to 5600 tons of structural shapes. No business of volume has been done, but plates in the fourth quarter can be obtained at 8c., Pittsburgh, by regular domestic buyers of the mills so quoting. There are still mills asking 10c. for tank quality and 8.50c. has been quoted to a jobber. We quote plates at 8.195c. and higher and out of store at 8c. and higher.

Iron and Steel Bars.—Steel bars are quoted at 4c. to 4.50c., Pittsburgh basis, depending on the mill, and a sale of 500 tons for the last quarter is quoted at the top price. Export buying in iron bars has tapered off considerably, but last quarter contracting is under active negotiations with 4.75c., Pittsburgh, as the usual figure. We quote steel bars in say two months' delivery at 4.195c. to 4.695c., New York, and iron bars at 4.945c. From New York district warehouses steel and iron bars are sold at 5c. to 5.50c.

Other Forms of Steel.—Some transactions showing strength in prices are noted on export business. One lot of 5000 kegs of wire nails and another of 6000 kegs for six to eight weeks' delivery have been sold at $5.30, Pittsburgh; 200 tons of galvanized barb wire has been closed at $5.50 per 100 lb.; 200 tons of wire rods were closed at $90 per gross ton.

Cast Iron Pipe.—The Warren Foundry & Machine Co. is furnishing about 500 tons of pipe for the new Government camp at Tenafly, N. J., where about 20,000 soldiers will be stationed from time to time before embarking for France. New business, both private and public, is extremely limited. Carloads of 6-in., 8-in. and heavier are quoted at $65.50 per net ton, tidewater, and 4-in. at $68.50.

Old Material.—The market continues extremely dull and there is a decided softening tendency, but prices show very little change, probably because there is not enough business to test them. The car situation continues to be very unsatisfactory and dealers say that a considerable part of their time is required in getting permits. Brokers quote buying prices as follows to New York producers and dealers per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$27.50 to $28.00
Old steel rails (short lengths) or equivalent heavy steel scrap	27.00 to 28.00
Relaying rails	63.00 to 65.00
Rerolling rails	37.00 to 38.00
Iron and steel car axles	40.00 to 42.00
No. 1 railroad wrought	39.00 to 40.00
Wrought-iron track scrap	30.00 to 31.00
No. 1 yard wrought long	30.00 to 31.00
Light iron	8.00 to 10.00
Cast borings (clean)	19.00 to 20.00
Machine-shop turnings	16.00 to 17.00
Mixed borings and turnings	14.00 to 16.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long)	28.00 to 30.00

For cast-iron scrap, dealers in New York City and Brooklyn are quoting as follows to local foundries per gross ton:

No. 1 machinery cast	$30.00 to $31.00
No. 1 heavy cast (column, building material, etc.)	26.00 to 27.00
No. 2 cast (radiators, cast boilers, etc.)	26.00 to 28.00
Stove plate	18.00 to 19.00
Locomotive grate bars	18.00 to 19.00
Old carwheels	31.00 to 33.00
Malleable cast (railroad)	30.00 to 31.00

Ferroalloys.—There has been a fair inquiry for domestic ferromanganese in the past week, particularly for future delivery as far as into the second quarter of next year, but very few sales are reported. Quotations continue firm at $400 to $425 for prompt and $400 for delivery the rest of this year, with $375 asked for delivery in the first half of 1918. There is practically no British alloy available for any delivery. Official returns show imports to have been only 2037 tons in July, the smallest this year. Inquiries indicate that receipts in August were better than in July, with those so far in September at about the same rate as in August. Domestic production continues to increase, the blast furnace reports of THE IRON AGE showing the output in August to have been about 500 tons greater than that of July, which itself was a record. The August output was 24,482 tons of 80 per cent alloy with the spiegeleisen production at 16,791 tons, or about 300 tons under that for July. There is an inquiry for 4000 tons of spiegeleisen for a Middle Western consumer, but otherwise the market is dull and few sales are reported. The quotation has eased off to $80 to $82.50, furnace, for the 20 per cent grade. Ferrosilicon, 50 per cent, is in quiet demand with the quotation for early delivery at $200 to $225. For delivery next year the range is $140 to $175, delivered.

The American Association of Engineers, 602 West La Salle Street, Chicago, has organized chapters in St. Paul, Indianapolis and Milwaukee, making a total of seven since the association was incorporated there two years ago. A joint meeting of the association and the Detroit Engineering Society was held Aug. 30 and plans are on foot to develop a working co-operation between the associations. The total enrollment of the American Association of Engineers is given now as over 2200.

IRON AND INDUSTRIAL STOCKS

Wall Street Has Another Bad Week, Attributed to Heavy War Demands

The setback given to La Follette and his little band of radicals was not sufficient to relieve the mental depression from which Wall Street has been suffering for a number of weeks and slumps were noted in nearly all the leading industrial stocks. This condition is attributed to a continuation of the re-adjustment of business to meet the heavy demand upon this nation resulting from the European war. The deplorable state of affairs in Russia, which promises to result in the indefinite continuation of the European struggle, was one of the discouraging influences of the week. The money market advanced to 6 per cent for call money following the publication of the bank statement showing the smallest surplus reserves in a long time. Fear is entertained that war taxes will take for government use such a large percentage of earnings that present holders will be compelled to sell large amounts of their present taxable securities.

Among the stocks that registered gains during the week were the following: American Car & Foundry, 2¾; American Locomotive, ¼; American Steel Foundries, 5¾; Baldwin Locomotive, 1¾; Colorado Fuel & Iron, ½; Crucible Steel, 1½; Lackawanna Steel, 1¾; National Enameling & Stamping, ¼; Pressed Steel Car, 2; Republic Iron & Steel, 1¼. Among the stocks that made losses during the week were the following: Allis-Chalmers, ⅛; American Can, 2; Bethlehem Steel, 7; Bethlehem Steel, Class B, 4; Gulf States Steel, 2; International Harvester, 3¼; Midvale Steel, 1; United States Steel, 1¾; United States Steel, Preferred, ¼.

The range of prices on active iron and steel stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com..	23 - 24¾	Int. Har. of N. J., com.	108 -112
Allis-Chal., pref..	81½- 82¾	Int. Har. of N. J., pref.	112½
Am. Can, com...	38¼- 42¼	Int. Har. Corp., com.	76
Am. Can, pref...	107½-108⅜	Lacka. Steel....	78 - 83¼
Am. Car & Fdry., com.	66½- 73	Lake Sup. Corp..	15¾- 17½
Am. Car & Fdry., pref.	112½-113	Midvale Steel....	51½- 53¾
Am. Loco., com..	58⅛- 62¾	Nat.-Acme	32½
Am. Loco., pref..	102 -103	Nat. En. & Stm., com.	37½- 38¾
Am. Rad., com..	296 -300	N. Y. Air Brake..	117¼-121
Am. Rad., pref.	133	Nova Scotia Steel	94½- 96
Am. Ship, com..	89 - 90½	Pressed Stl., com.	58 - 62⅝
Am. Ship, pref.	92	Ry. Steel Spring, com.	44 - 47½
Am. Steel Fdries.	62 - 69½	Republic, com....	77⅞- 82
Bald. Loco., com.	55 - 60½	Republic, pref. ..	101⅛-102½
Bald. Loco., pref.	99 - 99½	Sloss, com.	43 - 46⅞
Beth. Steel, com.	102½-109	Sloss, pref.	90
Beth. Steel, class B	101⅛-108¼	Sup. Steel	37
Beth. Steel, pref.	100 -103	Sup. Steel, 1st pref.	102½
Cambria Steel	155	Transue-Williams	40
Central Fdry., com.	27½- 29¾	Un. Alloy Steel..	42½- 43⅜
Chic. Pneu. Tool	59 - 65½	U. S. Pipe, com..	16 - 17
Colo. Fuel	43 - 45¾	U. S. Steel, com.	104¾-109⅛
Cruc. Steel, com.	68 - 70⅞	U. S. Steel, pref.	116½-116⅞
Cruc. Steel, pref.	95⅞- 98	Va. I. C. & Coke.	55 - 60
Gen. Electric....	137 -147½	Warwick	9
Gt. No. Ore. Cert.	32¼- 34⅞	Westing. Elec....	43⅝- 45¾
Gulf States Steel	98 -101½		
Gulf States Steel. 1st pref.	.107 -108		

Industrial Finances

The Westinghouse Electric & Mfg. Co. will pay out of treasury funds, Oct. 1, $2,720,000, 5 per cent collateral notes maturing on that date. The Westinghouse company, in the current fiscal year, which began April 1, will have the biggest period in its history. Unfilled orders on hand Aug. 1, for regular line work exclusive of war business, amounted to over $51,000,000, which is in itself larger than total sales billed in the entire fiscal period ended March 31, 1916, the latter figures being $50,269,240. Government work, if included, would raise the total of unfilled orders much higher than that given above.

The Breitung Iron Co., recently formed to take over the Breitung iron ore properties in the upper peninsula of Michigan, has secured permission from the Securities Commission of Michigan to sell $1,500,000 in notes, the money to be applied to the development of some of its properties, provided certain changes are made in its leases, royalties, etc. Important mines owned by the company include the Breitung Hermatite, the Mary Charlotte and the Juliet, all in the Marquette range.

Nova Scotia Earnings

The Nova Scotia Steel & Coal Co., Ltd., for the six months ended June 30, 1917, earned after interest on bonds and debenture stock, $1,596,469. This compares with net of $2,104,478 for the entire 1916 year, and is a little in excess of the $1,576,743 earned in the full 1915 year.

After deducting the 4% dividend for the six months on the $1,000,000 preferred, there is left a balance applicable to the common stock of $20.75 per share. This is an annual rate of $41.50. This is counting the common stock issue as $7,500,000, which will be increased to $15,000,000 when pending financing is completed and the proposed 20% stock dividend is paid. On the enlarged capital, therefore, Nova Scotia earned in the six months at the annual rate of $20.75 a share.

This compares with three previous years as follows:

	Net After Charges	Preferred Dividend	Balance for Common	Per Cent on Common
6 months, 1917...	$1,596,469	$40,000	$1,556,469	†20.75
1916	2,104,478	80,000	2,024,478	27.0
1915	1,576,743	123,600	1,453,143	19.3
1914	*308,986	41,200	.....	....

*Deficit. †On $7,500,000.

The Acme Wire Co., New Haven, Conn., has passed its usual quarterly dividend of two per cent, although its net earnings for the quarter were about double the dividend requirements. The officials have announced that the large increase in the cost of materials and the present transportation difficulties require the conservation of the company's cash. The gross business of the company for the first six months of 1917 was $1,600,000, as against a total of $2,000,000 for the year 1916.

Dividends

The Allis-Chalmers Mfg. Co., quarterly, 1¾ per cent on the common and ¾ per cent on account of accumulated dividends on the preferred, both payable Oct. 15.

The American Can Co., quarterly, 1¾ per cent and extra 3½ per cent on account of accumulated dividends on the preferred, both payable Oct. 1.

The American Car & Foundry Co., quarterly, 1 per cent and extra 1 per cent on the common and quarterly, 1¾ per cent on the preferred, all payable Oct. 1.

The American Steel Foundries, quarterly, 1¾ per cent, payable Sept. 29.

The Canadian General Electric Co., Ltd., quarterly, 2 per cent on the common and 3½ per cent on the preferred, payable Oct. 1.

The Central Foundry Co., quarterly, 2 per cent on the first preferred, payable Oct. 15.

The Gulf States Steel Co., quarterly, 2 per cent and extra ½ per cent on the common and quarterly, 1¾ per cent on the first and 1½ per cent on the second preferred, all payable Oct. 1.

The Sloss-Sheffield Steel & Iron Co., quarterly, 1¾ per cent on the preferred, payable Oct. 1.

The Trussed Concrete Steel Co., quarterly, 4 per cent on the common, payable Oct. 15.

The Brier Hill Steel Co., quarterly, 1½ per cent and extra 3½ per cent on the common, and quarterly 1¾ per cent on the preferred, all payable Oct. 1.

The plant of the Carbon Iron & Steel Co., Parryville, Pa., sold at sheriff's sale on a mortgage of $350,000 held by the Central Railroad of New Jersey, was bought by Albert Broden, representing that company, for $200,000. The plant, which employs about 100 men, will be enlarged and the business continued. Mr. Broden was for some time connected with the Philadelphia and Reading Coal & Iron Co.

The statement of the Thomas Iron Co., Allentown, Pa., for the current year shows total sales of $2,837,433; gross profits, $85,071, which with receipts from other sources made a gross income of $289,770. Interest, discount and dividend disbursements amounted to $104,898, leaving a surplus for the year of $184,873.

REVENUE BILL PASSED

Conference Committee Expected to Report in About Ten Days

WASHINGTON, Sept. 11.—The war revenue bill, carrying a total of $2,400,000,000, was passed by the Senate last night by a vote of 69 to 4. The bill raises approximately $533,000,000 more than the measure as passed by the House and together with existing revenue laws will produce annually about $3,700,000,000. On this basis, it is estimated that the United States will defray about 35 per cent of the cost of the war by taxation and 65 per cent by bond issues.

Of the total amount of new taxes provided by the bill, $842,200,000 will be taken from corporate and individual incomes and $1,060,000,000 from war profits. The remainder will be derived largely from taxes on liquor, tobacco and public utilities. In the closing hours of the debate on the bill, the consumption taxes on sugar, coffee, tea and cocoa, inserted by the Finance Committee, were stricken out by overwhelming majorities. The Senate also eliminated the proposed tax on publishers, the increase in postage on second class mail and the tax of one cent on each letter or post card. A tax on parcel post packages, the postage charge on which amounts to 25 cents or more, was retained.

Individual income taxes were increased by the Senate over the House rates, the principal change being the addition of three new "brackets" imposing taxes of 40 per cent on incomes exceeding $500,000 and not exceeding $750,000; 45 per cent on incomes exceeding $750,000 and not exceeding $1,000,000, and 50 per cent upon incomes exceeding $1,000,000. The normal rate of 4 per cent on individual incomes as adopted by the House was accepted by the Senate. The normal rate on corporate incomes, however, was increased to 6 per cent and the corporate income tax law was amended so as to levy an additional tax of 10 per cent upon the undistributed surplus of each taxable year, with a proviso that this tax shall not apply "to that portion of such undistributed net income which is actually invested and employed in the business or is retained for employment in the reasonable requirements of the business."

Sweeping changes in the war profits tax as adopted by the House were made by the Senate. In the bill as framed by the Ways and Means Committee, a tax of 16 per cent was levied upon all profits in excess of 8 per cent plus $5,000. The Finance Committee struck out the House provision and adopted a modified form of the English system for determining war profits, taking as a basis of the tax the difference between the average earnings of the pre-war period (i.e. the calendar years 1911, 1912 and 1913) and those of the taxable year with a proviso that in no case shall the pre-war earnings be calculated at more than 10 per cent nor less than 6 per cent of the capital invested. On this basis, the bill imposes the following scale of taxes: 12 per cent of war profits not in excess of 15 per cent; 16 per cent of profits exceeding 15 but not exceeding 25 per cent; 20 per cent of profits exceeding 25 but not exceeding 50 per cent; 25 per cent of profits exceeding 50 but not exceeding 75 per cent; 30 per cent of profits exceeding 75 but not exceeding 100 per cent; 35 per cent of profits exceeding 100 but not exceeding 150 per cent; 40 per cent of profits exceeding 150 but not exceeding 200 per cent; 45 per cent of profits exceeding 200 but not exceeding 250 per cent; 50 per cent of profits exceeding 250 but not exceeding 300 per cent; and 60 per cent of profits exceeding 300 per cent.

The bill as passed by the Senate was to-day received by the House and immediately referred to a conference committee composed of Senators Simmons, Stone and Williams, Democrats, Penrose and Lodge, Republicans, and Representatives Kitchin, Rainey and Dixon, Democrats, and Fordney and Moore, Republicans. Owing to the important increases made in the bill by the Finance Committee, it is believed the House will accept the bulk of the Senate changes and that the measure will be disposed of by the conference committee in about 10 days.

Lake Iron-Ore Shipments in August

Iron ore shipments from the Lake Superior region in August exceeds the record for the same month last year by 3.01 per cent, or 296,646 tons. The total was 10,146,786 gross tons, against 9,850,140 tons in August, 1916. The totals by ports, with season shipments and a comparison with 1916 are given below:

	August, 1917	August, 1916	To Sept. 1, 1917	To Sept. 1, 1916
Escanaba	951,620	1,061,285	4,089.191	4,708.477
Marquette	629,426	634,786	1,899,062	2,469.705
Ashland	1,278 118	1,289,439	4,425,912	4,796,384
Superior	2,444,632	1,950,249	8,202,216	7,815,795
Duluth	3 326,254	3,380,066	11,999,021	12,718,548
Two Harbors	1,516,736	1,534,315	5,908,152	6,706,955
Total	10,146,786	9,850,140	36,523,554	39,215,864
1917 increase	296,646	.....	.....	.....
1917 decrease	.....	.....	2,692,310	.....

There has been a decrease in the season's shipments to Sept. 1 of 2,692,310 tons, or 6.86 per cent. The Duluth percentage of this total is 32.85 per cent, as compared with 32.43 per cent last year, while that for the Great Northern also reveals an increase of this year's percentage of the total having been 18.58 per cent as against 17.43 per cent last year.

High Pay for Rollers

PITTSBURGH, Sept. 12—(*By Wire*).—Under the bimonthly settlement of sheet and tin plate wage scales in mills that sign the Amalgamated Association scale made at a conference held in Youngstown on Tuesday, Sept. 11, scale rollers on hot mills in sheet and tin plate plants will receive considerably over $25 per day for themselves, the remainder of the crew being paid by the company. Formerly the hot mill roller paid his own crew, but this was changed some years ago, and now the company pays the crew, the hot mill roller keeping his entire earnings for himself.

One of the Heaviest Armor Plates

What is claimed as one of the heaviest armor plates ever rolled is reported by the London *Ironmonger* to have been manufactured by Sir John Brown & Co., at their Atlas Work , Sheffield, England. The size of the slab of steel when in the furnace was about 20 ft. long by about 4 ft. broad and 21 in. thick. Its rough weight was over 21 tons. Before being rolled it was built up in the furnace by five mold plates, each 3 in. thick, and one solid plate of 6 in. At a proper heat this mass was withdrawn and in a quarter of an hour was reduced to a compact slab of iron of a uniform thickness of 15 in. The men at work were attired in thin steel leggings, aprons of steel and with a thin curtain of steel wirework dropping over their faces. All the rest of their bodies were muffled in thick, wet sacking.

Maximum Coke Prices in Italy

Maximum prices for coke in Italy have been fixed by a decree of the Minister of Industry, Commerce and Labor as follows: From Aug. 1 to Sept. 30, 1917, the maximum selling price of gas coke for immediate delivery C. O. D. at factory is as follows: Coke, large, 280 lire ($54.04) per ton; powdered, with mesh, 293.50 lire ($56.65); nut coke, 152 lire ($29.34); coke, bulk cargoes without mesh, 255 lire ($49.21). The communes are to fix a moderate superprice for the sale and delivery of these goods ex-factory in their territory, in accordance with a decree of Oct. 26, 1916.

Persons selling gas coke at prices higher than those established, plus any communal superprice that may be fixed, will be fined 200 or 300 per cent of the entire price received from such illegal sales in accordance with a decree of Aug. 6, 1916. Repeated offense will render the offender liable to one year's imprisonment in addition. In case a dealer, producer, or any other seller refuses to sell gas coke at the established maximum prices, plus the communal superprice, the prefect or, if necessary, the syndic may sequester the goods and cause them to be sold at the expense of the holder, for whom, however, the amount necessary for his own consumption will be served.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 19.5c.; Philadelphia, 18.5c.; Boston, 21.5c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c.; Denver pipe, 76.1c.; minimum carload, 46,000 lb.; structural steel and steel bars, 76.1c., minimum carload, 40,000 lb.; Pacific coast (by rail only), pipe, 65c.; structural steel and steel bars, 75c., minimum carload, 60,000 lb. No freight rates are being published via the Panama Canal, as the boats are being used in transatlantic trade.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in., angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 4.00c.

Wire Products

(Prices of independent mills)

Wire nails, $4 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire, $4.05 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.95; galvanized wire, $4.65; galvanized barb wire and fence staples, $4.85; painted barb wire, $4.15; polished fence staples, $4.15; cement-coated nails, $3.90 base, these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 43 per cent off list for carload lots, 42 per cent off for 1000-rod lots, and 41 per cent off for small lots, f.o.b. Pittsburgh.

Nuts and Bolts

Discounts in effect for large buyers are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days.

Carriage bolts, small, rolled thread, 40 per cent, small cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent with c. p. nuts, 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq. blank, $2.10 off list, and tapped, $1.90 off; hex., blank, $1.90 off, and tapped, $1.70 off; nuts, c. p. c. and t. sq. blank $1.70 off, and tapped, $1.50 off; hex. blank. $1.60 off, and tapped, $1.40 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Wire Rods

Soft Bessemer and open-hearth rods to domestic consumers at $90 to $95; high-carbon rods made from ordinary open-hearth steel $95 to $100, and special steel rods with carbons running from 0.40 to 0.60, $100 to $110 at mill; above 0.60 carbon, $115 to $120.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $7.00; ⅝ in., 7/16 in. and ½ in., $7.00 base. Boat spikes are occasionally quoted $7.00 to $8.00, all per 100 lb., f.o.b. Pittsburgh, but some makers are quoting higher. Track bolts with square nuts, 7c. to 7.50c. to railroads, and 8c. to 8.50c., in small lots, for fairly prompt shipment.

Steel Rails

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails, and on carload and smaller lots, 4c. to 4.25c. at mill. Light rails, 25 to 45 lb., $75 to $80; 16 to 20 lb., $80 to $81; 12 and 14 lb., $82 to $83; 8 and 10 lb., $83 to $84; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard Bessemer rails, $38; open-hearth, $40, per gross ton, Pittsburgh.

Tin Plate

Effective July 31, prices on all sizes of terne plate were advanced from $2 to $2.50 per package and are now as follows: 8-lb. coating, 200 lb., $16 per package; 8-lb. coating, I. C., $16.30; 12-lb. coating, I. C., $17.50; 15-lb. coating, I. C., $18.25; 20-lb. coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 4c. to 4.50c. for delivery late this year, and 4.50c. to 5c. from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c.; railroad test bars, 5.25c. in carload and larger lots f.o.b. mill.

Wrought Pipe

The following discounts on steel are to jobbers for carload lots on the Pittsburgh basing card in effect from May 1, 1917, all full weight, except for LaBelle Iron Works and Wheeling Steel & Iron Co., which quote higher prices, and National Tube Co., which adheres to card of April 1.

Steel			Iron		
		Butt Weld			
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	42	15½	⅛ and ¼	23	+4
½	46	31½	⅜	24	+3
¾ to 3	49	35½	½	28	10
			¾ to 1½	33	17
		Lap Weld			
2	42	29½	2	26	12
2½ to 6	45	32½	2½ to 6	28	15
7 to 12	42	28½	7 to 12	25	12
13 and 14	32½	..			
15	30	..			
		Butt Weld, extra strong, plain ends			
⅛, ¼ and ⅜	38	20½	⅛, ¼ and ⅜	22	5
½	43	30½	½	27	14
¾ to 1½	47	34½	¾ to 1½	33	18
2 to 3	48	35½			
		Lap Weld, extra strong, plain ends			
2	40	28½	2	27	14
2½ to 4	43	31½	2½ to 4	29	17
4 to 6	42	30½	4½ to 6	28	16
7 to 8	38	24½	7 to 8	20	8
9 to 12	33	19½	9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

Nominal discounts on less than carload lots, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap-Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in.	28	1¾ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3¼ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in.	No quotations
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths. Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net or 2 per cent discount in 10 days.

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer

	Cents per lb.
Nos. 3 to 8	8.00 to 8.50
Nos. 9 and 10	8.25 to 8.50
Nos. 11 and 12	8.50 to 8.75
Nos. 13 and 14	8.75 to 9.00
Nos. 15 and 16	9.00 to 9.25

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	8.30 to 8.80
Nos. 22 and 24	8.35 to 8.85
Nos. 25 and 26	8.40 to 8.90
No. 27	8.45 to 8.95
No. 28	8.50 to 9.00
No. 29	8.55 to 9.05
No. 30	8.65 to 9.15

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11	9.00 to 9.50
Nos. 12 and 14	9.10 to 9.60
Nos. 15 and 16	9.25 to 9.75
Nos. 17 to 21	9.40 to 9.90
Nos. 22 and 24	9.55 to 10.05
Nos. 25 and 26	9.70 to 10.20
No. 27	9.85 to 10.35
No. 28	10.00 to 10.50
No. 29	10.25 to 10.75
No. 30	10.50 to 11.00

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	7.80 to 8.30
Nos. 17 to 21	7.85 to 8.35
Nos. 22 to 24	7.90 to 8.40
Nos. 25 to 27	7.95 to 8.45
No. 28	8.00 to 8.50
No. 29	8.05 to 8.55
No. 30	8.05 to 8.55
Nos. 30½ and 31	8.10 to 8.60

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
		Electro-	New	New	St.	New	St.
Sept.	Lake	lytic	York	York	Louis	York	Louis
5	25.25	25.25	60.75	10.00	10.00	8.25	8.00
6	25.25	25.25	60.75	9.87½	9.75	8.25	8.00
7	25.25	25.25	60.75	9.87½	9.75	8.12½	7.87½
8	25.25	25.25	....	9.75	9.50	8.12½	7.87½
10	25.50	25.50	61.00	9.70	9.50	8.25	8.00
11	25.50	25.50	61.37½	9.70	9.50	8.25	8.00

NEW YORK, Sept. 12.

The entire market has a better tone but actual buying is not yet a market influence in any case. Copper is firmer and nominally higher. Tin is steady and stronger. Lead is dull and lower. Spelter is more active and steady. Antimony is still lifeless.

New York

Copper.—It is a fact that nearly 77,000,000 lb. of copper has been bought for the Allies at a price understood to be 25c. per lb. Deliveries on this sale are reported to extend from now to the end of the year. Active negotiations as to the price and the amount needed by the Government itself are being continued from yesterday into to-day at Washington and the trade is anxiously awaiting a decision. It is suspected that there is some controversy as to whether the price should not be lower than that arranged for the Allies. As a result of the Allied purchase and the other negotiations the market has a better tone and more inquiry is reported. There has been, however, no increased buying despite various reports to that effect and quotations continued nominal at 25.50c., yesterday, for both Lake and electrolytic. Buyers continue to hold back but it is expected that a more active market will develop in the near future. The London market continues unchanged at £137 for spot electrolytic and £133 for futures.

Tin.—After a week of more or less stagnation and with more sellers than buyers, the market yesterday was characterized by better demand and by moderate sales, aggregating 125 to 150 tons. The present better tone appeared on Monday and it was aided by fair sales. The quotation stiffened on Monday from its low range of last week to 61c., New York, and yesterday to 61.37½c. Arrivals this month have been 700 tons with 5400 tons afloat. The London market has receded slightly from that reported last week, the quotation yesterday having been £243 per ton for spot Straits, a decline of 10s. for the week.

Lead.—The leading producer has again made a reduction in its quotation which is the second in the last two weeks. Its price is again $10 per ton lower and now stands at 10c. per lb., New York. The reduction was made last week Tuesday but it did not leak out until Wednesday. There is a lack of confidence permeating the entire lead market and this has resulted in a lower tone which has continued to attain momentum. There is very little new inquiry and sellers are undecided as to the best course to adopt. It is realized that pressure will continue to force the market down and therefore very little business was reported last week. Yesterday the result of the tendency downward was free offers of lead at 9.50c., St. Louis, and it is understood that this has resulted in a fair business being done. A fresh assortment of inquiries from Canada is reported to be before the market. For the last quarter some dealers are quoting as low as 9.12½c. to 9.25c., St. Louis, but practically no business is reported for that position.

Spelter.—There has been more inquiry the past week than in many weeks and sales have also been of larger volume than in a long time, but this does not mean much in quantity. While these have not yet affected quotations perceptibly, sentiment is decidedly better and the market is firmer. There has been sufficient metal to supply the demand at the current quotation of 8.12½c. to 8.25c., New York, or 7.87½c. to 8c., St. Louis, for early delivery. There have been sales at 7.75c., St. Louis, but of small volume. It is believed in the trade that the bottom of the market has been reached and that a turn for the better is near at hand, if not already here. The fairly large inquiry of the past two days, exceeding that of last week, is an indication. Apparent progress toward a settlement of the copper situation is a stimulating influence. Another factor is the enormous expenditures on Government account and its ultimate effect on business. A conservative estimate places the reduction in output in the country at 30 to 40 per cent, due to high cost and low returns. For future delivery quotations are about ⅛c. to ¼c. above those for early delivery.

Antimony.—Chinese and Japanese grades are available in a dull market at 14.50c. to 14.75c., New York, duty paid.

Aluminum.—The market is lifeless and unchanged at 47c. to 49c. per lb. for No. 1 virgin metal, 98 to 99 per cent pure.

Old Metals.—The market became a little more active the latter part of the week. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible	26.50 to 27.00
Copper, heavy and wire	25.50 to 26.00
Copper, light and bottoms	22.50 to 23.50
Brass, heavy	18.50 to 19.00
Brass, light	13.00 to 14.00
Heavy machine composition	24.50 to 25.00
No. 1 yellow rod brass turnings	17.25
No. 1 red brass or composition turnings	19.00 to 21.00
Lead, heavy	9.00
Lead, tea	7.25
Zinc	6.25

Chicago

CHICAGO, Sept. 10.—Two causes of a scarcity in copper are arousing much interest in that metal, one being heavy Government buying on behalf of the Allies of this country; the other being the cutting down of production by labor troubles practically wherever copper is refined. One producer has been idle for six weeks because of a strike, another has made but 40 per cent of what it should, and other like instances are cited. Higher prices are a natural sequence of these conditions. Lead is weak, spelter inactive and tin and antimony without special feature. We quote as follows: Casting copper, 27c.; Lake, 28.50c.; electrolytic, 28c.; tin, carloads, 61c.; small lots, 63c. to 64c.; lead, 9.50c. to 10c.; spelter, 8c.; sheet zinc, 19c.; antimony, 17c. to 18.50c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 22.50c.; copper clips, 21.50c.; copper bottoms, 21c.; red brass, 21c.; yellow brass, 15c.; lead pipe, 8c.; zinc, 5.50c.; pewter, No. 1, 35c.; tinfoil, 40c.; block tin, 45c.

St. Louis

SEPT. 10.—The non-ferrous metals have been rather quiet during the past week and the quotations for car load lots of the Missouri product at the close to-day were: Lead, 9.75c.; Spelter, 8c. In less than car load lots the quotations were: Lead, 10.75c.; spelter, 9c.; tin, 66c.; lake copper, 30c.; electrolytic copper, 29.50c.; Asiatic antimony, 18c. In the Joplin district, while the range was $65 to $75 per ton for zinc blende, basis of 60 per cent metal, there was a weakening of $2.50 to $3.50 per ton in the second grade ores. The average for the district for the week was $69 per ton. Calamine ranged from $35 to $42 per ton with the average for 40 per cent ore for the week in the district at $39 per ton. Lead ore was down $10 per ton to $90 per ton, basis of 80 per cent metal, and the average for the week for the district was the same figure. On miscellaneous scrap metals, we quote dealers' buying prices as follows: Light brass, 11c.; heavy yellow brass, 14.50c.; heavy red brass and light copper, 19.50c.; heavy copper and copper wire, 22.50c.; pewter, 25c.; tinfoil, 42c.; tea lead, 5c.; zinc, 6c.; lead, 7c.

Pittsburgh and Nearby Districts

In announcing the opening of the Evening School of Economics, Accounts and Finance in the University of Pittsburgh, Oct. 1, for the fall term, Dr. J. T. Holdsworth, dean, says that the program of courses is arranged not only to meet the need of trained men in all departments of business, but to provide practical training for women who must be prepared to fill the gaps in business due to the enlisting and drafting of men for the war. Business courses in the evening school open to women on the same basis as to men include accounting, auditing, cost systems and industrial management, business English and correspondence, advertising and selling, business psychology, public speaking, commercial Spanish, French, etc.

The Mellon interests of Pittsburgh and D. B. Zimmerman of Somerset, Pa., will open 15 coal mines in the Indian Creek Valley, Fayette County, Pa., where they control 20,000 to 30,000 acres of thin vein coal. Three openings have been started and others will be made as rapidly as they can be equipped. Ground has been broken for a town at Indian Head to house employees.

The Washington Tin Plate Co., Washington, Pa., has given notice that it will retire on Oct. 1, all its 5 per cent gold coupon bonds dated Oct. 1, 1907, by paying the holders thereof the principal and accrued interest.

Stockholders of the Petroleum Iron Works Co. and its associated companies, the Pennsylvania Tank Car Co., and the Pressed Steel Products Co., Petroleum, Pa., have unanimously re-elected all their officers. The presidents of the three companies in the order named are G. B. Bard, L. F. Jordon and John H. Consindine.

The Norwood Supply Co., Norwood, W. Va., has been incorporated with a capital of $50,000 to engage in the manufacture and sale of mill supplies.

The Pittsburgh Coal Co. of Pennsylvania has made application to list on the Pittsburgh Stock Exchange 321,692 shares of common and 360,000 shares of preferred stock, par value $100 a share.

Nova Scotia's Steel and Pig Iron Output

Nova Scotia's iron and steel output in 1916 and 1915 are given as follows in net tons:

	1916	1915
Pig iron	429,615	295,868
Steel ingots	502,106	369,310
Coke	669,478	452,099

The increase for 1916 is marked. The imports of iron ore were 795,066 tons in 1916.

Figuring on Gun Carriages

MILWAUKEE, Sept. 10.—Detailed specifications of work included in a proposed $25,000,000 contract for manufacturing gun carriages to be awarded by the Government have been received in Milwaukee and are being scheduled by William J. Fairbairn, secretary Milwaukee Metal Trades and Founders Association, and secretary of the metal trades committee, department of manufactures, Milwaukee County Council of Defense. The figuring is being done to determine whether all or any part of the work can be handled in Milwaukee. The carriages are designed to fit the 3-in. field pieces to be manufactured by the Wisconsin Gun Co., Milwaukee, which, as previously noted, was organized by five large metal-working concerns of this district, and is erecting and equipping an ordnance plant at Thirty-fifth Avenue and Burnham Street, Milwaukee. If practicable local manufacturers will organize a new company to build gun carriages, so that the complete 3-in. guns will be made here, ready for service. It is stated, however, that Milwaukee manufacturers are already so fully occupied with Government work that there is a possibility that the gun-carriage work may have to be placed elsewhere.

CORRESPONDENCE

Pig Iron from Steel Scrap in Great Britain

To the Editor: On page 497 of your Aug. 30 issue you devote editorial space to the possibilities of the electric furnace in using up cheap scrap and producing a very high grade pig iron or washed metal. In places like the Pacific coast, where pig iron is scarce or in almost any district where there is an abundance of cheap iron or steel scrap, there is no doubt that the adoption of the electric furnaces would go a very long way toward solving the problem of the present scarcity of pig iron.

It might possibly interest your readers to know the developments of this industry in Great Britain. Before the outbreak of the war the government demanded extremely rigid chemical and physical specifications for all steel for guns, shells or other ordnance. This was made almost exclusively in acid open-hearth furnaces and, in order to comply with the tests, large quantities of very pure Swedish or other similar pig iron had to be used. The Swedes found they had a better market in Germany and this, together with shipping difficulties, brought the import of Swedish pig iron very low, while the price went up from $35 to $160 per ton. Experiments were made in the Greaves-Etchells electric furnaces by several works and it was proved to be a very simple operation to make a pig iron or washed metal from shell turnings, iron borings, etc., of better analysis than the original product. The furnaces have been making this material now for over two years and from practical experience I can say that in actual works practice it gives much better results than the original Swedish iron. It is very much stronger and denser than the Swedish iron, melts more readily without cutting effects on crucibles or open-hearth bottoms and is more reliable in composition. I attribute this very largely to the freedom of the material from occluded gases, oxides and slag fibre.

I should like to congratulate the Ludlam Steel Co. on the work it has done in the United States in this new line. As far as I know, we have both worked independently and arrived at the same conclusions.

F. HODSON, President,
Electric Furnace Construction Co.
Philadelphia, Sept. 4, 1917.

Iron Bars Rolled in Massachusetts Before 1800

To the Editor: Richard Gregg Lewis, whose letter you printed in your issue of Sept. 6, may be correct in regard to the first rolling mill in the United States, if he means the first rolling mill that made iron bars from ore or pig. In the first paragraph of his letter, however, he says that previous to Sept. 15, 1817, all of the bars made in the United States were *forged* and that on that date the first *rolled* bar of iron was turned out.

The Danvers Iron Works of the Sylvester Co. on the present location were rolling iron bars from Norway iron in the eighteenth century. Just how early, we do not know. These bars were brought into Boston, teamed about 20 miles to our works, heated with wood as fuel, rolled with water power and teamed back to the Boston stores.

JOHN P. SYLVESTER,
Treasurer Sylvester Co.
Danvers, Mass., Sept. 8, 1917.

Tin-Plate Shortage in Norway

A serious shortage of tin plates exists in the canning industry of Norway as a result of the prohibition by the British Government of the export of this article to Norway, according to reports from Christiana. Ten thousand cases of tinplates for canning which were sold to Norway are under embargo till an agreement as to the prices of canned goods destined for Great Britain is concluded.

Another Great War Bill Reported

Proposed Expenditure Nearly Five Billions—Gun Factory at Washington Navy Yard Will Be Enlarged on an Extensive Scale—Secretary Daniels' Statement

WASHINGTON, Sept. 11.—Another stupendous war money bill, the largest and the last to be brought forward at the present session of Congress, has just been reported to the House by the Committee on Appropriations. It carries the enormous sum of $4,810,979,370, of which $3,775,979,370 is directly appropriated while contracts for $1,035,000,000 additional are authorized, the money to be provided by Congress at the session beginning next December. The bill will be passed by the House during the present week and acted upon by the Senate in time to receive the President's signature before Oct. 1.

All but a small part of the fabulous sum carried by this bill will be expended for strictly war purposes. No less than $3,477,115,735 will be allotted to the military establishment while the Navy will absorb $263,-264,480. Some of the most important items under the military establishment provided for in the measure are the following: Machine rifles, $120,277,000; machinery for manufacture of rifles, $9,500,000; mountain, field and siege cannon, $676,213,000; ammunition for mountain, field and siege cannon, $663,000,000; mobile artillery, $155,600,000; armored motor cars, $16,750,000; submarine mines and nets, $700,000; ordnance stores, $70,000,000; small arms ammunition, $39,520,000; target practice small arms ammunition, $2,000,000; and supplies, quartermaster's corps, $100,000,000.

In addition to the specific appropriations for the military establishment enumerated the bill authorizes the following contracts, the money for which will be provided hereafter: Machine rifles, $50,000,000; mountain, field and siege cannon, $225,000,000; ammunition for mountain, field and siege cannon, $700,000,000; mobile artillery, $50,000,000, and armored motor cars, $5,000,-000.

Millions for Machinery

It will be noted that there is included in the above schedule an appropriation of $9,500,000 for machinery for the manufacture of rifles. This item is intended to cover the purchase price of the gages, dies, tools, etc., which the War Department recently contracted to buy from the British Government by which it was installed some time ago in the two plants of the Remington companies at Ilion, N. Y., and Chester, Pa., and the plant of the Winchester Repeating Arms Co. at New Haven, Conn. This machinery is being used to turn out the Lee-Enfield rifle rechambered to use Springfield ammunition. The Secretary of War solicited this appropriation many weeks ago, but as Congress delayed making the necessary provision, he was obliged to assume the responsibility of borrowing the equipment from the British authorities.

The appropriations included in the measure for the use of the naval establishment cover a broad field. The largest item is $100,000,000, which is carried as a blanket allotment to the Naval Emergency Fund for which Congress has heretofore appropriated $150,000,-000. The original fund has been substantially reduced by contracts for a considerable number of torpedo boat destroyers and Secretary Daniels has already submitted an estimate for $350,000,000 additional to pay for the 160 destroyers which he has decided to order. The fact that the appropriation recommended by the Secretary of the Navy for the additional destroyers is not included in this bill is regarded as somewhat significant and the question has been raised as to whether the entire naval emergency fund will be utilized to pay for the destroyers, leaving a deficit to be provided for next winter, or an amendment added to the bill in the Senate giving the Navy the allotment recommended by Secretary Daniels.

Chief among the items which the bill carries for the naval establishment are the following: Batteries and outfits for vessels, $22,000,000; ammunition for vessels, $25,000,000; ordnance and ordnance stores, $12,446,-480; aviation, $35,000,000; reserve ordnance supplies, $30,000,000; enlargement of gun factory, Washington navy yard, $7,500,000; handling appliances at navy yards and stations, $450,000; marine railways at yards and stations, $375,000.

Expansion of Gun Plant

The proposed expansion of the gun factory at the Washington navy yard is a matter of special interest to private manufacturers of war material. Of the sum appropriated, $5,000,000 will be spent on new buildings and $2,500,000 on tools and machinery, the purpose being to build and equip as large a gun factory as it is possible to construct in time to be of use in the war. In explanation of the plans of the department and its policy with respect to the construction of guns, torpedoes, etc., Secretary Daniels makes the following official statement:

Contracts for guns, mounts and other ordnance supplies are becoming increasingly difficult to place. A large amount of money in advance has been allotted for the construction of shops that after the present emergency will theoretically become part of the Navy's property, although, due to the scattered locations, it will not be practicable to utilize them to the fullest extent in the Navy's activities. Funds expended in an extension to the Washington gun factory would result in quicker return of manufactured ordnance material at a decidedly less cost and give a permanent installation of great value to the Navy. Had not the Navy possessed the present factory, the supply of all ordnance material would be so much less efficient than it is at present that the matter would have undoubtedly been forced to public notice. The bureau of ordnance can order direct and obtain material from this factory, and this alone. The matter of additional guns and mounts is most urgent, demands being made by our own and other governments for such equipment.

The naval gun factory, possessing as it does a complete organization and a large working force, is readily adapted to increasing its facilities for delivery of guns, mounts and other munitions. To develop any other source is not only expensive, but involves a matter of long delay. It is, therefore, considered to the best interests of the Government to increase at once the capacity of the Washington navy yard for guns, mounts, torpedoes, mines, telescopes, sights, optical instruments and miscellaneous ordnance supplies. For this purpose it is proposed to construct the necessary buildings, craneways, storage and handling facilities at an estimated cost complete of $5,000,000, with the necessary machinery to cost $2,500,000 additional. An appropriation of $7,500,000 for this purpose is earnestly recommended.

The proposed work includes the construction of a large six-story machine shop for mines, mounts and torpedoes, a five-story pattern and woodworking shop, an extension to the power plant, a new brass foundry, an extension of the steel forging plant, an optical shop, range-finder towers, administration building, quarters for enlisted personnel under instuction and the extension of the yard service system to supply adequately these new structures.

With the accomplishment of the extensions contemplated, ample manufacturing facilities will be provided for the manufacture of from 300 to 900 torpedoes per annum, at least 3000 mines per month, a large increase in the manufacture of guns, mounts and other accessories and the manufacture and repair of the larger part of the optical work for the entire naval establishment. The present output of the torpedoes at the Washington navy yard is approximately 100 per annum. No mines are manufactured and only a small part of the naval optical work is now done. It is thus apparent that the expenditure of these funds is amply warranted as an evident and urgent military necessity. Captain Willard, the acting superintendent of the naval gun factory, estimates that after improvements requested have been completed, with the plant working at full capacity, the annual saving in cost of ordnance materials would very nearly equal the first cost of the improvements. On this basis alone the expenditure would appear to be amply justified, while on the basis of military necessity for the purpose of increasing the country's

output capacity and affording production for ordnance material that cannot be produced elsewhere, the project would seem to be an urgent need.

Free from Usual Restrictions

A highly significant feature of this huge appropriation bill is the fact that the enormous sums carried by it are almost without exception free from the usual restrictions compelling the manufacture of the proposed material in Government establishments rather than its purchase from private producers. Now that the war is on, Congress has discovered the folly of attempting to manufacture any considerable proportion of the material needed, and aside from providing for the extension of the gun factory at Washington, it is looking to private establishments to meet all pressing needs.

An extraordinary "rider" has been added to the bill intended to prevent persons who have been appointed from civil life at nominal salaries to help the Government in the war emergency from being transferred to other bureaus with increased compensation paid from lump sum appropriations. Such transfers and increases are specifically prohibited and it is further provided that the United States Shipping Board Emergency Fleet Corporation shall be considered as a "Government establishment" for the purpose of bringing it within the scope of this prohibition. W. L. C.

Status of Iron and Steel Advisers

Attorney General Holds They May Act Providing Relation to Government Purchases Is Set Forth in a Written Statement

Attorney General Gregory, in an informal but comprehensive opinion, submitted to the War Industries Board of the Council of National Defense, holds that the service upon the sub-committees of the Advisory Commission of the Council of officers and stockholders of corporations having contractual relations with the Government is not forbidden by section 3 of the Lever food, feed and fuel control act. Copies of the opinion, which it is believed at Washington will remove all feelings of apprehension from the minds of members of the sub-committees, have been distributed by Mr. Baruch among the companies represented on advisory committees. As a result it is believed that the members of the sub-committees who have heretofore declared their purpose of resigning will abandon that intention and continue to give the Council of National Defense the benefit of their valuable assistance. It is understood that no move has been made by the Steel Committee of the American Iron and Steel Institute toward the resumption of its functions, as the members await the opinions of their attorneys, particularly in view of the Attorney General's caution in his answer to question 3.

The Attorney General's opinion is expressed in the form of questions and answers, prefaced by the text of section 3 of the Lever bill. Mr. Gregory takes up the entire organization of the War Industries Board and holds that all its operations as at present conducted are well within the law, but points to the necessity for careful observance on the part of members of the board as well as of the sub-committees of the stipulation in the Lever act that whenever a recommendation for a purchase or the awarding of a contract is made by an individual who is in any way connected with, or who has a financial interest in, the concern which is to furnish the material in question, he must file a written statement disclosing such connection or interest.

The Attorney General's opinion, which in all material particulars is in line with the suggestions heretofore made in Washington correspondence to THE IRON AGE with respect to the proper construction of the Lever act, is as follows:

F. A. Scott, Chairman War Industries Board,
Council of National Defense,
Washington, D. C.

DEAR SIR: I have your letter of Aug. 21 submitting a series of questions arising under section 3 of the Food and Fuel Control Act, approved Aug. 10, 1917, reading as follows:

SEC. 3. That no person acting either as a voluntary or paid agent or employee of the United States in any capacity, including an advisory capacity, shall solicit, induce, or attempt to induce any person or officer authorized to execute or to direct the execution of contracts on behalf of the United States to make any contract or give any order for the furnishing to the United States of work, labor, or services, or of materials, supplies, or other property of any kind or character, if such agent or employee has any pecuniary interest in such contract or order or if he or any firm of which he is a member, or corporation, joint stock company, or association of which he is an officer or stockholder, or in the pecuniary profits of which he is directly or indirectly interested, shall be a party thereto. Nor shall any agent or employee make, or permit any committee or other body of which he is a member to make, or participate in making, any recommendation concerning such contract or order to any council, board, or commission of the United States, or any member or subordinate thereof, without making to the best of his knowledge and belief a full and complete disclosure in writing to such council, board, commission, or subordinate of any and every pecuniary interest, which he may have in such contract or order and of his interest in any firm, corporation, company, or association being a party thereto. Nor shall he participate in the awarding of such contract or giving such order. Any wilful violation of any of the provisions of this section shall be punishable by a fine of not more than $10,000 or by imprisonment of not more than five years, or both; *provided*, That the provisions of this section shall not change, alter or repeal section 41 of chapter 321, Thirty-fifth Statutes at Large.

While the Attorney General is specifically authorized to give his official opinions on questions of law only to the President and the heads of the Executive Department, I think, nevertheless, that under the circumstances I am warranted in answering your questions informally. I can only speak generally, however, and not with reference to any actual case, because none is before me. You state that:

For convenience, in phrasing the questions below we shall use the term "interested person" to refer to a person having a pecuniary interest in a contract or order of the kind referred to in the act, and also to cover a person "if he, or any firm of which he is a member, or corporation, joint-stock company or association of which he is an officer or stockholder, or in the pecuniary profits of which he is directly or indirectly interested, shall be a party thereto."

We shall assume that the contract or order is the kind specified in Section 3, and that it has actually been awarded or given after the making of the recommendations referred to in the following questions:

Question 1: Is there compliance with the act where such interested person is a member of the War Industries Board and the board makes a recommendation to a contracting department or contracting officer with regard to such contract on order, and the interested person does not participate in making such recommendation?

Answer: No, not unless such interested person makes the disclosure required by the act. That he did not actually participate in the recommendation does not, in my opinion, relieve him of the duty of making the specified disclosure.

Question 2: Is there compliance with the act where such interested person is a member of the Purchasing

Commission of the War Industries Board and he makes a recommendation concerning such contract or order to the War Industries Board, making a full disclosure of his interest?

Answer: Yes.

Question 3: Is there compliance with the act where such interested person is a member of the Purchasing Commission of the War Industries Board and makes a recommendation directly to a contracting officer or department concerning such contract or order, making full disclosure of his interest?

Answer: Yes; although in view of the narrow margin of difference which might exist in a given case between *recommending*, on the one hand, and *inducing*, *soliciting* or *awarding*, on the other, it would be well as a practical matter for such persons to exercise great caution as to the kind of *recommendations* they shall make to a contracting officer.

Question 4: Is there compliance with the act where such interested person, being a member of the sub-committee of the Council of National Defense, makes or participates in making a recommendation concerning a contract or order to the War Industries Board, or to a council, board or commission of the United States or any member thereof, but not to a contracting department or officer, and makes a full disclosure of his interest?

Answer: Unless I misunderstand it, I can see no difference in principle between this question and Question 2, and therefore answer, yes.

Question 5: Is there compliance with the act where such an interested person is a member of the sub-committee and the sub-committee makes a recommendation concerning a contract to the War Industries Board, or to a council, board or commission of the United States or any member thereof, but not to a contracting department or officer, and such sub-committee makes a full disclosure of the interest of the interested person?

Answer: No. The law requires the interested person himself to disclose his interest to the council, board, commission or member or subordinate thereof to whom the recommendation is addressed.

Question 6: Does the provision, "Nor shall he (such interested person) participate in the awarding of such contract or giving such order," have the effect of nullifying the right to make recommendations to any council, board or commission, when accompanied by a full and complete disclosure of interest?

Answer: In my opinion, no. There is an obvious distinction between actually *awarding* a contract or *giving* an order and *recommending* that a contract be made or an order given.

Respectfully,
(Signed) T. W. GREGORY,
Attorney General.

Washington, D. C., Aug. 29, 1917.

The Steel Output of India

India's steel output in 1915 and 1916 is compared as follows according to reports of the Iron, Steel and Allied Trades Federation (British):

Class of Materials	1915, Tons	1916, Tons
Blooms, billets	....	2,156
Rails	15,780	35,097
Light rails	953	1,498
Sleepers and fishplates	432	2,217
Angles, tees, channels, etc.	5,881	12,680
Joists	28,481	25,247
Merchant steel	....	14,149
Unenumerated	17,107	425
Total	68,634	93,469

Mining Engineers to Discuss Manganese

The supply of manganese ore for the American steel industry and how to increase this in the war emergency will be one of the principal subjects discussed at the 115th meeting of the American Institute of Mining Engineers in St. Louis, Oct. 8 to 13. Members from all parts of the country will attend and zinc and lead mining operations in Missouri will figure prominently in the meeting.

OBITUARY

C. G. STEVENSON, a well-known manufacturer of Wellsville, Ohio, died at his summer home in Oak Grove Park, near that city, on Wednesday, Sept. 5. He was president and general manager of the Stevenson Foundry Co., Wellsville, a member of the National Brick Makers' Association, and the Canadian Foundrymen's Association.

LON WESTON, president Tuck Mfg. Co., Brockton, Mass., which he founded in 1879, died in that city Sept. 5. He was born in Harrison, Me., 84 years ago, and after being graduated from Union College was an instructor in mathematics and later a civil engineer.

The Establishment of a Shipbuilding Industry in Australia

The establishment of a shipbuilding industry in Australia is receiving serious Government consideration, and W. M. Hughes has had conferences with representatives of shipping and industrial interests. As a result of these, Mr. Hughes is satisfied that the hulls of composite ships, as well as the engines, steam and internal combustion, can be constructed in Australia, but the great difficulty is labor. It has been decided to call a conference of the unions interested in shipbuilding—boilermakers, shipwrights and engineers—at the earliest possible date in order to invite their co-operation.

Heavy Trade with Canada

TORONTO, ONT., Sept. 9.—The feeling of uncertainty that still governs the American steel trade has reached Canadian firms which handle American steel products in the Dominion. It is declared that if the embargo imposed by the authorities extends to the United States-Canadian trade, much inconvenience will be felt. This, of course, does not apply to the steel trade as a whole, but more particularly to the Canadian firms which have recourse to the American industries for all kinds of shapes and angles. During the past few years, a tremendous iron and steel trade has been developed between the two countries. During the fiscal year which closed in July, approximately $156,333,801 worth of metals of all kinds were imported into Canada. This is $10,273,-138 in excess of the amount of the business done in Canada's boom year, 1913, when the amount imported was $146,060,663. Of all the importations of iron and steel into Canada during the year just closed, 95.33 per cent was from the United States. The value of the manufactures of iron and steel brought into Canada from the United States during the past year was $119,-754,265. These figures have been exceeded only once before in the Dominion's history, that was in the celebrated expansion year, 1913, when the value of these importations amounted to $120,568,284. As the aggregate of all kinds of machinery imported by Canadians, $33,154,265 came from American companies, which is approximately $2,600,000 less than in 1913 and nearly 200 per cent greater than in 1914-15 and 16.

Day and night work is being done in several of the machine shops and foundries in Birmingham, Ala., and in a few instances it is necessary to operate on Sundays by reason of the immense amount of work in hand. One of the larger machine shops and foundries shipped out the past week several car lots of shells for the Government, castings of marine engines, castings for lathes, cotton compress machinery and sugar refinery machinery. More men are being employed in machine shops and foundries in that district than ever before.

The Goshen, Va., furnace of the Southeastern Iron Corporation is expected to go in blast on or before Oct. 15.

Ordnance and Munitions Investigation

Testimony of Secretary Baker on Defective Ammunition and of General Crozier on Ordnance Bureau's Delays on Rifles

WASHINGTON, Sept. 11.—What promises to develop into a comprehensive series of investigations of the Ordnance Bureau of the War Department was begun on Sept. 5, when the Senate Committee on Military Affairs examined Secretary of War Baker, General Crozier, chief of the Ordnance Bureau; Colonel Thompson, assistant in charge of small arms, and Chief Chemist Pritham of the Frankford Arsenal, concerning the defective ammunition supplied to the troops in France under General Pershing's command. Simultaneously the House Committee on Military Affairs reported a resolution authorizing a select committee of seven members "to inquire into the manufacture and purchase of ordnance and ammunition, including small arms ammunition and heavy artillery for use by the armed forces of the United States in the present emergency." It was also announced that the Secretary of War, pursuant to request from General Crozier, had appointed a board to make an exhaustive investigation into the cause of the defects which have been found in the ammunition made at Frankford and the methods of inspection which should be employed to guard against such defects.

The hearings before the Senate Committee on Military Affairs were not confined to the defective ammunition supplied to the troops in France, but afforded an opportunity for the ordnance experts to make an official explanation of the obstacles that have been encountered in securing prompt deliveries of Lee-Enfield rifles, due chiefly to the failure of the British Government to standardize the equipment for the manufacture of these guns in the three plants recently turned over to the United States. The committee received this information with great apparent interest and examined General Crozier in much detail as to the embarrassing situation in which the War Department found itself when the United States became involved in the war, because of the failure of Congress to provide the equipment for the production of small arms in private establishments.

Chemical Change in Ammunition

Secretary Baker, in a statement concerning the defective ammunition made at Frankford Arsenal, said that after the European war had been in progress for some time the supply of potassium chlorate used in the manufacture of primers for small-arms cartridges, being no longer procurable in Germany, was purchased in the United States. The product was subjected to the usual analysis and test at the Frankford Arsenal and was apparently in all respects up to the standard requirements. In May the War Department received from the Navy Department a complaint that in the target practice of the marines who were using ammunition supplied by the Frankford Arsenal there were occasional cases of miss-fire or hang-fire. Subsequently a report was received from a rifle club to which ammunition made in Frankford had been sold, also complaining of hang-fire.

Investigation was at once ordered and an ammunition chemist and several ordnance experts began an exhaustive inquiry. No such trouble had ever been heard of and a number of different theories were advanced as to its cause. It was at first thought that the granulation of the antimony used in the primers was either too fine or too coarse and considerable time was devoted to this line of investigation before it was abandoned. It was finally determined that the potassium chlorate contained an infinitesimal quantity of potassium bromate, which, in the presence of free sulphur in the primer, had a tendency to break down, leaving as one of the by-products of the chemical reaction a small amount of free sulphuric acid, which delayed the combustion of the primer and caused the hang-fire. The deterioration of the priming material, Secretary Baker said, did not manifest itself immediately after the ammunition was manufactured, but was a very slow process, probably depending to some extent on the presence of an exceedingly small quantity of moisture in certain of the cartridges. Under these conditions practically all the ammunition when made and immediately tested functioned properly, but when kept for some months began slowly to deteriorate, so that in three or four months about 10 per cent would hang-fire.

All from Frankford Arsenal

Replying to questions by members of the committee Secretary Baker said that the work done in the arsenals in the manufacture of ammunition was about equal to that in private factories. Sometimes it appeared to be a little better and sometimes not quite so good, but there was no marked disparity. All the defective ammunition, he said, could be used up in target practice under such conditions that the soldiers could be warned not to open the breeches of their guns until sufficient time had elapsed to take up any hang-fire. The defective ammunition constituted only about one-third the amount sent to France and was easily identified as the product of the Frankford Arsenal, being plainly marked. An ample supply of good ammunition was sent to France before any of that originally shipped was used.

Replying to questions as to whether the Allies had had similar troubles, Secretary Baker said that he did not know that they had experienced exactly the same difficulties. He added that a very large quantity of ammunition used on every battlefield does not explode. On the western front of Europe the fields are covered with unexploded cartridges, but the War Department had no definite data as to the cause of the defects. Answering the question as to whether ammunition produced by private concerns had ever developed the difficulty encountered in the case of that produced at Frankford, the Secretary said that he was informed that no such trouble had ever been traced to the same cause in the case of the output of private concerns, the explanation being that they use a different fulminate, usually employing fulminate of mercury or fulminating powders, which do not contain sulphur.

No Conspiracy Indicated

Chairman Chamberlain of the committee examined Secretary Baker at some length as to whether there was any reason to suspect that the defective ammunition was in any way due to the machinations of evily disposed persons, but the Secretary declared that there was not the slightest evidence of such interference. On the other hand, all who had taken part in the investigation were satisfied that the trouble was due to a wholly unforeseen cause, something entirely new in the technical experience of ammunition makers.

Asked why the arsenals did not employ fulminate of mercury instead of potassium chlorate in making primers, General Crozier said that fulminate of mercury had the effect of splitting the brass cartridge cases so that they could not be used again. As all the ammunition used by the Army in recent years was for target practice, it was practicable to save the cartridge cases and, therefore, a fulminate was employed which did not injure them. Since the United States has become involved in the war this point is no longer material, as there will be little or no salvage of cases. On this account the department had given permission to private manufacturers making ammunition for the Government to use a mercurial fulminate for primers. Since the discovery with regard to the presence of potassium bromate in the primers the department had come to consider the mercurial fulminate more desir-

able than the potassium chlorate, as it regarded safety as of more importance than salvage.

Dr. H. C. Pritham, chief chemist at the Frankford Arsenal, testified that all the chlorate of potassium purchased was of U. S. Pharmacopoeia standard and was carefully examined for all suspected impurities. No special test for potassium bromate had been made, as no such contamination had ever been encountered.

General Crozier, in reply to direct questions by members of the committee, stated that he did not think the trouble in this case "could have reasonably been avoided," but in view of what has happened it can easily be provided against in the future. He added that in the manufacture of material in large quantity there was always a conflict between excellence and output and the point at which they balance must be something of a compromise. In the case of ammunition, however, every effort was made to secure an article both safe and effective.

Delays in Rifle Manufacture

Taking as a text the proposition that in manufacturing material in large quantity a conflict between excellence and output always arises, General Crozier drew the committee's attention to recently published statements concerning delays in the manufacture of rifles at the three plants where the United States has acquired equipment originally installed to take care of a large contract for the British Government.

"We have been facing a serious problem," said General Crozier, "in the manufacture of rifles to quickly supplement our supply. We have been obliged to adopt the British Enfield rifle modified so as to fire our ammunition made for the Springfield rifle. The Enfield is now being made for us at three private factories. We did not have a sufficient number of Springfields to meet the sudden demand.

"Now, when the manufacture of Enfields was decided upon we had to determine two points, the first of which was, should we make them so as to use the United States ammunition instead of the English ammunition? For important reasons it was considered advisable to use United States ammunition, one reason being that we had a considerable amount on hand made for use in Springfields. The factories which had been making guns for the British Government could, of course, go ahead turning out Enfield rifles for English ammunition with less interruption, but we determined that to secure quality of supply, that is to say, for the sake of uniformity, which is an important factor in quality of supply, it was worth the time to make the change; hence we provided that the chambers of the Enfields should fit the Springfield ammunition.

Interchangeability of Parts

"The second question was a serious one. The British were so pressed for rifles that they considered it worth while to proceed with the manufacture of the Enfield at three different factories so rapidly as to make impossible interchangeability of parts between the rifles manufactured at the different places. Interchangeability requires an accurate co-ordination of gages and a co-ordination of inspection which require time and effort. The British authorities thought it was worth while to forego it to secure quantity production and, therefore, the rifles made at these three places are not interchangeable in all their parts. We have always insisted upon interchangeability and, although we make our Springfield rifle at the Springfield armory in Massachusetts and at the arsenal at Rock Island, Ill., we have always secured practical interchangeability. Of course, to apply this rule to the Enfield involved delay. It would take a certain amount of time to secure a certain degree of interchangeability, that is to say, in rendering interchangeable certain important parts of the rifle, and it would take more time if we insisted on a higher degree, or that a larger number of parts should be interchangeable, and even more time would be required if we attempted to secure 100 per cent interchangeability.

"We decided to stop at the second point and we have devoted the time necessary to secure interchangeability between the output of the three plants in what we consider the important parts of the rifle. The result will probably be that while there will be an ample supply of rifles for the army before any fighting begins, we shall probably have troops in camp and under training before there will be a rifle for every man. We think it probable that there will not be a worse state of affairs than that one company may have to use certain rifles in the morning and another company use the same rifles in the afternoon. We are already satisfied that it will not be necessary to send any soldier abroad without either a thoroughly modern Springfield or Enfield rifle."

In answer to questions General Crozier said that the English and French armies use different ammunition and that both types differed again from that supplied to the American forces. It was unfortunate that each force was dependent upon its own supply, but under the circumstances it was impossible to provide interchangeable ammunition.

Previous War Orders Fortunate

"If our industries had not been speeded up by the existence of the war prior to our entry into it," suggested Senator Frelinghuysen, "we would have been in much worse shape, would we not?"

"In very much worse shape," replied General Crozier. "We are vastly better off on account of the European demand for material in this country since the beginning of the war. The British were caught at the outbreak of the war with a rifle with which they were not very well satisfied. They had just about worked up to the manufacturing stage a new model rifle which they intended to substitute for the one they had been using. Of course, they were obliged to greatly increase their supply of rifles and they had to turn to this country to help them, while at the same time increase their own manufacture at home. They wished to have manufactured in the United States the new model, but they considered it inadvisable to have it made, as had been designed, for a different kind of ammunition from that which they had previously employed. The newly designed rifle would not use the ammunition employed with the old model British rifle, so the problem presented to our manufacturers was to take this new rifle and so alter it that it would use the older and less desirable type of ammunition."

Will Rifle Supply Be Sufficient?

Concerning the possibility of equipping an army of two million men in the field by next summer, General Crozier expressed the opinion that inasmuch as only 60 per cent of such a force would carry rifles, he believed the Ordnance Bureau would be fully equal to the task. Senator Frelinghuysen suggested that the British Government estimated about five rifles to a man on account of wastage.

"That estimate was made," responded General Crozier, "very early in the European war, when the wastage due to the hasty retreat of the French and British forces was prominent in everybody's mind, but the estimate has now been very greatly reduced. If we have an army of a million and a quarter carrying rifles we shall have ample facilities to supply them. The English and French Allies do not now need any more of our assistance in rifle making. We have some facilities which are being used for the Russians and for the Belgians, but this is not a large percentage of our capacity. We shall be able to meet all our own requirements and still have some facilities left for the Allies I have mentioned."

Artillery Investigation Also

There has as yet been made no disclosure of the detailed plans of the House Military Committee for investigating the Ordnance Bureau. It is understood, however, that considerable information has reached the committee respecting the production of heavy artillery, gun forgings, etc., which it wishes to sift carefully. On this account the Dent resolution, which originally provided for an inquiry limited to the small arms ammunition made at the Frankford Arsenal, was enlarged in scope to include "heavy artillery for use by the armed forces of the United States in the present emergency." This resolution has been adopted by the House and the following committee appointed: Representatives

Dent, Fields, Fess, Gordon, Shallenberger, Anthony, McKenzie, Greene and Morin.

The board appointed by the Secretary of War to investigate the manufacture of ammunition in the arsenals is composed of Dr. H. P. Talbot, professor of chemistry at the Massachusetts Institute of Technology; Dr. C. L. Parson, chief chemist of the Bureau of Mines, and an army officer to be designated by Maj.-Gen. Hugh L. Scott, chief of staff. W. L. C.

PERSONAL

Samuel A. Benner, general manager of sales, American Steel Export Co., becomes a vice-president on Sept. 17 of the Federal Export Corporation, 115 Broadway, New York, of which D. S. Guthrie is also vice-president. The Commercial Iron & Steel Co., its subsidiary, will continue to develop as an institution devoted to domestic business.

Henry Penton, of Babcock & Penton, naval architects, New York and Cleveland, has been called into the service of the United States Government by the United States Emergency Fleet Corporation and placed in charge of the extensive shipbuilding program of the Shipping Board on the Great Lakes, where vessels will be built by a number of plants for the Government and taken through the Welland Canal to the Atlantic Ocean. Mr. Penton has had long experience in shipbuilding. He has opened an office for the Government in the Perry-Payne Bldg., Cleveland.

James Nelson, in charge of the duplex department of the Bethlehem Steel Co. at Bethlehem, Pa., for some time, has resigned to return to the Algoma Steel Co. at Sault Ste. Marie, Ontario. Mr. Nelson was for years superintendent of the open hearth department of the Ohio Works, Carnegie Steel Co., Youngstown, and went from there to Sault Ste. Marie to take a similar position. He went from Canada to Bethlehem and will return about Oct. 1.

Myron C. Sumners has been appointed sales manager of the DeForest Sheet & Tin Plate Co., Niles, Ohio, succeeding C. N. Stewart, who is associated with the recently organized Valley Iron Co., Youngstown, Ohio. Mr. Sumners was formerly assistant general sales manager of the Canton Sheet Steel Co., Canton, Ohio.

B. A. Shutts, superintendent of the North Cornwall furnaces, Lebanon, Pa., who resigned to become superintendent of the Central Iron & Steel Co.'s plants, Harrisburg, Pa., was tendered a banquet by his associates and presented a handsome watch and chain.

Dr. H. B. North, associate professor of chemistry, Rutgers College, resigned recently to become director of the Research Laboratories of the York Metal & Alloy Co., York, Pa.

A. D. Shankland has been appointed chief chemist at the Saucon laboratory of the Bethlehem Steel Co., succeeding F. O. Kichline, who has been transferred to the American Iron & Steel plant, open hearth department, Lebanon, Pa. A. R. Hartzel has been appointed chemist, succeeding Mr. Shankland.

Edward O. Acker, metallurgist for the Bethlehem Steel Co. for the last 29 years, has resigned and retired from active work.

Stanton Freeman has resigned his position as general manager of the Carbon Iron & Steel Co., Parryville, Pa., to become secretary and treasurer of the Port Henry Iron Ore Co., with offices at 2 Rector Street, New York. Mr. Freeman, who is a graduate of the Ohio State University, class of '98, was connected with the Carbon Iron & Steel Co. for 18 years.

C. E. Jenkins, Allentown, Pa., formerly engineer of maintenance of way for the Lehigh Valley Transit Co., has been appointed construction engineer for the Traylor Shipbuilding Co., Cornwells, Pa.

Ferdinand W. Roebling, Jr., treasurer of the John A. Roebling Sons' Co., Trenton, N. J., has been elected a director and member of the executive committee of the Mechanics and Metals National Bank, New York, to succeed his father, recently deceased.

Arthur Booth, formerly assistant general purchasing agent of the Philadelphia Co., Pittsburgh, has resigned, and is now vice-president of the Burson Supply Co., 242 First Avenue, Pittsburgh, dealer in mill, mine, machinists', railroad, contractors', gas and oil well supplies.

Chester H. Lehman, for six years secretary and director of the Blaw-Knox Co., Pittsburgh, has entered the service of the United States Government for duration of the war as first lieutenant in the Ordnance Department. Mr. Lehman is a Harvard graduate, class of 1909. Communications for him should be addressed care of the Blaw-Knox Co., Farmers' Bank Building, Pittsburgh.

Geo. F. Alderdice, vice-president of the Brier Hill Steel Co., Youngstown, Ohio, is recuperating at Atlantic City from an operation for appendicitis.

A. L. Phelps, formerly superintendent of the Youngstown, Ohio, plant of the United Engineering & Foundry Co., has resigned to accept a position with the National Carbon Co., Niagara Falls, N. Y., and has assumed his new duties.

Howard F. Ingels, formerly with the William Tod Co., and later with the Realty Guarantee & Trust Co., Youngstown, Ohio, has been named assistant secretary of the War Industries Board and has asked for an indefinite leave of absence.

Dudley R. Kennedy, assistant to the president of the Youngstown Sheet & Tube Co., has been named by Gov. J. M. Cox of Ohio, a member of a commission to study health, old age insurance and sickness prevention as a basis for State legislation.

Paul Brennan, formerly sales manager of the Lawrenceville Bronze Co., Pittsburgh, is now connected with the Johnson Bronze Co., New Castle, Pa.

Ralph T. Haws has been appointed general manager, secretary and treasurer of the Climax Fire Brick Co., Climax, Pa., succeeding Charles H. Luke, resigned.

James Lloyd has been appointed general superintendent of the operating department of the Sharon Steel Hoop Co., Sharon, Pa. Mr. Lloyd for the last few years has been assistant superintendent of the steel works department in the Jones & Laughlin Steel Co. plant, South Side, Pittsburgh.

W. J. Nugent, formerly with the Sivyer Steel Casting Co., Milwaukee, Wis., has become associated with the Springfield, Ohio, plant of the Ohio Steel Foundry Co. as assistant to the vice-president.

George W. Wagstaff, formerly in charge of the Detroit, Toledo, and Cleveland districts for the Onondaga Steel Co., Inc., Syracuse, N. Y., has been appointed sales manager, and will be located at the general offices of the company at Syracuse.

Joseph T. Ryerson & Son, Chicago, have sent two of their engineers to the foreign field to act in a consulting capacity with their foreign agents. Paul H. Schatzmann sailed two weeks ago for Japan, China and Russia, and Marcel Cartier has just sailed from New York for France and Italy.

René F. Jacops, for eight years in charge of the export department in New York of the Keystone Driller Co., Beaver Falls, Pa., has joined the American Machinery Syndicate, Hudson Terminal Building, New York, which is a selling organization particularly for business in Spain for a group of some 38 American manufacturers in metal working lines.

B. S. Cutler, Washington, acting chief of the Bureau of Foreign and Domestic Commerce, now represents the Department of Commerce on the Tin Plate Conservation Committee, succeeding Dr. E. E. Pratt. Chauncey P. Carter, also of the Bureau of Foreign and Domestic Commerce, is secretary of the committee.

H. E. Derbyshire, general manager of the Chambersburg Engineering Co., Chambersburg, Pa., has resigned, effective Sept. 10.

Machinery Markets and News of the Works

AIRPLANE MAKERS BUYING

General Vehicle Co. May Close This Week

Gun Plants Are Also in the Market for Considerable Equipment—Tacony Ordnance Corporation Places Some Orders

The Government program for airplanes and heavy guns is furnishing the bulk of the business now being done in machine tools, with the shipbuilding industry promising to loom up as a big buyer in the very near future.

Interest of the New York machine-tool dealers the past week has been centered largely on the prospective large purchases of the General Vehicle Co., Long Island City, N. Y., which will be begun this week. Lists sent to the trade for bids totalled about 900 machines. The Simplex Automobile Co., New Brunswick, N. J., may begin placing orders at any time, and will need about 200 machines, about 100 of which were included in its recent list, and a second list will be issued soon. The Trego Motors Corporation, New Haven, Conn., has about concluded its buying, which is understood to have included about 100 machine tools.

Gun plants are large buyers, particularly in Philadelphia. The Tacony Ordnance Corporation has closed for the greater part of its list of machine tools for the rough machining of gun forgings, and will probably place an order this week for 21 cranes needed for open-hearth furnace building, forge shop and machine shop. The Taylor-Wharton Iron & Steel Co., which is building a large addition at its Tioga plant, Philadelphia, did not cover all of its requirements in its recent purchases, and will be in the market for other equipment as soon as its needs for gun forging and machining are fully known. The Standard Steel Works Co., Philadelphia, has issued lists for additional purchases of machine tools for its Burnham, Pa., plant, where 6-in. guns will be forged and rough machined. Most of this buying will be done in Philadelphia. A large part of the orders of the Bullard Machine Tool Co., Bridgeport, Conn., has been placed in New York and New England. The total purchases of the company are said to aggregate $750,000 and about $1,000,000 worth in all will be bought. The American Brake Shoe & Foundry Co., Erie, Pa., has been placing additional orders in New York for its gun plant. The Inland Ordnance Co., Bedford, Ohio, has been doing considerable buying in Cleveland. A manufacturer of the Central West has placed an order for 60 turret lathes for making rifle grenades and attachments for putting on the end of rifles for loading these grenades.

The impression prevails in the trade that the Government is now having difficulty in finding manufacturers who are in a position to take on ordnance and munition work. A number of large projects are pending, but negotiations have not yet reached a point that announcements can be made as to plans. Several companies in the East have been quietly inquiring for equipment and are expected to come into the market soon. Three of these projects are for machining of guns. A Government representative recently visited a number of large metal-working plants in Cincinnati and vicinity to make arrangements for the building of gun mounts, but is said to have met with little success owing to the overcrowded conditions of plants having suitable equipment for this work.

Little information has yet come to builders of cranes and plate-working machinery as to the requirements of the two shipyards to be established by the American International Corporation, at Hog Island, near Philadelphia, and by the Submarine Boat Corporation and Lackawanna Bridge Co., near Newark. Inquiries at the offices of these companies have revealed that they are not yet ready to proceed with the buying of equipment. It is presumed likely that these two plants will require a large number of cranes. Lists are expected within a week. Christoffer Hannevig, Inc., 139 Broadway, New York, which owns controlling interests in the Pennsylvania Shipbuilding Co., New Jersey Shipbuilding Co. and the Pusey & Jones Co., has chartered the Newfoundland Shipbuilding Co., Harbor Grace, Newfoundland. Wooden ships will be built in the immediate future, but a steel shipbuilding plant is being planned and complete equipment will be required. The company is now inquiring through the Norbom Engineering Co., Philadelphia, for five three-ton overhead electric cranes of 60-ft. span. A new shipbuilding company has been organized at Kingston, N. Y., by John Schoolmaker and associates, and will build small vessels for the Government. Equipment for fabricating steel will be bought and tools for machine shop. The Fort Mifflin Shipbuilding Co., Philadelphia, which has been promoted by men experienced in shipbuilding, has acquired a site in Philadelphia, and if certain expected contracts are closed, will come into the market in about 30 days for complete equipment for a modern plant. The Federal Shipbuilding Co., New York, is reported to have bought a large number of second-hand machines in Canada. This company has placed an order with the Norbom Engineering Co., Philadelphia, for 10 plate punch tables.

There is a good volume of miscellaneous business in all markets, but the past week was not as productive of new inquiries of large size as previous weeks. The Ingersoll-Rand Co. is buying for its plant at Johannesburg, South Africa. The Tock Screw Machine Products Co. has been buying screw machines for its new factory at Long Island City, N. Y. The Autocar Co., Ardmore, Pa., is placing orders and will buy about $200,000 worth of new equipment for additions to its plant. The North American Motors Corporation, Pottstown, Pa., is inquiring in Philadelphia and will probably buy soon for a Government shell contract. The Budd Mfg. Co., Philadelphia, the Wright Roller Bearing Co., Philadelphia,

the Nice Ball Bearing Co., Philadelphia, the Silvex Co., Hellertown, Pa., and the Keystone Motor Mfg. Co., East Greenville, Pa., are inquiring or buying in the Philadelphia market. The Rock Island Arsenal has been a persistent buyer in Chicago. The Western Rope & Mfg. Co., Milwaukee, Wis., the Edward Valve & Mfg. Co., East Chicago, Ill., and the Canadian Car & Foundry Co., Jeffersonville, Ind., have been buying in Chicago.

Many crane builders are indifferent to new inquiries because of the sold-up condition of their plants. Bids for eight cranes for the Watertown Arsenal were opened by Stone & Webster, Boston, last week. The Link-Belt Co. is building eight gantry cranes for use in France. The Fore River Shipbuilding Corporation, Quincy, Mass., is in the market for a few small cranes.

Commandeering by the Government of machine tools and cranes continues, though it has not been necessary to resort to this method to a very great extent. Some confusion has resulted from the practice of the Government to hold up the placing of orders until long after the time specified in the bids. In not a few instances the Government has been notified that it has delayed too long and that meanwhile prices have been advanced. The result in such cases is that the Government places the order at the bid price, commandeers the tools, pays 75 per cent of the price and advises the seller to put in a claim for the remaining 25 per cent, with a statement showing on what additional material and labor costs the advance in price is based.

New York

NEW YORK, Sept. 11.

The New York machinery trade has been more nearly in a waiting attitude during the past week than at any time since the United States entered the war. There was almost an entire absence of large new business, though many rumors are in the air as to pending projects. The interest in the recent list of the General Vehicle Co., Long Island City, N. Y., is widespread and machine-tool offices have been busy preparing estimates on the tremendous requirements of this company. It is expected that orders will be placed this week for many of the tools. All will be motor-driven and the order for motors alone will be a large one. Likewise, the machine-tool trade is still waiting for the Simplex Automobile Co., New Brunswick, N. J., to close on about 100 tools, for which lists were recently issued. The Simplex plant will probably require about 200 new tools, and another list is expected soon. The Trego Motors Corporation, New Haven, Conn., is reported to have closed for a large part of its requirements, totaling about 100 machine tools.

The Bullard Machine Tool Co., Bridgeport, Conn., has closed for about $750,000 worth of equipment, and will purchase more, about $1,000,000 worth in all, according to reports. The American Brake Shoe & Foundry Co., Erie, Pa., has been buying during the week for its gun-machining plant. Other concerns are now negotiating with the Government to machine heavy guns, but matters are still too indefinite for publication.

The American International Corporation and the Submarine Boat Corporation, which will build plants at Philadelphia and at Newark for building steel ships for the Emergency Fleet Corporation, have not at this time proceeded far enough with their plants to discuss the subject of equipment. Concerns inquiring at their offices have been asked to take the matter up again in about a week. It is reported that the orders for cranes will be very large. The Federal Shipbuilding Co. has bought 10 plate punch tables from the Norbom Engineering Co., Philadelphia, and is said to have obtained considerable second-hand machinery in Canada.

Christoffer Hannevig, Inc., 139 Broadway, New York, which owns the controlling interest in the Pennsylvania Shipbuilding Co., the New Jersey Shipbuilding Co. and the Pusey & Jones Co., has organized the Newfoundland Shipbuilding Co., which is building a plant at Harbor Grace, Newfoundland. This concern has sent out an inquiry, through the Norbom Engineering Co., Denckla Building, Philadelphia, for five 3-ton overhead electric cranes of 60 ft. span. Deliveries in four months are asked.

John D. Schoolnaker and associates, Kingston, N. Y., have organized a shipbuilding company and will build small steel vessels for the United States Government. Some equipment has been bought, and it is understood the company will be in the market for plate-working machinery for a fabricating shop. The Oltmer Iron Works, Hoboken, N. J., is in the market for punching and shearing machinery for its fabricating plant.

The Tock Screw Machine Products Co., Long Island City, N. Y., is buying screw machines for its new plant.

The Link-Belt Co., Philadelphia, has received an order for eight gantry cranes for use in France. The Union Pacific Railroad has closed for five cranes. The Fore River Shipbuilding Corporation is in the market for a few small cranes. Stone & Webster, Boston, on Thursday last, opened bids for eight cranes for the Watertown Arsenal. There were several bidders. The cranes wanted are four 10-ton, one 20-ton, one 30-ton and two 40-ton.

The Ingersoll-Rand Co., New York, is buying for its plant at Johannesburg, South Africa.

The W. F. Davis Machine Tool Co. has moved its offices from the fourth floor of the Singer Building to the ninth floor, where considerably more space has been taken.

The Morse Dry Dock & Repair Co., 17 Battery Place, New York, has awarded a contract for the erection of its new two-story machine shop about 100 x 200 ft., at First Avenue and Fifty-sixth Street, Brooklyn, to cost $50,000.

The Prospect Tool & Machine Co., New York, has been incorporated with a nominal capital of $5,000 to manufacture engines and boilers, machine shop and foundry supplies. J. H. Hamer, J. R. Zimmerman and M. Biedermann, 521 East 149th Street, are the incorporators.

The Todd Shipyard Corporation, 15 Whitehall Street, New York, is having revised plans prepared for its proposed new three-story building about 100 x 150 ft., to be erected on Third Avenue, near Twenty-fourth Street, estimated to cost $70,000.

The Laparmentier Shipbuilding Corporation, New York, has been incorporated with a capital of $20,000 to operate a local shipbuilding plant. E. T. Child and J. Boero, 1482 Broadway, are the principal incorporators.

The R. & L. Bearings Co., New York, has been incorporated with a capital of $10,000 to manufacture journal bearings and allied specialties. P. B. Rose, L. L. Lichstenstadter and L. Biel, 885 West End Avenue, are the incorporators.

The Premier Metal Etching Co., Long Island City, N. Y., will erect a two-story and basement building, about 75 x 210 ft., at Van Alst Avenue and Fourteenth Street, Long Island City, at a cost of about $75,000.

The Hudson Brass Works, 16 Nassau Street, Brooklyn, N. Y., has increased its capital from $15,000 to $150,000.

The Karmel Mfg. Co., Brooklyn, has been incorporated with a nominal capital of $5,000 to manufacture metal ware products. C. Marx and C. Karmel, 242 Ainslie Street, are the incorporators.

The Rolls-Royce Co., Ltd., 671 Fifth Avenue, New York, manufacturer of automobiles, has acquired property at Harris Avenue and Sunswick Street, Long Island City, for a new repair works. A one-story, reinforced-concrete building will be erected, about 100 x 135 ft.

The Automatic Straight Airbrake Co., New York, has been incorporated in Delaware with a capital of $25,000,000 to manufacture airbrakes. Louis C. Haggerty, Herbert H. Ramsay and Thomas J. Ward, New York, are the incorporators.

The Grand Talking Machine Co., Brooklyn, has been incorporated with a nominal capital of $5,000. S. H. Gottlieb and H. A. Kaplan, 230 West Fourteenth treet, are the incorporators.

Charles Kaiser, 216 Himrod Street, Brooklyn, has had plans prepared for a one-story building about 20 x 40 ft., on Prospect Avenue, near Woodbine Street, to manufacture thermometers.

The American Mailing Machine Co., New York, has been incorporated in Delaware with capital of $250,000 to manufacture automatic sealing and stamping machines. Arthur W. Britton, Samuel B. Howard and John A. Moore, New York, are the incorporators.

The Single Service Package Corporation of America, 326 Hudson Street, New York, has had plans prepared for the erection of a plant on the Saw Mill River Road, Yonkers, N. Y. A. R. Turner is president.

The Clark & Norton Mfg. Co., South Main Street, Wellsville, N. Y., manufacturer of gas engines and oil well machinery, has increased its capital from $165,000 to $215,000.

The General Electric Co., Schenectady, N. Y., is reported to be planning for the construction of a new plant at Cold Spring, N. Y., the coming year. J. A. Wood, 50 Church Street, New York, is consulting architect.

The Jamestown Auto Parts Mfg. Co., Jamestown, N. Y., is building a two-story addition to its plant on Steele Street. Oscar Lanna is president.

The Porter-Cable Machinery Co., 501 East Water Street, Syracuse, N. Y., manufacturer of machinery and machine tools, has acquired a portion of the factory of the Harvey A. Moyer Co., carriage manufacturer, at North Salina and Free Streets, consisting of a five-story building, about 60 x 150 ft., and a smaller two-story structure. It will be used for increasing the capacity and is expected to give employment to about 150 additional men. Walter A. Ridings heads the company.

The Continental Can Co., Syracuse, has awarded a contract for the erection of an addition to its plant at East Water Street and University Avenue, to cost about $60,000.

The Buffalo Truck & Tractor Co., Buffalo, has been incorporated with a capital of $150,000 to manufacture motors, trucks, etc. G. B. Burd, Buffalo, E. H. Oversmith, and S. B. Simpkins, are the incorporators.

The Delwood Elevator Co., Buffalo, manufacturer of elevators, etc., has increased its capital from $10,000 to $450,000.

A one-story, brick and steel power plant, 50 x 160 ft., will be erected by the Curtiss Aeroplane & Motor Co., in connection with its new works on Elmwood Avenue. The Austin Co., Cleveland, has the contract.

The Ford Motor Co., Highland Park, Detroit, is having plans prepared for the construction of a four-story reinforced-concrete assembling plant on Newark Bay, Kearney, N. J. G. Plaintiff, 1723 Broadway, New York, is manager.

The National Hoisting Engine Co., 313 Manor Avenue, Harrison, N. J., has awarded a contract for an addition to its machine shop to cost about $20,000.

The Crucible Steel Co., Harrison, N. J., will erect a brick and steel press and forge shop addition, about 225 x 425 ft., to cost approximately $390,000.

The Air Reduction Co., 120 Broadway, New York, is taking bids for the construction of a two-story reinforced-concrete addition, about 75 x 100 ft., to its plant on Pacific Avenue, Jersey City, N. J.

The D'Amour Machine Co., 239 Washington Street, Jersey City, has been incorporated with a capital of $100,000 to manufacture machinery. The incorporators are Edward D'Amour, Brooklyn; H. C. Gilson, and Otto E. Enell, Jersey City.

New England

BOSTON, Sept. 10.

For the first time in several weeks the local machine tool market has been enlivened by the issuing of two big inquiries originating in New England. One list is for equipment for a plant of an electric company and calls for 99 items, mostly large sizes of boring mills, lathes, planers, milling machines, radial drills and some other equipment. Both lists are being held confidential. The latter is issued by a local corporation acting in behalf of the Government and the machine tools are to be used in a gun repair plant to be established by the Government. The inquiry is for a complete equipment for a large machine shop, calling for motor-equipped tools and for delivery in November.

The situation in most New England machine building plants is unchanged and the inquiries that have been pending for weeks, and in some cases for months, are still inactive, as the expected Government contracts have not been placed. The production of some plants is becoming somewhat demoralized as they have refrained from taking large orders from private industries in the expectation that they were to devote their energies largely to Government work.

The feeling is well-defined that huge Government business will soon be forthcoming and the demand for labor will be such that wages will again soar. The calling out of drafted men for examination continues a disturbing influence and as men well down on the draft lists are being summoned, manufacturers are being more strongly impressed that the integrity of their skilled working force is being seriously threatened, for the attitude of the appeal boards shows no disposition toward exemption under industrial appeal unless the appeal is strongly fortified by indisputable evidence of the need of such exemption.

The Torrington Co., Torrington, Conn., as one of its steps in changing from a holding to an operating company, has taken over the plants of the Excelsior Needle Co. in Torrington and in Chicopee, Mass.

The American Brass Co. has awarded a contract for a one-story building, 173 x 200 ft.

The Wright Wire Co., Worcester, Mass., is putting in the foundation for a tempering building, 92 x 200 ft., one story, at its Palmer, Mass., plant.

The Chase Metal Works, Waterbury, Conn., has begun the erection of a one-story building, 60 x 120 ft.

The Chase Rolling Mills Co., Waterbury, Conn., is erecting a storage building, 67 x 74 ft., on Orange Street.

The Heald Machine Co., Worcester, Mass., has awarded contracts for an addition to its machine shop, to cost $30,000.

The Jones & Lamson Machine Co., Springfield, Vt., has awarded contracts for a machine shop, one story, 120 x 400 ft., and a power house one story, 30 x 60 ft.

The Rimmon Eylet Co., Seymour, Conn., has awarded a contract for a two-story factory, 50 x 125 ft.

The Klinch Mfg. Co., Boston, has been incorporated with authorized capital stock of $40,000 to manufacture hardware, metal and woodenware. Frank S. Elliot is president and Irvin L. Lindabury, Malden, Mass., treasurer.

The Waltham Watch Co., Waltham, Mass., is building a one-story addition, 35 x 150 ft.

The plant of the East Greenwich Iron & Metal Co., East Greenwich, Conn., was destroyed by fire, Sept. 6.

The National Foundry Co., East Whitman, Mass., has begun the construction of a one-story addition, 60 x 100 ft.

The New Remington Rifle Co., Bridgeport, Conn., has been incorporated with capital stock of $100,000 to manufacture fire arms. The incorporaters are Francis E. Jones and John T. Robinson, both of Hartford, and George F. Jebbett of New York.

The Graton & Knight Mfg. Co., Worcester, Mass., is building a storage building, 126 x 176 ft., three stories.

The Harriman Motors Co., South Glastonbury, Conn., which has a contract to build 1200 heavy airplanes for the Government, is reported to be about to move to Southington, Conn., where it will occupy the factory buildings of the Barnes & Kobert Mfg. Co., recently vacated. A tract of land consisting of nearly 100 acres of level ground has been secured near the factory for use as a proving ground.

The Houstatonic Shipbuilding Co., Bridgeport, Conn., has secured from the Government a contract for 10 3000-ton ships at a lump sum of $3,100,000. Work on the vessels will begin at once and the contract calls for delivery within 18 months. Simon Lake of the Lake Torpedo Boat Co., Bridgeport, and Archibald and Kenneth McNeil of the same city are officers of the company.

Philadelphia

PHILADELPHIA, Sept. 11.

The machine-tool requirements of the new gun-forging plants in or near Philadelphia are occupying the attention of the Philadelphia machinery trade. The Tacony Ordnance Corporation has closed for nearly all of the machines on its recent list, but has not yet bought the 21 cranes it inquired for. The Taylor-Wharton Iron & Steel Co., which is building a large addition to its Tioga plant, Philadelphia, for forging guns, will soon issue a list of further requirements, being in addition to orders which have been placed for about $300,000 worth of machine tools and several cranes, as mentioned last week. The Standard Steel Works Co., Philadelphia, has issued lists of machine tools it will buy for gun-forging work at its Burnham, Pa., plant.

Miscellaneous buying in this market continues at a good rate. The Autocar Co., Ardmore, Pa., is in the market and will complete purchases soon for about $200,000 worth of machine tools for additions to its motor truck plant. The North American Motors Co., Pottstown, Pa., now engaged in making truck motors, will make shells for the United States Government and will need considerable new equipment. The Budd Mfg. Co., Philadelphia, whose regular line is automobile bodies, will make pressed steel wheels for trucks, and will be in the market for the necessary machinery. The Wright Roller Bearing Co., Philadelphia, is buying some tools and inquiring for others for the equipment of a contemplaated large addition to its plant. The Nice Ball Bearing Co., Philadelphia, is building a new plant and has bought some of its equipment. Purchases are being made by J. L. McMichael, purchasing agent, Land Title Building. The Silvex Co. is buying for a new plant to be completed soon at Hellertown, Pa. The Keystone Motor Mfg. Co., East Greenville, Pa., has about completed an addition and is expecting a contract to make airplane engine parts. As soon as this contract is closed, new equipment will be bought. The Hero Mfg. Co., Philadelphia, which has a Government contract for gas masks has bought some machines, mostly for metal stamping.

The Fort Mifflin Shipbuilding Co., Widener Building, has acquired a shipbuilding site of 178 acres at a point near the junction of the Delaware and Schuylkill rivers, and if certain expected contracts are closed, will proceed soon with the erection of a shipbuilding plant. Present plans are for six berths, but the land affords room for 16. The company expects to come into the market for cranes and shop machinery in about 30 days. L. H. Swind, president Swind Machinery Co., Widener Building, is a director of the concern. So far as can be learned no inquiries have appeared in this market for the new ship-assembling plant of the American International Corporation on Hog Island. It is expected that 50 or 100 cranes will be required in addition to plate-working machinery. Most of the steel for the ships will come to the yard already fabricated.

L. R. Duffield, superintendent of the machinery exhibition in the Bourse, Philadelphia, says that France is buying, or attempting to buy, millions of dollars' worth of steel and machinery in this country, and that orders are going begging because of inability of the American manufacturers to fill them at once. During the past 30 days, he says, inquiries have been received at offices in the Bourse for more than $1,000,000 worth of steel and machinery, half of which have come from France, and the remainder from South American countries, Sweden and Norway. Mr. Duffield predicts that France will come into this market for large quantities of industrial machinery and that after the war that nation will become a greater manufacturing country than ever before.

The Electric Service Supplies Co., Seventeenth and Cambria Streets, Philadelphia, manufacturer of electrical specialties, will erect a three-story addition, about 65 x 80 ft., at a cost of $21,000.

John Kearns, and associates, Philadelphia, have incorporated in Delaware the National Airoil Burner Co., with capital of $75,000, to manufacture oil burners.

The proposed new shipbuilding plant of the American International Corporation, 120 Broadway, New York, to be erected on Hog Island, near League Island, Philadelphia, will be used for the construction of steel vessels of about 7500 tons capacity for the Emergency Fleet Corporation. The works, it is said, will comprise fabricating shops, machine plant, riveting shops, etc., and will be one of the largest plants in this section devoted to Government shipbuilding. The company also operates the New York Shipbuilding Corporation, 120 Broadway, New York, with works at Camden and Gloucester City, N. J. At this latter location the company has commenced the construction of new shipways and auxiliary structures to provide for the immediate building of two battle cruisers for the Government.

The Auto Radiator Co., Philadelphia, manufacturer of automobiles and parts, will erect a two-story brick and stone addition, about 30 x 80 ft., at its plant on Vine Street.

The Allied Motor Truck Co., Philadelphia, has been incorporated with a capital of $25,000 to manufacture motor trucks. T. Frank Mullin is the principal incorporator.

The Jacob Gerhab Co., Philadelphia, has been incorporated with a capital of $167,000 to manufacture automobiles and parts. William Gerhab is the principal incorporator.

The Barrett Mfg. Co., Bermuda Street, Philadelphia, has commenced the erection of a new one-story addition, about 100 x 200 ft., to cost $50,000. W. M. Childs is president.

The American Ice Co., Sixth and Arch Streets, Philadelphia, is having preliminary plans prepared for its new two-story ice manufacturing plant to be erected at Tenth and Callowhill Streets, at a cost of about $250,000. A. N. Reuteschlin is engineer.

A. Schoenhut & Co., Adams Street, Philadelphia, manufacturers of toys, will build a new two-story plant at Venango and Amber Streets. Bids for erection are now being taken. Ballinger & Perrot, Seventeenth and Arch Streets, are the architects.

The Tacony Ordnance Corporation, Philadelphia, a subsidiary of the Tacony Steel Co., Milnor and Bleigh Streets, is taking bids for the erection of a two-story building, about 44 x 50 ft. It is said to be having plans prepared for a one and two-story shop building to cost about $450,000. Thomas B. Lippencott, Philadelphia, is architect.

The Chester Shipbuilding Co., Chester, Pa., will build a new two-story punch shop at its works at the foot of Kerlin Street.

The Bearings Co. of America, Manheim Pike, Lancaster, Pa., manufacturer of bearings, is having plans prepared for two one-story additions, about 38 x 80 ft., and 30 x 45 ft.

O. D. Harvard, Allentown, Pa., has closed negotiations with the local Chamber of Commerce for the establishment of a plant for the manufacture of meters and kindred recording apparatus.

The Bethlehem Motor Truck Corporation, Allentown, Pa., a Delaware corporation, has filed notice of change in its name to the J. M. Meek Corporation. The company has been building a new plant fronting on the Central Railroad of New Jersey for the manufacture of automobile trucks.

The Bowen Anchor Co., Morton, Pa., is taking bids for the erection of a foundry 90 x 200 ft., for steel casting work, pattern shop 25 x 70 ft., and office building 25 x 45 ft., estimated to cost about $75,000. The H. C. Eisenbise Co., Pennsylvania Building, Philadelphia, is engineer.

A two-story power plant will be erected at the new factory of the Ebert Furniture Co., Glen Rock, Pa.

The Bramcote Foundry & Machine Co., Pottstown, Pa., specializing in general foundry and machine work, is building extensions to its plant to increase the present capacity. A new machine shop will be constructed to be about 50 x 120 ft. An addition to the molding department is nearing completion, providing for over 7000 sq. ft. of additional floor space, while a new core room, 25 x 40 ft., equipped with core oven, is now ready for occupancy.

The Reading Chain Block Co., Reading, Pa., manufacturer of chain blocks and specializing in iron and steel castings, has commenced the erection of a two-story building about 25 x 150 ft., and a one-story building, 20 x 110 ft., to cost about $25,000. F. H. Howard is president.

The Gurney Electric Elevator Co., Main Street, Honesdale, Pa., manufacturer of elevators, hoists, etc., is now operating its plant under 24-hr. service at full capacity. An order has recently been received from the Government for 18 electric passenger elevators.

The Mount Holly Paper Mills, Mount Holly, Pa., will build a one-story addition to its machine shop, about 30 x 150 ft., to cost $10,000.

J. H. Choetham, 536 Penn Street, Reading, Pa., has awarded contracts for the erection of a new two-story machine shop at Carpenter and Cherry Streets, to cost about $5,000. Calvin J. Young, 520 Washington Street, is architect.

The Scranton Foundry & Engine Works, Scranton, Pa., manufacturer of marine engines, shafting, propellers, etc., is planning for extensions in its plant for increased capacity. The company, a New York corporation, has increased its capital from $100,000 to $700,000 and authorized an issue of $150,000 of preferred stock to provide for expansion. New York offices are at 5 Nassau Street.

The Valley Railways Co., Wormleysburg, Pa., has acquired property in the vicinity of Walnut Street, and is reported to be planning for the erection of new car repair shops and electric power station.

Baltimore

BALTIMORE, Sept. 9

Efforts are being made by Mayor James H. Preston and others to secure one of the big shipbuilding plants to be established by the Government. Officials have investigated several sites, but no definite decision has been reached.

The Cape Fear Shipyards Co., Wilmington, N. C., has been incorporated with $100,000 capital stock by Edward D. Langley, Frank Viola and Frank Armstrong, all of New York. It is understood property has been secured at Cape Fear and North East Rivers.

The Continental Automatic Sprinkler Co., Richmond, Va., has been incorporated with $300,000 capital stock. William E. Word is secretary.

Rich Brothers, 221 West Pratt Street, Baltimore, are in the market for a hack saw to cut up to ½ in. square bars and a press to punch stock up to ⅛ in. thick, for both soft and spring steel. The company also desires manufacturers' catalogs of drill presses, punching machines and power hack saws, both new and second hand.

The Baltimore Hub-Wheel Mfg. Co., Fallsway and Gay Streets, Baltimore, will make alterations and improvements in its plant to cost about $3,500.

The Valk & Murdock Co., Charleston, S. C., is planning for the construction of a new floating dry dock, about 100 x 440 ft., together with shop buildings to provide for additional capacity at its plant on the Cooper River. The dry dock will be designed to hold vessels of 8000 ton type.

The Hampton Roads Shipbuilding & Dry Dock Co., Norfolk, Va., recently incorporated with a capital of $1,000,000, is planning for the construction of a shipbuilding plant at West Norfolk, on a branch of the Elizabeth River. The proposed works will include shipways, machine shops, construction buildings and other plant structures. Gaylord W. Feaga is president of the company.

The Stopshock Wheel Co., Washington, D. C., has been

incorporated in Delaware with a capital of $500,000 to manufacture shock absorbing hubs for automobiles, wheels, etc. Walter S. Sergeant, Washington, is the principal incorporator.

The Pyrites Co., Ltd., Christiana Avenue, Wilmington, Del., is planning for the erection of a one-story addition to its works, about 35 x 50 ft., to cost $4,000.

The Wilmington & Philadelphia Traction Co., Wilmington, Del., is planning for the erection of an addition to its power plant at Eighteenth and Buena Vista Streets.

The Chesapeake & Ohio Railroad, Richmond, Va., is planning for the erection of new car and locomotive shops at its Russell, Ky., yards, estimated to cost about $1,000,000.

The American Chain Co. of Virginia, Norfolk, Va., has been incorporated with a capital of $1,000,000, as a subsidiary of the American Chain Co., Bridgeport, Conn. The company has acquired a site and will build a plant to cost about $250,000. Tazewell Taylor is president.

Chicago

CHICAGO, Sept. 10.

The volume of business that is coming to dealers is satisfactory, despite the absence of new inquiries embracing large groups of machines such as have been common in the East. While a number of firms, most of which have been mentioned from time to time, have taken notable war orders, it is generally admitted that as a whole they look small in comparison with those placed in Eastern centers. Some companies which are making munitions for the United States will buy but little new equipment, as they possess all they need in the tools with which foreign orders were filled. If the West is to receive orders which would necessitate the purchase of large groups of small machines, buying has hardly started, this being the view of an authority in the trade. Of course, as heretofore reported, large orders have been placed for tractors, ordnance and gun mounts, and in a few cases for shells and fuse parts.

Heavy tools continue in the greatest demand, but second-hand stocks have been well cleaned up, and the deliveries on new machines are far off. Shipbuilding is largely responsible for the great call for punching and shearing machines, etc.

The Rock Island Arsenal has been a persistent buyer, and is distributing its orders in a way that gives something to most of the dealers. Considerable business has been placed in Chicago by Milwaukee interests, one of these being the Western Rope & Mfg. Co., 809 St. Paul Avenue, that city, formerly of Tulsa, Okla., which has bought machines for turning gas engine crankshafts.

The Edward Valve & Mfg. Co., East Chicago, will make a large number of valves and brass fittings for submarine-boat destroyers in addition to a Government order for fuse parts. The United States Ball Bearing Mfg. Co., Chicago, also is working on fuse parts.

The Canadian Car & Foundry Co. has bought a few machines for delivery to its plant at Jeffersonville, in southern Indiana.

In the last three months permits filed for new factories and additions in Chicago represent a value of $5,000,000. Of especial interest is the large number of small plants which have enlarged facilities. Included in the figures above are factories of various descriptions and some structures of a non-productive character, such as warehouses. New construction in general did not make a good showing in August, as the permits issued were less in number and estimated cost than in any month in 10 years. The August permits represented 374 buildings, involving a total estimated cost of $4,277,650, as compared with 758 buildings and $5,783,000 for the corresponding month a year ago, a decrease last month of 384 buildings and $1,505,350, or 26.03 per cent.

The George B. Lembert Co., 154th Street and Todd Avenue, East Chicago, Ind., has awarded the contract for a one-story pipe-bending shop and a one-story boiler house, to cost $11,000.

One of the machine shops of the McCormick Works, International Harvester Co., West Fourteenth Street and Western Avenue, Chicago, was damaged by fire Sept. 3 to the extent of $25,000.

The plant of the Chicago Drop Forge & Foundry Co., 116th Street and the Illinois Central Railroad, South Chicago, which has been idle for several months, has been purchased by Theodore Friedeberg, but no announcement has been made as to what use will be made of it. The plant embraces several one-story buildings.

William H. Pruyn, architect, 122 South Michigan Avenue, has taken bids on revised plans for the one and two-story factory, 100 x 600 ft., to be erected at Gary, Ind., for the International Airship Corporation, and it is expected that work will be started within 30 days. M. H. Cain, Gary Building, Gary, is secretary. The plant will cost $100,000 exclusive of three hangars.

The Charles W. Gindele Co., 3333 South La Salle Street, Chicago, has been awarded the general contract for a one-story shop, 157 x 203 ft., at 800 North Crawford Avenue, Austin, for the Chicago & Northwestern Railway, to cost $100,000.

The Swager Vaporizer Co., Saunemin, Ill., has been incorporated with a capital stock of $4,000 to manufacture a kerosene vaporizer for oil engines, the invention of Benjamin Swager. Mr. Swager, C. L. Tanner and C. R. Holdridge, all of Saunemin, are the incorporators.

The Weaver Mfg. Co., Springfield, Ill., will erect a one-story brick addition, 95 x 125 ft., which will be devoted to the manufacture of automobile specialties.

Plans have been revised for the four-story and basement factory to be erected for A. C. Ehman, president Ehman Tire & Rubber Co. and Vail Rubber Co., 142 West Twenty-seventh Street, Chicago. It will be of reinforced concrete construction, with metal trim and sprinkler system.

The Southern Illinois Machine & Foundry Co., Murphysboro, Ill., has had plans prepared for a new foundry and forge plant extension to cost about $35,000, exclusive of equipment. H. A. Bastien is secretary.

Milwaukee

MILWAUKEE, Sept 10.

Business booked by machine-tool builders the past week is probably the largest in the history of the local industry. Shops are fairly swamped by the overwhelming rush of orders for Government contracts which began about 10 days ago. The demand is especially broad for milling machines and comes from a variety of sources, in which airplane builders in the East predominate. Makers of milling tools are so rushed with business that even the increased facilities provided the past year are wholly inadequate, and more extensions are being planned for immediate construction.

Pressure upon the tool industry is the strongest ever known, but distinctions are being drawn between buyers identified with the Government and private shops, although it would appear that practically every purchaser is executing Government contracts.

The labor situation is comparatively favorable. There is no surplus of skilled men, however, and it is difficult to procure an adequate supply of unskilled workers.

The Oneida Motor Truck Co., Green Bay, Wis., is taking bids through Foeller & Schober, architects, for the erection of its new one-story plant, of brick, steel and concrete, 125 x 475 ft., with a separate office building and transformer house, to cost about $150,000. L. P. Fortin is works manager.

The Wisconsin Gun Co., Milwaukee, is taking bids for the erection and equipment of a one-story transformer house 25 x 66 ft., for its new ordnance manufacturing plant at Thirty-fifth Avenue and Burnham Street.

The Racine Motor Truck Co., Racine, Wis., manufacturing motor trucks in leased quarters in that city, is negotiating for a site in Milwaukee for its proposed new manufacturing plant, to cost about $100,000. It will be equipped for the production of truck and tractor axles, transmissions and other parts. Ira L. Miller is president.

The Kempsmith Mfg. Co., Milwaukee, manufacturer of milling machines, has increased its capital stock from $300,000 to $350,000 to accommodate the rapid increase in business. Four months ago $100,000 was added to its capital. The plant has been doubled in size the past year, due to the enormous demand for milling machines. Paul E. Thomas is president and general manager.

The International Harvester Co. of America, Milwaukee, has awarded contracts for the construction and equipment of a new core building, 80 x 240 ft., estimated to cost $100,000, at 784 Park Street.

The Townsend Mfg. Co., Janesville, Wis., maker of gas and kerosene engines, farm tractors and other machinery, has plans for a machine-shop extension, 50 x 200 ft., which will enable it to double its output. The business was established three years ago and was incorporated in August with $125,000 capital. A production of 200 engines and 600 tractors is planned for the coming year. R. B. Townsend is president and general manager.

The Jorgenson Mfg. Co., Waupaca, Wis., recently incorporated with a capital stock of $75,000, is moving its machine-shop and works from Tustin, Wis., to Waupaca. It will specialize in the manufacture of automobile and gas engine specialties. P. J. Jorgenson is president and general manager.

The Gillette Rubber Co., Eau Claire, Wis., has increased its capital stock from $1,000,000 to $2,500,000. The company was incorporated in Maine and is building a tire and

rubber goods manufacturing plant at a cost of $200,000. R. B. Gillette is vice-president and secretary.

The Western Steel & Iron Co., DePere, Wis., manufacturer of steel barn equipment, agricultural tools, etc., is installing considerable new machinery and will make further purchases from time to time. The capacity of the plant is being increased about 35 per cent.

The Marvel Clutch Co., Milwaukee, has been incorporated with a capital stock of $25,000 by David Schwartz, Markus Tenner and Carl J. Nelson.

The New Way Machine Co., Eau Claire, Wis., recently incorporated with $60,000 capital stock, will take over the business of Wege Brothers, Minneapolis, Minn., manufacturers of a combination farm truck-tractor and concrete mixer. The works have been moved from Minneapolis to Eau Claire. The officers are: President, E. Wege; vice-president, J. Heintz; secretary-treasurer, Grant Haas.

The Hamilton-Beach Mfg. Co., Racine, Wis., manufacturer of electric appliances and devices, which erected a new plant within the last 18 months, is about to award contracts for the erection of a three-story reinforced concrete and brick addition, 80 x 150 ft., to cost about $80,000. Fred J. Osius is president and general manager.

The J. J. Vollrath Mfg. Co., Sheboygan, Wis., manufacturer of enameled sanitary ware and plumbers' goods, is erecting a foundry, which will be ready for operations before Oct. 1. The company has been building a new plant and the foundry will be the last unit to be moved from the old site at North Fifth Street and Huron Avenue.

Detroit

DETROIT, Sept. 10.

The machine-tool market remains normal with no large orders placed the past week. Local automobile plants as a rule are well supplied with business. The manufacture of airplanes gives promise of becoming one of the leading industries of the city. Deliveries are improving on standard machines and, in general, machine-tool men are optimistic regarding fall prospects. Labor is in unusual demand and wages are high.

The Air-O-Flex Automobile Corporation, Penobscot Building, Detroit, has been organized to manufacture trucks with flexible suspension. John Ericson, Robert A. Weinhardt, Irving A. Cowles and others are interested in the enterprise.

The Lansing Forge Co., Lansing, Mich., incorporated with $100,000 by Eastern capital, has taken over the plant of the Emergency Drop Forge Co., which it will rebuild and operate on an enlarged scale. J. J. Callaghan, Detroit; E. M. Reifor, Pittsburgh, and Charles W. Nichols, a Lansing attorney, are the incorporators. Mr. Callaghan will be manager.

The Cook Car Journal Cooler Co., Flint, Mich., suffered a loss of several thousand dollars by fire, Sept. 1.

The Saginaw Shipbuilding Co., Saginaw, Mich., announces that its plants will be located on 20 acres of land with a 2000-ft. water frontage immediately north of Sixth Street. Plans and specifications have been completed and are ready for bids.

W. H. Kelly, formerly connected with the Bay City Body Co., and J. P. Friend are organizing a company in Bay City, Mich., for the manufacture of auto body covers. A portion of the Pioneer Boat Co.'s plant has been secured.

Plans are under way to bring to Grand Rapids, Mich., the E. R. Hayes Axle Co., Oshkosh, Wis., capitalized at about $500 000, which will mean a new industry in the automobile line. If plans go through, buildings will be erected on a five-acre site at a cost approximating $100,000, and the Grand Rapids Malleable Iron Co. will make extensions and increase its force to 200 men to take care of its relations with the axle company.

The Grand Rapids School Equipment Co., Grand Rapids, Mich., is assembling material for an order of 6400 motor truck bodies for the Government and will begin manufacturing in October. The first delivery will be in December and it is expected the production will be at the rate of 1000 a month.

The Grand Rapids Auto Products Co., Grand Rapids, Mich., has been organized with a capital of $10,000 to manufacture automobile parts. The stockholders are Harry C. Bennett, Robert J. Whyte, Christopher M. McCarthy and Arthur Post.

The Olds Motor Works, Lansing, Mich., has begun work on two new buildings, representing an investment of $400,000, to be completed by Jan. 1.

The Lapeer Truck Co., Lapeer, Mich., will erect a plant on an eight-acre site.

The plant of the American Magneto Co., Monroe, Mich., employing 200 men, will be moved to Toledo, Ohio, because of inability to get skilled help in Monroe. The company makes magnetos for automobiles, airplanes and gas engines. It has reincorporated in Ohio with a capital of $400,000.

The Tannewitz Works, Grand Rapids, Mich., maker of wood-working machinery, has purchased land adjoining its plant, and contemplates extensive additions. Carl E. Tannewitz is manager.

The Triangle Motor Truck Co., St. Johns, Mich., has awarded a contract for the erection of a one-story addition to its plant, about 70 x 235 ft., to cost $15,000.

Cleveland

CLEVELAND, Sept. 10.

The machinery market is more quiet. Some orders have been placed for Government work, but considerable business, particularly for airplanes, is still being held up. Orders were placed the past week by the Inland Ordnance Co., Bedford, Ohio, for lathes, hammers, drilling and grinding machines and additional purchases will follow. Considerable business in turret lathes is coming out for the Government.

The feeling has developed among buyers that there may be some easing up in machine-tool prices before long, and many are deferring purchases of machinery that they do not need immediately. This is due doubtless to the proposed regulation of prices by the Government and the belief in some quarters that other consumers of iron and steel will secure lower prices and be able to reduce the price of their products. Machine tool builders and dealers, however, say that prospects of lower prices are very remote. Some small lot cancellations of machinery are reported, coming largely from automobile part and accessory manufacturers. Deliveries on plain and universal grinders have improved considerably and shipment on some lines of lathes is also better.

The National Lamp Works of the General Electric Co., Cleveland, will erect a new factory and warehouse, 145 x 266 ft., at 1131 East 152nd Street, at an estimated cost of $160,000.

The Economy Machine Co., Cleveland, has been incorporated with a capital stock of $25,000 by Abraham Gradis, David Krause and others.

The National Malleable Castings Co., Cleveland, has had plans prepared for a three-story pattern building, 61 x 150 ft., to be built in connection with its new malleable foundry.

It is reported that the Engel Aircraft Co., Cleveland, recently incorporated, will shortly exercise an option it has on the plant of the Niles Car & Mfg. Co., Niles, Ohio, and make extensive improvements and add considerable equipment.

The Trumbull Motor Truck & Wagon Co., Defiance, Ohio, has been incorporated with a capital stock of $1,000,000 to manufacture motor trucks and wagons. W. O. Allen, C. C. German, R. J. Holgatt and others are the incorporators.

The Burt Foundry Co., Toledo, Ohio, has been incorporated with a capital stock of $50,000 by Harold J. Kehoe, N. E. Hutchins and others.

The Akron Mold & Machine Co., Akron, Ohio, has commenced the erection of a new plant in Barberton, Ohio.

The Turnbull Motor Truck & Wagon Co., Defiance, Ohio, has been incorporated with a capital of $1,000,000 to manufacture motor trucks and will take over the Turnbull Wagon Co., Defiance. W. O. Allen, general manager of the Allen Motor Co., Fostoria, Ohio, is head of the company.

Cincinnati

CINCINNATI, Sept. 11.

Rush orders are still coming from manufacturers having Government contracts. Large planers and lathes are in better demand than the smaller sizes. Airplane manufacturers are active buyers of small tools, including sensitive and portable electric drilling machines, etc. Engine makers are clamoring for equipment, but have not yet placed any large orders here. A Federal representative visited this section last week in an endeavor to place orders for gun mounts, but found all plants crowded with work, most of which is directly or indirectly for the Government.

The local labor situation is satisfactory, although more skilled mechanics could be used. The Niles Tool Works Co., Hamilton, Ohio, started up its foundry last week with a reduced force, but expects to have it in full operation within a few days. This foundry has been idle several weeks on account of a strike of molders for recognition of the union, which the company refused.

The W. T. Johnston Co., Cincinnati, is in the market for a gas-driven air compressor of 300, 400 or 500 cu. ft. capacity.

The Cincinnati Bickford Tool Co., Oakley-Cincinnati, will build a one-story addition to its plant, approximately 65 x

150 ft., of sawtooth roof construction. A. H. Teuchter is president.

The Worthington Pump & Machinery Corporation has awarded contract to Bert L. Baldwin, Cincinnati, for an addition to its plant at Elmwood Place, estimated to cost $100,000.

The Cincinnati Cornice Co., Cincinnati, is making an addition to its plant on West Court Street.

The Dayton Bronze Bearing Co., Dayton, Ohio, has acquired a site adjoining its plant on East Third Street on which it intends erecting an extensive addition at an early date.

The Advance Machine Co., Springfield, Ohio, will establish a plant on West Main Street for the manufacture of metal barrel plugs and other specialties. Grover Ilgen is general manager.

The Atcheson & Barok Die & Tool Co., Columbus, Ohio, recently organized, has equipped a shop for the manufacture of small tools and dies.

The Lieb & Allen Engineering Co., Columbus, Ohio, has been incorporated with $10,000 capital stock by Frank E. Allen and others.

The Royal Sand Co., Columbus, Ohio, recently organized, has opened an office in the Grand Theater Building, and will deal in foundry supplies. F. A. Downerd is president and H. L. Cabot vice-president and general manager.

The Columbus Steel Products Co., Columbus, Ohio, was recently incorporated to manufacture steel meter connections, unions, elbows and other steel specialties. Its plant will be located temporarily at Beech City, Ohio, but headquarters have been established at 43 West Long Street, Columbus. The officers are: President, S. A. Webb; vice-president, F. E. Sanborn; secretary and treasurer, O. H. Henry; sales manager, M. A. Corbett; superintendent of manufacture, H. B. Reading.

St. Louis

ST. LOUIS, Sept. 10.

The demand in the machine-tool market continues for minor equipment. Insistence of deliveries of machines on order continues, but plants having Government contracts are accorded priority.

The Jonesboro Compress Co., Jonesboro, Ark., has been incorporated with a capital stock of $50,000 by J. E. Parr, E. C. Stuck and E. J. Mason and is receiving bids for power plant and compressing machinery.

The Gregory Drainage District, H. P. Foley secretary, Gregory Landing, Mo., is receiving bids for equipment for a drainage system, including two 42-in. centrifugal pumps, motors, engines, boilers, etc., for two 250-hp. units, one 10-ton traveling crane and other machinery.

The Manning Vaporizer Co., Fort Smith, Ark., has been organized with a capital of $50,000 by H. E. Manning, Sidney C. Reagan and others to manufacture a vaporizer for gasoline engines.

The Universal Heater Co., St. Louis, has been organized with a capital of $50,000 by J. G. Beckmann, C. R. Garrison and Francis B. Runder to manufacture water heaters.

Harry E. Alton, Enid, Okla., and others will equip an oil pipe line, expending about $50,000 for pumping equipment, etc.

The Kansas City Wholesale Oil Co., Kansas City, Mo., will establish an oil refinery and compounding plant at Oklahoma City, involving about $150,000 worth of machinery.

The Grand River Hydro-electric Co., H. C. Holderman, West Tulsa, Okla., manager, will equip a plant to develop 56,000 hp. H. C. Blackwell, Davenport, Iowa, is president.

The Solid Steel Scissors Co., Fort Smith, Ark., is in the market for machinery to increase its capacity.

The Missouri Quarries Co., Carthage, Mo., has been organized with a capital of $100,000 by J. B. Robertson, F. J. Lantz and others and is in the market for heavy quarry equipment.

J. P. Buchanan, Joplin, Mo., will equip a 400-ton concentrating plant at Picher, Okla., with electric motor power.

Miami, Okla., has approved an expenditure of $150,000 for waterworks and electric light plant equipment.

Sentinel, Okla., F. A. Mosher, mayor, is in the market for $7,000 worth of machinery for a waterworks, including fuel oil engine, etc.

S. J. Stewart, 312 Carondelet Street, New Orleans, La., will install foundry equipment.

The Mississippi Shipbuilding Co. is equipping its new plant at Mobile, Ala. Work will be started as soon as possible on several vessels of 2000 tons each.

The Turn Right Headlight Co., Harrison, Ark., has been incorporated with a capital of $100,000 to manufacture headlights for automobiles. George Henkle, A. R. Baker and J. C. Medley are the incorporators.

The Tennessee Land Co., Mobile, Ala., a subsidiary of the Tennessee Coal, Iron & Railroad Co., is planning for the construction of a new shipbuilding plant on the Mobile River. The proposed works will specialize in steel vessels, and will include shipways, shops and general construction buildings. George G. Crawford is president of the parent company.

Indianapolis

INDIANAPOLIS, Sept. 10.

The Spring Steel Fence Co., Anderson, Ind., has been incorporated with $250,000 capital stock. The directors are Henry J. Wiethe, William A. Anglemyer, L. Bruce Sherwood, Bert Aldridge and John Lauch, Jr.

The Columbia Furniture Co., Rensselaer, Ind., has been incorporated with $20,000 capital stock to manufacture furniture. The directors are E. N. and A. M. Loy, Emil Besser, Solon G. Spiegel and S. O. Penrod.

The Stutz Motor Car Co., Indianapolis, has been dissolved and is succeeded by the Stutz Motor Car Co. of America, Inc., with capital stock of $1,125,000.

The plant of the Peerless Wire Co., Lafayette, Ind., was damaged by fire, Aug. 30, the loss being $50,000. About 100 men were employed.

California

SAN FRANCISCO, Sept. 4.

The rapid advance in the price of silver has stimulated mining along the coast and inquiries are appearing for machinery. A revival of activity in the oil fields is reported. The big demand for shipbuilding and lumber machinery continues, small tools being particularly active.

The Moore & Scott Iron Works, Oakland, is having plans drawn for a fireproof machine shop.

The Basket Machinery Co., San Francisco, has been incorporated with a capital stock of $200 000 to manufacture basket-making machinery. The incorporators are F. B. Gibson, J. E. Laidlaw and Claude Daly.

The Hollywood Shipyard Co., Oakland, is asking for bids for the construction of four shipways and one long wharf at its shipbuilding plant.

The Nevada, California & Oregon Railroad Co. is erecting a machine shop and round house at Alturas.

The Southern Pacific Railroad Co. will replace its steam pumping plant at Casa Grande with a gasoline plant.

The Golden Gate Brass Mfg. Co., San Francisco, will equip a brass manufacturing and finishing plant.

The Los Angeles Standard Wood Steamship Co. has been incorporated at Phoenix, Ariz., with a capital stock of $200,000 by W. Bowring, J. C. Bond, J. F. Hubbard, L. Bowring and B. Porter.

The Standard Brass Casting Co., Oakland, has bought additional property on which it will build an extension.

The City Council, Oakland, has leased to the Union Construction Co. a shipbuilding site of 31 acres on the water front, to run for 25 years.

Bids are being taken by the Union Iron Works, San Francisco, for the construction of a machine shop to be erected at Alameda.

W. A. Boole, Martinez, has leased 30 acres of water front for a shipbuilding site.

The Pneumatic Loading Machine Co., San Francisco, has been incorporated with a capital stock of $25,000 by W. T. Scott, R. Bailey, M. H. Smith, J. Schlussel and J. D. Rutledge.

The H. C. Macaulay Foundry Co., Oakland, will erect an addition, 75 x 100 ft.

The Schaw-Batcher Co., which is to erect a shipbuilding plant in South San Francisco, announces that eight steel steamers of 8800 tons each will be constructed before Dec. 1, 1918. It will also install a plant for marine repair work.

John Nicholl, president Nicholl Terminal Co., Richmond, announces that the company will postpone its plans for the construction of docks and will install a plant to build both wooden and steel vessels. It has a site on the Richmond water front.

The Fageol Motor Car Co., Oakland, has applied for permission to reincorporate and increase its capital stock from $600,000 to $3,000,000. It will install a plant to manufacture motor cars, trucks and tractors.

The Pacific Coast Shipbuilding Co., Oakland, has been incorporated with a capital stock of $5,000,000 by Frank L. Hain, J. P. Lacey, Nellie Peters, K. C. Sullivan, C. E. Mulvany and E. M. Hanks.

The Hy-Pres Mfg. Co., Oakland, manufacturer of pumps, compressors and airplane engines, is having plans drawn for a plant at the foot of Eighty-second Avenue.

Benjamin F. Graham has leased six acres of tide lands at San Diego, on which he will erect a shipbuilding plant.

Improvements to be made to the La Playa Naval Station, San Diego, include marine ways, a machine shop and concrete coaling station.

Texas

AUSTIN, Sept. 8.

The machinery and tool trades have benefited by the improvement in crop conditions. The demand for mining and other heavy machinery for shipment to Mexico shows a noticeable increase and large orders have been placed with companies in San Antonio, Houston, Dallas and El Paso. A heavy demand for small tools is also noted. It is stated that considerable machinery will be required in that country for the rehabilitation of industrial plants. Mexico formerly did a very large machinery business with Germany, which under present conditions is being diverted to the United States.

The Crown Oil & Refining Co., incorporated at Houston with a capital stock of $2,000,000, will build a refinery and operate extensively in the Gulf coast oil fields. R. L. Young of Houston is a stockholder.

The State Line Utilities Co., Texico, N. M., incorporated with a capital stock of $30,000, will build an electric light and power plant to supply that section with electrical energy.

The Marfa Electric Light & Ice Co., Marfa, has sold its electric light plant to Morrison & McCall, St. Louis, who will install additional machinery and greatly increase the capacity.

J. P. McDonough, head of the McDonough Iron Works, Galveston, is promoting the construction of a drydock at Galveston to cost about $500,000.

The Pacific Northwest

SEATTLE, WASH., Sept. 4.

Capt. J. F. Blain, in charge of the local branch of the United States Shipping Board, will receive bids for the construction of wooden steamships or auxiliary power vessels, following advices from Washington that the Government will resume wooden ship construction. Practically all of the 10 wooden shipbuilding plants in Seattle are ready to submit proposals. The decision of the Shipping Board will also mean immediate resumption of work in several yards, construction of which has been held up on account of the indecision of the Government and the lumber situation.

Nothing definite has developed in the lumber situation. A few plants have agreed to the men's demands, but the majority are still idle or running with small forces. Sufficient lumber is being cut to supply Government needs, and spruce mills are busy on airplane products.

The Grant Smith-Porter-Guthrie Shipbuilding Co., Portland, Ore., will build a joiner shop and machine shop, each one-story, 40 x 80 ft., to its plant at St. Johns.

The Independent Foundry Co., Portland, has awarded contract for a crane runway at a cost of $2,500.

Ship construction has started at the Standifer Shipyards in Vancouver, Wash., which has Government contracts for six vessels, to be equipped with boilers, engines and auxiliary gear in the plant. Ships built at the company's yards in North Portland will be taken to the Vancouver plant for completion.

The Aberdeen Shipyards, Aberdeen, Wash., plans extensive improvements during the fall and early winter. Several slips will be added.

The Howd Turbine Co., Nampa, Idaho, has been formed with capital stock of $5,000,000 to manufacture rotary engines, convertible car attachments, etc., and plans to establish a factory.

The Allen Shipbuilding Co., Seattle, recently incorporated by C. J. Smith and Frank P. Allen, has started work on the construction of its wooden shipbuilding plant.

The Foundation Co. of New York has acquired a 50-acre site on the tide flats, Tacoma, Wash., where a shipyard with 10 or 12 ways will be built.

Construction will be started at once on the new plant of the Wilson Shipbuilding Co., Seattle. Three ship ways and a sawmill plant will constitute the first unit, to cost $15,000.

The plant of the National Engineering Co., Seattle, under construction at a cost of $100,000, is nearing completion. It will manufacture hydraulic rams, air compressors, boilers, fuel oil and water tanks, and conduct a general machine shop. A number of contracts have been booked. C. R. Briggs is president.

The Marine Pipe & Machine Works, Seattle, is establishing a new plant, 100 x 180 ft., for the manufacture of the Sumner heavy duty marine oil engine. Traveling cranes of 15 tons capacity and other equipment will be installed and six engines will be erected at one time. All of the material and crank shafts, forgings, etc., will be manufactured in Seattle. The company has under construction in its old plant two four-cylinder Sumner engines of 400 hp. each and costing $60,000 for the Olympia Shipbuilding Co.

Equipment, including boiler and engine, generator, motor, pump, etc., in the auxiliary steam plant of the Coast Utilities Co., Arlington, Wash., was recently destroyed by fire. The plant will be rebuilt.

Canada

TORONTO, ONT., Sept. 10.

The Liberty Motor Car Co. of Canada, Ltd., Windsor, Ont., has been incorporated with a capital stock of $10,000 by Percy Owen, James F. Bourquin and Harland M. Wirth, all of Detroit, to manufacture motor cars, vehicles, accessories, etc.

The Mutual Motors, Ltd., Hamilton, Ont., has been incorporated with a capital stock of $25,000 by James M. McGill, Harry E. Phillips, William F. Roney and others to manufacture automobiles, motors, etc.

The Collingwood Steamship Co., Ltd., Collingwood, Ont., has been incorporated with a capital stock of $40,000 by George C. Coles, Frederick G. Moles, Michael P. Byrnes and others to manufacture boats, from wood and steel, boilers, engines, etc.

The Whalen Pulp & Paper Co., Victoria, B. C., which is engaged in establishing a large paper manufacturing plant on Vancouver Island, at the new town of Port Alice, near the head of the southeastern arm of Quatsino Sound, will lay two keels at a time and will continue building ships, until it has enough to handle its export trade.

Contracts for the plant to be erected at Midland, Ont., for the McDougall-Smith Shipbuilding Co., in which Capt. Alexander McDougall is interested, consist of a carpenter shop, 50 x 200 ft.,, two stories; two one-story workshops, each 32 x 300 ft.; two-story office building, 50 x 65 ft., and a boiler and oil house. It is the intention to have the plant ready by late fall.

The Dominion Wheel & Foundries, 131 Eastern Avenue, Toronto, has had plans prepared for the erection of a machine shop to cost $5,000. Construction will start immediately.

The Canadian Vickers, Ltd., shipbuilder, 3072 Notre Dame Street, East, Montreal, has awarded contract, for the erection of a concrete factory to cost $48,000.

David Eidt, Mildmay, Ont., is in the market for a steel or iron bulkhead for a 42-in. waterwheel and inserted tooth circular saw, from 52 to 60 in. in diameter.

The Hamilton Lumber & Coal Co., Ltd., Hamilton, Ont., is in the market for a four-sided molder and sticker, joiner, cut-off saw, etc.

NEW TRADE PUBLICATIONS

Drop Forged Tools.—J. H. Williams & Co., 57 Richards Street, Brooklyn, N. Y. Russian catalog. Describes and illustrates an extensive line of drop forged tools, including wrenches of all types, lathe and planing machine tool holders, limit gages, clamps, lathe dogs, eye bolts, hooks, pipe wrenches, etc. The catalog is arranged practically the same as the English edition with an illustration of a tool at the top of the page, followed by a brief description and tables of the various sizes that can be supplied.

Pneumatic Tools and Electric Drills.—Independent Pneumatic Tool Co., Thor Building, Chicago. Circular Z. Concerned with a line of pneumatic hammers and pneumatic and electric drills. The various types of drills are shown, as well as the pneumatic hammers which are made with inside and outside triggers for chipping, calking, light riveting, scaling, cleaning and flue beading. Condensed specification tables of the different tools are included.

Grinding Wheels.—Carborundum Co., Niagara Falls, N. Y. Catalog No. 6. Covers a line of Carborundum and Aloxite wheels for all classes of grinding and other products of the company used in the metal-working trades. After

brief descriptions of the manufacture and characteristics of the two abrasives, the manufacture of the wheels is gone into at some length. Instructions for testing and mounting grinding wheels are given, together with a number of tables of useful information. Recommendations as to the various grades of wheels to be used for different kinds of work are presented, followed by drawings of the various shaped wheels that can be supplied and instructions for their use on different classes of work. A telegraph code and alphabetical and numerical indexes are included.

Gear Hobbing Machine and Lathe.—Himoff Machine Co., Astoria, N. Y. Two circulars. The first relates to a line of gear hobbing machinery which is built in two sizes for handling work up to maximum diameters of 8 and 24 in. respectively. The construction of both sizes is gone into at some length, and illustrations and condensed specification tables of the two machines are included. The other circular deals with a 12-in. engine lathe for thread cutting. The construction is gone into in some detail, the text description being supplemented by numerous engravings of the various parts. A general table of dimensions, weights, etc., is included.

Telephones for Interior Use.— Connecticut Telephone & Electric Co., Meriden, Conn. Catalog No. 25. Gives illustrations and brief descriptions of an extensive line of telephones, annunciators and electrical specialties. The telephones include intercommunicating and switchboard equipment of all kinds. Wiring diagrams of the various systems are included with brief descriptions of the uses to which they may be put and the types of telephones that can be employed. An index of systems is included, together with an alphabetical index of the contents and a numerical index of list numbers.

Gear Planing Machines.—Gleason Works, Rochester, N. Y. Catalog. Treats of a line of gear planing machines which operate on the generating principle to produce bevel gears and pinions. The machines are automatic in operation and the various types are illustrated and described. The advantages of accuracy and adaptability for various kinds of work are briefly touched upon. Mention is made of a grinding machine for the tools employed and machines for hardening and testing the gears. Line drawings of a number of parts are included.

Graphic Meter.—Esterline Co., Indianapolis. Circular. Shows what is claimed to be the largest graphic meter in the world, a 250,000-kw. instrument installed at the Keokuk plant of the Mississippi Power Co. A description of the meter, which is of the induction type and employs 30 polyphase meter elements, each made up of two single-phase units, is gone into at some length.

Automatic Motor Starter.—Electric Controler & Mfg. Co., Cleveland. Bulletin No. 1042. Contains a brief description of an automatic compensator for starting squirrel cage induction motors and a brief discussion of its advantages. Among the latter are rapidity, safety, lessened power consumption and a reduction in the amount of floor space required. The design of the compensator is gone into at some length and the text is supplemented by views of the compensator and the master switch with the push buttons for starting and stopping the motor.

Sandblast Machines.—Hoevel Mfg. Corporation, 50 Church Street, New York. Catalog F-1917. Describes and illustrates a line of dustless, automatic, self-contained sandblast machines. The advantages of using the sandblast for cleaning castings and forgings are briefly touched upon and a short general description of the construction of the machines is given. This is followed by illustrations of the different ones, which include the stationary nozzle, revolving barrel and rotary and sprocket table types. In connection with the illustrations of the machines descriptions of the construction and statements of the particular work for which they are adapted are included.

Bolts and Nuts.—Samuel Hall's Sons, 229 West Tenth Street, New York. Catalog. Calls attention to an extensive line of screw and tap bolts, nuts, washers; lag, cap and set screws; bolt ends, turnbuckles and milled goods of every description. There is practically no text in the catalog, illustrations of the various products supplemented by size tables where necessary being relied upon to tell the story.

Oxy-Acetylene Apparatus.—Imperial Brass Mfg. Co., 1200 West Harrison Street, Chicago. Catalog No. 140. Shows the various oxy-acetylene cutting and welding outfits and the torches, regulators and accessories used in connection therewith. A brief description of the process for welding and cutting is presented, followed by a discussion of its application to various industries and a general description of the equipment furnished. This is followed by detailed descriptions of the several outfits, the text being supplemented in practically every case by illustrations and specification tables. A number of views of typical operations performed by the equipment are included.

Grinding and Polishing Machinery.—Webster & Perks Tool Co., Springfield, Ohio. Loose-leaf catalog. Illustrates and describes a complete line of grinding and polishing machinery and accessories. The machines include plain and ball bearing and direct-connected motor-driven types. In almost every case a separate page is devoted to a machine or accessory with an illustration at the top, a brief description and a condensed table of specifications.

Grab Bucket.—Blaw-Knox Co., Pittsburgh. Circular. Describes the Blaw Bulldog bucket used for handling ore and other materials from steamers to docks and from docks to cars for shipment. The construction of the bucket is gone into at some length, emphasis being laid upon the character of the material used. A condensed specification table for the buckets, which are built in sizes ranging from 1 to 4 cu. yd., is included.

Steels.—Peter A. Frasse & Co., Inc., 417 Canal Street, New York. Catalog. Pertains to a line of electric and open-hearth steels for a variety of purposes. The catalog is divided into sections, each of which is devoted to some one kind of steel. In these sections the different grades are briefly described with lists of the uses to which they may be put and instructions for welding, forging, annealing and hardening. Complete instructions on cold finishing and heat treating steels are presented and mention is made of a line of screw steel, shafting and tubing. Tables of the various sizes that can be supplied are included.

Coal Briquetting Machine.—Excelsior Tool & Machine Co., East St. Louis, Ill. Circular No. 58. Calls attention to a machine for briquetting all kinds of coal, lignite or coke. The construction of the machine is gone into at some length and emphasis is laid upon the output, which is 150 tons of briquettes in a 10-hr. day. Illustrations and a condensed specification table are included.

Drilling and Boring Machine.—Medina Machine Co., Medina, Ohio. Circular. Calls attention to a high duty drilling and boring machine which was illustrated in THE IRON AGE, March 29, 1917. A general description of the machine is presented, supplemented by an illustration and condensed table of specifications. The description is in the form of a series of short paragraphs with the first few words capitalized to indicate the subject covered.

Air Washers.—Carrier Air Conditioning Co., Buffalo. Folder. Lists the advantages of an air washer for schools, office buildings and factories. The folder is intended to represent the exterior of the washer when closed and by opening it out the appearance of the interior and its construction are shown. The advantages of the washer are set in type on the parts which fold over.

Blowers and Injectors.—Eynon-Evans Mfg. Co., Fifteenth and Clearfield streets, Philadelphia. Catalogs Nos. 15 and 16. The first relates to a line of injectors, syphons and water heaters. Illustrations of the different types are presented with brief descriptions in some cases and condensed tables of dimensions and specifications in every instance. The other catalog is concerned with a line of blowers for furnishing draft for boilers and gas producers. A description of the apparatus, which is of the steam jet type, is first presented followed by illustrations and specification tables of the various sizes. A discussion of the advantages of the blower for use with gas producers is presented and the text is supplemented by a number of test curves and views of installations.

Lamp Hanger.—Thompson Electric Co., 5606 Euclid Avenue, Cleveland. Supplement B to catalog B-16. Concerned with a disconnecting hanger for use with overhead incandescent lamps. The advantages claimed for the hanger are that the man is protected from shock while cleaning the lamp or reflector or making repairs as the lowering of the lamp disconnects it from the supply circuit and as the rope is inclosed, the lamp is protected from molestation in exposed places and is secured in place by a ring on the lower end of the hoisting rope which is locked.

Induction Motor.—Crocker-Wheeler Co., Ampere, N. J. Bulletin No. 180, superseding No. 160. Relates to a squirrel cage induction motor for constant speed operation on polyphase circuits. The mechanical construction and the electrical features are briefly touched upon followed by a description, more or less in detail, of the various parts. Views of the motor assembled and separated into its component parts are presented.

Turret Lathes.—Gisholt Machine Co., Madison, Wis. Circular. Calls attention to the rapidity with which the machining of circular or cylindrical chuck work such as castings, forgings, bar stock, etc., can be performed on the company's turret lathe. A number of views of parts made on the lathe are presented, the time in which they were made being emphasized. Several illustrations of the lathe equipped with various standard tool arrangements are included. Mention is made of a grinding machine for sharpening the tools used.

THE IRON AGE

New York, September 20, 1917

ESTABLISHED 1855 VOL. 100: No. 12

New Foundries in New England

Some of the Plants That Have Been Erected in the Past Year—Pen and Picture Sketch of How They Have Been Planned and Equipped

BY W. E. FREELAND

EVEN the most optimistic prophet in 1914 could not have foreseen the wave of foundry expansion that was to take place within three short years. From the doldrums, the manufacture of castings has leaped to an activity unparalleled in the history of the foundry business. This has resulted in new construction everywhere, and New England has not been behind in its proportion of new or greatly enlarged foundries or in the number of new companies that have entered the field. It is not possible to make this review comprehensive; its intent is to show some examples of the results that have sprung from the demand for foundry products.

One of the new plants that the visitors to Boston for the foundry meetings and exhibition next week will have an opportunity to see is that of the Stafford Co., Readville, Mass., a suburb of Boston. The company manufactures weaving machinery, especially automatic looms, and the foundry output is largely of the light, thin castings that enter into loom construction. This makes a special problem of the rapid distribution of metal from the cupola to the various floors and one of the most interesting features of the foundry is the absence of cranes and the extensive use of a monorail system and trolley buggy ladles for filling hand ladles at a number of designated pouring stations at various points on the monorail.

The foundry building is a double monitor type which gives an admirable distribution of light into every part of the building. The two cupolas are situated at one end of the foundry at the end of the central gangway. The larger is a 74 in. and the smaller is a 42 in., both of Paxson make. The



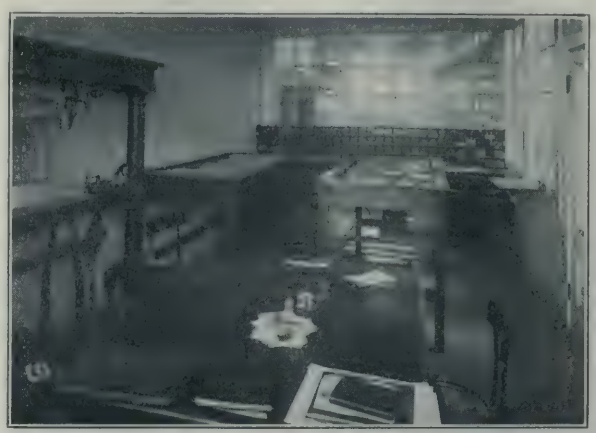
Interior of Stafford Co. foundry—a view that shows the location of cupolas and the routing and suspension of the monorail system that makes possible the pouring of many floors in an unusually short time



The double monitor roof of the Stafford foundry gives well distributed light. The monorail that serves the foundry is extended under a covered passage to the machine shop

practice is to take a heat from the smaller cupola at the end of the forenoon and a heat from the larger cupola at about three o'clock in the afternoon. The day's melt is about 39 tons. Two motor-driven Green pressure blowers are placed on a mezzanine floor above the cupolas and the charging floor above is served by an elevator. A winch, located outside the building, is used to pull out the bottoms.

Most of the molding is done on machines, about 50 of the stripping plate type doing the bulk of the work. Two power squeezers, two hand roll-overs, one power roll-over and a few hand squeezers are also a part of the machine equipment. Two special machines for molding worm gears and dobby frames will attract the attention of visitors. In both of these machines, the pattern is pushed up into the sand by the action of gearing under the bed plate. By this method of rotating the worm-gear pattern into and out of the sand a perfect mold is obtained and the output multiplied many times over any other method. A motor-driven reciprocating riddle is used to prepare the sand and a home-made attachment serves to operate the riddle in case of failure of the motor or power.

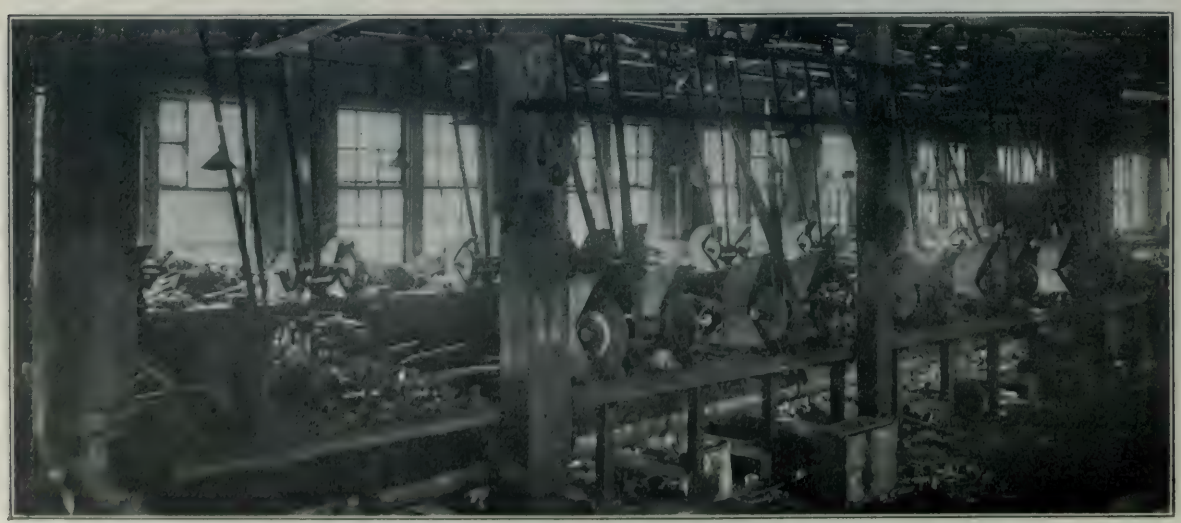


In the two files are the cards for over 19,000 patterns of the Stafford foundry on which are kept the records of each order

The cleaning room is unusual in its equipment on account of the character of the work. Two large sandstone grinding wheels are used for snagging some of the longer pieces and also the rolls which form a part of the looms. Two floor stands and 17 bench stands are used for general snagging and certain castings are cleaned upon polishing frames. Seven tumbling barrels and two large pickle benches complete the equipment. There are enough large castings to keep a group of chippers constantly employed. A considerable quantity of intricate pasted cores are made and a large number of small round cores are constantly kept in stock.

The demand for malleable castings has kept the air furnace plants of New England working at top capacity for months. The Arcade Malleable Iron Co., Worcester, Mass., is one of the foundries which has been forced to make extensive additions and improvements in order to accept the business booked in the last year. The present management took hold of the business in 1907 and has fostered its growth from a small output in that year to a capacity output of the plant whose importance in its special field is better shown by the illustrations than by any possible grouping of statistics.

The first melt in a new addition—a complete and



A portion of the cleaning room of the Stafford Co. where bench stands are employed to snag the light, thin castings used in looms



This new foundry of the Arcade Malleable Iron Co. was being put into operation as this photograph was made. It will be used eventually for the heavier malleable castings

separate melting and molding department for heavier castings—was made in the early part of this month. The new structure is 75 x 150 ft. The old main foundry is 60 x 400 ft., the annealing room 50 x 200 ft., the cleaning and shipping building 75 x 120 ft. with a second-story section 25 x 120 ft., devoted to a pattern shop and other purposes. A smaller building, until recently occupied as an office, has been remodelled into a pattern storage with a fireproof vault in the basement. The upper part of a two-story building, 52 x 52 ft., has been made into a model foundry office.

A high spur track affords unusual facility for unloading raw materials and supplies into storage piles or into a concrete storage building, the lower portion of which is divided into bins for molding sand, fire brick, clay and fire sand. The upper part has bins for two kinds of core sand and for seacoal. In a small separate building is housed a machine for pulverizing old firebrick into any size of grain desired. The ground firebrick makes a good bottom for air furnaces, and, combined with new clay, makes fine ladle linings and repair material. This machine paid for itself in the first three months of use and is an unusual item of equipment that will interest foundrymen, particularly in these times.



The Arcade general office is in marked contrast with those of many foundries. A series of private offices and consultation rooms open from this general office

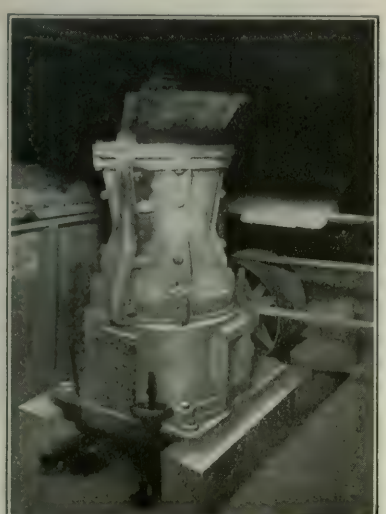
The air furnace in the older foundry is of 15 tons capacity; that of the newer foundry, 18 tons capacity. The work is about one-third floor molding and two-thirds bench molding. A few power squeezers are installed. The core room employs about 25 men and the cores are baked in two large, coal-fired ovens. The equipment of the annealing department comprises four large furnaces, of which one of the reproduced photographs gives a good illustration.

A small muffle oven is built at the annealing room end of the air furnace for the gradual cooling of castings whose shape does not permit rapid cooling in the air. A complete pyrometer equipment is installed for the control of the heat of the annealing furnaces, the watchmen having indicator instruments and two continuous-reading instruments in the manager's office. An air hoist on a monorail is used for dumping the annealing pots. A sand blast barrel and ten tumbling barrels do the major part of the work of cleaning the castings.

The company has recently secured a good supply of water by boring an artesian well, equipped with a motor-driven pump. Another new feature is a



One of the bank of four annealing furnaces at the Arcade Malleable Iron Co. Photographed as it was ready for sealing



This grinding machine is used to grind old fire brick to any desired size

modern factory hospital with adequate equipment to take care of all minor injuries.

Another interesting Massachusetts foundry is the plant of the Framingham Foundries at South Framingham, Mass. The chief interest in this plant lies in the adaptation of a machine plant to foundry use, involving some difficulties, due to the construction of the buildings, that have been successfully overcome. The No. 1 foundry will have an 84-in. cupola, which at the present time is in the process of erection. The No. 2 foundry has a 76-in. and a 54-in. Paxson cupola. The No. 1 foundry consists of two buildings of the older peak-roof type, one of which will be used for heavy floor work and the other for side-floor work. A 7½-ton motor-driven crane of 64 ft. span will serve the larger building and two cranes with 30-ft. span and 3-ton chain blocks will serve the side floor buildings.

In the No. 2 foundry, which is of typical saw-tooth roof machine shop construction, the service for conveying the metals to various floors is a monorail system with trolley ladles. Some of the machine equipment includes 14 roll-overs, two small plain jolt machines, 15 jolt squeezers, one plain squeezer, two jolt squeezers, split-pattern machines, and 14 "Little Wonder" machines. Extensive use is made of air rammers.

The core room is notable for its fine light and good arrangement. One large oven is constructed with two sets of tracks and trucks so that it serves for both ladle drying and for baking large cores. Six sets of Foundry Equipment Co.'s ovens are used for baking the smaller cores. The coremakers do not have to leave their benches as supplies are brought to them and cores are taken away by other workmen. A group of men is kept solely upon the work of pasting cores and inspecting. The core department also looks after the delivery of cores to the molders.

In the cleaning department is a tilting pickle bench, shown among the illustrations. It is an interesting variant from the general type of such construction. Another interesting apparatus in this department is the grinding fixture shown. This lessens the difficulties that certain awkward pieces present to the snagger. The bank of New Haven sand-blast barrels and a bank of tumbling barrels are employed to clean the smaller castings. Two swing-frame grinders, four floor stands and three sand-blast rooms are in use to take care of the cleaning of larger pieces.

The welding department and a rather large galvanizing department play a part in the finishing of some of the work turned out at this foundry. Having a large air-compressor plant, an extensive use is made of air chisels. This foundry will be found notable among the New England jobbing foundries because of the excellence and completeness of its engineering and chemical control of operations, processes and materials. Four views are here given.





This pickle bench at the Framingham Foundries is tilted to allow the pickling acid to flow off in one direction and the water to flow off in the opposite direction.

The light and pleasant core room at the Framingham Foundries is shown at the left.

About a year ago a new corporation, the Mansfield Foundry Co., took over the old Rider Foundry in Mansfield, Mass., and has made extensive additions. The old foundry was 60 x 90 ft. and a new foundry has been put up 80 x 120 ft. The old foundry has been divided into offices and pattern storage. The new foundry is of the monitor type over a craneway of 29-ft. span, which, while awaiting delivery of an electric crane, is equipped with a hand-operated crane and a 3-ton chain block. Two large jib cranes, located to be of efficient help in handling the heavy flasks and castings on the main floor, and a monorail for conveying the hot metal to different parts of the foundry are other items of handling equipment.

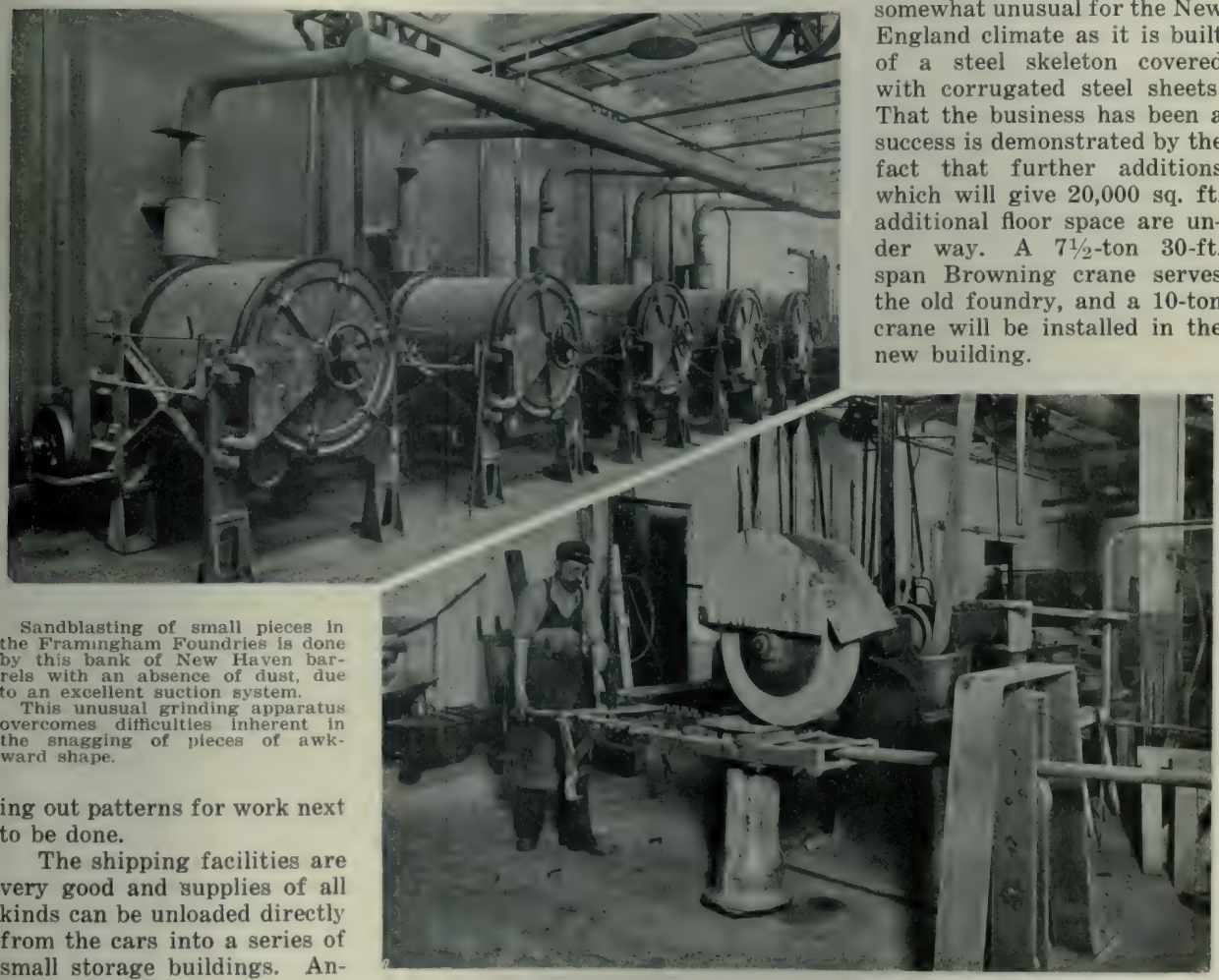
The cupola in the old foundry is a 5-ton and that in the new foundry is a Whiting 8-ton cupola. The blower and its motor are housed in a separate room at the side of the cupola and the charging floor is reached by a ramp on the outside of the building. Construction now projected will replace the ramp by an elevator.

A new oven has been built in the core room, equipped with a truck to take care of the larger cores, and a smaller oven is built into the side of

this for smaller cores. A Millett oven is also in use for baking small cores and a wing of the new foundry, extending over the new core oven, is of sufficient width to provide bins for the storage of core sand. The leakage of heat from the oven helps to keep the sand in good condition.

The usual equipment of grinding machines, tumbling barrels and a pickle bed are found in the cleaning room. Some foundrymen may wonder at the continued use of pickling on a large scale in most of the New England foundries, but those who have tried to do away with pickling find that the demand of the New England customers compels the continued use of this method of cleaning castings.

Patterns are stored in a bay adjoining the old foundry and the room next to this is used for laying out patterns for work next to be done.



Sandblasting of small pieces in the Framingham Foundries is done by this bank of New Haven barrels with an absence of dust, due to an excellent suction system.

This unusual grinding apparatus overcomes difficulties inherent in the snagging of pieces of awkward shape.

The shipping facilities are very good and supplies of all kinds can be unloaded directly from the cars into a series of small storage buildings. Another detached building is used as a shipping department for the entire plant.

A new foundry that has come into the field in Hartford, Conn., in the past year, is that of the Philbrick-Booth Co. This plant is new throughout and has been very successful in the production of the finer grades of machine castings and similar work.

The melting cupola is a 54-in. Whiting with the charging floor in the usual position, served by an elevator. An industrial track with convenient turntables serves all parts of the plant. Over the main molding floor is a 5-ton Whiting crane equipped with a 5-ton Ingersoll-Rand air hoist.

An air compressor plant permits the use of air rammers on the molding floor and air chisels in the cleaning room. A gyratory riddle is used for preparing sand and some of the molds are made on three-power roll-over machines.

A large truck oven in the core room is fired from an outdoor pit. A small oven built into the side of this and a Blodgett oven are used for the smaller work. An interesting feature of this core room shown on page 651 is a home-made crane. The truck wheels of this crane have a ¾-in. oval bearing surface which eliminates much of the friction between truck and track when moving the crane. The lifting apparatus is a 1-ton air hoist. A monorail extends through the cleaning room and far enough outside the building to permit easy loading of castings upon motor trucks. The cleaning room has a complete and adequate equipment of sand blast, pickle bed, floor stands and auxiliary tools and apparatus.

A few months ago the Connecticut Electric Steel Co., Hartford, Conn., began business with a 2-ton Heroult furnace in a plant having 12,000 sq. ft. of floor space. This building is somewhat unusual for the New England climate as it is built of a steel skeleton covered with corrugated steel sheets. That the business has been a success is demonstrated by the fact that further additions which will give 20,000 sq. ft. additional floor space are under way. A 7½-ton 30-ft. span Browning crane serves the old foundry, and a 10-ton crane will be installed in the new building.

A compressor equipment of considerable size permits the use of a 3½-ton air hoist and a liberal number of air rammers and air chisels. Chain hoists are in common use. The core room has a truck oven and a Millett oven for small work, and a large oven is to be built for baking dry-sand molds. The cleaning-room equipment has been carefully selected to take care of the special requirements of a foundry of this type and includes swing-frame grinders, floor stands, tumbling barrels and a Pangborn sand-blast room.

Two home-made oil-fired annealing furnaces that have been in use for some months have been so successful that four more of the same type are to be a part of the expansion which is under way. Fuel-oil torches are used for skin drying and ladle drying. Among the improvements included in the present new construction are a sheet-steel building, 40 x 100 ft., for pattern storage, and the remodeling of a cottage on the property into an office building.

About 1820, Annes Allen Lincoln established in Norton, Mass., the Norton Furnace Co. This is believed by many to have been the first foundry established in New England. In 1853, his son, A. A. Lincoln, Jr., assumed the management and continued to operate it until the plant was destroyed by fire in 1873. He removed the business to Wollaston, Quincy, Mass., where it was incorporated as the Wollaston Foundry Co. Mr. Lincoln continued to be the active manager until his death in 1910, a period of 59 years. Aug. 25, 1916, the plant was again almost totally destroyed by fire. At that time the record melt was 12 tons a day. The plant was at once rebuilt and at the present time is being extended so that the main foundry building will be 300 ft. long. On the anniversary of the fire, Aug. 25, 1917, a new high melt record of 21 tons was reached.

Recently the company has installed a 10-ton electric crane, a duplex air compressor, air vibrators for all molding benches, air rammers, a Blystone core and sand mixer, and has enlarged its power plant. Two jolt machines and 10 power squeezers are in use, most of these being new equipment. New core ovens have been built so that now the plant has two large and two small ovens. An oven is being built for dry sand work. A tramway is used for conveying hot metal and a second crane is to be installed. The present cupola is a 54 in. and it is expected to install another cupola shortly. The company is now doing considerable Government work, particularly for destroyers, submarines and incidental work for the Navy Department.

Two of the most notable among the new plants in New England have been described in detail in previous issues of THE IRON AGE—the Parsons Foundry, Bridgeport, Conn., now a part of the Bilton Machine Tool Co., in the issue of Jan. 4, 1917, and that of the Universal Winding Co., Cranston, R. I., in the issue of June 7, 1917.

New England Foundry Activity in the War Period

Summary of What Some of the 600 Foundries Scattered Over New England Have Been Doing and Expansion Now Going On

SOME conception of the growth of the foundry industry in New England during the war period can be gained from the following brief notes of what some of the more important plants have been doing in that time. Naturally Connecticut, Rhode Island and Massachusetts have led in this growth, not only because the foundry plants are more numerous, but also because the munitions business and its attendant activities have largely centered in these three States.

In Connecticut, Wilcox, Crittenden & Co., Middletown, Conn., operating brass, malleable and gray iron departments, have increased the capacity of their iron foundry by about 30 per cent with corresponding additional equipment of machines and other tools. The company is now building a brass foundry, 40 x 90 ft., which will increase their output of brass castings considerably.

The Birmingham Iron Foundry, Derby, Conn., completed last July a foundry building, 100 x 208 ft., exclusive of core ovens. The new building cuts through the middle of the old foundry by which construction the ends of the old building form two large wings to the main new foundry. In addition there is a large cleaning room and a separate department for light castings. The total floor space devoted to foundry purposes, exclusive of pattern storage buildings, is 50,000 sq. ft. The new foundry is of heavy construction, wholly of steel and glass, and the main crane is of 25 tons capacity and of 62-ft. span. Each side of the main bay is equipped with traveling jib cranes which supplement the main crane above. The side bay, 40 ft. wide, has a 5-ton crane and the opposite side is a long flask runway served by a 7½-ton crane for carrying heavy flasks. Three cupolas are installed and the daily melt is from 40 to 50 tons. New equipment of sand blasts has been installed, air tools of all kinds, and large sand bins with concrete floors have been built. Another new feature is a series of concrete roll pits for casting chilled rolls. The company's own machine department's consumption of castings is about 6000 tons per annum, the remainder of the output going into a large jobbing business in heavy machine castings.

The Eastern Malleable Iron Co., which operates three plants in New England—the Naugatuck Malleable Iron Works, Naugatuck, Conn., Bridgeport Malleable Iron Works, Bridgeport, Conn., and Vulcan Iron Works, New Britain, Conn.—has done little expansion in the way of new construction recently, but has added considerable new equipment wherever it would increase the output or improve the quality of the product. Within the past year it has installed a complete research and analytical department to control and standardize the chemical and physical properties of its malleable products.

The Pequonnock Foundry, Bridgeport, Conn., in the latter part of 1915 added a 75-ft. extension to its main foundry building and in the early part of 1916 installed an additional cupola having a capacity of 9 tons per hour. A number of molding machines and other auxiliary equipment have been installed so that the output in the last two years has been increased 50 per cent. The company has also recently added to its real estate holdings to provide for further additions.

The Manufacturers Iron Foundry, Bridgeport, Conn., has built an addition to its foundry, 50 x 100 ft. in size, and has added to its equipment eight squeezers, two roll-over machines and two traveling cranes. An addition, 40 x 112 ft., has been made to the core room and two core ovens, one, 15 x 25 ft., and another, 15 x 20 ft., have been built. The core room equipment includes three motor-driven riddles and a crane for handling large cores.

In March, 1916, the Bullard Machine Tool Co., Bridgeport, Conn., purchased the small foundry in Fairfield, previously operated by Joseph H. Taylor. A new foundry, 102 x 142 ft., is nearing completion, also another building, 60 x 320 ft., which will be used for a pattern shop, pattern storage and office. The old building, 68 x 135 ft., will be used as a cleaning room and for casting storage. The plant will be devoted solely to making castings for Bullard vertical turret lathes and Bullard Mult-au-matics. The new foundry will probably be in operation by Oct. 1.

The D & W Fuse Co., Providence, R. I., has more than doubled the floor area of its foundry and has installed in the past year two melting furnaces, one for iron and one for brass. At the present time, a further enlargement which will increase the present floor area about two and one-half times with equivalent melting capacity is under consideration.

The Rhode Island Malleable Iron Works, Hillsgrove, R. I., has added approximately 52,000 sq. ft. to core and pattern departments. The annealing capacity has been increased 60 per cent and the melting capacity about 30 per cent.

The Fairmount Foundry, Woonsocket, R. I., is a recent addition to the list of Rhode Island foundries, pouring its first heat Feb. 12 of this year.

The Henry Perkins Co., Bridgewater, Mass., has installed a Byram cupola, with an electric elevator to serve the charging floor, and two jolt-squeeze molding machines. The company has also remodeled its brass foundry.

The Lundin Steel Casting Co., Neponset, Mass., has made no structural additions, but has made a number of additions to and improvements in its equipment. Electric motors have replaced gas engines for power and the grinding equipment and sand blast facilities have been considerably added to; also the compressed air facilities have been extended and increased throughout the plant.

The Gardner General Foundry Co., Gardner, Mass., has made additions to its main plant, increasing it by about one-third in size, and has also purchased the foundry plant formerly operated by the Simplex Time Recorder Co. Both foundries are working at full capacity, principally upon machine tool castings, and the number of employees has grown from 90 to 160.

The Millbury Steel Foundry Co., Millbury, Mass., is installing a 2-ton Heroult furnace which will be the first electric steel equipment in the central part of New England. The company is also making extensive additions which will enable it to double the size of its working force. The extension to the foundry will be 50 x 64 ft., and another addition will be a pattern storage building, 30 x 120 ft. These additions will be of frame construction, as it is the intent of the company to build later an entirely new fireproof plant with all the modern features of construction and equipment special to a steel foundry. The present number of employees is 60.

The General Electric Co. at Lynn, Mass., has remodeled its open hearth plant to accommodate a 5-ton Alliance charging machine now being installed to operate in a 39 by 192 ft. bay. This machine will serve three 20-ton acid furnaces, two of which are operating continuously. A covered storage building for raw materials, 50 x 192 ft., was added to the open-hearth furnace bay and provided with a 10-ton overhead traveling crane. Incoming material is unloaded by means of an electric magnet and in turn loaded into charging boxes, which are carried on all steel roller bearing cars.

At its Everett foundry the General Electric Co. has remodeled the main foundry building, 500 x 120 ft. in size. Side walls of brick and metal sash have replaced galvanized iron, making the building more comfortable for the men. An extension to the main foundry building, 300 x 90 ft., has recently been added. The open hearth department has received a 10-ton overhead traveling crane, which will serve a Brosius charging machine.

New equipment in process of installation includes car type core ovens, four exhaust system sandblasts, a 16 x 24 ft. pit annealing furnace and sand conveyor. A new mill type pattern storage building, 200 x 116 ft. in plan, has just been completed and in this will be located the general stock room, and the first aid emergency room. The molding machines installed include an electric jolt ram machine 72 x 72 in., capable of lifting a mold weighing 40,000 lb.

The Gray Foundry, Poultney, Vt., on Jan. 1, 1917, took over the foundry business of the Ruggles Machine Co. In 1915 the floor space devoted to melting was 2700 sq. ft., the number of employees, 10, and the melt was about 1½ tons four days a week. At the present time the melt is about 6 tons per day and about 40 men are on the pay-roll; 7000 sq. ft. are used for melting and molding and 1200 sq. ft. for shipping and snagging. The actual new construction has added about 2000 sq. ft. of floor space.



In these days of crane scarcity, interest attaches to the home-made crane which serves the core room of the Philbrick-Booth Foundry Co.

The Vermont Snath Co., Springfield, Vt., added materially to its plant in 1914 and is now engaged in making another extension, 140 x 200 ft. This latest addition will be ready for business about the first of next year and will give a total capacity of about 50 tons per day.

Charles E. Davis, Rutland, Vt., in the fall of 1915 was employing about 6 men in his gray iron foundry and was melting from 2 to 3 tons of iron per day. The number of employees has grown to 100 and the daily melt to an average of 16 tons. Two years ago the only machine equipment was 2 Adams squeezers. The present machine equipment is 11 Adams squeezers, 2 Modern molders and 3 roll-overs.

O. V. Hooker & Son, St. Johnsbury, Vt., has operated a foundry in a small way for some time in the manufacture of its own machinery products and in a general repair business, but since Sept. 1, 1916, has entered largely into the regular jobbing business and since that time the output of the foundry has been increased about 300 per cent. To meet the increasing demand the foundry is now being enlarged and new equipment is being installed.

The Laconia Car Co., Laconia, N. H., enlarged its

(*Continued on page 724*)

Electric Oven Used for Baking Cores



Installation in Plant of Willys-Overland Co. Cores Baked While Passing Through Oven on Continuous Conveyor

ELECTRICITY for heating a core oven is being successfully used in the first oven of this type that was recently installed in the aluminum and brass foundry of the Willys-Overland Co., Toledo, Ohio. One electrically heated oven has been in use several months, and the erection of a second oven of a similar type, for larger cores, was started recently, but it is not completed at this writing. The two ovens are located side by side under the roof of one of the core rooms in which ovens of the standard type are used. One of the electric ovens is 20 ft. above this core-room floor and the other is 5 ft. higher.

The ovens are of the continuous-conveyor type, and each has a vertical leg of the same section, 20 ft. long, at the front of the oven, extending to the floor, in which doors are provided for loading and unloading the cores. The oven in use is 45 ft. long, and the new one is 60 ft. long. They are 10 ft. 8 in. in height and 5 ft. 6 in. wide, being built in two sections, with a 2-in. asbestos partition between the upper and lower sections. The framework is of steel, and the first oven has asbestos walls 2 in. in thickness on the four sides. The second oven is covered on the four sides with Nonpareil insulating brick. The ovens are supported by steel trusses on which is laid a floor or platform of steel plates. Other steel trusses carry the conveyor machinery in the ovens, so that the supports of the ovens and their conveyors are entirely independent.

Cores baked in the continuous electric ovens are made on a second-floor core room, at one end of which, at a convenient height above the floor for loading, are the oven doors. Beneath the core room is a sand storage room, from which core sand is carried up in a bucket elevator. A roller chain conveyor, 100 ft. long and 24 in. wide, extends the length of the second-story core room through the center, terminating near the entrance to the oven. This is shown in one of the illustrations. The core-room makers' benches are located on both sides of the conveyor, and when they finish their cores they put them on plates or trays which are placed on the conveyor and thence are carried to the oven. The trays are flat sections of cast iron, 14 in. wide and 30 in. long, and having numerous circular perforations to allow the free circulation of the hot oven atmosphere. Usually, two or three cores are placed on one tray, the number depending on the size. The cores remain on the trays until removal from the oven.

The movement of the core-room conveyor, which is not in continuous operation, is controlled by a push-button by an operator who stands at the end of the conveyor. This operator lifts the tray of cores from the conveyor and places it on a short section of a roller platform built on a slight incline, over which he pushes it into the oven conveyor, the tray fitting into an angle-iron shelf in a carriage or rack in this conveyor. The carriages, which are pivoted to the conveyor on 5-ft. 6-in. centers, have double rows of shelves, each carriage having eight shelves on each side. The conveyor is 126 ft. 6 in. long, and has 23 carriages. The second conveyor, for large cores, has four carriages on 5-ft. centers, but only four shelves on each side. One of these carriages, about to be installed in the new oven, is shown standing on the floor in the illustration of the loading end of the oven.

The travel of the cores, after being placed on the conveyor at the loading door, is upward to the top half of the oven, from the front to the back of the oven, back through the lower section, and down a vertical section of the conveyor to the lower floor, where the baked cores are taken out. Here a short section of roller platform is provided for handling the trays and cores, similar to that at the loading end. The conveyor carriages pass on and up to the loading end of the oven, again to be filled. After the cores are taken from the conveyor trays the latter are placed on a 12-in. belt conveyor with steps bolted to it for carrying the trays to the second-floor core room.

The conveyor travels at a speed of approximately 9 in. per minute, and is driven by a 5-hp. motor. It takes 2 hr. 5 min. for the cores to pass from the loading end to the discharge end of the oven, the conveyor making the complete circuit in 2 hr. 40 min. The time required in the new oven will be slightly longer, owing to its greater strength. Large cores have been baked in the first oven pending the completion of the larger oven, these being allowed to make two circuits through the oven instead of one circuit. The capacity of the oven for small cores is approximately sixteen trays of cores every 7 min. It has proved of sufficient capacity to bake all the cores made by its sixteen core makers, although on the average it will handle

the output of twelve men. With the completion of the new oven all the cores made for the foundry will be baked in the two electric ovens.

The heating units are distributed all through the ovens, in both the lower and upper sections. The cores are dried off in the upper half of the oven, and are baked in the lower half, where the temperature is higher, and cooled off somewhat while passing through the vertical section on their way to the discharge door on the lower floor. A 30-in. stack 20 ft. high, controlled by a damper, is located above the front of each oven to carry away the gases, which travel in a direction opposite to the movement of the conveyor. The conveyors and steel frame supports for the ovens were supplied by the Link-Belt Co., and the ovens were built by the Young Brothers Co.

There are 21 heating units in the oven, of General Electric make, with a rating of about 8.2 kw. each. Nine are controlled by a hand-operated switch, and the remaining twelve are on a circuit controlled automatically by a Brown pyrometer. The heat is thrown on the oven by the watchman at 5.30 a. m., and this allows about two hours for the oven to get up temperature before the core makers start to work.

In the table are given the results of a test of the oven, made recently by a representative of the power company supplying current for the plant.

Supplementing the figures showing the results of the test, the following statement was made:

"The results of this test are indicative of continuous operation since the oven was up to operating temperature when the test was begun.

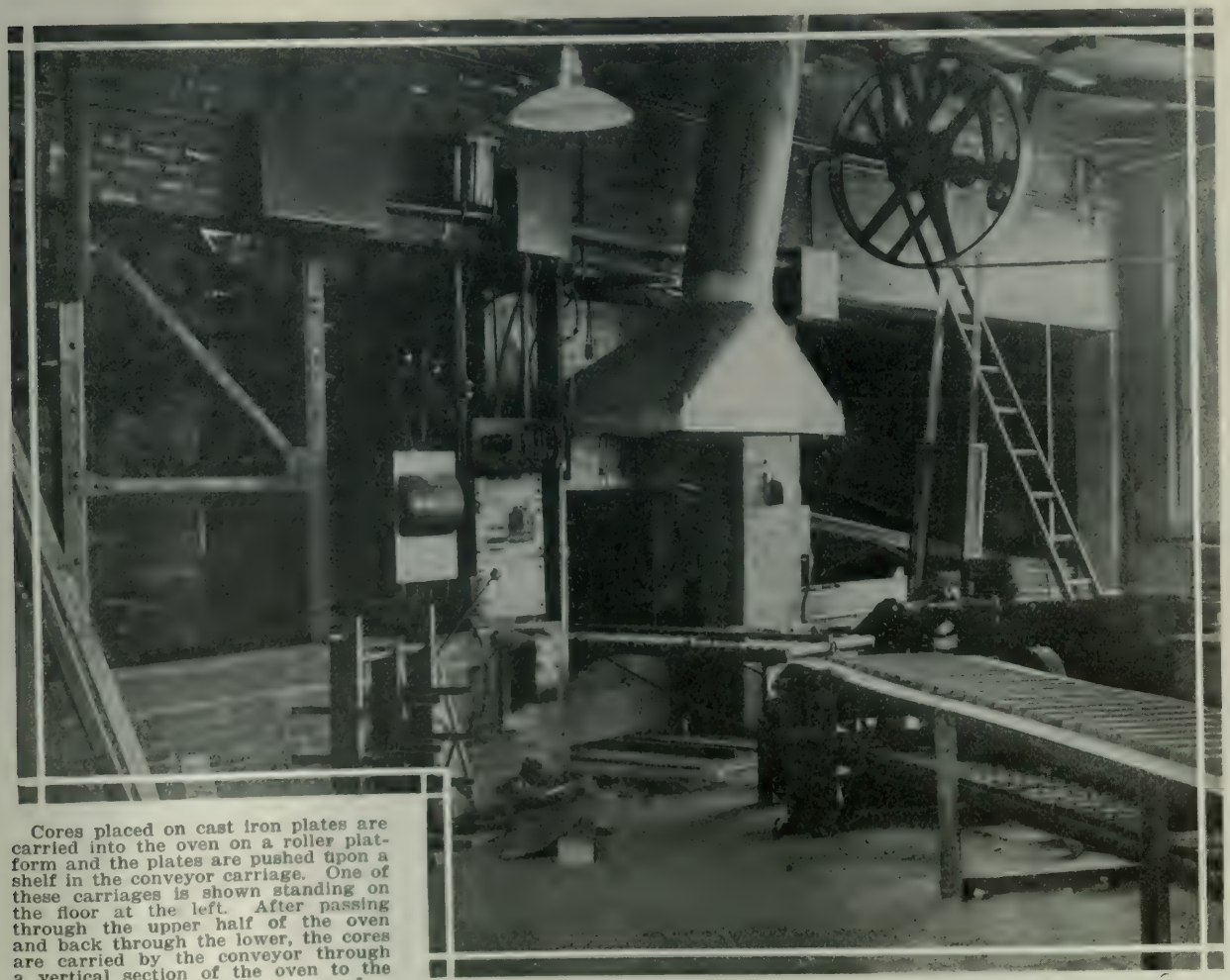
"The heat required for the operation is that to bring the cores up to temperature, to drive off the moisture, to bring the plates up to temperature, to heat the ventilating air and to supply the losses through the walls and through metal. There is also a loss of heat by the larger cores while passing through the vertical leg of the oven, as they are returning to go through the horizontal leg the second time. Since the large cores have to be sent through the oven twice, the production is cut down.

Test of the Electrically Heated Core Oven

Duration of test, min	320
Average temperature of operation, deg. Fahr	386
Cores baked, lb	6 907
Electric power, kw. hr	915
Pounds of cores per kw. hr	7.55
Kw.-hr. per pound of core	0.1324
Moisture in the sand, 6 per cent assumed, lb	415
Heating moisture, 415 × (326 + 966), B.t.u.	536,180
Heating sand, (6,907 — 415) × 0.45 × 326, B.t.u.	952,376
Total heat to bake neglecting air, B.t.u.	1,488,556
Heat input, 3.412 × 915, B.t.u.	3,121,980
Thermal efficiency, per cent	47.68
Radiation per hr., 1,009 × 0.25 × 326, B.t.u.	82.234
Total radiation during test, B.t.u.	438,304
Heat absorbed by plates, B.t.u.	221,940
Total heat accounted for, B.t.u.	2,148,800
Heat consumed by air and through iron, the amounts of which it was not feasible to ascertain, B.t.u.	973,180

"The heat required for absorption of the iron temperature of operation. Results show that there is a loss of 24 kw. per hour with the present 2 in. With 4 in. of insulation this loss would be only one-half as great.

"The heat required for absorption of the iron plates is 41,640 B.t.u. per hour, or 12.2 kw. hr. If these plates were made of aluminum, the same size, the heat required for absorption would be 26,500 B.t.u. per hour, or 7.77 kw. hr."



Cores placed on cast iron plates are carried into the oven on a roller platform and the plates are pushed upon a shelf in the conveyor carriage. One of these carriages is shown standing on the floor at the left. After passing through the upper half of the oven and back through the lower, the cores are carried by the conveyor through a vertical section of the oven to the lower floor where they are removed.

Effect of Embargo is Clearly Shown

Exports of Iron and Steel Products in July Decline Sharply, Being Most Marked in Machine Tools—Increased Imports of Scrap and Billets

WASHINGTON, Sept. 18.—The embargo instituted by the Exports Council, effective July 15, cut heavily into the exportations of iron and steel for the month of July, according to the official statistics of the Bureau of Foreign and Domestic Commerce. As compared with previous high records, the decline was heaviest in machine tools, tonnage iron and steel and machinery in the order named. The fact that the decrease in shipments of tonnage commodities was substantially greater than that in total exports by values is significant of the price trend. The decline in exports of machine tools, being in line with the uniform tendency of the past year, is less notable than the shrinkage in other machinery, which fell off one-third as compared with the preceding month. A feature of the July statistics is the separate enumeration of a number of export items which recently have assumed considerable importance and the subdivision of the classes, including parts of engines and machine tools, with a view to furnishing more detailed information to the trade.

Exports of iron and steel by values during July gained 10 per cent over the corresponding month of 1916, but lost no less than 35 per cent as compared with the high record of June of this year. Tonnage iron and steel recorded a marked decline, losing 30 per cent as compared with July, 1916, and falling 46 per cent short of the record figures for September, 1916. Exports of machinery, which gained notably in the closing months of the last fiscal year, declined 4 per cent as compared with July, 1916, and fell 35 per cent below the high water mark reached in June of this year. Shipments of machine tools, which have been steadily declining since the munition factories of the Allies practically completed their equipment, were 40 per cent less than in July, 1916, and 52 per cent below the maximum recorded in May, 1916.

Exports of Machinery

	July		Seven Months	
	1916	1917	1916	1917
Adding machines	$108,662	$194,860	$827,802	$1,332,671
Air-compressing machinery	87,489	45,331	381,865	591,541
Brewers' machinery	791	11,417	11,282	72,358
Cash registers	74,559	32,090	871,821	586,933
Parts of	22,600	10,572	87,534	51,927
Concrete mixers	.....	a14,365	.....	a14,365
Cotton gins	4,606	11,274	39,344	61,367
Cream separators	26,375	51,100	320,863	428,568
Elevators and elevator machinery	155,527	105,728	948,364	1,317,935
Electric locomotives	13,176	21,961	373,479	293,692
Gas engines, stationary	30,690	65,881	211,946	558,941
Gasoline engines	981,345	1,459,909	9,224,071	13,843,789
Kerosene engines	.....	a208,107	.....	a208,107
Steam engines	1,126,375	2,622,340	5,697,812	15,420,458
All other engines	197,511	117,688	3,109,225	2,842,622
Parts of	875,130	.....	5,075,839	b9,276,925
Boilers	.....	a211,754	.....	a211,754
Boiler tubes	.....	a481,538	.....	a481,538
All other parts of engines	.....	a867,050	.....	a867,050
Excavating machinery	.....	a26,683	.....	a26,683
Milling machinery, flour and grist	152,040	29,971	1,514,683	481,683
Laundry machinery, power	18,714	23,511	170,908	268,084
All other	16,591	10,039	119,657	143,720
Lawn mowers	15,705	22,146	147,307	137,626
Metal-working machinery (including metal-working tools)	7,814,691	.....	47,182,401	b44,604,259
Lathes	.....	a1,559,834	.....	a1,559,834
Other machine tools	.....	a769,435	.....	a769,435
Sharpening and grinding machines	.....	a442,042	.....	a442,042
All other metal-working machinery	.....	a1,929,328	.....	a1,929,328
Meters, gas and water	26,166	53,618	204,992	297,081
Mining machinery, oil well	355,190	86,342	1,122,709	795,847
All other	651,537	616,005	3,519,661	6,359,970
Paper-mill machinery	76,007	187,898	417,471	1,083,432
Printing presses	114,042	74,119	1,052,668	925,439
Pumps and pumping machinery	437,277	454,902	2,995,688	3,513,627
Refrigerating and ice-making machinery	111,445	125,471	419,762	660,625
Road-making machinery	.....	a30,051	.....	a30,051
Sewing machines	398,068	869,683	3,222,701	4,623,733
Shoe machinery	72,680	155,248	583,926	924,007
Sugar-mill machinery	448,428	359,559	1,954,068	3,833,619
Textile machinery	333,511	230,511	1,995,143	1,898,385
Typesetting machines	130,363	58,648	737,902	686,282
Typewriting machines	742,879	705,389	5,899,249	6,179,118
Windmills	78,605	141,097	678,752	637,408
Wood-working machinery, saw mill	30,938	135,180	244,027	349,986
All other	52,002	120,813	483,164	653,563
All other machinery and parts of	3,189,337	2,457,941	21,558,897	24,056,764
Total	$18,971,052	$18,208,429	$123,406,983	$156,334,172

a Not separately enumerated prior to July 1, 1917.
b Six months ending June 30, 1917.

Imports of Iron and Steel

	July		Seven Months	
	1916, Gross Tons	1917, Gross Tons	1916, Gross Tons	1917, Gross Tons
Ferromanganese	5,341	2,037	40,162	32,633
Ferrosilicon	487	702	4,042	6,233
All other pig iron	606	2,933	22,975	10,453
Scrap	4,615	13,107	34,289	150,576
Bar iron	987	968	4,289	1,503
Structural iron and steel	7	1,128	1,012	1,681
Steel billets without alloys	145	5,742	8,031	20,029
All other steel billets	1,202	1,232	9,007	4,248
Steel rails	546	579	16,520	4,321
Sheets and plates	192	263	1,094	1,100
Tin and terne plates	150	....	671	115
Wire rods	495	168	2,666	193
Total	14,773	28,859	145,309	233,085

Record Not Surpassed

The record for the seven months ended July 31 remains unbeaten in spite of the general declines throughout the closing month. Total exports by values for the seven months rose 62 per cent over 1916, which in turn surpassed any previous record by more than 150 per cent. Tonnage iron and steel gained 20 per cent over the record total for 1916, machinery showed an increase of 27 per cent over 1916, which exceeded by nearly 100 per cent any previous corresponding period, and machine tools surpassed by 5 per cent the record of 1916, which exceeded by 100 per cent that of any prior seven months.

The value of all shipments of iron and steel products in July, 1917, was $77,782,294, as compared with $70,745,162 for the same month of 1916 and $119,141,836 for June of this year which is now the record total. For the seven months of 1917, the total was $713,426,557 as compared with $442,640,120 for the corresponding period of 1916 and $174,971,176 in 1915. Exports of machinery in July were valued at $18,208,429 as against $18,971,052 for the same month a year ago. For the seven months, the total was $156,334,172 as compared with $123,406,983 for the same period of 1916. The best previous record, that of 1915, was $67,957,315. Shipments of metal-working machinery aggregated $4,700,639 in July as against $7,814,691 in the same month of 1916. For the seven months of 1917, the exports totaled $49,304,898 as compared with $47,182,401 for the corresponding period of 1916. Details of the exports of machinery in July, 1916 and 1917, and for the two seven-months' periods are given in the accompanying table.

Exports of iron and steel for which quantities are given aggregated 349,649 gross tons in July, 1917, as compared with 496,624 tons in the same month of 1916.

Exports of Iron and Steel

	July		Seven Months	
	1916, Gross Tons	1917, Gross Tons	1916, Gross Tons	1917, Gross Tons
Pig iron	28,718	.....	178,118	b375,687
Ferromanganese	.....	a629	.....	a629
Ferrosilicon	.....	a2,067	.....	a2,067
All other pig iron	.....	a29,672	.....	a29,672
Scrap	4,788	3,196	103,684	127,948
Bar iron	6 934	3,438	47,038	34,156
Wire rods	14,598	8,503	96,133	79,059
Steel bars	78,947,	32,109	445,256	374,391
Billets, ingots and blooms, n.e.s.	129,278	112,085	727,644	1,142,032
Bolts and nuts	2,286	2,833	16,704	17,556
Hoops and bands	3,953	5,092	25,94L	31,961
Horseshoes	841	154	5,834	1,619
Cut nails	630	197	2,517	1,936
Wire nails	12,328	7,157	84,532	53,869
Wood screws	.....	a451	.....	a451
All other nails, including tacks	869	912	4,918	980
Cast-iron pipes and fittings	6,466	7,328	36,025	42,119
Wrought pipes and fittings	14,420	7,132	71,060	74,703
Radiators and cast-iron house heating boilers	193	461	1,198	3.829
Railroad spikes	1,495	1,006	17,195	11,965
Steel rails	21.822	19,704	262,953	315,237
Galvanized iron sheets and plates	7,138	5,157	46,596	50,148
All other iron sheets and plates	2,941	3,964	26,527	33,638
Steel plates	21,778	36,269	145,812	305,691
Steel sheets	7,323	9,931	59,574	82,048
Ship and tank plates, punched and shaped	.....	a1,417	.....	a1,417
Structural iron and steel	26,583	14,633	154,569	181,888
Tin and terne plates	18,742	16,719	141,599	145,142
Barb wire	47,474	14,544	252,672	104,097
All other wire	36,079	12,889	162,135	116 950
Total	496,624	349,649	3,116,234	3,742,885

a Not separately enumerated prior to July 1, 1917.
b Six months ending June 30, 1917.

The record for exports of these commodities is still held by September, 1916, with a total of 643,763 gross tons. For the seven months ended July, 1917, these shipments aggregated 3,742,885 gross tons as against 3,116,234 tons for the same period of 1916. The accompanying table shows the exports for July and for the seven months ended July, 1917, as compared with 1916.

The imports of iron and steel in July recorded an increase of 100 per cent, due almost wholly to increased receipts of scrap and steel billets. The total imports for July, 1917, were 28,859 gross tons as compared with 14,773 tons in the same month of 1916. For the seven months of 1917, the imports aggregated 233,085 gross tons as against 145,309 tons for 1916. The imports of tonnage commodities for July and for the seven months of 1917 as compared with 1916 are shown in the accompanying table.

British Restrictions on Chrome Ore and Benzol

The British Minister of Munitions forbids purchase or delivery of chrome ore except under permit from the Director of Materials. He has also ordered that from Oct. 1 no person shall supply, accept or attempt to obtain delivery of crude benzol, crude naphtha or light oils containing recoverable quantities of benzol or toluol except under license. Crude benzol and crude naphtha mean such as are obtained by distillation of coal tar or extracted from coal gas. Light oils mean light oils obtained by the distillation of coal tar.

Two New High-Speed Tool Steels

Two patents have been granted recently for new high-speed steels. One is a tungsten-chromium-vanadium type of steel patented (U.S. 1,233,118) by James H. Parker, Reading, Pa., and B. H. De Long, Springmont, Pa., and assigned to the Carpenter Steel Co. of Reading. It is characterized by a high percentage of cobalt as the following analysis shows:

	Per Cent		Per Cent
Carbon	0.35	Tungsten	12.00
Vanadium	2.00	Cobalt	30.00
Chromium	3.50	Iron	52.15

The iron and cobalt proportions correspond with the eutectic relation and it is claimed that maximum service with increase of speed and cutting efficiency is possible.

The other new alloy is covered by a patent (U.S. 1,233,862) granted to Radclyffe Furness of Jenkintown, Pa., and assigned to the Midvale Steel Co. According to the patent, if a certain amount of both cobalt and tungsten is added to an ordinary high-speed tool steel containing tungsten, chromium and vanadium, a substantial increase in cutting efficiency is attained. The following table is given as the preferred analysis, together with the limiting proportions:

	Preferred Analysis, Per Cent	Limiting Proportions, Per Cent
Cobalt	4.5	3.0 to 7.0
Uranium	0.7	0.1 to 2.0
Tungsten	13.5	12.0 to 20.0
Chromium	3.5	2.0 to 6.0
Vanadium	1.5	0.5 to 2.0
Carbon	0.7	0.5 to 0.9

The amount of uranium is so little that it cannot be said to replace the regular high-speed tool steel elements to any extent. Its presence, however, even in almost insignificant proportions is said to improve the efficiency of the tools.

British Iron-Ore Production

The iron-ore output of the United Kingdom in 1916 was officially 13,700,039 gross tons, of which 6,300,000 is estimated as coming from quarries. The corresponding figures for 1915 were 14,235,012 tons, with 6,358,907 tons from quarries. For 1914 the total was 14,867,582 tons, with 5,883,090 tons from quarries and for 1913 it was 15,997,323 tons, with 6,405,851 tons from quarries.

Many plants which have hitherto been engaged in the manufacture of 8 and 9.2 in. shells for the British Government in Canada will be converted into plants suitable for producing 6 in. shells.

Structure of Iron Cast in Metal Molds

A Comparison With That of Iron Cast in Sand Molds—Relative Size of Microconstituents — Chemical Composition of the Two

BY EDWIN F. CONE

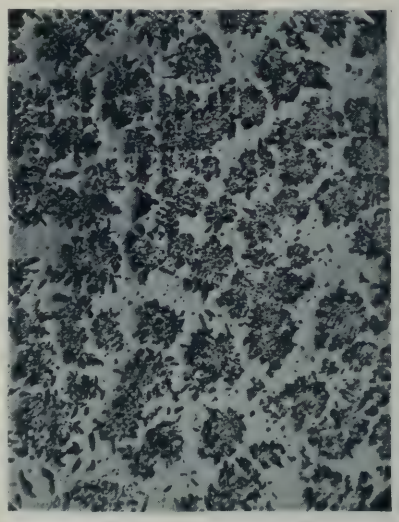
IT is evident that there must be a decided difference between the microstructure of cast iron cast in sand molds and that of the same iron cast in a metal mold, especially a rapidly revolving one. It has been commercially demonstrated that it is possible to make cast-iron pipe in rapidly revolving molds, the metal being deposited by centrifugal action. The pipe so made are of considerably thinner section than the sand cast, but are equally strong or stronger. An investigation of the structure and composition of pipe made by the two processes is the object of this brief study.

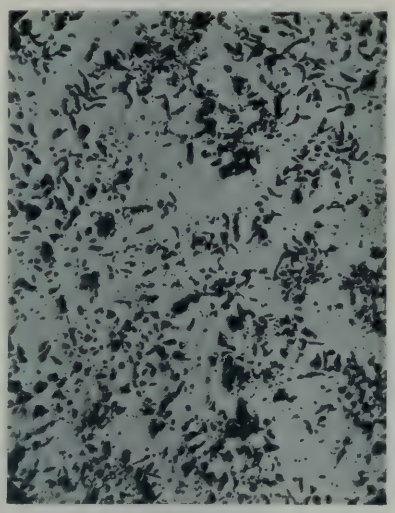
The usual method of making sand-cast pipe is familiar. The metal cools very slowly, affording opportunity for it to crystallize in large form. In metal molds the conditions are different, depending on the time the hot metal remains in contact with the mold. In pouring hot metal into a rapidly revolving metal mold and removing the casting as soon as it has become solid, the crystal formation is proceeding under entirely different conditions. The crystals are not given the time to develop slowly. The question of the extent to which the carbon assumes the combined form is also important.

One of the principal constituents of cast iron which affect its structure and strength is carbon. This exists largely in the graphitic state in such pipe. If the graphite is coarse or inclined to be lamellar or platy, the strength of the iron is not so great as when the graphite is in a more finely divided condition. This is one of the points made by J. E. Johnson, Jr., in his claim for the superiority of cast iron or pig iron containing oxygen, the graphite in such iron being in a fine state.

Theoretically the carbon in slowly cooled iron should be found in larger globules or flakes than in iron that cools more quickly. Iron cast in a permanent mold, whether it revolves or not, should contain smaller crystals of carbon or graphite as well as of other constituents. When the iron so cooled is removed into the air, the cooling and formation of the crystals is accelerated. This is demonstrated by a microscopic examination.

It has been possible for the writer to obtain samples of 4-in. cast-iron pipe made by both processes. The sand-cast pipe had an average thickness of about ½ in. and the centrifugally cast-iron pipe a thickness of 3/16 in. The latter was practically of uniform wall section throughout. A microscopical examination of the sand-cast pipe is shown by Figs.





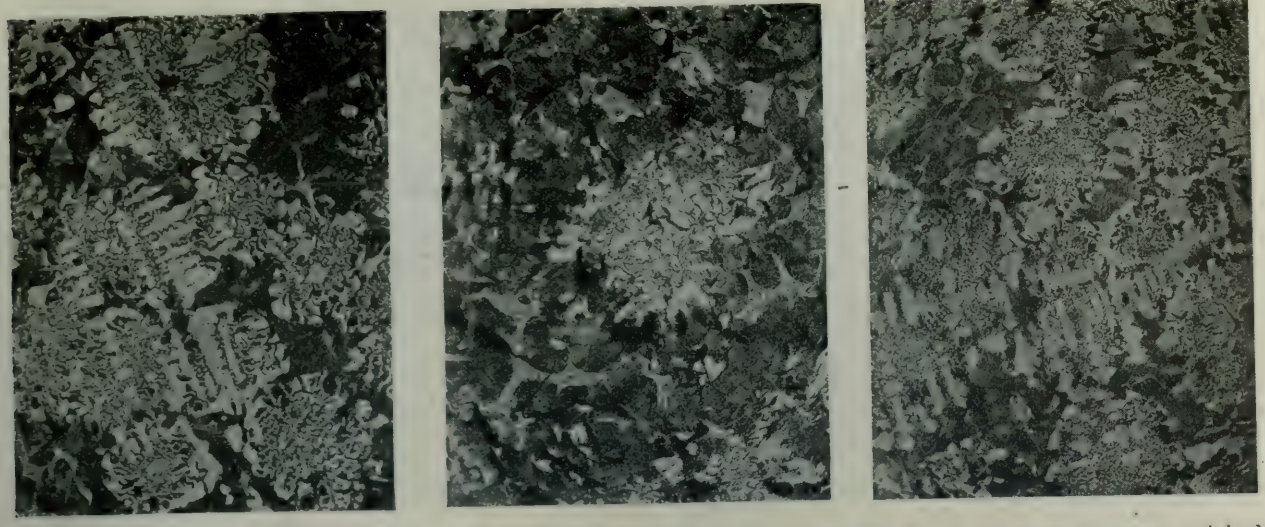






Photomicrographs of cast-iron pipe cast in sand, all reduced about one third from an original diameter of 90. Fig. 1 (upper left) is from the inside wall as polished. It shows graphite in fine clusters. Fig. 2 (upper right) is from the center of the cross-section of the wall of the pipe and shows the graphite as coarser and inclined to be platy.

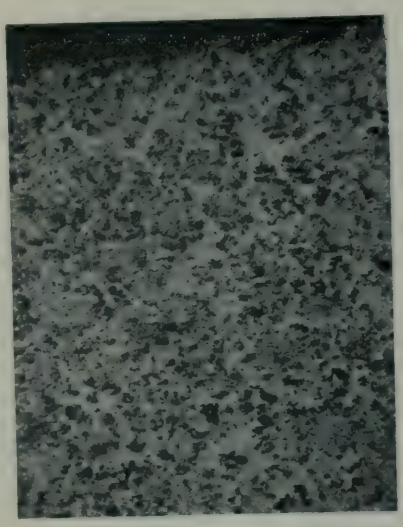
Figs. 3, 4 and 5 (lower row, left to right) are the same metal etched. Figs. 3 and 5, the inside and outside wall surface, show white dentrites which are ferrite (silico-ferrite), the ground mass being pearlite with some carbide eutectic. The center of the metal, Fig. 4, is similar but much coarser, graphite plates being more distinct.



Photomicrographs of cast-iron pipe cast in revolving metal mold, all reduced about one-third from an original diameter of 250. Figs. 6, 7 and 8, left to right, represent the inside, center and outside sections of the cross-section, respectively, similar to Figs. 3, 4 and 5, and are from etched specimens. Figs. 6 and 8 reveal white dentrites, silico-ferrite, surrounded by a mixture of fine graphite and ferrite. The network of pearlite contains cementite eutectic which is phosphoric in places. Fig. 7, the center of the metal, shows a grain of ferrite and graphite surrounded by pearlite in which is graphite as plates, together with cementite-phosphide eutectic.

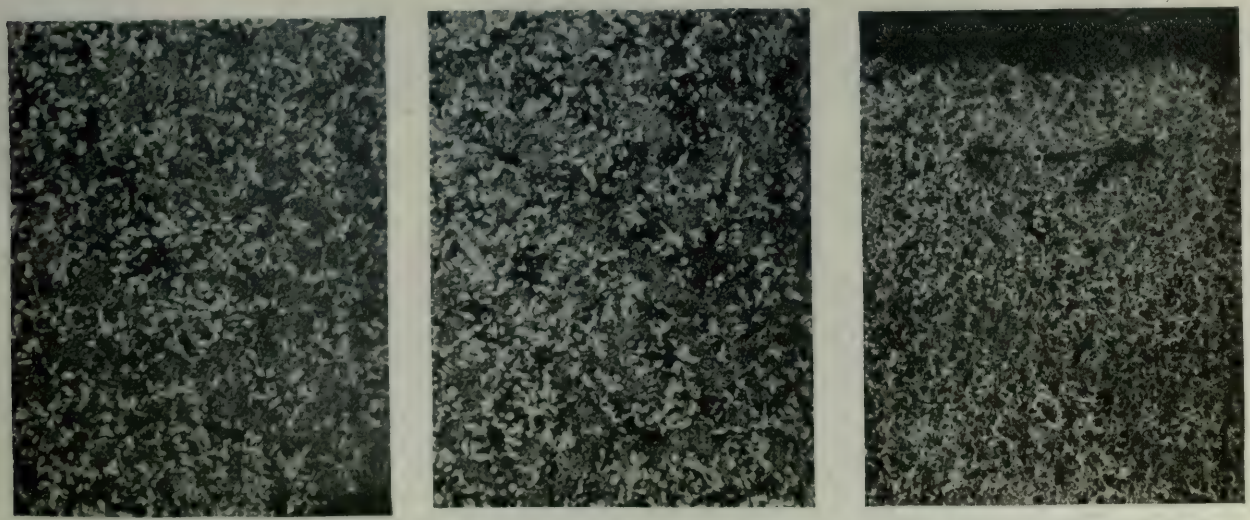
1 to 8. Figs. 1 and 2 reveal the inside and center of a cross section, the outside surface being the same as the inside. They are unetched. Fig. 1 shows graphite in clusters which are very fine. Fig. 2, the center of the metal, shows a coarser graphite which is inclined to be platy.

The same metal etched is shown by Figs. 3, 4 and 5, inside, center and outside respectively. Fig. 4, the center, is similar to the others, but much coarser. The same metal under a higher magnification is shown by Figs. 6, 7 and 8, outside, center and inside respectively. There is again but little difference between the outside and inside, but the microstructure of the center, Fig. 7, shows a grain of ferrite and graphite surrounded by pearlite in which the graphite exists as plates, together with cementite - phosphide eutectic.





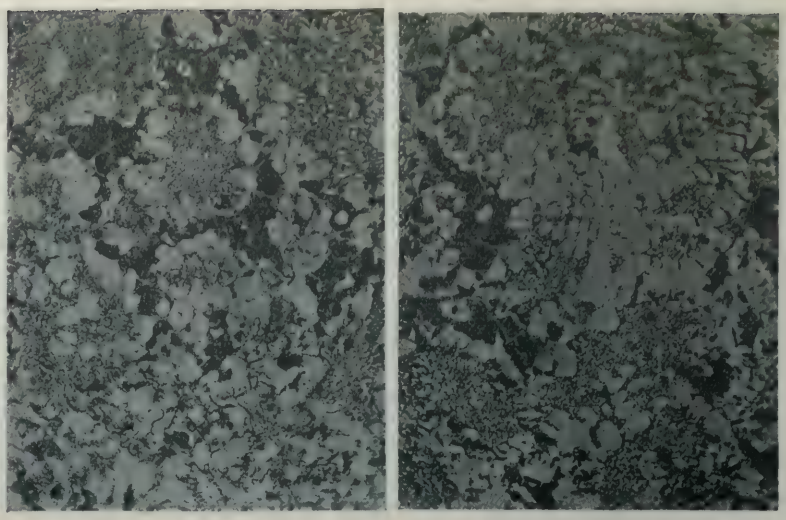
Photomicrographs of the machine - cast metal are seen in Figs. 9 to 15. They represent the hot metal quickly thrown against the surface of a rapidly revolving water-cooled metal mold and removed into the air as soon as congealed or within a few seconds of its



Photomicrographs of cast-iron pipe cast in a rapidly revolving metal mold and removed immediately, all reduced about one-third from an original diameter of 90. Fig. 9 (upper left) is from the inside wall and Fig. 10 (upper right) is from the center of the cross-section of the wall, both as polished. The graphite is very fine on the inside surface (same on the outside) but a little coarser at the center. The absence of plates is noticeable.

Figs. 11, 12 and 13 (lower row, left to right) are the same metal etched representing inside, center and outside, and correspond with Figs. 3, 4 and 5, for the sand-cast metal. They reveal white grains and dentrites of silico-ferrite in a matrix of pearlite, fine graphite and ferrite. A flaw is noticeable in Fig. 13.

contact with the mold. Figs. 9 and 10 show the metal unetched, Fig. 9 representing the inside wall of a cross section of pipe 3/16 in. thick, and Fig. 10 the center of the same section and wall. In these the graphitic carbon is in a very fine condition of crystallization on both the outside and inside walls, but a little coarser at the center, Fig. 10. The contrast between these structures and those of the sand-cast metal, Figs. 1 and 2, is striking.



Photomicrographs of cast-iron pipe cast in a revolving metal mold, all reduced about one-third from an original diameter of 250. Figs. 14 and 15 (left to right) represent the metal near the inside wall and the center section respectively and are from etched specimens. The structure is similar to sand cast (Figs. 6, 7 and 8) but there is much less pearlite.

Taking photomicrographs of the same metal etched, we have Figs. 11, 12 and 13, corresponding to Figs. 3, 4 and 5, the sand-cast metal. In the former, Figs. 11, 12 and 13, the graphite and ferrite are both in fine grains, also a marked contrast to the metal in the sand-cast condition. At a higher magnification the pipe, cast in a metal mold, Figs. 14 and 15, reveal a structure similar to the sand cast, but there is considerably less pearlite present. This is to be expected under the conditions of manufacture.

By allowing the metal in a rapidly revolving cooled mold to remain a few seconds longer, it is possible to develop a slight chill on the surface. In so doing a little more metal is used and the thickness of the pipe slightly increased. It becomes ¼ in. in wall thickness instead of 3/16 in. The presence of the chill is claimed to bestow anti-corrosive quality to the metal.

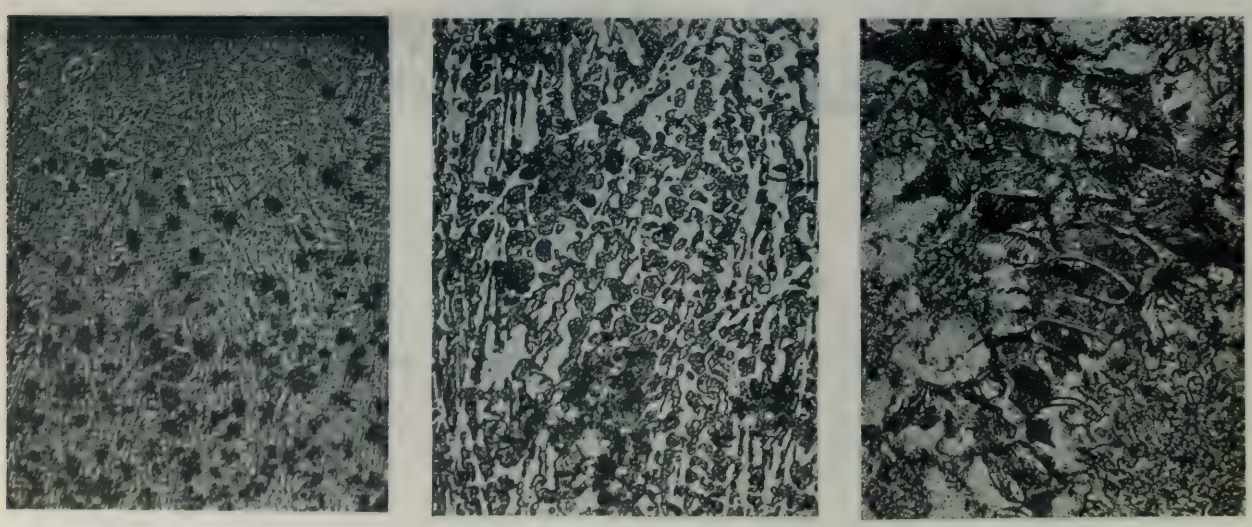
The microstructure of the chilled surface is shown by photomicrographs, Fig. 16, unetched. It consists of cementite and pearlite with a few black spots showing graphite. The same at a higher magnification is represented by Fig. 17. Microscopic examination of the center of metal cast with the chill reveals no essential difference from that cast in the metal mold but quickly removed. Examination of the metal next to the chill reveals the presence of much more pearlite of a distinctly lamellar nature — shown by Fig. 18. An investigation of the composition of the three samples revealed the fortunate coincidence that they were very similar in each case, especially as to carbon and silicon, affording a fair basis for comparison. The following table gives the results of the analyses:

	Sand Cast Metal, Per Cent	Machine Cast Metal, Per Cent	Metal Allowed to Chill, Per Cent
Silicon	2.12	2.10	2.58
Manganese	0.65	0.40	0.45
Phosphorus	0.491	0.575	0.624
Sulphur	0.044	0.081	0.081
Graphitic carbon	3.14	3.36	3.22
Combined carbon	0.33	0.12	0.23

Drillings were taken on the inside of the curve of each pipe.

In the case of the chilled pipe the sample does not represent the chill but only an average of nearly the entire metal section. The silicon is intentionally higher in such pipe. Comparing the machine-cast with the sand-cast, it is noticeable that the combined carbon is less, due to the amount of pearlite present, caused by the conditions of cooling.

Comparison of the photomicrographs of the sand-cast and machine-cast metal reveals the distinct superiority of the latter from the point of view of crystalline structure. It is evident that when the crystals are smaller and more closely knitted together, and especially when the graphite which is a potent weakening constituent is in smaller flakes and not in long plates that the iron itself should be different and stronger.



Photomicrographs of cast-iron pipe cast in a revolving metal mold, but allowed to remain long enough to form a slight chill on the surface. Fig. 16 (left) represents the chill of a cross-section at the surface as polished, reduced about one-third from an original of 90 diameters. It reveals white grains of silico-ferrite in a matrix of pearlite and graphite with some cementite eutectic visible. Fig. 17 (center) is the chill etched and reduced about one-third from an original diameter of 500. It shows cementite and pearlite (eutectic structure) with an occasional patch of graphite. Fig. 18 (right) is from near the outside surface of the metal, next to the chill. It is etched and reduced about one-third from an original diameter of 250. Much more pearlite, distinctly lamellar, is visible, with cementite-phosphide eutectic.

Foundry Built for Economical Production

Malleable Plant of Timken-Detroit Axle Co. Has Notable Features Including Utilization of Waste Heat and Equipment for Handling Cores and Sand

SOME time ago the Timken-Detroit Axle Co., Detroit, decided to build a malleable-iron foundry to make its own castings, used in the manufacture of automobile axles, and selected a site in Canton, Ohio, where its new plant has recently been placed in operation. This foundry was designed to meet the special requirements of the company and has an output of 30 tons of castings per day, ranging in sizes up to 150 lb.

It is a modern type of plant in plan and arrangement, being designed both for quality and economical production, and has a number of interesting features. These include the utilization of waste heat from the furnaces for supplying all the power requirements for the operation of both an air compressor and a turbo-generator for generating electricity for the operation of cranes and conveyors and for lighting, heating and ventilating the plant; a very complete sand-handling system; a continuous core oven located high above the foundry floor, resulting in a large saving in floor space, and a unique arrangement of the cleaning-room equipment that results in much saving of labor in handling castings. Electric steel castings for the company's requirements will also be made in the same plant, a 2-ton Heroult furnace now being installed for that purpose.



A vertical water-tube boiler of 300 hp. capacity in the center of the foundry utilizes a portion of the waste heat from the furnaces for generating steam, which furnishes all the power for operating cranes and other machinery driving a turbo-generator and air compressor.

The plant occupies a space 200 x 350 ft. and consists of three connected buildings of brick, steel and concrete construction with the Pond type of saw-tooth roof. A large portion of the sidewalls and the vertical roof sections are covered with factory ribbed glass in continuous Pond steel sash, affording good light and ventilation.

The foundry building is 260 ft. long and 160 ft. wide, and is divided into two separate foundry units with bays 60 ft. wide on each side. Between the foundry bays is a center bay 40 ft. wide, in which is located the melting equipment, boiler for utilizing waste heat from the furnaces, core room and core ovens. An extension on the east side of the main building provides a 40-ft. bay reaching the length of the building, which is occupied by the offices, pattern shop, pattern storage room and engine room, in which the generator and compressor are located.

Adjoining the lower end of the foundry building are two transverse buildings, without separating partitions, 200 ft. long or extending the width of the main building. One of these, adjoining the foundry and 30 ft. wide, is occupied by the cleaning department, and the second, 60 ft. wide, houses the annealing department. The foundry has a clay floor and the annealing and cleaning departments, creosoted wood block floors. The roofs are covered with tile.

The melting equipment consists of three 12-ton air furnaces near the center of the foundry, two on one side and one on the opposite side of the center bay. The furnaces are 21 ft. in length between bridge walls, 5½ ft. wide inside dimensions, and have 4 ft. x 5 ft. 6 in. fire boxes. The location of the furnaces, in close proximity instead of having them widely separated in the two molding units, was considered desirable from the standpoint of economy and operation and a better arrangement for the utilization of the waste heat. All furnace piping is under the floor.

Near the center of the center bay, near the furnaces, is a 400-hp. Wickes vertical water tube boiler for utilizing the waste heat. Heat from the furnaces is discharged into underground flues that join in a main flue and a portion of this heat is carried from the main flue in a branch to the boiler. The remainder is discharged from the main flue into a stack at the side of the boiler, only a portion of the waste heat being required for generating the steam for power purposes when all the furnaces are in operation. It is stated that the waste heat from one furnace is sufficient to generate steam at the required pressure in the boiler. A slight coal fire is kept under the boiler at all times to provide steam

in an emergency, should a quick shutting down of the furnaces be necessary.

Steam for power purposes is generated in the boiler at 140-lb. pressure and this drives the air compressor and a 200-kw. alternating current turbo generator unit consisting of a Kerr turbine directly connected to an Allis-Chalmers generator. The air compressor, which was furnished by the Chicago Pneumatic Co., has a capacity of 1100 cu. ft. of free air per minute.

The exhaust steam from the turbine and compressor will be used in winter for heating the plant. This will be supplied to two heating units installed by the American Blower Co. The hot air will be forced through a main header in the roof trusses and carried down through blast pipes, attached to the building columns, and discharged into the foundry several feet above the floor. In hot weather the blower equipment that distributes the hot air throughout the plant will be used for the circulation of fresh air. Equipment will be installed for washing this air as it is drawn into the system from outside.

Each foundry bay and the melting bay are served by a 5-ton crane, the one in the melting bay being used for lifting off the roofs and charging the furnaces. Furnace charges are made up in the yard in 3 x 4 ft. rectangular steel boxes and are placed on a truck and run into the plant on a track on a platform, built up in the basement just beneath the foundry floor, and on a level with the yard. An opening is provided in the floor through which the charging boxes are raised by the centerbay crane.

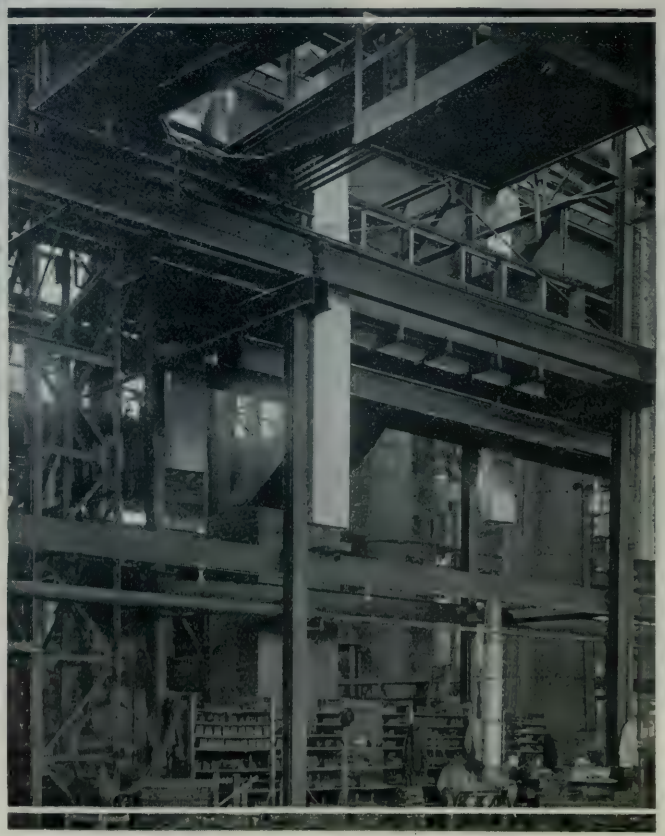
On each side of each foundry bay building columns provide 7-ft. bays or aisles in which the molding machines are located. A monorail trolley track extends the length of each of these bays for handling sand so that the sand is supplied on each side of both molding floors. This sand is conveyed on two electric traveling monorail cranes each equipped with two tub buckets which discharge the sand on the floor between the molding machines. The plans, however, provide for the placing of a hopper over each machine, sand to be dumped into these and discharged through a chute as needed by a molder.

The monorail track extends across the lower end of the foundry floor and out on a traveling bridge on the west side of the plant. This bridge has a 40-ft. span and a runway 300 ft. long. Beneath the bridge is a railroad siding for unloading and storage space for pig iron and coal. Switches are provided in the monorail track within the plant so that the monorail crane can be run from the transverse track up any one of the four tracks that extend the length of the building. An extension of one of these tracks also serves the core room, the sand being dumped by the buckets into storage bins on the core-room floor, having discharge chutes at the bottom.

One foundry bay is used for light work and the other for heavy work. In the bay for light work molds for the most part are made on squeezers. The larger molds made in the other bay are made on the floor and on the large molding machine of the roll-over jar-ramming type. The molding-machine equipment consists for the most part of Arcade squeezers and Osborn roll-over and drop-plate machines. Each foundry floor is operated independently and has its own foreman. Molds are poured with hand ladles, and after cooling are carried by the overhead cranes to the lower end of the foundry where they are shaken out over a grating.

Occasionally more iron is melted in a





Bucket elevators carry the sand from the basement to storage bins above the foundry floor from which it is discharged through chutes into the tub buckets of a monorail crane. There are three separate units of this conveyor system, two appearing in the illustration, one each for foundry, core and facing sand.

The continuous core oven is located 24 ft. above the foundry floor, a view of this in the picture to the right being obstructed by the crane runway. The vertical section of the conveyor that passes through the oven, the vertical part not yet enclosed, appears at the left.





An electric charging truck is used for charging annealing pots.
Transfer track, a 3000-lb. ladle and ladle truck shown at the right for carrying metal from one foundry bay to the other.

furnace than is required on the foundry floor which this furnace serves, and in that case it is used in the other foundry bay. For transferring the metal from one bay to the other a transfer track is provided between the two foundries, the metal being poured into a 3000-lb. ladle which is conveyed to the opposite foundry floor on a ladle truck, from which the ladle is picked up with the crane.

The continuous core oven which is located above the core room at the front of the center bay is 95 ft. in length and 24 ft. above the floor level. The conveyor extends horizontally from the floor to the oven and through the latter. The cores are placed on one side of a vertical leg of the conveyor near the floor and are removed from the opposite side when they have completed the circuit. The conveyor is 4 ft. 8 in. wide, and suspended from it on 30-in. centers are carriers, the shelves of which maintain a level position during the circuit of the conveyor. Each carrier has three shelves made of small bars, the shelves being adjustable to accommodate large or small cores. The cores are placed on steel plates on the shelves. The conveyor moves at the rate of 6 in. per minute and it takes 8 hours for it to complete its circuit, making three round trips in a day. It is driven by a 3-hp. motor through a worm drive.

The continuous core oven is coke fired from two fire boxes located under the foundry floor, two flues leading up to different sections of the oven. These flues are brick lined the greater part of the way. The stack is at the extreme end of the ovens and terminates above the roof. A Bristol pyrometer, located on the core-room floor, is connected to the oven.

In addition to the continuous core oven, there is a battery of three ovens in the core room. These are 12 ft. deep, 5 ft. 9 in. wide and 7 ft. high. Cores baked in these are placed on large racks that nearly fill the interior space of the ovens and these racks are taken in and out of the ovens on hand trucks with elevating platforms. Some of the cores are made by hand and others on a Hewlett-Demmler core machine. Adjoining the foundry core room and partitioned off from the foundry floor is a core room for women employees. This has a second floor for rest, lunch and lavatory rooms.

Across the lower end of the foundry building is a basement, 200 ft. long, 60 ft. wide and 18 ft. deep, which is used for sand storage and the sand-handling and sand-mixing equipment. Molding sand as it is shaken out from the molds falls through gratings upon a belt conveyor under the basement ceiling, from which it is distributed on the basement floor and left 12 hours or longer to temper. A grab bucket, operated by a monorail hoist, picks it up from the floor and drops it in a hopper that feeds a mixing machine. The tailings and dirt are carried away in a magnetic separator and the tempered sand is deposited in a bucket elevator which elevates it to storage hoppers over the foundry floor. Three elevators are provided for molding, core and facing sand. These storage hoppers are located directly above a monorail track that runs along the directly above a monorail track that runs along the east side of the building and from these hoppers the sand is discharged through chutes into the tub buckets of the monorail crane. These buckets have a capacity of about 2 cu. yd. Sand from the outside yard is brought into the plant with a monorail bucket conveyor and dropped through holes in the foundry floor to storage bins in the basement.

The floors of the cleaning and annealing departments in the rear of the foundry are 8 ft. below the foundry-floor level. Having these departments on a lower level was made practical because the plant is located on a hillside, and the lower floor level permitted an arrangement of the cleaning equipment that effects considerable economy in the handling of castings during cleaning. On a platform in the cleaning department at the edge of the foundry floor is a battery of five tumbling barrels, the tops of which are on a level with the foundry floor so that the castings do not have to be lifted to be placed in these barrels but are shoved directly into them from the floor. From these tumbling barrels castings are discharged down chutes at the side to sorting benches, and are ground before being annealed. During the grinding operation the castings are handled in the cleaning room on wooden racks moved by elevating platform trucks.

The annealing ovens are arranged in a line along

the annealing room. These ovens, 12 in number, are 21 ft. deep, 15 ft. wide and 9 ft. high. They are charged with a Baldwin electric charging truck. After annealing, the pots are lifted by a 5-ton crane which serves the annealing department and are shaken out on a grate on a platform at the side of the cleaning department 8 ft. above the floor. The packing passes down chutes into buckets and the crane carries it back to the packing floor. Another battery of four tumbling barrels is located at the side of this platform and above the sorting benches for cleaning the castings after being annealed. The elevation of these tumbling barrels permits the dropping of the finished castings from the barrels down to the soft iron sorting tables below the barrels. Here the castings are sorted and packed for shipment and taken to a loading platform through a door at the side of the cleaning room. The cleaning equipment includes two sand-blast tumbling barrels and two sand-blast rotary tables, one of each of these being provided for hard castings and one for soft castings.

The plant is provided with six monorail hoists, three of these being tub monorails and two double hook hoists for various handling purposes, and one single hook hoist, the latter in the basement for sand handling. The hoists are of 4-ton capacity. The sand-conveying equipment was furnished by the Link-Belt Co., the monorail hoists by the Sprague Electric Works, the electric traveling cranes by the Northern Engineering Works, the sand-mixing machinery by the Standard Sand & Machine Co., the tumbling barrels by the Whiting Foundry Equipment Co., and the sand-blast equipment by the American Foundry Equipment Co. The plant was erected by the Canton Bridge Co. Details for the plans of the plant and the sand-handling equipment were prepared by the H. M. Lane Co., Detroit. A 40 x 40 ft. extension is now being built to the plant to provide a molding floor for steel castings.

The plant occupies a 28½-acre site, a portion of which is used by the employees for gardening purposes, and another section will be fitted up shortly by the company for an athletic field for its workmen. The company has made arrangements with a real-estate company to build houses for employees on a portion of its site. Eighteen residences of a modern type are now being erected which will be sold on the installment plan at prices ranging from $3,000 to $3,400, the monthly payments being small enough to make it possible for an employee to buy his own home.



The annealing pots are shaken out on a platform 8 ft. above the cleaning room floor. The castings pass to adjoining tumbling mills on a lower level, and from these mills down to sorting benches, eliminating hand lifting

Electric Steel Industry of the United States and Canada

Discussing the "Electric Steel Industry in Canada" at a recent meeting of the Manitoba branch of the Canadian Society of Civil Engineers, A. M. Tirbutt pointed out that the wonderful growth of the electric steel industry in Canada and the United States during the past few years is best shown in terms of output. From 18,309 tons made in 1912 it jumped to a total of over 225,000 tons in 1916, and taking the units installed during the latter part of that year and those at present under construction, the total output for this year, at a conservative estimate, should easily reach the 500,000-ton mark.

Some Latter-Day Problems of the Foundry

In Part They Grow Out of War Conditions in Industry—Others Are New Phases of Long Familiar Questions

BY DR. RICHARD MOLDENKE

Few industries in the world are so dependent upon quality in raw materials of ordinarily low cost as is the foundry. When the present cataclysm shall have passed and things become normal, the foundryman will feel as if he has awakened from a nightmare. While he shares with most of the industries the shortage of labor, he has to draw upon a division of skilled workmen that cannot be trained in a week or a year. Furthermore, unless the iron and fuel bought is of proper quality, he starts with a handicap making the production of high grade castings a sheer impossibility. The raw materials must be "good" and not merely "near good."

Since, however, results are wanted and not complaints, a few thoughts bearing upon the present foundry situation may not be amiss. What is given here is based upon the observations of the writer in his professional work since the problems of the foundry have become acute. When called in to diagnose the cause of bad castings as entirely apart from high shop costs, the first thing that strikes the close observer is the general deterioration of most of the raw materials received in the foundry. Since it is almost impossible to make rejections and buy elsewhere, it becomes a problem of what to do under the circumstances. The items may therefore be taken up one by one.

Poor Molding Sand

Probably the first trouble experienced had to do with poor molding sand. Whether the foundries suddenly decided to lay in big supplies, or the sand pits had become bare of the cream of this essential foundry raw material from competition during hard times, the fact remains that as the rush came on everything went. Shiploads and trainloads of molding sand arrived at destination, were stocked, and in regular course this new sand arrived on the heaps. Very soon the castings showed the effect of poor bond, the metal cutting and the heat destroying the fine surfaces above the rising iron in the mold; copes dropped, etc. Investigation was usually started too late and the sand heaps were in exceedingly poor condition. The only thing that could be done to save the situation until arrangements for better sand could be made was to throw clay wash on the heaps regularly to work in new bonding material. Where possible, the foundryman was advised to go to the sandpit of the dealer and select his material even if he had to pay a bonus.

Remedies

This situation, prevalent in most parts of the denser foundry territory of the country to-day, points to two lines of activity: first, the study of molding sand as received and as in daily use; second, the improvement of the sand at the pit, or, if necessary, entry into the manufacture of artificial molding sands.

The origin, functions and testing of molding sand are now pretty well understood, the latest textbooks giving light upon the subject. Wide-awake foundrymen can, therefore, have tests made on the bonding power of their sands as shipments come in, and also of the separate heaps on the floor. A limit of strength must be fixed below which the heaps may not be allowed to drop. Further, specifications should be made requiring a given minimum of bonding value in new sand even if such sand commands a premium. Molding sand is one of the fundamentals of the foundry industry and one had better commence right rather than have a defect follow all through the subsequent operations. As stated above, the addition of a very fat and refractory clay to the heaps in the foundry is about the only means of correcting them until a better grade can be brought on. It is to be hoped that the sand merchants may give the matter attention before the foundrymen do this for them, otherwise it will be only a question of time when an artificial product finds a footing in the industry. The foundryman cannot afford the loss of castings which he can directly trace to outside sources.

Higher Sulphur and Oxygen

Next would come the metal problem. On the whole, the difficulty is not so much one of deterioration of pig iron owing to the rush, as from a different situation. The furnaces are working steadily and fairly well, so that here it is more the price that hurts (and this is loaded upon the customer), besides the heartbreaking delivery problem. The real difficulty, however, lies in the pig-scrap ratio which directly affects the value of the pig iron used. If, instead of taking 60 per cent pig and 40 per cent scrap, the proportions are reversed the same quality results cannot be expected. In spite of the high levels to which all the scrap metals have climbed, there is every temptation to use heavier scrap percentages to cheapen the mixture. Cases with 80 per cent scrap are common today, and indeed the results show it. Even in the case of the scrap varieties there is to be found a variation in prices dependent upon the supplies of the region. In some places car wheel scrap is abundant; in others stove plate can be picked up at reasonable figures. Necessarily, with the pig iron levels existing it would be strange if such chances are not being utilized regardless of the ultimate consequences. The two items of the sulphur and oxygen content in iron castings are therefore climbing steadily and will later on confront the industry with disastrous effect.

In view of the above, two items must be watched with the closest attention; namely, the fuel used and the melting practice. When the fuel aggravates the sulphur situation it is bad enough, but if added to this the melting practice is calculated to bring out cold iron, this will mean abnormal sulphur figures besides oxidized and hence defective work from the standpoint of shrinkage, gas holes, cracks, etc.

Fuel Difficulties

The fuel problem to-day is a serious one. Carload after carload of coke is received in foundries with ash up to 14.50 and sulphur near the 1.50 mark. What is the foundryman to do? He may protest, but he gets all sorts of excuses. He is told that others are having no trouble with the coke, which may be a source of satisfaction, but investigation usually shows that the class of work in question had no machining of consequence and could stand defects of a pretty serious nature before rejection would take place. With such coke, advice is difficult. All the foundryman can do is to

watch his cupola so that he may get the hottest iron the coke is capable of producing; further, that melting is done at the proper bed level to prevent oxidation of metal, which in raising the freezing point means short "life," poor feeding, gas holes, etc.

Right Cupola Conditions

Perhaps a short review of the cupola conditions necessary for good work may not be amiss here. The position of the bed is the crucial point. Depending upon the blast and cupola cross-section relation, will there be a certain velocity of the gases upward? There will be one bed level for the best results. This is when the air coming from the tuyeres has had its oxygen completely consumed, but in doing this has not yet allowed much of the carbon dioxide formed to become carbon monoxide—with the rendering latent of a lot of the heat. This point is incidentally the position of maximum temperature and is independent of the weight of the bed. It is dependent only upon the height necessary to allow the above mentioned reactions. The best guide the foundryman has in getting his coke bed right, is to time the "first iron." With conditions of charging normal, when putting on the blast, molten iron should be seen to trickle past the tuyeres in about six minutes. As this drops upon the bottom and comes out of the tap-hole attention should be given to note when a stream begins to run over the spout into the ladle or on the floor. This should take place between eight and ten minutes. Then the bed will have been right. If in six or seven minutes, the bed should be raised, and conversely if the first iron comes in twelve minutes or more, the bed must be held lower as coke is wasted otherwise.

Poor Practice Rather Than Poor Coke

Right here, when speaking of "normal charging conditions," many a foundryman is to-day suffering from poor coke because of his own poor practice. Going about the country many a cupola will be seen in operation the charging door of which is perhaps only 8 ft. above the bottom plate, whereas it should be at least 15 ft. The heat imparted the iron in the melting process may be divided into three parts: that needed to bring it up to the melting point, the heat necessary for the actual melting, and finally the additional amount to superheat the molten iron to the proper point. In the metallurgy of cast iron it happens that most of the heat is required in bringing the metal to the melting point, or somewhere over white heat. All this heat must get into the iron as it passes from the charging door downward into the zone of melting. It will naturally make quite a difference whether the column of metal and fuel in the cupola is 5 ft. above the top of the bed or 12 ft. Furthermore, when the bed has burned through properly and the cupola has been charged, it also makes quite a difference in the temperature of the first part of the heat whether the fully charged cupola has been allowed to stand an hour or more, or blast is put on at once. With the ash content in coke at about 8 per cent this situation is perhaps not so marked; but when the ash approached 12 per cent, matters begin to be serious.

Hence, the foundryman should observe his practice closely and see whether he cannot increase the height of his charging door, if too low. Also, he should charge very early in the day, if possible, to allow the cupola a chance to warm up for at least an hour, and preferably two. In this way the coke may be high in ash and sulphur and yet give serviceable results. Charging early naturally brings up the question of daubing up the cupola. Unless the brick in the melting zone is chipped off clean, so that a proper contact is established between brick and clay daubing, the latter will not stick when under the high temperatures of the melt. Any slag between brick and daubing will soften and allow the patches put on to slide down. The result is not only a thick, pasty slag and bridged tuyeres, but a further cutting into the lining. Furthermore, it is necessary to use the highest grade of clay for daubing purposes, as the idea of daubing-up is to restore the lines of the brick-work, and this cannot be done successfully with inferior clays.

Preserving the Level of Cupola Bed

Granted that the cupola bed is of the right height, the next point is to see that it stays at the right height during the entire melting operation. That is to say, as the top of the bed burns away in furnishing the heat necessary for melting the metal charge upon it, the level must be restored by the intermediate coke charge coming down after the iron has melted away. This intermediate coke charge is a matter of weight and not height, as was the case with the bed, for here it is a question of burning enough fuel to melt the metal over it. Again, as the bed dare not be lowered very much before the ideal conditions at the proper point are spoiled, the iron charge must not be too large. This requires further explanation:—With ordinary blast and cupola cross-section conditions the height of the coke bed is 22 to 24 inches above the top of the tuyeres (it is understood that but one row of tuyeres is used). The oxygen of the blast will therefore vary from maximum at the tuyères to zero or at least minimum at the top of the bed. Similarly, the carbon dioxide will vary from nothing at the tuyères to maximum at the bed level, with carbon monoxide just forming. It is quite evident then that just below the top of the bed—say six inches—the ideal conditions will not have been reached as yet, some oxygen being present, the carbon dioxide in lower percentage, and incidentally the temperature not at the maximum. Hence there is danger if the metal has to melt at this low level of cold and oxidized iron. In practice it is not advisable to allow the bed to lower more than four inches.

Formula for Metal Charge

This at once gives the standard metal charge for any cupola; that is, with the understanding that not more than 4 in. of coke may be burned away each time a metal charge is melted—and this 4 in. of coke of the bed being replaced by the intermediate fuel charge—the weight of metal allowable for each charge will be the amount which can be properly melted by the weight of four inches of coke in that cupola. In practice, everything being right, there is usually ten times as much. Hence the foundryman has only to find the weight of coke filling four inches in height of his cupola and multiply this by ten to know the standard metal charge he must use. This does away with a big first charge and discussion on big and little charges, etc.

And yet how different things are in actual practice when a comparison is made between the plants one sees or finds described in the technical press. For the same diameter cupolas one foundry may use an 8000-lb. charge of metal and another foundry 3500 lb. In one case the foundryman doubles the first charge, in another he also doubles the first intermediate fuel charge. In nearly all cases more coke gets into the cupolas than the owners imagine. This may be the saving condition where big first charges are used, and considering the class of men employed to attend cupolas such coke charged unnecessarily covers a multitude of sins of poor distribution of metal, mistakes in weighing, etc.

Factors in the Fuel Ratio

Unfortunately, however, too much fuel means cold iron just as much as too little, yet it has the advantage of unoxidized metal, which is not the case with

a low bed. The importance of getting just the right amount of fuel for the cupola can be seen from the above. Where more than the required amount of coke has to be used to care for poor charging methods it means an abnormal sulphur increase in the castings produced. It also means more ash to be fluxed away, the chances of dirty iron and a higher fuel cost. While it is very poor policy to skimp with the fuel, it is not necessary to throw money away. The foundryman should therefore give close personal attention to the charging floor of his foundry and see that the necessary amount of brains is diverted to that department.

The proportion of fuel and metal, given as one to ten, the bed excluded, will of course vary somewhat with the character and heating value of the coke, the length of the heat, nature of the metal charges, etc. The foundryman should watch the scoring of his cupola every day to see whether this is confined to less than a foot, as in good practice, or whether the evidences begin at the tuyères and run up 3 ft. or more. The metal should also be charged evenly and in sequence of steel first, pig and heavy pieces next, and the lightest material for the top. Such a situation should be self-evident.

Air Furnace Troubles

If the cupola is run under difficulties today the air furnace is in a similar predicament. Anything in coal goes, whether the sulphur is up or down, lumps are conspicuous by their absence and the slate to be seen tells of high ash. The mines are evidently being thoroughly cleaned out in preparation of a coming competitive campaign when things are normal again. In addition to coal troubles there are the dearth and deterioration of refractories to face. Firebrick is a scarce article of commerce today, and hence furnaces and ovens are run to the last ditch, with the usual consequences to the castings made. Here the truth of the saying about "the stitch in time" finds it application, for repairs kept up to the minute mean a safe and economical furnace. The same situation in regard to scrap-pig percentages is met with in air furnace practice to-day as in the cupola, and hence the sulphur is climbing steadily. The low efficiency of the air furnace must eventually bring the open-hearth method of melting into the foundry. While the open-hearth is familiar in advanced malleable practice, the gray iron foundry has tenaciously clung to the air furnace where furnace melting is used at all. But with the excellence in product obtained and at a cost but little over cupola iron the first cost and greater operating skill required will not prevent the eventual introduction. Probably the first foundries to take the matter of open-hearth melting for high class gray iron work up for trial will be the plants forced into making steel castings by their customers. With an open hearth equipment at hand odd heats can be made at any time and cupola and hearth furnace results and costs compared.

The Electric Furnace Gives Promise

On the credit side of the rather gloomy situation for the foundry may be placed the rapid introduction of the electric furnace—the only method free from pig-scrap proportions, high sulphur stock, oxidized metal and bad fuels. While it is not yet applied commercially for gray iron casting work, the elements of cost are being learned, as also the many minor kinks every process seems to embrace. The largest amount of heat to impart to the metal being that up to the melting point there is no reason why this should not be applied in a soaking pit, whence the charge can be transferred into the electric furnace for melting, super-heating and final purification. With the knowledge gained while perfecting the electric steel casting process the gray iron or specialty iron foundry should benefit greatly thereby eventually.

If there is any time for the introduction of molding machinery it is now. Wages are so high and conditions comfortable that the men themselves see the desirability of machine work in view of the scarcity of labor. The plants making this line of machinery cannot fill their orders fast enough, but, in spite of this, there is a gradual improvement in plant equipment noticeable in this direction. With the increasing solidity of the machines themselves and the attention being given by the makers to the peculiar problems of the foundryman mutual benefit is resulting.

The foundryman, therefore, must put up with his troubles as best he can and be positive that his end of the business is up to date. He can then, at least, do as well as the next man. If his own practice is poor it is quite certain that the present difficulties will put him in a very bad position with his customers for the day when things become normal again. He must live from hand to mouth, as it were, doing his share as best he can and at the same time keep up his courage to face the great readjustment bound to come sooner or later.

Exhibit of Safety Devices at New York

In conjunction with the convention of the National Safety Council, an exhibition of safety devices took place at Grand Central Palace throughout last week. Two of the largest spaces were reserved by the American Museum of Safety and the National Safety Council, under the combined auspices of which the exposition was held.

Exhibits of safety plans and specifications of the plants of the Illinois Steel Co., and a miniature of the plant of the American Rolling Mill Co., Middletown, Ohio, were conspicuous. The Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., had an exhibit of safety devices, including a guard for milling cutters, guards for saws, a safety device for grinder heads, an overhead belt guard, a safety ladder, safety devices for punch presses, a welder's helmet, etc. The Research Corporation, 63 Wall Street, New York, gave a demonstration of the Cottrell electrical precipitation process for collecting and recovering dust from blast furnaces, lead and copper converters, etc. The Commonwealth Steel Co., St. Louis, showed models of its steel underframe for passenger cars. The Western Electric Co. gave a working demonstration of its flood lamps for lighting industrial plants for night work. The Carrier Engineering Corporation, New York, showed its temperature and humidity control apparatus, and demonstrated their adaptation to industrial plants. The Powers Regulator Co., New York, also demonstrated an automatic temperature-controlling apparatus for industrial purposes. Power-transmitting appliances were shown by the Standard Pressed Steel Co., Philadelphia. The Safety First Supply Co., Pittsburgh, had an exhibit of its products. The Zeh & Hahnemann Co., Newark, N. J., gave a demonstration of safety devices on power presses. John Gibson, Detroit, showed a newly patented article, a chuck guard. The Safety First Mfg. Co., Washington, D. C., showed Bull Dog shaft couplings.

There were several exhibits of helmets, respirators and similar devices. Walter Soderling, Inc., New York, among others showed a dust respirator. The Multi-Metal Separating Screen Co., New York, the Protecto Safety Appliance Co., Newark, N. J., and the American La France Engine Co. showed safety helmets.

Safety goggles were displayed by a number of companies, including the Merry Optical Co., Kansas City, Mo.; the Julius King Optical Co., New York; the Standard Optical Co., Geneva, N. Y.; T. A. Willson & Co., Inc., Reading, Pa.; F. A. Hardy & Co., New York, and the Strong, Kennard & Nutt Co., Cleveland.

The Kny-Scheerer Co., New York, had an exhibit of an emergency hospital of a type adapted to industrial plants. Pure water for workmen was emphasized by the Puro Sanitary Drinking Fountain Co., Haydenville, Mass.; the Lungmotor, an oxygenizing device for resuscitating those overcome by gas fumes, was exhibited by the Life Saving Devices Co., Chicago.

Practical Welfare Work in Foundries*

Specific Forms Developing Better Personal Relations Between Employer and Employee Irrespective of Size of Plant

BY S. W. ASHE

Many large foundries operated by the iron and steel industry for some time have carried on welfare work. Many plants were located at some distance from a town and it therefore became necessary practically to build a town adjacent to the plant. Streets were laid out; sewerage systems, lighting systems and water supply installed; hospitals, Y. M. C. A.'s, schools and libraries were built, and many playgrounds were laid out. This was done with the realization that the average human being requires something more than the ordinary routine of work, refreshment and sleep to be contented; for if the worker does not have his social needs provided for he is likely to seek employment elsewhere or dissipate. Foundries that have undertaken this work are still continuing it, indicating that they feel it has been wise. However, where so much has been done it is difficult for the small plant with limited means at its disposal to know just what to do. The following ideas covering this matter may properly be divided into two parts: 1, covering the personal relations between employees and employers which apply to any plant irrespective of size, and 2, covering specific forms of welfare work which do not involve great expense but which bring results and which are within reach of the small foundry.



Committee of employee-gardeners receive instructions from an agricultural expert

Labor Turnover

At a recent meeting of the safety and health section of the National Association of Corporation Schools, held in Buffalo, statistics were presented showing that from 50 to 60 per cent of the accidents which occur are due either directly or indirectly to those employed less than six months. These accidents are the result of carelessness or inexperience of the new men in either injuring himself or someone else. It is evident, therefore, that if means can be developed for holding workers in employment for longer periods or decreasing labor turnover to reasonable proportions, accidents will automatically be reduced 50 per cent.

In addition to heavy accident rates we find in plants with a high labor turnover much restlessness, poor esprit de corps, little initiative and low efficiency. In plants where some thought has been given to this problem, it has been found that while wages and hours of work have some bearing, the personal factor also has considerable weight. In the smaller plant, where the manager is personally acquainted with practically all of his men, there should be a better relationship than in larger plants where this co-operation between executive and worker is practically impossible. Commenting on this point, E. W. Rice, president of the General Electric Co., wrote as follows in the *General Electric Review*: "There is today a serious lack of mutual understanding between the manufacturer and the wage earner and while considerable progress has been made in bringing about more harmonious relations, the situation leaves much to be desired. This lack of understanding and confidence is largely due to a lack of knowledge of each other and the knowledge is lacking in the manufacturer as well as the wage earner."

It is evident that interest must be mutual and the desire for co-operation must exist to an equal degree in order to obtain maximum efficiency. If an employer makes unusual efforts to educate his employees, to protect them against accidents, sickness, old age, to stimulate thrift, initiative; if he pays them a fair wage, etc., and finds his employees indifferent, taking things for granted without any attempt at reciprocal co-operation, there is something wrong. There must be equality of interest and if this interest cannot be brought about, there are certain wrong policies which are being followed by subordinates.

As an illustration, few in the industry realize the importance of little things of a personal nature, whereas it is usually the little things which cause the most trouble. A foreman may have an employee who is clever, who is popular with his fellow employees and who perhaps has rather positive ideas. Rather than use, to advantage, this latent energy and originality which the employee possesses, the foreman may resent the characteristics in the man and even though he is an excellent workman, doing his work probably with care and with greater efficiency than other employees, will discharge the man for some slight infraction of rules. Such actions not only arouse great bitterness in the discharged workman, but also a feeling of resentment creeps in among the remaining workers. Where before there was some loyalty in the department, a feeling of dissatisfaction starts, resulting in time in demoralization of the department.

Factors Which Influence Contentment

There is no factor which means quite so much to an employee as the factor of stability. Where attempts are made to regulate production so that employees are not periodically out of work, a better condition is created than in those places where a continual feeling of uncertainty exists. High labor turnover is the cause of more ills than it is ordinarily given credit for. Employers are doing much at the present time to minimize it. Service bonuses and pension systems have been introduced, besides the practice of some corporations of making it imperative that every executive must come up through the ranks. Where the employees in an organization are frequently changing the new employee does not have time to become acquainted with the human side of the business before he is off seeking employment with a new concern. With a view to bettering conditions some companies have taken from their foremen the privilege of discharge, and when an employee does not fit for some reason in a particular department, he is given another trial in another depart-

*Paper read before the foundry section meeting of the National Safety Council, New York, Sept. 13. The author is in charge of the educational and welfare department of the General Electric Company, Pittsfield, Mass.

ment. In this way the longer an employee remains the better opportunity he has of understanding the service of the particular organization in which he is employed.

Characteristics Desirable in Social Workers

A welfare worker's success at the present day depends largely upon his ability to understand people. In business this also applies, which is the reason why so few people become executives. Some people call it a knack, others say he is a good mixer, but it is seldom we find the combination of a mild nature and ability to get results. It seems to take a certain amount of push to put things across and in doing this it is difficult to keep from treading on someone's toes. It therefore requires, in a successful welfare worker, considerable caution and diplomacy, besides steadiness and common sense at critical moments under pressure in order to meet unusual situations as they develop. As few social workers possess all these qualifications, they are only successful as a rule to a degree.

Primarily a welfare worker must give his life to his work. Otherwise he is useless in meeting the continual strain on his sympathy, enthusiasm, energy and initiative which is constantly made. He soon learns to compromise and that progress can be made only in slow easy stages. For this reason he must have several matters under development at the same time. Where an activity is once started it must be given time to grow. A plant which is dug up and its roots examined every few days to see what growth it has made soon dies. So it is with social activities constantly meddled with. Then again organizations can only readjust and assimilate at a certain rate and it is better to spend excess enthusiasm and energy in more thoroughly investigating and preparing a new activity in its preliminary stages than to spend too much time creating an endless chain of new methods and new ideas which have not been thoroughly thought out and adapted to an organization. Things must fit; they may require some adjustment, but there must be a real need for them. They must have a personal appeal; there must be permanency or stability to them. They must be organized so that they practically run themselves, and so that they will not require constant attention, expense and support.



A raising bee in 40 minutes erected 800 ft. of fencing and laid 1000 ft. of water pipe

What Counts in Welfare Work

We can always trace some good in any form of welfare work, depending upon the angle we view it from, but the question naturally arises as to what counts the most. At the present time much is being done, and to weigh this matter properly we should place ourselves in the position of the average employee and ask what really counts the most and what things in emergency we could dispense with. It is evident from this viewpoint, with the present high cost of living and with war conditions, that things which bear a direct relation to the employees' salary are the things which count the most. These are the things which necessarily exert the greatest holding influence. Company gardens, bonuses, selling articles, such as coal and insurance at cost, have the greatest weight these times. Where we get employees in the habit of saving their money and purchasing in bulk at the proper season, we are not only establishing the fundamentals of thrift, but at the same time we are solving many of the problems of labor turnover. The average workingman has a large amount of free time at his disposal which should bring him in, if properly used, a fair revenue, and when fall comes if this man has his cellar full of winter's coal, wood and vegetables and is in good physical condition as a result of his out-of-door activities, his whole viewpoint towards life and his company will change and he will stick to his job.

Service Bonuses

Service bonuses, as the name implies, may be offered for varying degrees of service, such as five, ten or twenty year periods. The bonuses are usually paid in cash, although some companies give stock or part cash and part stock. The bonuses vary from 5 to 20 per cent of the individual's salary and are paid annually or semi-annually. The same idea has been worked out in connection with apprentice courses where a bonus is given for the completion of the course. It is found that such bonuses do have a restraining influence. On the other hand, when labor trouble occurs, these bonuses as well as pension systems have very little restraining effect.

Company Gardens

The idea of company gardens also is not new, as many steel companies for some time have taken part of their land, ploughed and harrowed it, arranged for watering and policing. Such an arrangement is equivalent to creating a medium whereby the employee can use his spare time to advantage and obtain a revenue which reduces considerably his living expenses. The employee benefits by being in the open air, his spirits are better, his health is better and he is more cheerful and contented. Usually it is well to delegate some single individual to be responsible for such an activity, although when the gardens have been assigned and are under cu tivation it is important to have a committee o employees take general charge, having an exhibit at the end of the season.

Accompanying illustrations illustrate gardens at the Pittsfield works of the General Electric Co. Three hundred gardens, 50 x 100 ft. in size, were assigned. Each gardener signed an agreement stating that he would take proper care of his garden. The gardens were adjacent to the works and their use was offered by the widow of the late William Russell Allen. Out of the entire plot only one piece has not been cultivated. This was very stony and was assigned late. It was necessary to build 800 ft. of temporary fence and run 1000 ft. of water pipe line into the property. A "raising bee" was therefore held one Saturday afternoon, the company supplying old lumber and pipe. It took just forty minutes to complete the work. Care has been taken to check these 300 plots and with the exception of one employee, who was dropped, every one has remained with the company and taken good care of his plot. While it is true that this covers only a small percentage of the employees and refers to a period of only three months, the unusual interest which has been taken shows that it is a form of welfare work which benefits the employee considerably and does bear a definite relation to labor turnover.

Selling Coal

Coal the past winter was difficult to secure and the price was high. Some companies have tried the experiment of co-operating with their employees in selling coal at cost. At the Pittsfield works we formed a Coal Club and sold 2000 tons of coal at cost. The

coal was screened with an automatic loader, as shown in the illustrations, and delivered with motor trucks and teams. In securing the coal about one-half of the coal was purchased at a low figure and the other half was secured at a somewhat higher figure, as it was purchased on a rising market and it was necessary at that time to buy fancy coal or take nothing. Nevertheless, the employees supported the proposition exceedingly well and it has had the effect of steadying the local market, due to increasing the amount which would normally have been received.

As before stated, when fall comes and the average employee has his cellar well supplied with coal and vegetables it is going to give him a chance to catch up and accumulate. This sort of welfare work reaches. Many of our other forms of work are desirable and the men are generally interested in them, but they exert a holding influence to a less degree than the grouping discussed.



In loading for distribution the 2200 tons of coal of the Coal Club, a portable elevator was used, discharging across a screen into the truck

Large New Japanese Steel Plant

What is called one of the largest steel organizations in Japan is just about to complete its organization. U. S. Consul General George H. Scidmore, of Yokohama, reports its plans. It is to be known as the Oriental Steel Mfg. Co. and has been projected to take over the rights obtained by the Sino-Japanese Industrial Development Co. and to work the Taochun iron mine in Anhui. The promoters delayed the organization of the company to make sure of the official bounties under the steel industry encouragement law just promulgated.

The company plans to establish a blast furnace to produce pig iron at the rate of 170,000 tons a year, a steel mill with a capacity of 100,000 tons of steel ingots, a rolling mill to produce more than 75,000 tons of various shapes and other units which will turn out miscellaneous products. There will be two blast furnaces with a capacity of 250 tons a day each. In the steel plant three furnaces will be installed with auxiliary equipment. The company's experts for some time past have been investigating possible locations, and Imari, Saga prefecture, has been finally approved as the site.

At present the output of the Trumbull Steel Co., at Warren, Ohio, is about 70 per cent tin plate and 30 per cent black and galvanized sheets. Formerly the larger part of the output of this company was sheets, but owing to the heavy demand for bright plate for containers for perishable foods, the company has been increasing its output of tin plate and cut down sheets.

Gear Manufacturers Meet in Chicago

The semi-annual meeting of the American Gear Manufacturers' Association was held at the Edgewater Beach Hotel, Chicago, Sept. 13, 14 and 15, about 40 gear manufacturers from various cities being present. The membership of the association consists solely of corporations, firms or individuals actively engaged in the manufacture and cutting of gears for the use of others, and its purpose is the development, standardization and improvement of the gear industry. Standardization, such as has been effected in electrical motors, was given special attention at the meeting.

The executive committee of the association met Sept. 13 and on the following day the general meeting was called to order by F. W. Sinram, Van Dorn & Dutton Co., Cleveland, president of the organization. During the convention papers were read as follows:

"Advertising Don'ts," J. C. McQuiston, R. D. Nuttall Co., Pittsburgh.

"Heat Treating and Hardening of Gears," W. H. Phillips, R. D. Nuttall Co.

"Inspection of Gearing," B. S. Waterman, Brown & Sharpe Mfg. Co., Providence, R. I.

"Spur Gearing by the Rotary or Disk Cutting Process," H. E. Eberhardt, Newark Gear Cutting Machine Co., Newark, N. J.

"Spur Gears by the Shaper Method," F. Schneider, Van Dorn & Dutton Co., Cleveland.

The afternoons of Sept. 14 and 15 were devoted to entertainment furnished by the Chicago members. The officers of the association, aside from Mr. Sinram, are: H. E. Eberhardt, vice-president; F. D. Hamlin, Earle Gear & Machine Co., Philadelphia, secretary, and Frank Horsburgh, Horsburgh & Scott Co., Cleveland, treasurer. The executive committee consists of F. W. Sinram, F. D. Hamlin, H. E. Eberhardt, Frank Horsburgh, Milton Rupert, of the R. D. Nuttall Co., George L. Markland, Jr., of the Philadelphia Gear Works, and Biddle Arthens of the Simon Mfg. Co., Pittsburgh.

The Government now classes a 40-mile haul as a motor truck haul, according to R. E. Chamberlain, truck sales manager Packard Motor Car Co, and shippers who want to aid the Government as well as to improve their own service have enlisted the motor truck as the logical carrier for hauls up to and even beyond this distance.

The Pacific Coast Steel Co. blew in its blast furnace at Irondale, Wash., Sept. 10. The furnace, which was owned and for a time operated by the Western Steel Corporation, was last active in 1910.

Foundrymen's Conventions at Boston

Plans for the Professional Sessions and the Machinery Exhibition — Elaborate Arrangements for Entertainment—New Record for Number of Exhibitors

THE city of Boston, famous for its history and its greatness, past and present, will be the place of the meeting of the American Foundrymen's Association and the American Institute of Metals this year, beginning Monday, Sept. 24, and ending Friday, Sept. 28.

When the foundrymen last met in Boston, 15 years ago, there was an attendance of less than 300. This year there will be probably 3000. Last year, when the conventions were held in Cleveland and there were about 130 exhibitors, with a very large attendance at the professional meetings, a new record was established, but this year space has been assigned to nearly 150 exhibitors. As the reserved floor space is considerably in excess of that occupied in Cleveland, the success of the exhibition is assured, and the outlook is that the attendance at the professional sessions will be larger than it was in Cleveland.

A long and varied list of papers has been prepared by the two associations, and complete arrangements have been made for the holding of the meetings at such times as to accommodate the greatest number in attendance. The plan, which was so successful last year, of having joint management by the two associations of the exhibition of foundry equipment and supplies and of machinery and accessories will be continued this year, as will also the plan of holding one meeting each day so as to allow those attending the conventions to inspect the exhibits, visit plants and participate in entertainment features at their pleasure. Some of the reports of the committees promise to be exceedingly interesting. Special attention will be given to the manufacture of implements of war.

The associations will have a joint opening session in Paul Revere Hall, Mechanics Building, at three o'clock Monday afternoon, Sept. 24, and this will be the only afternoon session. The associations will meet separately Tuesday, Wednesday, Thursday and Friday mornings.

The exhibition will open at 10 a.m. Monday at Mechanics Hall and will close Friday night. Throughout the week, plants of interest will be visited. The Waltham Watch Co., Waltham, Mass., will receive a limited number of visitors. Friday afternoon will be devoted especially to plant visitation and arrangements have been made with a number of foundries and industrial plants in the Boston district for their inspection by the visitors.

With the libraries, art galleries, Harvard University and the magnificent new buildings of the Massachusetts Institute of Technology it will not be difficult for any visitors to pick out places of interest to visit, but a number of entertainment features have been provided. On Tuesday afternoon a steamer will leave for a special harbor trip, including a landing at Nantasket Beach, and luncheon will be served on board. Wednesday afternoon the visiting foundrymen will attend a baseball game between the Boston and Cleveland American League teams at Fenway Park. A vaudeville performance will be enjoyed Wednesday evening at Keith's theater. Thursday afternoon the West Lynn plant of the General Electric Co. will be visited, and in the evening the annual banquet, which has become famous in the past three or four years for its admirable features, will be held at the Copley-Plaza Hotel. Speakers of national reputation will be heard and some unusual entertainment features will be provided.

As was the case last year, the visiting ladies are assured a delightful time. They will take part in the boat ride Tuesday afternoon and be given tickets for the ball game Wednesday afternoon and Keith's theater Wednesday evening. They will also enjoy a luncheon Thursday and the banquet Friday.

Condensed Program of Foundry Week

Monday, Sept. 24

10.00 a. m.—Registration, Mechanics Building. Opening of exhibition.
3.00 p. m.—JOINT OPENING SESSION, American Foundrymen's Association and American Institute of Metals, Paul Revere Hall, Mechanics Building.

Tuesday, Sept. 25

9.30 a. m.—MELTING AND CASTING SESSION, American Institute of Metals, Hotel Somerset.
10.00 a. m.—PROFESSIONAL SESSION, American Foundrymen's Association, Paul Revere Hall.
1.30 p. m.—Boat ride in and about Boston Harbor with a landing at Nantasket Beach.

Wednesday, Sept. 26

9.30 a. m.—NON-FERROUS METALS FOR MUNITIONS, American Institute of Metals, Hotel Somerset.
10.00 a. m.—GENERAL SESSION, American Foundrymen's Association, Paul Revere Hall; and MALLEABLE SESSION, Mechanics' Hall.
3.00 p. m.—Baseball game, Fenway Park, Boston versus Cleveland.
8.15 p. m.—Theater party, Keith's vaudeville house.

Thursday, Sept. 27

9.30 a. m.—TESTING SESSION, American Institute of Metals, Hotel Somerset.
10.00 a. m.—STEEL SESSION, American Foundrymen's Association, Mechanics Building; GRAY IRON SESSION, Paul Revere Hall.
12.00 m.—Luncheon for the ladies, followed by an automobile ride.
12.30 p. m.—Visit to the West Lynn plant of the General Electric Co., luncheon to be served at the plant.
7.00 p. m.—Annual banquet, Copley-Plaza Hotel.

Friday, Sept. 28

9.30 a. m.—METALLURGY AND METALLOGRAPHY, American Institute of Metals, Hotel Somerset.
10.00 a. m.—STEEL SESSION, American Foundrymen's Association, Mechanics Building; GENERAL SESSION, Paul Revere Hall.
Plant visitation.
Exhibition closes at night.

Exhibitors at the Foundry and Machine Exposition

(Letters designate general location on the plans on the facing page)

Abell-Howe Co., 565 West Washington Boulevard, Chicago..B
Ajax Metal Co., Philadelphia....A
Albany Sand & Supply Co., Albany, N. Y....A
American Foundry Equipment Co., Cleveland....B
American Gum Products Co., 200 Fifth Avenue, New York..A
American Lighting Co., 1422 West Randolph Street, Chicago....A
American Molding Machine Co., Terre Haute, Ind....D
American Museum of Safety, New York....A
American Pipe Bending Machine Co., 39 Pearl Street, Boston....B
Arcade Mfg. Co., Freeport, Ill....D
Armstrong Cork & Insulation Co., Pittsburgh....C
Asbury Graphite Mills, Asbury, N. J....A
Athol Machine Co., Athol, Mass....A
Atkins & Co., E. C., Indianapolis....C
Ayer & Lord Tie Co., Railway Exchange Building, Chicago..B
B. & B. Mfg. Co., Indianapolis....D
Beaudry & Co., Inc., 141 Milk Street, Boston....C
Berkshire Mfg. Co., Cleveland....B
Chas. H. Besley & Co., 118 North Clinton Street, Chicago...C
Bilton Machine Tool Co., Bridgeport, Conn....C
S. Birkenstein & Sons, 377 West Ontario Street, Chicago..B
G. S. Blodgett Co., Burlington, Vt....B
Blystone Mfg. Co., Cambridge Springs, Pa....B
Brass World Publishing Co., New York....A
Bridgeport Safety Emery Wheel Co., Bridgeport, Conn....C
Brown Specialty Machinery Co., 2448 West Twenty-second Street, Chicago....D
Buckeye Products Co., 919 Fifth Street, Cincinnati....B
Carborundum Co., Niagara Falls, N. Y....A
Cataract Refining & Mfg. Co., Buffalo....A
Champion Foundry & Machine Co., Chicago....B
Frank D. Chase, Peoples Gas Building, Chicago....B
Chase Turbine Mfg. Co., Orange, Mass....C
Chicago Pneumatic Tool Co., Fisher Building, Chicago....D
Chisholm-Moore Mfg. Co., Cleveland....B
Cincinnati Pulley Machinery Co., Cincinnati....C
Charles J. Clark, 1716 West Adams Street, Chicago....B
Cleveland Blow Pipe & Mfg. Co., Cleveland....D
Cleveland-Osborn Mfg. Co., New York....A
Cleveland Pneumatic Tool Co., Cleveland....D
Thos. E. Coale Lumber Co., Philadelphia....B
Combined Supply & Equipment Co., 766 Grant Street, Buffalo....A
Corn Products Refining Co., New York....B
Curtis Pneumatic Machinery Co., St. Louis....D
Cutter & Wood Supply Co., 70 Pearl Street, Boston....B
Davis-Bournonville Co., Jersey City, N. J....D
Debevoise-Anderson Co., 56 Liberty Street, New York....A
Dings Magnetic Separator Co., Milwaukee, Wis....B
Divine Brothers Co., Utica, N. Y....C
Joseph Dixon Crucible Co., Hancock Building, Boston....A
Stanley Doggett, New York....A
G. Drouve Co., Bridgeport, Conn....B
Eastern Brass & Ingot Corporation, Waterbury, Conn....A
Federal Foundry Supply Co., Cleveland....D
Felt & Tarrant Mfg. Co., Chicago....A
Forbes & Myers, 172 Union Street, Worcester, Mass....C
Foreign Crucibles, Ltd., Hudson Terminal Building, New York....A
Foundry Equipment Co., 1831 Columbus Road, Cleveland..B
Gardner Machine Co., Beloit, Wis....C
General Electric Co., Schenectady, N. Y....C
General Fire Extinguisher Co., Providence, R. I....B
General Platers' Supply Co., New York....A
Goldschmidt Thermit Co., 120 Broadway, New York....A
Great Western Mfg. Co., Leavenworth, Kan....B
Harrison Supply Co., 5 Dorchester Avenue Extension, Boston....A
Hart & Hutchinson Co., New Britain, Conn....A
Hauck Mfg. Co., Brooklyn, N. Y....B
Hayward Co., 50 Church Street, New York....A
Herman Pneumatic Machine Co., Union Bank Building, Pittsburgh....B
Hill, Clarke & Co., 156 Oliver Street, Boston....C
Hoevel Mfg. Corporation, 50 Church Street, New York....D
Herman A. Holz, 1 Madison Avenue, New York....A
International Molding Machine Co., 2614 West Sixteenth Street, Chicago....B
THE IRON AGE, New York....A
Jennison-Wright Co., Toledo, Ohio....A
Spencer Kellogg & Sons, Buffalo....B
T. P. Kelly & Co., Inc., 355 West Twenty-sixth Street, New York....A
Julius King Optical Co., 7 West Madison Street, Chicago...A
Lamson Co., Boston....B
Lees-Bradner Co., Cleveland....C
Lewis-Shepard Co., 48 Binford Street, Boston....A
Ludlum Electric Furnace Corporation, New York....A
David Lupton's Sons Co., Philadelphia....B
Lynd-Farquhar Co., 419 Atlantic Avenue, Boston....C
J. S. McCormick Co., Pittsburgh....B
McCrosky Reamer Co., Meadville, Pa....C
McLain's System, Inc., 808 Goldsmith Building, Milwaukee, Wis....B
Maclean Publishing Co., Toronto, Ont....A
Macleod Co., Cincinnati....B
Mahr Mfg. Co., Minneapolis, Minn....D
Malleable Iron Fittings Co., Branford, Conn....D
Metal Industry, New York....A
Michigan Smelting & Refining Co., Detroit....A
Midland Machine Co., Detroit....D
Moltrup Steel Products Co., Beaver Falls, Pa....B
Monarch Engineering & Mfg. Co., Baltimore, Md....B
Mott Sand Blast Mfg. Co., Brooklyn, N. Y....D
E. H. Mumford Co., Elizabeth, N. J....D
Mumford Molding Machine Co., 1765 Elston Avenue, Chicago....B
National Engineering Co., 505 Tacoma Building, Chicago...D
National Safety Council, Chicago....A
New Chicago Crucible Co., Chicago....A
New England Coal & Coke Co., 111 Devonshire Street, Boston....A
New Haven Sand Blast Co., New Haven, Conn....B
Wm. H. Nicholls Co., Brooklyn, N. Y....D
Norma Co. of America, 1790 Broadway, New York....A
Norton Co., Worcester, Mass....C
S. Obermayer Co., Chicago....B
O. K. Crucible Co., New York....A
Oliver Machinery Co., Grand Rapids, Mich....C
Osborn Mfg. Co., 5401 Hamilton Avenue, Cleveland....D
Oxweld Acetylene Co., 646 Frelinghuysen Avenue, Newark, N. J....C
Pangborn Corporation, Hagerstown, Md....B
J. W. Paxson Co., 1021 Delaware Street, Philadelphia....A
Penton Publishing Co., Cleveland....A
Philadelphia Bourse, Philadelphia....A
Pickands, Brown & Co., Chicago....A
Pittsburgh Crushed Steel Co., Pittsburgh....A
Portage Silica Co., Youngstown, Ohio....B
Henry E. Pridmore, Inc., 1901 South Rockwell Street, Chicago....D
Quigley Furnace Specialties Co., 26 Cortlandt Street, New York....B
Railway Mechanical Engineer, Chicago....C
Richey, Browne & Donald, Inc., Maspeth, N. Y....B
Rivett Lathe & Grinder Co., Brighton, Boston....C
Robeson Process Co., 18 East Forty-first Street, New York..A
Rogers, Brown & Co., Cincinnati....A
Safety First Shoe Co., Providence, R. I....A
Sand Mixing Machine Co., 52 Vanderbilt Avenue, New York....B
Shepard Electric Crane & Hoist Co., Montour Falls, N. Y...B
Simonds Mfg. Co., Fitchburg, Mass....C
W. W. Sly Mfg. Co., Cleveland....B
R. P. Smith & Sons Co., Chicago....A
Werner G. Smith Co., Cleveland....A
Standard Equipment Co., New Haven, Conn....D
Sterling Wheelbarrow Co., West Allis, Wis....A
W. F. Stodder, Syracuse, N. Y....B
Strong, Kennard & Nutt Co., Cleveland....A
Sullivan Machinery Co., Chicago....D
Swan & Finch Co., New York....B
Thomas Iron Co., 50 Congress Street, Boston....A
Titanium Bronze Co., Inc., Niagara Falls, N. Y....B
United Compound Co., 228 Milk Street, Buffalo....A
United Metal Hose Co., 89 Chambers Street, New York....B
U. S. Graphite Co., Saginaw, Mich....B
U. S. Molding Machine Co., Cleveland....D
U. S. Silica Co., 419 Peoples Gas Building, Chicago....B
J. D. Wallace & Co., 1401 West Jackson Boulevard, Chicago..B
Warner & Swasey Co., Cleveland....C
Wentworth Institute, Boston....B
Wheeler & Holcomb Co., 1360 Wells Street, Chicago....A
White & Bro., Richmond and Hedley Streets, Philadelphia..A
Whitehead Brothers Co., Providence, R. I....A
Whiting Foundry Equipment Co., Harvey, Ill....B
E. J. Woodison Co., Detroit....D
T. B. Wood's Sons Co., Chambersburg, Pa....A





Mechanics Building Boston

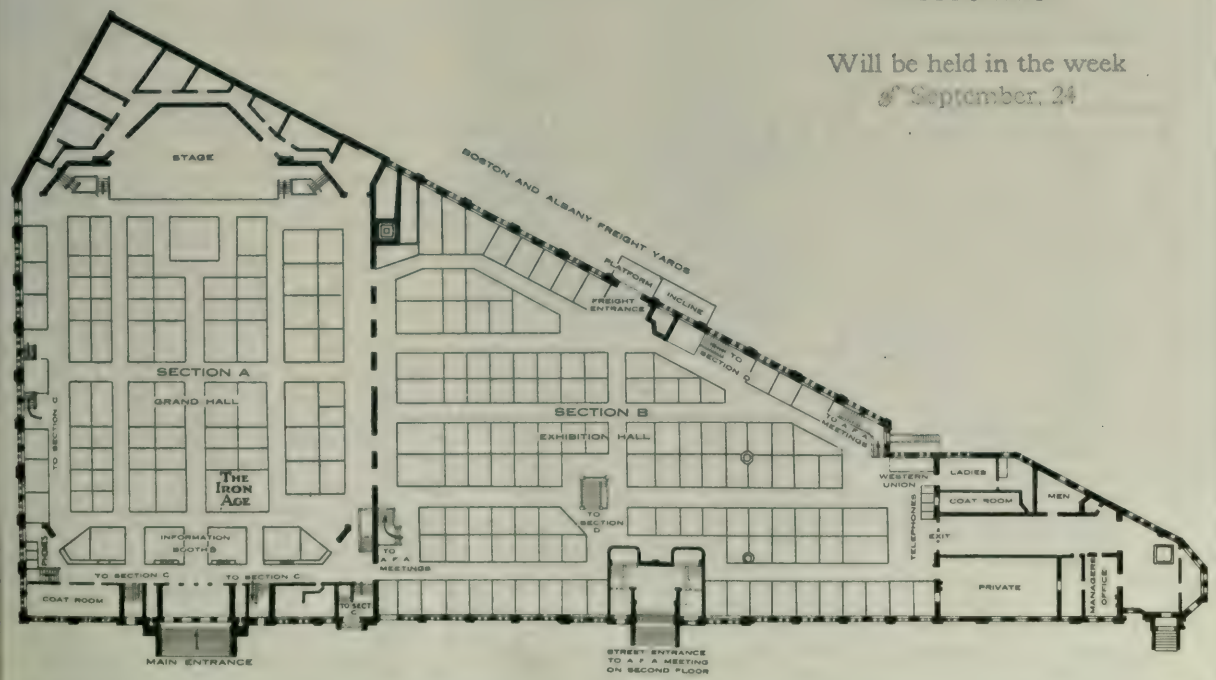
Where the 12th Annual

Foundry & Machine Shop

Exhibition of the

American Foundrymen's Association

Will be held in the week of September 24



Exhibitors and the Products Displayed

Abell-Howe Co., Chicago.—A display of the Howe detachable tongue truck in various styles of platforms and bodies; also an American electric hoist in operation, and operating models of American high speed chain and Union roller and bushing chain. Represented by Oliver J. Abell, president.

Ajax Metal Co., Philadelphia.—Display of Ajax process ingots and a variety of castings. Exhibit in charge of Frank M. Willeson, New England representative, with G. H. Clamer, first vice-president and secretary; Charles F. Hopkins, superintendent; A. MacDougall, New York representative, and Joseph C. Brightbill, Philadelphia representative, and J. Millson Graham in attendance.

Albany Sand & Supply Co., Albany, N. Y.—Exhibit of a range made in the company's sand by the Walker & Pratt Mfg. Co., Watertown, Mass., and Boston. Represented by Charles H. Bird and Lawrence Murray, president.

American Foundry Equipment Co. and the Sand Mixing Machine Co. (combined), New York.—A display of a new design of sand cutting machine for cutting molders' sand which in addition to cutting it will also pile it alongside the bench or machine for stationary molding; also new "Humane" rotary table sand blast room in operation, and other sand blast equipment. Represented by V. E. Minich, vice-president and general manager; H. L. Wadsworth, Cleveland, factory manager; Hutton H. Haley, Detroit, district manager; John D. Alexander, Cleveland, and Charles G. Smith, Philadelphia, sales representatives.

American Gum Products Co., New York.—Goulac core binder, together with cores and castings. Represented by Gordon I. Lindsay, general manager; W. E. Baird, manager foundry department; R. H. Mills, salesman; F. B. Thomas and M. F. Coughlin.

American Lighting Co., Chicago.—Display of Western Electric-Davis flood lights. Represented by Will J. Davis, Jr., president; F. M. Evans and J. C. Starr.

American Molding Machine Co., Terre Haute, Ind.—A 10-in. jolt-ramming, rock-over molding machine in operation, as well as a jolt-ramming stripping plate machine with a 12-in. draw. Represented by W. C. Norcross and L. J. Cox.

American Pipe Bending Machine Co., Boston.—Display of three models of "Wonder" pipe bending machines. Represented by Marks Angel, James Heggie, John Heggie and Edmond P. Blake.

Arcade Mfg. Co., Freeport, Ill.—Display of 24-in. power rollover jolt and pattern drawing machine, 24-in. modern jolt showing a ferrule plate, piston cope machine, piston drag machine, 38-in. modern jolt, No. 2 modern jolt, No. 90 combined jolt squeezer, 8-in. air squeezer, 3-in. Midget core jolter, 2-X hand squeezer, 17½-in. Norcross jarring machine, and Brillion pouring device. Represented by E. H. Morgan, Charles Morgan, L. L. Munn, R. E. Turnbull, Henry Tscherning, August Christen and G. D. Wolfley.

Armstrong Cork Co., Pittsburgh, Pa.—Display of insulating brick, cork covering for water, brine and ammonia lines, high pressure covering, and corkboard for refrigeration purposes. Represented by A. L. Dorr and E. C. Lloyd.

Athol Machine Co., Athol, Mass.—Display of Athol and Starrett improved vises of all types, mechanics' fine tools and other products of this concern's manufacture. Represented by Stephen E. French, general manager and superintendent, and H. K. Parkman, salesman.

E. C. Atkins & Co., Indianapolis.—An exhibit of metal saws, such as circular, hack blades and frames, hand saws, Kwik Kut metal cutting machines and foundry plates. Represented by T. H. Endicott, W. L. Timpone and T. A. Carroll.

Ayer & Lord Tie Co., Chicago.—A display of A & L interior creosoted wood blocks installed in the floor of the booth. Represented by A. H. Noyes, secretary and treasurer; W. H. Blythe, Chicago; B. S. McConnell and F. W. Decker, construction engineers, Cleveland; R. G. Inslee and R. H. Inslee, construction engineers, New York, and H. G. Stephens, construction engineer, Philadelphia.

B. & B. Mfg. Co., Inc., Indianapolis.—Display of portable and stationary power and hand molding machines. Represented by W. Kesler, secretary.

Beaudry & Co., Boston.—Display of 100-lb. Beaudry Champion hammer and a 50-lb. Fairbanks hammer, both in operation. Represented by O. Abrahamsen, treasurer, and Archibald Parsons, treasurer of the United Hammer Co.

Berkshire Mfg. Co., Cleveland.—Display of air and hand squeezer molding machine with special lifting device; iron, wood and aluminum flasks, match plates, vibrators, flask fittings, etc. Represented by R. H. York, president; W. A. Price, treasurer; W. D. Fraser, manager, and G. L. Cannon.

Charles H. Besly & Co., Chicago.—Display of No. 17, 24-in. L Besley wide face ring wheel grinder with 30-in. disk wheel; No. 15. 30-in. B Besley pattern makers' disk grinder; No. 19, 53-in. Besly horizontal disk grinder, and No. 6, 20-in. Besly double-spindle disk grinder. Represented by Edward P. Welles, president; Charles A. Knill, Ralph W. Young, Charles H. Munch and John C. Curns.

Champion Foundry & Machine Co., Chicago.—Exhibit of two Champion electric sand riddles in operation. Represented by T. J. Magnuson and H. O. Magnuson.

S. Birkenstein & Sons, Chicago.—Display of ingot brass, manganese bronze ingot, phosphor bronze ingot, ingot copper, pig tin, pig lead and babbitt metal and other non-ferrous base metals and their alloys, also castings made from these products for the purpose of showing their working qualities.

G. S. Blodgett Co., Burlington, Vt.—Display of small portable ovens used for enameling, japanning and for core baking purposes. Represented by R. L. Patrick, treasurer.

Blystone Mfg. Co., Cambridge Springs, Pa.—Display of 7 cu. ft. Blystone mixer with screen, 3-hp. motor and power discharge attached. Represented by Luther G. Conroe and T. A. Graham.

Bridgeport Safety Emery Wheel Co., Bridgeport, Conn.—Display of No. 7 alternating current motor-driven floor grinders with ball bearings, equipped with improved steel guards, and a No. 1 alternating current swing frame grinder. Represented by D. T. Homan, vice-president, and A. H. Kean, treasurer.

Brown Specialty Machinery Co., Chicago.—Display of No. 1 revolving barrel sandblast machine equipped with cloth screen type dust arrestor and exhaust fan, and Style A hammer core machine, both of which will be in operation, and Style B hammer core machine and an electric duplex shaker. Represented by Elmer A. Rich, Jr.; J. E. Sweet, R. E. Laycock, J. L. Laycock and R. G. Coburn.

Buckeye Products Co, Cincinnati.—Display of metal melting crucible and non-crucible furnaces, air and electric vibrators, parting compound, core compound, patent flask guides and pins, metal fluxes, etc. Represented by C. J. Goehringer, president; D. S. Marfield, treasurer, and the following salesmen: B. Bernbaum, C. Gysin, J B. Carpenter and E. R. Sutton.

Carborundum Co., Niagara Falls, N. Y.—Samples of crude carborundum crystals and crude aloxite. Represented by J. E. Rayner, manager of the Boston store, and John MacArthur, H. E. Hammond, G. E. Dresser and H. H. Miller, of the Boston store; O. C. Dobson, of the Pittsburgh store; H. E. Kerwin, of the Chicago store, and C. E. Hawke, manager service department.

Cataract Refining & Mfg. Co., Buffalo.—Cutting oils and compounds, quenching and tempering oils, core oil and parting. Represented by A. A. Schaefer, F. F. Hennessy, J. A. MacVeagh, M. E. Becker, F. N. Tweedy, J. Purvis, N. C. Back, F. M. Edwards and L. C. Smith.

Frank D. Chase, Chicago.—A display of photographs and colored illustrations of plants designed by the firm as an industrial engineer, and standards developed for the construction of furnaces, ovens, etc.

Chase Turbine Mfg. Co., Orange, Mass.—An exhibit of automatic polishing and buffing machines under power and in actual use, adapted for the polishing and buffing of round, flat or cylindrical parts. Divine Bros. Co., polishing engineer, Utica, N. Y., occupies a part of this space, showing a complete line of wheels, wheel dressers and balancers and polishing tools. Chase Turbine Mfg. Co. represented by W. G. Chapman and Divine Bros. Co. represented by B. H. Divine and F. W. Sturdevant.

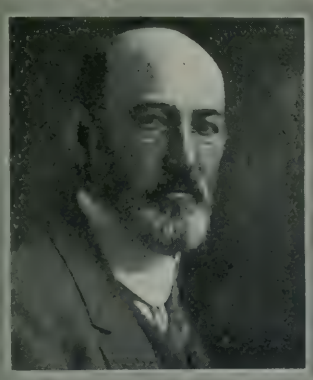
Chicago Pneumatic Tool Co., Chicago.—One of its compressors will furnish about one-half of the compressed air used by exhibitors. Pneumatic riveting, chipping, sand ramming, grinding, hoisting, electric drilling and other tools and a new portable electric sand sifter will be displayed. In charge of A. C. Andresen; also F. S. Eggleston, manager Boston office; E. J. Foley and others.

Chisholm-Moore Mfg. Co., Cleveland.—Cyclone hoists and matchless trolleys displayed. Represented by George W. Bateman.

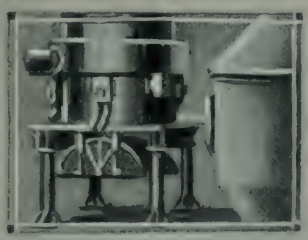
Cincinnati Pulley Machinery Co., Cincinnati.—A display of one three-spindle No. ½ Avey drilling machine equipped with gravity feed for each spindle; and a number of other machines, many of them in operation. Represented by L. B. Patterson, president and treasurer; J. G. Hey, vice-president and general manager; J. F. Merrielees, general superintendent, and C. K. Cairns, sales manager.

Charles J. Clark, Chicago.—Display of blast volume meters and allied instruments. Represented by Charles J. Clark.

Cleveland Blow Pipe & Mfg. Co., Cleveland.—A display of a motor-driven exhaust fan, various designs of hoods for use on buffing, polishing and emery wheels, dust collector and the necessary material required to connect from the emery wheels to the exhaust fan and from the exhaust fan to the dust collector; also a two-section shower bath for foundry and factory use. Represented by Edward Coney.



WILLIAM A. VIALL





W. E. FREELAND



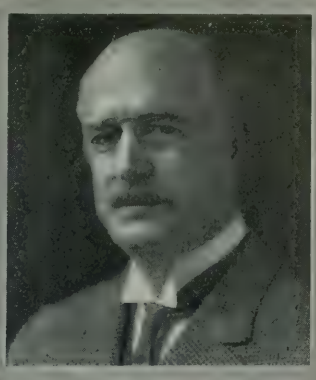
W. J. LAVELLE



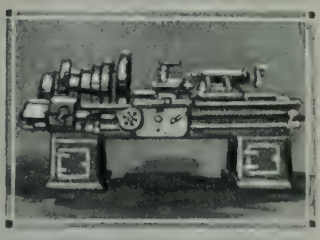
E. ARTHUR TUTEIN



CHARLES A. REED



JOHN O. HENSHAW





R. D. WALKER

Chairmen of Committees for Foundry Week

Mr. Lavelle, New England Coal & Coke Co., Everett, Mass., is chairman of the executive committee.

Mr. Tutein, Thomas Iron Co., Boston, is chairman of the reception committee.

Mr. Viall, Brown & Sharpe Mfg. Co., Providence, R. I., is chairman of the finance committee.

Mr. Henshaw, pig iron and coke, Boston, is chairman of the golf committee.

Mr. Reed, Reed, Fears & Miller, pig iron and coke, Boston, is chairman of the entertainment committee.

Mr. Freeland, New England editor THE IRON AGE, Worcester, is chairman of the press committee.

Mr. Walker, Walker & Pratt Mfg. Co., Boston, is chairman of the ladies entertainment committee.

Cleveland Pneumatic Tool Co., Cleveland.—Riveting, chipping, beading, calking, scaling and bushing hammers; jam riveters, reversible and non-reversible air drills, tapping and wood boring machines, compound and corner drills, bench and center grinders, portable grinders; floor, flask, bench and core rammers, angle gears, pneumatic hold-ons, Bowes air hose couplings and Never-Slip hose clamps. Represented by H. S. Covey, secretary; Arthur Scott, superintendent; G. Gregory, manager New York office; F. E. Schwarze, manager Philadelphia office, and C. D. Garner, manager Toronto office.

Thomas E. Coale Lumber Co., Philadelphia.—Display of samples of Michigan soft cork white pine pattern lumber of various grades. Represented by Thomas E. Coale and Andrew Warren Anderson.

Combined Supply & Equipment Co., Buffalo.—Display of Angle Stem chaplets. Represented by S. LeViness, Jr., and C. L. Jackson.

Curtis Pneumatic Machinery Co., St. Louis.—Display of Curtis vertical double cylinder single-acting compressor, water-cooled with regulatable sight feed splash oiling feature, motor driven unit with automatic pressure control and circulating pump for cooling water; Curtis pendant vertical cylinder air hoist; Curtis horizontal rope compounded cylinder air hoist suspended from single I-beam trolleys; single I-beam hand operated bridge crane with trolley and single I-beam bracket jib crane.

Cutter & Wood Supply Co., Boston.—Display of miscellaneous foundry equipment, especially machines for casting, cleaning, machining, polishing, plating and lacquering. Represented by W. S. Wood, president, and W. H. Mulholland, secretary and treasurer, and the following traveling salesmen: A. E. Carpenter, C. G. Bills, George H. French and A. M. Ham.

Davis-Bournonville Co., Boston.—Exhibit will consist of oxy-acetylene welding and cutting equipment, including acetylene generators, welding and cutting torches, regulators, etc.; No. 2 Oxygraph and Radiagraph in operation. Represented by Stuart Plumley, F. C. Hobbs, George Jaeger, George J. Strobel, George V. K. Greene, Fred A. Blood and A. Blaser of the New England sales and demonstrating force, also W. W. Barnes, district sales manager, Philadelphia, and Hugh F. Dyar, district sales manager, Cleveland.

Debevoise-Anderson Co., New York.—Samples of several brands of coke pig iron, charcoal pig iron, various brands of coke and limestone. Represented by N. Anderson, C. A. Wyatt, W. K. Callow, A. E. Kelly and C. K. Sutton.

Dings Magnetic Separator Co., Milwaukee, Wis.—Display of four types of separators, all power driven, as follows: Type O No. 2, with motor attached; type M No. 3, with motor generator set; magnetic pulley type with motor, and a hand magnet. Represented by Mr. Fobian, sales manager, and Mr. Bethke.

Joseph Dixon Crucible Co., Boston.—Display of Dixon's crucibles, covers, stirrers, stoppers, sand crucibles, scorifiers, cupels, etc. Represented by D. A. Johnson, manager Chicago office; H. A. Nealley, manager Boston office, and the following salesmen: H. C. Sorenson, R. J. Belleville, J. J. Tucker, R. H. Brinkerhoff, C. A. Shaw, E. A. St. John, A. L. Haasis, R. F. Leonard, J. K. Moses, John A. Condit, A. G. Quimby and M. McNaughton.

G. Drouve Co., Bridgeport, Conn.—Models of Anti-Pluvius puttyless skylights and Straight-Push sash operators. Represented by William V. Dee, secretary.

Eastern Brass & Ingot Corporation, Waterbury, Conn.—A display of samples of briquet-ingots formed by pressure from fine metal scrap; also charts showing the savings effected by the use of briquet-ingots. Represented by Howard Baker, F. A. Purdy, G. G. Hanson and W. S. Lord.

Federal Foundry Supply Co., Cleveland.—Display of eight power squeezers and combination jolt and squeeze machines of various sizes; jolt machines for making cores and molds; core ovens, electric vibrators and knee valves, flasks, etc. Represented by W. J. Adams, Ralph Ditty, Ellsworth Kaye, John Bayer, W. J. Smith, I. D. Adams and T. R. Ditty.

Felt & Tarrant Mfg. Co., Chicago.—Demonstration of the Comptometer adding and calculating machine. Represented by William F. Sims, J. G. Luniak and W. G. Resch.

Forbes & Myers, Worcester, Mass.—Display of Models 56, 156X and 110 motor grinders of this firm's manufacture.

Foreign Crucibles, Ltd., New York.—A display of European crucibles. Represented by George H. Ames.

Foundry Equipment Co., Cleveland.—Display of various types of Coleman core ovens, metal melting furnaces, oil burners, crucible lifters, squeezers, etc. A feature of the exhibit is a combination battery of one Coleman roller drawer oven and a portable rack type of oven. In the latter type of oven a transveyor is used to move the loaded racks of cores into and out of the oven. Represented by F. A. Coleman and C. A. Barnett.

Gardner Machine Co., Beloit, Wis.—Display of five types of belt and motor driven polishing lathes and ten types and sizes of Gardner grinders, and an assortment of supplies and accessories. Exhibit includes two recent additions to the Gardner line, the No. 15 double spindle grinder, which is of 20-in. ring wheel capacity, and a new No. 24 vertical spindle 53-in. disk grinder. Represented by W. B. Leishman, treasurer; W. L. Townsend, demonstrator; A. A. Swinnerton, Springfield, Mass., sales representative; F. M. Rigler, New York sales representative, and also by representatives from Boston agents, the Lynd-Farquhar Co., and from the New York agents the Vandyck-Churchill Co.

General Electric Co., Schenectady, N. Y.—Display of centrifugal air compressors for cupola service, electric core baking ovens, etc. J. M. Hollister, representing the general office at Schenectady, and M. R. Griffeth, of the Boston office. Other representatives are A. R. Bush, J. W. Ham and B. L. Spain of the Schenectady general office; J. F. Steele, C. B. Davis and D. G. Brokaw of the Boston office; P. A. Dyer, New York office, and W. C. Fish, manager of the Lynn works

General Fire Extinguisher Co., Providence, R. I.—Display consists of an installation of an automatic sprinkler complete with wire glass house for demonstrating operation of sprinkler, together with ADT supervisory system. Represented by W. A. Kennedy, mechanical engineer; A. J. Richmond, Boston manager; R. A. Jenckes, department agent; J. D. Pryor, department of publicity and promotion; George S. Barrows, manager of gas heating, and Carl Hausler Hale, gas mixer.

Goldschmidt Thermit Co., New York.—Complete line of samples of the various metals and alloys which this concern manufactures, such as manganese, chromium, cobalt, tungsten, ferrotungsten, ferrochromium, manganese copper, ferromolybdenum, ferrotitanium, etc. W. R. Hulbert, sales manager; A. F. Braid, metallurgical engineer; H. G. Spilsbury, metallurgical engineer; H. D. Kelley and J. G. McCarty.

Great Western Mfg. Co., Leavenworth, Kan.—Type V, type CR, type CS and type HS gyratory foundry riddles. Represented by George W. Combs, superintendent, and F. A. Pickett.

Harrison Supply Co., Boston.—Metallic sand blast materials, including the company's principal products, chilled shot and Diamond grit.

Hauck Mfg. Co., Brooklyn, N. Y.—Hauck cupola lighters, mold dryers, ladle heaters, melting furnaces and kerosene torches. Represented by A. E. Hauck, president; Busch Hauck, vice-president, and A. P. Link.

Hayward Co., New York.—Display of photographs showing its Hayward buckets in operation on various classes of work. Represented by H. M. Davison and C. F. Hutchings.

Herman Pneumatic Machine Co., Pittsburgh.—Display of plain jarring machine of 4-ton capacity and a smaller plain jarring machine; also a new type of combination jar and squeeze machine Represented by Thomas Kaveny, A. M. Frauenheim, H. T. Frauenheim, Alfred Herman, Robert F. Ringle, I. J. Oesterling, R. P. Morgan, Walter Hughes, A. McWithey, Robert Porteous and Harry W. Gahan.

Hill, Clarke & Co., Boston.—This display shows the following new machines: Henry & Wright drilling machines, Fraser grinders, Superior drilling machines, Millholland screw machines. Jarecki pipe machines, Flather lathes, Roulsted lathe, Boye & Emmes lathe, Greenfield cutter grinder, Consolidated press, Carlton radial drilling machine, Atlas arbor press and Wilmarth & Morman universal grinder.

Herman A. Holz, New York.—Display of the Brinell meter, a portable apparatus for the accurate determination of the hardness of metals and metal products, and the Erichsen machine for testing metal sheets, strips, wires, tubes, etc. Represented by Herman A. Holz and W. O. Little.

Hoevel Mfg. Corporation, New York—Revolving barrel sand blast machine and rotary table sand blast machine. Represented by H. F. Hoevel, president; F. W. Weiss, vice-president; L. B. Passmore, Western representative, and G. H. Seltzer, salesman.

International Molding Machine Co., Chicago.—Jarring machines, electric and air; power squeezers, combination stripping squeezers, combination jolt squeezers, hand turn-over draw, etc. Represented by Edward A. Pridmore, president; W. W. Miller, vice-president; F. W. Hamel and J. L. Lanigan.

Jennison-Wright Co., Toledo, Ohio.—Display of Kreolite wood blocks used for factory flooring. Represented by F. E. Jennison, Frank B. Goodman, George L. Dresser, L. P. Drinker and Henry P. Consaul.

Spencer Kellogg & Sons, Inc., Buffalo.—Display of liquid core compounds. Represented by Alfred P. Mason, William L. Goetz and Robert C. Boggess.

T. P. Kelly & Co., Inc., New York.—Booth arranged as a rest room. Represented by H. F. Maurel, V. J. Rohe, B. H. Forman and W. F. Kaine

Julius King Optical Co, Chicago.—Display of approved safety goggles, helmets, masks, etc. Represented by W. G. King.

vice-president; F. W. King, of New York office. and J. J. Duffy and A. G. Larson of Chicago office.

Lamson Co.. Boston.—Display includes a special installation of Lamson gravity roller conveyors adapted for use in carrying molds, cores, pig iron, castings, etc., and a working demonstration of Lamson pneumatic tubes.

Lees-Bradner Co.. Cleveland.—Display of No. 6 standard thread millers and No. 5-A 19-in. universal gear generators equipped with motor drive and in operation. Represented by E. A. Bayton.

Lewis-Shepard Co., Boston.—Display of Jacklift Master trucks. Represented by A. L. Lewis, president; F. J. Shepard, Jr., treasurer, and J. W. Adams and E. E. Wallace.

Ludlum Electric Furnace Corporation.—See Thornton W. Price.

David Lupton's Sons Co., Philadelphia.—Display featuring the Pond truss roof formation which is extensively used in foundries, and samples of Lupton products, such as Pond continuous sash, Pond operating device, Lupton steel sash of various types, etc. Represented by Clarke P. Pond, sales manager; H. R. Wilkinson, district manager, and C. F. P. Buckwalter. assistant sales manager.

Lynd-Farquhar Co.. Boston.—Display of the Lynd-Farquhar 26-in. open side crank planer and shaper; also the American 14-in. tool room lathe; sensitive radial drill; the Lees-Bradner No. 6 thread milling machine and the Lees-Bradner gear hobbing machine. All of these machines are in operation. Represented by H. L. Rich and John S. Alcorn.

J. S. McCormick Co., Pittsburgh.—A general line of foundry supplies. Represented by J. S. McCormick, president; T. E. Malone, secretary and treasurer; S. R. Costley and A. T. Richardson, salesmen.

McCrosky Reamer Co., Meadville, Pa.—A complete line of various styles of adjustable reamers, turret tool posts for lathes, universal lamp brackets, and a demonstration of the Wizard quick-change chucks and collets. and tapping and stud setting devices for a drill press. Represented by C. M. Sutton. assistant sales manager, and Clyde Derby.

McLain's System, Inc., Milwaukee, Wis.—Samples of semi-steel castings of light section such as automobile cylinders and pistons, and other castings containing from 20 to 50 per cent steel; also projectiles of various weights and sizes made by McLain graduates, open-hearth steel castings poured from metal made in a McLain-Carter oil-fired furnace. Represented by David McLain, I. V. Scanlan and Carl Huebl.

Mahr Mfg. Co., Minneapolis, Minn.—Display of foundry torches for cupola lighting, mold drying, pre-heating, etc.; also melting furnaces, rivet furnaces and forging furnaces. Represented by J. A. Mueller, J. R. Matthews, R. B. Ecker and H. H. Warner.

Malleable Iron Fittings Co., Branford, Conn. A full line of all-steel hardened and ground vibrators from ⅜ in. up to and including 2 in.; also a full line of accessories for vibrators. Represented by George D. Pickop, assistant superintendent, and J. C. Page, head of the pattern department.

Michigan Smelting & Refining Co., Detroit.—Exhibit of Detroit standard ingot brass, Sillman's Apex bronze, brass and copper ingot metals, tin, lead products, including lead pipe and solders, babbitt metals, type metals, etc. Represented by Joseph Sillman, president; Henry Levitt, secretary; W. J. Schweitzer. J. T. Tiernan and H. E. Berliner of the sales department; R. R. Arnold, R. E. Moore and I. W. Rollins of the white metal department, and R. H. Evans of the advertising department.

Midland Machine Co., Detroit.—Display of a small hand-rammed rollover machine, small size jar-rammed rollover machine and a special core machine to go on a core bench for making small cores. Represented by G. L. Grimes, manager, and L. V. Grimes, C. R. Jones and Oswald Carliss, salesmen.

Moltrup Steel Products Co., Beaver Falls, Pa.—Display of Moltrup's flattened steel foundry pattern plates, steel engraving plates, cold drawn steel bars, finished machine keys, finished machine rack. Represented by F. H. Guppy and N. S. Leyda.

Monarch Engineering & Mfg. Co., Baltimore. Md.—Display of a complete line of Monarch industrial furnaces for the melting of metals, heat treatment of metals, forging, etc., and a complete line of oil, gas, coal and coke crucible furnaces, tilting and stationary; also a complete line of core ovens for all fuels, shop and tool tempering and heating furnaces. Represented by James J. Allen, M. W. Woodburn, H. D. Harvey, Frank Maujean and William Raber.

Mott Sand Blast Mfg. Co., Inc., Brooklyn.—Working exhibit showing the operation of its sand blast barrel; also a sanitary sand blast cabinet in operation. Represented by E. J. Rosenthal, F. J. Hull and E. C. Gilmour of the New York branch, and David Mayer and C. B. Schneible of the Chicago branch.

Mumford, E. H., Co., Elizabeth, N. J.—Samples of molding machines. Represented by T. J. Mumford, H. W. Sinclair and J. A. Walsh.

Mumford Molding Machine Co., Chicago.—Drawings and possibly a molding machine. Represented by Donald Alexander, assistant sales manager; Otto F. Weiss, salesman; James T. Lee, sales manager, and W. H. Huelster.

National Engineering Co., Chicago.—Display of No. 2 Simpson intensive foundry mixer in operation. Represented by H. S. Simpson, manager.

New England Coal & Coke Co., Boston.—A display of New England foundry coke produced at the Everett Works of the New England Fuel & Transportation Co., made into a model of the Bunker Hill monument rising into the air about 50 ft. Represented by W. J. Lavelle, F. C. Knight, J. M. Dunbar and J. M. Taylor.

New Haven Sand-Blast Co., New Haven, Conn.—Display of Model A sand blast rolling barrel, hose type sand blast machine, sand blast accessories, etc. Represented by Charles A. Dreisbach, president; C. S. Johnson and C. E. Billings.

William H. Nicholls Co., Brooklyn, N. Y.—Plain power squeezer, combination jolt and power squeezers with split pattern drawing, drawing, stripping plate and rollover devices. Represented by William H. Nicholls.

Norma Co. of America, New York.—Norma ball and roller bearings in a variety of sizes. Represented by E. A. Perkins, sales engineer.

Norton Co., Worcester, Mass.—Four grinding machines in operation, with the types of protection hoods furnished with these machines; also a display of grinding wheels used in foundry work. Represented by George C. Montague, W. G. Snow, Herbert Duckworth and Wallace T. Montague.

S. Obermayer Co.. Chicago.—Display of brass furnaces, core ovens, snap flasks, sprue cutters, tumbling barrels, chaplets, etc. Represented by S. T. Johnston, E. D. Frohman, William Fenton, William Fitzpatrick, Sr., William Fitzpatrick, Jr., J. J. McDevitt, O. J. Peterson, A. N. Wallin and George Deyette.

Oliver Machinery Co., Grand Rapids, Mich.—Display of Oliver 16-in. tool room engine lathe in operation. Represented by J. W. Oliver, A. Blake, G. W. Crosley, A. S. Kurkjian and J. R. Duthie.

Osborn Mfg. Co., Cleveland.—Display of hand and power operated machines covering direct draw roll over jolt machines, plain air squeezer machines, combination jolt squeezer machines, "Little Wonder" roll over machines. drop plate and stripping plate machines, combination jolt stripper squeezer machines. Represented by H. R. Atwater, vice-president; J. C. Alberts, E. H. Byerlein and E. W. Jacobi, sales engineers.

Oxweld Acetylene Co.. Newark, N. J.—Oxweld low pressure type acetylene generating unit in operation, and welding and cutting blow pipes in representative applications. Represented by L. E. Ogden, R. D. MacMillen, J. N. Walker, F. R. Chadwick, G. M. Kerr, C. C. Pilsbury, A. H. Koeller, Jr., and Harold DuBois.

Pangborn Corporation, Hagerstown, Md.—Photographs of sand blast and allied equipment. Represented by John C. Pangborn, W. C. Lytle, P. J. Potter, Alfred L. Holmes, George A. Cooley and Charles M. Goldman.

J. W. Paxson Co, Philadelphia.—Display of complete line of foundry equipment and supplies, sand blast machinery, sands, facings, etc. This display includes moving pictures. Represented by H. M. Bougher, president; W. S. Thomas and R. H. Rehm, New England representatives; E. M. Taggart, New York representative; A. G. Warren, general superintendent, and I. F. Kremer, mechanical engineer.

Pickands, Brown & Co., Chicago.—Display of samples of Solvay coke arranged in the form of a hub. Represented by George A. T. Long, Thomas W. Glasscot, Bayard T. Bacon and James A. Galligan; also James A. Ballard and William H. Ball of the Semet-Solvay Co., Detroit and Syracuse.

Pittsburgh Crushed Steel Co., Pittsburgh.—Complete line of samples of "Angular Grit," a metallic sand blast abrasive. Represented by G. H. Kann.

Portage Silica Co., Youngstown, Ohio.—Samples of silica sand, gravel and sand blast sand and the original rock from which these materials are obtained. Represented by E. E. Klooz, vice-president and general manager, and L. R. Farrell, secretary.

Thornton W. Price, New York.—Display of a working model of the Ludlum electric furnace, together with samples of various grades of cast iron, pig iron, washed metal and cast steel, also various grades of tool and alloy steels which are the product of the Ludlum Steel Co. Also charts showing analyses and results of tests now being made by the General Electric Co. regarding the cost of producing cast iron, pig iron, etc., in an electric furnace, and also tests of the strength of the cast iron and cast steel, which have been made by Columbia University.

Henry E. Pridmore, Chicago.—Display of electric jarring machines, plain hand rock-over drop machine, plain air-power rock-over hand draw machine, hand stripping plate

machine and air-power squeezer machine. Represented by Mrs. Henry E. Pridmore, president and treasurer; Henry A. Pridmore, vice-president and secretary; D. F. Eagan, C. H. Ellis, A. V. Magnuson, and J. W. Dopp of J. W. Dopp & Co., Detroit.

Quigley Furnace Specialties Co., New York.—A display of the Hytempite furnace cement with a practical demonstration of this product in two small high temperature electric furnaces equipped with pyrometers; also a showing of rammed-up lining for pit type melting furnaces and ladles.

Richey, Browne & Donald, Maspeth, N. Y.—Exhibit of a small working model illustrating the company's roller-ramming and molding machines and sand handling appliance, together with samples showing a wide variety of work which can be manufactured by this equipment. Represented by Walter H. Hofmann, J. C. Burdick and J. B. Donohue.

Rivett Lathe & Grinder Co., Boston.—Display of No. 103 internal straight hole and angle grinder, No. 106 internal straight hole and angle grinder, No. 608 back-geared precision lathe mounted on special cabinet with individual motor drive and supplied with a number of this company's attachments, No. 208 automatic radial grinder and an improved Rivett thread tool. Represented by Cecil Ogden, A. O. Richter, Fred Lord and F. H. Halstead.

Robeson Process Co., New York.—Samples of glutrin and cores made with this material; also photographs of cores and castings in which glutrin was used. Represented by T. J. Ryan, R. S. Hughes and George N. Moore.

Rogers, Brown & Co., Cincinnati.—A large display of samples of pig iron, display of beehive and by-product oven metallurgical coke and an asortment of ferroalloys; also gray iron, semi-steel and malleable iron castings of various types. Represented by George R. Sullivan and Richard Peters, Jr., Philadelphia office; A. A. Fowler, R. W. Clark, Otto Arlt and J. A. Claussen, New York office; Sterling W. Hubbard, Cleveland office; Thomas E. Wilson, Pittsburgh office; W. T. Shepard, F. J. Waldo and A. T. Stengel, Buffalo office; J. C. Mears, St. Louis office; H. W. Fernald, F. E. Fitts, W. R. Maher and E. F. Bowden, Boston office; E. L. Billingslea, Chicago office, and F. W. Miller and F. W. Bauer, Cincinnati office.

Sand Mixing Machine Co.—See American Foundry Equipment Co.

Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.—A display of standard Shepard hoists, including a foundry hoist, with variable speed control; also Shepard new light capacity hoist which is designed to take care of loads that are just too heavy for one man and other hoisting devices. Represented by F. A. Hatch, general manager; R. H. McGredy, sales manager; A. J. Barnes, advertising manager, Montour Falls, N. Y.; W. A. Battey, Eastern sales manager and W. C. Briggs, sales engineer, New York office; and Norman Farrar, district manager, and Herbert W. Gledhill, sales engineer, of Philadelphia. Cutter & Wood Co., Boston agents for the Shepard company in that territory also will have its representatives and attendants at this exhibit.

Simonds Mfg. Co., Fitchburg, Mass.—Exhibit includes hack saw blades, files, metal cutting circular saws and metal slitting saws. An inserted tooth metal cutting saw will be in operation on a machine. Represented by H. B. McDonald, Charles E. Woods and H. D. Horton.

W. W. Sly Mfg. Co., Cleveland.—Display of two-section drawer type core oven, 10 x 10 ft. steel sand blast room, No. 5 "Baby" sand blast mill in operation and a resin mill, continuous feed. Represented by W. C. Sly, president; George J. Fanner, vice-president; P. W. Graue, Western representative, and H. P. Furlong, Eastern representative.

R. P. Smith & Sons Co., Chicago.—Display of "Protec-toe" safety shoes for molders and foundrymen. Represented by J. B. Smith, Jr.

Werner G. Smith Co., Cleveland.—Display of Linoil and other core oils, specimen cores made with Linoil, and castings; also a line of plumbago and firebrick. Represented by W. G. Smith, president and general manager; F. H. Dodge, manager of foundry supply department; L. F. Ferster, advertising manager; W. S. Rayel, service expert; A. L. Fay, Western manager; M. S. Finley, Eastern manager, and L. P. Robinson, New England manager.

Standard Equipment Co., New Haven, Conn.—Display of No. 5 cinder mills in operation. Represented by C. A. Dreisbach and L. Bradley.

Strong-Kennard & Nutt Co., Cleveland.—Display of safety devices, including first aid cabinets, hospital equipment, safety cans, fire extinguishers; rubber, leather and asbestos gloves, leggings and clothing; dust hoods, safety signs, respirators and masks, and numerous other devices.

Sterling Wheelbarrow Co., West Allis, Wis.—Wheelbarrows, flask pins, special rolled steel flasks, snap flasks and shop boxes. Represented by E. W. Dowd, New England representative; George H. Lambkin, New York representative; Charles L. Kirk, Pittsburgh representative; J. W. Dopp, Detroit representative, and the following factory representatives: I. R. Smith, president and general manager; H. H. Baker, secretary and sales manager; J. J. Coyne, Chicago manager, and J. M. Dickson, salesman.

Sullivan Machinery Co., Chicago.—The main feature will be a 14 x 8¾ x 10-in. class WJ-3 angle compound compressor equipped with Sullivan plate valves throughout; also air lift boosters for securing water supply from wells. Represented by G. E. Wolcott, sales manager for New England; H. C. O'Brien and G. H. Richey, sales engineers, and Alexander Milne, operating engineer in charge of the exhibit.

Thomas Iron Co., Boston.—Pig iron. Represented by William A. Barrows, Jr., president; Elbridge E. Walker, general sales agent; E. Arthur Tutein, New England representative, and Philip E. Wright, Philadelphia and New York representative.

Titanium Alloy Mfg. Co. and the Titanium Bronze Co., Niagara Falls, N. Y.—A display of castings, including bronze die castings. Represented by W. M. Corse, manager Titanium Bronze Co.; H. R. Corse, sales manager Titanium Bronze Co.; John McCallum, foundry superintendent Titanium Bronze Co.; A. C. Olfs and William Evans of the sales department of the Titanium Alloy Mfg. Co. and the Titanium Bronze Co., and George F. Comstock, metallurgist of the Titanium Alloy Mfg. Co.

United Compound Co., Buffalo.—Display of Buffalo brand vent wax and Buffalo brand pattern wax. Represented by John W. Bradley and L. F. Leney.

United States Graphite Co., Saginaw, Mich.—Exhibit space used for a rest room and for the display of samples of graphite ore and brushes for motors and generators.

U. S. Molding Machine Co., Cleveland.—Display of plain air squeezer, jar and squeeze machine, jar squeeze pattern draw machine, plain air jar machine, jar and pattern draw machine and jar roll-over pattern draw machine. Represented by J. N. Battenfeld, J. L. Battenfeld, C. F. Battenfeld and J. F. Jerka.

United States Silica Co., Chicago.—Display of samples of flint shot. Represented by A. Volney Foster, Lewis B. Reed, Harry F. Goebig and Oliver Cook.

United Metal Hose Co., New York.—Exhibit of flexible metal hose and tubing, including armored, lined, lined welding and lined air hose, also pneumatic tool hose for chipping hammers, etc., metal armored sand blast hose, hose for steam and oil. Represented by Joseph M. Lewin.

J. D. Wallace & Co., Chicago.—Display of a Wallace bench planer driven by a direct connected motor and fitted with a flap and shutter safety guard. Represented by J. D. Wallace, president.

Warner & Swasey Co., Cleveland.—Display of No. 2A universal hollow hexagon turret lathe working on chucking work, No. 4 universal turret screw machine working on bar work, and No. 2 plain head, bar feed, screw machine working on bar work. Represented by H. L. Kinsley, Boston manager, and A. C. Cook, sales manager.

Wheeler & Holcomb Co., Chicago.—Display of a full line of safety wearing apparel. Represented by F. H. Wheeler and Charles A. Kingsbury.

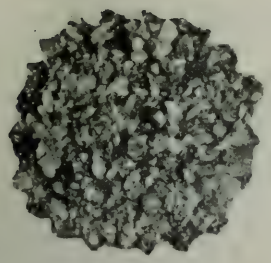
White & Brother, Philadelphia.—A display of ingot metals, white metals, the WB and CC brand of copper and castings made from these various classes of ingot metals. Represented by Clarence B. White, president; John T. Fegley, purchasing agent; Frank Krug, sales manager; Raymond Hunter, Eastern representative; William J. Crighton Canadian and Western representative; C. G. Dickinson manager New York office; Theodore Gruenbaum, special representative, and Raymond Galbraith, white metal representative.

Whitehead Brothers Co., Providence.—No products exhibited. Represented by A. J. Miller, treasurer; Charles E. Andrews, Eastern sales manager; J. H. Whitehead, purchasing agent, and Van Loan Whitehead, Jr., Western sales manager.

Whiting Foundry Equipment Co., Harvey, Ill.—Display of teapot spout ladle, type "R" electric crane trolley, latest improved design, having all gearing inclosed and operating in oil bath, and type "A" round plate tumbling barrel; also photographs showing complete line of cranes and foundry equipment. Represented by R. H. Bourne, R. E. Prussing, A. H. McDougall and C. A. Hardy.

T. B. Wood's Sons Co., Chambersburg, Pa.—Display of the Wood system of taper snap molding, comprising the Peerless patented tapered snap flask and automatic adjustable patented snap jacket. Represented by Charles M. Wood, George M. Naylor and Victor Lesher.

E. J. Woodison Co., Detroit.—Foundry equipment and supplies, including electrically operated jolt-ramming rollover molding machine, air squeezer molding machine, electric vibrator in operation, wood grinder, core oils, buffing compositions, etc. Represented by E. J. Woodison, D. H. Woodison, G. A. Burman, U. W. Frink, W. J. Wark, W. M. Maybank, W. Ranchie, D. D. Baxter, H. T. Taylor, C. G. Howe, G. Brady and C. J. Skeffington.

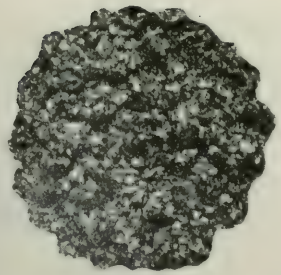


Sand Before Using

Sand-Blast Operation

Quantity and Character of Work Governs Selection of Equipment—Several Methods Briefly Described

BY DAVID EVANS*



After One Day's Use

AS everyone connected with the foundry industry knows, sand blasting is a method of applying sand under air pressure to rough castings to remove the dirt and scale as they come from the foundry.

Very little is known of the early history of the sand-blast, but there is a record of an exhibit of sand-blast equipment at the American Institute Fair, held in New York in 1871. The principle employed at that time is still used in the small sand-blast hose machine, which was the only type in use up to 1900. It seems likely that the use of sand under pressure to clean castings was borrowed from the glass industry, where sand has long been used for producing various effects in ground glass. At that time the use of compressed air was not generally known. Mr. Westinghouse was just introducing it for air-brakes on the railroads and there was no such thing as an air compressor of any great capacity on the market.

Some of the earlier attempts to use sand as a cleaning agent called for the employment of live steam in place of air. This method was said to be effective for cleaning certain kinds of castings for plating, but it made a very dirty and disagreeable job and was abandoned after a short time. This attempt to use live steam is interesting because in modern practice nothing causes so much trouble in the operation of the sand-blast as moisture. Regardless of the method or the type of machine used, or the grade of sand, care must be taken that the sand is "bone-dry" when it is charged into the machine and that no moisture created by the condensation of the air in the pipe line be permitted to come into contact with the sand, as it will choke up the machine, or at best will cause a pulsating effect instead of a steady, even flow.

Cleaning Steel Requires High Pressure

Sand-blasting should be, and usually is, the first work done on a rough casting preparatory to chipping and grinding. The sand-blast operation, therefore, should be done at a point on the line of route between the molding floor and the cleaning room.

For cleaning non-ferrous metals and for malleable and cast iron, a lower air pressure and a finer grade of sand may be used than for steel. Steel castings are difficult to clean. The metal is poured at a high temperature, and the molding sand burns in so that the only effective method of cleaning is by a sand-blast using air at a pressure of about 80 lb. High pressure, although costing more to produce, is invariably recommended for steel castings and, reckoned by the saving in time and the increase in work accomplished, is really cheaper in the long run. It has been estimated by some engineers that it costs about 15 per cent more to deliver air to the machine at 80 lb. than at 35 to 40 lb., but that the air at 80-lb. pressure strikes a 44 per cent harder blow, resulting in a saving of time, and consequently an increase of work of about the same per cent, leaving a net saving in favor of the higher pressure machine of 25 per cent. There is a further benefit in using higher pressure in that it requires a smaller volume of sand, and consequently creates a smaller volume of dust, which must be handled and eliminated, so that the saving in the use of the sand itself and the less amount of dust to be handled are both proper credits in favor of the high pressure.

Four Familiar Types of Equipment

There are several different methods of sand-blasting, and a different type of equipment for each method as follows:

Sand-blast hose machine
Sand-blast table
Sand-blast tumbling mill
Sand-blast room

The sand-blast room uses the same principle as the sand-blast hose machine, but is adapted for handling work on a much larger scale.

In considering the installation of a system for any particular plant, special attention must be given to the quantity and character of the work turned out in order to select the equipment best adapted. A steel foundry turning out as small a quantity as 3 tons per day needs a sand-blast just as much as a plant turning out ten times that amount, and for small plants where the volume of work does not justify a heavy outlay for equipment, the sand-blast hose machine is very satisfactory. This type of machine, Figs. 1 and 2, is common, and most foundrymen are so familiar with it that a detailed description is hardly necessary. Because of its flexibility, i. e., the capability of being used on any class of work, it is still a favorite in its modern form where the work is of a miscellaneous character. The part which receives the greatest wear and which requires the most frequent replacement is the nozzle.

Our first experience in sand-blasting was with a machine of this type, and we were able to effect a great saving in the cost of nozzles by designing a single piece to take the place of the three-piece nozzle furnished by the manufacturer. This single-piece nozzle is cast of hard manganese steel with flat threads on the neck to fit the inside surface of the hose. The hole is tapered, the end within the hose being but a thin shell to offer as little resistance as possible to the sand. About twenty are cast on one gate, and they are broken off by the workman as he needs them. The action of the sand very soon increases the diameter of the hole to such an extent that it will consume twice the amount of air that it is intended to use. These nozzles require changing once or twice a day, and the changes are made by the operator within a very short time. This is a very important point, as the plant may provide 100 cu. ft. of air for a small sand-blast hose machine and find that it uses 200 cu. ft. because of a worn-out nozzle.

The sand-blast table, Fig. 4, consists of a circular, grated disk revolving in a horizontal position.

*President and treasurer Chicago Steel Foundry Co., Chicago.

Compressed air, preferably at 80 lb. or more pressure, carries the abrasive and discharges it through one or more nozzles upon the work resting on the

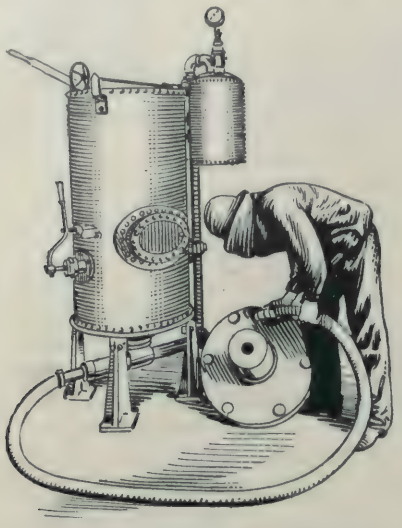


Fig. 1—Sand Blast Hose Machine

disk. When one side of the work is cleaned, the casting is turned over so that it can be blasted on the opposite side. The nozzles are placed to discharge the abrasive at an angle from the perpen-

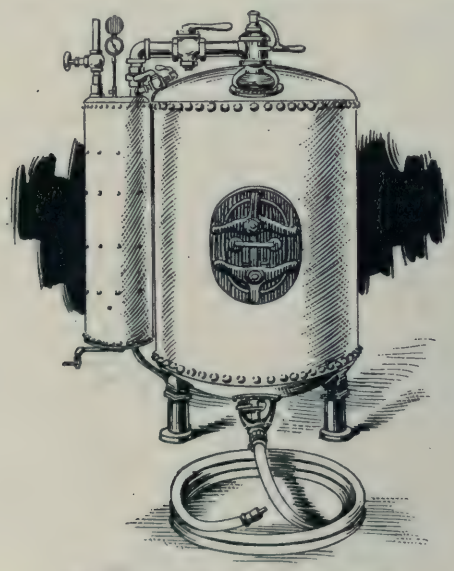


Fig. 2—Sand Blast Hose Machine

dicular so that the sides and top of the casting are cleaned at the same time. This type of equipment is especially adapted for cleaning flat work, but is by no means limited to any particular kind of casting as it compares with the sand-blast tumbling mill in the variety of work it will handle.

The sand-blast tumbling mill is entirely automatic in its action and is especially adapted to handle small or medium parts of more or less irregular design. There are at least two types of this mill on the market; one of them horizontal and one tilted, Figs. 5 and 6. The object of having the barrel tilted is to impart a dual motion to the castings as the barrel revolves, so that every part will come into contact with the stream of sand, which enters through suitable nozzles located in the stationary head and, together with the dust and dirt from the castings, is exhausted through the lower end. The same theory is used in the horizontal mill by having false heads located inside of the stationary heads which give a lateral as well as a horizontal motion to the castings.

This equipment is adapted to jobbing steel foundries with a wide range of work and should be used in conjunction with the hose machine, or with the sand-blast room; the latter equipment to handle the larger pieces and the sand-blast tumbling mill to handle the small and medium-sized castings. It is estimated that a 50 x 40-in. mill will clean about 1500 lb. of small castings, on the gates, within twenty to thirty minutes, using No. 3 sand and air at 80 lb. pressure. The amount it is possible to charge into the barrel varies considerably with the class of castings. Pieces weighing 1 to 3 or 4 lb. take up more room than castings 8 to 10 lb., and our judgment is that if a machine will hold 1500 lb. of the latter it will not hold to exceed 1000 lb. of the former.

The dust from these mills is exhausted by a fan of the proper size and the clean sand elevated to the bin above the mill, either by exhaust or by a bucket elevator system. The hoisting of the sand by air exhaust is preferable to an elevator whose working parts would be rapidly worn out by the action of the sand and would require frequent replacing.

The best method of cleaning large castings in-



Fig. 3—One-Piece Nozzle of Manganese Steel Fitting Into End of Hose

volves the use of the sand-blast room, Fig. 7. The room should be fitted with a grated floor having a hopper bottom beneath it to catch the sand and dust as they fall from the casting. The bottom of the hopper enters a pipe through which an exhaust system raises both the dust and the sand to the dust separator located at the top of the room and above the sand bin. The dust arrester consists of wood frames covered with a special grade of cotton duck. The dust passes through the screens leaving the clean sand to be returned to the sand bin and the clean air to the sand-blast room. The sand may be used directly from the bin by a hose or it may be returned to a hose sand-blast machine located within the room. The latter method is very satisfactory for jobbing steel foundry work as it enables the operator to stop or start at will, to control the hose with one hand and manipulate the castings with the other.

The sand-blast room may be built of brick, in

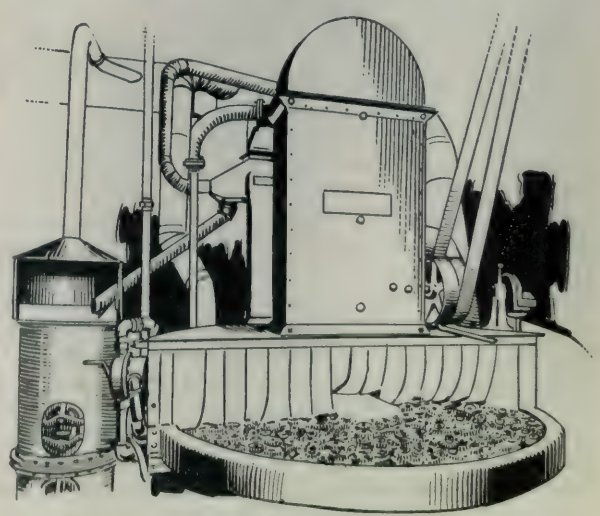


Fig. 4—Rotary Table Sand Blast Machine

which case it should have a wood paneling as the action of the sand on the brick wears the walls down very rapidly, or it may be of steel. In any case it should be tight enough to exclude the entrance of outside air which interferes with the work of the exhaust. No hard and fast rule may be laid down for the size and design of the sand-blast room. The requirements of the plant must govern each case.

Ventilation Is Important

Reference has been made to ventilation, which is a point to be clearly emphasized by means of exhausters of suitable design and centrifugal or screen type dust arresters. The former type of arresters is adapted to plants where it is desired to prevent diffusion of dust in the room where the equipment is located, and where it would not be objectionable to discharge a small amount into the atmosphere. With the latter type the dust is entirely suppressed and purified air returned to the room from which it was drawn instead of discharging into the atmosphere. This is a decided advantage and economy in the winter, as the necessity of continually warming incoming cold air is avoided.

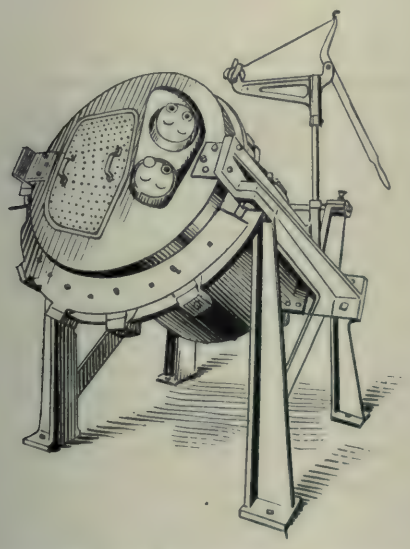


Fig. 5—Tilted Type of Sand Blast Tumbling Mill

The Question of Sand

The grades of sand best suited for the different types of machines and character of work to be cleaned is a vital question. Here again the size of the foundry is a determining factor, and one which runs generally on small and medium-size castings and uses the smallest and simplest type of machine can use ordinary silica sand that has been washed perfectly free from dust and is perfectly dry. This is No. 1 grade. This is not the best sand to use, as being already a fine grain it is soon reduced to dust, but it is usually the easiest to obtain and costs so much less than the higher grades it is expedient for the small foundry to use it. The amount of dust which the fine sand creates would be a serious matter in a large plant, while it would not be very objectionable in a small one where the sand blast is only run two or three hours a day.

For the sand-blast room and the sand-blast tumbling mill, a grade of sand illustrated at the head of the article and designated A is recommended. This grade is about as large as can be handled satisfactorily by an exhaust system. It is sharp to begin with and does not require to be used and split up into small particles in order to get the maximum cutting effect. We have heard the contention made that the sharpness of the sand has nothing to do with the cleaning effect, that it is the force with which it hits the casting that does the work. This sounds about as reasonable as saying a dull razor will cut as well as a sharp one. The most desirable sand is that which does the work the best and in the shortest time, and which creates the smallest amount of dust.

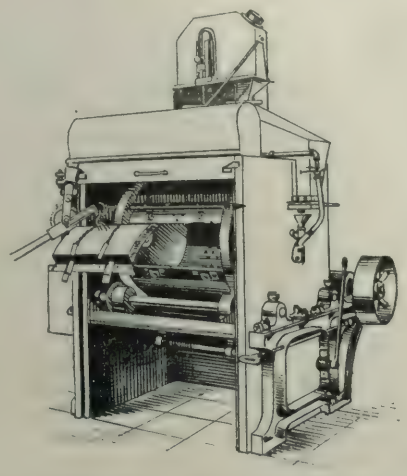


Fig. 6—Horizontal Type of Barrel Sand Blast

The cuts of sand used as illustrations are from photographs made by the writer. The sand A is abrasive material from Ohio, and it is shown as new material, and after being used for a day the difference in the appearance of the grains will show how they are reduced in diameter with use. Ocean sand, really smooth pebbles that have been worn down by the action of the waves, is better after it has been used for a short time, because it is split into smaller particles after it goes through the machine the first time and the sharp edges increase the cutting speed. For foundries located at interior points, a long way from seaboard, the freight alone on ocean sand makes it rather expensive.

The adoption of the sand-blast has undoubtedly increased the cleaning room cost of the steel founder, but it has greatly improved his work, and the increased cost is more than compensated for in the saving in tool steel where castings are to be machined. Nothing is so injurious to machine tools as the burnt sand on steel castings, and in these days of high prices for tool steels almost any cost necessary to remove the burnt sand is warranted.

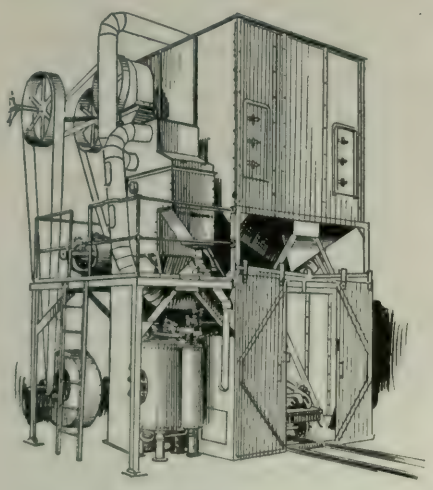


Fig. 7—The Sand Blast Room

Some Phases of American Sand Blasting

A Sand Manufacturer's Investigation Forms a Contribution to the Art—Uses Other Than for Cleaning Castings

IN a book just off the press, the United States Silica Co., Chicago, gives so much information bearing on the evolution of the art of sand blasting and its newer applications that more than ordinary comment is justified. The book was written to emphasize the merits of the sand the company manufactures for sand blasting and which it calls Flint Shot, obtained by disintegrating, washing and screening St. Peter's rock, the quarries being at Ottawa, Ill., and said to be the oldest conglomerate rock known to geology. The product consists of pure flint nodules, 95 per cent of which will pass over a 40-mesh screen, 24 per cent through a 30-mesh, and all through a 20-mesh screen. It is not only hard, but clean and round.

In its introductory to the uses of the sand in question the book states: "Sand blasting is employed for a great variety of purposes which may be roughly divided under three general headings:

Uses of Sand Blasting

Removing from castings the adhering core sand and molding sand.

Finishing metallic surfaces preparatory to painting, enameling, plating, rust-proofing, etc.

Removing mill or furnace scale from metal surfaces in order to save wear on cutting and finishing tools and forming dies"

To each of these uses a chapter is devoted. Flint Shot, it is stated, is successfully used in blowing out the cores from pipe or other tubular work and for cleaning out the deep cores in the cooling fins of steel or aluminum motor cylinders. As compared with pickling, the use of the flint sand is asserted to possess great advantages, while the wire brush, either when revolving or used by hand, is giving way to the newer process. Under the heading "Sand Blasting for Art Finish," it is stated: "The testimony from the whole automobile industry is that sand blasted bodies, whether they be made from sheet steel or aluminum sheets, also fenders and other metal parts, not only hold their enamel better, but also present a much more uniform and beautiful appearance." Emphasis is laid on the advantages resulting from sand blasting bars, especially those of chrome nickel steel prior to machining.

Reverting to castings, the anonymous author says: "It may be remarked that another angle in which sand blasting is proving of value to the purchasers of castings lies in the fact that sand blasting is in itself the most rigid 'inspector' that anybody could place on the job, as it reveals every imperfection in the casting as nothing else could."

After reviewing the various sand blast systems, attention is given to sand blast waste, in part as follows:

Utilizing Sand Blast Waste

"Unfortunately, no practical plan for reshipping and marketing sand blast waste has yet been worked out to get rid of any considerable tonnage to advantage. This is largely because the waste from different plants varies so widely in cleanness, coarseness, etc. But new cases are developing all the time and when this waste product can be used in the plant where it is accumulated, to replace products which would have to be purchased, there is a double gain. Here are some such uses:

1. As a parting in place of lycopodium, being shaken from a bag exactly the same as ordinary parting.
2. Mixed with dead core sand or gangway sand to form a very excellent core and for difficult work or very thin cores.
3. As core wash in place of silica dust bought for that purpose.
4. As a foundry facing. Of course it would not be suitable for facings of all kinds and the foundryman's judgment must come into play before taking any chances.
5. Mixed with clay for luting or sealing covers of annealing pots. Some customers report that they also use waste gangway and core in this mixture.
6. As an interlining between the brick flooring and the metal bottom of annealing and other furnaces. A layer 1½ in. thick of dry dust of this kind gives a cushioning effect to the brick which saves it from breakage under impact of heavy loads and also insulates the bottom of the furnace, greatly lengthening its life. The testimony of some customers is that this more than doubles the life of the brick flooring, one customer making changes under the new system twice a week instead of daily.

"It is quite likely, too, that this dust can be used as a mixture for making cement blocks, but as the particles of steel would lead to discoloration it would not be advisable to experiment with this except for underground purposes or where the color or the appearance of the finished block is of no consequence.

"Waste dust, when clean and white, can also be used by workmen to supplement soap in removing grease and dirt from their hands. It could not well be used as a permanent abrasive in soap as it would quickly discolor from the oxidation of the iron particles. The same objection would hold in using it in a plaster for exposed uses, though it might be used for a plaster where appearances do not count."

Recovering Blast Wastes

Under the heading: "Disposing of the Waste," it is explained that "Two principal methods of separation are employed; first, the centrifugal; second, the bolting or screening method. The centrifugal seems to be the simpler and in the main the freer from repair costs and is also less expensive in first installation. The bolting method uses in some cases wire screens and in others bolting cloth. The bolting cloth may be in the shape of long tubes in which the descending dust is met by an ascending column of air, the heavier particles falling to the bottom and the finer being blown out at the top into a receiver. Where metal screens are used the chief objection seems to be the short life of the metal owing to the abrasive quality of the dust.

"After the separation is accomplished means must be provided for carrying away the dust without its blowing all about the premises. Very good installations of this kind consist of overhead hoppers with tubular fabric spouts to carry the dust into closed wagons or cars. Another solution of the problem is by wetting the dust with a spray of water or jets of steam in order to coagulate and precipitate it before final disposition. Systems of this latter kind are recommended only where the importance of avoiding any dust whatever is sufficient to warrant the cost of maintenance. For instance, in residential neighborhoods, or where the character of the manufacturing work is such that the buildings themselves must be absolutely free from dust."

Unique Application in New Jersey

The sand blasting outfit of the Spicer Mfg. Co., South Plainfield, N. J., is thus described: "It consists of a battery of four Mott barrels, all of which deposit the heavy used sand in a trough running under the length of the series, the trough being fitted with a screw conveyor that carries the sand to an elevator which deposits it in storage tank above. The dust is carried off by an exhaust system that deposits it in a 30-in. galvanized steel down-spout outside of the building. This spout is fitted with a sprinkler system consisting of six ½-in. L-shaped spray nozzles extending outward and upward from a 2-in. center-pipe. A vat on the ground receives the dirty water, an overflow carrying the water to a drain, while the sludge is shoveled out from the bottom of the vat each evening."

In this plant the air is pre-heated before it enters the sand system, the reason being given as follows: "This is done in order to insure dry sand even in humid weather, as well as to enable them to load their sand blast barrels with wet forgings out of the curing yard, and to economize to the extent of about 25 per cent in

amount of air required of the compressor. The preheater requires a relatively very small amount of fuel or attention and eliminates all troubles due to moisture in the air or sand or on the forgings."

The book enumerates a large number of sand blast installations where work efficient beyond the ordinary has been accomplished, several of these installations being illustrated. The product of the United States Silica Co., flint shot, is not a sharp sand, but is composed of rounded flint granules, having no sharp angles or lines of cleavage. The company admits the long-standing insistence of sharp sand, but asserts that successful sand blasting depends upon the impact of the sand grains, not on their sharpness; that sharp sand has a pronounced tendency to split and splinter itself into useless dust.

CROMWELL STEEL CO.

Max McMurray President—Other Officers of the Forging and Rolling Mill Company

A reorganization of the Cromwell Steel Co., Cleveland, involving important changes, was made at a meeting held Sept. 13. This company recently placed its new steel works in Lorain, Ohio, in partial operation. The reorganization means the addition of important



MAX McMURRAY
President Cromwell Steel Co., Cleveland

new interests to the company and the securing of additional capital for carrying out the company's building program.

Max McMurray, who has been general manager of the blast furnaces of M. A. Hanna & Co. since 1904, was elected president, succeeding J. C. Cromwell. Mr. Cromwell will take an active interest in the company as soon as he recovers his health, which has not been good recently, and is scheduled to become one of the two vice-presidents. W. D. Batsholts, Paris, France, continues as vice-president. In addition to Mr. McMurray, two other Cleveland men, prominently identified by the iron and steel industry, have become associated with the company. These are Robert L. Ireland, who recently retired from the M. A. Hanna & Co., of which he was a member, and George H. Beaumont, of Pickands, Mather & Co., both of whom are on the new directorate. Other directors are J. C. Cromwell, E. S. Griffiths, president of the Cleveland Machine & Mfg. Co. and W. H, Purcell, president of the Alliance Machine Co., Alliance, Ohio, who were associated with the company before the reorganization, A. C. Ryan, who continues as general manager, Parmely W. Herrick, and George P. Steele of the First National Bank, Cleveland. Mr. Steele was elected treasurer, and G. L. Jones, secretary. The capital stock of the company will be increased from $2,000,000 to $3,500,000.

The Cromwell Steel Co. was organized a year ago by J. C. Cromwell, E. S. Griffiths and others, and late last year commenced the erection of a steel plant to make light and heavy forgings to be used largely in the automobile field. The plant is located on a site of 233 acres on the river bank in Lorain opposite the plant of the National Tube Co. The company plans ultimately to erect blast furnaces on the river bank where Lake vessels could unload directly to the plant. The plant now being built and partially completed includes four 75-ton open-hearth furnaces with ample provision for 10 additional furnaces. Two furnaces are now in operation and the ingots are being sold on the market until the finishing department is completed. The finishing equipment will include a hammer, taking the place of the blooming mill for breaking down the billets, and a 30-in. bar mill. The plant will have a capacity of 700 tons daily of forging steel. The new company has not yet worked out any plans for further extensions.

Mr. McMurray and the new directors at once took up their duties with the company. Mr. McMurray, who was born in Toronto, Canada, became associated with the Illinois Steel Co., at the South Works in 1890, became assistant superintendent of the Joliet Works in 1896, and in 1900 was appointed general superintendent of the Newburgh Works of the American Steel & Wire. Co., Cleveland, where he remained until 1904, when he became associated with M. A. Hanna & Co. He was also general manager of the United Iron & Steel Co., the Detroit Iron & Steel Co., the Penn Iron & Coal Co., all Hanna interests. He is a member of the American Institute of Mining Engineers, and of the American Iron and Steel Institute.

Renewed Activity at Ojibway

TORONTO, ONT., Sept. 17.—Plans for the erection of the United States Steel Corporation's plant at Ojibway, Ont., to cost $20,000,000, will now be carried forward, according to a statement made by Ward B. Perley, vice-president and general manager of the Canadian Steel Corporation, the Canadian subsidiary of the United States Steel Corporation. The Canadian company was incorporated about three years ago, a tract of land on the St. Clair River, north of Windsor, Ont., was purchased, a separate municipality was established and streets were laid out for an ideal town, such as the United States Steel Corporation has at its American plants. Then the war put a temporary stop to construction. The recent call for bids for the construction of a slip and huge concrete and steel docks for the Canadian company was the sign for the renewal of construction, and further plans for construction will now be proceeded with. The plant is well situated, being on the direct water route from the Lake Superior iron mines to the ocean. Hydroelectric power will be available from Niagara Falls. The operations will include blast furnaces and mills for the manufacture of wire, rails, bars and other steel products.

The Resistal reinforced safety glass is to be used in lenses for gas masks and aviators' goggles, approximately 360,000 pairs having been contracted for by the United States Government. The Strong, Kennard & Nutt Co., Cleveland, control the use of the glass for optical and other purposes, and has an exhibit at the safety exposition at the Grand Central Palace, New York, this week.

The Booth Felt Co., manufacturer of mechanical felts, including washers, gaskets, etc., has removed its Chicago plant and offices from 116 South Fifth Avenue, to 732 Sherman Street, corner of Polk Street, where it has greatly increased space in a daylight factory for manufacturing purposes.

A Simple System of Foundry Accounting

Continuous Record of Progress of Orders, Allowing Quick Replies to Customers' Inquiries and Eliminating Weighing Delays on Shipment

BY RODNEY DERBY

CONSTANTLY narrowing margins of profit on castings have forced foundries to devote more and more attention to methods of accounting. An example of this movement is the several years' committee investigations of the American Foundrymen's Association. A well known firm of accountants has been engaged as advisory counsel to direct the investigation and formulate a method of accounting which can be adopted with modifications to various foundries.

As foundry accounting is the topic of the hour, the system outlined herewith may prove of interest. In general it is simple, easily understood and can readily be modified to suit the average foundry, whether engaged in jobbing or in manufacturing their own castings exclusively. The dominant idea has been to eliminate red tape and yet record in quickly available form pertinent facts in regard to costs, progress of orders and the usual foundry routine.

There are four fundamental features that should appeal to the average foundryman.

1. Complete information at hand at all times to answer inquiries from customers or departments relating to the progress of casting orders and shipments. This feature eliminates the usual "I'll look it up and let you know" method of answering.

2. A follow-up system provided with a daily check on the progress record of casting orders, such as number of good castings, or defective castings, castings shipped, ready to ship, or balance to be made.

3. Labor distribution sheets whose extended totals check with the weekly payroll. These same sheets are virtually a journal of daily production and can be used in many ways to ascertain routine data.

4. A system of weighing and recording weights that distributes the work equally throughout the day for the shipping clerks, thus doing away with rush weighing at the shipping period and the consequent chances of error.

Under many systems castings are weighed when shipped, which usually results in the congestion of several trucks at the shipping doors and causes unfavorable comments from customers who follow closely their trucking costs. With the system described the castings are snagged, sorted, weighed and stored in bins until the arrival of a customer's truck. They are then quickly transferred from the bins to the truck with a check on the count to agree with the shipping tickets.

The accompanying illustrations show five forms of records for compiling the data outlined. Form 1 is a loose leaf daily production sheet kept in the main office for a record of the so-called productive or direct skilled labor charges, castings molded and data pertaining thereto.

Form 2 is a sheet that serves a similar purpose for the record of the direct and indirect unskilled labor charges.

Form 3 is a permanent record card which is made out for each pattern number. The items on both production sheets according to order numbers—with the exception of the weights and the nonproductive labor—are posted to this card. The cards are filed in the main office.

Form 4 is a card with squares numbered from 1 to 9, representing the number of hours opposite the various classifications of unskilled labor. The time of the unskilled labor is recorded by punching a card for each workman. These cards are posted to sheet form 2 and the overhead labor charges can be deduced from this sheet. The combined extended labor totals of sheets 1 and 2 check with the weekly payroll.

Form 5 is a progress card filed on each molders' floor and is the source of supply for the records of molders' time and number of castings made on sheets form 1 and the shipping data on card form 3.

When an order is received, card form 3 is made out. The back of this card can be ruled suitably for billing, shipping and mail address information. The order number, B X L 468, is given to the order. B X is the code that denotes the customer's name, and 468 is the rotation number of the foundry production order series L. The tabs of the index bear the code numbers, and cards are filed in numerical rotation behind their respective tabs.

Card form 5 is made out and goes to the molder, with the pattern, to denote the number of castings to be made. When production starts this card is returned to the office after the first day's work and a new card is made out for the remainder of the order. This second card goes through the same routine. The first card then goes to the shipper, who finds the castings, weighs them, and records the weights on the card. The good ones are placed in the customer's bin and the bad ones returned to the cupola. This card then goes to the office if there are defective castings, and to the shippers' file if all are good. Yellow replacement cards are made out in the office for all defective castings; these cards are ruled like form 5.

When proceeding with shipping, each customer's cards for castings weighed and stored in bins are taken from the shippers' file and shipping tickets are made out from the records thereon. As the castings are transferred from bin to truck a count is made to check with the ticket record. A copy of this ticket with the cards that belong to it goes to the office. As the weights and number of castings classified by patterns appear in total form on the shipping ticket, they are posted from the ticket to card form 3.

When an inquiry comes over the 'phone, or otherwise, as to the status of production on any pattern, the office clerk can readily select the right card form 3 by means of the order number and pattern number. An addition and subtraction of the items will show how many castings have been made and how many have been shipped. 'Phone inquiries can therefore be answered immediately.

By going over these cards at regular intervals each week production and shipping can be closely followed. If production or shipping lag on any one pattern or series, the age of the dates will quickly

Foundry Daily Production Record

Distribution Sheet for Molders Time

Date

ORDER NO. Shop	ORDER NO. Pattern	DESCRIPTION	Pieces Prod.	Good	Bad	Cause of Loss	Charges	MOLDER Name	MOLDER No.	WAGES Hours	WAGES Rate	WAGES Amount	WEIGHTS Good	WEIGHTS Bad
BXL468	F36	Cover Plate	30	22	8	2B-2E-4R		Jones	64	9		4 00	330	120

(1)

Distribution Sheet for Unskilled Labor

Date

Foundry Order No.	Workmans Number	Molding	Cores	Snagging	Flasks	Melting	Yard	Shop	Prod.	Non Prod.	Total
NDL 469	106	60		60			1 50		60	2 10	2 70

(2)

300 Cover Plate Castings Patt. No. F36 ORDER No. BXL 468

Date Cast	9/3	9/4	9/6	9/7	9/8	9/9	9/10	9/11	9/13	9/14	9/15					
No. pcs. made	30	30	30	30	30	30	30	30	30	30	24					324
" " defect.	8	5	3	3	2		1		2							24
Date shipped	9/10	9/11														
No. pcs. shipped	150	150														
Weight	2256	2259														4515
Molder No.	64	64	64	64	64	64	64	64	64	64	64					
Labor	4 00	4 00	4 00	4 00	4 00	4 00	4 00	4 00	4 00	4 00	3 20					43 20
Helper No.																
Labor																
Coremaker No.																
Labor																
Snagger No.																
Labor																

(3)

MAN No. 106	ORDER No. NDL469									DATE Sept 3,17
CORES	1	2	3	4	5	6	7	8	9	½	
MOLDING	1	2	3	4	5	6	7	8	9	½	60
MELTING	1	2	3	4	5	6	7	8	9	½	
YARD	1	2	3	4	5	6	7	8	9	½	$1.50
SHOP	1	2	3	4	5	6	7	8	9	½	
SNAGGING	1	2	3	4	5	6	7	8	9	½	.60

(4)

Floor No. 12 / Man No. 26	Order No. BXL 468	Defect. 120 lb. 2B-2E-4R	Date Rec'd Sept. 2, 1917
Pattern No. F36	No. of Pcs. Ord. 300 / " " " Made 30 / " " " Good 22	Good-Weight 330	Date Cast Sept 3, 1917
Description Cover Plates. (5)			Date Wanted Sept. 20, 1917
			Date Shipped Sept 10, 1917

PUNCH TIME BELOW

1		2		3		4		5		6	
7		8		8	$14.00	¼		½		¾	

A Few Forms Give Continuous Record of the State of the Foundry Order and Direct and Indirect Labor Costs

show it. Tracers in the form of lists of delinquent order and pattern numbers can be made out for the foreman and shipper, who must report reasons for delay.

As sheets 1 and 2 are virtually a daily journal of each employee's work during the day, a daily study of these sheets and a comparison with previous sheets will give information that should enable the management to keep production in the right proportion to the payroll. The "day's work put up" by each molder and his percentage of defectives can be so closely followed that his worth can be readily determined. Likewise the daily averages of casting tonnage, defectives, direct and indirect labor costs per ton can be ascertained from the totals.

It will also be found that the groupings and totals of labor, weights, etc., will be in convenient form to use as a basis in determining overhead expenses, melted metal costs, etc., and will readily dovetail into established systems. It is not the intention to cover in this article these subjects in detail, as they are worthy of an article by themselves.

The system as outlined is something that should prove valuable to the average foundry to answer inquiries promptly, to group labor costs, to ascertain daily tonnage of good and defective castings, as well as serve as a guide and follow-up on the progress of production and shipping.

To Manufacture Chucks in Chicago

The Nielsen-Barton Chuck Co., Chicago, has been formed to manufacture the Eclipse roller-bearing drill chuck, formerly manufactured by the Eclipse Machine Co., Elmira, N. Y., the new company having purchased the patent rights, jigs, fixtures and machinery with which the chucks have been manufactured. A shop at 106 South Jefferson Street, Chicago, is now engaged on a lot of 2000 chucks, and it is expected that deliveries will begin in 30 days. The chucks will be marketed by the H. E. Barton Tool Co., 106 Jefferson Street, Chicago, which also represents makers of twist drills, reamers, cutters, taps and dies, hack-saw blades, files and high-speed tools.

The Eclipse chuck is of the self-closing type and has been made about five years. It can be tightened sufficiently with the thumb and forefinger to start drilling, after which it automatically grips the drill. Keys or spanner wrenches are unnecessary.

May Exceed 40,000 Aviation Engines

Large Plans of the Government—Creation of an American Motor Standardized and of Minimum Weight

WASHINGTON, Sept. 18.—The Liberty motor, a standardized, minimum weight, high-powered aviation engine, work on which was begun at the Bureau of Standards early in June, is pronounced a complete success in an official statement promulgated by the Secretary of War. It is the lightest engine per horse power ever constructed for airplanes, and will be the main reliance of the United States in the rapid production in large numbers of high-powered battle planes for service in the war. The entire producing capacity of the United States for engines of this type will now be concentrated upon the manufacture of this engine with the object of equipping as many as possible of the 22,000 airplanes embraced in the aviation program. As it is expected that the great majority of these planes will be supplied with the new motor and as in service two engines will probably be required for each plane, the output of the Liberty motor during the coming year may exceed 40,000 complete engines.

The new motor represents the best features of all the airship engines heretofore produced in this or any other country. Light weight and great power having been achieved early in the designing of this motor, perfect standardization was the next object aimed at. Cylinders, pistons and every other part of the motor have been most accurately standardized so that they can be produced rapidly and economically by a great many factories operating under Government contracts. They may be as rapidly assembled either by these plants or at a central assembling plant.

Standardization and Pooling of Secrets

The standardization of parts materially simplifies the problem of repair and maintenance. Spare parts will be promptly available at all times. Even the cylinders are designed separately. It is possible to build the new engine with four models ranging from 4 to 12 cylinders and the standardization plan makes possible an 8-cylinder or a 12-cylinder model by merely assembling the necessary cylinders, pistons, valves, cam shafts, etc. So carefully has the scheme of standardization been worked out that parts of wrecked 8-cylinder or 12-cylinder engines will be interchangeable and a new engine may be readily assembled from parts of machines that have been put out of action. This feature will make the matter of repairs back of the lines comparatively simple.

In a formal statement given out here the Secretary of War states that he regards the invention and rapid development of this engine as one of the really big accomplishments of the United States since its entry into the war. More than a score of engineers pooled their skill and many important trade secrets in the development of this design, working with the encouragement of the Aircraft Production Board, of the War Department and of the Bureau of Standards.

"The story of the production of this engine is a remarkable one," says Secretary Baker. "One of the first problems which confronted the War Department and the Aircraft Production Board after the declaration of hostilities was to produce quickly a dependable aviation motor. Two courses were open. One was to encourage manufacturers to develop their own types; the other to bring the best of all types together and develop a standard. The necessity for speed and quantity of production resulted in a choice of the latter course and a standard motor became our engineering objective.

Creative Work Under Pressure

"Two of the best engineers in the country, who had never before seen each other, were brought together at Washington and the problem of producing an all-American engine at the earliest possible moment was presented to them. Their first conference on June 3 lasted from afternoon until 2:30 in the morning. These two engineers were figuratively locked in a room in a Washington hotel and charged with the development of an airplane motor for use by American aviators over the battlefields of Europe. For five days neither man left the suite of rooms engaged for them. Consulting engineers and draftsmen from various sections of the country were brought to Washington to assist them. The work in the drafting room proceeded continuously, day and night. Each of the two engineers in immediate charge of motor development alternately worked a 24-hour shift.

"An inspiring feature of this work was the aid rendered by consulting engineers and motor manufacturers who gave up their trade secrets under the emergency of war needs. Realizing that the new design would be a Government design and no firm or individual would reap selfish benefit because of its making, the motor manufacturers, nevertheless, patriotically revealed their trade secrets and made available trade processes of great commercial value. These industries have also contributed the services of approximately 200 of their best draftsmen.

"The two engineers locked together in a hotel room in this city promised the Government if given an opportunity, they would design a satisfactory engine before a working model could be brought from Europe. A remarkable American engine was actually produced three weeks before any model could have been brought from Europe. It was promised that this engine would be developed before the Fourth of July. Twenty-eight days after the drawings were started the new engine was set up. This was on July 3. In order to have the engine in Washington and in actual running order at the Nation's capital on Independence Day the perfected engine was sent from a Western city in a special express car. The journey was made in 21 hours and four young men guarded the engine en route to Washington and personally attended to its transfer from one railroad to another.

Engine Parts from Twelve Plants

"With the need for speed as an incentive tools for building the first engine were made even before the drawings were finished—on the assumption that they would be correct. Parts of the first engine were turned out at 12 different factories, located all the way from Connecticut to California. When the parts were assembled the adjustment was perfect and the performance of the engine wonderfully gratifying. This in itself demonstrates the capabilities of American factories when put to the test and when thoroughly organized for emergency work of this sort.

"One of the chief rules outlined at the beginning of the designing work was that no engineer should be permitted to introduce construction which had not been tried out. There was no time for theorizing. The new engine is successful because it embodies the best thought of engineering experience to date. Not only did this country furnish ideas through celebrated consulting engineers, but the representatives in the United States of England, France and Italy co-operated in the development of this motor.

"Thirty days after the assembling of the first engine preliminary tests justified the Government in formally accepting the engine as the best aircraft engine produced in any country. The final tests confirmed our faith in the new motor in every degree. Both the flying and altitude tests of the new motor have been gratifying. One test was conducted at Pike's Peak, where the United States aviation engine performed satisfactorily at this high altitude. One of the engines, in an airplane, broke the American altitude record in a recent flying test.

"The standardized United States aviation engine, produced under Government supervision, is expected to solve the problem of building high-class, powerful and yet comparatively delicate aviation engines by American machine methods—the same standardized methods which revolutionized the automobile industry in this country. With the completion of final tests of the motor—tests which satisfied and gratified both expert engineers and army officers—progress already has been made toward organizing industry for the manufacture of the new machines and deliveries will begin within a comparatively short time."

The formal adoption of the Liberty motor by the Aircraft Production Board does not mean that there will be no change in it during the war. There will be continuous experimentation as new types and improvements develop at the front and new ideas are born of the war emergency. If the engine can be improved it will be improved, but as the motor stands today it is a notable success. Construction of the new standard engine will not interfere with the manufacture of other serviceable models, either European or American, which existing plants are already turning out. The production of the Liberty motor will be carried on almost entirely in a new and expanding industrial field.

In explanation of the fact that the United States has not adopted one of the successful British or French high-powered airplanes and engines, the War Department states that they are not as a rule adapted to American manufacturing methods, being highly specialized and requiring much hand work from specially skilled mechanics with long experience. Not less than a year would be required to perfect organizations capable of turning out such highly specialized machines.

W. L. C.

Developing Japan's Iron Industry

Japan's output of iron ore is not sufficient to meet the demands of that country's iron and steel industry, according to a series of articles in the *Financial and Economic Review*, a Japanese paper, by Dr. Jisaburo Yokobori. At present large quantities of iron ore come from Korea, Manchuria and China; indeed, the Tayeh mine in the Hupeh Province, China, supplies more than half the quantity required at the Government foundry at Wakamatsu, and the Oriental Iron Foundry Company, recently organized by Japanese business men, will get the materials from the Tao Chung mine in the Anhwei Province, China, the quality of which is even superior to that of the ore that is obtained from the Tayeh mine. Before the outbreak of the war freight rates between Korea and Wakamatsu ranged from 2 to 3 yen (96c. to $1.44) per ton of ore, and those between the Yangtse River and Wakamatsu averaged nearly 3 yen. Two tons of ore and seven yen (about $3.36) worth of coke are necessary to produce one ton of pig iron, which sells for 20 yen (over $9.75) in ordinary times. When imported materials are used the cost of production, excluding the price of ore and refining expenses, is 12 to 13 yen (more than $5.76 to $6.24) per ton of pig iron. The Government foundry at Wakamatsu, however, is getting the product of the Tayeh mine on comparatively easy terms, because of its connection with the Tayehping Iron and Coal Co., which owns the mine.

Dr. Yokobori next considers the supply of coal, of which Japan produces enough in Kyushu and Hokkaido. There is every prospect of increasing the output from the collieries in the north of Kyushu, while it might be said of the coal industry in Hokkaido that it is just beginning. He is very hopeful of the future of Hokkaido as an iron manufacturing district.

The Whiting Foundry Equipment Company, Harvey, Ill., has issued a series of bulletins of a patriotic character which are attracting much attention. One of them is in the cause of food conservation, giving the recommendations made by Food Administrator Hoover, and the other, looking forward to the next Liberty loan, urges the saving of money to invest in the second issue to help win the war.

INDUSTRIAL EXEMPTIONS

Several Thousand Claims Pending for Munitions Workers and Others

WASHINGTON, Sept. 18.—The situation with respect to the drafting of skilled workers, especially those employed in munitions factories, is becoming acute. Several thousand claims for army exemption on the ground that the claimant is indispensable to a war industry have been received by the office of Provost Marshal General Crowder for reference to the President, who is the appellate judge in such cases. Preliminary examination is being made by General Crowder on whose final recommendation the President probably will act, as it is obviously impossible for him personally to examine every case. The Provost Marshal General has decided that no personal hearings will be granted by his office and notice has been promulgated that it will avail claimants nothing to employ attorneys or other agents to press their pleas.

According to information received here from Bridgeport, Conn., the factories of that city, which are very largely engaged in the production of war material, will lose an average of 23 per cent of their skilled workmen by the draft. These figures have been carefully prepared by the State Council of Defense and have been officially forwarded to Washington. Some of the more important plants, it is said, will lose as high as 50 per cent of the men, while the lowest percentage is 6. A large number of appeals from the draft on industrial grounds have been carried to the district appeal board but so far only one full exemption, presumably covering entire factory, has been made. In about three-fourths of the cases the appeals were denied. Provost Marshal General Crowder has sent the following telegram to the Governors of all states:

Please communicate to all local and district boards and give the widest possible newspaper publicity to the following:

1. By the regulations of the President governing appeals from the action of district boards the claim of appeal must be filed with the district board and cannot be received if sent direct to the President, the Provost Marshal General, members of Congress, or to any other place than to the district board itself.

2. Papers, evidence and affidavits not considered by the district board cannot be considered on appeal from the district board.

3. The only cases in which there is an appeal to the President are cases in which a claim for discharge on the ground of engagement in agriculture or industry has been made in the district board. There is no appeal to the President from the action of the local board in dependency or other cases whose determination is within the jurisdiction of the local board.

4. All attempts to appeal cases other than those involving the decision of the district board on agricultural or industrial exemptions from whatever source received; all affidavits, letters, arguments, evidence, papers, or other matter not considered by the district board; all appeals made to the President direct or sent to any other official or person in Washington, will have to be returned to the sender.

Inasmuch as the rulings of the President are made upon the recommendations of the Provost Marshal General's office based upon the papers accompanying appeals, industrial managers desiring to secure exemptions for indispensable men should exercise great care in preparing their affidavits to render them strong and conclusive. The fact should be borne in mind that mere employment in an establishment engaged in producing war material for the Government is not a sufficient basis for exemption. Indispensability is the sole criterion recognized by the authorities here. A fair working rule for such exemptions is the fact that the place of an employee whose exemption is asked cannot be filled without devoting a substantial amount of time to the training of a substitute, pending which Government work will suffer more or less delay. W. L. C.

The John Illingworth Steel Co., whose plant and main office are at Frankford, Philadelphia, has opened a branch office in the Astor House Building, 217 Broadway, New York, for the sale of its products, which are chiefly cold rolled and cold drawn shapes and bevels.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

Owned by the United Publishers Corporation, 243 West 39th Street, New York. H. M. Swetland, *Pres.* Chas. G. Phillips, *Vice-Pres.* W. H. Taylor, *Treas.* A. C. Pearson, *Secy.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: Equitable Building. Philadelphia: Real Estate Trust Building. Cleveland: Guardian Building. Cincinnati: Mercantile Library Building.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

Bonds, Taxes and Prices

The principle the Government is endeavoring to observe in floating bonds, imposing taxes and regulating prices is that there is a delicate balance among these three things so that for the best results certain proportions should exist. The floating of large bond issues tends to produce inflation, and while some inflation is necessary there should not be too much. The imposing of taxes tends to restrict inflation and thus while taxes are necessary they are also economically sound. The regulation of prices may be essential, in certain directions, not simply to prevent the Government paying too much for what it buys, but also for the purpose of protecting buyers and distributing or allotting the ability to pay taxes.

These principles are well recognized, as to conditions that may exist during the war, but the immediate problem is so important that no corresponding amount of attention has been given to conditions after the war. It would be a fine thing if it were possible so to arrange affairs as to loans, taxes and price regulation that the transition from war conditions to peace conditions would create a minimum of disturbance. At the end of the war the Government presumably will cease borrowing. The construction of merchant ships will necessarily continue, but there would be something radically wrong with the situation were it to appear desirable for the Government itself to continue to build ships. The war taxes now being formulated by Congress will cease with the war and a new program of taxation will then have to be adopted. That will cause a disturbance in the balance. Government price regulation will also cease, creating another influence. Prices that are made in the open market will be subject to their own influences. Some prices will tend to fall, while it is quite conceivable that others will tend to rise, by reason of the changes in relation between demand and supply caused by the transition from war to peace conditions.

Keener sighted business men have lately been thinking more of trade conditions after the war and less of trade conditions during the war. There has been a distinct change of interest. It is human nature to desire to cling to "war profits," and it is hardly worth while to criticise human nature, but it is coming to be realized that war profits are not all that lie before American business men. All precedents teach that business is good after a war, and all comparisons of the present war with those of the past indicate that the principle is even more applicable in this case than in others.

Considering bonds, taxes and prices during and after the war, it seems fair to maintain, with regard to bonds, that if a reasonable degree of inflation is desirable during the war, to promote the flotation of bonds, a sort of wholesome inflation, then a similar condition after the war, in moderation, is not necessarily undesirable. Without something of this sort there cannot be the expansion that is to be desired. Inflation toward the close of a period of great trade activity has always brought undesirable results, but there is a distinction. Such inflation occurs because men do not see the end of the period, whereas no one assumes that the present war will be of indefinite duration. If such a view were entertained it would prevent the inflation.

With respect to taxes, it would undoubtedly be an error to assume that at the end of the war there will be opportunity for a great reduction. While it is impossible at this time to forecast the annual amount that will be raised by taxation and the quantity of bonds that will be issued, less the amount upon which our Allies will pay the interest, it is certain that the interest will be a very considerable part of the tax levy. Congress has not determined finally what the rates of taxation will be, and beyond that the Congressional "estimates" of what one tax rate or another will produce are largely guesswork. If bonds are issued at intervals up to the close of the war, the full interest charge will not begin until that time. If, for illustration, the bond rate is 4 per cent and the taxes represent 12 per cent of our cost of the war then, roughly speaking, a reduction of two-thirds in the rate of taxation after the war would leave the Government with only sufficient revenue to pay the interest. There would be nothing left for retiring the bonds. If a reduction of only one-third were made the contributions to sinking fund would not be very large. The remaining cost of the war would be spread over a long period. It is true that a part of our war expenditures consists in the building of merchant ships, representing the investment

of capital which will earn some money, but the investment will be on a competitive basis with the rest of the world's merchant marine and may earn no large sum over a period of years.

With respect to prices, by far the best thing that could occur would be for such a scale of prices to be developed during the war that business could adopt it without hesitation after the war. When prices in our markets rose some time after the European war started, the view was promptly adopted that when the war ended there would be a period of depression, to allow for a general and drastic price realignment. That may still be necessary; but everything that can be done to forestall the necessity, to reduce the extent of the readjustment required, will prove to be a positive and valuable asset. The delicate relations that exist between bonds, taxes and prices should be considered not as a feature alone of the war time but as a feature also of the peace time that is to follow.

The Highest Trade Balance

It is quite clear that the fiscal year 1917 precisely marked the high point in our favorable balance in the foreign trade. There was an almost unbroken rise in the monthly trade balance until January, 1917, while thereafter there were some declines, and a scrutiny of the monthly balances shows that the best period of twelve consecutive months fell upon the fiscal year 1917. The preliminary figures for July show a very great decrease from the July a year earlier. The favorable merchandise trade balances in calendar and fiscal years are shown below:

	Favorable Balances	
	Calendar	Fiscal
1912	$581,084,638	$551,057,475
1913	691,421,812	652,875,915
1914	324,348,049	470,653,491
1915	1,776,074,152	1,094,419,600
1916	3,089,769,254	2,135,599,375
1917	.....	3,634,450,905

The trends in our foreign trade have been simple, the figures telling a plain and succinct tale. Exports increased to a maximum of $613,555,693 in January of this year, in which month there was the record favorable balance of $371,848,411. Imports, which had previously been increasing, continued to increase after January, reaching the record high of $306,622,939 in June, while exports decreased, though by a less amount than that by which imports increased, and the June favorable balance was only $268,587,110. This was, however, a larger balance than had been shown for any month prior to July, 1916, and the total for the twelvemonth ending last June was, as noted above, the largest shown for any consecutive twelve months. The record could only be broken by the balances running heavier in succeeding months.

July, however, has shown nothing of the sort, the trade balance dropping to $148,000,000, produced by $226,000,000 of imports and $374,000,000 of exports. Comparing June and July, imports decreased 26 per cent, exports 35 per cent and the trade balance 55 per cent.

The restriction upon exports involved in the successive embargoes should not in themselves produce a decrease in the value of merchandise exported. Our transatlantic Allies are relatively near at hand and in so far as the embargo operates to divert shipping to this trade the volume and value should increase rather than decrease. By the same token our imports should decrease as our Allies have less goods to send us than have neutral countries from which shipping may be diverted.

There are, however, two factors of much greater importance—the general decrease in merchant shipping, a not inconsequential item, and the more important factor that our Government takes a great deal of shipping for the transport of troops and of supplies to France. Merchandise thus taken out of the country will not, of course, appear as exports. The British Board of Trade has never included such movement in its returns and there is no reason why this country should compile its statistics in different form. While this seems to be perfectly obvious it may be remarked that some complications will eventually arise. For instance, we are building a railroad in France and we shall hardly take the material back after the war, and if the Government effects sales, after the war, some place may have to be made in the statistics for the transactions.

While our exports promise to be smaller in future than during the fiscal year just ended it is reasonably certain that they will continue very large, for the billions of dollars loaned by the Government to our Allies must result in merchandise exports. Thus with these and some other exports, and with necessarily reduced imports, the trade balances are bound to be large compared with all records prior to the last twelve or eighteen months.

A War Lesson for Industry

The announcement by Major-General Gorgas of the selection of nineteen cities as tentative sites of "reconstruction hospitals" for the work of rehabilitating wounded soldiers for private life calls attention to the splendid work now being accomplished by Belgium, France, England and Canada. One of the essentials of this work is the establishment in connection with the hospitals of professional schools of the technical and trade types for the training of maimed and crippled soldiers in new trades, so that they may become productive assets of society and self-respecting citizens.

This is a magnificent and fruitful service. It should not stop with work merely among crippled soldiers. A great duty that both Government and public have too long neglected is the establishment of hospitals and training schools to save the thousands crippled each year in industry from the disgrace of inactivity and dependence upon the bounty of others for the rest of their lives, and to enable them to continue to contribute to the national welfare. Results already achieved abroad demonstrate beyond question that the nation can be spared the burden of thousands of unproductive citizens by intelligent collaboration of surgeon and educator. Such schools result not only in the complete or partial removal of dependency but also, and equally important, in a complete change of mental attitude and a restoration of happiness, confidence and initiative to the crippled man.

The employment of surgical and orthopaedic skill to help men to overcome the obstacle of lost or immobile limbs or the loss of one of the sense organs,

supplemented by trade re-education, is not primarily a development of this war. The great schools for disabled soldiers and sailors at Rouen, Lyons, Montpellier and other places in France, and the Belgian schools at Le Havre and Vernon have been established under the direction of Belgians who learned the needs and methods of such institutions at the famous Labor College of Charleroi, founded some years before the war to teach disabled laborers new trades. The province of Hainault, Belgium, in which Charleroi is situated, is comparable in the character of its industries with our Pittsburgh district, as it was the center of great metal working and coal mining industries. By 1914 similar schools had been founded in Brussels and Tournai. The school at Charleroi at the end of 1914 had 1500 pupils. Two of the most perfect schools now operating in France are at Lyons and were founded by M. Baseque, a Belgian refugee and formerly professor at Charleroi. At L'Hopital Anglo-Belge, Rouen, and its annexes at Orval and Saint-Aubin lez Elboeuf, a great work is going on in charge of Dr. Armand Deltenre, director of the Belgian Army Medical Service.

Surely the lesson of these institutions will not be lost on American industry. Prof. Jules Amar, director of the Laboratoire des Recherches sur le Travail Professionel, Paris, is authority for the statement that 80 per cent of maimed or mutilated men are re-educable. Of these, 45 per cent can be fitted to earn normal salaries, on condition that at least 10 per cent specialize within the limits of their former trades; another 20 per cent will attain an appreciable output but may not arrive at full working capacity; the remaining 15 per cent will have to practice subordinate trades as their re-education will be fragmentary. It is fair to assume that the disabling effects of injuries received in industry do not vary greatly from the effects of war wounds. The figures of Professor Amar are sufficiently promising to warrant as strong a public interest in the rehabilitation of injured workmen as in that of injured soldiers. Manufacturers appreciate the growing burden of the cost of compensation for injuries but only the litte group carrying on our organized charities appreciates the tremendous cost of enforced idleness or the mental suffering of those unfortunate enough to have to eke out a pension by taking up the secondary posts that industry and society have to offer the maimed citizen.

The urgency of this work has not been recognized. If the projected Government institutions are actually established, we shall have object lessons in our own land worthy of study by every taxpayer and public-spirited citizen. It is to be hoped that the work initiated for wounded soldiers will set an example that will endure as a part of our municipal, State and national program.

Rapid Progress of the Safety Movement

The sixth annual safety congress of the National Safety Council, held in New York last week, with its large attendance, its strong papers and its able discussions by wide-awake, progressive men, furnished impressive evidence of the growth of the safety movement in this country in the past few years. One of the most gratifying features of recent progress is the action of the Navy Department at Washington in placing a safety engineer at each of the navy yards now employed on Government work. Being engaged in a great war, the Government is able to obtain the services of engineers of high grade and extended experience who are sacrificing salaries and going into the work with enthusiasm for purely patriotic motives. These men intend to continue in the service until they see it thoroughly established and then retire in favor of others, but they will not leave until they know that others can carry on the good work. Thus one of the results of the war will be the building of a splendid system for the promotion of safety which otherwise might never have been constructed.

The present National Safety Council, with its 3000 members, is an outgrowth of a meeting of a mere handful of men six years ago. The movement has progressed because it was founded upon sound, ethical and economical reasons. It will make still further progress, as a few important facts are dwelt upon so that all manufacturers and their employees alike will become convinced that:

First, three-fourths of all accidents are preventable.

Second, that it is known how these accidents can be prevented.

Third, that investment in prevention brings the greatest return of any kind of capital invested in a manufacturing plant.

Fourth, that in order to prevent accidents employees must be trained to do their part, for upon them rests fully three-fourths of the responsibility; in other words, the machine alone will prevent one-fourth of the number of accidents which the machine and men working together can prevent.

As the above facts are borne home, thousands of lives will be saved, an untold amount of suffering will be prevented and the safety movement will receive a great impetus.

Under the heading "An Economical Crime," the *Northwestern Miller* discusses the action of Congress in guaranteeing a price of $2.20 a bushel on the wheat crop for 1918. That journal expresses the opinion that if the war should end before the crop, estimated at 1,000,000,000 bushels, is harvested, the price of wheat everywhere except in the United States would rapidly decline and it is probable that in England, for example, it would be somewhere near 60 cents. In that event the United States Government will be compelled to pass on the charge of $2 to the consumer or resell the wheat at the world's price and pocket the loss, which is likely to amount to not less than $1,000,000,000 and might amount to $1,500,000,000. The *Miller*, however, does not point out what is the most unfair feature of this kind of price fixing, which is that it grants a special favor to the farmer while manufacturers and miners are compelled to accept lower than the prevailing market price. For the Government to expect miners of bituminous coal to sell their product at $2, which is considerably below the market price, while the farmer is guaranteed $2 or about twice the usual market price, is rank discrimination.

CORRESPONDENCE

Will Accept Old Tracings and Convert for Red Cross Uses

To the Editor: Old and discarded tracings on cloth are of no value to any one, but they would make good bandages and handkerchiefs for soldiers. In every drawing room there are a great many of such tracings that will never be of use. These could be washed, ironed, and then turned over to the Red Cross Society. Any laundry should wash and iron these free of charge, but for any firm which will send these old tracings prepaid to the Shartle Brothers Machine Co., Middletown, Ohio, maker of paper mill machinery, that company will run them through its shop laundry. After they have been washed, they will be made into handkerchiefs and bandages and turned over to the Red Cross Society.

This certainly ought to bring forth from dark places a lot of material which is to-day very scarce and very high in price and put it to the best possible use. Now is a good time to clean up your old files.

CHAS. W. SHARTLE.
President Shartle Brothers Machine Co.
Middletown, Ohio.

British Export and Controlled Prices for Steel Bars

Some light may be thrown on the question whether Great Britain is selling steel products to her Allies at higher prices than those controlling her domestic market by the following table which shows the British official figures for exports of steel bars in the first half of 1917 and the average export price, also the exports of steel bars to France with the average price on these shipments:

British Exports of Steel Bars and Their Values

1917	Exports, Gross Tons	Average* Value per Ton in £	Official Control Price per Ton in £	Exports to France, Gross Tons	Average Value of Exports to France
January	26,293	24.2	15.5	19 044	16.8
February	39,242	23.0	15.5	33,662	16.0
March	38,057	23.1	15.5	.....	...
April	27,840	23.4	15.5	.....	...
May	19,537	24.8	15.5	.....	...
June	25,650	25.0	15.5	.....	...

*These values in each case represent the average of the months of the year preceding and including the month estimated; for example the £23.1 set down for March is obtained by dividing the total shipments for January, February and March into the total value for those months. Values are not given for each month's shipments.

Since February the destination of exports of bars has not been given. It is evident, however, that there is considerable difference between the official control price of £15 10s. per ton tested (£15 untested), and the average export price of £23 to £25 per ton. The price to France is also quite a little in excess of the control price in the domestic trade. The high average value of export bars may be due to the fact that crucible steel exports are included in the bar classification. It will be seen that in January and February France took 80 per cent of the exported bars. In the remaining 20 per cent must have been included considerable high-grade steel to bring the valuation up nearly 50 per cent above the average value of the shipments to France.

A proposal for the extension of Kimball Street, Fitchburg, Mass., has developed the fact that Manning, Maxwell & Moore, Inc., New York, owner of the Putnam Machine Co., has plans for the erection of a steel rolling mill to cost about $500,000 on the land in question, although the erection will probably be postponed for some time due to the high cost of materials and equipment now prevailing. Nothing definite has been decided upon, but at the meeting of the city council Herman F. Brandes, local manager for the company, stated that there was a probability of such use of the land.

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NATIONAL SAFETY MEETING

Some of the New Angles Developed at Last Week's Congress

LABOR turnover, the result in part of the continued influx to industries of men unfamiliar with methods and equipment; the industrial physician and the industrial nurse; the difficulty of promulgating safety regulations without antagonizing the employees, and a notable reduction in numbers of accidents came in for attention at the sixth annual safety congress held in New York last week at the Hotel Astor by the National Safety Council. By far the greater number of accidents, it appears, occurs to those employed for a period of less than 30 days. The welfare movement as a means of minimizing the numbers of roving workmen was thus regarded as necessarily close to the safety movement. To educate the man in the shop on safeguarding matters and to secure his co-operation the industrial doctor and nurse are held as of first importance, and it was urged that these individuals must have high qualities of personality and sympathetic interest calculated to maintain the humanitarian as well as the professional side of their work. It was brought out that the number of accidents in manufacturing began to increase early in 1914, reached a peak in 1916 but receded sharply in 1917, due, it was stated, to more efficient organization for increased production.

New Basis for Expressing Accident Statistics

A uniform method of expressing accident statistics by establishing for each casualty a definite number of hours of employment lost was urged by Dr. Lucian W. Chaney, Department of Labor, Washington. His ideas were explained at length in THE IRON AGE of Sept. 13. He offered the following statistics as obtained in the iron and steel industry from 1910 to 1914:

Frequency Rate

Deaths	1.2 cases per 1000 men
Permanent injuries	3.9 cases per 1000 men
Temporary disability	172.6 cases per 1000 men

Severity Rate

Deaths	10.5 days lost per man per year
Permanent injuries	2.5 days lost per man per year
Temporary injuries	2.1 days lost per man per year

Severity Rate by Departments and Years

	Days lost per man per year				
	1910	1911	1912	1913	1914
Blast furnaces	38.4	26.5	29.5	29.1	20.1
Steel works	35.7	19.7	30.8	20.8	14.9
Rolling mills	20.8	14.2	10.2	9.5	8.7
Entire plant	19.7	12.3	15.3	16.8	11.9

In blast furnaces the high rate is probably due, he said, to the dangerous work associated with casting in the cast house and the frequency of asphyxiations. The discussions of this paper by D. R. Kennedy, assistant to the president, Youngstown Sheet & Tube Co., Youngstown, Ohio, and L. W. Hatch, chief statistician, Department of Labor, State of New York, Albany, N. Y., indicated opposite points of view. Mr. Kennedy agreed with Dr. Chaney that units should be established for measuring the amount of accidents occurring in plants, so that data compiled at any place might be comparable with those compiled at other places, and emphasized that this was fundamental to further study of safety. Mr. Hatch pointed out that the Department of Labor, State of New York, was carrying on extensive work with a view to determining the direct causes of accidents on particular machines. He said that the department is willing to go as deeply into this problem as it thought necessary, and is willing to spend money and time with the expectation that the results obtained will justify the means.

Further discussions indicated that difficulties might be encountered in the analysis of data obtained by Mr. Hatch, the point made being that information reaching his office would not disclose the number of machines of any particular type in operation and, as accidents probably would be proportional to the number of machines operating, this precludes accuracy in the determination of causes of accidents. Mr. Kennedy believes that this method is too detailed for state work.

W. E. Watters, National Malleable Castings Co., Melrose Park, Ill., discussing the method of training and obtaining the co-operation of foundry foremen in safety work, stated that large organizations must get at the minds of their foremen to get co-operation. He divided foremen in two classes; those who are enthusiastic and interested in their work, and those who are of a dormant nature, sluggish and uninterested. In foremen he seeks five qualities of mind; appreciation, gratitude, faithfulness, co-operation and enthusiasm. He favors the use of rigid discipline to prevent recurrences of accidents and explained a system in which a jury of foremen determines the cause of accidents when they occur and provides for punishment of those responsible.

Paraffin for Treating Burns

S. W. Ashe, education and welfare department, General Electric Co., Pittsfield, Mass., explained that ambrine used for treating wounds and burns is a good grade of paraffin containing antiseptics, does not leave a scar and lessens the time required for proper healing 50 per cent.

Reducing Labor Turnover

F. W. Shepard, safety inspector, American Cast Iron Pipe Co., Birmingham, Ala., discussed how improvement in safety conditions reduces labor turnover and accidents. He estimated that the usual cost of training a new laborer is $45, and explained that in his plant men are trained before entering new work by a method of filling in when temporary vacancies occur in the work for which they are thought qualified.

The following means of reducing labor turnover were suggested as having proved efficient in his plant: A medical department including a dentist; a welfare committee extending its services to the families of the workmen; a Y. M. C. A.; a day school for the illiterate; an athletic field; a branch bank and a mutual aid benefit run by men who pay 10c. a week, whereas the company puts into this fund an amount equal to that given by the workmen. As a means of fostering a spirit of safety he suggested a plant paper publishing news as well as safety ideas and a motion picture show which, besides entertainment, would afford opportunity to visualize for the men safety ideas. The following results he credits to the use of these means in his plant:

The number of men employed has increased 30 per cent since 1912, when 930 men were employed. The number employed for one year or more has increased 170 per cent; the number of men losing not more than four days has increased 327 per cent; the number of men working every day has increased 455 per cent; and accidents have decreased 47 per cent.

D. R. Kennedy pointed out that the Youngstown Sheet & Tube Co. had a labor turnover in the last year of 187 per cent; 85 per cent of the men had been there less than six months; 11 per cent were men who rented and 4 per cent were home owners, and he paid particular stress to the latter feature. Considerable trouble, it appears, was experienced with men of the floater type, who come in groups with their own foremen and unless satisfied leave with their foremen. Regarding the question of the negro labor turnover, it was suggested that this problem could be handled by properly equipped club houses for negroes only, making them feel that they were receiving consideration.

John P. Eib, supervisor of safety and labor, Illinois Steel Co., Joliet, Ill., discussed the successful establishment of a lunchroom in the Joliet plant. Previous to the installation of the lunchroom, the men found it absolutely necessary to obtain their food either from the poor restaurants adjoining the plant or nearby saloons.

A paper given by S. W. Ashe on practical welfare work in foundries is reviewed elsewhere in this issue.

J. Claude Smith, safety director, Inland Steel Co., Indiana Harbor, Ind., presented a paper on the mechanical safeguarding of electric traveling cranes which was in fact a complete specification of crane requirements so far as safety regulation is concerned. He

pointed out that the purchasing agent is inclined to cut down costs and cut out safety devices, and so long as this is true it will be difficult to improve the design of cranes from a safety viewpoint.

Safety in Plant Yards

Dr. Chaney, discussing the paper by F. G. Bennett, safety director, Buckeye Steel Castings Co., Columbus, Ohio, on safety in yard practice, stated that while other departments in the steel plants had decreased accidents 30 to 35 per cent, the yards had only decreased these 3 per cent. He believes that this difference is due to the fact that inter-plant traffic is not brought up to the standard of the railroads as required by the Interstate Commerce Commission. Frank E. Morris, safety engineer, American Rolling Mill Co., Middletown, Ohio, discussing safe practices in sheet mills, pointed out that the great problem is transporting sheets, and that the danger lies in this part of the manufacture rather than in the rolling process. To obviate some of its hazards he said his company uses a steel frame on cranes which facilitates tying the sheets in bundles, also the men handling sheets use sheepskin gloves having the wool outside, and this prevents cuts on the forearm. Hand trucking, he said, is a dangerous method of transporting sheets. The discussion appeared to attach importance to the question of cramps. It was brought out that some form of cooling blast should be afforded the men working around the sheet rolls, and in this connection it appeared that either a blast through a 6-in. diameter pipe or slowly moving currents of air could be used, and that some companies found it preferable to use the slowly moving body of air as relieving to some extent the tendency to cramps.

Leslie M. Rice, district safety inspector, American Steel & Wire Co., Worcester, Mass., discussing open-hearth hazards suggested that stairways be provided under or over tracks in the yard of the open-hearth department. He laid stress on the importance of choosing a well-qualified man to operate cranes in the open-hearth department, and believes that this man should be thoroughly examined by both the electrical superintendent and the master mechanic. Considerable discussion centered around the point of a tap hole shield to protect men during the period of blowing out the furnace after tapping.

Protection in the Steel Department

Earl B. Morgan, safety engineering, Norton Co., Worcester, Mass., stated that he had experimented with a protective shield for the tap holes, but had found the design of this to be rather difficult. He also suggested the use of a bridge across the top of the furnace, so in case men found it necessary to go above the furnace they would not step on the arch. George T. Fonda, safety engineer, Bethlehem Steel Co., South Bethlehem, Pa., pointed out that in one case where a mold had not been properly cleaned and a butt remained in it the collection of gas when the molten metal was poured caused an explosion with considerable damage. In using a box ladle to pour ingots it was suggested as being desirable that steel shields be used on the pouring platform to protect the men working there, but considerable difficulty was found in designing this. This brought out information that a canopy forming a part of the roof of the pouring platform, extending across the first six ingot molds, proved satisfactory in one plant, a shield 2 ft. high being used on the floor at the first two molds.

J. S. Herbert, superintendent of the safety department, Cambria Steel Co., Johnstown, Pa., estimated that 93 per cent of the accidents had no mechanical connection and 73.9 per cent were up to the man himself from one cause or another, ignorance, carelessness, indifference or whatever the cause might be. He stated that a man employed in a steel mill under 30 days was 12 times as likely to be hurt as a man employed over 30 days. He considered it unnecessary to teach men all safety methods pertaining to a plant, as they have specific jobs to perform. He believes that a $1,200 a year foreman should produce $1,500 for the company, and if the accidents in his department run high, the compensation may obviate any profits and may cost the company from $3,000 to $5,000. J. M. Larkin, service department, Fore River Shipbuilding Co., Quincy, Mass., said that in his company accidents in departments are charged as overhead expense against the foreman. He found that the co-operation of the foreman in safety work can be obtained by consulting them on safety movements.

Electric Shock Resuscitation

Dr. C. A. Lauffer, medical department of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., discussed the hazards of low voltage. The discussion of his paper indicated that when a man has been shocked by electricity resuscitation may sometimes be accomplished by striking the man's feet, pulling his hair or even dropping him to the ground and such infliction of pain was advocated in conjunction with the prone pressure methods of resuscitation.

L. L. Park, safety and apprentice supervisor, American Locomotive Co., Schenectady, N. Y., discussing new kinks in eye protection, pointed out that there is a large field for the development of a small portable screen which may be moved from one machine to another. These screens, he said, are frequently more desirable than goggles, and the men take more kindly to them. He emphasized the importance of designing goggles so that when broken glass will not fly into the eye of the man, and suggested aluminum frames to reduce their weight.

New Officers

The informal dinner held in the Hotel Astor Sept. 12 was well attended, about 800 persons being estimated as present. Officers for the ensuing year were announced as follows: President, David Van Schaack, Ætna Life Insurance Co., succeeding L. R. Palmer; first vice-president, S. W. Tener, American Steel & Wire Co., second vice-president, J. M. Eaton, Cadillac Motor Car Co.; and third vice-president W. L. Chandler, Dodge Mfg. Co., Mishawaka, Ind. General manager, secretary and treasurer, W. H. Cameron; assistant secretary, J. J. Lamont; field secretary, C. W. Price, and editor, E. R. Wright, were re-elected.

Large Contract for Forgings

The Tioga Steel & Iron Co., Philadelphia, a subsidiary of the Taylor-Wharton Iron & Steel Co., High Bridge, N. J., has been awarded a contract by the Bureau of Ordnance, United States Navy, covering a heavy tonnage of rough-machined and heat-treated forgings for 4-in. naval guns. A forge shop and heat treating plant, 120 x 280 ft., and a machine shop, 90 x 240 ft., are in course of construction at the Tioga plant, Fifty-second Street and Grays Avenue, Philadelphia, and it is expected that these buildings will be ready for occupancy within 90 days. New equipment aggregating about $600,000 in value has been purchased. The forge and machine shop equipment ordered is very heavy and efficient in design and the heat treating department is to be modern in every particular.

The Taylor-Wharton Iron & Steel Co., the parent concern, and its predecessors have been engaged in business at High Bridge, N. J., for 175 years. They made cannon balls for the Revolutionary War and have furnished munitions for every war in which the United States has been engaged. The Taylor-Wharton Iron & Steel Co. is about to celebrate the anniversary of the first successful manufacture of manganese steel in America, which occurred at the High Bridge plant just 25 years ago.

The Government contract, it is announced, will not interfere with the regular business of the company.

The Reading Iron Co., Baer Building, Reading, Pa., manufacturer of iron and steel forgings, bar iron and steel, etc., has filed plans for the erection of a new rolling mill, about 70 x 290 ft., to cost about $25,000, exclusive of equipment. The company is also planning for the erection of a new puddle mill to cost about $10,000.

Iron and Steel Markets

EFFECT OF COAL PRICES

Lesson of Non-Deliveries at Set Figure

Contracting of Coke, Iron and Steel to Insure Delivery—Prices Secondary

The fuel situation has become more serious since the fixing of the $2 basis for bituminous coal and present and future effects upon the steel industry are giving no small concern. Eastern producers of plates and shapes have been facing a shutdown for the past ten days because of short shipments of gas coal, and it appears that the Government must actually get into the business of supplying coal to some iron and steel producers from whom it has bought material.

The fact that $2 coal is not coming out and that users whose contracts at higher prices are still in force are getting a supply indicates what will happen when a price is fixed on coke. Steel companies which buy blast furnace coke in the market may have to look to the Government to supply them with coke in order to be able to deliver Government steel.

Only recently blast furnaces were unwilling to enter into contracts for coke, expecting almost daily the announcement of the Government price. In the past week some furnaces which have sold pig iron through the first half of 1918 have contracted for coke at $8.50, some of these contracts running through all of 1918.

In connection with the allotment of 15,000 tons of Government coke among merchant coke operators for delivery over 12 months, it should be said that the prices of $3.50 for foundry and $3 for furnace were tentative and in the nature of advance payments. Final payment is to be paid after prices are fixed by the Government.

Dissatisfaction with present war buying methods grows and manufacturers who recently ceased to act on advisory committees in view of the legal questions raised are not likely to resume this relation. Sentiment is being made daily in favor of larger powers for the War Industries Board and the recognized need of further centralization may explain the delay in announcing iron and steel prices, though the impression in Washington is that the question will be settled this week.

It is becoming clearer that recent contracting at concessions from the lately firm levels is to fix with a certainty the supply of material. Consumers may believe that the quantities available at Government prices after Government needs, general contracts and spot demands are cared for will be small.

Certainly there is an increasing inclination to find prices which will bring takers. Last quarter contracts for steel bars at 3½c. at mill stand as an illustration; as do also a quotation of 7½c. on tank plates and of 7.75c. on round lots of black sheets. The reduced consumption of fabricated material shows to what an extent high prices have been a check. To reach the totals of 1915 and 1916 in bridge and building construction as much business would need to be done in the remainder of the year as was covered in the eight months passed.

The pig iron market is largely made by resale transactions, chiefly of iron intended for export, but there are evidences of weakening in furnace prices. In foundry iron the most marked recession is in connection with Eastern sales. In one case as low as $43 at furnace was done in a sale of No. 2 plain. Generally the market may be put at $2 below last week's level. Southern iron for this year can be had at $47 Birmingham for No. 2 and at $45 for 1918 delivery.

In basic iron the break is a reminder of the rapid advances of a few months ago. A Shenango Valley steel interest has sold 2000 tons from an accumulation for prompt shipment at $42 at furnace, against $48 ruling a week ago, and Southern basic has been bought in the Chicago market at $40, delivered, though the latter may be slightly off standard analysis iron. In the face of this, quotations as high as $50 are still made.

As iron and steel prices fall, the course of wages is upward and still upward, as the Pacific Coast shipyard strikes emphasize anew. A strike in Pittsburgh has forced the banking of six blast furnaces.

Consumers of Lake Superior ore will be fairly well supplied at the close of navigation, it now appears. The sub-committee of the Council of National Defense cut estimates of requirements and has established the amounts to be hauled meanwhile by the railroads.

Waiting for the move at Washington has had its effect on export buying where license difficulties are nil. Though inquiries are a-plenty they have earmarks of feelers, with questions as to makers' attitude on the contracts proposed in the event of price recessions.

A sale of 30,000 tons of basic iron for Italy is noted. Besides the 15,200 tons of plates for ships for Italy, 12,000 tons is wanted for France and 15,000 tons, probably for Australia. On 2000 tons of plates 10c. has been done.

The general price on lead has now touched the Government price of 8 cents, a reduction of 3 cents in as many weeks.

Pittsburgh

PITTSBURGH, Sept. 18 (*By Mail*).

The question of securing a full supply of coal and coke for operating steel mills and blast furnaces is now the most serious one that is before the trade. On Monday night, Sept. 17, the Pennsylvania Railroad declared a flat embargo against all shipments of coal over its own lines and leased lines for delivery west of Rochester, Pa. This has entirely cut out shipments of coal to the Mahoning and Shenango Valleys and also to all manufacturing plants located at places near the Valleys. Concerns that use by-products coal for their coke ovens are suffering greatly, and the embargo may result in the banking of a number of blast furnaces in the two Valleys, and also the shutting down of some

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Sept. 19, 1917.	Sept. 12, 1917.	Aug. 22, 1917.	Sept. 20, 1916.
No. 2 X, Philadelphia....	*$50.00*	$52.00	$53.00	$19.50
No. 2, Valley furnace....	*50.00*	52.00	53.00	18.50
No. 2 Southern, Cin'ti...	49.90	49.90	49.90	17.40
No. 2, Birmingham, Ala.	47.00	47.00	47.00	14.50
No. 2, furnace, Chicago*.	*54.00*	55.00	55.00	18.00
Basic, del'd, eastern Pa..	*48.00*	50.00	50.00	19.75
Basic, Valley furnace....	*42.00*	48.00	52.00	18.25
Bessemer, Pittsburgh....	*50.95*	51.95	53.95	22.20
Malleable Bess., Ch'go*..	55.00	55.00	55.00	19.00
Gray forge, Pittsburgh..	46.95	46.95	46.95	18.95
L. S. charcoal, Chicago..	58.00	58.00	58.00	19.75

Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	38.00	38.00	38.00	33.00
O.-h. rails, heavy, at mill	40.00	40.00	40.00	35.00
Bess. billets, Pittsburgh.	65.00	65.00	80.00	45.00
O.-h. billets, Pittsburgh.	65.00	65.00	80.00	45.00
O.-h. sheet bars, P'gh...	75.00	75.00	85.00	45.00
Forging billets, base, P'gh	100.00	100.00	115.00	69.00
O.-h. billets, Phila.....	*75.00*	85.00	90.00	48.00
Wire rods, Pittsburgh....	90.00	90.00	90.00	55.00

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	4.935	4.935	5.185	2.659
Iron bars, Pittsburgh....	4.75	4.75	4.75	2.60
Iron bars, Chicago.....	4.50	4.50	4.50	2.35
Steel bars, Pittsburgh...	4.00	4.00	4.00	2.60
Steel bars, New York....	4.195	4.195	4.695	2.769
Tank plates, Pittsburgh..	8.00	8.00	9.00	4.00
Tank plates, New York..	8.195	8.195	10.195	4.169
Beams, etc., Pittsburgh..	4.00	4.00	4.00	2.60
Beams, etc., New York..	4.445	4.445	4.669	2.769
Steel hoops, Pittsburgh..	5.75	5.75	5.75	3.00

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Sept. 19, 1917. Cents.	Sept. 12, 1917. Cents.	Aug. 22, 1917. Cents.	Sept. 20, 1916. Cents.
Sheets, black, No. 28, P'gh	8.50	8.50	8.50	2.90
Sheets, galv., No. 28, P'gh	*9.50*	10.00	10.00	4.15
Wire nails, Pittsburgh...	4.00	4.00	4.00	2.60
Cut nails, Pittsburgh....	4.65	4.65	4.65	2.60
Fence wire, base, P'gh..	3.95	*3.95*	3.95	2.55
Barb wire, galv., P'gh..	4.85	4.85	4.85	3.45

Old Material, Per Gross Ton:				
Iron rails, Chicago.....	$44.50	$44.50	$40.50	$19.25
Iron rails, Philadelphia..	*43.00*	45.00	45.00	20.00
Carwheels, Chicago.....	*32.50*	33.50	29.00	11.75
Carwheels, Philadelphia..	32.00	32.00	34.00	15.50
Heavy steel scrap, P'gh..	33.00	33.00	31.00	16.25
Heavy steel scrap, Phila..	30.00	30.00	33.00	14.75
Heavy steel scrap, Ch'go.	*31.00*	33.00	*30.00*	16.25
No. 1 cast, Pittsburgh....	30.00	30.00	30.00	14.50
No. 1 cast, Philadelphia..	*30.00*	32.00	33.00	16.00
No. 1 cast, Ch'go (net ton)	24.00	24.00	24.00	12.25
No. 1 RR. wrot, Phila....	*43.00*	45.00	45.00	20.00
No. 1 RR. wrot, Ch'go (net)	*34.00*	36.00	34.00	16.50

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	*$12.50*	$13.00	$15.00	$2.85
Furnace coke, future....	*8.50*	10.00	10.00	2.75
Foundry coke, prompt...	*13.50*	14.00	14.00	3.25
Foundry coke, future....	*12.00*	12.50	12.50	3.50

Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York..	**26.25**	25.50	26.50	28.25
Electrolytic copper, N. Y.	**26.25**	25.50	26.50	28.50
Spelter, St. Louis.....	**8.12½**	8.00	8.50	9.50
Spelter, New York.....	**8.37½**	8.25	8.75	9.75
Lead, St. Louis.....	7.87½	9.50	10.50	6.85
Lead, New York.....	*8.00*	9.70	10.62½	7.00
Tin, New York.....	**61.75**	61.37½	61.75	38.50
Antimony (Asiatic), N. Y.	**15.00**	14.50	15.00	11.00
Tin plate, 100-lb. box, P'gh.	$12.00	$12.00	$10.00	$5.75

of the steel plants, or at least only partial operations, until the embargo is removed. The Pittsburgh & Lake Erie Railroad, which also serves the two Valleys and adjacent districts with transportation of coal and coke, is still open, but the yards of this road at Glassport, Pa., and several other places are badly congested, and the movement of coal and coke over its lines is extremely slow. Conditions for doing business in steel and iron these days are very difficult. Buyers are afraid to buy anything and sellers are afraid to sell. In the matter of coke, all the coke operators believe the Government may shortly fix a price on blast furnace and foundry coke and some coke producers believe the price of blast furnace coke may be put as low as $4 per ton, but of course there is nothing official on this. For this reason, there has been a good deal of anxiety on the part of coke operators to sell their coke as far ahead as possible and as near as they can to the high prices ruling for prompt coke, with the result that in the past week or so there have been a number of contracts for blast furnace coke made at a flat price, and some on a sliding scale basis. It is not believed the Government, if it does fix the price on coke, will disturb any existing contracts. In the past week there has been more active inquiry in pig iron, steel and also for some forms of finished material, but when it comes to absolute sales there is usually a violent decline in prices, especially in pig iron and steel. In the meantime the whole market is waiting for the Government to fix its prices on steel, and present dull conditions are not likely to change until these prices come out. It is not believed anywhere now that the Government will attempt to fix prices on steel for general consumers, but will do so only for its own purchases, and probably for the Allies. It is not believed the prices the Government will fix will be as low as first expected. It is also the general opinion that just as soon as the Government prices are given out there will be a quick buying movement, as it is known that stocks have been running very low for some time. In fact, for nearly two months consumers have not been buying any material they could get along without, and in addition, jobbers have been working off stocks as fast as possible. It will take some little time for the market to adjust itself after the Government prices have been made known, but how much decline there may be in prices on steel products to general consumers will depend to a very great extent on what prices the Government gives out. The greatest activity in this market is in prompt furnace coke, for which there is a heavy demand at $12.50 to $13 per net ton at oven.

Pig Iron.—It would seem that the long expected break in prices of pig iron, notably basic, has come. For nearly two months there has been practically nothing done in sales of iron by furnaces to consumers, the only transactions having been in resale iron and at prices usually considerably lower than what were regarded as the market. Within a day or two there has been a sale of 2000 tons of basic iron by Shenango Valley steel interests at $42 per ton at furnace for prompt shipment. It seems the steel interest has 15,000 to 16,000 tons of basic iron on hand, and in view of the uncertainty of the market and the probability of lower prices ruling before long, the company decided to sell a part of this iron at the best prices it could get, and the sale noted above has been made. Several weeks ago there was a sale of 50,000 tons of basic iron at $48, at Valley furnace, noted in this report at the time, and this last sale is the only one of any importance that has since been made. The price represents a drop of $6 per ton, but this is really no more violent than the advances in prices on Bessemer and basic iron a few months ago, when it was no uncommon thing for prices on Bessemer and basic to be marked up in our reports in one week anywhere from $3 to $5 per ton. Whether the basic iron market has squarely declined to $42 per

ton is a question, but the sale and the price noted above are absolutely authentic. The Keystone Steel & Wire Co., Peoria, Ill., is in the market for 6000 tons of basic iron and as high as $50, Pittsburgh, has been quoted on the inquiry. A sale is also reported of 1200 tons of standard Bessemer iron, 300 tons per month over this year, at $50 Valley furnace. We also note small sales of No. 1 foundry iron at $52, and No. 2 at $50 to $51 Valley furnace. Reports are that a recent sale was made of 800 tons of No. 2 foundry iron at $43 at furnace, but this has not been confirmed. It is very evident that the tendency in prices of pig iron is strongly downward, but the market is very sensitive and is just as liable to advance as it is to decline. The Jones & Laughlin Steel Co. has a strike at its Eliza furnaces in this city, and four or five of these stacks are banked until the trouble is settled. If the strike should last any length of time, it might force this concern into the market to cover the iron lost in output by reason of the strike. There has been a considerable sale of No. 2 foundry iron for Government work at as low as $27.50 at furnace. A good deal of this iron is being shipped to shipyards on the Pacific Coast.

We now quote as follows: Standard Bessemer iron, $50; basic, $42; No. 2 foundry, $50 to $51; malleable Bessemer, $51 to $52; and gray forge, $46 to $47; all at Valley furnace. The freight rate for delivery in the Pittsburgh and Cleveland districts from Valley furnaces is 95c. per ton.

Billets and Sheet Bars.—The local steel market has been very quiet in the past week, no sales of moment in billets and sheet bars being reported. Negotiations are on for a considerable quantity of Bessemer and open-hearth sheet bars that may be put through before this week ends. Nearly all the sales of billets and sheet bars made recently were of resale steel, and were at prices considerably lower than would have been accepted by the mills. It develops that the English Government wants its shell steel as fast as contracts call for deliveries. The French Government is not urging the mills in this respect, but in fact is rather anxious that shipments be deferred to some extent, and this is being done by large steel mills in the Youngstown, Ohio, district that have contracts with France for shell steel made late last year and for delivery running over all of this year. We quote soft Bessemer and open-hearth billets at $65, Pittsburgh, and sheet bars and large slabs at $75 to $80, Pittsburgh. The decline in prices on sheet bars and large slabs has not been proportionately as large as in 4 x 4 billets. We quote forging billets at nominally $100 per ton, Pittsburgh, for ordinary sizes and carbons, but consumers are not buying, believing prices will be materially lower.

Ferroalloys. — The new demand for the various grades of alloys is quiet and prices are showing a downward tendency. While 80 per cent domestic ferromanganese is held at $400 per ton for prompt delivery, it is said there have been sales of carload lots recently at $375 or lower. We also note small sales of 50 per cent ferrosilicon at prices ranging from $160 to $200 per gross ton, for prompt delivery. We quote 80 per cent domestic ferromanganese for prompt shipment at $375 to $400 and for first half of 1918 delivery at $350 at furnace. We quote 18 to 22 per cent spiegeleisen at $80 to $82.50 per gross ton, delivered.

We quote 9 per cent Bessemer ferrosilicon at $89, 10 per cent $90, 11 per cent $95, 12 per cent $100, 13 per cent $105, 14 per cent $115, 15 per cent $125, and 16 per cent $135. We now quote 7 per cent silvery iron at $79 to $84, 8 per cent $80 to $85, 9 per cent $81 to $86, 10 per cent $82 to $87, 11 and 12 per cent $83 to $88. All f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having a uniform freight rate of $2 per gross ton for delivery in the Pittsburgh district.

Steel Rails.—The Carnegie Steel Co. has rolled and shipped 29,000 tons of 80-lb. rails, this being its portion of the recent Government order for France and the rails are now on their way to that country. There is practically no new buying in standard sections or light rails and it is evident the consumers of light rails are looking for lower prices. Standard sections and light rails are quoted in detail on page 705.

Structural Material.—Very little new work is coming out in this district, but local fabricators are filled up for the remainder of this year or longer, and are not actively bidding on new work. The American Bridge Co. has taken 1600 tons for new steel buildings for the Lincoln Motor Co., at Detroit. This concern is erecting a new plant to build engines for aeroplanes. The American Bridge Co. is now shipping about 11,000 tons of fabricated material from its Western plants for the new Federal shipbuilding plant being built in Hackensack Meadows, N. J. It is expected that on Tuesday or Wednesday of this week the Government will place about 13,000 tons of steel for 32 buildings to be erected in France. Prices will be found on page 705.

Plates.—Compared with the great activity in the plate market less than 60 days ago, present conditions are extremely quiet. The Government embargo on plates for Japan and in fact for all other neutral countries has released a very large tonnage of plates which has reverted back to the mills, and now is available for domestic users. More prompt deliveries of plates can be had than at any time in a good many months. The Government is buying enormous quantities of plates for its programs, and it is said the two leading local plate mills are furnishing over 100,000 tons of sheared plates to it per month and the smaller mills are also furnishing considerable quantities. Prices on plates are undoubtedly easier, and we quote ¼ in. and heavier plates at 8c. to 9c. for delivery over the remainder of this year. Small lots from warehouse bring 11c. to 12c., prices depending on sizes, the quantity and delivery wanted.

Sheets.—About the only new buying in sheets of any moment is being done by the Government. The Navy Department placed last week among the different mills 11,000 tons of black and galvanized sheets, and the War Department placed 6800 tons of galvanized sheets, the leading interest taking half of the latter order. The supply of sheets for early shipment is larger than for some time. Some mills that some time ago stated they were pretty well filled up over remainder of this year are now actively seeking new business, and are making promise of fairly prompt deliveries. Mills that some time ago could get 9c. and 10c. and even higher for No. 28 Bessemer or open-hearth sheets now find they will have to reduce their prices considerably to get any new orders. It is believed that the quantity of sheets sold at the top prices quoted by some of the mills are very limited. We now quote Nos. 3 to 8 blue annealed sheets at 8c. to 8.50c., No. 28 Bessemer black, 8.50c. to 9c., and No. 28 galvanized, 9.50c. to 10c., f.o.b. Pittsburgh, in carloads and larger lots. Prices on smaller lots from warehouse are slightly higher. Prices on sheets are given in detail on page 705.

Tin Plate.—Nothing of interest developed in the tin plate trade in the past week. The output of the mills is restricted to some extent by shortage of labor and coal, and also by the disposition on the part of tin mill labor not to work more than three or four days per week. Rollers on hot tin mills, under the recent advance in wages, can earn $800 per month and more, and they are not inclined to put in a full week's work, being satisfied to earn less money and have more leisure time. The energies of the tin plate mills are still in the direction of producing a maximum output of bright plate this year for the packing of perishable foods, and it is believed there will be plenty turned out to meet the demand. There is an active export inquiry for tin plate, but this is being turned down by the mills, even at offered prices of $17 to $18 per base box, the mills not having the plate to spare. The new inquiry is light, small lots of primes from stock selling from $12 to $14 per base box, Pittsburgh. Prices on terne plate are given on page 705.

Hoops and Bands.—New buying is dull and is only for small lots for prompt shipment. Large consumers are covered over the remainder of this year, and specifications are fairly active. We quote steel hoops in small lots for prompt shipment at 5c. to 5.50c., and steel bands 5c. to 5.25c. at mill.

Wire Rods.—Makers report the new demand for wire rods as active, particularly for export to Canada, Japan and other countries. One lot of 1300 tons of soft wire rods was sold recently for shipment to Canada at $90 at mill. We also note a sale of 300 tons of high carbon rods to a domestic consumer at $110 at mill. Two local

makers of wire rods say their output for the remainder of this year is well sold up and they have very few more rods to spare. Prices on rods are given in detail on page 705.

Wire Products.—While the domestic demand for wire and wire nails is dull, export demand is heavy, and considerable sales of both nails and wire have been made at relatively higher prices. Recently there were sales of about 6000 kegs of wire nails for export, which netted the mills about $4.75 base, per keg, at mill. Also there have been sales of bright basic wire which netted the mills about $4.50 at mill. Local mills have lately taken nearly 7000 kegs of wire nails for the Government, the leading interest taking a like amount at $3.20 base, per keg. Independent mills are now operating largely on contracts for wire nails taken some time ago at $2.50 per keg, and on plain wire $3.55 per 100 lb. Prices on nails and wire of the independent mills, the American Steel & Wire Co. price being $16 per ton lower, are given on page 705.

Iron and Steel Bars.—There seems to be no doubt that prices on both iron and steel bars are easier, and consumers are getting better deliveries than for some time. As before noted, one large producer of steel bars has covered some of its trade for last quarter of this year at 3.50c. at mill, but other makers are quoting 4c. and 4.50c. at mill. Large consumers like the implement trade and car builders are specifying at a fairly active rate against contracts, and the Government has been a fairly heavy buyer of steel bars for war buildings that are being erected all over the country. The tonnage of steel bars used in each of these buildings is relatively small, but in the aggregate represents a considerable amount. The new demand for reinforcing bars is only fair, due to a general falling off in building operations. Mill prices in carloads and larger lots on iron and steel bars are given on page 705.

Shafting.—The domestic demand for shafting is dull, but the Government demand is heavy, and it has just placed an order for 600 tons with a local maker for use in various navy yards, the price to be fixed later. It is still reported that the Government is taking from 30 to 35 per cent of the entire output of shafting of all the makers, this going into shells, adaptors, nose pieces and for other uses. Two local makers recently opened their books for contracts for shafting for last quarter of this year delivery and have taken a fair number of orders. For the domestic trade, discounts on shafting remain at 10 and 5 per cent off list, small lots sometimes being sold at list.

Railroad Spikes and Track Bolts.—Domestic buying of railroad spikes and track bolts is dull, but the Government is a very heavy buyer and is in the market at present for several large quantities of spikes and still larger quantities of tie plates. The demand for boat spikes is very heavy, several of the leading makers conserving practically their entire output for the Government and it will very likely be needed. Prices on standard sizes of railroad spikes, while fairly firm at 7c., Pittsburgh, are being shaded at other places, notably in the Chicago district. Prices on railroad spikes and track bolts are given in detail on page 705.

Nuts and Bolts.—Makers report the domestic demand is quiet, and specifications are only fair. It is very evident that consumers of nuts and bolts are looking for lower prices in the very near future. The Government is a heavy buyer of nuts and bolts, and is said to be now distributing an order for about 20,000,000 bolts among the manufacturers. Discounts on nuts and bolts are unchanged and are given on page 705.

Cold Rolled Strip Steel.—The new demand is dull, but the Government is a fairly heavy buyer and has lately placed some large orders among the different makers. Makers are quoting for delivery to Oct. 31 only, except that in a few cases where urgency is shown they agree to accept orders for delivery over the remainder of this year. Specifications are fairly active, but in some cases shipments are being held, and so far few cancellations of contracts are reported.

On contracts, mills are quoting 9c. at mill, but on small current orders prices range from 10c. up to 12c. at mill. Terms at 30 days, less 2 per cent off for cash in 10 days when sold in quantities of 300 lb. or more.

Rivets.—New buying is quiet and specifications against contracts are only fairly active. It is evident that consumers of rivets look for lower prices in the near future and are not taking in any more rivets than they actually need.

Wrought Pipe.—The general demand for merchant iron and steel pipe is only fairly active, but mills are filled up for months ahead. The Government is still a heavy buyer, and lately placed about 700 tons of 2, 4, 6 and 8-in. pipe for railroad work in France, and also for heating the cantonments to be built in that country. So far, Government purchases of pipe have amounted to nearly 25,000 tons, divided among the different mills, the leading company having taken half or more of this quantity. Discounts on iron and steel pipe quoted by most of the independent mills, prices of the National Tube Co. being considerably lower, are given on page 705.

Boiler Tubes.—Mills are filled up on orders for iron and steel tubes for nearly a year, and are somewhat indifferent to the falling off in new demand that has developed lately. Prices are still very high, but are believed to have reached the crest and may be lower in the near future. The demand for oil country goods is enormously heavy, and premiums in prices are readily paid where the seller can promise fairly prompt delivery. On seamless steel tubing, the National Tube Co. is reported sold up for this year, and also for nearly all of next year. There are no regular prices on either iron or steel tubes, these depending entirely on the quantity, the sizes, and delivery. Nominal discounts, but which do not represent actual prices, are given on page 705.

Coke.—The expectation that the Government will shortly announce prices on furnace and foundry coke has resulted in some of the coke operators getting together with the blast furnaces and making contracts for blast furnace coke in various ways. One leading producer whose coke has a very high reputation in the trade has made several large contracts for blast furnace coke for all of 1918 delivery at the flat price of $8.50 per net ton, at oven. Two other producers have made contracts on a sliding scale basis, i. e., 5 tons of coke for the market price of one ton of basic iron, until basic iron declines to a certain price when the basis is 4½ to 1, and should basic iron reach a still other lower price, the basis is 4 to 1. The severe drop in basic iron this week to $42 per ton would mean that on a coke contract on a five to one basis the coke producer would receive $8.40 per ton for his coke, which is certainly a very high price. Another producer of blast furnace coke which always commands a little higher than the average market price is not favorable to making sliding scale contracts, but has agreed to sell its blast furnace coke for delivery starting Oct. 1 next and running through all of 1918 at $9 per net ton, at oven. Three or four blast furnaces operators that are now getting this coke, the price being fixed from day to day, are not agreeable to paying $9 per net ton, and it is possible this coke may go to other consumers, who seem willing to pay the price. Negotiations are still on for this coke, and will likely be concluded before this week ends. The railroad embargoes, shortage in coal and labor, and the heavy demand are all serving to keep up prices on blast furnace coke for prompt shipment which are ruling firm to-day (Tuesday) at $12.50 per net ton at oven. Sales of close to 100 cars are reported at this price. We now quote best make of blast furnace coke for prompt shipment at $12.50 to $13 per net ton at ovens and on contracts over the next six months to a year at $8.50 to $9 per net ton at oven. We quote 72-hr. foundry coke for prompt shipment at $13.50 to $14 per net ton at oven. The Connellsville *Courier* gives the output of coke in the upper and lower Connellsville regions for the week ending Sept. 8 as 355.987 tons, an increase over the previous week of 19,817 tons.

Old Material.—The local market on all kinds of scrap remains practically stagnant The Pennsylvania Railroad now requires a permit before moving any cars loaded with scrap and must have assurance that the consumer will take the scrap in promptly when it is

received. The P. and L. R.R. will not load any cars with scrap until a permit is secured. It is said the loading consumers in this district may come in the market in a short time for a large tonnage of heavy melting steel scrap. If this proves to be the case, a better all around market is expected. Prices are purely nominal, and only a few carloads have been sold in this market for some weeks. In this condition there is nothing to do but repeat former prices:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$33.00 to $34.00
No. 1 foundry cast	30.00 to 31.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	38.00 to 40.00
Hydraulic compressed sheet scrap	25.00 to 26.00
Bundled sheet scrap, sides and ends, f.o.b. consumers' mill, Pittsburgh district	23.00 to 24.00
Bundled sheet stamping scrap	21.00 to 22.00
No. 1 railroad malleable stock	26.00 to 27.00
Railroad grate bars	18.00 to 19.00
Low phosphorus melting stock	42.00 to 45.00
Iron car axles	45.00 to 46.00
Steel car axles	45.00 to 46.00
Locomotive axles, steel	52.00 to 53.00
No. 1 busheling scrap	24.00 to 25.00
Machine-shop turnings	21.00 to 22.00
Cast iron wheels	31.00 to 32.00
Rolled steel wheels	36.00 to 37.00
*Sheet bar crop ends	41.00 to 42.00
Cast iron borings	22.00 to 23.00
No. 1 railroad wrought scrap	32.00 to 33.00
Heavy steel axle turnings	23.00 to 24 00
Heavy breakable cast scrap	24.00 to 25.00

*Shipping point.

Chicago

CHICAGO, Sept. 17, 1917.

A lull of the most pronounced character has come over the entire market so far as domestic inquiry is concerned, but in the past few days export inquiries for steel products, including plates, shapes, bars and sheets have been numerous, the mail of to-day alone making known a large volume of such requirements, while previous days have been prolific. Little or no attempt is being made to care for the foreign demand for plates because of the export restriction, although the mills could easily load up with orders for this product subject to the raising of the embargo. It is pointed out that while domestic consumers are not inclined to take hold at present prices, the mills are declining not a little business at those very prices. Incidentally, it may be remarked that the export business is done at top quotations, and with no possible revision of prices, inasmuch as payment is made on presentation of shipping documents and credits are confirmed. France, Italy, Japan, India and South American countries are seeking material, with the mills favoring the Far East because of geographical reasons. Uncertainty as to Government action and the consequent future course of prices continues the dominating influence with domestic buyers. Though opinions differ, in the absence of official guidance, the majority of producers do not believe that the Government will attempt to say what private consumers shall pay for either iron or steel. By some sellers the view is held that the present lull is simply a contest in waiting between the consumers and the sellers, also that it is healthy inasmuch as the situation will clear up through the consumption of stocks of raw material, and that the outcome will be a good buying movement inside of 60 days, by which time the high peaks of prices will have disappeared. The producers of pig iron insist they are making no concessions in the small deals they are effecting, but resales at concessions continue, Southern No. 2 having sold at $45, Birmingham. More sales of plates at 8c., Pittsburgh, are recorded. The leading local independent will re-engage in the manufacture of galvanized sheets and expects to make shipments about Nov. 1.

Pig Iron.—Except in a few cases, buying has been confined to occasional carloads of resale iron. Furnace representatives state they are receiving very few inquiries, and what do appear call mostly for quick shipments of small lots. Inasmuch as they have more than they can do in filling their contract commitments, they declare they see no reason for granting concessions, and Northern No. 2 foundry iron is held at $55, furnace, for delivery into next year, with the Southern makers still asking $54, Chicago, for last half No. 2 soft, and $49, for the first half. In the week, 500 tons of malleable Bessemer, which was hurriedly wanted, was taken, it is reported, at the full price. Southern basic pig iron has been purchased in the Chicago market at near $40, delivered, but both seller and buyer assert that the iron exceeded standard analysis in sulphur. The heavy concession is construed as an evidence of weakness. While sellers assert they see no reason why the market should break, there can be no denial of the fact that a protracted period of dullness usually presages a decline in price, but against this it may be argued that these are peculiar times, and conditions are extraordinary both as to volume of contracts and troubles encountered in production. As to resale iron, there have been concessions granted by consumer-sellers of both Northern and Southern iron, and it is pointed out that a consumer who bought iron around $20 can well afford to sell his surplus under the prices quoted by first-hands. Resale Southern No. 2 has been let go at $49, Chicago, or $45, Birmingham. Some 2000 or 3000 tons of basic has changed hands at a figure below $55, Northern furnace, but it is declared that it ran 0.07 and over in sulphur, some of it being very bad. Inquiries for about 3000 tons of basic are still before the trade. Some of the resale iron offered, on the other hand, has brought the full price quoted by producers, and where the silicon or manganese was high, premiums have been paid. For 1000 tons of low phosphorus, close to $90 was the price. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 1 to 4	$58.00
Lake Superior charcoal, Nos. 5 and 6, Scotch and No. 1 soft or special	60.50
Northern coke foundry, No. 1	54.50
Northern coke foundry No. 2	54.00
Northern coke foundry No. 3	53.50
Northern high-phosphorus foundry	55.00
Southern coke No. 1 f'dry and 1 soft	55.00
Southern coke No. 2 f'dry and 2 soft	54.00
Malleable Bessemer	55.00
Basic	55.00
Low-phosphorus	$85.00 to 90 00
Silvery, 8 per cent	77.50 to 82.50

Ferroalloys.—In a quiet market, 80 per cent ferromanganese is a little easier at $375 to $400 for the remainder of this year, and $350 to $375 for the first half.

Plates.—More business in plates has been done at 8c., Pittsburgh, or 8.189c., Chicago, although one Eastern producer is still quoting 10c., Pittsburgh, and has done a little on that basis. A local mill has received orders from Washington for light plates wanted in the construction of destroyers, but the leading interest reports that it has received no very large orders from that source. Were the mills disposed to take plate orders subject to the granting of export licenses, they could pile up an overwhelming array of commitments, but transactions of this kind are regarded more as options than as actual contracts. Not only would they involve the mills in doubt as to where their output was to go, but should the licenses be granted, they would be swamped with specifications and demand that orders be filled at once.

For Chicago delivery out of stock, jobbers quote 10c.

Structural Material.—Shapes for domestic delivery in the remainder of this year have been purchased at 4.50c., Pittsburgh, or 4.689c., Chicago. For foreign shipment, there have been transactions at 4.50c. to 5c., Pittsburgh. From India, China, Japan and South America has come a large demand for structural sections, considerable of which has been cared for. Only one structural letting is reported—270 tons of steel frames for four box-car unloading machines, placed with the Moravia Construction Co. An Eastern mill continues to quote 6.189c., Chicago.

For material out of stock, jobbers quote 5c.

Bars.—Steel bars are in good demand for export,

the demand coming from Europe, as well as the Orient, but business with the Far East is the more attractive, and not so much, if any, attention, is being paid to that which emanates from Europe. The quotation of both Eastern and local makers is unchanged at 4.50c., Pittsburgh, or 4.689c., Chicago. Rail carbon bars range from 4.25c. to 4.50c., Chicago, depending on tonnage, delivery, etc. Consumers of hard bars show the hesitancy in buying common in all lines, and in the case of steel bars, one or two good inquiries for tonnages have been withdrawn. Iron bars range from 4.50c. to 5c., Chicago. Jobbers' quotations are unchanged.

We quote prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c. to 5c.; reinforcing bars, 4.50c., base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Sheets.—The leading independent in this territory announces its intention of reengaging on the manufacture of galvanized sheets, and will be ready to make shipments by Nov. 1. The price of galvanized ranges from 10c. to 10.25c., Pittsburgh, or 10.189c. to 10.439c., Chicago. Sheets are in heavy demand from abroad, while the Government continues to place orders, but nevertheless they have developed a little easiness in price. No. 10 blue annealed are quoted at 8.50c. to 8.75c., Pittsburgh, or 8.689c. to 8.939c., Chicago, and No. 28 black or box annealed at 8.75c. to 9c., Pittsburgh, or 8.939c. to 9.189c., Chicago.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 10c.; No. 28 black, 10c., and No. 28 galvanized, 11.50c.

Wire Products.—No change is reported, the leading producer adhering to its base of 3.20c. for nails, and to its general policy of carefully regulating the placement of its output. The independents still quote $4 for nails, on which base we quote per 100 lb. to jobbers.

Plain fence wire, Nos. 6 to 9, base, $4.189; wire nails, $4.189; painted barb wire, $4.339; galvanized barb wire, $5.039; polished staples, $4.339; galvanized staples, $5.039; all Chicago, carload lots.

Rails and Track Supplies.—Several inquiries from foreign countries, including South America, are under consideration by the mills, although the combined tonnage of these inquiries is not large. The quotation of the leading producer for spikes is 4.50c. to 5c., but other makers ask 5c. to 5.25c. In standard section rails there is a wide divergence in prices, small lots from stock being quoted from $60 to $90.

Standard railroad spikes, 4.50c. to 5.25c., base; small spikes, 4.75c. to 5.50c. base; track bolts with square nuts, 5.50c. to 6c., all in carloads, Chicago; tie plates, $70 to $90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base (nominal); open hearth, $40 (nominal); light rails, 25 to 45 lb., $70; 16 to 20 lb., $71; 12 lb., $72; 8 lb., $73; angle bars, 3.25c., base.

Bolts and Nuts.—The makers have plenty to do in filling the contracts on their books, but new business is practically at a standstill. For prices and freight rates, see finished iron and steel, f.o.b., Pittsburgh, page 705.

Store prices are as follows: Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to ⅞ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to ⅞ x 6 in., 40-2½; larger sizes, 30-5; hot pressed nuts, square, $2.50, and hexagon $2.50 off per 100 lb.; lag screws, 50 per cent off.

Cast-Iron Pipe.—St. Louis, on Sept. 21, will take bids on 1000 tons, this being the only municipal letting in prospect. A contractor is asking bids on 200 tons, but the general trade is extremely quiet.

Quotations per net ton, Chicago are as follows: Water pipe, 4 in., $68.50; 6 in. and larger, $65.50, with $1 extra for class A water pipe and gas pipe.

Old Material.—The week has been even more quiet than the preceding one, consumers buying, for the most part, only to cover urgent needs. While a number of items show declines, and the trend is toward lower levels, rerolling rails have firmed up a little, evidence of which lies in the purchase of 1000 tons at $41.50, a railroad being the seller. Uncertainty is still a marked feature of prices, for the reason that consumers adhere to their tendency to await Government action on prices of iron and steel products. The railroad offerings as a whole are small. A small list has been issued by the Atchison, Topeka & Sante Fe and one of moderate size by the Chicago & Eastern Illinois. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$44.50 to $45.00
Relaying rails	50.00 to 55.00
Old carwheels	32.50 to 33.50
Old steel rails, rerolling	41.00 to 42.00
Old steel rails, less than 3 ft.	40.00 to 41.00
Heavy melting steel scrap	31.00 to 32.00
Frogs, switches and guards, cut apart	31.00 to 32.00
Shoveling steel	29.50 to 30.50
Steel axle turnings	23.00 to 24.00

Per Net Ton

Iron angles and splice bars	$40.00 to $41.00
Iron arch bars and transoms	43.00 to 44.00
Steel angle bars	31.00 to 32.00
Iron car axles	42.00 to 43.00
Steel car axles	41.00 to 42.00
No. 2 railroad wrought	32.00 to 33.00
No. 2 railroad wrought	32.00 to 33.00
Cut forge	31.00 to 32.00
Pipes and flues	22.00 to 23.00
No. 1 busheling	24.00 to 25.00
No. 2 busheling	17.00 to 18.00
Steel knuckles and couplers	37.00 to 38.00
Steel springs	40.00 to 41.00
No. 1 boilers, cut to sheets and rings	20.00 to 21.00
Boiler punchings	35.00 to 36.00
Locomotive tires, smooth	40.00 to 41.00
Machine-shop turnings	17.00 to 17.50
Cast borings	16.50 to 17.00
No. 1 cast scrap	24.00 to 25.00
Stove plate and light cast scrap	18.00 to 18.50
Grate bars	17.50 to 18.50
Brake shoes	19.00 to 19.50
Railroad malleable	31.00 to 32.00
Agricultural malleable	25.50 to 26.50
Country mixed scrap	18.00 to 19.00

Cleveland

CLEVELAND, Sept. 18.

Iron Ore.—Without having large surplus stocks it is expected that most consumers of Lake Superior ore will be fairly well supplied at the close of the season of navigation. Under the schedule of blast furnace requirements the amount of ore due the inland furnaces, exclusive of the Eastern consumers, in September, October and November is 12,506,370 gross tons, this amount being based on actual requirements up to June 1, 1918, and exclusive of ore handled at Conneaut. Estimates of requirements made by many consumers early in the season were materially cut by the subcommittee of the Council of National Defense. The railroads have been asked to move 40 per cent of the ore still due in September, 40 per cent in October and 20 per cent in November. It is probable, however, that consumers will have considerable of this ore placed on docks. For the entire season the interior furnaces will receive over 34,000,000 tons, the remainder going to Lake front and Eastern furnaces. It is expected that to meet the requirements of all consumers, a steady movement of the ore from docks will have to be kept up during the whole winter. We quote prices, delivered lower Lake ports, as follows: Old range Bessemer, $5.95; Mesaba Bessemer, $5.70; old range non-Bessemer, $5.20; Mesaba non-Bessemer, $5.20.

Coke.—One producer who has been selling standard Connellsville foundry coke at $12.50 per net ton at oven is now sold out for the remainder of the year and has withdrawn from the market. Other makers are asking $13 to $13.50 for prompt shipment foundry coke. For the first half of next year standard Connellsville foundry coke is quoted at $10, at which price considerable business was booked during the week. Furnace coke is quoted at $12.50 to $13 for prompt shipment.

Finished Iron and Steel.—The demand for steel bars is more active than for some time and a fair volume of orders is being taken at 4.50c., Pittsburgh, for early delivery. There is an increase in inquiry for steel bar contracts for the first half, but mills are refusing to quote for that delivery. However, the price uncertainty is keeping many buyers out of the market. One Cleveland consumer inquired a few days ago for 1000 tons of billets per month for the first half, but after receiving quotations decided to defer buying. There is an increasing demand for steel for Government work and mills are finding it more difficult every day to supply the other demands of their trade. One new inquiry from the Government is for about sixty cranes, mostly locomotive cranes, which will require about 5000 tons

of bars, plates and shapes. The plate market is easier. While sales are reported as high as 10c., the more general quotations range from 8c. and 9c., Pittsburgh, for early delivery. The large plate mills are crowded with Government work and the low prices are being named by some of the smaller mills. The National Tube Co. is making plates for some of the Lake ship yards on one of its skelp mills. There is a good demand for steel rails for industrial companies and light rails for coal mines. Two inquiries from steel plants for about 1000 tons of 85-lb. rails for early delivery brought a quotation of $85. Two railroads have sounded the market on rails for 1918, but were told by the mill receiving the inquiry that it had no rails to offer for next year. The sale of one lot of light rails in 20-lb. sections is reported at $78, although most of the mills are asking considerably higher prices. One independent mill has covered its trade for fourth quarter contracts for Bessemer rods at $92.50, but on an export inquiry quoted $95. The sheet market is more active than it was for several previous weeks. Some business is coming from consumers who have been holding off for lower prices. Additional offerings of black sheets in round lots at 7.75c. at mill for No. 28 have been made to Cleveland steel barrel manufacturers, but this price is not being met by other producers. The usual quotations are 8.50c. for No. 28 black and No. 10 blue annealed, and 10.50c. for No. 28 galvanized. A new Government inquiry is for 500 tons of corrugated sheets either painted or galvanized for quick delivery. Prices on hard steel bars are easier, quotations ranging from 3.75c. to 4c. at mill. We quote bar iron at 4.25c. to 4.50c., Cleveland. Warehouse prices are unchanged at 4.50c. to 5c. for steel bars, 5c. to 5.25c. for structural material, 8.50c. for blue annealed sheets and 10.50c. for galvanized sheets.

Pig Iron.—The market continues inactive, sales being limited to a few small lots of foundry iron for prompt shipment. No Cleveland made iron is available for early shipment, but Valley iron is quoted at $52.75 to $53 for No. 2 delivered in this city for early shipment, and Virginia iron at $53.20. Both Northern and Southern furnaces are behind on shipments and are being crowded by consumers for deliveries. Some foundries are in actual need of iron, and others are trying to accumulate a reserve stock. Furnaces are now receiving actual orders for 16,000 tons of iron allotted by the Government several weeks ago for the Navy Department and Emergency Fleet. Some of this iron is wanted in about sixty days and a portion not until next spring. Steel making iron is quiet. A Cleveland interest is offering 1000 tons of Valley resale basic iron for prompt shipment, but so far has not found a consumer who wants the iron. A Pittsburgh broker is inquiring for 4000 tons of basic iron for delivery around the end of the year. Southern iron is quoted at $47 to $48 for prompt shipment, but can be bought at $45 for the first half. Silvery iron is easier and although no late sales are reported. an inquiry would probably bring out an $80 price. We quote, delivered Cleveland, as follows:

Bessemer	$50.95 to $52.95
Basic	48.95
Northern No. 2 foundry	52.75 to 53.00
Southern No. 2 foundry	49.00 to 54.00
Gray forge	48.95 to 50.95
Ohio silvery, 8 per cent silicon	81.62 to 86.62
Standard low phos. Valley furnace	85.00

Bolts, Nuts and Rivets.—The demand for bolts and nuts for Government work for motor trucks, wagons, airplanes and other equipment is very heavy and makers are getting further behind on deliveries of some lines. Prices are firm. New inquiry for rivets is not active, but specifications on contracts are very heavy. We quote rivets at 5.25c., Pittsburgh, for structural and 5.35c. for boiler rivets. Bolt and nut discounts are as follows, round lot buyers being allowed 5 to 10 per cent discount from these prices:

Common carriage bolts, ¾ x 6 in., smaller or shorter, rolled thread, 35 off; cut thread, 30 and 5, larger or longer, 20. Machine bolts, with h. p. nuts, ⅝ x 4 in., smaller or shorter, rolled thread, 40; cut thread, 35; larger and longer, 25. Lag bolts, cone point, 40. Square h. p. nuts, blank, $1.90 off list; tapped, $1.70 off list. Hexagon, h. p. nuts, blank, $1.70 off; tapped, $1.50 off. C. p. c. and t. hexagon nuts, all sizes, blank, $1.25 off; tapped, $1 off. Cold pressed semi-finished hexagon nuts, 50 and 5 off.

Old Material.—The market, which has been very dull, has taken on a little life and a firmer tone has developed, due largely to some activity reported in the Pittsburgh district and to the expectation of a fall buying movement soon. Heavy melting steel is slightly higher and several other grades, including borings and turnings, have been marked up 50c. to $1 a ton. A Canton mill is reported to have purchased about 2000 tons of heavy melting steel at $34 and a western Pennsylvania consumer is inquiring for several thousand tons of turnings. Some inquiry is also coming from dealers for turnings. Relaying rails are bringing higher prices because of the scarcity of new rails. We quote prices, f.o.b. Cleveland, as follows:

Per Gross Ton	
Steel rails	$32.00 to $33.00
Steel rails, rerolling	44.50 to 45.50
Steel rails, under 3 ft	35.00 to 36.00
Iron rails	42.50 to 43.50
Steel car axles	50.00 to 51.00
Heavy melting steel	33.00 to 34.00
Carwheels	30.50 to 31.50
Relaying rails, 50 lb. and over	50.00 to 60.00
Agricultural malleable	24.50 to 25.00
Railroad malleable	32.00 to 33.00
Light bundled sheet scrap	24.00 to 25.00
Per Net Ton	
Iron car axles	$46.50 to $47.00
Cast borings	18.50 to 19.00
Iron and steel turnings and drillings	18.00 to 18.50
No. 1 busheling	27.00 to 28.00
No. 1 railroad wrought	41.50 to 42.00
No. 1 cast	27.00 to 28.00
Railroad grate bars	22.00 to 23.00
Stove plate	21.00 to 22.00

Philadelphia

PHILADELPHIA, Sept. 18.

Coal troubles are still a conspicuous factor in the Philadelphia district. Virtually no soft coal at the $2 Government price is being sold. Mills that have contracts are specifying heavily, but the diversion of fuel to other points and the shortage of cars makes it possible for many plants to operate only on a day-to-day basis, with no telling when supplies of fuel may be exhausted. A plate mill in Eastern Pennsylvania has four furnaces ready to light, but has been obliged to delay doing so because of shortage of gas coal, and thereby output is being reduced. Repeated offerings of resale pig iron in this territory have had comparatively little effect upon prices quoted by the furnaces, but inquiry has been too light to offer a real test of what furnaces might be willing to do. Some blast furnaces have been persuaded that it is to their interest to contract ahead for furnace coke and several contracts for the first half of next year at $8.50, ovens, have been made. The coal situation is being pointed to as an example of what might happen in the coke trade following Government regulation of prices. It appears that furnaces which have sold their iron well ahead would rather be sure of a supply of coke at $8.50 than to take chances on getting a supply at the price the Government may dictate.

Pig Iron.—It is estimated that from 4000 to 5000 tons of resale foundry iron have been disposed of in this market within the past two weeks, largely in lots of one or two carloads. Prices have ranged from $2 to $4 under the lowest prices which furnaces have been willing to quote. Much of these offerings have been traced to an exporting house in New York which had a considerable tonnage under contract for export to Sweden when the embargo was declared. Some consumers are also re-selling. Although buyers have tried to use these resales to draw lower quotations from furnaces, they have been largely unsuccessful. The Eastern furnaces are in a favorable position, having sufficient tonnage on their books so that they can afford to sit tight and await the outcome of the present unsettled condition. Producers of iron are firm in their views and are not as greatly disturbed by the possibility of Government price-fixing as might be expected. Alabama No. 2 foundry iron is being offered for delivery in the first half of next year at $47, Birmingham. Eastern Pennsylvania No. 2 X foundry and Virginia No. 2 X foundry are to be had at $51, furnace, for prompt delivery, and possibly $50 could be done on a sizable order, but we have no knowledge of sales at the latter price. A sale of 1000 tons of Bessemer iron

for export at $54, delivered in New York, was made yesterday, but undoubtedly a lower price could be had on a domestic inquiry. A fair tonnage of 0.07 low phosphorus was also sold for export at $55, delivered, New York. There have been no other sales of importance. Prices are as follows for these standard brands, prompt delivery in buyers' yards:

Eastern Penna. No. 2 X foundry	$50.00 to $53.00
Eastern Penna. No. 2 plain	49.25 to 52.25
Virginia No. 2 X foundry	51.75 to 54.75
Virginia No. 2 plain	51.25 to 54.25
Basic	48.00 to 50.00
Standard low phosphorus	85.00 to 90.00

Coke.—Blast furnaces which have sold their iron for some time ahead show a disposition to place contracts for coke as they foresee a condition similar to that existing in the coal trade, if the Government fixes coke prices, where only those holding contracts can be sure of a supply. Several contracts for furnace coke for the first half of 1918 at $8.50, ovens, are reported. Spot furnace coke continues to sell at about $13, ovens. Spot foundry coke is $13 to $14, ovens, while $11 to $11.50 is quoted for delivery in the first half of next year.

Ferroalloys.—Ferromanganese is dull and weaker, with $375 now being quoted for prompt and $350 to $375 for fourth quarter and $350 for first half of 1918. Receipts of Brazilian manganese ore are said to be liberal. Spiegeleisen is now being quoted at $82.50, furnace.

Billets.—Several leading producers have no billets to offer, but because of low-priced offerings in Pittsburgh the market has weakened greatly, and $70 to $75, Pittsburgh, is now heard here for open-hearth and Bessemer rerolling billets, with forging billets about $10 higher.

Sheets.—Jobbers are placing very little business. Deliveries continue easy, with three to six weeks, and, in some instances, even better being quoted. Prices are weaker on the basis of 8.50c. for No. 10 blue annealed, 8.50c. to 9c. for No. 28 black and 10.50c. to 11c. for No. 28 galvanized, Pittsburgh, with quotations as low as 9.50c. to 10c. for galvanized being heard.

Structural Material.—Export licenses for ship shapes going to Japan are now being quite freely issued by the Government and several shipments have gone forward during the past week. A liberal tonnage of plain material for export to the Far East was sold a few days ago at 8c., Pittsburgh. Resale lots continue to appear at around 4.50c. The mill price is about 4.50c. to 5c., the lower price being on contract with shipments at mill convenience. The only domestic inquiry of importance is for 2500 tons for the new gun-forging plant of the Tacony Ordnance Corporation, Tacony, Pa., which will be awarded in a few days. The Stone & Webster Engineering Corporation, Boston and New York, is about to close for steel for 32 buildings to be erected for the United States Army in France, and which it is now estimated will require 425 tons each, or a total of 13,600 tons. Local fabricators have given estimates. Contracts for fabricating steel for 100 buildings to be erected by army engineers in France, each building requiring 110 tons, have nearly all been let. As mentioned last week, the Blaw Steel Construction Co., Pittsburgh, took a large share. Other companies receiving contracts include the Virginia Bridge & Iron Co., the Fort Pitt Bridge Works, the Lackawanna Bridge Co., and the King Bridge Co.

Plates.—Some mills are anxious for business, but are not willing to enter into competition with resellers whose offerings are made at prices varying from 7c. to 9c. One or two mills, which have little or no tonnage to offer, continue to quote the market for tank plates at 10c., base, Pittsburgh, but 9c. can be done for fairly prompt delivery and 8c. for fourth quarter. Several thousand tons have been sold for the last quarter by one producer at 8c. to 9c., Pittsburgh. A sale of 2000 tons of ship plates for shipment to Japan was made last week at 10c., Pittsburgh, the purchaser declaring that an export license had been granted. Despite the lack of definite information from Washington, the belief persists here that this Government will soon raise the embargo on shipments of plates to Japan. Inquiries for export are coming in almost daily. An inquiry received yesterday called for 13,000 tons of hull steel and 2000 tons of boiler steel wanted for shipment throughout 1918. The coal situation continues to be a disturbing factor. An eastern Pennsylvania plate mill has four furnaces ready to be lighted, which cannot be started on account of shortage of gas coal.

Iron and Steel Bars.—Sales of steel bars for prompt delivery have been made at 4.40c., Pittsburgh, with 4.50c. as the ruling quotation. Contracts for fourth quarter have been made at 4c. to 4.25c. Bar iron is unchanged at 4.75c. to 5c. and a fair business is being done.

Old Material.—Mills are buying very lightly and trading is confined largely to transactions between dealers. Prices per gross ton delivered in the Pennsylvania district are about as follows:

No. 1 heavy melting steel	$30.00 to $32.00
Steel rails, rerolling	41.00 to 43.00
Low phosphorus heavy melting	40.00 to 43.00
Old iron rails	43.00 to 45.00
Old carwheels	32.00 to 34.00
No. 1 railroad wrought	43.00 to 45.00
No. 1 forge fire	23.00 to 24.00
Bundled sheets	23.00 to 24.00
No. 2 busheling	16.00 to 17.00
Machine shop turnings (for blast furnace use)	17.00 to 19.00
Machine shop turnings (for rolling mill use)	20.00 to 21.00
Cast borings (for blast furnace use)	17.00 to 19.00
Cast borings (clean)	22.00 to 23.00
No. 1 cast	30.00 to 32.00
Grate bars	21.00 to 22.00
Stove plate	21.00 to 22.00
Railroad malleable	32.50 to 35.00
Wrought iron and soft steel pipes and tubes (new specifications)	30.00 to 32.00

Cincinnati

CINCINNATI, Sept. 18. (*By Wire.*)

More than the usual quantity of off iron has been made lately, due to the irregularity of furnace operations and the low grade coke furnished. The low prices prevailing for scrap make it somewhat difficult to dispose of this iron, but fortunately no important tonnage has yet been piled. Buyers are slower than they have been in covering even for nearby requirements, which is evidenced by their refusal to become interested in a few cars of consignment iron that were offered at attractive prices. The only inquiry out is from Michigan for foundry iron, for 500 tons for last quarter and first quarter shipment. The specifications indicate that Northern iron will be bought, if the order is placed. While there is very little iron in the Hanging Rock district for this year's shipment and no large tonnage for the first half, price reductions there are simply reflections from other Northern markets. To-day's quotations for this year now range from $53 to $54, Ironton, and for the first half all the way from $51 to $54. The Southern furnace price on No. 2 foundry is from $47 to $50 for this year and around $44 to $45 for the first half. Holders of resale iron seem to realize that any reduction in prices will not induce melters to contract now and they are holding close to the furnace figures. Offers are solicited, but without result. Virginia 2X is quoted at $51 furnace, but very few carloads have been sold in this vicinity lately. A typographical error in this report last week was responsible for the statement that a rate of Virginia iron was made at $45, whereas $51 was the price. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, as follows:

Southern coke, No. 1 f'dry and 1 soft.	$51.40 to $52.40
Southern coke, No. 2 f'dry and 2 soft.	49.90 to 50.90
Southern coke, No. 3 foundry	49.40 to 50.40
Southern coke, No. 4 foundry	48.90 to 49.90
Southern gray forge	48.90 to 49.90
Ohio silvery, 8 per cent silicon	87.26 to 91.26
Southern Ohio coke, No. 1	54.76 to 55.76
Southern Ohio coke, No. 2	54.26 to 55.26
Southern Ohio coke, No. 3	53.76 to 54.76
Southern Ohio malleable Bessemer	54.26 to 55.26
Basic, Northern	54.26 to 55.26
Standard Southern charcoal	56.90 to 57.90

(*By Mail*)

Finished Material.—As a rule, the warehouses report business as keeping up fairly well, although new purchases are for limited amounts of structural material, cold rolled shafting, boiler tubes, sheets, etc. Ship-

ments from the mills are moving fast enough on all contracts to take the place of material shipped out. The nearby mills are quoting No. 28 black sheets at $8.65 and No. 28 galvanized at $10.65. These are the minimum prices named on any new business that is accepted. At the present time, new customers are not being sought and almost the entire mill outputs are employed to take care of old customers needs. We quote from warehouse stocks, iron and steel bars at 5c.; twisted steel bars, 5.05c.; plates ¼-in. and heavier, 10c. base; wire nails, $3.90 per keg and barb wire 5c. a lb. There is a very small demand for nails due to the curtailed building operations in the Central West.

Coke.—Late reports from reliable sources show that there is very little coke in the Wise County and Pocahontas fields that can be shipped this year. Some operators are said to have disposed of their outputs through the first half of next year. In the New River district, this condition exists, but in a more limited degree and there is still some foundry coke offered there for nearby shipment around $15 per net ton at oven. Connellsville 48-hr. coke for spot shipment is bringing all the way from $12 to $14 at oven and the average contract price per shipment next year is $10. On 72-hr. coke, the spot shipment price ranges from $13.50 to $14.50 and contract figures are from $10 to $12.50. These same figures are quoted in the Wise County and Pocahontas fields for what little coke there is to be obtained in those districts. The car supply has improved to a limited extent, but the labor shortage continues to be the chief obstacle in the way of obtaining anything like an average output.

Old Material.—Although there is still trouble in moving shipments east, local dealers have not used box cars for sending scrap to the rolling mills as has been done in other centers, realizing that scrap thus shipped would have to be unloaded by hand. There is very little demand for scrap of any kind and the foundries are buying only small quantities to carry them along from two to four weeks in advance. Heavy melting steel scrap has declined to $30 and steel rails for melting are also quoted at $30 per gross ton. The following are dealers' prices, f.o.b. cars southern Ohio and Cincinnati:

Per Gross Ton

Bundled sheet scrap	$19.50 to $20.00
Old iron rails	33.50 to 34.00
Relaying rails, 50 lb. and up	45.50 to 46.00
Rerolling steel rails	36.00 to 36.50
Heavy melting steel scrap	30.00 to 30.50
Steel rails for melting	30.00 to 30.50
Old carwheels	29.00 to 29.50

Per Net Ton

No. 1 railroad wrought	$31.00 to $31.50
Cast borings	13.50 to 14.00
Steel turnings	13.50 to 14.00
Railroad cast	21.50 to 22.00
No. 1 machinery cast	25.00 to 25.50
Burnt scrap	14.50 to 15.00
Iron axles	44.00 to 44.50
Locomotive tires (smooth inside)	37.00 to 37.50
Pipes and flues	17.50 to 18.00
Malleable cast	22.50 to 23.00
Railroad tank and sheet	16.00 to 16.50

Birmingham

BIRMINGHAM, ALA., Sept. 18.

Pig Iron.—The Southern pig-iron market shows but little change, few sales being made, consumers apparently waiting until the Government has fixed a price in its control. The manufacturers are still behind in deliveries, production is a little off and the high quotations of the past several weeks are being maintained. Very little iron is to be offered from the probable make during the last three months of the year. There has been considerable iron sold also through the first half of 1918. Several of the larger consumers who placed orders in this district several months ago have sent representatives here again to urge deliveries, delays being troublesome. Inquiries being received again indicate a need for iron and intimation is given that if there should be some concessions, a good-sized tonnage might be placed. The accumulated stocks of pig iron show still further reduction this week, notwithstanding the reports of delays in deliveries. The quotations on iron are based on $50 for this year delivery on No. 2 foundry and basic, and $48 for next year's delivery. No reports are to be heard as to resale iron, though it is a fact that thousands of tons are still at various ports waiting transportation facilities for export. Pig iron quotations in the South are as follows:

No. 1 foundry and soft	$49.50 to $50.00
No. 2 foundry and soft	48.00 to 50.00
No. 3 foundry	47.50 to 48.00
No. 4 foundry	47.00 to 47.50
Gray forge	46.00 to 46.50
Charcoal	55.00 to 56.00
Basic	48.00 to 50.00

Old Material.—The old-material or scrap-iron and steel market in the South is weak and prices have declined a little as compared to last week. Consumers of heavy melting steel are offering under $21.50, and other scrap shows a deflection in price. Dealers report further increase in stock on hand. Quotations are as follows:

Old steel axles	$32.00 to $33.00
Old steel rails	24.00 to 25.00
No. 1 wrought	26.00 to 27.00
Heavy melting steel	20.50 to 21.50
No. 1 machinery	23.50 to 24.50
Car wheels	23.00 to 24.00
Tramcar wheels	20 00 to 21.00
Stove plate	18.00 to 19.00
Shop turnings	11.00 to 12.00

Coal and Coke.—Coal and coke production in Alabama shows improvement, as the labor agitation is at rest pending revision of prices for coal, f.o.b. at mines on the schedule given out by President Wilson at Washington. The United Mine Workers of America, Alabama district No. 20, is making efforts to induce the Government officials to recognize the protest of the Alabama operators against the prices fixed, and the hope is expressed that the miners will then be given some consideration. In the meantime there is to be no cessation of work by the union men. Every ton of coal and coke that can be produced is needed. The Woodward Iron Co. is drying out the 60 Wilputte by-product ovens at Woodward and will within the next three to four weeks be making coke and other by-products there. This plant will add considerably to the coke production by this company, not only supplying its own needs but giving much coke for the open markets. Producers of coke are unable to take on any new business now and will hardly be able to until next year. Quotations of coke are still around $12.50, foundry coke, and $8 to $10 on furnace coke, though contracts at almost half these prices are being worked on.

Pipe and Foundries.—The United States Cast Iron Pipe and Foundry Co. has piled up much pipe on the Argentine order and can get no transportation therefor, hence efforts are being transferred into other directions. Considerable iron is being melted by the above company, the American Cast Iron Pipe Co. and the National Cast Iron Pipe Co. Foundries are still laden with numerous orders for various products, Government orders in particular being numerous. Pipe prices still range between $60 and $63 for 6-in. and 4-in. sizes respectively.

St. Louis

ST. LOUIS, Sept. 17.

Pig Iron.—The interest in pig iron, aside from some special needs for small lots of analysis iron for immediate delivery has been rather slight, except for one inquiry for 1000 to 2000 tons of malleable for the last half of 1918 and 500 tons of No. 2 Southern foundry, in which latter case the inquiry was withdrawn after sounding out the market conditions. One call from an outside territory for 4000 tons of basic was presented to the local furnace, but it was not in position to consider the deliveries desired, although it is at present operating on basic iron. About 100 tons of ferromanganese was sold during the week at top prices and there was a considerable call for spiegeleisen for early delivery, about 400 tons being wanted. Quotations, despite the nominal condition of the market, were placed, largely as for the past several weeks, at $47 to $48 for deferred deliveries of No. 2 Southern foundry and $50 for spot or nearby delivery. Basic is held by the local

furnace at $55 per ton, though it can make only very deferred delivery.

Coke.—Very little was done during the week in foundry coke, only small lots being considered in the transactions closed, which were in the vicinity of $13 to $13.50, Connellsville, for the best selected 72-hr. On deferred deliveries there was some weakening of prices and the quotation was put at $10, Connellsville, for next year. The local by-product plant continues out of the market.

Finished Iron and Steel.—In finished products there was practically nothing being done so far as future contracts were concerned, and the consumers turned naturally to the warehouses to meet their immediate wants, particularly as deliveries on existing contracts are in an unsatisfactory condition. Mill representatives will not accept new business and are devoting all their attention to problems involved in material already contracted for and badly wanted by customers. Movement out of warehouse has been as active as ever with the demand exceeding the ability of warehouses to meet it as promptly as is desirable. For stock out of warehouse we quote as follows: Soft steel bars, 4.55c.; iron bars, 4.50c.; structural material, 5.05c.; tank plates, 10.05c.; No. 10 blue annealed sheets, 10.05c.; No. 28 black sheets, cold rolled, one pass, 10.35c.; No. 28 galvanized sheets, black sheet gage, 11.75c.

Old Material.—It continues to be a dealers' market in scrap and not much of a market at that as the dealers are unwilling to commit themselves either way and are awaiting the long expected Government action as to iron and steel prices which they are figuring will have a decided effect upon the quotations of their material. Dealers are trading a little among themselves to meet contract requirements, but are doing nothing other than this. Locally the rolling mills are taking very little and then only bargains as they appear. The steel mills are not in the market at all. The foundry grades are in very slight call. The Wabash list which closed last week went at fair prices to Chicago and Eastern interests, while the Union Pacific list went largely to Western interests. No new lists appeared this week. We quote dealers' prices f.o.b. customers' works, St. Louis industrial district as follows:

	Per Gross Ton
Old iron rails	$40.25 to $40.75
Old steel rails, re-rolling	38.00 to 38.50
Old steel rails, less than 3 ft.	37.00 to 38.00
Relaying rails, standard section, subject to inspection	50.00 to 55.00
Old car wheels	31.50 to 32.00
No. 1 railroad heavy melting steel scrap	30.50 to 31.00
Heavy shoveling steel	29.00 to 29.50
Ordinary shoveling steel	26.00 to 26.50
Frogs, switches and guards cut apart	30.50 to 31.00
Ordinary bundled sheet scrap	20.50 to 21.00
Heavy axle and tire turnings	20.00 to 21.00
Per Net Ton	
Iron angle bars	$39.00 to $39.50
Steel angle bars	28.00 to 29.00
Iron car axles	44.50 to 45.50
Steel car axles	42.50 to 43.00
Wrought arch bars and transoms	41.50 to 42.00
No. 1 railroad wrought	35.50 to 36.00
No. 2 railroad wrought	33.50 to 34.00
Railroad springs	31.50 to 32.00
Steel couplers and knuckles	36.50 to 37.00
Locomotive tires, 42 in. and over, smooth inside	39.00 to 39.50
No. 1 dealers' forge	26.50 to 27.00
Cast iron borings	16.50 to 17.00
No. 1 busheling	25.00 to 25.50
No. 1 boilers, cut to sheets and rings	21.50 to 22.00
No. 1 railroad cast scrap	21.00 to 21.50
Stove plate and light cast scrap	16.00 to 16.50
Railroad malleable	29.00 to 30.00
Agricultural malleable	24.00 to 24.50
Pipes and flues	22.50 to 23.00
Heavy railroad sheet and tank scrap	18.00 to 18.50
Railroad grate bars	18.50 to 19.00
Machine shop turnings	17.50 to 18.00
Country mixed scrap	16.50 to 17.00

San Francisco

SAN FRANCISCO, Sept. 11.

There is not the same activity in the market here that prevailed a few weeks ago. War conditions have changed the local situation, and the trade, generally, is marking time only. None of the jobbers is placing any orders of consequence, waiting for events to develop, with a possible regulation of iron and steel prices by the Government. Some anxiety is felt over the general industrial unrest. It now looks as though the present car strike in San Francisco, which has lasted a month, is about to be made worse by a walk out of the iron trades' employees, supplemented by a strike in the shipyards. All these factors have contributed to a slacking of orders in most lines of the trade not subject to Government requisitions.

Bars.—Local mills are still announcing that, in consequence of the number of orders yet on file, they find themselves unable to contract for new business. Most of these orders are intended for export, as the local demand, on account of the doubtful aspect of the future, is less demonstrative than formerly. For some months, a strong demand has prevailed for twisted steel bars, used in the construction of concrete buildings, but the cessation in building has caused an easing off on orders. Jobbers and local mills quote a base price of 6.50c.; on steel bars, out of stock, in small quantities, but the latter decline to quote on carload lots, except on specifications. Some independent Eastern mills, owing to a temporary surplus of certain sizes, are able to quote small rounds, not over 2-in. in carload lots, not less than 25 tons of a size, at 5.25c., which is under the local market.

Structural Materials.—With few public edifices going up and a halt in private building, there has been a considerable falling off in the placing of orders for structural materials. Needs are confined largely to requirements for odd work, rather than for building operations. In small quantities, quotations, out of merchant's stocks, are given at 7.75c, for 3-in. and larger, angles, channels and beams.

Plates.—Owing to the influence of the embargo, pronounced offers are arriving from Eastern mills, indicating that they can spare tonnage on plates for October shipment, and independent concerns offer deliveries on orders, in 30 to 60 days. Tank plates, out of merchants' stocks, are still quoted at 10.50c., but the situation is easier because of prompter shipments.

Sheets.—Although there is still a fairly active demand for some sizes, the demand lately has not kept up its former pace. The general feeling in the trade here is that the peak of the high prices of sheets has been reached, as indicated by the fact that the same level of prices has been maintained for several weeks, without an advance. However, with the Government's requisitions yet to be filled, the amount of which cannot be gaged, as no orders from the Government have been received, prices may advance when they arrive at the mills.

Wrought Pipe.—Deliveries of wrought pipe have not been so satisfactory as they have been in some other lines. Demand for most sizes continues brisk. Oil pipe for the oil fields is eagerly sought and a shortage of stocks makes it difficult to fill orders. Prices of wrought pipe remain unchanged, 4-in. black oil pipe being quoted at a base price of $96.25 per 100 ft.

Cast Iron Pipe.—For the present, few public works of a character requiring cast iron pipe are planned, and there are no gas or water works under construction that have not already contracted for their requirements. The largest contract offering to manufacturers of cast iron pipe comes from Santa Barbara, which city calls for bids on 100 tons. Quotations are given at $73 for 6-in. or larger, with gas pipe Class A, at $77, delivered here. Notification has been received that after Oct. 15 the railroad freight rate on cast iron pipe will be advanced $4 a ton.

Pig Iron.—Jobbers report that, in view of possible Government action in the matter of prices, buyers are holding off and refraining from making any contracts for pig iron. The halt in inquiries is so decided that there is, practically, no demand at all in this market, and buying will not reopen until something more definite is known of the Government's intentions.

Coke.—A more pronounced stringency in the coke market exists here and prices have advanced materially. As high as $30 a ton is asked, but buyers will not consider any purchases beyond their actual needs, at this time, on account of the uncertain outlook.

Old Materials.—Holders who had entertained very strong views regarding prices have now modified their demands somewhat. Finding that stocks did not move at prices asked, they have been letting go at more modest figures. Country scrap is now quoted at $23 to $25, and heavy melting at $30 to $33, but these figures are not firmly held to. The mining camps of Aurora and Bodie, besides many other smaller camps, have been stripped of the old machinery, much of which has been shipped to San Francisco. From 2000 to 3000 tons of this scrap has been taken out of the two camps. The Mono Lake and Bodie Railroad, long disused, has also been torn up and the steel rails and fish plates shipped to the war zone.

British Steel Market

Foundry and Hematite Iron Strong—Some Tin Plates Sold Below Official Price

LONDON, ENGLAND, Sept. 19—(*By Cable*).

Demand for Cleveland foundry pig iron is firm and broadening. Forge iron is somewhat easier, but hematite iron is strong. The tin plate market is generally firm, but concessions are being made for light plates below the official basis. American tin plates, double boxes, standard weight, are being offered at $35 f.o.b. New York. American semi-finished steel for November-December shipment is idle. Ferromanganese is nominal. We quote as follows:

Tin plates, coke, 14 x 20; 112 sheets, 108 lb., f.o.b. Wales, maximum, 30s.
Ferromanganese, £45 nominal.
Ferrosilicon, 50 per cent, c.i.f., £35 upward.
On other products control prices are as quoted in THE IRON AGE of July 19, p. 171.

Basic Iron Output Increased—American Semi-Finished Steel Unobtainable

(*By Mail*)

LONDON, ENGLAND, Aug. 28, 1917.—More activity has appeared in the second than in the first half of August when holidays restrained operations. Government control is still being extended in various directions at the expense of the merchant trade, whose overseas connections have been nearly obliterated with not much prospect of being reopened during the war. A fair amount of business is still proceeding to meet urgent Allied requirements arranged through Government departments or under close official control. Labor conditions are tight. There is certainly no relaxation of the intense firmness which has long prevailed, although there is an impression that the inflation of prices has about reached its apex, while the official maxima remain unchanged.

The additional steps taken to stimulate the production of basic iron seem to meet with a fair measure of success. Furnaces in the Midlands have been provided with the necessary accommodation and operations should improve shortly, while a widening of enterprise is contemplated in Staffordshire. Demand for Cleveland common iron has slackened, but considerable is being diverted to Scotland against August allotments, consumers' operations there being on a big scale in connection with shipbuilding. Exports to the Allies are being made as far as shipping tonnage will permit and old contracts are being worked off satisfactorily, but there is still an insatiable domestic demand for hematite while deliveries are closely supervised although output, which was temporarily weakened by furnace repairs should again increase soon. Inquiry from the Allies is persistent. There has been some interruption of iron-ore receipts through the labor troubles in Spain, but supplies are still coming so as to enable furnaces to secure enough material to protect their operations.

British semi-finished steel is unchanged, practically the whole output being allocated for essential Government contracts and official prices for Welsh bars as well as billets are retained at £10 7s 6d. The supply of discard material is being quickly absorbed at full prices, manufacturers being only too glad to utilize them, for there is no sign of relief in other directions and American material is virtually unobtainable. No offers of American billets have been made in spite of the reports of resales being attempted in America at reduced prices. The market for wire rods seems in a few hands with prices varying from £28 to £29 c.i.f. Liverpool, but demand is now slow, consumers being apparently well covered.

The latest advices available from the Midlands speak of a more lively demand for finished products, all descriptions being wanted in much larger amounts than can possibly be obtained. The mills have to face a flood of Government orders to which have first consideration and merchant business is more handicapped than ever. Bar makers seem booked to the end of the year. High premiums are being paid for early delivery of uncontrolled material such as iron and steel hoops and gas-strip.

Regulating the Tin-Plate Market

The tin-plate market has remained idle with business chiefly confined to "free" stock lots, selling up to 50s, usual basis, the concession for which will be entirely withdrawn Aug. 31, so that all sales will then be based on the official basis price of 30s net at makers' works against permits as fixed recently, whether for home trade or export. The official order giving all particulars of extras, allowances, etc., has at last been issued, the details being practically as anticipated. The delay in issuing this has held up business against permits for weeks past, and trading should now revive, although makers are already well sold up and not inclined to increase commitments inasmuch as some hope that the basis price may be raised a shilling or two. The official price is based on tin at £240, and an allowance either way has to be made at the rate of 1½d per box for each advance or decline of fully £5 a ton in tin. The strict regulations will probably entail much clerical work. There is a big Government inquiry for France and Italy.

As already advised by cable, the price of black sheets, basis No. 24, was about a week ago tentatively fixed at £17 10s net at makers' works, with allowances for other sizes, but there seems nothing definite regarding the control to be enforced, and business is largely held up for the present.

According to mail advices a commission has been appointed by the Queensland Government to make inquiries as to establishing an iron and steel plant there. The commission will inquire into the deposits of iron ore in Queensland, together with the deposits of limestone and fuel. It will also make inquiries as to the most suitable site and the cost of their erection. The Queensland Department of Mines is well furnished with reports on iron ore, as well as on limestone deposits in various parts of the State.

Buffalo

BUFFALO, Sept. 17.

Pig Iron.—Only a very small total of sales is reported for the week. Consumers are apparently not inclined to buy at present for next year's delivery, which is the only period for which the majority of furnaces have iron to sell. Another Government order of very moderate tonnage has been placed with one of the producers of the district. Aside from this, sales made have consisted almost entirely of small tonnages of resale iron which melters had on hand in excess of their requirements, and which they were able to dispose of at a price yielding them a good profit over the purchase cost. A little No. 2 X foundry has been sold at $53 and a little Malleable at $53 to $55, but the tonnage of sales has been really insignificant.

Price schedules are about the same as last week, and we quote as follows, f.o.b. furnace, Buffalo for 1918 delivery:

High silicon irons	$55.00 to $56.00
No. 1 foundry	54.00 to 55.00
No. 2 X foundry	53.00 to 55.00
No. 2 plain	52.00 to 54.00
No. 2 foundry	51.00 to 53.00
Gray forge	51.00 to 53.00
Malleable	53.00 to 55.00
Basic	54.00 to 55.00
Lake Superior charcoal, f.o.b. Buffalo.	55.00 to 60.00

Finished Iron and Steel.—Specification from the general lines of trade for commercial uses remains light, but specifications are coming in more freely against Government contracts. The mills are still averse to taking on new obligations because of this increased Government demand. Prices for finished material remain unchanged at 4 to 4½c. for bars, 4¼ to 4½c. for structural shapes, 8c. for universal plates and 8 to 10c. for sheared plates. In cold rolled steel a little tonnage has been moved at a minimum of 10 off to the largest dealers, 5 off to the average dealer, with full list price for less than carload lots. Of the 11,000 tons of fabricated structural steel, for which the tonnage is to be distributed by the Government among a number of companies in this country for storage warehouses to be erected in France, 1500 tons has been awarded to the Lackawanna Bridge Co., Buffalo. A contract has also been awarded by the Government for 450 tons of steel sheets for roofing these storage warehouses, one-half of which went to a Buffalo producer.

Old Material.—Although the market shows more activity than reported a week ago, there has not been sufficient business transacted to thoroughly test prices. There is some disposition among dealers to believe that the schedule current for the past week or two would prove to be low in actual test; and that at the present tension any attempt to buy any considerable tonnages would mean a higher price level. Dealers are apparently not making much effort to dispose of material, except in cases where they find it necessary to move loaded material on track promptly. The embargo situation, which makes it necessary to secure a shipping permit for nearly every consignment prevents the free movement of material, and dealers are inclined to accept reduced figures on consignments to points that are obstructed by embargoes, and to provide outlet for material which otherwise would have to be unloaded into stock. Reports of the disposal of large tonnages of heavy melting steel and other scrap commodities in the Pittsburgh district during the past few days have had a tendency to check the downward trend in prices noted last week. We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$31.50 to $32.00
Low phosphorus	41.00 to 42.00
No. 1 railroad wrought	43.00 to 44.00
No. 1 railroad and machinery cast	30.00 to 31.00
Iron axles	45.00 to 47.00
Steel axles	45.00 to 47.00
Carwheels	35.00 to 36.00
Railroad malleable	32.00 to 33.00
Machine shop turnings	18.00 to 19.00
Heavy axle turnings	26.00 to 27.00
Clean cast borings	20.00 to 21.00
Iron rails	43.00 to 44.00
Locomotive grate bars	20.00 to 21.00
Stove plate	21.00 to 22.00
Wrought pipe	28.00 to 29.00
No. 1 busheling scrap	28.00 to 29.00
No. 2 busheling scrap	18.00 to 19.00
Bundled sheet stamping scrap	20.00 to 21.00

New York

NEW YORK, Sept. 19.

Pig Iron.—Last week the lowest price reported on eastern Pennsylvania No. 2 X was $47, furnace, but it has since developed that a sale of No. 3 foundry pig iron was made recently at $45, furnace, and that last week a sale of 800 tons of No. 2 plain was made for delivery to a New Jersey machinery company's foundry at $43.50, delivered, or about $43, furnace. Other sales have been made, however, at higher prices and buyers insist that the market is not weak. Some sales of resale iron have been made at concessions, but furnaces for the most part are not willing to sell at less than $50, furnace, for No. 2 foundry, and some are holding for considerably higher. The American Locomotive Co. is in the market for 500 tons of basic, high phosphorus and No. 3. The railroad situation seems to be somewhat improved at present, but the supply of cars is still limited and sellers expect that, with the return of winter, troubles will multiply. The coke situation is highly unsatisfactory and furnaces are having trouble in getting enough to keep in operation. We quote for tidewater delivery in the near future as follows:

No. 1 foundry	$45.75 to $50.75
No. 2 X	44.75 to 49.75
No. 2 plain	43.75 to 45.75
Southern No. 1 foundry	50.75 to 51.75
Southern No. 2 foundry and soft	50.25 to 51.25

Ferroalloys.—Quotations for domestic ferromanganese, 80 per cent, are somewhat easier. For prompt or last quarter delivery, $375 is being asked and for delivery in 1918, $350 is the prevailing quotation. It develops that higher quotations, put out soon after the liberal sales made about six weeks ago, were not established, the result being the foregoing levels. Inquiries at present are few and sales are negligible, consumers in general being apparently well provided for, despite the fact that deliveries on British contracts are considerably in arrears. Receipts in September are proceeding at a comfortable rate compared with July or August, and promise to exceed either one of those months. It is interesting to note that Government official statistics for July, just issued, show that exports of ferromanganese in that month were 628 tons, this being the first time that data for this particular product have been separately given. A sale of fair size for export is reported. The 4000 tons of high-grade spiegeleisen, referred to last week as before the market, is reported to have been purchasd by a Middle Western consumer at a price understood to be $80, furnace, for delivery this year. The market is quiet at $80 to $82.50, furnace, for this year's delivery. The market for 50 per cent ferrosilicon is inactive and about $200, delivered, is asked for material wanted this year and $140 to $175 for delivery in 1918.

Old Material.—While the market is still very dull, heavy melting steel shows a slight increase in activity, with a little higher price generally prevailing. There is a feeling, however, that before business increases to any considerable extent, lower quotations will be made. Brokers quote buying prices as follows to local producers and dealers, per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$28.00 to $28.50
Old steel rails (short lengths) or equivalent heavy steel scrap	28.00 to 29.00
Relaying rails	63.00 to 65.00
Rerolling rails	37.00 to 38.00
Iron and steel car axles	43.00 to 44.00
No. 1 railroad wrought	39.00 to 40.00
Wrought-iron track scrap	30.00 to 31.00
No. 1 yard wrought long	30.00 to 31.00
Light iron	8.00 to 10.00
Cast borings (clean)	19.00 to 20.00
Machine-shop turnings	16.00 to 17.00
Mixed borings and turnings	15.00 to 16.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long)	28.00 to 30.00

For cast-iron scrap, dealers in New York City and Brooklyn are quoting as follows to local foundries per gross ton:

No. 1 machinery cast	$30.00 to $31.00
No. 1 heavy cast (column, building material, etc.)	26.00 to 27.00
No. 2 cast (radiators, cast boilers, etc.)	26.00 to 28.00
Stove plate	18.00 to 19.00
Locomotive grate bars	18.00 to 19.00
Old carwheels	31 00 to 33.00
Malleable cast (railroad)	30.00 to 31.00

Cast Iron Pipe.—The Government has failed to a large extent in its effort to obtain other pipe for use in the cantonments in the different parts of the country and has used a much larger tonnage of cast-iron pipe than was expected. The result is that stocks of cast-iron pipe shops have been almost completely cleaned up. Owing to this fact and also to the fact that the shops have orders on hand which will keep them busy for about three months, conditions are satisfactory, although present demand is very light and no business of importance is in sight. The only municipal tonnage of any consequence pending is 300 tons for Jersey City, N. J. Carload lots of 6 and 8-in. and heavier are quoted at $65.50 per net ton, tidewater, and 4-in. at $68.50.

Structural Material.—The dullness which has been prevailing is indicated by the report of the Bridge Builders and Structural Society that only 38 per cent of the country's fabricating capacity was put under contract in August. So flat has the building situation

become locally that a meeting has been called in New York, Sept. 20, at 3 p. m., at the quarters of the president of Manhattan Borough, to "discuss with building investors and bankers ways and means of stimulating building construction in this city." Calls to the trade for the meeting have been issued by C. J. Curtin, Woolworth Building, in behalf of the Building Material Exchange of New York. No plain material transactions at less than 4.25c., Pittsburgh, are noted, though it is admitted that an attractive lot might be done at 4c., Pittsburgh. Fabricators were called to a meeting in Washington on Tuesday to settle the distribution of contracts for the 32 buildings of approximately 500 tons each for France. The distribution of the 100 buildings of 100 tons steel each seems not definitely settled, but those mentioned as getting five to ten buildings each include the King Bridge Co., the Lackawanna Bridge Co., the Virginia Bridge & Iron Co. and Milliken Brothers, Inc. Other new work, is as usual, largely for the Government or growing out of Government needs, but one new proposition, the first of its kind in some weeks, is for an addition for the Oppenheim-Collins store in Brooklyn, of 700 tons. Another sizeable project on which bids will be taken Sept. 28 is for Penn Treaty Pier 57, Philadelphia. For an ordnance plant at Tacony, Philadelphia, 2000 tons will be required, and the following covers the remainder of new large work: 1400 tons for the Watertown Arsenal; 250 tons for the Navy for storing models at Washington; 400 tons for the Penn Seaboard Corporation, Chester, Pa., and 200 tons for a power house for the Niles-Bement-Pond Co., Plainfield, N. J. For the Culver Line elevated road, Brooklyn, some 3800 tons will again be before the market, the bid received some months ago having finally been rejected. We quote mill shipments at 4.445c. to 5.195c., New York, while from warehouses shipments are made at 5c. to 5.50c. per lb., New York.

Steel Plates.—Sizeable inquiries continue for export, but no business is consummated, chiefly because of the impossibility apparently of getting licenses. Added to the 15,200 tons for ships for Italy, mentioned last week, may be noted 13,000 tons of hull plates and 2000 tons of boiler plates for Japan, to be taken over the remainder of this year and through 1918, and 12,000 tons for France for delivery over the first half. If deliveries could be arranged for, the supply of plates is forthcoming. It is interesting to note that one inquiry asks particularly for the mill's stand in the event of price recessions. While 8c., Pittsburgh, is regarded as minimum, a quotation of 7.50c., Pittsburgh, has been made on tank quality for export, with the transaction still open. One mill has under consideration a proposition to roll 5000 tons of slabs into plates at $20 for the conversion with 20 per cent rolling allowance, or in other words, to deliver 4500 tons of finished product from 5000 tons of semi-finished material. We quote plates from mill at 8.195c. and higher, New York, and out of store at 8c. and higher.

Iron and Steel Bars.—Business is flat, and while there are considerable export steel bar inquiries, they seem to be feelers and to indicate that exporters are taking the attitude of the domestic users to hold off as long as possible before purchasing. Contracting for iron bars is not being pushed ahead as fast as expected, and there are signs that deliveries on bar iron and bar iron products will shortly be easier, though no price changes are noted, owing to the absence of business in volume. With some mills steel bar deliveries show little improvement, some of these covering commitments under relatively low-priced contracts. We quote steel bars from mills over the rest of this year at 4.195c. to 4.695c., New York, and iron bars at 4.945c. From New York district warehouses steel and iron bars are sold at 5c. to 5.50c.

Steel Rails.—Numerous small lots for industrial plants continue to move and a price of $70 per ton for standard sections which obtained not long ago is now generally about $85 per ton, and as high as 5c. per lb. has been paid for rails cut to short lengths.

IRON AND INDUSTRIAL STOCKS

Preparing to Meet War Demands Has Depressing Effect

The stock market was not very active last week and the general tendency was downward. It is evident that preparations for meeting heavy demands for war financing are continuing and are having a decided effect on speculation in holding it down to a low point. Some stocks that are regarded as in the safe class are selling as low or lower than they did in the panic of 1907 and the depression is not confined to shares which are speculative in character. Standard railroad and other corporation bonds have felt the effect of the depression as much as stocks. Week before last 73 new low records were made in prices of bonds and last week 87 made new low records. The injurious effects of the new taxes are being thoroughly discounted.

Among the stocks that registered gains during the week were the following: American Car & Foundry, 1⅝; Baldwin Locomotive, ⅜; Baldwin Locomotive, pref., ½; Bethlehem Steel, 3¼; Bethlehem Steel, Class B t.cfs., 1½; Crucible Steel, ¼; International Harvester, N. J., 2; Lackawanna Steel, ¾; U. S. Steel, pref., ⅛. Among the stocks that made losses during the week were the following: American Locomotive, pref., 1⅜; American Steel Foundries, 1½; Bethlehem Steel, pref., 2; Midvale Steel, ⅞; Pressed Steel Car, 2; Republic Iron & Steel, ⅝; U. S. Steel, ⅝.

Allis-Chal., com..	22 - 24⅛	Int. Har. of N. J., com.	109 -112½
Allis-Chal., pref.	81½	Int. Har. Corp., com.	71 - 73½
Am. Can, com...	39 - 42¾	Lacka. Steel	77½ - 82
Am. Can, pref...	102 -108½	Lake Sup. Corp.	15½ - 16½
Am. Car & Fdy., com.	67½ - 73	Lukens, 1st pref.	102
Am. Car & Fdy., pref.	108 -112	Midvale Steel ...	47½ - 53¼
Am. Loco., com..	58¼ - 61	Nat.-Acme	32 - 33
Am. Loco., pref..	101 -101½	Nat. En. & Stm., com.	37½ - 40½
Am. Rad., com.	298	N. Y. Air Brake.	118 -123
Am. Ship. com...	89 - 90½	Nova. Scotia Stl.	91½ - 95¼
Am. Stl. Fdries..	63½ - 66	Pitts. Steel, pref.	97⅛ - 99¾
Bald. Loco., com.	55½ - 60½	Pressed Stl., com.	60 - 62½
Bald. Loco., pref.	100	Pressed Stl., pref.	99⅞ -101
Beth. Steel, com.	93 -105½	Ry. Steel Spring, com.	45 - 47½
Beth Steel, class B	90¼ -104½	Ry. Steel Spring, pref.	98⅜
Beth. Steel, pref.	95⅛ - 99	Republic, com...	76⅝ - 81½
Case (J. I.), pref.	80¼	Republic, pref.	101½
Cent. Fdry., com.	25½ - 27	Sloss, com.	42 - 46
Cent. Fdry., pref.	45	Superior Steel...	38 - 39½
Chic. Pneu. Tool	60¼ - 61	Transue-Williams	40¼
Colo. Fuel.....	42¼ - 44½	Un. Alloy Steel..	42 - 43
Cruc. Steel, com.	65½ - 70⅞	U. S. Pipe, com..	16 - 16½
Cruc. Steel, pref.	98	U. S. Pipe, pref.	50 - 51
Gen. Electric ...	135¼ -139⅞	U. S. Steel, com.	103¾ -106
Gt. No. Ore Cert.	32 - 33¾	U. S. Steel, pref.	115¼ -116⅝
Gulf States Steel	92½ -101½	Va. I. C. & Coke.	54⅞ - 58
Gulf States Steel, 1st pref.	105	Westing. Elec...	43½ - 4

Dividends

The American Brake Shoe & Foundry Co., quarterly, 1¾ per cent on the common, 2 per cent and extra 1 per cent on the preferred, all payable Sept. 29.

The Empire Steel & Iron Co., quarterly, 1½ per cent on the preferred, payable Oct. 1.

The International Harvester Co., of New Jersey, 1¼ per cent on the common, payable Oct. 15.

The Standard Screw Co., quarterly, 6 per cent, payable Oct. 1.

The Trumbull Steel Co., quarterly, 1½ per cent on the common and 1¾ per cent on the preferred, payable Oct. 1.

The United Shoe Machinery Co., quarterly, 50c. on the common and 37½c. per share on the preferred, payable Oct. 5.

The Willys-Overland Co., quarterly, 1¾ per cent on the preferred, payable Oct. 1.

The Yale & Towne Mfg. Co., quarterly, 2½ per cent, payable Oct. 1.

The Youngstown Sheet & Tube Co., quarterly, 2 per cent and extra 3 per cent on the common, and quarterly 1¾ per cent on the preferred, all payable Oct. 1.

The Metal Products Corporation, Providence, R. I., has gone into the hands of a receiver upon application of Harry M. Mays, Warwick, who holds a majority of the stock. Common stock amounting to $175,000 is outstanding and the attorney for the petitioner stated that creditors would probably be paid in full.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 19.5c.; Philadelphia, 18.5c.; Boston, 21.5c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c.; Denver pipe, 76.1c.; minimum carload, 46,000 lb.; structural steel and steel bars, 76.1c., minimum carload, 40,000 lb.; Pacific coast (by rail only), pipe, 65c.; structural steel and steel bars, 75c., minimum carload, 60,000 lb. No freight rates are being published via the Panama Canal, as the boats are being used in transatlantic trade.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in., angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 4.00c.

Wire Products

(Prices of independent mills)

Wire nails, $4 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire, $4.05 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.95; galvanized wire, $4.65; galvanized barb wire and fence staples, $4.85; painted barb wire, $4.15; polished fence staples, $4.15; cement-coated nails, $3.90 base, these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 43 per cent off list for carload lots, 42 per cent off for 1000-rod lots, and 41 per cent off for small lots, f.o.b. Pittsburgh.

Nuts and Bolts

Discounts in effect for large buyers are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days.

Carriage bolts, small, rolled thread, 40 per cent, small cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent with c. p. nuts, 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq. blank, $2.10 off list, and tapped, $1.90 off; hex., blank, $1.90 off, and tapped, $1.70 off; nuts, c. p. c. and t. sq. blank $1.70 off; and tapped, $1.50 off; hex. blank, $1.60 off, and tapped, $1.40 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Wire Rods

Soft Bessemer and open-hearth rods to domestic consumers at $90 to $95; high-carbon rods made from ordinary open-hearth steel $95 to $100, and special steel rods with carbons running from 0.40 to 0.60, $100 to $110 at mill; above 0.60 carbon, $115 to $120.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $7.00; ⅝ in., 7/16 in. and ½ in., $7.00 base. Boat spikes are occasionally quoted $7.00 to $8.00, all per 100 lb., f.o.b. Pittsburgh, but some makers are quoting higher. Track bolts with square nuts, 7c. to 7.50c. to railroads, and 8c. to 8.50c., in small lots, for fairly prompt shipment.

Steel Rails

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails, and on carload and smaller lots, 4c. to 4.25c. at mill. Light rails, 25 to 45 lb., $75 to $80; 16 to 20 lb., $80 to $81; 12 and 14 lb., $82 to $83; 8 and 10 lb., $83 to $84; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard Bessemer rails, $38; open-hearth, $40, per gross ton, Pittsburgh.

Tin Plate

Effective July 31, prices on all sizes of terne plate were advanced from $2 to $2.50 per package and are now as follows: 8-lb. coating, 200 lb., $16 per package; 8-lb. coating, I. C., $16.30; 12-lb. coating, I. C., $17.50; 15-lb. coating, I. C., $18.25; 20-lb. coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 4c. to 4.50c. for delivery late this year, and 4.50c. to 5c. from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c.; railroad test bars, 5.25c. in carload and larger lots f.o.b. mill.

Wrought Pipe

The following discounts on steel are to jobbers for carload lots on the Pittsburgh basing card in effect from May 1, 1917, all full weight, except for LaBelle Iron Works and Wheeling Steel & Iron Co., which quote higher prices, and National Tube Co, which adheres to card of April 1.

Steel			Iron		
		Butt Weld			
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	42	15½	⅛ and ¼	23	+4
½	46	31½	⅜	24	+3
¾ to 3	49	35½	½	28	10
			¾ to 1½	33	17
		Lap Weld			
2	42	29½	2	26	12
2½ to 6	45	32½	2½ to 6	28	15
7 to 12	42	28½	7 to 12	25	12
13 and 14	32½	..			
15	30	..			
		Butt Weld, extra strong, plain ends			
⅛, ¼ and ⅜	38	20½	⅛, ¼ and ⅜	22	5
½	43	30½	½	27	14
¾ to 1½	47	34½	¾ to 1½	33	18
2 to 3	48	35½			
		Lap Weld, extra strong, plain ends			
2	40	28½	2	27	14
2½ to 4	43	31½	2½ to 4	29	17
4 to 6	42	30½	4½ to 6	28	16
7 to 8	38	24½	7 to 8	20	8
9 to 12	33	19½	9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

Nominal discounts on less than carload lots, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap-Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in.	28	1¾ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3¼ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in.	No quotations
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths. Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net or 2 per cent discount in 10 days.

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer

	Cents per lb.
Nos. 3 to 8	8.00 to 8.50
Nos. 9 and 10	8.25 to 8.50
Nos. 11 and 12	8.50 to 8.75
Nos. 13 and 14	8.75 to 9.00
Nos. 15 and 16	9.00 to 9.25

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	8.30 to 8.80
Nos. 22 and 24	8.35 to 8.85
Nos. 25 and 26	8.40 to 8.90
No. 27	8.45 to 9.00
No. 28	8.50 to 8.95
No. 29	8.55 to 9.05
No. 30	8.65 to 9.15

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11	8.50 to 9.00
Nos. 12 and 14	8.60 to 9.10
Nos. 15 and 16	8.75 to 9.25
Nos. 17 to 21	8.90 to 9.40
Nos. 22 and 24	9.05 to 9.55
Nos. 25 and 26	9.20 to 9.70
No. 27	9.35 to 9.85
No. 28	9.50 to 10.00
No. 29	9.75 to 10.25
No. 30	10.00 to 10.50

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	7.80 to 8.30
Nos. 17 to 21	7.85 to 8.35
Nos. 22 to 24	7.90 to 8.40
Nos. 25 to 27	7.95 to 8.45
No. 28	8.00 to 8.50
No. 29	8.05 to 8.55
No. 30	8.05 to 8.55
Nos. 30½ and 31	8.10 to 8.60

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
Sept.	Lake	Electrolytic	New York	New York	St. Louis	New York	St. Louis
12	25.50	25.50	61.75	9.60	9.50	8.25	8.00
13	25.75	25.75	62.25	9.00	8.87½	8.25	8.00
14	26.00	26.00	62.50	8.90	8.77½	8.25	8.00
15	26.25	26.25	....	8.85	8.72½	8.37½	8.12½
17	26.25	26.25	62.37½	8.75	8.60	8.37½	8.12½
18	26.25	26.25	61.75	8.00	7.87½	8.37½	8.12½

NEW YORK, Sept. 19.

The markets continue dull with sales few and of small volume. Copper is lifeless but nominally higher. Tin is quiet and steady. Lead is unsettled and much lower. Spelter is firmer with a better tone. Antimony is dull but higher.

New York

Copper.—The better tone which resulted last week from the large purchase for the Allies at 25c. per lb. has given way again to uncertainty and stagnation. The absence of a decision by the Government as to a price for its own needs seems to indicate a decided difference of opinion at Washington. Something definite, which was expected last week, is hoped for this week. The result is continued hesitancy by buyers to purchase any more than absolutely necessary and the market is therefore devoid of transactions sufficiently significant on which to base quotations. As a result of the purchase last week and because of the feeling that 25c. would be the domestic price, quotations were in most cases gradually marked up until yesterday both Lake and electrolytic were regarded as nominal for early delivery at 26.25c. For last quarter the average nominal quotation seems to be 26.50c. to 27c., New York. Quotations in London continued unchanged yesterday at £137 for spot electrolytic and £133 for futures.

Tin.—Since last week there has been but one day on which a fair amount of business was transacted. Last Wednesday, Sept. 12, sales of considerable volume were made quietly, mostly for tin afloat to the United States, for prompt shipment from London and for metal coming overland from Vancouver to New York. Sales were also made for November and December shipment from the East. As a result of this the tone that day was better but for the rest of the week the market dragged. Some spot Banca tin was sold for 60c. in store, New York, with occasional 5-ton lots of spot Straits, which was scarce. The sudden decline in the lead market on Tuesday had a sympathetic effect on tin, interfering with sales. Yesterday and Monday the market was stale and lifeless, with practically no sales. The tone, however, has been easier, due to more liberal arrivals and with sellers apparently more anxious to sell. The quotation yesterday was 61.75c., New York. Arrivals this month have been 1635 tons, an increase of over 100 per cent above those reported last week. The quantity afloat was 4600 tons. The London market has advanced £3½ since last week, the quotation yesterday having been £246 15s. for spot Straits.

Lead.—For the fourth time in three weeks and for the second time in the last week the leading producer has made a reduction in its quotation, bringing its price yesterday to 8c. per lb., New York, which is the figure at which the Government has made its recent purchases for its monthly requirements. The first reduction in the last week of 1c. per lb. was made on Thursday, Sept. 13, and the second one yesterday, Sept. 18. At the time of the first reduction of 1c. few in the trade expected it likely before it occurred. Reasons advanced at the time to explain the price alteration, which is the greatest ever made at one time by the big producer, include the plausible one that refiners' receipts of ores, concentrates and bullion were larger than the sales of the metal. Under such unprecedented price conditions there has been an absence of active demand and of sales and consumers have been content to await developments. Before it took place, some regarded the fixing of 8c. per lb. as a possible bright spot at which level it was thought a greater demand would develop. The realization of this sooner than expected may act as a settling influence on the entire lead market. The quotation yesterday in the outside market was also 8c., New York, or 7.87½c., St. Louis.

Spelter.—The market is stronger and the feeling is better. Quotations are about ⅛c. higher than a week ago for all positions, prompt and September being 8.12½c., St. Louis, or 8.37½c., New York, with October delivery at 8.25c., St. Louis, or 8.50c., New York. In some cases better than these prices has been done, but sales in all instances have thus far been light. Inquiry, while better, is of a modest nature thus far, but is reported to be an improvement over August. Dealers generally expect a gradual improvement from now on, culminating in a strong buying movement in the not distant future. The Government yesterday asked for bids for extended delivery on 1000 tons of grade B spelter, on which the minimum quotation has been 11.50c., with some asking 12c. per lb.

Antimony.—After falling in the past week to about 14c., New York, duty paid, at which price fairly liberal sales were made, the market has rebounded to 15c. to 15.50c. per lb. for Chinese and Japanese grades, but the demand has fallen off and the market is dull.

Aluminum.—The market has declined due to poor demand and is now quotable at 41.50c. to 42.50c. per lb., New York, for No. 1 virgin metal, 98 to 99 per cent pure. For January delivery 42c. has been bid.

Old Metals.—The market showed more activity this week. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible	26.50 to 27.00
Copper, heavy and wire	25.50 to 26.00
Copper, light and bottoms	22.50 to 23.50
Brass, heavy	18.00 to 18.25
Brass, light	14.00 to 14.25
Heavy machine composition	25.00 to 25.50
No. 1 yellow rod brass turnings	17.25
No. 1 red brass or composition turnings	19.00 to 21.00
Lead, heavy	8.50
Lead, tea	7.00
Zinc	6.50

Chicago

SEPT. 17.—The general aspect of the metal market is considered good from the dealers' point of view. The copper situation is altered by a belief on the part of consumers that the price ultimately to be fixed by the Government will be under 25c. It is predicted that difficulty in procuring this metal will be experienced before long, a contingency which some consumers are preparing to meet by stocking up. Tin is stronger, but there has been no noteworthy buying. Lead is rather weak, the recent reduction by the leading interest being met in some instances by independent smelters. Spelter has a better tone, although the price is unchanged. In antimony the feeling is stronger, some fairly large orders giving the market unexpected strength. We quote as follows: Casting copper, 26c.; Lake, 28c.; electrolytic, 27.50c.; tin, carloads, 63c.; small lots, 65c. to 66c.; lead, 9c. to 9.25c.; spelter, 8c.; sheet zinc, 19c.; antimony, 17c. to 18.50c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 22.50c.; copper clips, 21.50c.; copper bottoms, 21c.; red brass, 21c.; yellow brass, 16c.; lead pipe, 7.25c.; zinc, 5.50c.; pewter, No. 1, 32.50c.; tinfoil, 40c.; block tin, 45c.

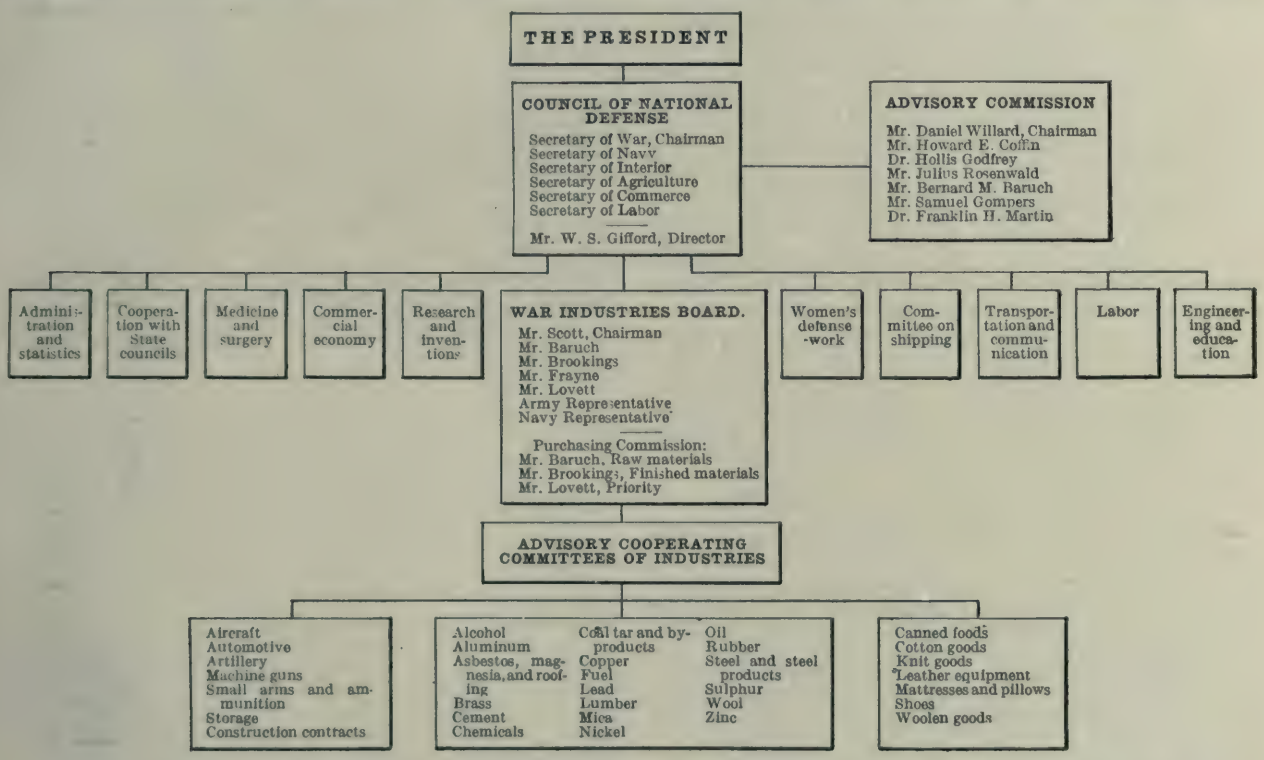
St. Louis

SEPT. 17.—Non-ferrous metals have been rather quiet during the past week and the close today, on carload lots, for the Missouri product was: Lead, 8.92½c.; spelter, 8c. In less than carload lots the quotations today were: Lead, 10c.; spelter, 9c.; tin, 66½c.; Lake copper, 30c.; electrolytic copper, 29.50c.; Asiatic antimony, 18c. In the Joplin district the market for all ores was rather dull.

Workings of the War Industries Board

Chairman Scott Explains Present Functions in Relation to Army and Navy Buying—Larger Scope Expected

WASHINGTON, Sept. 18.—The inner workings of the War Industries Board and its co-ordination with the purchasing bureaus of the War and Navy Departments were the subjects of a hearing in executive session recently given by the House Committee on Appropriations to Chairman Frank A. Scott and Robert S. Brookings of the board. The committee has formally removed the seal of secrecy from the report of the hearing and the correspondent of THE IRON AGE is therefore enabled to present a synopsis of the statements made, which it is hoped will go far toward removing misunderstandings prevailing among manufacturers and dealers who are in position to supply the manifold war needs of the Government. Special interest attaches to this outline of the operations of the board for the reason that it is based upon the interpretation of the law as given by the Attorney General in his formal opinion published in THE IRON AGE of last week.



The Administrative Departments of the Government for the Prosecution of the War As Now Constituted

Much Army and Navy Buying

Chairman Scott and Mr. Brookings were at special pains to explain to the committee the scope of the buying for the Government which the War Industries Board is now doing and to correct the misapprehension that all war purchases are being made or directed by the board. As a matter of fact, the Quartermaster General's Department of the Army and the Bureau of Supplies and Accounts of the Navy Department are making all routine purchases as heretofore, and in the main are doing so without consulting the board. Where the purchase is of an extraordinary character, however, either as to quantity or kind of material, or where there is reason to believe the different purchasing bureaus of the departments may be bidding against each other, and especially in cases where the requirements of the Government are likely to exceed the market supply, recourse is had to the board, which thereupon makes the necessary investigation, determines the proper source of supply, fixes reasonable prices and recommends purchases.

"The powers of the War Industries Board," said Mr. Scott in his statement before the House Committee, "are to co-ordinate the needs of the Army and the Navy, to assist in the acquirement of such needs and to aid in the development of facilities for supplying the requirements of both departments, as well as to assist in securing priority therefor. Mr. Baruch is devoting his attention particularly to the subject of raw materials, Mr. Brookings particularly to the subject of fabricated materials, and Judge Lovett to the subject of priority. Mr. Rosenwald has been the head of the section of manufactured supplies of the old Advisory Commission organization, and he still continues his work as the head of that section, although now he reports to the War Industries Board instead of to the Advisory Commission with respect to that work.

"Heretofore the committees of the Advisory Commission, which have been working on supplies for the Quartermaster's Department, have to a considerable degree made their recommendations direct to a representative of that department. They will now be required to transmit their recommendations to the War Industries Board through Mr. Brookings, who, by the desire of the council and of the President, is to pass on all such matters to see if there is any element of interest represented in the recommendation in order that it may be eliminated before the recommendation passes to the Government department."

Mr. Brookings' Functions

Mr. Brookings, at the suggestion of Mr. Scott, interpolated at this juncture a statement concerning his functions as intermediary between the Government and the contractors. "As I understand it," he said, "it is the desire of the President and of the Council of National Defense that I personally represent the Government and that every contract suggested by these subcommittees shall be submitted to me; that I shall investigate them just as I would if I were spending my own money in every way, both as to the parties named, as to the price and everything else.

"I must satisfy myself about it before I approve it.

I am required to investigate and to ascertain whether any of these advisers were or were not directly or indirectly interested. As I interpret it, that is my responsibility. I have not been in active business myself for some years and have no active interests of any kind, but I am supposed to have sufficient training to enable me to elicit the facts in some form or another. I must go to the bottom of all those things and ascertain them with reference to the things that the Government is being supplied with. I must ascertain when they are needed, where they are needed, and the minimum cost, consistent with an endeavor to derange the markets as little as possible. That is a small responsibility blanketed in a few words.

To Avoid Departmental Competition

"I gather that necessarily in the carrying on of the enormous business of the war there has been more or less confusion, more or less duplication of effort, and, in some cases, competition between the departments of the Government themselves, the Navy Department bidding on the same thing at the same time the War Department was bidding, which might result in a higher price on some articles amounting to 5, 10 or 15 per cent, brought about by both of them bidding at the same time. I do not think it was ever intended that anyone should be criticised in connection with that; it is simply the sort of confusion which has grown out of the enormous undertakings of the departments. We are expected to bring a certain amount of order out of this chaos; we are to co-ordinate all of the Government's interests, as relating to the War Department and the Navy Department, and simply advise these departments where they can get the things they want, because the emergency feature of this sometimes means more than price, and the judgment that we are expected to exercise covers giving the Army and Navy what they need and when they need it. I approach it in that order, because to my mind that is the order of its importance—when they need it, at a fair price to the Government, and with the least possible derangement of the markets."

War Industries Board an Intermediary

Chairman Scott, resuming his statement, told the committee that the functions of the board did not extend to all purchases of the Government nor even to all buying for war purposes. "The work of the board," he said, "relates only to those purchases that are of such character that the intervention of some outside help is needed by the departments. They still go forward with a tremendous volume of war purchasing that is not referred to any of these subcommittees and that probably will not be referred to the War Industries Board. The intention is that anything that is difficult to obtain will be passed on by some individual member of the War Industries Board or by the board itself. May I tell you the reason why I say with perfect co-operation, because you can see that in many things the departments may proceed about their own affairs; they may consult some representative of an industry or representatives of industry and go ahead without reference to the War Industries Board. That is possible, and the board might not even know of such a transaction; but it is the general intention that wherever it is necessary to seek the co-operation of men engaged in the trade or for the purpose of protecting the Government against the interests of particular individuals or groups of individuals the matter will pass through a disinterested body."

Board Has No Authority

Mr. Brookings, in again taking up the statement on behalf of the board, drew attention to the fact that the Secretary of War and the Secretary of the Navy have final authority with regard to purchases of their respective departments. "Everything that we do," said he, "is in an advisory way at their request and subject to their final disposition. It is a matter of form, comparatively, and unless the department has some reason to believe that advice is necessary as to the purchase of a given article they would not come to us, because I think that if an officer of either the War Department or the Navy Department believed that the purchases were proper he would have a perfect right to make them and would be held responsible for those purchases; but I think they recognize that we are acting largely to save the Secretary of War and the Secretary of the Navy from the necessity of going into details of this sort, which they would have to do in order to accomplish this end, but that in the last analysis it all goes to the Secretary of War or to the Secretary of the Navy, and that we might be considered advisory to them. I do not believe we have any authority to do anything, because I think that authority is clearly vested in them by law, and that all we do is in the way of a voluntary advisory service, to be acted upon by those in authority or not."

Board to Buy More

Foreshadowing the ultimate extension of the scope of the board's authority to make purchases of war material, Mr. Scott said that in his judgment it is intended eventually that the board shall "cover the whole field," but that the buying organization of the Government at the moment is too large and too intricate to transfer instantly to the new board. "At present," he said, "the board is helping the departments rather than directing them. The Government is willing to admit that it is not possible for the War and Navy Departments as constituted to-day to carry the full load imposed upon them by the war for acquiring the needs of those two branches of the service, and it therefore has established an industrial reinforcement in the shape of the War Industries Board, supported by many groups of individuals more or less interested in the various industries of the country to assist those departments in acquiring their needs in the shortest possible time at the lowest cost and, if necessary, to aid in the establishment of facilities for the production of things which cannot now be obtained in sufficient quantities.

"An important function of the board, as I understand it, is to broaden as much as possible the contact of the War and Navy Departments with those parts of the American business world with which before the war it was not necessary for them to have relations. Another function of the board, if I may employ mechanical terms, is to furnish a point of insulation to prevent the current of selfish interest from flowing into a department from any section of our business activities."

Resuming his statement, Mr. Brookings said that the moment the War Industries Board was organized the Secretaries of War and the Navy instructed the heads of their departments having to do with purchases to meet the board and reach a clear understanding as to its responsibility and authority. "It lay with me, as the responsible party, to give advice regarding a large number of the items of the finished-product business, and I have explained to all officials that the board is prepared to give any help and assistance it can. We are all interested in just one thing, and that is to win this war. We have told the officials to come to us for anything we can do, that we are here with certain knowledge and certain experience, and possibly, inferentially, these officials have been made to understand that if they do not take advantage of it, it will increase their responsibilities.

"Now, as to how this works out practically in the case of the War Department, it should be understood that the Quartermaster General's department is probably buying 500 articles, the great majority of which are being purchased without advising with anyone. I presume that the articles which it has been necessary to refer to us, as an advisory body, number less than 20 out of 500. These are only the big items that deal with production as well as price. Nearly all these 20 items are absorbing a large part of the production of the country and have to be dealt with with all the economical and business genius that the Government can bring to bear. My impression from talking with the purchasing officers of these departments is that they are very grateful for this opportunity and they realize that aid is necessary if the Government is going to get what it wants when it wants it at anything like a reasonable price."

Direct Buying Illustrated

Replying to a question as to whether a producer of a particular article could approach the departments for its sale or would be required to take the matter up with the War Industries Board, Mr. Scott said that he would be at liberty to approach the department direct if he preferred to do so and that in most cases that course was pursued. "If there is any doubt about the matter," continued Mr. Scott, "the department would notify the board that it is about to buy a certain article of a certain party and the question will be asked as to whether there is any interference with that purchase by any other department of the Army or by the Navy. If the answer is 'No' the purchase will be made. If the answer is that the article about to be purchased is needed 40 per cent by some department of the Navy, then the two departments may buy together or divide the facilities between them or make some adjustment so that each gets its immediate needs.

"There is one very important exception to which I shall call attention and that is a definite order to all the departments issued by the Secretary of War some months ago under date of April 12, making it plain that the desirability of clearing needed items with the other military arm, namely, the Navy, and the desirability that the several bureaus of the War Department should clear with each other, would not relieve any bureau from acquiring what it needed for immediate use and wherever the time was not sufficient to allow it to clear it could acquire its articles and it must proceed immediately to acquire them. That is treated as a military necessity.

Government as Finder of Raw Material

"In many items," continued Mr. Scott, "so long as the war lasts, the Government is bound to be the largest buyer in the market. The cheapest form of buying for the Government will be to anticipate its needs as far in advance on those things as it can and acquire those materials which are necessary to supply those things. For example, if it were shoes, it would be cheaper for the Government to arrange to purchase the raw hides, to arrange for those hides to be tanned at an agreed price for the tanning, to arrange for the purchase of the lasts, because there are at least 90 different sizes of shoes that are made for an American Army, to arrange for the linen thread, for the pegging, and all the items that go into those shoes, and last of all to arrange with the people who will fabricate the shoes, for the cost of fabrication, with the understanding that these elements of the article will be delivered to them. You can see how if that were followed through in that manner it would eliminate all along the line elements of excess profit and the excess of cost which otherwise would remain in the article.

"If the Government were merely to go out and buy the shoes, if what the Government required was a very small number of shoes, so that when it asked for competition there could be actual competition, because the country could supply many more than the total number that the Government asked, the method which I have described might not be the best way to do it, but during this war, with the number of men that our Government now proposes to ask for, it is not possible to have real competition in that article, because the total supply is not equal to the total demand, and in all such cases, whether it were shoes, clothing, or shells, loaded with their detonators or fuses, or whatever the parts were, the further back you could go to the original elements that enter into the fabricated article the cheaper would be the final price that would be paid for the article.

Less Competition Now

"The departments under the peace basis were required by law to advertise a certain number of days and to request competition, and several departments of the Army and several departments of the Navy did buying for those respective departments, and when they went into the market and asked for bids on certain articles it made no difference that they competed with each other, because the total amount that they wanted compared to the total production of the country was so small that you could have actual competition.

"At the present time that is not so. Therefore, the Government now follows the policy of having the Quartermaster General arrange, for example, with the canners, just as the wholesale grocer does, that they will plant a certain quantity of tomatoes, of corn, of peas, of beans, whatever he may expect to require in cans at the end of the season, to be canned at a price for the Army at the end of the season. As I understand, that is the exact arrangement that the Quartermaster General did make with the canners, and he will get those articles at a very much lower price than he would pay if he would wait for the articles to be canned and pass into the hands of the wholesale grocer or remain in the hands of the canner, and then go into the market and attempt to compete with civilian consumption for what articles were in the cans. If you will apply that all the way through to the larger items needed for the conduct of the war, you will have the system that the departments, to a very large extent, are following." W. L. C.

FURTHER CONTROL OF PRICES

Chamber of Commerce Committee Favors Extension of Government Regulation

WASHINGTON, Sept. 18.—A strong recommendation for additional Federal legislation creating authority to control prices during the war accompanies a referendum to ascertain business opinion on this subject, which is now being sent out by the Chamber of Commerce of the United States. The matter is of special interest at this time in view of the agitation for Congressional action on the Pomerene bill authorizing governmental control of the distribution and prices of iron and steel products. Business organizations throughout the country will have the opportunity to vote for or against such a recommendation and 45 days will be given them to discuss the subject, the expectation being that if a decisive majority favors additional legislation, measures to that end will be presented to Congress when it meets in regular session in December.

Raw as Well as Finished Materials

A price control committee of the National Chamber, which was recently appointed to investigate this subject, has recommended that authority to control prices should extend to all articles which have importance in basic industries as well as in war, and which enter into the necessaries of everyday life; that authority to control prices should be extended to raw materials and finished products; that authority to control prices should extend to the prices the public pays as well as those paid by the Government; that authority to control prices should be administered by a small executive board appointed by the President.

It is also recommended that an agency working in harmony with the board controlling prices should have authority to distribute available supplies to those purchasers whose needs are most directly related to the public welfare; and that each leading industry and trade should create a committee to represent it in conference and to advise with agencies that control prices and distribution. In a recent referendum the National Chamber went squarely on record committing its members to the principle that there shall not be a profit interest in war. This position has been reiterated several times by the Chamber since the United States became involved in the conflict. To maintain this principle, however, stable prices are deemed by the Chamber to be absolutely essential. Every seller of products is a purchaser of materials. No business can be satisfactorily conducted if it cannot ascertain its own costs and prices in advance. When there can be no reasonable certainty about the future course of costs for materials and equipment, it is pointed out by the committee in its report, every business faces unknown elements as

soon as it endeavors to determine its scale of operation, the goods it will make, and the prices it should ask for its product.

Protection to Private Buyers

The Chamber emphasizes the fact frequently pointed out in THE IRON AGE that control of prices charged to the Government, whether exercised under authority of law or through voluntary arrangement with the sellers, leaves the situation of private buyers, who have to meet their requirements out of a diminished supply, worse than before the prices to the Government were dealt with. This is the case, too, it is further shown, whether the position of industries buying for further manufacture is considered or the situation of ultimate purchasers among the public.

With respect to foods, feeds and fuel this inequity is recognized in legislation which has just been enacted. The Lever food control act contemplates a system of licensing of manufacturers and handlers of food products and the other articles affected, with the profits of licensees limited by the Government to a reasonable figure. Some commodities the Government may buy in quantities and sell at reasonable prices as a means of influencing the general market. In order that the President may make measures of this kind effective, he may, if necessary, take over and operate the facilities for production, including the mines from which coal is obtained. The extension of these principles to other industries, in the opinion of the Chamber, would serve to stabilize the business of the entire country. W. L. C.

SPECIAL EMBARGO LIST

Administration Tightening Regulation of Foreign Commerce

WASHINGTON, Sept. 18—The Exports Administrative Board has announced a special embargo upon an important list of commodities whose conservation is necessary on account of the limited supply and the needs of the United States in its successful prosecution of the war. This list has been made up without regard to the consideration as to whether the commodities in question may be shipped to neutral countries without risk of reaching the enemy and is based solely upon the broad principle of conservation. The category of articles, the exportation of which is prohibited except under the conditions noted, includes the following:

Acetone, alcohol, aluminum, ammonia salts, ammonia nitrate, anhydrous ammonia, arsenate of lead, arsenate of soda.

Boiler tubes (iron and steel), butter.

Carbolic acid (phenol), castor oil and castor beans, chrome nickel steel, cotton linters, cyanide of sodium.

Ferromanganese, ferrosilicon, ferrovanadium, flax.

Glycerin.

Iron and steel plates, including ship, boiler, tank, and other iron and steel plates ⅛ in. thick and heavier and wider than 6 in., whether plain or fabricated.

Mercury salts.

Nitrate of soda, nitric acid, nitric salts.

Phosphoric acid, phosphorus, pig iron, potash and chlorate of potash, potassium salts.

Saltpeter, scrap iron, scrap steel, searchlights and generators (suited for Army or Navy use), sodium sulphite, spiegeleisen, stearin and stearic acid, steel billets, steel blooms, steel ingots, steel sheet bars, steel slabs, sugar, sulphate of ammonia, sulphur and sulphuric acid, superphosphate.

Tin plate, toluol, tungsten.

Wireless apparatus.

Exceptions Permitted

Export licenses may be granted, however, for the above articles when destined for actual war purposes or when they will directly contribute thereto; and in certain unusual cases when such exports will contribute directly to the immediate production of important commodities required by the United States; and also in certain other cases where the articles may be exported in limited quantities without detriment to this country. Further, licenses may also be granted for limited quantities of these conserved articles when required for purely medicinal or pharmaceutical purposes.

Shipments in Transit to Canada

To facilitate exports to Canada and Newfoundland, the Bureau of Export Licenses has heretofore issued, through the customs service, a special license whereby goods have been permitted to enter Canada and Newfoundland without individual licenses for each shipment, except in the case of certain articles which the Exports Administrative Board has heretofore found it necessary to conserve, namely:

(1) Iron and steel plates, including ship, boiler, tank and all other iron and steel plates ⅛ in. thick and heavier, and wider than 6 in., whether plain or fabricated; iron and steel scrap, pig iron, steel billets, for which individual licenses have been required for shipments made on bills of lading dated on or after Aug. 16, 1917.

(2) Ferromanganese, ferrosilicon, spiegeleisen, steel sheet bars, steel blooms, steel ingots, steel slabs, for which individual licenses have been required for shipments made on bills of lading dated on or after Aug. 29, 1917.

All the other articles above mentioned, which are now added to the "Conservation List" in accordance with this statement, will likewise require individual licenses for each shipment of such additional conserved commodities as are covered by bills of lading dated on or after Sept. 20, 1917. This date has been fixed in order to avoid interference with goods in transit.

Application Forms

To procure export licenses for articles on the "Conservation List" shippers must use Application Form A-3 for proposed shipments of—

Pig iron, ferromanganese, ferrosilicon, spiegeleisen, steel ingots, billets, blooms, slabs and sheet bars; iron and steel plates, including ship, boiler, tank (and all other iron and steel plates ⅛ in. thick and heavier, and wider than 6 in., whether plain or fabricated); scrap iron, scrap steel, when destined to any country in the world.

For all other commodities controlled by the President's proclamation of Aug. 27, 1917, shippers must use Application Form A-1 for proposed shipments to the following countries, or their colonies, possessions, or protectorates:

Albania	Norway
Denmark	Spain
Kingdom of the Netherlands (in Europe)	Sweden
	Switzerland

Shippers must use Application Form A-2 for proposed shipments to the following countries, or their colonies, possessions, or protectorates:

Abyssinia	Liberia
Afghanistan	Mexico
Argentina	Monaco
Belgium (that portion not occupied by Germany or her allies)	Montenegro
	Morocco
	Nepal
Bolivia	The colonies, possessions and protectorates of the Netherlands
Brazil	
China	
Chile	Nicaragua
Colombia	Oman
Costa Rica	Panama
Cuba	Paraguay
Dominican Republic	Persia
Ecuador	Peru
Egypt	Portugal
France	Roumania
Greece	Russia
Guatemala	Salvador
Haiti	San Marino
Honduras	Serbia
Italy	Siam
Great Britain	Uruguay
Japan	Venezuela

Fuel Administrator Garfield has requested the Export Administrative Board to allow no coal to be exported from the United States without specific licenses, and further that the board authorize no such licenses before notifying him of the application. This step was taken by the fuel administrator in order that he might keep in close touch with both the quantity and the destination of coal exports.

The action is specifically for the purpose of protect-

ing the northwest part of the United States, which has been complaining that it has not been receiving its fair share of the coal sent to Lake ports. An investigation by the fuel administration substantiated this complaint. It was found that plenty of coal was reaching the Lake ports, but it was not getting through to the Northwest.

In the period between Aug. 24 and Sept. 6, out of a total of 1,755,812 tons, 530,973 tons, or 30.2 per cent, had been shipped into Canada. This is far in excess of the proportion of Canadian exports by Lake ports in normal times.

The fuel administration does not intend to cut off Canadian exports, but with this supervision it will be able to equalize the distribution of coal, and see that the Northwest and Canada both get their fair shares.

Machine for Making Metal Briquets

An improved machine for making briquets, which U. S. Consul Homer M. Byington, Leeds, England, reports to be attracting considerable attention in that country, is said to produce briquets 2½ in. in diameter with an average length of 2¼ in. These products, made from metal as used in shell fuses, weigh 2 lb. 13 oz. each and the machine is said to turn out 23 hundredweight (2576 lb.) of briquets an hour. The saving from the briqueting of brass borings varies from 5 to 15 per cent, it is claimed, depending largely on the class of metal treated and the care and efficiency of the whole smelting process. If it is operated 20 hr. a day it is said that the machine could yield 115 tons in a week of five days. If 7½ per cent is gained by briqueting, this means that 115 tons of metal briquets would yield 8 tons, 12½ hundredweight more metal than the same quantity of unbriqueted borings when smelted would yield. At the average price during the half year 1917 of about £120 ($584) per ton for this metal, the weekly saving would represent £1,035 ($5,037), against which would have to be reckoned the cost of briqueting. Labor and power are put at not to exceed $0.97 per ton of briquets made.

The machine also will make briquets of cast-iron borings and will turn out about 1 ton per hr. At 1917 prices of borings and iron, the briquets would be worth about $25.55 per ton and the profit derived from the briqueting would amount to $9.73 per ton.

A large machine may be constructed to turn out briquets 4 in. in diameter by 3 to 3½ in. in height, when the output would rise to fully 4 tons per hr. The name of the patentee, the manufacturer and the United States patent number of the machine mentioned may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, or its district or co-operative offices. A photograph of the machine may be inspected at the bureau or its district offices.

Decreased Contracting for Fabricated Work

The records of the Bridge Builders and Structural Society, as collected by its secretary, George E. Gifford, 50 Church Street, New York, show that 38 per cent of the entire capacity of the bridge and structural shops of the country was put under contract in August. This corresponds to about 68,500 tons and is the lowest rate at which fabricated business has been done since 1911, except in September, 1913, when the total tonnage booked was about 64,000 tons, and in the seven months immediately following the outbreak of the war in August, 1914, when the rate for that period was about 52,000 tons per month. So far this year about 780.000 tons of bridge and building work have been closed against 980,000 tons for the same period of 1916. The total amount of such business done in both 1915 and 1916 was about 1,500,000 tons, so that in the eight months of 1917 the volume of business totals about one-half of that done in the 12 months of the two years preceding.

The total membership of the American Society for Testing Materials is now 2218, an increase since the annual meeting in June of 51.

Pittsburgh and Nearby Districts

The first of the fall and winter meetings of the Pittsburgh Foundrymen's Association was held in the Fort Pitt Hotel, Monday evening, Sept. 17, and was largely attended. L. A. Way, president, was in the chair and F. H. Zimmers was secretary. Professor A. B. Wright of the political science department of the University of Pittsburgh gave an address on "Our Aims in the War." Professor Wright believes in the vigorous and effective prosecution of the war, and in addition stated that he does not believe the Government should name prices on iron and steel products for domestic consumption. The meeting was preceded by a dinner.

The Valley Mold & Iron Corporation, Sharpsville, Pa., large manufacturer of ingot molds, has opened offices in room 491 Union Arcade Building, Pittsburgh, in charge of Floyd K. Smith, vice-president of the company.

E. W. Mudge & Co., Frick Building, Pittsburgh, have blown out Claire furnace at Sharpsville, Pa. The stack will be relined, the bosh and hearth enlarged, and a new engine, purchased from the Brier Hill Steel Co., of Youngstown, Ohio, is being installed. The Sharpsville Boiler Works, Sharpsville, Pa., is doing all the plate work, and it is expected to have the stack in operation again early in November. The output will be increased to about 350 tons per day. Ella furnace of this company at West Middlesex, Pa., is in blast, turning out about 350 tons of Bessemer iron per day.

Fixing Metal Prices in Australia

A metal exchange for Australia at Melbourne, similar to the London exchange, is to be established according to reports from that country. Instead of metals being sold to London, they will be sold to Sydney and Melbourne and treated in Australia. Efforts are being made to fix a standard price for copper for three years. If the smelters are prepared to treat all grades of tin ore at a fair price, the ministry is willing to stop the exportation of tin ore for all time. The federal government has made arrangements as regards zinc, fixing the prices for 10 years. Regarding rare metals, the ministry has submitted a scheme to the producers whereby the government will take over the whole of the tungsten production at the world's current prices. Australia will probably have a representative at the Material Resources Bureau in London

Norway's Imports and Exports of Steel and Iron

Norway's imports of some leading iron and steel products are given as follows in metric tons for 1916 as compared with the two previous years:

	1914	1915	1916
Pig iron	32 200	39,700	34,800
Bars, rods and hoops	45,000	64,900	60,200
Plates and sheets, plain	41,100	71,500	55,400
Sheets, tinned and galvanized	34,000	41,200	29,300
Wire	17,500	20,400	14,700

Exports, compared for the same years, have been as follows, in metric tons:

	1914	1915	1916
Ferrosilicon	6 144	9,308	24,789
Iron ore and iron-ore briquets	467,800	425,900	414,700
Pyrites of iron and copper	360,200	466,800	251,800
Crude zinc	16,517	22,617	28,150
Aluminum	2,942	2,883	4,270

The increase in ferrosilicon, probably for munition steel purposes, as well as in crude zinc, is marked.

Decided to Strike

The machinists' unions of Bridgeport, Conn., have voted to go on strike to obtain demands recently presented and have appointed a committee to set a day for the walk-out. The Government has been trying to prevent a strike until arbitration had been tried, but its efforts have apparently proved unavailing. It is claimed that 133 plants will ultimately be affected.

CARBON ANALYSIS BY COLOR

Slowly Cooled Steels with Same Manganese Content Essential for Comparisons

THE color carbon determination for steel, originally devised by Eggertz, is not employed to as great an extent as formerly because of the rapidity and accuracy of the direct combustion process. It still remains, however, a valuable method and, when carried out with the proper care, is not only rapid but accurate. There have been numerous studies of this interesting process, the most recent of which was carried out by the eminent French savant, H. Le Chatelier, and one of his students, F. Bogitch. Their paper was published in the *Revue de Metallurgie*.

The first part is introductory, but the theory of the process, as outlined by Osmond, is worth repeating. Under the action of nitric acid, the drillings rapidly dissolve giving ferric nitrate, the combined carbon in the metal dividing into two parts. One dissolves immediately forming a brown solution, the other remains at first insoluble as a brownish flocculent precipitate. Raising of the temperature and a continuation of the heating discolors the primary solution by driving off the carbon in the form of carbon-dioxide and cyanogen. On the other hand the flocculent precipitate, as it dissolves, tends to deepen the color. This new carbon disappears as a gas in its turn, but more slowly than the primary dissolved carbon. The authors speak of the numerous conditions that affect the correct carrying out of the process and then investigate these.

Strength of Acid and Speed of Solution

The first of these conditions is the concentration of the acid as related to the speed of solution of the drillings. The temperature employed throughout the experiments was that of boiling water and the maximum speed was obtained with acid of 1.18 to 1.15 Sp. Gr. The 1.18 acid was made by diluting 40 c.c. of 1.40 acid to 100 c.c. In diluting the solutions for comparison they recommend the use of ferric nitrate solution instead of distilled water, prepared by dissolving electrolytic iron in nitric acid. This is particularly valuable in the case of steels low in carbon.

Their studies lead them to propose the following method: The drillings or turnings are placed in a conical flask of 250 cc capacity, and for each gram of steel 20 c.c. of cold 1.16 nitric acid is added, then rapidly heated so as to bring it to a boil in 1 min. After boiling 1 min. 30 c.c. of boiling nitric acid of 1.23 Sp. Gr. is added and the boiling continued for 3 min. The total operation therefore lasts for 5 min. (The reason for the addition of the stronger acid is that the flocculent precipitate dissolves more rapidly in stronger acid.) At the end of the 5 min. the solution is quickly cooled by dipping the flask into water and shaking it, this cooling lasts for 1 min. The color comparison is then made with a similarly prepared solution of a standard steel of similar composition and treatment.

Influence of Other Elements

Some very interesting observations are then made on the influence of the percentage of carbon, the presence of manganese, of nickel, of silicon and the influence of heat treatment. The differences of speed of cooling of the steels modify considerably the coloration of the solution due to carbon, even with speeds of cooling altogether insufficient to give real quenching (that is the formation of martensite). The fineness of division of the cementite in the pearlite modifies the solubility of the carbon and the hardness of the steel. This influence of speed of cooling is the more marked the richer the steel is in manganese. The depth of color may be reduced one-third in this way. That is to say if the color test is made on a steel cooled quickly, taking as standard a similar steel cooled slowly in the furnace, the percentage found would be one-third too low. On the other hand, if the sample taken as standard were from a steel cooled rapidly the result on a steel slowly cooled would be one-third too high.

The conclusion of the second part of the research is that to use properly the Eggertz color carbon determination it is indispensable to work on samples from slowly cooled steels and furthermore to use, as standards, steels containing practically the same manganese contents as the steels being tested. G. B. W.

Government Price Fixing Expected This Week

WASHINGTON, Sept. 19 (*By Wire*).—The impression is strong here to-day that the Council of National Defense, at the direction of the President, will this week announce the prices the Government will pay for copper and for iron and steel. It is rumored copper will be bought at a flat price in the neighborhood of 24c. As to iron and steel, the President is said to be still in doubt whether an attempt should be made to fix a scale of basic prices or authorize purchase to be made at cost of production plus a certain percentage of profit.

Strike at Eliza Furnaces of Jones & Laughlin Steel Co.

PITTSBURGH, Sept. 19—(*By Wire*)—The labor troubles at the Eliza blast furnaces of the Jones & Laughlin Steel Co., Pittsburgh, are still unsettled. On Wednesday morning, Sept. 19, there were five of the six Eliza blast furnaces banked and Soho blast furnace, which is located near the Eliza furnaces, was also banked. The strikers have made up a set of demands which they have presented to the company and which are as follows:

"That there shall be no discrimination shown by the company toward any man now on strike, that the men be given an 8-hour day, with time and a half for overtime for four hours and double time after the 4-hour period, that the men be paid double time for all work done after noon on Saturday and for work on Sundays, New Year's Day, Decoration Day, Fourth of July, Labor Day, Thanksgiving Day and Christmas; that the men be given an increase of 25 per cent in wages in all branches, and that no man be paid less than $3 for eight hours' work; that the men working nights be put on a 48-hour weekly basis to be made the first five nights of the week, and double pay for all overtime; that the company recognize a duly elected shop committee of employees for the adjustment of all grievances."

The shortage in pig iron caused by the banking of the blast furnaces is seriously affecting operations at the steel works of the company on the South Side, Pittsburgh. The duplexing department is off and the Bessemer and open-hearth departments are running very light and will have to close in a few days unless the trouble is settled.

On Wednesday morning from 3500 to 4000 men were idle on account of the strike of the furnacemen. No conference has yet been held with the company and prospects for an early settlement of the trouble are not very good.

Six-ton electric furnaces of the Graves-Etchells type will be installed by the American Radiator Co., Buffalo, N. Y., and by the Singer Sewing Machine Co., New York, according to an announcement of the Electric Furnace Construction Co., Philadelphia. This makes a total of five furnaces of this type installed so far in this country.

The roll-over straight draft molding machine is the subject of a generously illustrated bulletin issued by the National Founders' Association as No. 8 of the series issued by its committee on foundry methods.

No. 1 furnace at the North Lebanon (Pa.) plant, Bethlehem Steel Co. has been banked for repairs. The men employed at the furnace will be used in other parts of the plant.

The British Minister of Munitions on Aug. 24 prohibited dealings in tin plates and terne plates except under license.

PERSONAL

J. J. Nordman, formerly secretary of the Foreign Trade Commission of Pittsburgh, and also secretary of the Pittsburgh Export Co., has retired from those two organizations for the purpose of acting as American purchasing representative for foreign account, under the trade name of J. J. Nordman & Co., with offices in the Farmers' Bank Building, Pittsburgh.

C. W. Bennett has resigned, effective Sept. 30, as vice-president and general manager of the American Metal Wheel Company, Toledo, Ohio. He has disposed of his interests in the company and after a winter's vacation in California expects to establish a new business connection.

R. F. Williams, for six years connected with the Pittsburgh office of Manning, Maxwell & Moore, Inc., has resigned and is now connected with the Sherritt & Stoerr Co., Inc., Philadelphia, dealer in machine tools, railway and machine shop equipment.

Norman L. Warford, mechanical engineer, in charge of construction for the Powdered Coal Engineering & Equipment Co., Chicago, recently sailed from New York to take up his new duties as engineer in charge of the coal-pulverizing and copper smelting department of the Société des Mines de Cuivre de Catemou at Catemou, Chile. Mr. Warford has had many years' experience in the use of powdered fuel and was the designer and first operating superintendent of the installation of the Anaconda Copper Mining Co., Anaconda, Mont., where about 1000 tons of powdered coal per day are used in reverberatory copper smelting furnaces.

E. Jordan, Toronto, Ont., has been appointed general manager and chief engineer of L'Air Liquid Society, manufacturers of acetylene and welding machinery, etc., head office Maisonneuve, Que., in succession to E. Royer, who resigned to go into business on his own account in Montreal. Mr. Jordan recently came to Canada from France, but had previously visited Canada. The company is erecting a new manufacturing plant at Halifax, N. S., and is building an addition to its Toronto plant.

H. T. Harrison, who has been chief engineer of Corrigan, McKinney & Co., Cleveland, Ohio, for several years, and under whose directions this firm's steel plant and new blast furnaces were erected, has been appointed general manager of the firm and has been succeeded as chief engineer by J. Y. Blackwood, formerly chief draftsman.

The Asbestos Protected Metal Co., Pittsburgh, is well represented in the army, the following being a list of employees in responsible positions who have entered the service: Stuart S. Caves, engineering department, now of officers' reserve at Ft. Niagara; F. C. Easterby, district representative at St. Louis, now constructing quartermaster, Ft. Riley, Kan.; W. C. Fanning, engineering department, now of officers' reserve, Ft. Niagara; Wm. H. Hale, district representative at Minneapolis, Minn., now of officers' reserve; E. G. Irwin, district representative at Cincinnati, now in the South with Ohio National Guard regiment; J. R. Nichols, district representative at Atlanta, Ga., now captain of field artillery; Walter A. Slingluff, skylight department, now with Pittsburgh regiment of engineers in France; John B. Williamson, erection department, now first lieutenant of engineers; P. J. Young, chief engineer, now first lieutenant of engineers in France; T. R. Galey, district representative at Dallas, Tex., now of officers' reserve, Leon Springs, Tex.

Elbert H. Gary, chairman of the United States Steel Corporation, has returned to New York after a six weeks' vacation in Alaska.

Gen. T. C. du Pont has joined the directorate of the Vulcan Steel Products Co., 120 Broadway, New York. Other new members on the board of directors are former Postmaster-General Frank H. Hitchcock, who becomes vice-president, and L. W. Baldwin, Empire Trust Co., New York.

William L. Austin has retired as chairman of the Standard Steel Works, Philadelphia, and has been succeeded by William Burnham.

J. C. Pinney, Jr., since May, 1912, superintendent of bridges and public buildings, city of Milwaukee, Wis., has been granted a leave of absence for three months to assume the position of dean of the college of engineering, Marquette University, Milwaukee. He takes the place of John C. Davis, who has been commisisoned a captain in the United States Coast Artillery.

J. B. Morris, chief engineer of the steamship Great Northern of the Great Northern Steamship Co., of San Francisco, has been appointed chief inspector of machinery for the United States Shipping Board in Seattle.

J. B. Laird, until recently connected with the Moore Steam Turbine Corporation, Wellsville, N. Y., has resigned his position with that company to go into the machine tool business.

Thomas Stanion, for a number of years connected with the Commonwealth Steel Co., St. Louis, and during the past year with the White Sewing Machine Co., Cleveland, has accepted the position of safety engineer in the Government service and has been assigned to the navy yard at Charleston, near Boston.

Eugene Kelly, assistant secretary of the Syracuse Smelting Works of Brooklyn, has taken full charge of the Chicago office of that company.

H. J. Richardson has been appointed works engineer for the Berger Mfg. Co., Canton, Ohio. His new work includes the power plant, new construction, maintenance and repair of manufacturing equipment and buildings. Mr. Richardson recently was connected with the New England Westinghouse Co. as manager of the gage department. Previous to this connection he was acting chief engineer of the ordnance department of the Crucible Steel Co. of America, at Harrison, N. J., and prior to that for a long time was with the Commonwealth Edison Co., of Chicago.

Norman R. McLure, for the past three years chief engineer of the Phoenix Iron Co., Phoenixville, Pa., has resigned that position and formed a connection with the Taylor-Wharton Iron & Steel Co., High Bridge, N. J. He will assist for the time being in the construction and operation of the extension to the plant of the Tioga Steel & Iron Co., a subsidiary in Philadelphia, in which the ordnance contract recently taken by the company from the Navy Department will be executed.

John E. Kemp, for several years civil engineer of the National Tube Co.'s Kewanee Works, now Walworth Mfg. Co., Kewanee Works, has received a commission as captain in the United States Engineers Corps, and is at the U. S. Engineer Officers' School at Ft. Leavenworth, Kan. During his military service his work at Kewanee Works will be assumed by John J. Harman, formerly associated with the Elliott & Harman Engineering Co., Peoria, Ill.

J. R. Van Dyk, of the Van Dyk-Churchill Co., Singer Building, New York, machine tools, has become associated with the Exports Administrative Board in Washington as trade expert. Mr. Van Dyk has general supervision over export licenses for machinery and machine tools.

F. M. Long, representative in France of the Gisholt Machine Co., Madison, Wis., arrived in New York last week, and will remain here for a few weeks.

R. F. Williams, formerly connected with Manning, Maxwell & Moore, Inc., Pittsburgh office, has become connected with the sales department of the Sherritt & Stoer Co., Inc., Philadelphia, machine tools.

The following organization changes have been made in the Baldwin Locomotive Works: Samuel M. Vauclain, vice-president and general manager, has been made senior vice-president; James McNaughton, formerly with the American Locomotive Co., has been made consulting vice-president; Grafton Greenough, sales manager, has been made vice-president in charge of sales; John P. Sykes, general superintendent, has been made vice-president in charge of manufacturing.

The following changes have also been made in the organization of the Standard Steel Works, a subsidiary of the Baldwin Locomotive Works Co.; Alba B. Johnson has been elected president to succeed William Burnham. Mr. Burnham has been made chairman of the board to succeed Wm. L. Austin and Samuel M. Vauclain has been made senior vice-president.

John E. Woods, manager of sales, Carnegie Steel Co., Cincinnati, has been promoted, and transferred to the sales department of the company at Pittsburgh as assistant general manager of sales in charge of plates and structural material succeeding the late J. W. Dix. He will be succeeded as manager of sales in Cincinnati of the Carnegie and Illinois Steel Companies by J. G. Carruthers, who has been his assistant for several years past.

J. Arthur House, first vice-president of the Guardian Savings & Trust Co., Cleveland, has become connected with M. A. Hanna & Co. He will look after that firm's important financial matters and be associated in a general capacity with the firm's business.

P. J. Moran, general superintendent of the Detroit Iron & Steel Co., Detroit, has been appointed general manager of the blast furnaces of the M. A. Hanna & Co. succeeding Max McMurray, who has resigned to become president of the Cromwell Steel Co., Cleveland. Mr. Moran's first connection with the iron and steel industry was with the Hannah furnace of the Republic Iron & Steel Co., Youngstown, Ohio, where he worked up to the position of superintendent. Later he became general superintendent of the United Iron & Steel Co., operating the Fannie and Cherry Valley furnaces and held this position when these stacks were taken over by the Hanna interests. When the Detroit Iron & Steel Co., controlled by M. A. Hanna & Co., built its second stack in Detroit in 1910, Mr. Moran was given a promotion by being made general superintendent of the Detroit furnaces.

George A. Turville, secretary and treasurer Crucible Steel Co. of America, was appointed a vice-president of the company at a meeting of the board of directors held Sept. 17, and J. M. McComb, credit manager, was appointed an assistant treasurer.

E. B. Hotchkiss, American Steel Export Co., sailed Aug. 28 for France. He is to visit France, Italy and Spain in connection with a number of large engineering problems. He resided in France and Belgium for over 19 years in charge of engineering work.

George McCall was elected vice-president of the Westmoreland Coal Co., Philadelphia, Sept. 18. Herman Roll succeeds him as treasurer and Howard R. Yearsley is now secretary of the Westmoreland Coal Co., Penn Gas Coal Co. and Manor Gas Coal Co. George B. Seyms was appointed manager of sales of each of the companies.

A. D. Shankland has been appointed chief chemist of the Lehigh and Saucon plants of the Bethlehem Steel Co., succeeding F. O. Kichline, recently transferred to Lebanon, Pa. Samuel Lewis has been appointed chemist at the Saucon laboratory, succeeding A. R. Hartzell, resigned.

Fred H. Brussel, formerly foreman of the pattern shop of the Bayview Foundry, Sandusky, Ohio, and A. Helmrich have gone in business for themselves, having organized the Sandusky Pattern Company of Sandusky. Mr. Brussel is president and general manager of the company and Mr. Helmrich is secretary and treasurer.

Emile Chouanard, Forge Vulcane, rue St. Denis, Paris, is expected shortly to arrive in this country to purchase a large quantity of machinery.

Charles M. Terry, president Charles M. Terry, Inc., dealer and exporter of machinery, railroad and engineering materials and supplies, operating in Australia, is in this country on a business trip and is located at the offices of the company, 23-25 Beaver Street, New York.

Lawrence H. Cooney, general manager of the St. Algoma Steel Co. plant and wharves at Sault Ste. Marie, Ontario, Can., has resigned. He was for many years in charge of the rolling mill department of the Ohio Works, Carnegie Steel Co., Youngstown, Ohio, before going to Canada three years ago. He is to be succeeded at the Algoma works by James Nelson, formerly of Youngston, but for the past year in charge of the duplex department of the Bethlehem Steel Co. at Bethlehem, Pa. Mr. Nelson was in charge of the open hearth department of the Ohio Works, under Lewis H. McDonald, before going to the Algoma company more than two years ago. From Sault Ste. Marie he went to the Bethlehem works to take a better position.

Edel Moldenke, son of Dr. Richard Moldenke, Watchung, N. J., is now en route to Burmah, where, as geologist of the Burmah Mines, Ltd., he will conduct explorations for lead in the districts bordering on Thibet.

T. M. Avery, one of the New York City representatives of the Blaw-Knox Co., of Pittsburgh, has gone to the Pacific Coast to take charge temporarily of the San Francisco office of that company. Edwin M. Ornitz, its San Francisco representative, has joined the Engineering Corps as first lieutenant.

F. H. Willcox has resigned from the Huessener Engineering Co. to become associated with Freyn & Co., Chicago.

Thomas S. Garrett has resigned as manager of the machinery department of Easton, Williams & Wigmore, Inc., New York, to go into business for himself after taking a rest.

D. S. Forsyth of Louisville, Ky., has been appointed auditor of Rogers, Brown & Co., Cincinnati, succeeding the late J. Russell Houston.

OBITUARY

GEORGE W. KING, president of the Marion Steam Shovel Co., Marion, Ohio, died Sept. 9, aged sixty-three years. He had been connected with the company since its formation in 1884, and had been its president since 1904.

ELWOOD BEAUMONT BLANDY, one of the best known men in the pig iron business in the Eastern territory, died at his home in New York Sunday, Sept. 16, after an illness of a week with pneumonia. Mr. Blandy was 63 years of age and was born at Zanesville, Ohio. When a very young man, he was engaged for a few years in the machine works at Zanesville owned by his father, and then went into the selling of pig iron, in which he continued throughout his life. For a number of years he was connected with George H. Hull in New York and was active in selling Alabama irons. Later he represented M. A. Hanna & Co. at Buffalo and was also for a time connected with B. Nicoll & Co. For several years before its absorption by the Steel Corporation, Mr. Blandy was general sales agent of pig iron of the Tennessee Coal, Iron & Railroad Co., and seven years ago became New York representative of Pilling & Crane. He resigned Sept. 1 to accept the position of secretary of the Northern Ore Co. of New York, which some months ago acquired the Keystone blast furnace at Island Park, near Easton, Pa., formerly owned by the Thomas Iron Co. Mr. Blandy is survived by his wife and a son, Thornton, who lives in Washington.

GEORGE S. RIDER, head of George S. Rider & Co., engineers, Cleveland, designer of many large industrial plants, died suddenly of heart failure, Sept. 11. He went to Cleveland from Providence, R. I., 25 years ago, and opened offices as consulting engineer. He was a member of the American Society of Mechanical Engineers and of the Cleveland Engineering Society.

HARRY L. ALLEN, assistant to the fourth vice-president of the American Steel Foundries, died at Cleveland, Aug. 31. President Lamont says of him: "Under 35 years of age at the time of his death, he was, in point of service, one of the old employees of the company, having come to it at the time of its organization, 15 years ago, along with others of the staff of the

American Steel Castings Co. Starting as an office boy, without influence of any kind, and in spite of a frail body which always put a limit to the activities of his more than ordinary mind, he had for nearly five years occupied an important position among the officers of the company. Always a careful and painstaking student of his work, especially along chemical and metallurgical lines, he possessed organizing and executive abilities of a high order. The company suffers a real and serious loss in his death."

SOUNDS NOTE OF WARNING

Chairman of Appropriations Committee Makes Important Statement

WASHINGTON, Sept. 18.—The final war budget of the current special session, which has been increased by the House from $4,800,000,000 to $7,023,786,000, will probably be passed by the Senate and disposed of in conference during the coming week. The bill now carries cash appropriations of $4,769,583,000 and authorizations to make contracts in advance to the extent of $2,254,000,000. The increases in the bill made by the House include $993,604,000 in cash and $1,219,202,000 in authorizations. The biggest cash item in the House amendments is $635,000,000 for the Shipping Board, to which is added permission to contract for work amounting to a further sum of $849,000,000 to be appropriated next December.

For the new fleet of destroyers planned by the Navy Department, the House has granted $225,000,000 in cash and authority to contract for $125,000,000 more. The bulk of the remainder of the increase added by the House has been provided to meet estimates of the War Department for ordnance, including machine guns, mountain and siege guns and field artillery for which the house has given $132,621,000 in cash and $245,000,000 in authorizations to make contracts. These enormous sums, it will be understood, are carried by the bill in addition to the amounts reported in the original measure and heretofore described in this correspondence. In making up the bill in committee no less than $42,000,000 of estimates furnished by various Government departments were rejected.

During the debate on this record-breaking budget bill Representative Fitzgerald, chairman of the House Committee on Appropriations, warned his colleagues that because of the colossal appropriations already authorized there will be a deficit of no less than $2,600,000,000 at the end of the current fiscal year in spite of the heavy program of taxation about to be adopted by Congress. This deficit, he said, would have to be provided for and would soon force an increase in the war profits tax to a maximum of 80 per cent and in the income tax to 60 per cent in addition to other tax levies.

CALLS WAR BOARD INADEQUATE

Waddill Catchings at Chamber of Commerce Convention Advocates Reorganization of Buying System

Waddill Catchings, president Sloss-Sheffield Steel & Iron Co., New York, in addressing the convention of the Chamber of Commerce of the United States at Atlantic City on Tuesday, advocated the entire reorganization of the Government's purchasing system, declaring that the recently created War Industries Board had failed to meet the situation for lack of complete authority under the law.

"Chaos exists in business to-day," declared Mr. Catchings, "and order must be brought out of the situation if we are to win the war. The price control committee of the Chamber of Commerce, the Wall Street man, the farmer, distributer and merchant, all are of this opinion. The Government, we are informed, intends to spend $19,000,000,000 for itself and its Allies during the next year. When we consider that the entire gross turnover of the United States Steel Corporation and its subsidiaries is $853,000,000 each year, it will be seen that the Government will place upon business a demand 20 times as great."

In advocating a general war board with the broadest powers Mr. Catchings declared that competitive buying between the Government and private industry had produced high prices. The power to make purchases, he said, should be taken out of the hands of the army and the navy. The War Industries Board, he said, had filled a useful purpose but was not the proper kind of an organization. With the power to fix all prices, he asserted, the Government should be given authority to decide not only priority of railroad shipment, already given it, but priority of purchase as between individual manufacturing firms. The shortage of materials, he said, forces out of business not the industry least needed but the industry least able to pay the bill.

HOPKINS & ALLEN ARMS CO.

Federal Court Orders Sale of Plant to Satisfy a $3,850,000 Mortgage Held by Belgian Government

Judge Edwin S. Thomas of the United States District Court, New Haven, Conn., has ordered the sale of the equity in that portion of the plant of the Hopkins & Allen Arms Co., Norwich, Conn., that is encumbered by mortgage. The plant has been in the hands of receivers for several weeks. The company had an order for the manufacture of 150,000 Mauser rifles for the Belgian Government, but had delivered only 11,392 of the rifles. The contract price for the rifles was $27 and under the terms of the contract the Belgian Government advanced $1,012,500. The company soon needed more money and got it from that Government in the form of successive loans, secured by a mortgage on certain of the property. Aside from the $1,012,500, the principal and interest of these loans now amount to about $3,850,000. Bids for the plant are to be opened Oct. 17. The lowest bid that will be accepted for the equity is $65,000 and the purchaser must assume a mortgage of $200,000 which secures an outstanding issue of bonds of the company, as well as the Belgian mortgage.

At the hearing, the receivers, the Belgian Government, the United States War Department and a protective committee of stockholders were represented. A bid from the Belgian Government for the property is assured and if it secures the plant it will turn the contract over to the Marlin-Rockwell Corporation, New Haven, Conn., which will operate the plant and complete the order for rifles at a price of $42.30 each. The Belgian Government will assume all sub-contracts of the Hopkins & Allen Arms Co. and will not bring suit against the company for failure to complete the contract.

Capt. Perry Osborn, representing the United States Government, told the court that the Government had determined to secure machine guns manufactured at this plant and it was hoped that there might be a solution of the situation. The Marlin-Rockwell Corporation is one of the larger manufacturers of machine guns and would carry on this work while completing the Belgian rifle contract.

The Continuous Zinc Furnace Co., Hartford, Conn., which developed the "Johnson" process of electric smelting of zinc-lead ores to save all the values, has sold the major right and title in this process to the American Smelting & Refining Co. The latter company will build a commercial furnace at one of its Western plants and develop the process, which it is claimed uses ores now commercially valueless and also largely eliminates labor.

The Dominion Steel Corporation has started work on the extensive improvements undertaken at its iron ore properties at Wabana, Newfoundland, with the object of increasing its annual output of ore from 800,000 tons to 1,500,000 tons per annum.

SHIP CONTRACTS AWARDED

Government Arranging for Building of Large Number of Vessels

WASHINGTON, Sept. 18.—The Emergency Fleet Corporation has finally signed the long delayed contracts for Government-owned shipyards and the construction of fabricated steel ships therein with the American International Corporation and the Submarine Boat Corporation. A similar contract with the Merchant Shipbuilding Corporation will probably be executed in a few days. Each of the contracts calls for the construction of 50 ships, but the Government has the option of increasing this number from time to time as Congress may provide the necessary money.

The first of the three shipyards, which will be in the nature of assembling plants, is already in course of construction by the American International Corporation at Hog Island, Pa. The plant will cost about $20,000,000, will be financed by the Government on a cost-plus-profit basis and upon its completion will become the property of the United States. The Shipping Board will supply the fabricated steel for the vessels, which will also be built on a cost-plus-profit plan. The 50 ships ordered will be of 7500 tons cargo capacity and deliveries will begin in 10 months, the contractors agreeing to complete them within 16 months. They will cost approximately $150 per ton, or about $56,250,000. It is probable that in the course of a few weeks a second order for ships will be given and that a few vessels of 9000 tons will be included in the second lot.

Provides for Plant

The contract with the Submarine Boat Corporation will cover the construction of a plant at Newark, N. J., at an estimated cost not far from that of the American International Corporation. Fifty ships of 5000 tons each have been ordered at an estimated cost of $150 per ton, or $37,500,000. The Government also holds an option from the Submarine Boat Corporation for additional vessels when the first lot are completed. The third plant will be built at Chester, Pa., the initial order being for 50 ships to be followed by others upon the passage by Congress of the pending urgent deficiency appropriation bill.

Both Chairman Hurley, of the Shipping Board, and Admiral Capps, general manager of the Emergency Fleet Corporation, are enthusiastic over the plans for the construction of fabricated ships and express the belief that this system will eventually revolutionize shipbuilding. The plans of the board for the construction and commandeering of foreign vessels promise to add to the American merchant marine between four and five million tons within the next 18 months. This will mean a 50 or 60 per cent increase in the total tonnage of vessels flying the American flag and represents no less than ten years' construction at the average rate of the past decade.

Destroyer Program

Relying upon the early passage of the pending appropriation bill, carying $360,000,000 for the new destroyer building program, the Navy Department has prepared tentative contracts with the Cramps, the Fore River Shipbuilding Co., the New York Shipbuilding Co., the Newport News Shipbuilding & Dry Dock Co., and the Union Iron Works at San Francisco, for the construction of 150 vessels to be built on a percentage basis. The margin of profit is still under consideration, but will probably be in the neighborhood of 10 per cent. To secure the necessary facilities for building the destroyers, all the plants which are to take contracts will require to be enlarged and this expense will be financed by the Government. Stipulations are now under discussion as to the disposition of the extensions after the war. The Navy Department will become responsible for the steel needed and will guarantee priority for the shipment of all material required.

It is understood that the Navy Department will specify standardized turbine engines and conferences are now being held with representatives of the General Electric and Westinghouse companies concerning the type and construction of the power units. It is stated that the Government will also provide the funds necessary to enlarge the plants of the concerns contracting for the engines, as existing facilities are inadequate and the department is very anxious to expedite the completion of the power units in order that there may be no delay in putting the destroyers in commission.

Victory for Bethlehem Steel Corporation

Vice-Chancellor Lane, at Newark, N. J., last week, vacated the injunction obtained by Clarence H. Venner and others to prevent the Bethlehem Steel Corporation voting on the issue of $30,000,000 common stock and $30,000,000 accumulative preferred stock. After going over the points that had been raised by Venner's counsel against the proposed transaction and the contentions with which they were met by counsel for the corporation, the court took occasion to criticise the complainant, Venner, as a man with a long history in the line which he pursued in the present case and as a "professional privateer."

The way having been cleared of legal objections, the stockholders, by a vote of 242,521 shares to 300, approved the plan for the issue of new stock. Charles M. Schwab, chairman of the board, voted in person 104,959 shares of both classes of stock, while the management voted 116,104 shares of both classes in proxies.

Canadian Locomotive Earnings

The Canadian Locomotive Co. Ltd., Kingston, Ont., during the 12 months ended June 30th last enjoyed the largest earnings in its history, most of which were derived from the manufacture of locomotives and locomotive parts and not from munitions.

The company's manufacturing profits during the past year totalled $721,254.90, and the net $616,254.90. This, with a balance of $304,322.42 brought forward from the previous year, gave $920,577.32 available for distribution. Out of this, $105,000 went in dividends on the preference shares, $25,000 was transferred to reserve for special replacements, $100,000 transferred to reserve for general depreciation and $15,000 added to the sinking fund. The balance carried forward to the current year was $690,577.32.

Will Resume Manufacture of Galvanized Sheets

CHICAGO, Sept. 19.—The Inland Steel Co. is to resume the manufacture of galvanized sheets, and announces it will be prepared to make deliveries about Nov. 1. Because of peculiar market conditions, only half of the company's galvanized sheet capacity will be used at the start. It has eight galvanizing pots and 14 sheet mills, of which six are new, while three more are to go on. Of the total of seven, four will be jobbing mills used for the heavier gages.

It is estimated that since the price of galvanized sheets went to abnormal levels, demand for them has been only about 50 per cent of normal, for the reason that substitutes replaced these sheets as a roofing material. The lower cost of various prepared roofings still causes them to be favored in the domestic market, but the export demand for galvanized sheets for roofing and other purposes has lately been growing.

The New England Westinghouse Co. has brought suit against the Crucible Steel Co. to collect $120,000, with interest from Aug. 5, 1915, which was paid as advance on a contract for 1,000,000 rifle barrels which it is claimed were never delivered. In its answer, filed Sept. 12, in the Federal District Court of New Jersey, the Crucible Steel Co. put in a counter claim for $800,000 for breach of contract on the part of the plaintiff. The contract price was fixed at 10 cents a pound for straight bars and 16 cents for barrel-shaped bars, and deliveries were to have been at the rate of 2500 barrels a day.

BIG BUYING FOR AIRPLANES

Government Places Orders for Plant in France

About 1000 Tools to Cost Nearly $3,000,000 Are Virtually Commandeered—Stone & Webster to Buy for Gun Repair Plant

Coincident with the announcement by the Secretary of War of the discovery of the Liberty airplane motor, which is expected to revolutionize aerial warfare, machine-tool builders last Thursday received telegrams from the J. G. White Engineering Corporation, 43 Exchange Place, New York, acting on behalf of the Signal Corps Equipment Division of the United States Army, to send representatives as early as possible to that address to submit propositions and enter into contracts for machine tools. More than 50 machine-tool men from out of town, in addition to resident New York representatives, presented themselves at the White corporation's offices and orders for about 1000 machine tools were given with a rapidity never before known in buying of such an important character. It is said that the purchases, which were made under the direction of an officer of the United States Army, will approximate $3,000,000. A company which received an order for about $100,000 worth of tools completed the whole transaction in less than one hour. This is an example of the speed with which the buying was done. Deliveries were demanded in many instances in 30 days, the tools being subject to commandeer process, if necessary.

It is understood that the Government will build 5000 Liberty motors in its plant in France. The J. G. White Engineering Corporation will erect the buildings. Fifteen thousand Liberty motors will be made in the United States. It is said that the Packard Motor Car Co. and Henry M. Leland & Son, Detroit, will each make 6000 and that the Trego Motors Corporation, New Haven, Conn., and the Nordyke-Marmon Co., Indianapolis, in co-operation with the Hall-Scott Motor Car Co., Oakland, Cal., will each make 1500. Parts for these motors will be manufactured in a number of plants; in fact, virtually every automobile factory will be utilized, according to information which has reached THE IRON AGE. The Liberty motor has previously been known as the U. S. A. motor, and though official announcement concerning it has just been made, it was perfected at least two or three months ago.

The General Vehicle Co., Long Island, N. Y., will make Gnome motors. Purchases of machine tools in this company's recent list have not been completed, but builders of tools have been requested to make reservations and formal buying will be concluded soon. The Trego Motors Corporation has bought quite heavily. The Simplex Automobile Co., New Brunswick, N. J., last week asked for a duplication of estimates on its recent list, but has not closed as yet for any tools.

Buying for a gun repair plant in France is to be done by the Stone & Webster Corporation, Boston, which has asked for bids by Sept. 19 on 359 tools, mostly engine lathes, boring lathes, grinding machines, horizontal drilling and milling machines, planers, boring and turning mills, radial drills, slotters, bolt cutters, etc. Deliveries are requested by Nov. 15, if possible, and not later than Dec. 31.

The Government has placed orders for 90 cranes, 30 locomotive and 60 of the gantry type, for terminal facilities in France. These orders were split up among a number of builders. Deliveries on one-third of the number are required by Oct. 15.

Aside from direct Government buying, there is a good volume of business, but most of it is for plants engaged on war equipment of some kind. The General Electric Co. has issued a list of 99 tools wanted for its West Lynn, Mass., plant. The Brazilian Navy is making miscellaneous purchases through a representative who makes his headquarters with Arkell & Douglas, 44 Whitehall Street, New York. Charles Hass, 50 East Forty-second Street, New York, has issued an inquiry for six milling machines for export to France. F. H. Lovell & Co., Arlington, N. J., have contracted to make powder cans for the United States Navy. The contract calls for about $1,500,000 worth of work and additional sheet-metal working machinery will probably be required.

The Poole Engineering & Machine Co., Baltimore, Md., has been buying in Philadelphia and New York for the machining of 4-in. guns. The Taylor-Wharton Iron & Steel Co. has placed additional orders for equipment for its Tioga plant, where gun forgings will be made for the Navy. Its total purchases now aggregate about $600,000. The Eddystone Steel Co., Eddystone, Pa., will soon buy machine tools and cranes. The Ingersoll-Rand Co. is buying for its Athens, Pa., plant.

Two lists have appeared in the Chicago market during the past week, one aggregating about $75,000 for the Beloit, Wis., plant of Fairbanks, Morse & Co., and the other of fair size for the Buda Co., Harvey, Ill. The Inland Steel Co., Indiana Harbor, Ind., is in the market for large lathes and other tools to cost about $50,000. The Holt Mfg. Co., Peoria, Ill., builder of caterpillar tractors, has placed a few orders, but has much more to buy. Government shell orders are expected soon in the Chicago territory and will doubtless precipitate a scramble for smaller sizes of machine tools.

There has been a good miscellaneous demand in Cleveland, mostly from makers of airplane parts, motor trucks and munitions, and the orders average from one to 10 tools. The Hampton Roads Shipbuilding & Dry Dock Co., recently organized, which will establish a plant at Norfolk, Va., has deferred buying equipment until expected Government contracts for ships are closed.

The American International Corporation, 120 Broadway, New York, and the Submarine Boat Corporation, 11 Pine Street, New York, will proceed at once with

the construction of yards for the fabrication of steel ships under the direction of the Emergency Fleet Corporation of the United States Shipping Board. After many weeks' delay, the contracts have been signed and accepted. Preliminary details for the yards have been arranged and no time will be lost in erecting shipways, shop buildings and in buying equipment necessary for the work.

Crane business continues active. The Tacony Ordnance Corporation has changed its recent list and will require only 14 cranes instead of 21, one of which is a 60-ton ladle crane. The Groton Iron Works, New London, Conn., has bought steel for shipways and will soon issue a list of its additional crane requirements. The Worthington Pump & Machinery Corporation has purchased three 5-ton cranes and one 10-ton crane for additions to its Harrison, N. J., works. George F. Pawling & Co., engineers, Philadelphia, have bought five 3-ton cranes for the Newfoundland Shipbuilting Co.'s plant at Harbor Grace, Newfoundland. The Foundation Co., New York, and the Buffalo Dry Dock Co., Buffalo, are in the market for cranes.

New York

NEW YORK, Sept. 18.

The J. G. White Engineering Corporation, 43 Exchange Place, New York, has been rapidly closing orders during the past several days for about $3,000,000 worth of machine tools. Orders for about 1000 tools have been placed under the direction of an officer of the United States Army. Many deliveries are required in 30 days, the machines all being subject to commandeer if necessary. They will be promptly shipped to France for an airplane motor plant, it being understood that the United States Government will make 5000 of the new Liberty motors in that country. Last Thursday morning machine-tool companies in all sections of the country received telegrams asking that representatives be sent promptly to New York to confer with the J. G. White Engineering Corporation. More than 50 outside men, in addition to those who make headquarters in New York, came here, as no orders were placed with agencies, factory representatives in all instances receiving preference.

Bids will be closed on Sept. 19 for 359 machines required by the Stone & Webster Corporation, Boston, for a gun repair plant in France. The tools are to be used for repairs to French field pieces, which the United States Army will use. The list includes engine lathes, boring lathes, grinding machines, horizontal drilling and milling machines, planers, boring and turning mills, radial drills, slotters, bolt cutters, steam hammers, coal forges, etc. Deliveries are requested by Nov. 15, if possible, and not later than Dec. 31.

The General Electric Co. is in the market again, having issued a list of 41 boring mills, seven planers, nine radial drills, one horizontal drilling machine, 16 milling machines, one slotter, 23 lathes and one punch press, mostly of large sizes, for its plant at West Lynn, Mass.

Orders have not been placed as yet by the General Vehicle Co., Long Island City, N. Y., on its recent list of about 900 machine tools, but builders have been requested to make reservations and the definite orders will probably soon be forthcoming. It is understood that the General Vehicle Co. will proceed with its original plan to make Gnome motors, despite the announcement of a new Liberty motor of a standardized type. Every available automobile factory in the country will be called upon, it is said, to make parts of the new Liberty motor. The Simplex Automobile Co., New Brunswick, N. J., has not bought yet, but has asked for a duplication of the estimates recently furnished on its list of about 100 machines.

The United States Government has given orders for 90 cranes, 30 of which are of the locomotive type and 60 of the gantry type. These are for two terminals in France. Orders were placed through Samuel M. Felton, who is in charge of railroad purchases. Delivery of about one-third of the cranes is required by Oct. 15, and the remainder soon thereafter.

General buying is good, the orders mainly being for one or two machines, but there are a large number of these. The Electro Dynamic Co., Bayonne, N. J., has not yet closed for all of the tools it recently inquired for. The Brazilian Navy is making purchases of machine tools, air compressors, cranes, etc., through a representative who makes his headquarters with Arkell & Douglas, 44 Whitehall Street, New York. Charles Haas, 50 East Forty-second Street, New York, has sent out an inquiry for six milling machines for shipment to France.

The Tacony Ordnance Corporation, which has closed contracts for a large part of its machine-tool equipment, has changed its list of cranes, and now asks for bids on 13 overhead electric traveling cranes, of 5, 10, 25 and 30-ton capacity and one ladle crane of 60-ton capacity. The former inquiry called for bids for 21 cranes. The Groton Iron Works, New London, Conn., has purchased steel for shipways and will soon issue a list of cranes to be bought. The Worthington Pump & Machinery Corporation, Harrison, N. J., has purchased three five-ton cranes and one 10-ton from the Pawling & Harnischfeger Co., Milwaukee. George F. Pawling & Co., engineers, Philadelphia, have closed for five three-ton cranes for the shipbuilding plant of the Newfoundland Shipbuilding Co., Harbor Grace, Newfoundland. The Foundation Co., New York, is in the market for a few small cranes. The Buffalo Dry Dock Co., Buffalo, N. Y., will buy several cranes.

Recent Government awards to F. H. Lovell & Co., Arlington, N. J., amounting to $1,500,000, necessitate further additions to their plant. Contracts for a considerable part of the work have been let to the David Henry Building Co. Lovell & Co. will make powder cans for the United States Navy. New sheet metal working machinery will probably be required.

The Downey Shipbuilding Corporation, 120 Broadway, New York, will erect a new machine shop, about 120 x 400 ft., to cost $75,000, at the former works of Milliken Brothers, Milliken, Staten Island, recently acquired for a shipbuilding plant. Plans have also been filed for the construction of five other buildings to cost about $88,000. Wallace Downey is president.

The Improved Motor Securities Co., New York, has been incorporated with a capital of $20,000 to manufacture internal combustion engines. D. C. Conkling, V. H. Hansen and H. Ferrari, 874 West End Avenue, are the incorporators.

The Doehler Die-Casting Co., Court and Ninth Streets, Brooklyn, N. Y., has had plans prepared for a one-story addition, about 42 x 290 ft., to cost $18,000.

The J. D. Johnson Co., 43 Boerum Place, Brooklyn, manufacturer of lead pipe, traps and plumbers' supplies, will build a one-story addition on State Street, about 50 x 100 ft., to cost $8,000.

The Runyon Corporation, New York, has recently been incorporated with a capital of $25,000 to do general foundry and machine shop work. A. W. Britton, S. B. Howard and G. V. Reilly, 65 Cedar Street, are the incorporators.

The Cosmopolitan Utilities Corporation, New York, has been incorporated with a capital of $50,000 to manufacture metal goods. I. L. Pasacal and L. Bonow, 309 Broadway, are the incorporators.

A four-story cold storage plant, about 60 x 100 ft., to cost $50,000, will be constructed on Hall Street by the Hutwelker & Briggs Co., 14 Hall Street, Brooklyn. G. M. Langdon, 103 Park Avenue, New York, is engineer.

The Yorkville Motor Co., New York, has been incorporated with a capital of $15,000 to manufacture motors and engines. W. Spiess, M. Kinsburg and R. Getzler, 1326 Lexington Avenue, are the incorporators.

The Johnson Shipyards Corporation, 515 Fifty-ninth Street, Brooklyn, N. Y., has increased its capital from $25,000 to $100,000.

The Interborough Rapid Transit Co., 165 Broadway, New York, has acquired property at 113 East Eighteenth Street, adjoining its power plant, for the erection of an extension.

The Pacco Vaporizer Corporation, New York, has been incorporated with a capital of $10,800 to manufacture vaporizing apparatus. M. Pruden and F. F. Pearz, 55 West Forty-fourth Street, New York, are the incorporators.

The Progressive Machine & Metal Products Co., 297 Water Street, New York, has leased property at 210-212 Canal Street for extensions.

The American Can Co., 120 Broadway, New York, is having plans prepared for the erection of a two-story addition, about 50 x 120 ft., to its plant on McWhorter Street, Newark, N. J.

The Onondaga Belting & Supply Co., Syracuse, N. Y., has been incorporated with a capital of $60,000 to manufacture belting. A. D. Page, V. V. Morgan and R. M. Langley, Syracuse, are the incorporators.

The Atlantic Stamping Co., 180 Ames Street, Rochester, N. Y., will build a one-story addition, about 45 x 98 ft.

The McKinnon Chain Co., Fremont Street, Tonawanda,

N. Y., manufacturer of iron chains, has awarded a contract for the erection of a one-story, brick and steel plant, about 80 x 145 ft.

The Buffalo Foundry & Machine Co., Fillmore Avenue and East Ferry Street, Buffalo, manufacturer of machinery and castings, has increased its capital from $500,000 to $1,500,000.

The Power Efficiency Corporation, 102 Clinton Street, Buffalo, operating a foundry at 419 Broadway, has increased its capital from $25,000 to $100,000.

The Buffalo General Electric Co., Buffalo, has filed plans for the erection of an addition to its power station on River Road.

The Reliance Air Brake Co., Buffalo, has increased its capital from $200,000 to $450,000.

The Niles-Bement-Pond Co., 111 Broadway, New York, has taken bids for the construction of a one-story, brick and reinforced-concrete power plant, about 89 x 108 ft., at its works at Plainfield, N. J.

The Walter Scott Printing Machine Co., South Avenue, Plainfield, N. J., has awarded a contract for the construction of three additions, 80 x 230 ft., 63 x 85 ft., and 20 x 43 ft., respectively, to cost about $100,000.

The New York Tool Mfg. Co., Alpine, N. J., has been incorporated with a capital of $25,000 to manufacture tools. B. S. Yankus, Alpine, and P. Turpeach, Brooklyn, N. Y., are the principal incorporators.

De Mattia Brothers, Garfield, N. J., machinists, will build a one-story foundry, about 70 x 80 ft., on Wellington Street, to cost about $9,000.

G. Grant Wilbur, New York, and B. Wright, Montclair, N. J., have incorporated in Delaware the Wilbur Mfg. Co., with capital of $200,000 to manufacture internal combustion engines.

The American Metal Treatment Co., Elizabeth, N. J., operating a plant for case hardening and tempering, is having plans prepared for a one-story addition, about 60 x 80 ft.

The New Process Rubber Co., 584 Bergenline Avenue, West New York, N. J., has been incorporated with a capital of $100,000 to manufacture automobile tires and inner tubes. John Berger and Tobias Schellenberger, Union Hill, and Reinhard Brueckner, West New York, are the incorporators.

The Metal Products Co., 790 Broad Street, Newark, N. J., manufacturer of taps, reamers, twist drills, etc., has removed its office to 32 Broadway, New York.

The Hay Foundry & Iron Works, Plum Point Lane, Newark, will erect a one-story building, about 40 x 100 ft., to cost about $7,500.

Fire, Sept. 10, destroyed a portion of the machine shops of Loy & Nawrath, 21-29 Runyon Street, Newark, with a loss estimated at $10,000. Joseph Svenson is superintendent.

The Newark Gear Cutting Machine Co., 69 Prospect Street, Newark, manufacturer of gear cutting machinery, is having plans prepared for a new four-story machine shop, pattern department and office building, about 42 x 50 ft., on Prospect Street. Henry E. Eberhardt is president. The F. H. Ogden Co., Union Building, is engineer.

Philadelphia

PHILADELPHIA, Sept. 18.

The Poole Engineering & Machine Co., Baltimore, appeared in this market last week as a buyer of big tools for work on 4-in. guns. The Taylor-Wharton Iron & Steel Co., which has received a Government contract to build naval guns at its Tioga plant, Philadelphia, has placed additional equipment orders, its total purchases now aggregating about $600,000. The Ingersoll-Rand Co. is buying for its plant at Athens, Pa., where it is said to be doing Government work. The Eddystone Steel Co., Crum Lynne, Pa., expects to come into the market shortly for cranes and machine tools. The Frankford Arsenal continues as one of the largest purchasers in Philadelphia or vicinity, and is now buying for a new fuse plant. The Standard Fuse Corporation, Paulsboro, N. J., has a French Government fuse contract, but will probably not need additional equipment. The Harris Engine Co., Wilmington, Del., has been reorganized and will buy new equipment for the manufacture of marine engines.

The John Whitaker Mfg. Co. will consolidate its Philadelphia and North Wales, Pa., factories at Lansdale, Pa., where it has leased a two-story building. The company manufactures adding machines.

The Midvale Steel Co., Widener Building, Philadelphia, has awarded a contract for the erection of a two-story machine shop, 112 x 210 ft., at its Nicetown works.

The Lutz Co., 3111 Grays Ferry Avenue, Philadelphia, manufacturer of machinery and parts, will build a one-story extension, about 40 x 88 ft.

The Supplee Biddle Hardware Co., Commerce Street, Philadelphia, is having preliminary plans prepared for the erection of a new factory. Purcell & Elmslie, 122 South Michigan Avenue, Chicago, are the architects.

The Henry Sheip Mfg. Co., Sixth Street and Columbia Avenue, Philadelphia, is taking bids for the erection of an addition to its power plant.

William Pilton, 5832 Ashland Street, Philadelphia, will erect an addition to his machine shop at Sixtieth Street and Larchwood Avenue.

The Bureau of Yards and Docks, Washington, D. C., has had plans prepared for the erection of a new power plant at its local yard to cost about $45,000.

The White Motor Car Co., Philadelphia, is having plans prepared for a new one-story building, about 250 x 300 ft., at Twentieth and Erie Avenues.

The Atlantic Auto Radiator Co., Philadelphia, Pa., has been incorporated in Delaware with a capital of $50,000 to manufacture automobile parts. Harry G. Goodman, Joseph Carmin and C. M. Hogarth, Philadelphia, are the incorporators.

Dougherty & Bachram, North American Building, Philadelphia, manufacturers of scales, will build a one-story addition to their plant at 1620 Washington Street, about 22 x 32 ft. Contract has been awarded.

A one-story power house, about 35 x 44 ft., will be erected by the Girard Point Storage Co., Philadelphia, at Twenty-sixth Street and Forty-fifth Avenue, to cost $31,000.

The Olson Testing Machine Co., 1204 Nectarine Street, Philadelphia, will build an addition to its plant.

A one-story power plant, 30 x 60 ft., will be erected by the Treen Box Co., Memphis and Tioga Street, Philadelphia.

The Baldwin Locomotive Works, Philadelphia, has awarded a contract for the construction of a new shop at Fifteenth and Spring Garden Streets to cost about $60,000. The company recently established a new record in the completion of an average of nine locomotives a day.

The William Cramp & Sons Ship & Engine Building Co., Philadelphia, has received a Government contract for 15 destroyers, similar to eight vessels now under way, at a cost of $19,000,000.

The J. G. Brill Co., Woodland Avenue and Sixty-second Street, Philadelphia, manufacturer of cars and car wheels, etc., will build a new one-story shop addition, about 100 x 120 ft. Contract has been awarded.

The New York Shipbuilding Co., Camden, N. J., will erect a one-story building, about 64 x 96 ft., at Fairview Street and Broadway.

Joseph Palese, 302 Spruce Street, Camden, will build a new one-story machine shop at 710-12 South Second Street.

The Chester Shipbuilding Co., Chester, Pa., has purchased a block of land bounded by Front, Second, Ulrich and Lloyd Streets, for proposed extensions.

The Jacob Wilson Estate, Easton, Pa., operating a foundry on Delaware Street for the production of iron and steel castings, has awarded a contract for the construction of a one-story addition, 60 x 130 ft., and 35 x 60 ft., to cost about $35,000. J. Wilson Harrison is manager.

The Steacy Schmidt Mfg. Co., 230 Hay Street, York, Pa., manufacturer of cars, car wheels and machinery, has commenced the erection of a new foundry on Queen Street for iron and steel castings. It has been making extensions to double its former capacity and has purchased the plant formerly occupied by the Spangler Mfg. Co.

The Bethlehem Steel Co., South Bethlehem, Pa., has commenced the erection of a one and two-story addition, about 200 x 980 ft., to be used as a machine shop and armor working plant.

The Frog, Switch & Mfg. Co., Carlisle, Pa., manufacturer of railway frogs and switches, is planning for the erection of an addition to its plant, for extensions in the manganese department.

The Carlisle Tire & Rubber Co., Carlisle, recently organized, has leased a local factory which it will equip and plans to begin operations about Jan. 1. Charles S. Moomey, formerly vice-president of the Keystone Rubber Mfg. Co., Erie, heads the company.

The Frick Co., West Main Street, Waynesboro, Pa., manufacturer of agricultural implements and machinery, will build a two-story addition, about 60 x 90 ft., for the manufacture of gas tractors.

The Standard Steel Works Co., Burnham, Pa., manufacturer of car and car wheels, is arranging for the immediate installation of equipment for gun forging work and will specialize in the production of forgings and rough borings for 6-in. guns.

The Industrial Foundry & Machine Co., Laurel and Wash-

ington Streets, Pottstown, Pa., has commenced the erection of a new pattern shop. It has inaugurated operations for the manufacture of automobile accessories, including engine parts. George A. Mohn is president.

The Light Mfg. & Foundry Co., Pottstown, Pa., manufacturer of aluminum goods, is planning for the erection of an addition. E. S. Fretz is president.

The Johnstown Traction Co., Johnstown, Pa., is having plans prepared for the erection of a new car repair plant at Coopersdale. George N. Smith is chief engineer.

The New Castle Construction Co., New Castle, Del., having completed its Russian order for shells, has closed its plant.

The Bower Auction Co., Media, Pa., has purchased a five-acre tract along the Pennsylvania Railroad, and has begun the construction of a plant for the manufacture of anchors.

Baltimore

BALTIMORE, MD., Sept. 17.

Mayor James H. Preston has launched an energetic campaign to have the Government establish one of its shipbuilding plants here and also to have capitalists interest themselves in some of the yards already established with the view to securing contracts for them. As a step along this line he has sent out letters to leading men. The plants mentioned in this connection are the Mann Shipbuilding Co., Henry Smith & Sons and the Coastwise Shipbuilding Co.

The Coale Muffler & Safety Valve Co., 325 East Oliver street, Baltimore, will erect a two-story building, 32 x 40 ft. The contract has been awarded to Gladfelter & Chambers, Thirty-sixth Street and Roland Avenue.

The first unit of the plant of the Westinghouse Electric & Mfg. Co., Essington, Pa., is expected to be in operation by Jan. 1, employing about 5000 men. By the middle of 1918 about 22,000 will be employed. Steam machinery and turbines will be the first products.

The Maryland Metal Cross Tie Co., Munsey Building, Baltimore, Md., is having plans prepared for a new one-story building, about 200 x 400 ft., to cost $100,000. Thornton W. Price, Woolworth Building, New York, is the engineer.

The McNamara Brothers Co., Ransteads Wharf, Baltimore, Md., manufacturer of boilers, tanks, etc., has awarded a contract for the erection of a new plant on Bush Street to cost about $15,000.

Paul W. Custer, Cumberland, Md., associated with the United States Sales Service Corporation, is organizing a company to establish a local brass working plant, including rolling mill and other departments.

The Richmond Engineering Co., Richmond, Va., manufacturer of sheet metal specialties, is planning for the erection of a two-story, brick and steel addition.

The Eastern Shore Shipbuilding Co., Sharptown, Md., recently incorporated with a capital of $500,000, is planning for the operation of a local shipbuilding plant.

New England

BOSTON, Sept. 17.

Machine tool builders are working at highest speed to keep up with the demands for their product, but are themselves buying little new equipment. General machinery makers are in the market for some new equipment, but large orders or inquiries originating in New England are the exception. The Blake & Knowles works of the Worthington Pump & Machinery Corporation have a good-sized inquiry out for equipment for an addition. The company is busy making pumps for shipbuilders and if certain contracts which local ship builders expect materialize, a further enlargement of the Blake & Knowles works is expected to follow. The Watertown Arsenal has recently added two 42-in. and two 36-in. lathes.

The United States Airplane Co., recently organized in Delaware, has purchased a site in Bridgeport, Conn., and will build a plant for the construction of airplanes, engines and for a school of instruction in flying. The first building is to be ready for operations in 30 days and it is reported that the equipment is ready for delivery. The company will build a new type of engine which is said to develop 1 hp. per lb. of weight and to be rated at nearly 350 hp. It is expected that an announcement of officials will be made this week. The first unit of the plant will be a factory 100 x 300 ft., one story, and the entire cost of the buildings projected and their equipment will be about $500,000.

The Federal Stoker Co., Boston, has been incorporated with authorized capital stock of $100,000. John J. Hammers is president and Albert H. Wright, 50 Saville Avenue, Quincy, treasurer.

The Groton Iron Works, Groton, Conn., has begun the erection of a building, 150 x 350 ft., one and two stories.

The Colt's Patent Fire Arms Co., Hartford, Conn., is receiving bids on a forge shop, 40 x 225 ft., one story.

The American Chain Co., Bridgeport, Conn., announces plans for the erection of two buildings at Norfolk, Va., one 60 x 305 ft., and the other, 56 x 506 ft. Both are to be ready for occupancy in 80 days and will cost about $250,000. The company has received Government contracts for heavy anchor chains.

Work is well under way on an erecting shop and other buildings at the Watertown Arsenal, Watertown, Mass. The contract calls for the expenditure of about $500,000.

The Waterbury Buckle Co., Waterbury, Conn., is to build three additions, 16 x 34 ft., 14 x 27 ft., and 14 x 20 ft., one story.

The Donnelly Iron Works, Lowell, Mass., has been incorporated with authorized capital stock of $10,000. Frank A. Donnelly is president and treasurer.

The Fitchburg Engine Co., Fitchburg, Mass., has received a Government contract to build 18 marine engines, to be completed by Jan. 1, 1919. Additions are being made to increase the capacity of the plant.

The Millbury Steel Foundry Co., Millbury, Mass., has awarded a contract for an addition, 50 x 64 ft., and for a building to be devoted to pattern storage and office. A 2-ton Heroult furnace is being installed. The changes under way will enable the company to double its present working force of 60 men.

The Housatonic Shipbuilding Co., Bridgeport, Conn., awarded a contract for 10 wooden ships as noted last week, has erected a machine shop and four ship ways and has six more ship ways under construction. The officers are Simon Lake, president; Thomas L. Lake, vice-president; Kenneth W. McNeil, secretary; Carl Foster, treasurer, and Foster L. Kawkins, general manager.

The Government is soon to ask bids on the erection of five ordnance buildings and a machine shop at New London, Conn.

The Trego Motors Co., New Haven, Conn., has awarded a contract for a testing building, 51 x 51 ft., and work on the building has begun.

The Bantam Ball Bearing Co., Bantam, Conn., has awarded a contract for an addition to its machine shop, 42 x 80 ft., two stories.

The Fellows Gear Shaper Co., Springfield, Vt., is to build an addition, 72 x 170 ft., two stories.

The Scovill Mfg. Co., Waterbury, Conn., has awarded a contract for a pattern building and garage, 62 x 216 ft., four stories.

The Wyman-Gordon Co., Worcester, Mass., is to build an addition 40 x 100 ft., one story.

The Lombard Machine Co., Worcester, has awarded a contract for a three-story building to replace one recently destroyed by fire.

The Bush Mfg. Co., Hartford, Conn., has increased its capital stock from $39,700 to $125,000. No new building operations are contemplated but the working force will be largely increased. The principal product of the company is radiators for tractors, commercial cars and aeroplanes.

The Wright Wire Co., Worcester, is to build an 80-room hotel for employees of its Palmer, Mass., plant.

The Connecticut Brass Foundry Co., Waterbury, Conn., has been incorporated with capital stock of $3,500. The incorporators are Franklin W. Cohen and Samuel J. Lifty, both of Ansonia, and Henry L. and Benjamin Silver, Waterbury.

The Fitzgerald Mfg. Co., Winsted, Conn., has had plans drawn for an addition, 100 x 140 ft., one story.

The Winchester Repeating Arms Co., New Haven, Conn., has bought a large tract of land adjoining its present plant.

The Hendey Machine Co., Torrington, Conn., has secured a permit for the erection of an addition, 65 x 160 ft.

Wood & McClure, yacht builders, City Island, N. Y., who some time ago purchased a part of the plant of the Holmes Motor Works, Mystic, Conn., have bought the machine shop formerly owned by the Holmes Co. and a strip of land extending back 100 ft. from the water front. It is reported that repair work on Government vessels will be undertaken.

The American Thermos Bottle Co., Norwich, Conn., has purchased additional land on which a building to cost $50,000 will be erected.

The North Dighton Stove Co., Taunton, Mass., has been incorporated with authorized capital stock of $40,800. Daniel Crotty is president and John P. Dary, 23 South Street, treasurer.

The Athol Homes Corporation, Athol, Mass., has been organized with capital stock of $150,000 to build workingmen's homes. John A. McGregor, president Union Twist Drill Co., is president, and Frank E. Wing, treasurer. L. S. Starrett Co. is treasurer.

Henry Fletcher and Joseph P. Burlingame were appointed receivers of the Metal Products Corporation, Providence, R. I., on Sept. 11. The company specialized in the automatic production of drawing, forming, piercing and blanking work.

Chicago

CHICAGO, Sept. 17.

Two lists have come to the attention of the trade, one embracing several large tools wanted by Fairbanks, Morse & Co., for delivery at their Beloit, Wis., plant, the value of which will be close to $75,000; and another of fair size to be purchased by the Buda Co., Harvey, Ill. The headlight department of the latter company will fulfill a Government order for which the tools are needed. The Inland Steel Co., Indiana Harbor, Ind., is in the market for large lathes, a big gear-cutting machine and a tool-room grinder, the aggregate cost of which will be about $50,000. The scarcity of large tools is so acute that some dealers are not able to bid on some of the machines wanted. The Chicago & Northwestern Railway Co. has taken estimates on three machines, a belt-driven 42-in. upright drill press; 30-in. lathe, 10 ft. between centers, and a single crank planer, 24 in. x 6 ft.

The Holt Mfg. Co., Peoria, Ill., has placed a few odd orders, but has much more to buy. Its activities have been seriously impeded by labor troubles. The Stone & Webster Corporation, Boston and New York, has sent to some Western representatives of tool builders a large list of machines for shipment to France, with the request that quotations be f.o.b. Newport News, Va. Dealers can do little or nothing with the list for territorial reasons.

While purchasing of odd tools forms a good aggregate, it is notable that little buying is being done by the smaller jobbing shops and manufacturers, for the reason that prices of both new and second-hand machines are so high that the man with a small capital does not purchase unless the most urgent need exists. The scarcity of many tools is another deterrent factor to activity. Many of the new and second-hand machines in warehouses have already been sold, but are being held for future delivery. The most difficult to secure are large boring mills, heavy gear cutting, planing, horizontal boring and radial drilling machines.

It is predicted by excellent authority that the placing of Government shell orders in and near Chicago is not far distant, whereon a scramble for the smaller sizes of machine tools will take place. Local sellers continue to derive considerable business from the Wisconsin Gun Co., the Harley-Davidson Motor Co. and other Milwaukee interests.

The Linden Ice Machine Co., 2640 Holly Avenue, Chicago, has started work on a two-story mill construction shop, 49 x 100 ft., at 4849 and 4851 Grand Avenue, to cost $15,000. Charles Kophamer, 601 North Homan Avenue, has the contract.

The contract for an additional one-story foundry, 60 x 120 ft., at 2119 to 2123 Carroll Avenue, Chicago, for the Monighan Foundry Co., has been awarded to F. E. Doherty, 133 West Washington Street, Chicago.

Charles W. Secord, 417 West 117th Street, has been awarded the general contract for a one-story factory, 90 x 123.5 ft., to cost $30,000, to be erected for the Belden Mfg. Co., 2300 South Western Avenue. It is to be a section of a plant that ultimately will cost $100,000.

Plans have been drawn for a foundry, 75 x 100 ft., at Fulton and Curtis Streets, Chicago, for H. G. Lang, 162 North May Street.

The Union Specialty Machine Co., 300 West Kinzie Street, Chicago, is planning the construction of an eight-story factory.

The Interstate Brass Co., Chicago, has been incorporated with a capital of $10,000 by Maxwell L. Herman, A. L. Epstein and Morris Lasdon, 1325 Turner Avenue.

The Metal Produce Co., Chicago, has increased its capital stock from $5,000 to $20,000, and changed its location from 1749 Grace Street to 100 South Jefferson Street, Chicago.

The Illinois Steel Co. has taken out a permit for a one-story brick extension to a machine shop, 69 x 160 ft., to be erected at Eighty-seventh Street and Mackinaw Avenue, South Chicago, at a cost of $40,000. Leonard C. B. Holmbee is the architect.

Peter W. Meyn of Gostlin, Meyn & Co., has sold approximately 32 acres of land at Hammond, Ind., on which a plant for the construction of tank cars is to be built. The identity of the company has not been disclosed but it is said to be an established one, and plans building at once.

The Western Electric Co. will erect a one-story brick factory at 4537-39 West Twenty-second Street, Chicago, at a cost of $30,000. Walter R. Kattelle is the architect.

The Bradwield Sales Co., Peoria, Ill., has been incorporated with a capital of $25,000 by J. S. Bradfield, T. Bradfield and H. S. Bradfield. It will manufacture automobile parts, accessories, complete machines, and will transact other business incidental thereto.

The Comet Automobile Co., Decatur, Ill., has started the construction of its new plant which, when completed, will cost approximately $140,000. The first unit will be 150 x 600 ft., running north and south along the Illinois Central and Vandalia railroads. It will be one-story, of concrete and steel, while the front section will be two stories and will contain the administrative offices. An office building will also be erected south of the factory.

The Merrill-Higgins Co., Omaha, Neb., has been incorporated with a capital of $100,000 by H. B. Merrill, E. A. Higgins and C. J. Miller, to manufacture stoves, furnaces, heating plants and heavy hardware.

The Republic Phonograph Co. of Illinois, Chicago, has been incorporated in Delaware with a capital of $250,000 to manufacture phonographs. L. L. and B. F. Cowan and P. Zak are the incorporators.

The Moline Forging & Mfg. Co., Moline, Ill., has awarded a contract for the erection of a one-story addition to its plant, about 110 x 260 ft.

The Union Drawn Steel Co., Gary, Ind., specializing in the production of high grade steel for tools, has placed its new plant in operation, which has been in course of construction for the past year. It is expected to install additional machinery to run at full capacity within the next month, with the employment of about 500 hands.

Milwaukee

MILWAUKEE, WIS., Sept. 17.

Contracts and orders for a vast variety of material for Government purposes are coming in so rapidly that the metal-working industry is being taxed to a degree never before known. The immediate problem is to find facilities sufficient to handle all the business, a considerable volume of which has been turned away, because there is no hope that required deliveries can be met. Manufacturers of internal combustion engines for automobiles, trucks, tractors and airplanes are finding it difficult to produce the number required by their bookings. The present metal-working capacity is perhaps twice as large as it was a year ago, yet facilities are lacking to meet all demands.

The Kempsmith Mfg. Co., Milwaukee, maker of milling machines, has awarded contracts for the erection of another shop extension, 102 x 200 ft., of brick, steel and reinforced concrete, with sawtooth roof, which, together with additions erected the past eight months, will more than treble the capacity.

The Cutler-Hammer Mfg. Co., Milwaukee, manufacturer of electric controlling devices, expects to begin work within 10 days on the construction of the second unit of its new plant at Twelfth Street and St. Paul Avenue, which eventually will cost about $1,250,000 and involve the replacement of practically all structures comprising the old works. The first unit is now ready for occupancy. Each unit will be 50 x 200 ft., seven stories and basement, of reinfored concrete. A. W. Berresford is vice-president and general manager.

The Standard Crucible Steel Castings Co., 719 Thirtieth Street, Milwaukee, will erect a one-story foundry addition, 30 x 60 ft., of brick and reinforced concrete. Theodore F. Schutz is the architect.

The Falls Motors Corporation, Sheboygan Falls, Wis., has taken a contract for furnishing cylinder castings and other parts for 5000 airplane motors to the Curtiss Airplane Co., delivery to begin Sept. 22. The company recently doubled its capacity and is employing more than 600 men.

The United States Switch Co., a Delaware corporation with $1,750,000 capital stock, which has been granted a Wisconsin charter, will establish a plant in Eau Claire, Wis., to manufacture automatic railroad and electric railroad switches and other equipment, appliances and safety devices. It has purchased the former plant of the Eau Claire Mfg. Co. and five acres of ground, and will award contracts at once for several buildings. The officers are: President, James W. Hubbard, Eau Claire; vice-president and general manager, T. C. Hadley, Atlanta, Ga.; executive committee, N. J. Whelan, J. J. Ott, R. B. Gillette, F. E. Nicoles and R. L. Meader.

The Universal Motor Co., Oshkosh, Wis., manufacturing electric lighting units for army trucks, field machine-shops, farms, etc., will increase the capacity of its plant from 75 to 100 per cent by the erection of a two-story addition, 40 x 165 ft. The owners of the company recently organized the

Universal Foundry Co., Oshkosh, which is operating a shop to provide castings for the motor company and other consumers.

The Milwaukee Tank Works, 851 Kinnickinnic Avenue, Milwaukee, has increased its capital stock from $25,000 to $100,000. It manufactures light and heavy sheet steel tanks, stacks, etc., and has been enlarging its facilities the last four or five months. R. L. Bienenstok is president.

The Cluley Multiplier Co., Green Bay, Wis., has suspended production of its multiplying machines pending important developments in the design, and is occupying its facilities at present by the manufacture of automobile accessories and specialties, which include jacks, tire pumps, superheated manifolds, tire meters, headlight reflectors, dimmers, etc. John P. Cluley is vice-president and general manager.

The American Auto Body Co., 531 Caswell Block, Milwaukee, will expend about $80,000 in the construction and equipment of a frame and metal-working plant, four stories, 100 x 300 ft., of reinforced concrete, brick and steel. David J. Borun is treasurer.

The West Bend Aluminum Co., West Bend, Wis., is taking bids this week for the erection of additions costing $75,000. The plans call for a three-story reinforced concrete shop, 72 x 190 ft., and a one-story wing, 50 x 60 ft.

The Davis Mfg. Co., Milwaukee, gasoline engine manufacturer, has awarded the general contract for the erection of a new core building, 92 x 100 ft., to the Robert L. Reisinger Co., First National Bank Building, Milwaukee. The company is completing work on a large foundry and machine-shop addition, to be served by the new core building. Frank M. Davis is president and general manager.

The A. E. Martin Foundry & Machine Co., 705-723 Park Street, Milwaukee, is making a number of additions and erecting a new office building costing $5,000.

Detroit

DETROIT, Sept. 17.

A great increase in the number of machine tools booked was noted in the past week and in addition many inquiries were received for large orders. Dealers state that the fall business has opened with more of a rush than was anticipated, due to many companies enlarging their plants.

The general manufacturing business in this district is very good, brass, copper, aluminum and iron-working plants working to capacity. Shipbuilding companies are unable to keep up with orders and despite reports to the contrary pleasure car manufacturers are well supplied with orders. Banks are growing more conservative on loans and as a result new industries are not being formed as rapidly as formerly.

The plant of the Standard Screw Products Co., Bellevue and Warren Avenues, Detroit, was destroyed by fire Sept. 12 with an estimated loss of $400,000. It was engaged in turning standard machines for the United States Government, and more than 400 men are thrown out of work.

The Air-O-Flex Automobile Corporation, 570 Penobscot Building, Detroit, has announced it will manufacture a 1½-ton flexible suspension truck. The company was incorporated in Delaware, with an authorized capitalization of $2,500,000. E. M. Walker, Jr., is president, and Mr. Kreis, research engineer of the Continental Motor Co., is vice-president and chief engineer.

The Landover Motor Truck Co. will occupy the plant of the Marinette Iron Works, Marinette, Mich. Machinery will be installed and operations will begin shortly.

The Muskegon Engine Co., Muskegon, Mich., capitalized at $150,000, will begin the manufacture of a 2-ton truck Oct. 1. C. E. Johnson is president and general manager. J. A. Mohrhardt, vice-president, and L. H. Shuh, secretary and treasurer.

The plant of the Duplex Truck Co., Grand Rapids, Mich., will be completed by Nov. 1. It is 72 x 402 ft., with a wing 72 x 306 ft., two stories, and will have a capacity of 75 trucks per month. H. M. Lee is general manager.

The Kuhlman Electric Co., Bay City, has completed plans for the construction of additions to its plant.

The Flottorp Mfg. Co., Chicago, manufacturer of aircraft propellers, will move to Grand Rapids, where increased capacity has been secured. It has a large Government contract and operations will begin within 30 days.

The Grand Rapids Textile Machinery Co., Grand Rapids, Mich., has completed a new factory and has awarded a contract for a power house to cost $8,000.

The Clipper Belt Lacer Co., Grand Rapids, Mich., is building a power house at a cost of $8,000.

The Fisher Body Corporation, Detroit, will erect a one-story steel frame factory, 100 x 560 ft., and 23 ft. high, for use of its airplane division at an estimated cost of $200,000.

The Henseler Trolley & Mfg. Co., Holden Avenue, Detroit, will build a new one-story machine shop and foundry, about 35 x 150 ft. E. J. Fezzey is manager.

Indianapolis

INDIANAPOLIS, Sept. 17.

The plant of the Peerless Wire Works, Lafayette, Ind., recently destroyed by fire will be rebuilt. Contract has been let for two buildings, 26 x 70 ft., and 28 x 70 ft., respectively, giving 8000 ft. of floor space.

The Hammond Malleable Iron Co., Hammond, Ind., has increased its capital stock from $75,000 to $150,000.

The Jay-Vee Differential Co., Indianapolis, has increased its capital stock from $110,000 to $125,000.

G. A. Robinson, Anderson, Ind., has disposed of his interest in the Standard Plating & Brass Co., and will devote his entire attention to the manufacture of brass and aluminum castings. He is building a new foundry, 30 x 100 ft., especially for this purpose at Sixth Street and the Big Four Railroad, work on which is well under way.

It is reported that the Pennsylvania Lines West will build car-repair shops and other terminal facilities at its new yards now under construction at Richmond, Ind., to cost $250,000.

Cleveland

CLEVELAND, Sept. 17.

Machinery dealers report a good volume of orders for single tools and for lots up to 10 machines. The demand is mostly from makers of airplane parts, munitions and motor trucks. Some inquiry for large machines for gun plants is still pending. The Hampton Roads Shipbuilding & Dry Dock Co., Cleveland, which contemplates building a plant at Norfolk, Va., has deferred the purchase of shipbuilding equipment until it secures expected Government contracts for boats. Among orders placed the past week was one by a local company for a number of machines for a new tool room. Automatic screw machinery in small lots is in fairly good demand, but no large inquiries are pending. The demand for standard screw machine products for Government work is heavy. Many manufacturing plants in this section have Government orders on their books and much additional work of a miscellaneous character is coming out.

The Westinghouse Electric & Mfg. Co., Cleveland, will build a malleable iron foundry, 160 x 260 ft., in connection with its gray iron foundry, which will be used particularly for Government work. The plant will be equipped with two air furnaces and other required equipment, including annealing ovens and molding machines, none of which has yet been purchased. A second building will be erected to be used as a machine shop.

The Cleveland Brass & Copper Mills, Inc., Cleveland, placed its new plant partially in operation this week. It will have a monthly capacity of about 3,000,000 lb. of sheet brass and rods and is starting with about one-fifth of full capacity which will be increased as remaining sections are ready for operation.

The Lakewood Engineering Co., Cleveland, has purchased the plant of the Galion Dynamic Motor Truck Co., Galion, Ohio, which it will use for the manufacture of storage battery trucks and trailers, with a four wheel steer and four wheel drive. An extension will be built as soon as plans can be prepared. In addition to this and its Cleveland plant the company now owns and operates works in Elyria, Ohio, and Milwaukee.

The Austin Co, Cleveland, has recently taken contracts for an addition 50 x 420 ft. for the Frankford Asenal and for a new building for the Dow Chemical Co., Jackson, Mich., and the Worthington Pump & Machinery Co., Cincinnati.

The Reliance Electric & Engineering Co., Cleveland, has increased its capital stock from $180,000 to $600,000. No extensions are contemplated.

Brennan & McBride, 6719 Carnegie Avenue, Cleveland, will erect a two-story building, 50 x 120 ft., to be occupied partly by a machine shop for automobile repair work.

The Kilby Mfg. Co., Cleveland, is making some changes and improvements to its plant which will increase its machine shop capacity.

The Manufacturers' Brush Co., Cleveland, has purchased a site on West 114th Street, where it contemplates erecting a new plant next spring.

The J. C. Ulmer Co., Cleveland, will erect a two-story factory at East Thirty-eighth Street and Kelly Avenue to cost $20,000. Plans have been prepared by the Poe Engineering Co.

The American Auto Trimming Co., Cleveland, has acquired a two-acre site adjoining its plant on East Seventy-second Street, and it is reported, plans the erection of a factory addition.

The Toledo Machine & Tool Co., Toledo, Ohio, is having plans prepared for its new foundry and is expected to pur-

chase equipment shortly. It will probably be equipped with two cupolas, with a daily melting capacity of about 50 tons, and designed to make large gray iron castings used in the manufacture of the company's line of presses, which are now furnished by outside foundries.

The Smith Gas Engineering Co., Lexington, Ohio, is building gas producer plants for use in connection with heat treating furnaces for the Jeffery Mfg. Co., Columbus; Timken Roller Bearing Co., Canton, and the Reliance Mfg. Co., Massillon, Ohio, and several units for the Ford Motor Co., Detroit, where it installed two 6-section plants several months ago.

The Burt Mfg. Co., Akron, Ohio, has received an order for 125 24-in. Burt ventilators and bases to provide fresh air in the quarters of the army in France. The company has shipped 50 ventilators for use at Camp Fort Benjamin Harrison at Indianapolis.

Cincinnati

CINCINNATI, Sept. 17.

If all inquiries now being figured on should develop into orders it would be impossible for local machine tool builders to catch up with the demand in over a year. The majority already have sufficient business in hand to keep their plants in full operation several months ahead. Inquiries are from steel mills, shipbuilders and manufacturers of internal combustion engines. The railroads are not buying any machines except for replacement.

The Niles Tool Works Co., Hamilton, Ohio, is again having trouble with its molders. The foundry was started last week, but was compelled to close the second day. The question at issue is simply a demand for recognition of the union. A temporary Federal injunction against the strikers was obtained last week and the case will be heard in Cincinnati Sept. 24.

Airplane makers have bought machine tools quite heavily in this market, including sensitive drilling machines, etc. It is stated that much more business from this source is expected to come to light within a few days.

It is reported that the B. A. Wesche Electric Co., Cincinnati, maker of small electric motors and generators, has plans under way for a new factory that will enable it to double its output.

The Recording & Computing Machine Co., Dayton, Ohio, it is reported, has received a large Government order for war munitions. Its present plant was built to make shell detonating devices for the Allies.

It is reported that the International Harvester Co. will enlarge its plant at Springfield, Ohio, to engage in the manufacture of farm tractors and motor trucks. Heretofore the plant was operated almost entirely as a foundry.

The addition to the plant of the Kelly-Springfield Motor Truck Co., Springfield, Ohio, will soon be under cover and ready for the necessary equipment.

The Victor Rubber Co., Springfield, Ohio, will build an addition to its plant. W. H. Christman is the architect.

The addition to the plant of the Springfield Metallic Casket Co., Springfield, Ohio, will be 62 x 150 ft., three stories, of brick, concrete and steel. J. A. Poss has been awarded the contract.

The Portsmouth Supply & Mfg. Co., Portsmouth, Ohio, is removing to a new building on Gallia Street.

The Mt. Vernon Foundry & Engineering Co., Mt. Vernon, Ohio, has been incorporated with $100,000 capital stock by James J. Sexton and others.

The Central South

LOUISVILLE, Sept. 17.

Numerous orders, delayed on account of high prices, are now being booked by local machinery manufacturers. Ice-making machinery is unusually active. Dealers report a big demand for hoisting engines, while a dearth of casings and other supplies needed by the oil well industry continues. Skilled labor is difficult to obtain.

The Vogt Brothers Mfg. Co., 1402 West Main Street, Louisville, is in the market for a second-hand, 15-ton alternating-current electric crane, to span 40 ft. 3 in. and to lift 25 ft., for immediate delivery.

The Standard Sanitary Mfg. Co., Pittsburgh and Louisville, has taken over the Ahrens & Ott Mfg. Co., Louisville, which will be known as the Ahrens & Ott Division of the Standard Sanitary Mfg. Co. It will continue to handle plumbers' supplies and fixtures and steam fitters' and machinists' supplies.

Fire, Sept. 13, destroyed the pumping plant of the municipal waterworks at Harrodsburg, Ky., with the exception of the boilers.

The John G. Duncan Co., Knoxville, Tenn., is asking for dealers' prices on two 150-hp. return tubular boilers, of 125 to 150 lb. working pressure, with complete data; and prices on a second-hand steam pump, 4½ or 5-in., to pump water 220 ft. high, in good condition and for immediate shipment.

The Central Iron & Metal Co., Louisville, Ky., has been incorporated with a nominal capital of $5,000 to manufacture metal specialties. Herman and Benjamin B. Kort are the principal incorporators.

Texas

AUSTIN, Sept. 15.

It is expected that the new conservation law of the State, which will be passed by the Legislature, will cause a great impetus to irrigation and drainage projects and will create a big demand for machinery.

The Hughes Tool Co., Houston, will equip its new plant now in course of construction, with modern machinery, and will give employment to 125 skilled mechanics.

The Multa Power Tractor Co., Fort Worth, has been incorporated with a capital stock of $10,000. R. W. Wynne is a stockholder.

The George W. Pittman Co., Waco, will build a plant for the manufacture of shovel handles.

St. Louis

ST. LOUIS, Sept. 17.

The Loeb Compress Co., Ruston, La., has been organized by Henry Loeb and others of Shreveport, La., and will equip a cotton compress at a cost of about $50,000.

The Williams & Miller Gin Co., Elk City, Okla., has been incorporated with a capital stock of $200,000 by Sam Williams, A. O. Miller and others and will equip a cotton ginnery and compress.

Scooba, Miss., is in the market for equipment for an electric light and power plant.

The Davis Mfg. Co., Enid, Okla., will equip a plant to manufacture threshing machines and separators, including a machine shop and foundry, at a cost of about $50,000. W. R. Lence is president and G. E. Richmond, engineer.

The Oil State Refining Co., Enid, Okla., capitalized at $250,000, will equip a pumping station with a daily capacity of 10,000 bbl. and a refinery with a capacity of 2500 bbl.

The Enid Oil & Pipe Line Co., H. H. Champlin in charge, will equip a pipe line and pumping stations, the contemplated investment being $200,000.

Wilson & Co., Little Rock, Ark., will equip a cold storage plant and are in the market for about $5,000 worth of machinery.

Meridian, Miss., J. M. Dabney, mayor, will expend about $150,000 in the equipment of a municipal ice plant.

The Fort Smith Metal Products Co., Fort Smith, Ark., has increased its capital by $50,000 and will enlarge its capacity to manufacture 1000 iron beds per day.

Galena, Mo., under the direction of the mayor, will expend about $100,000 in the equipment of a waterworks plant.

H. J. Wobus, Fullerton Building, St. Louis, is reported in the market for equipment for isolated plants, including oil engines of 30 hp. and generators of 25 kw. capacity.

California

LOS ANGELES, Sept. 11.

The Cochise Machine Co., Los Angeles, has awarded a contract for the erection of a one-story machine shop and blacksmith works, 100 x 105 ft., at Broadway and 115th Street, South Los Angeles.

The Pacific Platinum Works, 229 East Ninth Street, Los Angeles, has acquired property in the vicinity of its plant for the erection of a one-story factory, about 30 x 100 ft., plans for which have been prepared.

A four-story cold storage plant to cost about $54,000 will be erected by Wilson & Co., Los Angeles, on Lyon Street.

The Reliable Storage Battery Mfg. Co., Los Angeles, has been organized to operate a plant at 743 North Main Street. C. V. Graham, 1200 East Main Street, Alhambra, heads the company.

The D. & B. Pump & Supply Co., 2625 Humbolt Street, Los Angeles, will erect a one-story machine shop, about 50 x 160 ft., at 2616 Artesian Street.

The United States Hydrogen Generator Co., Los Angeles, has been incorporated with a capital of $25,000 to manufacture generator equipment. H. T. L. Hillman, W. S. Von Bergen and Frank Sparks are the incorporators.

The Los Angeles Shipbuilding & Dry Dock Co., San Pedro, Los Angeles, will erect a one-story addition, 50 x 150 ft., for blacksmith and forging work.

The Wilmington Shipbuilding Co., 621 Investment Building, Los Angeles, has leased property on the east basin in the Wilmington section for a new shipbuilding plant. It has received a Government contract for the construction of vessels to cost about $500,000.

A one-story brick and concrete power plant, about 80 x 98 ft., will be erected by the Board of Supervisors, Los Angeles, at 1126 Mission Road for county service, to cost about $38,500. William Davidson is chief engineer.

The Bleeker-Nelson Mfg. Co., Los Angeles, formerly operating a sheet metal working plant at San Diego, has removed its works to 1215-17 San Pedro Street, Los Angeles. It specializes in the production of sheet metal work for buildings, etc.

The Pacific Northwest

SEATTLE, WASH., Sept. 11.

To relieve the lumber shortage, which seems imminent, several wooden shipbuilders, it is reported, have leased lumber mills and others have deals pending to acquire sawmills and timber holdings. It is believed that unless a speedy adjustment of the lumber strike is effected, wooden shipbuilders will be forced to fabricate their own lumber to meet shipbuilding demands.

Machine shops and foundries throughout the Northwest are working 24 hr. per day to keep up with the enormous demand for their products. In many cases plants are booked with sufficient orders to keep them running for many months.

Allotment of contracts in New Westminster for the construction of auxiliary machinery for ships for the Imperial Munitions Board, B. C., is well under way, and machine shops in this city, Vancouver and Victoria are receiving their quota. Contracts totalling $60,000 have been awarded to shops in New Westminster. As rapidly as designers of the Imperial Munitions Board complete the designs for any unit of the work, they are submitted to the Metal Trades Association, tenders are called for, and contracts let, distribution being left in the hands of the association. No decision has been made in the matter of main engines for the vessels. It is considered possible that some complete sets may be built in Vancouver by the Wallace Shipyard, which plans a new shop for this purpose equipped with the necessary machinery.

Veltum & Clow, Eugene, Ore., have been notified that the Government has approved the valve grinding machine invented by the firm, and will order 36 for use in France.

The Pacific Sheet Metal Works, Victoria, has been reorganized under the name of the Pacific Sheet Metal Works, Ltd., with capital stock of $25,000.

The Olympic Steel Works, Seattle, has completed plans for a one-story addition, 73 x 102 ft., to cost $7,000.

The Modern Torch Co., formerly of Portland, Ore., is operating a plant at 413 Railroad Avenue, Seattle, for the production of oxy-acetylene cutting and welding torches.

The Reedsport Lumber Co., Gardiner, Ore., has been incorporated and will construct a sawmill at Reedsport with a daily capacity of 60,000 ft.

The Erickson Shipbuilding Co., Seattle, has purchased a 12-acre site on the Duwamish Waterway, on which will be erected a plant for the construction of steel ships for the Government. It is stated the company holds contracts for steel ships costing approximately $1,000,000 each.

The Foundation Co., Portland, has secured permits for the erection of 10 350-ft. shipways on the harbor between Nicolai and Sherlock Streets, at a cost of $24,000. It has also completed plans for the erection of a two-story saw shed and mold loft to cost $7,000.

The King & Winge Shipbuilding Co., Seattle, has been incorporated by Thomas J. King, president; B. Winge, vice-president, and C. B. Winge, secretary-treasurer. It will take over and enlarge the King & Winge shipyards in West Seattle.

The Los Angeles Shipbuilding & Drydock Co., which has just completed four ways for steel vessels at its yards on Smith's Island near Portland, is now working on plans for four additional ways for steel vessels.

The Pacific Steamship Co., San Francisco, has bought the old Price shipyard at Bandon, Ore., and will equip a plant for building wooden schooners.

A. J. Gyllenberg, Baker, Ore., will equip a one-story machine shop 50 x 100 ft., with machinery and tools for automobile and general iron and steel work.

The Markey Machinery Co., Seattle, will build an additional frame machine shop, 65 x 100 ft., one and one-half stories.

The Helser-Unden Machine Co., Portland, has completed plans for a one-story addition, 73 x 100 ft.

Canada

TORONTO, Sept. 17.

The Morrison Steel & Wire Co. will build a plant on Lulu Island, B. C., to cost $25,000.

W. A. Hunter, Ltd., Galt, Ont., has been incorporated with a capital stock of $40,000 by Frank Ellingham, Mary H. Hunter, and others, to manufacture automobiles, parts, accessories, etc.

The Canadian Coil Co., Ltd., Walkerville, Ont., has been incorporated with a capital stock of $40,000 by Carlos C. Cleverdon, Frank Nauta, Harry E. Westerdale, and others, all of Detroit, to manufacture spark and ignition coils, electrical goods, etc.

The Henderson Transfer & Lighterage Co., Ltd., Fort William, Ont., has been incorporated with a capital stock of $100,000 by Robert J. Henderson, John R. Smith, Frederick R. Morris, and others, to build ships.

Veneers & Panels, Ltd., Montreal, has been incorporated with a capital stock of $500,000 by Arnold Wainwright, Aubrey H. Elder, D. Burley-Smith, and others.

The Hamilton Lumber & Coal Co., Ltd., Hamilton, Ont., is in the market for a double drum hoisting engine.

The Goldie & McCulloch Co., Ltd., Galt, is in the market for a direct-current generator, 15 to 20 kw., 110 to 120 volts, from 600 to 700 r.p.m., and to include a rheostat.

A. E. Ponsford, St. Thomas, Ont., has been awarded contract for a plant at Tillsonburg, Ont., for the Maple Leaf Harvest Tool Co., at a cost of $50,000. It will consist of five buildings, 50 x 60 ft., 50 x 140 ft., 50 x 90 ft., 50 x 90 ft. and 100 x 130 ft., respectively, of concrete and steel, one story, and will be completed within three months.

The London Art Woodwork Co., London, Ont., is receiving bids for the erection of a factory and boiler house to cost $15,000. Watt & Blackwell, Bank of Toronto Building, are the architects.

William & J. G. Greey, Toronto, are in the market for a 20 or 25-hp. motor, 760 r.p.m., 25 cycle, 550 volts.

W. P. Near, city engineer, St. Catharines, Ont., will receive prices on motors, pumps, fittings, etc., for the Facer Street sewage system.

New Toronto, Ont., will purchase an electrical centrifugal pump.

The Brunner Mond Co., Amherstburg, Ont., will establish a power house at Canard River. It is erecting a plant at Amherstburg at a cost of $250,000.

Thomas McQueen, secretary of the Board of Control, City Hall, Toronto, will receive bids until Oct. 2 for stop valves, valve-operating pumps, etc., for the main pumping station.

New Foundries in New England

(*Continued from page* 651)

malleable foundry last year and is getting about a 25 per cent increase in output. Part of this is due to the installation of a number of molding machines. The gray iron foundry has been rearranged and a Paxson 42-in. cupola added, together with other equipment which will enable the company to double the output of this department. The core department has been increased to double its capacity to keep pace with the growth of the malleable and gray iron foundries.

The Worcester Foundry Co., Worcester, Mass., has a new plant, 52 x 198 ft., under construction and nearing completion. The main building will be 52 x 198 ft. and the company will conduct a general foundry business.

The Union Steel Casting Co., Boston, Mass., has experienced an increase of 300 per cent in the volume of business and to keep pace with this has added a second 2-ton converter and a 10-ton open-hearth furnace. The present total capacity of the plant is about 40 tons a day. Another 10-ton open-hearth furnace is ordered and as soon as it can be installed a further increase in production will be made. An increase in equipment and a considerable number of improvements will follow further expansion of the plant.

THE IRON AGE

New York, September 27, 1917

ESTABLISHED 1855

VOL. 100: No. 13

Minimizing Lost Motion in Foundry

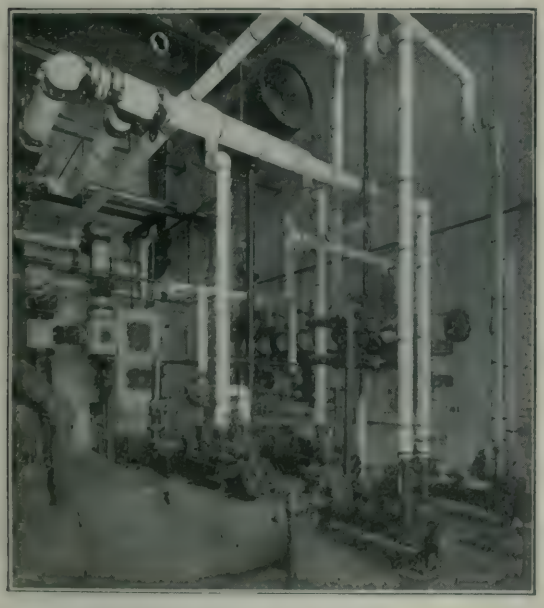
Keeping Materials Flowing from Raw to Finished Product — General Features of New Chicago Plant – Protection Against Fire Loss

IN the design and construction of the new plant of the W. A. Jones Foundry & Machine Co., Chicago, two ideas were foremost in the minds of the designers, these ideas not being new, but of the kind invariably interesting in their evolution. It was sought to arrange every building and department in a manner that would insure the continuous progression of material from raw to finished products; in other words, to have all material move steadily forward from the receiving platform or foundry supply house, always under roof and invariably by mechanical means, until placed in a freight car or vehicle for shipment. Also kept in mind was provision for future extension of the plant. The general desire, in conjunction with the ideas to which reference is made, was to provide good lighting and ventilation, and a general layout that would make for maximum efficiency and the comfort of employees. Before the plans were drawn, many plants were visited, and desirable features, wherever found, were adopted, if their inclusion in the general plan was found feasible. The company manufactures elevating, conveying and handling equipment, power transmitting machinery and spur gear speed reducers.

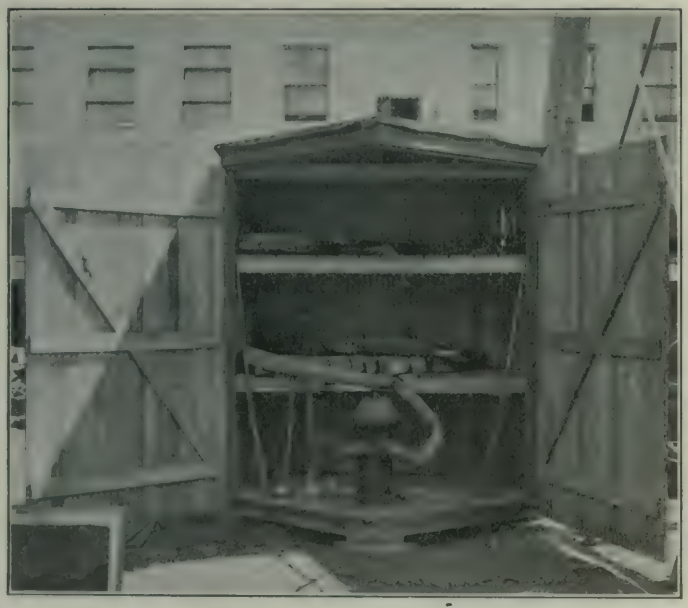
In furtherance of continuous movement, always toward the goal of completion and with all tendency to retrogression minimized, the plant is laid out in a manner to permit the fullest sequence of operations. To facilitate handling of the product in all stages of manufacture, every department, except that in which patterns are made, is traversed by an industrial railway and an electric monorail trolley hoist which augment the service rendered by overhead traveling cranes. The foundry and machine shop are equipped with 10-ton traveling cranes, and the capacity of the trolley crane is 2 tons. The handling of materials by manual labor is therefore reduced to the minimum, and the work greatly expedited.

GENERAL FEATURES OF LAY-OUT

In the view of the foundry herewith, the trolley and the industrial tracks which extend around the four sides of the foundry floor are shown. Near the left center is a turntable enabling the cars to run at right angles to the main track and transport heavy cores from the core ovens. The supply of iron for filling the smaller molds is contained, in the usual manner, in large ladles mounted on cars from which the smaller ones, used in pouring, are filled, while in the case of a large mold the overhead crane handles a ladle of sufficient size. Both foundry and machine shop are of steel frame construction and have continuous monitor sash controlled from the floor. The side windows have triple sash



Pumps and piping in the pump room. At the extreme left is a 1000-gal. per min. pump for supplying water in fighting fire



Water supply and fire-fighting equipment is ready for use. Though protected by the Chicago Fire Department, the W. A. Jones Foundry & Machine Co. has a fire crew among its own employees.



An industrial railway and monorail system reaches every department, facilitating the progressive movement of material from receiving to shipping platforms. The longitudinal section of the foundry is served by a 10-ton Whiting crane. The tracks are laid in cement.

which are counterbalanced, and so constructed that two-thirds of their area can be opened.

One end of the foundry is devoted to the casting of machine-molded pulleys up to 60 in. in diameter, while in the center of the floor are pits for casting pulleys, etc., up to 10 ft. in diameter. The office of the foundry superintendent, located in a square balcony in one corner of the foundry, has continuous sash, affording a clear view of every part of the floor, while outside light pours in on two sides; has facilities for washing, etc., and is as comfortable as that of any other executive. The foundry is 130 x 200 ft. in plan. A two-story building of mill construction, the first floor of which is devoted to cleaning and grinding castings, is 80 x 100 ft. Castings leaving the foundry find this room in their path on their way to the machine shop.

CONVENIENT STORAGE OF RAW MATERIALS

The pattern shop occupies the second floor of a two-story building, 77 x 93 ft., the ground floor being devoted to pattern storage, for which there is the usual rack equipment. Adjoining the foundry is a room for the storage of sand, coke and other materials unloaded from cars which approach the building on a spur of the Chicago Belt Line Railway. Coke for consumption in the core ovens is shoveled directly from the piles into convenient pits adjacent to the fire doors of the ovens. Coke and iron for the cupola is carried to the charging floor in cars which before being run on the electric elevator are weighed, the tracks passing over a scale. The storage and melting compartments are enclosed by thick brick walls.

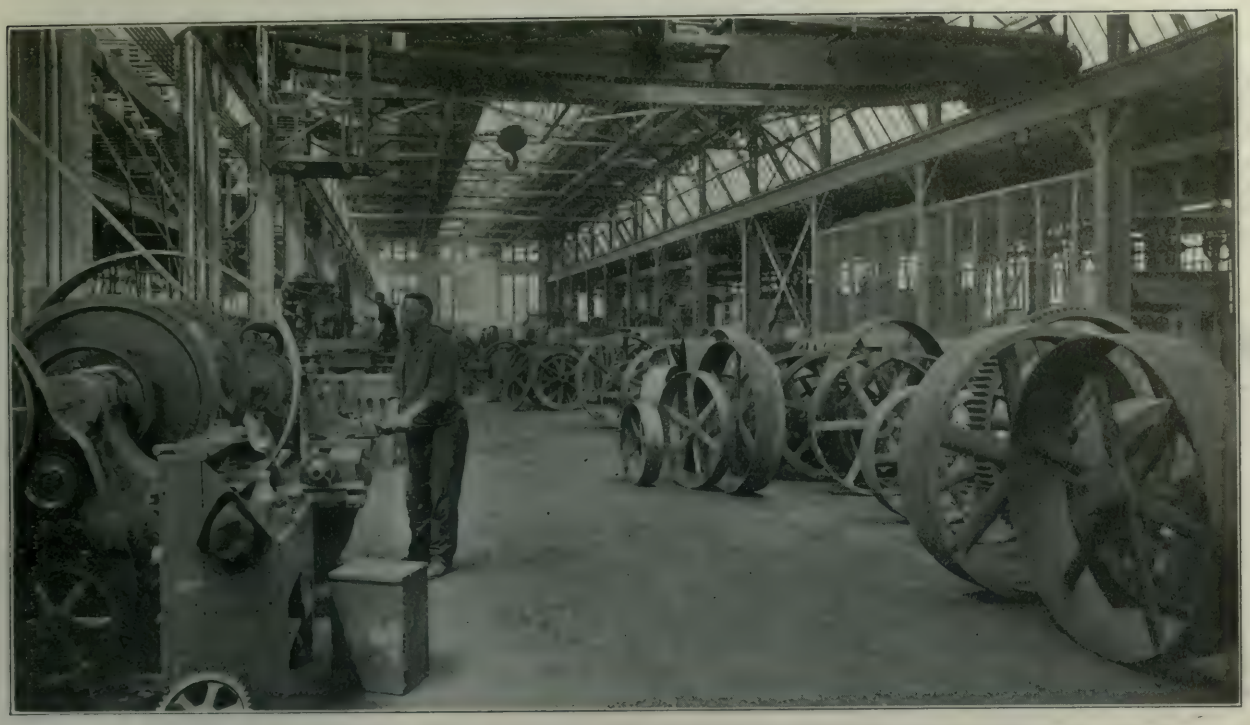
The charging floor, reached by an iron stairway, is entirely of steel plates supported by heavy steel beams and capable of supporting all that can be placed on it. One cupola, with a capacity of 50 to 60 tons per day, is in use, while there is provision for a second of similar size. The core oven equipment consists of two double-drawer Whiting ovens, and another for the accommodation of large pieces on cars. Among other items of equipment are electric riddles.

The machine shop, 130 x 320 ft., is planned to permit of its extension to 600 ft. in length. Through one end of it passes another spur of the belt line railroad, the arrangement enabling the traveling crane to assist in loading without regard to weather conditions. Large doors give access to trucks, when delivery is to be made in that manner. Work in the shop is departmentalized, pulleys being machined in one section, gears in another, turret lathe operations performed in another, etc. All spur gears up to 84 in. are hobbed, and there is equipment for hobbing worm gears and planing bevel gears. The larger machines are equipped with direct motor drive, and the smaller tools have group drive. The shop floor is of factory maple, with a sub-floor of concrete.

On the second floor of a building adjoining both the foundry and machine shop are locker rooms, and bathing and washing facilities for the employees, separate rooms containing shower baths and white enamel-ware wash bowls being provided for the machinists and molders. Each has its own entrance. Toilets and drinking fountains are located conveniently to the working floors.

COMPLETE FIRE-FIGHTING EQUIPMENT

The attention given to preventing and fighting fire is worthy of note. While the buildings have the protection afforded by the fire department of Chicago, and all are equipped with sprinklers and automatic fire doors, the company has its own department composed of employees, each of whom has his appointed place or duty should fire occur. A signal system is there to notify the power-house employees when an alarm is given, and cause a 1000-gal. per min. underwriters' fire pump to be set in motion. Also available is the water from a 60,000-gal. gravity tank. Scattered about the grounds are small houses about 8-ft. sq. in which fire hose is laid on shelves, already connected with the water mains, and ready for action. These small houses also contain axes and crowbars. Each unit of the plant is separated from the adjoining one by automatic fire doors. Adjoining the drafting room is a large fireproof vault for the storage of plans and records, and there is a similar vault for the storage of office records. As a result of these precautions against fire, and the equipment for fire



The machine shop of W. A. Jones Foundry & Machine Co. Monorail and industrial railway are located to the left of the picture. Toolroom is to the right, enclosed by wire netting. Through one end, from which deliveries are made, passes a spur of the Chicago Belt Line Railway.

fighting, the insurance rate of the plant is low.

The power house is equipped with automatic smokeless furnaces made by the Model Stoker Co., Dayton, Ohio, with boilers of 400-hp. capacity, and an automatic ash removal system. For convenience in coal storage, the boiler room is depressed below the engine-room floor. The engine room contains a direct-connected Ridgeway engine and dynamo, the engine being 265 hp. Recording meters cover all requirements in that direction.

The entire plant is heated by exhaust steam, and lighted by nitrogen incandescent lamps having reflectors. It was designed by Davidson & Weiss, architects, and erected under the supervision of Patterson & Davidson, engineers, Chicago.

The W. A. Jones Foundry & Machine Co. was founded in 1890 by W. A. Jones, who is still its president, its first home being in an alley between Clinton and Canal Streets, Chicago. Subsequently it occupied two other locations. Its new plant covers approximately four acres, and the company owns altogether 26 acres, part of which is used as a ball ground for the employees. T. A. Jones and W. G. Jones are the active heads of the company.

Will Install New Open Hearth

The Judson Mfg. Co., Emeryville and Oakland, Cal., is putting a modern saw-tooth roof building of structural steel over its rolling mills. The company is now operating very successfully its new 35-ton open-hearth furnace. Ground is broken and concrete foundation started for an additional 35-ton open-hearth furnace. Electric motors and gearing have been ordered for rolling mill operation, dispensing with two-thirds of the steam power, which has been in use for 30 years.

A bill imposing a tax on apprentices in all technical and commercial establishments has been introduced into the French Chamber of Deputies. The sums thus levied are to be paid into a departmental treasury and are, together with a proportionate government grant, to be spent on technical and commercial education. The tax per apprentice varies with the total number of hands employed by the same company. The bill has been referred to the Commission for Commerce and Industry.

Pulverized Fuel for Metal Furnaces

In the September issue of the *General Electric Review*, V. Z. Caracristi, vice-president, Locomotive Pulverized Fuel Co., discussing the utilization of waste and undeveloped fuels in pulverized form, touched on the use of pulverized fuel in metallurgical furnaces. He said that no serious difficulty has been met in the substitution of pulverized fuel for fuel oil in furnaces of large volume where the feeders utilized were such as to deliver the fuel at a uniform rate, without a lumpy condition at the delivery point. Serious difficulties have had to be overcome to apply its use to furnaces of small volume.

It is necessary in furnaces of small volume, he continued, to reduce the velocity of the incoming fuel to the minimum. This velocity should be less than the velocity of the low pressure air used for combustion, which should have less than ¼ in. of water pressure and which should be thoroughly intermingled with the fuel before combustion is commenced. If this intermingling is attempted where the temperature is sufficient to draw off the volatile constituents from the coal and form coke, serious difficulties in the combustion and ultimate entire stoppage of the furnace operation will take place.

It has been found possible to operate pulverized fuel furnaces, he stated, to give an oxidizing or reducing atmosphere and to secure close temperature regulation as low as 400 deg. C. The cost of fuel under these conditions, with an allowance of 35 cents per ton for pulverizing and a cost of $3 per ton for the coal, is comparable with fuel oil at 1½ cents per gallon.

For metallurgical and industrial purposes it is desirable to have a volatile content in the coal in excess of 22 per cent, and to pulverize this coal to a fineness so that 75 per cent will pass through a 200-mesh screen, and that the product will be relatively free from particles of coal of a coarseness to exceed an 80-mesh screen. He emphasized also that the coal should be dried so that the moisture content of the 22 per cent volatile coal be less than 1 per cent. The moisture content of coals from 36 to 38 per cent volatile may be as high as 2½ to 3 per cent.

Powdered coal is to be burned in the 2500 hp. of boilers of the Oneida Street plant of the Milwaukee Electric Railway & Light Co., Milwaukee, a contract for the equipment having been placed with the Locomotive Pulverized Fuel Co., 30 Church Street, New York.

Cost-Plus System Severely Criticized

But the Perplexing Problem Is How to Find a Better Method of Granting Government Contracts—Some Modification May Be Devised to Meet Objections

WASHINGTON, Sept. 25.—There is a growing feeling in Congress that the cost-plus-profit form of contract is a bad thing for the Government and possibly a worse thing for the industries of the country at large. If Congress would remain in session another 60 days, there is no doubt a very serious attempt would be made by certain members to force through either a joint resolution or a rider on a budget bill forbidding this method of contracting. Whether the movement would be successful cannot be hazarded, for representatives of the War Industries Board and of the chief purchasing bureaus of the Government have done much to convince the leaders that while the cost-plus contract has its weak points, there is no other method to meet the situation that now prevails in the industries with which the Government is doing business. In view of the fact that Congress is now making every effort to adjourn by the middle of October, it is probable that any serious attempt at legislative restriction of contracting methods will be postponed until the regular session in December. There is no doubt, however, that a great deal more will be heard on this subject, the importance of which is daily increasing.

The first suggestion of a cost-plus contract was made to the Navy Department by the Bethlehem and Midvale Steel companies in connection with the controversy in the last Congress as to the price of armor plate. It was then proposed that the Federal Trade Commission should investigate the cost of production and fix a "reasonable" profit at which the armor makers agreed to supply the needs of the Navy for an indefinite period. The Secretary of the Navy did not adopt this suggestion and Congress finally appropriated $11,000,000 for the construction of a Government armor factory. The sum allotted for the purpose proved wholly inadequate and for various reasons, heretofore set forth in this correspondence, the project has been indefinitely postponed, if not abandoned.

Building Battleships

When the Navy Department undertook to let contracts for the first installment of warships included in the three-year program adopted by the last Congress, the cost-plus contract was again suggested by several of the leading shipyards. With a runaway market for steel of all kinds and with the cost of labor rising by leaps and bounds, the shipbuilders found it impossible to protect themselves by options which must, in some cases, run nearly four years into the future. They, therefore, offered to build several of the battleships at cost plus a profit which was either included in the proposal or left to the Federal Trade Commission for determination. At the time this proposition was made to the Navy Department, only a small part of the Administration's commandeering project had been enacted into law and as Congress, foreseeing the situation that would develop, had authorized the Secretary of the Navy to make cost-plus contracts for certain vessels, if in his opinion it seemed to the advantage of the Government to do so, the proposals for several battleships made on this basis were accepted and the contracts let in accordance therewith.

The Cantonment Problem

A big impetus was given to the cost-plus method of contracting when it became necessary to build in three months 16 big cantonments, each of them a small city, capable of housing 30,000 to 40,000 men. Time was the essence of these contracts and was regarded by the War Department as so overshadowing a consideration that cost became almost a negligible item. It was necessary to bring together an enormous mass of material and 16 small armies of workmen ranging from 5000 to 15,000 men each. Plans for the cantonments had not even reached the stage of pencil sketches and there were absolutely no specifications for a single important detail of the work. Under the circumstances, it is not surprising that no contractor could be found who would put a price upon such work. More than two score of reputable concerns, however, offered to build the cantonments at cost plus a fair profit and on this basis all the contracts were let. To guard against the payment of exorbitant profits, the Government adopted a graduated scale under which a profit of 10 per cent on the smallest contracts diminished steadily with the amount involved until that on the largest contracts it was but 6 per cent, supplemented with the stipulation that in no event should a single contracting concern receive a profit in excess of $250,000.

As the upset limit for the cantonment contracts restricted the contractors, in any event, to what would be regarded as a fair commercial profit, the interests of the Government were fairly safeguarded so far as this factor in the equation was concerned. It soon became apparent, however, that the restriction of the contractor's profit in no way limited the cost to the Government of the cantonments. The necessity of gathering together a large force of skilled workmen to complete the buildings on time resulted in a steadily rising scale of wages and it is understood that in many trades some of the contractors have paid 100 per cent advances over normal wage scales. It has been a common thing for carpenters previously earning $4 per day to receive $7.50, and in other trades the advances are said to have been even greater. At the time this is being written, there are running in the Washington newspapers and on cards in the street railway cars advertisements of the contractors of the cantonment at Camp Meade, a few miles from this city, offering day laborers $3.30 per day with free transportation to and from work. This cantonment is now two weeks overdue and the contractors are making every possible effort to complete it. The Government officials in charge, including the constructing quartermaster, are fully aware of what is being done but can suggest no other method of meeting the situation.

Contracts for Rifles

Another notable instance of the use of the cost-plus contract is in connection with the manufacture of 1,000,000 rifles for the army by the Remington and Winchester companies with the use of special machinery purchased from the British Government. At the time these contracts were made not a single manufacturer in the United States possessed the necessary equipment to make the Springfield rifle, the standard arm adopted for the service, and it was only by substituting the Lee-Enfield rifle that the War Department was able to contract with the Remington and Winchester companies. To equip the smallest plant to make a complete rifle would involve the manufacture of a full set of dies, jigs, gages, automatics, etc., which, even in time of peace, could not be turned out in less than eight months, and with the gage makers fully employed as they have been since the beginning of the war, the period would be indefinitely longer.

The companies having the British rifle contracts lost heavily on them, and, facing a rising market for both material and labor, they declined to make rifles for the United States Government at a flat price, frankly declaring their willingness to have their plants commandeered and operated by the Government rather than take the risk that would be involved in working on the basis of an upset price. The War Department, acting under the advice of the Munitions Board, thereupon made a contract on a basis of cost plus 10 per cent for

profit and included as an item of cost either the interest on the plant owned by the contractors or the amount paid for the rental of leased plants. These contracts have been severely criticized in Congress though stoutly defended by both Democratic and Republican leaders.

The System in Shipyards

Cost-plus contracts have also been used for the construction of three big shipyards to be owned by the Government and for the assembling of fabricated steel ships therein. The United States Shipping Board had exhausted the shipbuilding facilities of the country and could find no shipyard owners willing to extend their plants at their own risk or to undertake the assembling of fabricated steel ships throughout a period of at least 18 months during which labor costs might increase very materially. The cost-plus contract appeared to be the only solution of this difficulty and it was accordingly adopted.

The War Department is now pushing another huge project on the cost-plus basis involving very large extensions in 12 of the leading private plants capable of making gun forgings and machining and assembling guns and gun carriages and of producing artillery ammunition. Obviously a large part of these facilities will be almost valueless after the war, when neither the contractors nor the Government will have any use for them. With so much uncertainty as to the cost of building material and the expense of construction, the War Department has decided that the cost-plus contract is the only practicable method for arranging for this work.

The Big Fleet of Destroyers

It is understood that the Navy Department will also utilize the cost-plus contract for the extension of half a dozen of the largest shipyards in which the big fleet of destroyers are to be built and will extend the system to two or three private establishments in which the power units are to be manufactured. It goes without saying that after the enormous addition to the destroyer fleet contemplated by this project has been made, the special facilities provided for their construction will hardly be worth 10 cents on the dollar, as they are practically useless for the building of merchant vessels, even if the demand for such vessels after the war cannot be fully met by other equipment.

In considering the advisability of making cost-plus contracts in the various instances above summarized, the Government has had but a single alternative, namely, the commandeering of the plants in question and production under direct governmental supervision. It hardly need be said that the Government has no organization for any such purpose and could not assemble one and properly train it within a period of several years. Government manufacture, in nearly all instances where it has been tried, has proven uniformly more costly than private work. Where wages are concerned, Government establishments are easily forced to make increases and the leaders of organized labor have found little difficulty through political pressure in so influencing conditions of employment, hours of labor, etc., as to drive the labor cost of Government establishments far above that of private concerns. With these facts in view, Administration officials and conservative members of both houses of Congress have felt that any profit which contractors might make on cost-plus contracts would be much more than offset by the increased cost of production under governmental supervision.

The Effect on Industries

No one here is blind, however, to the highly demoralizing effect of these contracts on the industries of the country and the tremendous burden upon the taxpayers resulting from their operation. In the House of Representatives during the past week, the subject has been debated almost to the exclusion of every other topic and several members have declared their intention to do everything in their power to put an end to this system. Representative Mondell, of Wyoming, a prominent member of the Committee on Appropriations, recently attacked the cost-plus contract in connection with the manufacture of rifles. "A contract," said he, "that takes from the man who spends the money every incentive to economy and efficiency, every incentive to keep down the cost, and, on the other hand, increases his compensation, increases his income, increases his profits as the cost advances and inefficiency increases, is bound to be a delusion and a snare. It cannot help being expensive. In nine cases out of ten, it is more expensive than any contract that would be likely to be entered into under competitive bidding, even when prices are increasing and costs mounting, because when you take from a man the incentive to keep down costs in labor, material, and overhead charges added costs do not interest him except as they advantage him in the matter of increased profits.

"In this case it would seem that in addition to the contractor receiving 6 per cent income on his investment, full recompense for all the wear and tear of his machinery, a certain amount for overhead charges, he is to get 10 per cent on the cost of the output. Such a contract does not strike me as being likely to result in economy, as being wise or judicious, or one that the Government ought to enter into. It had been entered into before the committee took the matter up, but I, for one, hope that in the future in the expenditure of these vast sums of money, the Government may find better forms of contract and pursue better business methods in the expenditure of the money than seems to have been pursued in this particular case."

Mr. Sisson's Criticism

Representative Sisson of Mississippi, another member of the Appropriations Committee, declared that the tendency of cost-plus contracts "is to increase the price of material and labor, for it entirely eliminates all source of competition, and, however good and patriotic and honest a munition maker may be, costs the people many millions, for there is that desire in every heart to make money, and this leaves the matter of profits entirely in the hands of three concerns, and unless our officials act with more business judgment in the future, the people will pay dearly for this lack of efficiency.

"There is every encouragement," Mr. Sisson continued, "for extravagance in labor, extravagance in materials, and there is no incentive to the saving, except the miserable milk-and-cider sentiment urged by some, that these men will continue business after the war is over and will not want unreasonably to increase the price of labor or unreasonably to increase the price of materials. I have no sort of sympathy as a business man for that sort of proposition; and I do not believe there is a member of this House, in the transaction of his own business, who would have entered into this sort of contract for the purpose of manufacturing anything for himself. I believe in competition; and if we had permitted members of these smaller concerns to put in bids for 25,000, 30,000 or 50,000 rifles, we would not have impeded the progress at all in the million rifles and the Government then would have had the opportunity to determine whether or not it got just as good rifles and got them as promptly as under this contract, and whether this method would have been a proper method to have been pursued by the Government, even though they wanted to make contracts with these large concerns."

An Erroneous Assumption

Representative Sherley, of Kentucky, one of the best informed members of the Appropriations Committee, who for several years has had charge of the fortifications appropriation bill, drew Mr. Sisson's attention to the fact that the assumption that there are many small concerns that can make rifles is wholly erroneous. "I wish it was true," he said, "but it is not true. It would take a great deal of time to get the tools, jigs, dies, etc., to equip a manufacturer even if he were familiar in a general way with the work of making rifles."

Representative Dallinger of Massachusetts made a very sharp attack on the cost-plus contract under which he said the most extravagant compensation was being paid by contractors to men who were not even skilled workers. He instanced a man who was not a carpenter by trade but merely more or less handy with tools and

who was employed at $7.50 a day and $15 a day on Sundays and holidays on a cantonment job. The result of such practices, he said, was to greatly embarrass manufacturers who are working on a reasonable basis of profit. "Manufacturers who are honestly trying to do the best they can for the Government in this crisis," said he, "find that their men are being hired away from them by these contractors who are offering all kinds of wages. It is not fair to the manufacturers of the country who are seeking to give the Government supplies at a fair price. It does seem to me that something ought to be done by the Committee on Appropriations with regard to future contracts to limit, and, if possible, to prohibit the system of awarding contracts without competition on the cost-plus-commission basis."

Fitzgerald Sees Both Sides

Mr. Fitzgerald, of the Appropriations Committee, who has had a wider experience in supervising the expenditures of the Government than any man in Congress, sees both sides of this problem. "The 10 per cent cost contracts," he said in discussing the matter on the floor, "have been criticized. One of the difficulties that confronted the Government at the time was that no reputable contractor, no contractor who understands his business and who is not attempting to get a contract merely to finance it and to turn it over at a profit, in view of the conditions of the labor market and the material market, was willing to enter a contract on a very large scale which did not make provision for a constantly increasing cost, both of materials and labor. No one can predict from day to day what labor will bring, and unless the Government had taken the measures it did take to control and obtain the materials to be utilized in many of those enterprises, it would have been impossible to determine what the cost of material would be.

"The Government was not in the position of a private citizen to go into the market where there was an ample supply and ample competition, but the Government was in the position of having requirements that far exceeded not only the visible supply but were far in excess of existing facilities to furnish materials. Under such circumstances, the contracts had to be made and business had to be done, and the Government work had to be carried on under conditions and in ways that in normal and ordinary times would not have been attempted. I suggest to the gentlemen that if they will take the public hearings of the Committee on Appropriations and read them carefully, they will find that many of these suggestions are without foundation and should not be used here as the basis of criticism for which there is no justification."

Uncle Joe's Comment

Next to Chairman Fitzgerald in point of experience in overlooking governmental expenditures is Representative Cannon, who for many years headed the Appropriations Committee and served for a long period as Speaker of the House. "I am not a manufacturer," Mr. Cannon said in discussing the rifle contracts; "I do not hold a brief for the defense of any man connected with the Government, for the defense of any man that makes one of these contracts or for any commission. I know very few of them. I think I need not assure the House when I make that statement that I do not know or even recall the names of the three concerns that got these contracts for the manufacture of rifles. Now, you speak of these parties that have the contracts for the rifles. They might have been commandeered, the Government might have taken possession, making compensation, if you please, for the plants, sending the owners thereof to the courts. If we had followed that policy, you could see at once that the Government, now having its hands full, would have been swamped, because to undertake to make explosives, to construct such heavy and light artillery, to manufacture clothing, if it was all thrown on the Government, if you had commandeered the whole thing, you would have absolutely swamped it. So we had to do the practical thing.

"I never was inside of a factory that made rifles, and I suppose I never will be. I am a tenderfoot, but I do know as an individual that when you take the whole of a plant, when it loses its ordinary business and you set it at work for six or twelve months upon something else, it throws it out of joint. I know that the investment in the plant depreciates. It is said that it depreciates 6 per cent. But after all, when the contract is completed, I undertake to say that while there is some guess as to this or that or the other, with these great concerns on their hands with all that means, under all the circumstances I would not give one-half of the investment for it."

May Be Modified

In spite of reports to the contrary, there is every reason to believe that the Congressional leaders will resist all attempts that may be made at this session to restrict the use of the cost-plus contract. They take the position that, whether or not it may be practicable to work out a better system of purchasing, it is not possible to develop it in time for its utilization in connection with the appropriations now being voted. There is no doubt, however, that the vigorous discussion of the matter in Congress will put the executive departments on their mettle to supervise more closely manufacturers operating under these contracts and instructions have already been issued to the various cost accounting bureaus to give the closest possible scrutiny to all items of expense and to freely invoke the Government's right to veto extravagant expenditures. Several of the bureaus are seeking to devise new safeguards for use in the cost-plus contract which may now be said to be in a process of evolution that may develop a much less objectionable form. W. L. C.

Women in Iron and Steel Works

Replying to the question, "Should Women Be Employed in the Iron and Steel Trades?" W. T. Griffiths, a rolling mill operator, says in the London *Iron and Coal Trades Review* that the absolute necessity of such an innovation in British works has yet to be demonstrated. As far as his own experience guides him and the instances that have come under his direct observation, where women have been engaged in men's work—wheeling scale from rolls to furnaces, wheeling sand, wheeling and cutting scrap at shears and work of such character—he hastens to the conclusion that their introduction into the trade should be a last resort. He is convinced that it is not good for the women themselves, not good for the trade and not good for the State. The atmosphere and the general surroundings of iron and steel works are anything but conducive to the better and brighter side of social life; therefore personally he would strenuously oppose any developments toward bringing more women into the iron and steel trades until at least the surplus male labor has been exhausted in the trade itself from outside the manufacturing departments.

More Open Hearth Furnaces

The Bethlehem Steel Co. is planning for the erection of 13 open-hearth furnaces at its Colebrook plant, Lebanon, Pa. The installation will consist of a new 700-ft. extension for the open-hearth department. The company has commenced the construction of an addition to its local concentrator plant to more than double the present capacity.

Charles Townley, assistant to the president of the Westinghouse Electric & Mfg. Co., in an address before the Chester, Pa., Rotary Club, said that on Jan. 1, 1918, 5000 men would be employed at the new plant at Essington, which covers 14 acres, and that by the middle of the year 22,000 men would be employed. Steam machinery appliances, principally turbines for ships building along the Delaware River, will be the first output of the plant.

The Thor Iron Works, Bathurst Street, Toronto, is having plans prepared for the erection of a steel plant on Ashbridges Bay to cost $75,000, to be of reinforced concrete and brick construction.

BLOWING ENGINE VALVES

Installation of Blowing Units Remodeled to Meet Increased Furnace Production

TO increase capacities of existing blowing engines the Mesta Machine Co., Pittsburgh, has fitted them with the Iversen valves on the air ends. The former

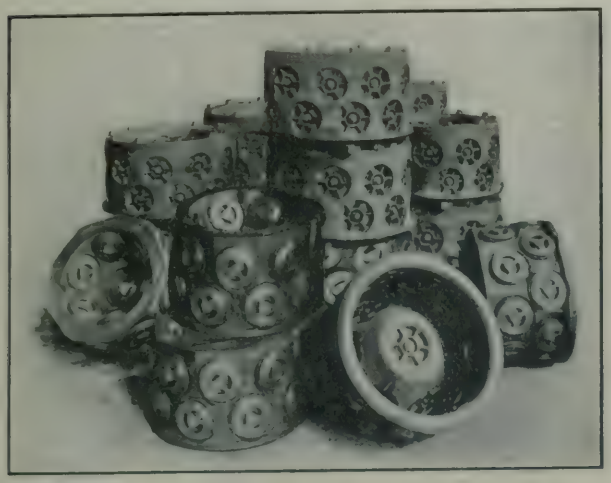


Plate Valves in Cages Are Used to Replace Large Poppet Valves, the cages being removed for repairs and replaced by spares

custom of blowing a furnace with three or four tubs, it holds, has given way to the present possibility of blowing a furnace with two, say, 84-in. diameter air cylinders equipped with these valves. Remodeling blowing engines is, in some cases, limited to the simple replacing of existing valves by automatic plate valves. In other instances it requires removing old cylinder heads, replacing them by heads containing plate valves, and in extreme cases, the removal of the whole air cylinder.

A method of employing plate valves is shown in the illustration. The plate valves are in cages and take the place of large poppet valves, originally operating in the head. The cages are dished to reduce clearance. In many cases the clearance volume, it is stated, is made smaller than it was with the original valves, while in other cases it is increased slightly, depending on the type of valves replaced. The advantages gained by the instantaneous opening of the valves and the large area secured are held to compensate for slight increases in clearance volumes. The removal of one cover plate exposes all outlet valves of the cage to inspection on the delivery side. As the inlet cages are made in two parts, the removal of one cover and the top of a cage exposes all the valves of that cage to inspection. When a valve breaks the whole cage can be removed and replaced by a spare one.

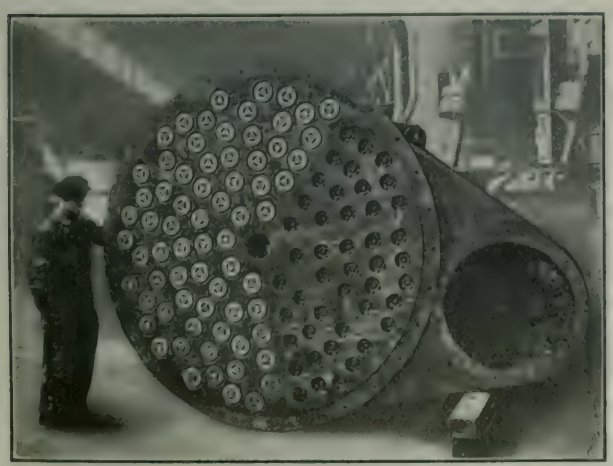


Plate Valves Installed in Place of Existing Valves in the Head, a Practice Recommended Where Leather Valves Are in Use

An illustration of the method of installing valves in place of existing valves in the head is also shown. This method as a rule gives some increase in valve area, so it is claimed, but not enough to warrant increasing the speed of the engine materially. It is recommended particularly in the case of old blowing engines equipped with leather valves. Replacing old air has been found necessary only occasionally.

Refractories for Steel Furnaces

Discussing a paper on "Refractories for Steel Furnaces," which was presented recently before the refractory materials section of the Ceramic Society (British), W. J. Jones of the Ministry of Munitions, refractory materials department, pointed out that the shortcoming of those engaged in manufacturing refractory products should not be put down entirely to culpable indifference or negligence. Since the war commenced the demand for silica bricks has increased very considerably. Moreover, many of the men who were getting ganister had joined the colors and their successors could not expect to show the same results as those with experience. Bricks might be the same in chemical analysis, but not in physical properties. Material containing 98 per cent silica was not suitable for making bricks and no practical silica brickmaker would think of using such material. Before the war a few magnesite bricks were obtained from Norway and these were fairly high in silica. Probably the loss of half the weight in calcining was the cause of no serious attempt being made to produce magnesite bricks for so long a period. He agreed with the suggestion for close intercourse between makers, users and scientists. The effort should be national and concerted with one co-ordinating center presided over by Dr. Mellor, and a number of other centers, such as Sheffield, Glasgow, South Wales, Birmingham, etc., each dealing with different questions.

Arthur G. McKee & Co., Cleveland, have taken the engineering contract for the stove fittings, stoves, skip bridge, top and skip cars for the new blast furnace to be built by the Brier Hill Steel Co., Youngstown, Ohio. This firm will furnish the distributor and stove fittings for the stack. Other contracts taken recently by this firm are as follows: Power plant for the Cleveland Cliffs Iron Co. at Gladstone, Mich.; work for the American Manganese Mfg. Co., Dunbar, Pa., including the completion of a tunnel system, putting a skip and top on furnace No. 1, and furnishing a distributor for furnace No. 2; completion of bin system and erection of skip hoist and top for the Ironton, Ohio, stack of the Marting Iron & Steel Co.; new steel and concrete bins for the Culbertson, Ohio, plant of this company; complete new pig machine for the Columbus, Ohio, plant of the American Rolling Mill Co., and coal brakers, coal and ash conveying equipment, stokers, feeders, etc., for the Cleveland plant of the American Shipbuilding Co.

New interests are to become identified with the Gillette Safety Razor Co., Boston. They include H. J. Fuller, vice-president Fairbanks, Morse & Co., New York; Philip Stockton, president Old Colony Trust Co., Boston; J. E. Aldred, Aldred & Co., New York; R. C. Morse, Jackson & Curtis, Boston, and Bradley W. Palmer, Storey, Thorndike, Palmer & Dodge, Boston. The company will be reincorporated and the new capitalization will comprise $6,000,000 five-year notes and 190,000 shares of capital stock without par value. During the first eight months of this year, the net earnings of the company were at the rate of $4,500,000 a year. The present management will be retained.

The Marlin-Rockwell Corporation, New Haven, Conn., which has been preparing an aviation field for testing the Barlow aerial bombs which it is manufacturing, conducted its first test Sept. 12 with five bombs, which were dropped from an aeroplane on the salt meadows near New Haven. The test was declared successful.

EXPORTS STILL DECLINING

Effects of Embargo Shown—President Using Club with Good Effect

WASHINGTON, Sept. 25.—Advance information from the principal ports of exit indicates a further substantial decline in exports of iron and steel in August, due chiefly to the operation of the embargo imposed by the Exports Council. This check upon shipments is now two-fold, the general embargo of July 15 relating to many important items of iron and steel having been further tightened by the ruling promulgated last week imposing drastic restrictions on the exportation of articles the conservation of which in the United States for war purposes is regarded as of the utmost importance.

Exports of shapes and plates for shipbuilding purposes have been cut down under the original embargo, and while negotiations have been on foot for several weeks between the diplomatic representatives of Japan and several neutral countries and the State Department, no adjustment has yet been reached for a systematic relaxation of the export prohibition, although in certain specific instances small quantities of shapes and plates identified as intended for warship construction have been licensed. The Japanese Government is manifesting an earnest desire to co-operate with the United States in meeting the submarine problem and in solving the difficulties of transporting troops, food and munitions to France. Definite promises have been made that a considerable tonnage of Japanese ships will be transferred to the Atlantic and operated in accordance with the desires of the United States Government. The Japanese Ambassador is anxious to secure a very broad dispensation permitting the free shipment to Japan of shapes and plates for the construction not only of warships but of cargo vessels and is seeking a practical waiver of the embargo, but while the State Department is willing to permit steel shipbuilding material to be sent to Japan in quantity commensurate with the aid afforded by the Japanese Government in meeting the transportation situation in the Atlantic, there is no intention of lifting the embargo or making any wholesale exceptions to its provisions.

Officials of the Administration are highly gratified with the practical effect of the work of the Exports Council. The dominating position of the United States as a great manufacturing country to which all the nations of the earth have come to look for important products has never been so fully realized as since Congress placed in the hands of the President the club which he is now so vigorously wielding to secure cooperation in the conduct of the war. Official reports indicate that indirect shipments of goods to the enemy have been reduced to negligible proportions and that exports from the United States of all kinds of merchandise are now reaching the people who really need them and who are helping in the great struggle for democracy. Neither the President nor his advisers have any thought of weakening the power of this weapon by a general relaxation of the embargo restriction; on the contrary, every atom of information that can be obtained is being utilized to strengthen the position of the United States and to insure the world-wide distribution of its products with the greatest possible intelligence.

The Exports Administrative Board has promulgated a new application form "A-2" for ordinary export licenses which must be executed by shippers. It has also, as a result of a large number of inquiries, found it necessary to elaborate the list of articles for the exportation of which licenses are now required, and a new category has been prepared, in alphabetical order, for the convenience of shippers. Many articles appear twice in this new list, steel articles, for example, being enumerated alphabetically in addition to being specified under the general head of "steel." The list may be obtained by writing to this board or the branch office, 11 Broadway, New York.

It is stated at the headquarters of the Bureau of Export licenses that the work of issuing licenses has been brought up to date and that the time required for passing on applications now averages not more than two or three days. Following the President's proclamation of Aug. 27 there was a large accumulation of applications for licenses for goods which were not included in the restricted list and which were forwarded through a misunderstanding on the part of shippers as to the scope of the proclamation. These arrears have been cleared up and the work is now up to date.

British Government Curbs Electric Steel Development

The British Ministry of Munitions has prohibited the further installation of electric furnaces in Great Britain, except under permit. Permission to proceed with a number of furnaces ordered before the prohibition came into force has also been withheld. The reasons given are scarcity of labor, materials, electrodes and electric current as well as the non-essentiality of such plant for war purposes.

Discussing the new order, the London Ironmonger says that "it is threatening to bring to a standstill, or nearly so, the development of electric steel making, which has lately made such astonishing progress in this country, and thereby to injure seriously the future welfare of the British steel industry. The leading authorities are agreed that electric steel is destined to play a part of enormous importance, and a country which fails to prepare for the new conditions must therefore be grievously handicapped in competition with more far-seeing rivals. In Great Britain very little had been done to develop the manufacture of electric steel prior to the war and Germany was easily first among the great industrial nations in the production of this material. Since 1914 the United States had gone ahead at such a pace that she had already surpassed the German output, and many furnaces are still being built in America. Britain took up the industry 18 months ago with a most promising vigor and until our Government applied the brake there seemed every probability that we would in due course catch up with our rivals.

"The prohibition is not absolute but dissatisfaction is felt with the manner in which the applications for permits are dealt and it is alleged that there is inconsistency in the decisions taken in reply to applications for permits. It must be admitted in fairness that the task of those who are responsible for carrying out the order is one of great delicacy, owing to the difficulty of making sure whether the erection of an electric furnace will be an advantage to the country or otherwise in the present circumstances. But the position now taken by the authorities contains possibilities of injustice to firms whose applications are rejected, for such firms may be seriously handicapped in competition with more fortunate rivals, who will be enabled to get a long way ahead in supplying the future demand for electric steel.

"The claims of the nation at war must necessarily involve many individual hardships which must be borne willingly, but in this matter it is not only the interests of the individual but those of the country as a whole that are at stake. In carrying out schemes for controlling manufacture it is possible to commit errors that may cripple industry in the future and seriously injure the restoration of national finances. In the coming reconstruction a prosperous steel trade is of prime importance and if electric steel is essential to this prosperity, every encouragement should be given to the installation of the necessary plant now. If the work is deferred until peace arrives it may be too late, as other countries will be in a position to snatch the trade in electric steel which is awaiting us before our own manufacturers are able to deal with it."

The Governor General in Council, Ottawa, Canada, under the provisions of section 242 and 291 of the customs act, has ordered that the exportation of cast scrap iron from Canada is prohibited to all destinations abroad except to the United Kingdom, British possessions and protectorates.

Germany's Foreign Trade Organization Now Busy on Post-War Business

An important report on German foreign trade organization has been issued by the U. S. Bureau of Foreign and Domestic Commerce at Washington, written by Chauncey D. Snow, assistant chief of the Bureau. Mr. Snow was in Germany when the war broke out, investigating industrial conditions. He has made use of original material based on personal contact with the German organization and methods of commerce and those of other countries.

The report sets forth the development of the German export trade, the systematic organization of German commercial education, the promotion of trade by the German settlements in foreign countries; the German banking and shipping facilities, trade-promoting agencies and trade associations and the painstaking cultivation of foreign markets. Detailed statistics of German trade, general statistics dealing with Germany and extracts, chiefly from official reports, describing German trade methods are presented in appendices. In an introductory statement it is pointed out that:

> The German point of view with regard to foreign trade and the German system of education for foreign trade are distinctive. The German banking and transportation systems are referred to as well-known factors in the development of the country's foreign trade. In connection with the technique of actual export shipments, it may be pointed out that this or that large American corporation with long experience in exporting uses this or that admirable method, in which it was perhaps a pioneer. Probably few phases of German export science might not be proved to be known and practiced by individual concerns in the United States. But such scientific organization is the exception in the United States; in Germany it is the rule. That fact justifies placing it under the heading of German methods.

The cosmopolitan point of view that has been acquired by the German trader is emphasized. The facts in Teutonic commercial history show how thorough are the methods that have been employed for more than half a century and how earnestly that nation is preparing to reach out into the world markets as soon as the war is ended.

"In looking to the future," states the Bureau, "the United States has many of the same problems as Germany and the other warring nations. Like the German exporters, the American exporters have to face a period of sharp business competition in foreign countries such as probably has never before been met. In Germany the individual business man, all the local and great national associations of business men and the Government departments *are even now strenuously occupied with the problems that must be worked out.* The American business men's associations and the Government departments are alive to the importance of these matters and upon their individual and co-operative efforts through the coming critical years will depend in a large measure the nation's future in international commerce."

Rolling Iron Sheet Bars

The Wilkes Rolling Mill, Sharon, Pa., idle for several years, is now rolling iron sheet bars, and is prepared to book orders for iron roofing sheets of No. 14 to 28 gauge. Henry F. Gilg, 207 Fulton Building, Pittsburgh, is in charge of sales.

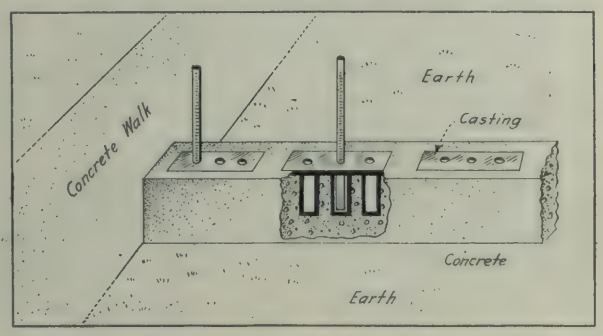
A large German museum on the Kirchenfeld at Berne, Switzerland, is being built by the German Work Association (Werkverbund), according to a Swiss paper. The museum is intended for the permanent exhibition of models and samples of German industry in order to push the sale of German goods in Switzerland. The German Legation at Berne has subscribed about $60,000 toward the necessary funds.

The Bethlehem Steel Co., Steelton, Pa., is planning to increase the capacity of its local furnaces from 45,000 to about 70,000 tons a month. The company is also enlarging its Sparrows Point, Md., works to provide increased output.

NOW DRAWING STEEL AT GARY

Union Drawn Steel Co. Has Its New Plant in Partial Operation.

THE Union Drawn Steel Co., the parent plant of which is at Beaver Falls, Pa., has in partial operation its new plant at Gary, Ind., the only one of its kind in that state. It is located in East Fifth avenue, and consists of three buildings, the main structure, 150 x 456 ft., containing the finishing department, one where the rough stock is cleaned by a pickling process, a large department for the storage of rough stock, a wire department and a tool room and machine shop. In addition there is a power house, 50 x 100 ft., and a transformer house, the last named now needed for the reason that the company is buying its electricity. At present the plant is concentrating on cold-die rolled steel, but at no distant day special shapes and wire will be drawn, the machinery for the latter already being installed. When in full operation the plant will employ between 500 and 600 men.



Bases of Cast Iron Imbedded in Concrete Admit Bars for Holding Rough Stock in Storage

The buildings are of steel and brick, the main structure having transverse monitors and a roof of cement slabs, all obviously fireproof. Like most modern shops, the side walls consist largely of glass. The travelling cranes, of which there are several, were supplied by the Shaw Electric Crane Co. In the finishing department there are two 10-ton travelling cranes and one 5-ton. In the pickling room is a 10-ton crane, while that in the stock room is of 15 tons capacity. A monorail system is to be installed in the finishing department. The flooring in this department is of creosoted wood blocks.

When fully equipped the plant will have seven machines for the drawing of rounds and other regular and special shapes, and five single and one double machine for drawing wire, as well as equipment for turning shafting, cold rolling, straightening, etc., most of it designed by the company's own engineers. The material used is obtained principally from the Gary Works of the Illinois Steel Co. Shafting 2¾-in. and larger is usually open-hearth steel and screw cutting stock is Bessemer because of its free cutting qualities. It is in demand for other purposes also, especially automobile work. The larger sizes of shafting are usually turned, likewise piston rods. The wire department is equipped to draw wire ½ in. and smaller.

A feature of the cleaning room, where the rough stock is immersed in long vats containing a hot acid solution to remove scale preliminary to drawing, is contained in the heating system. The atmosphere of this room is extremely humid because of the steam which arises from the acid bath, and condensation on the ceiling must be guarded against. Should the steam condense it would eventually fall in drops and injure the stock by causing acid spots after the steel has been cleaned and is ready for finishing. The ceiling is of wood. The desired result is obtained by heating the room with warm air from a blower system, the air being admitted to the room through circular openings placed at intervals along the longitudinal center of the ceiling. In the ceiling, at the sides, are rectangular openings for ventilating, these openings, however, extending several feet before the outer air is reached. The installation is yet to be tested by severe cold weather.

In the large room where rough stock is stored is an



HUGE FLOATING CRANE

Lifted 200 Tons at 105 Ft. Radius—For Norfolk Navy Yard

interesting arrangement for economizing space and keeping the various sizes of material in their respective piles. Set in concrete are rectangular cast-iron plates, each having on one side what somewhat resembles the hubs of flange couplings, the hubs, in this case, extending from one common plate or surface. Through these hubs—3 to each casting—are holes about 4 in. in diameter. In position, the hubs, to call them that, are imbedded in the concrete. The castings are placed near enough together to form a continuous row of holes, and in these are placed upright 3¼-in. bars of various lengths. The height and width of the bins can thus be altered at will. Between the stock piles are cement walks. It may be noted that the system is one that can be used wherever bars, pipe or rods are stored.

Beneath the finishing department is a large, light basement with a concrete floor, wherein are contained the motors and power transmission machinery required for operating the drawing machines, etc., on the floor above. Electricity, steam and water are conveyed to the main building from the power house through a tunnel of sufficient height to enable a man to walk. Also in the basement is the blower, a large supply room, a wash room for the employees and an electrical control board. The main floor is supported by pillars of reinforced concrete, these being placed more closely together at one end of the basement to support the finished material which is stored on racks on the floor overhead. The placing of the power equipment in the basement gives the shop a singularly open and unobstructed appearance, aside from eliminating much noise in the shop.

In view of the plant being the first of its kind in Gary it was recognized that difficulty would be encountered in obtaining employees capable of directing operations, and for this reason each department is headed by a foreman who was brought from the East. The superintendent, Oliver W. Thompson, and the master mechanic, H. M. Aley, are Eastern men also.

The products of the new plant will eventually include all those manufactured by the company at its Beaver Falls plant, namely, shafting, piston and pump rods, screw steel, flats, squares, hexagons, sheets and shapes of Bessemer open-hearth and crucible steel.

Albert M. Allen, Cleveland, Ohio, architect, designed and supervised the construction of the plant, which represents an investment of about $1,000,000.

A FLOATING crane, the largest lifting crane ever constructed in the United States, and the first large rotating pontoon crane ever built in this country, was placed in operation a few days ago at the Norfolk, Va., navy yard. This crane was designed and built by the Wellman-Seaver-Morgan Co., Cleveland, which has built three other large floating cranes for the Navy Department, but none as large as this. The previously built cranes have been of the bridge type in which the whole crane with its boat are turned to bring the hoisting cables to the proper position for lifting loads.

The builder is particularly gratified that the crane withstood successfully the Government tests, because a crane of similar type, it will be recalled, purchased in Germany about four years ago by the Isthmian Canal Commission collapsed and was wrecked under a similar test load, because, it is claimed, of the faulty design of the structure. There were two or three American bidders for the two Panama pontoon cranes of the same capacity as the one just built, one of these being the Wellman-Seaver-Morgan Co., but the contract was awarded to the German competitor. The design of the Norfolk crane proved so satisfactory that it was not found necessary to make any changes in a second crane of this type now being built.

The Norfolk crane has a capacity of 150 gross tons, although the test load required by the Navy Department, which it successfully handled, was 403,200 lb. at a reach of 62 ft. 6 in. over the side of the pontoon, or at a radius of 105 ft. from the center of the boat. The crane rotates in a complete circle, the rotating ring being 22 ft. in diameter. The fixed tower on which the crane rotates is 44 ft. in height. Power for rotating is supplied by two 60-hp. motors.

The crane has a main hoist consisting of two hoisting units of 75 tons capacity each fixed on the boom and an auxiliary hoist of 25 tons capacity movable up and down the boom and having a travel of 107 ft. The two main hoisting units can operate separately or together simultaneously as desired. For handling a load of 75 tons or under either main hoist is used. For handling a larger load the two main hoisting blocks are connected by means of an equalizer carrying a 150-ton hook. Power for the main hoist is supplied by two 60-hp. motors, both of which are of course used when lifting the maximum load. The auxiliary hoist has two motors, one for hoisting and the other for traveling up

and down the boom, each motor being of 60 hp. capacity.

The boom, which is 135 ft. long luffs up and down from a practically vertical position to an angle of about 30 deg. from the horizontal in its lowest position. The luffing is accomplished by two 10-in. screws operated by two 60-hp. motors. The main pivotal bearing or step bearing supports a ball or universal joint and carries a maximum load of 2,021,000 lb.

The speed of the main hoist under a maximum load is about 6 ft. per minute. The speed of the auxiliary hoist is 30 ft. per minute. The rotating speed is one revolution in 4 min. The boom is luffed from one to the other extreme position in 12 min. During the tests all the speeds of the crane were in an excess of the requirements of the specifications, and the side and end lists were both under the specified limits. The maximum side lists were specified at 6 deg.

The machinery except the power plant and control equipment is located in a machinery house at the back end of the rotating frame, this house extending down to near the bottom of the tower and rotating with the crane, is weight counterbalancing the crane.

The pontoon is 140 ft. long, 85 ft. wide, and 16 ft. deep. This is provided with a power plant, including boilers and an engine generator of 150 kw. capacity, that supplies the electric current for operating the crane. A fixed weight of 600,000 lb. is provided in the pontoon at the aft end of the crane as a counterbalance. The various movements of the crane are controlled by one operator by means of levers and master controllers from an operator's cage mounted above the deck on the rotating structure. A dynamic breaking system is applied to all motors. Safety features and accuracy of control are essential as the crane is used to handle large guns and turrets on battleships which might be seriously damaged by handling with equipment not provided with every safeguard possible.

The capstans, one at each corner of the pontoon, are electrically driven. There are two steam driven anchor hoists, one at each end of the pontoon. The total displacement of the crane is 5,000,000 lb. When raised to its maximum height the boom is over 200 ft. above the water level. The lifting hooks alone weigh about 2 tons. About 5000 tons of steel was required to build the superstructure including the crane and its tower.

A description of the Panama cranes and a view of the general character of construction were given in THE IRON AGE of May 15, 1913.

Exports of Manufactured Articles Increased

Seventy-eight per cent of the more than six billion dollars' worth of American goods exported in the fiscal year 1917 consisted of wholly or partly manufactured goods. In 1914, the last normal year before the war, the percentage of such goods exported was only 59, according to a statement just issued by the Bureau of Foreign and Domestic Commerce, of the Department of Commerce.

In 1914 exports of manufactures ready for consumption were valued at $724,908,000, or 31 per cent of the total exports, while in 1917 their value reached $2,943,923,212, or 47 per cent of the total. Manufactures for further use in manufacturing were exported in 1914 to the value of $374,224,210, or 16 per cent of the total, whereas $1,191,787,957 worth, or 19 per cent of the total, was exported in 1917. The exports of foodstuffs partly or wholly manufactured amounted to $293,218,336 in 1914, or 12½ per cent of the total, and in 1917 to $739,037,884, or 12 per cent of the total.

The following are some of the principal articles classed as partly or wholly manufactured which show increased exports in 1917 as compared with 1914:

Articles and Classes	Twelve Months Ended June 1917	Twelve Months Ended June 1914
Iron and steel manufactures	$1,129,341,616	$251,480,677
Explosives	802,789,437	6,272,197
Brass manufactures	383,291,964	7,472,476
Copper manufactures	322,284,174	146,222,556
Chemicals, dyes, etc.	182,040,380	22,714,611
Cars, autos, etc.	166,504,339	51,676,222
Zinc manufactures	66,108,586	406,208
Electrical machinery, etc.	52,158,773	25,060,844
Lead manufactures	16,563,290	4,122,007

A new process which lowers the cost of making low-grade concentrates of molybdenite is reported as having been discovered by the staff of the mining department of the University of Toronto. It is hoped that it will render available the deposits if low-grade ore which have been discovered in Manitoba and British Columbia.

Because of the difficulty in securing coal promptly and the high prices existing at present, the Central Iron & Steel Co., Harrisburg, Pa., is arranging to use river coal almost exclusively by the use of blowers. The company operates a small coal fleet and recently purchased another one to be used in dredging for the supply.



The Pontoon Crane Lifting 150 Tons of Armor Plate

Government's Rifle Contracts Defended

Text of Those Made With the Winchester and Remington Companies and Chairman Scott's Analysis of Profit Features

WASHINGTON, Sept. 24.—The House Committee on Military Affairs yesterday began a comprehensive investigation of the defective ammunition produced at the Frankford arsenal and shipped to the American troops in France. The special board appointed by the Secretary of War at the instance of General Crozier, chief of the Ordnance Bureau, to sift the ammunition trouble, is planning a thorough technical investigation not only of manufacturing methods at Frankford, but the latest practice at the plants of private manufacturers throughout the country.

The most important development of the week, however, is a series of disclosures concerning the rifle contracts between the Ordnance Bureau and the Remington and Winchester companies made in the fourth of this interesting series of investigations by the House Appropriations Committee, which has examined at great length Chairman Frank A. Scott of the War Industries Board who approved these contracts and General Crozier, who signed them on behalf of the department. The correspondent of THE IRON AGE is able to present the text of one of the contracts, which will be examined by manufacturers with unusual interest as typical of the purchasing agreements now being made by the War Department with the co-operation and approval of the War Industries Board.

The Winchester and Remington Contracts

The contracts made by the War Department with the Remington and Winchester companies for 1,000,000 Lee-Enfield rifles have been the subject of much criticism in Congress, where, although the details of the contracts were unknown, it was commonly understood that they would result in a net profit to the manufacturers of approximately $4,000,000 with less than the risks usually encountered by manufacturers. When, therefore, the last big budget bill, which has now reached a total of more than $7,000,000,000, was taken up by the House Committee on Appropriations, Chairman Fitzgerald and Assistant Chairman Sherley called upon the War Department to furnish copies of the contracts in question and summoned General Crozier and Chairman Frank A. Scott of the War Industries Board to explain their provisions and the considerations that induced the department to enter into them. Contracts were thereupon forwarded by the Secretary of War covering the department's agreements with the Remington Arms Co., the Remington Arms-Union Metallic Cartridge Co. and the Winchester Repeating Arms Co. These provide that the work shall be done on the basis of cost plus a 10 per cent profit and are practically identical, except that the agreement with the Remington Arms Co. stipulates that the Government shall reimburse the contractor as an item of cost outlay for the rental of the plant at Eddystone, Pa., owned by the Baldwin Locomotive Works. In the other contracts it is provided that the Government shall make an allowance of 6 per cent upon the valuation of the plants in lieu of rental. Following are the principal articles in the agreement with the Remington Arms Co., article 9 being elided for military reasons:

Article 1. The contracting officer will arrange with the British Government for the continued use by the contractor, for the purpose of manufacturing rifles under this agreement, of the machinery, tools, equipment, and appliances which will, at the time of the completion of the manufacture of rifles for the British Government by the contractor, under the terms of a certain written agreement bearing date Dec. 30, 1916, become the property of the British Government under the terms of the aforesaid agreement between the contractor and that Government. The contracting officer will secure to the contractor the right to the use thereof without cost or charge, or liability for, use of, damage to, or loss or destruction thereof.

Article 2. The contractor will make the necessary outlays in advance, and manufacture and supply in conformity with the aforesaid drawings and specifications, including duly authorized changes therein, 475,000 rifles, and such spare parts as may be required by the contracting officer during the period in which rifles are manufactured hereunder, and will supply said rifles packed for shipment at the contractor's works.

Article 3. The manufacture of said rifles (the word "rifle" as used in this contract being intended to include everything covered by the drawings and specifications above referred to) shall conform in all respects to and with said drawings and specifications, including duly authorized changes therein, all of which are to be deemed and taken as forming a part of this contract with like operation and effect as if the same were incorporated herein. The contracting officer is expressly authorized from time to time, by notice in writing to the contractor, to make such changes in the drawings and specifications and such additions thereto as he may deem advisable.

Article 4. (a) The contracting officer may arrange to secure and to supply to the contractor for use in the manufacture hereunder the material, raw and in course of manufacture, on hand at the plant of the contractor as property of the British Government.

(b) The contracting officer may purchase and supply to the contractor any part of or all material, appliances, equipment, or other personal property of whatsoever nature required for the manufacture of said rifles.

(c) The contractor will from time to time, except as otherwise provided, purchase or contract for the purchase of all materials, tools, equipment, or other personal property of whatsoever nature required for the manufacture of said rifles, and upon such terms as appear to the contractor to be reasonable.

(d) The contractor may supply or furnish for use in such manufacture at the option of the contracting officer all materials, tools, equipment, or other personal property of whatever nature of a consumable character required for the manufacture of said rifles owned by it and not purchased for use in the manufacture of rifles hereunder, and that in case the contractor shall so furnish such material, tools, equipment, or other personal property, the book value of the same at the time furnished shall be treated as an expenditure of the contractor in the performance of this contract and considered as a part of the cost of manufacture.

(e) Immediately upon the execution of this contract the parties hereto shall confer for the purpose of determining what material will be required to complete this contract, taking into consideration the material referred to in subtitles (a), (b), (c), and (d) of article 4 of this contract, with a view to providing for such material as may be necessary to cover the entire requirements under the contract.

Article 5. The materials to be used in the manufacture of these rifles shall be of quality and characteristics acceptable for the various purposes for which they may be used, and shall conform to the specifications forming a part of this contract. The materials and workmanship used and applied in the manufacture of these rifles in details and finish in all their parts shall be of the prescribed quality and shall, from the beginning to the end of the work, be subject to the inspection of the contracting officer, who may appoint suitable inspectors to whom the contractor shall furnish such samples of said materials and such information as to quality thereof and the manner of using the same, as may be required, and also any assistance such inspectors may require in determining the character of workmanship applied, and the quality of the materials, either used or intended for use in the manufacture of the rifles, and that the inspectors may, with the approval of the contracting officer, peremptorily reject any unfit workmanship or material or forbid the use thereof. The inspectors shall at all times during the progress of the work have full access thereto, and the contractor shall furnish them with full facilities for the inspection and superintendence of the same.

Article 6. When and to the extent requested by the contracting officer, the contractor will procure such liability insurance and such insurance in addition to that regularly carried by the contractor, as may be lawfully procured against loss or damage to property.

No deduction from any payment to be made to the contractor hereunder shall be made because of depreciation or loss of or destruction or damage done to the machinery, tools, equipment, appliances, materials, or supplies furnished by the Government for use in such manufacture, nor for any loss, destruction, or damage done to any raw material, manufactured material, material in process of manufacture, rifles in

process of manufacture, manufactured rifles, or any other personal property at any time acquired by the contractor under the terms of this agreement for use in the manufacture of the rifles, whether such damage or destruction be occasioned by fire, flood, storm, riot, vandalism, any acts of God, acts of war, or other casualties, and whether while such property is at the plant or in course of transportation.

Article 7. Unless prevented by strikes, the work under this contract shall be prosecuted at all times with the utmost vigor and dispatch, without interruption for any cause within the control of the contractor, and the number and class of men engaged on the contract and hours of work, subject to the limitations imposed by law, shall be subject to the approval and direction of the contracting officer.

Article 8. No laborer or mechanic doing any part of the work contemplated by this contract in the employ of the contractor, or any subcontractor contracting for any part of said work contemplated, shall be required or be permitted to work more than eight hours in any one calendar day upon such work, such prohibition being in accordance with the act approved June 19, 1912, limiting the hours of daily service of mechanics and laborers on work under contracts to which the United States is a party. For each violation of the requirements of this article a penalty of $5 shall be imposed upon the contractor for each laborer or mechanic for every calendar day in which said employee is required or permitted to labor more than eight hours upon said work, and all penalties thus imposed shall be withheld for the use and benefit of the United States: Provided, that this article shall not be enforced nor shall any penalty be enacted in case such violation shall occur while there is in effect any Executive order suspending the provisions of said act approved June 19, 1912, or waiving the provisions and stipulations thereof with respect to either this contract or any class of contracts in which this contract shall be included, or when the violation was due to any extraordinary event or conditions of manufacture, or to any emergency caused by fire, famine, or flood by danger to life or property, or by other extraordinary events or conditions on account of which, by subsequent Executive order, such past violation shall have been excused.

This contract is subject to the Executive order issued by the President on March 24, 1917, under authority contained in the naval appropriation act approved March 4, 1917, suspending the provisions of the act approved June 19, 1912, during the pending emergency and until further orders.

Article 9. * * *

Article 10. This contract shall not, nor shall any interest therein, be transferred by the contractor to any other person or persons, and in the performance of this contact no person shall be employed that is under sentence of imprisonment at hard labor.

Article 11. No member of or delegate to Congress or resident commissioner, nor any person belonging to or employed in the military service of the United States is, or shall be, admitted to any share or part of this contract, or to any benefit that may arise therefrom, but under the provisions of section 116 of the act of Congress approved March 4, 1909 (35 Stats., 1109), this stipulation shall not apply, or be construed to apply, to any contract made with an incorporated company for its general benefit.

Article 12. The price to be paid for the rifles to be manufactured and furnished in accordance with this contract, including authorized changes therein, shall be the actual cost, plus 10 per cent for profit. For the purpose of this contract actual cost shall be generally as defined in the revenue bill approved Sept. 8, 1916, section 302, in so far as the requirements of said revenue bill are applicable to and not inconsistent herewith. The accounts and records of the contractors appertaining to this work shall be open at all times to the contracting officer and his representatives, and such statements and returns relative to the expenditures shall be made as are directed by the contracting officer. No change shall be required in the present methods and principles of keeping costs, provided the contracting officer finds them adequate for the determination of actual costs. All information obtained from the contractor's accounts and records shall be treated as confidential.

The actual cost shall include the following, and items similar thereto in principle, it being intended that the contractor shall be fully reimbursed for expenditures actually made in good faith in the performance of this contract:

(a) The cost of materials, supplies, labor, special appliances, jigs, tools, fixtures and gauges made by and for the contractor entering into or in good faith purchased, made, supplied, or acquired for use in the manufacture of the rifles, and other direct charges, such as insurance on rifles, etc.

(b) A proper proportion of running expenses, including ordinary rentals, cost of repairs and maintenace, light, heat, power, isurance, management, salaries and other indirect charges.

(c) A reasonable rate of interest on a proper proportion of the investment in plant, facilities, inventory and working capital not owned or provided by the Government.

(d) A proper proportion of taxes of all kinds paid or accrued with respect to the business or property.

(e) A proper proportion of physical losses actually sustained in connection with the business, including losses from fire, flood, storm, riot, vandalism, any acts of God, acts of war, or other casualties, and not compensated for by insurance or otherwise, and a proper proportion of a reasonable allowance for losses and damages resulting from displacement or from delay in work contracted for prior to the date of this contract caused by or contributed to by work under emergency conditions performed by the contractor for the contracting officer; also, all losses actually sustained in the conduct of the business of manufacturing such rifles on account of death of and personal injury to employees or others to the extent that the same shall not be compensated for by insurance or otherwise.

(f) A reasonable allowance, according to the conditions for the depreciation of values of plant and property.

Article 13. It is understood that the premises and plant of the contractor which will be employed in the manufacture of the rifles are occupied under the lease dated Dec. 30, 1916, of the Baldwin Locomotive Works, a copy of which is hereto attached. Payments which will be required to be made by the contractor to the Baldwin Locomotive Works upon such lease accruing for the period of time which will elapse from the termination of manufacture of rifles for the British Government under contract dated Dec. 30, 1916, to the date of tre removal, under the terms of this contract, by the Government, of the materials, appliances, equipment, or other personal property belonging to or removable by it at the termination of this contract, are to be reimbursed and paid the contractor as ordinary rentals within the meaning of the language employed in subparagraph (b) of article 12 hereof.
to be reimbursed and paid the contractor as ordinary rentals within the meaning of the language employed in subparagraph (b) of article 12 hereof.

Payments upon these contracts are to be made monthly and all accounts covering cost of production are to be reviewed by a compensation board composed of officers of the U. S. Army. Within 90 days from the termination of the contracts the Government agrees, if desired by the contractor, to remove from the plants the special equipment which the War Department has agreed to purchase from the British Government for the sum of $9,500,000.

At the hearing before the House Committee on Appropriations General Crozier testified that these contracts will probably result in the production of rifles for the United States at a price substantially lower than that paid by the British Government, notwithstanding the fact that materials and labor have advanced heavily since the work of making rifles for Great Britain was practically completed. The British Government, he said, paid approximately $43 per rifle, while the United States will probably pay less than $40 for a better weapon. In reply to suggestions by the committee that cost-plus-profit contracts, such as those made in this instance, are open to numerous objections, General Crozier said:

This kind of contract is subject to the criticisms that have been indicated, and there may not be a perfect answer to them. The reliance that we have is, first, the entrance into the methods of management with the right of control, the right of consent to wages and salaries, and to the prices paid for material; the right to the advantage of any reduction of the price of any class of material that the Government can obtain through any arrangements, such as arrangements with steel producers, copper producers, etc. Now, that still does not cover the general subject of carelessness, the subject of inefficiency, and the subject of expensive operation, because that does not hurt the people conducting the manufactory; but the reliance for protecting the interests of the Government on that score is, first, the reputation of those companies. They are in this business and they will continue in this business; they have been in it for a good many years, except one of them, and that one has been engaged in other similar business. They have their business reputations to maintain and they have got to make their living hereafter. Now, there is a certain character which they have for conducting business efficiently. It is true that they have engaged in some transactions comparatively recently which have not indicated all kinds of efficiency, but I think that such troubles as these companies have had are not traceable to inefficiency in the management of their plants, but they are due to the mistakes of the people who put up the money, generally speaking. So we have hired their demonstrated capacity—a capacity demonstrated over a long series of years. Then, we have a certain rivalry between them.

Those companies are in a way joined together in this

matter with the Government, but we are dealing with them independently. We expect a certain amount of co-operation in production and interchangeability in production to as high a degree as we can get it, and we hope for a friendliness of that kind. But these companies have something at stake, each one as against the other, in making this an efficient and economical manufacturing cost. The manufacturing cost in each plant will be made public. We will make it perfectly well known, and the companies have an interest in not making a discreditable showing with reference to one another. Now, there is another thing which might be a safeguard, and that is that these contracts stipulate that there shall be the right of cancellation at any time the Government chooses to cancel the contracts. We can cancel them at any time.

Why Cost Plus Ten Per Cent

The fact having been developed that Chairman Scott of the War Industries Board, when acting as the head of the old Munitions Board, approved the rifle contracts, the Committee called him to ascertain his views as to the fairness of these agreements from the Government's standpoint. Replying to a question as to how it was determined that 10 per cent of the manufacturers' cost was a reasonable profit under these contracts, Mr. Scott said that the margin was fixed because it was the least percentage that the manufacturers could be induced to accept and that rather than take a lower figure they preferred to have the Government commandeer and operate their plants. "The manufacturers," said Mr. Scott, "were entirely unwilling to make the rifles at any flat price. Each of them had had contracts with the British or Russian Government, on every one of which they had lost money and which they had been compelled to adjust with those governments. They were very much afraid of other business of that kind and were unwilling to enter into any contract for rifles at a fixed price; therefore, the Chief of Ordnance was compelled to make a bargain with those manufacturers on the best basis that he could obtain. That contract, however, will produce for this Government rifles at a lower cost than the rifles that have been acquired by any government participating in this war."

Chairman Fitzgerald called Mr. Scott's attention to the current reports that the allied governments have paid high prices for everything purchased in the United States, to which Mr. Scott replied that enormous increases in material and labor costs have occurred since the Allies began buying. The normal commercial profit on articles like rifles would certainly be considerably in excess of the amount which will be produced by the contracts under examination.

A Simple Lesson in Dividend Figures

Chairman Fitzgerald objected to the allowance of 6 per cent, either as rental or to meet the interest on the money invested in plant, which he said would produce an abnormal profit and drew Mr. Scott's attention to the fact that the Winchester Repeating Arms Co. "for eleven years has been paying dividends of 55 per cent."

"The dividends that the company pays," replied Mr. Scott, "are determined by two factors—its earnings and the amount of its capital stock outstanding. The Winchester Repeating Arms Co., I think, has a capital of $1,000,000, but it has an investment of many millions of dollars. That investment is used to earn money which is paid in the form of dividends on this $1,000,000 capital. Assuming, however, that it has an actual investment of $20,000,000, you can see that 55 per cent of $1,000,000 in the way of profits makes a very small return upon the actual money in the business."

Profits Not Exorbitant

Chairman Fitzgerald, referring to the fact that at the time these contracts were entered into the Government had no accurate inventories of the plants in question to determine the amount of capital invested, suggested that without such information it would be impossible to determine whether any certain percentage of profit was reasonable. Mr. Scott dissented from this view, however, declaring that because the Government lacked in information referred to and could not tell what the rifles would cost, it was necessary to make cost-plus-profit contracts. "That is the reason why the Government followed this plan in the construction of cantonments," he said, "because it had no means of determining in advance what a reasonable profit would be. When the Government undertook its building program it did not know where the cantonments were to be built. I think the question to be considered in such cases is, What would be a fair percentage to pay in the way of a profit to any given industry? If you want me to state whether I concur in the opinion of the War Department officials that these are fair contracts and that they will produce rifles at a reasonable price to the Government and not at an exorbitant profit to the manufacturers, I am perfectly willing to say, 'Yes, I do believe that.'"

What Is Organization Worth?

Representative Sherley suggested that if the Remington Arms Co. rented its plant at the expense of the Government and used equipment belonging to the Government, it really furnished nothing and must, therefore, make an exorbitant profit under its contract. Mr. Scott combatted this view. "The most expensive thing which this company has," said he, "is something that costs the most and for which you get back the least, viz., its organization. You pay a great deal in acquiring an organization of the size of any one of these great companies. Looked upon as a business proposition, it will work out that it was an absolute Godsend to this country that we had in existence three organizations of the size of the Winchester and Remington companies, with the machinery ready to go on to the manufacture of rifles to fit the American ammunition and which could be produced within a period of less than one year. I believe that if we could get the organization expenses of the plant at Eddystone you would find that it cost perhaps a million dollars or more just to bring together the 10,000 or 15,000 employees of that plant. The transaction as a whole will, in my opinion, be a very desirable one for the Government."

Flat Prices vs. Cost Plus Profit

In debates in Congress during the past week leading members of the Appropriations Committee have defended the action of the Ordnance Bureau in making these rifle contracts. There has been, however, a general tendency to criticize the cost-plus-profit basis of contract for war material and, under the stress of this criticism, a disposition is being manifested by Government officials to employ flat prices wherever possible. It is realized that the cost-plus-profit plan has a strong tendency to raise wages and the prices of materials, the contractor having very little incentive to resist the demands of either workmen or producers of materials. In the case of labor, there being no possible loss to the contractor, every demand for higher wages is quickly conceded for the purpose of keeping the organization intact, and thus the labor market throughout an extensive district may easily be demoralized by the policy of a few Government contractors, working under these cost-plus-profit agreements. In cases where the Government is obliged to induce manufacturers to extend their plants and undertake the manufacture of material involving a large element of risk, such as the production of rifles, artillery, etc., the officials are strongly of the opinion that the cost-plus-profit plan is the only practicable one, and they emphasize especially the fact that wherever pursued it has resulted in expediting deliveries to a very extraordinary degree.

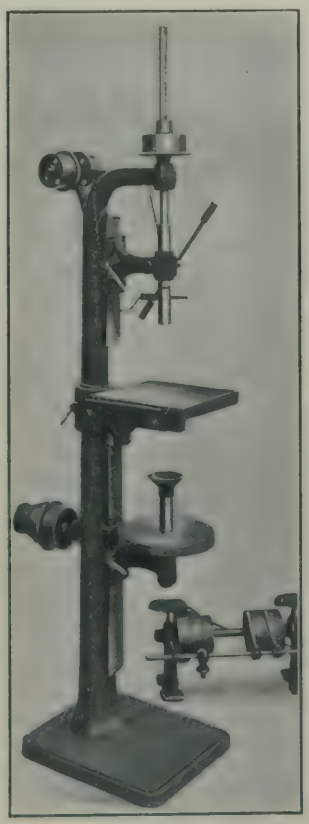
W. L. C.

An instrument for comparing the magnetic properties of two similar pieces of steel has been devised by F. P. Fahy, of the Pennsylvania Railroad Co. An experimental study of this machine is the subject of Scientific Paper No. 306 of the U. S. Bureau of Standards. It is written by Charles W. Burrows and Raymond L. Sanford, associate and assistant physicists, respectively, of the Bureau.

Large deposits of manganese ore, lying on top of the ground, are reported to have been found in the Cypress Hills in South East Alberta.

Floor Drilling Machine Built at Waukegan, Ill.

A drilling machine designed to drill holes 9/16-in. and smaller, shown in the accompanying illustration, is being built by the Waukegan Machine Tool Co., Waukegan, Ill. It is provided with two tables—a square one, which may be swung around the column and tilted at desired angles, and a round one resting in a bracket and vertically adjustable on the column. The round table may be removed and the cup center shown used in the bracket. A block on the side of the square table may be used as a vise. The spindle is provided with a fiber thrust bearing and is counterbalanced by a weight inside column.



Waukegan 14-in. Floor Drilling Machine

The total height of the machine with the spindle in the up position is 6½ ft., and the area of the base is 15 x 17½ in. The vertical adjustment of the head is 7½ in.; the travel of the spindle, which is ⅞ in. in diameter, is 3 in., and the distance of the column to the center of the spindle is 7½ in. The distance from the spindle to the square table is 10 in., and from the spindle to the round table 36 in. The round table, which has a diameter of 10 in., has a 20-in. vertical adjustment.

To Stimulate General Building Construction

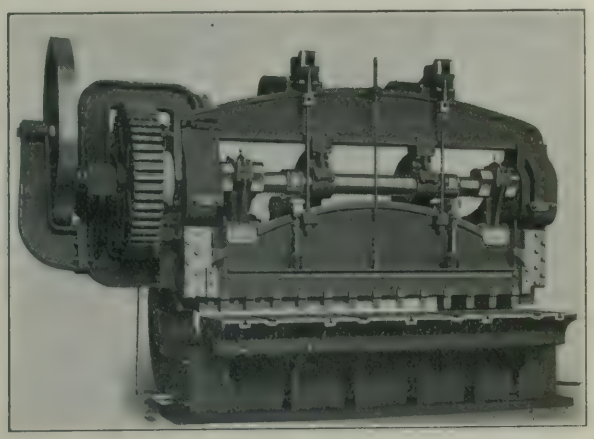
Building interests in New York passed a resolution at a mass meeting held on Thursday afternoon, Sept. 20, at the office of Marcus M. Marks, president of the Borough of Manhattan, to ask Congress to appoint a commissioner of peace industries. The commissioner is to regulate prices if necessary so that business of peaceful industries may continue during the war on a reasonably normal basis. Before the request is to be formally presented, Mr. Marks is to appoint a committee including members of the various building trades, architects, commercial interests and labor organizations to make a detailed study of the building situation and material prices. The conference was called, as noted in these pages last week, at the request of the Building Materials Exchange of New York. According to President Marks the estimated value of new structures for which plans were filed in Manhattan so far this year was $23,850,000 against over $100,000,000 in the same period of 1916.

The Chase Metal Works and Chase Rolling Mills, Waterbury, Conn., have discharged about 1000 men as a result of the completion of war orders of the Allies. For the same reason the Scovill Mfg. Co. has laid off some of its working force and it is reported that the same action has been taken by the American Brass Co. The companies expect to put the men back at work on United States Government orders.

At Pittsburgh, the appellate board has granted, until Jan. 1, 54 claims for industrial exemption asked by the Westinghouse Air Brake Co. and the Carnegie Steel Co. for drafted employees in the Wilmerding, Homestead and Braddock local draft districts. The employees exempted are engaged in various departments of steel plants and perform semi-skilled or skilled work.

Large Gate Shear

The accompanying illustration shows the latest type gate shear made by the Long & Allstatter Co., Hamilton, Ohio. The machine is 146 in. wide between the housings and has a throat depth of 30 in. It has an automatic hold-down for clamping and holding the work while it is being cut, but instead of using leaf springs on the hold-down, heavy coil springs are now employed. These have proved satisfactory and have also a longer life, it is said, than the leaf springs. To make the machine rigid for heavy work, it is made with a solid base, instead of with a cut-out. The machine is designed to



Shear 146 In. Wide Between Housings and 30 In. in Throat Depth

cut off 12 ft. sheets and plates up to 1 in. thick, at any length.

The main frame, or housing, as well as the table in front for supporting the work, and the slide and gearing are all made of semi-steel. The cam shaft is made of an open-hearth steel forging, and runs in a cast iron bushing in the head of the machine, with the lower half adjustable. The machine is double geared at the ratio of 14 to 1, and the cam pintles giving movement to the slide are made from steel castings bushed with phosphor bronze. Phosphor bronze gibs are also provided for taking up the wear on the slide. The machine is self-contained, being driven by a 40-hp. motor running at a speed of 850 r.p.m.

Motor-Generator Set with Two Bearings

Two motor-generator sets, embodying departures from usual construction, have been designed and built by the Crocker-Wheeler Co., Ampere, N. J. The sets consist of an 845 kva. 2200-volt 60-cycle three-phase synchronous motor, driving two 250-kw. 125-volt com-



The Elimination of the Outboard Bearings in This Motor-Generator Set Enables the Brushes to Be Adjusted Readily, While the Use of Two Interpole Generators Is Claimed to Provide Flexibility of the Direct-Current Voltage

pound-wound interpole direct-current generators. Only two bearings are used instead of four. The brushes are thus readily accessible for adjustment.

By substituting a three-unit set for a two-unit set having a three-wire generator, it is emphasized that a greater unbalanced overload capacity and greater flexibility of the direct-current voltage are secured.

American Shipbuilding to Decide the War

James A. Farrell on the Part the United States Must Take in Marshalling Transportation and Keeping Up Foreign Trade

President James A. Farrell of the United States Steel Corporation read a paper at the convention of the Chamber of Commerce of the United States at Atlantic City, Friday, Sept. 21, on "Helping to Win the War Through Foreign Trade." The greater part of the address is given below:

Tonnage of 2,500,000 for Transport

"Whatever other contribution we may make to the prosecution of the war, that of ships must be first, because it is only by means of ships that other contributions can be successfully delivered. In the three years that the war has lasted we have been sending more and more of our raw materials, our foodstuffs and our manufactures to countries that are now our allies in the struggle. Our leading industries had undergone substantial reorganization in order to meet the new demands for the production of war material. The demand for tonnage had increased side by side with our increased supply of ships. Thus, there had been produced a situation where our Government had determined to enter the shipping business as an owner, and the newly created Shipping Board was laying its plans for the construction of Government ships. Our first plans call for the transportation of an army of more than 1,000,000 men, involving 2,500,000 tons of shipping, at least, for their transportation, without considering the tonnage required for the maintenance of such a force on foreign soil. As an American army abroad grows in numbers, the demand for tonnage for its maintenance must constantly increase, because these men must be supplied from the home base and cannot depend upon supplies to be drawn from abroad.

Readjustment of Steel Industry

"To meet this situation the United States, through the Shipping Board, has undertaken a colossal program of ship construction, calling for an expenditure of more than a billion dollars, with hundreds of millions more for ships transferred from private ownership or secured in other ways. Here is a new, enormous and imperative demand for steel that must be met. It is a demand which requires a readjustment of the steel business of the nation. Production must be stimulated, as millions of tons will be required for military necessities and the naval and emergency fleet program. New shipyards must be built, and thousands of men selected and trained for the new service as officers and crews of the ships that are to be forthcoming.

"The United States, as may be seen, is definitely launched upon a vast enterprise of shipbuilding on a scale which, in view of the war conditions, calls for the co-operation and support of every department of American industry and of every productive interest in the country. These ships may well be the very means by which the war may be won for us and for our allies. It is through them that we can insure the delivery of our war resources at the point of contact with the enemy. The men for the fighting line, the guns, the rifles and all other materials for them to fight with, food and clothing to keep them in fighting condition—all the elements of our fighting strength—wait for transportation in determining quantities upon these ships.

No Unified Control of Ships

"The United States is called upon to do its share of a tremendous task with a meager merchant marine. It is freely admitted that Great Britain at the outset of the war allowed a vast amount of merchant tonnage to be wasted through lack of centralized power, and it is doubly important that the United States should profit by the lesson by avoiding any such loss in efficiency. Yet, although it was apparently the intention of Congress to concentrate in the Shipping Board all the functions relating to the American merchant marine, there is, as yet, no unified control of tonnage. Vessels are impressed for the navy and held under navy control; vessels are impressed for the army and held under army control. This is precisely what happened in England at the outbreak of the war, and caused an enormous wastage of available tonnage because of the disposition of army and navy commanders to requisition ships at the earliest possible moment and hold them until there remained no possibility of their being further required.

A Lesson from Great Britain

"As a result, many vessels were used for months as warehouses or remained idle, transporting neither troops nor supplies, to the manifest detriment of a commerce which suffered for lack of ships and from the burden of freights which kept mounting on the imports of the foodstuffs and munitions of war upon which England was dependent. It was only after two years of such wastage that the British Government was moved to create a Ministry of Shipping with supreme powers over all tonnage. The methods of this body which have been the product of British experience with a merchant marine many times larger than ours, may be profitably imitated by the United States Shipping Board. So far the Board, as now organized, has shown a marked degree of efficiency in proceeding with its great task, and it is to be hoped that it will adopt such a central and unified control of shipping as will economize tonnage at every possible point to prevent wastage through lack of foresight or conflict of jurisdiction.

Imports Needed for War

"But our fighting resources are not wholly within our control. There are elements of the supply which we have been sending forward in steadily increasing volume that come to us from other sources. Thus, the share of American business in winning the war will not be determined merely by the use we make of materials of native origin; we must make sure of the continued supply of indispensable supplies from other countries. The nitrates from Chile that our farmers must have in order to meet the demand for increased production of foodstuffs, the tin from the Malay Peninsula and Bolivia, the manganese from Brazil, and other like essential materials must have their uninterrupted supply firmly secured, and in every case the need for the complementary exchange of products, direct or indirect, must be met.

Foreign Trade Must Be Maintained

"The experience of our allies has been that the development and maintenance of their war supplies at home has rendered necessary a thorough reorganization of their industry and commerce. From the outset of the struggle there has been a clear recognition in Great Britain of the necessity of maintaining foreign trade at the highest possible standard, not only as a means of insuring the absolutely imperative supplies for the British army and the British people, but also as a not less important means of maintaining British finance and credit.

"The foreign trade of the United States, particularly in exports, has nearly trebled in value since the war began. To the maintenance of this export commerce an assured supply of raw materials is essential. In what may be termed the non-German world, the transactions of international commerce nourish the sinews of war. They bind not merely one ally to another, but they are frequently passing from neutral to ally and back to neutral again, in a complicated web of trade, transportation and finance. They are all giving life to economic activities and through these to the military

action to which all energies are bent. Conversely, the control of international commerce so as to deprive the enemy of essential materials and of any share of the good possessed by the allied neutral nations has been found to be as essential as the promotion of legitimate trade.

"Thus the problem of our Government is twofold: how to maintain trade with our allies and with neutrals, particularly non-European neutrals, as a means to the winning of the war; and how to restrict commerce that might be of possible direct or indirect benefit to the enemy. It is apparent that the attempt to solve one phase of this problem may interfere with the solution of the other, but there can be no question about the need for the exercise of all the resources and influence of the United States in both endeavors. At a time when so much is expected of us in feeding and arming our allies, a million and a quarter of vigorous young men are being withdrawn from productive industry, and further withdrawals in drafts will occur from time to time. Here is an additional argument for the exercise of every possible economy of method and of every impetus to maximum production that the patriotism of the people can suggest or Government policy can promote.

Trade with Latin America and Orient

"While the supply of the needs of our allies and of our own expeditionary forces is, of course, the first necessity, it would be a mistake to regard this as entirely apart and separable from the maintenance of our neutral commerce, especially of that with Latin America and Asia. Several hundred thousand tons of manganese ore per annum from Brazil is required to keep the steel industry in operation; the tin ore of the Straits Settlements becomes the container of the army ration; the rubber of Brazil and Ceylon enters the tires of trucks and ambulances beyond the battle line; the wool of Argentina is needed in large quantities for military clothing. No American army can subsist without coffee, and the cocoa of Ecuador and the Central American republics is the base of an important element in the emergency ration. Between the neutral nations that possess these materials and the United States there exists a condition of reciprocal dependence. They are as much dependent on us for merchandise which, on account of war conditions, is obtainable nowhere else, as we are on them for indispensable military supplies.

"Happily, we seem to be in the way of having the cooperation of the larger part of Latin America in the prosecution of the war, but should that not come to pass, we can still reckon on its benevolent neutrality. We may realize practical pan-Americanism by steadfast recognition in principle and practice of the economic ties between the United States and the other American republics. Our country must continue to offer a market for a considerable part of the products of Latin America, and must see to it that adequate transportation is provided for the conveyance of that merchandise.

"So also, the United States must stand ready to serve as a source of supply to the countries of Latin America of merchandise which they can obtain nowhere else but which is necessary for their life and industry and the development of their resources which were interrupted three years ago. The Exports Administrative Board has a great opportunity in constructive work in fostering trade with Latin America. The needs of our sister republics for the articles of export with which we can supply them can be definitely determined, and a policy adopted calculated to give them an assured source of supply here. Once it is realized throughout Latin America that the United States recognizes, as a primary principle of its war policy, the duty of supplying the needs of its southern neighbors and of maintaining uninterrupted the means of tansportation, a surer basis will be supplied for satisfactory pan-American relations."

The Thomas Spacing Machine Co. is now the name of the Standard Bridge Tool Co. The main office will remain in the Fulton Building, Pittsburgh, but the company has erected a machine shop on a site near Pittsburgh which was recently purchased.

Ornamental Iron and Bronze Manufacturers Meet

At the tenth annual meeting of the National Association of Ornamental Iron and Bronze Manufacturers, Sept. 19 and 20, held at the Hotel Sherman, Chicago, officers were re-elected as follows:

President, H. H. Suydam, Cincinnati Mfg. Co., Cincinnati; vice-president, E. F. Lasar, Lasar Mfg. Co., St. Louis; treasurer, Fred J. Meyers, F. J. Meyers Mfg. Co., Hamilton, O., and commissioner, Charles F. Waltz, Cincinnati. The officers, with the following, compose the administrative council: W. B. Rix, Barbee Wire & Iron Works, Chicago; F. H. Howe, Columbus Wire & Iron Works, Columbus, O.; F. P. Smith, F. P. Smith Wire & Iron Works, Chicago, and W. Hume Logan, Dow Wire and Iron Works, Louisville, Ky.

Addresses were made by F. P. Smith, E. F. Lasar, F. H. Howe, Theodore R. Tiesler, St. Louis Wire & Iron Works, St. Louis; C. Zimmerman, W. S. Tyler Co., Cleveland, and F. Grimm, Buffalo Wire Works, Buffalo.

A point emphasized by the speakers was that business conditions and methods are changing, and that the war has brought co-operation and efficiency to the front as nothing else could have done. To meet the changed conditions continued co-operation and careful consideration of overhead expense are needed. It was pointed out that the association was one of the first to lay stress on the beneficial results secured by adequate overhead allowances, and that in 10 years not one member of the association had failed or discontinued business from any cause.

The headquarters of the association are in Cincinnati.

Fire Extinguisher of the Pump Type

The Fire Gun Mfg. Co., Inc., 17 Battery Place, New York, has developed a new piece of hand fire fighting apparatus. It resembles in external appearance the ordinary chemical fire extinguisher to some extent, but is a positive double-acting liquid pump. By moving the handle in and out the extinguishing agent is expelled at each stroke. The fluid employed is a non-conductor of electricity and it is pointed out will not freeze or injure fabrics or delicate machinery. It is offered also for extinguishing gasoline and oil fires where water cannot be used.

Buys Coal Mines

The Trumbull Steel Co., Warren, Ohio, has purchased a half interest in the Pitt Gas Coal Co., owning and operating mines in Washington County, Pa., and at present producing about 800 tons daily. These mines will assure the company its coal supply for many years.

The Sangamo Electric Co. has opened a Chicago district office in the Old Colony Building in charge of C. H. Hurtt as district manager. In establishing this office the company has made no change in the selling arrangements it has had for many years with the Electric Appliance Co. and the Federal Sign System (electric) of Chicago, which will continue to handle Sangamo products. The new office has been established to give a more complete service on Sangamo meters and other products. A repair department will be maintained under the management of the Chicago office.

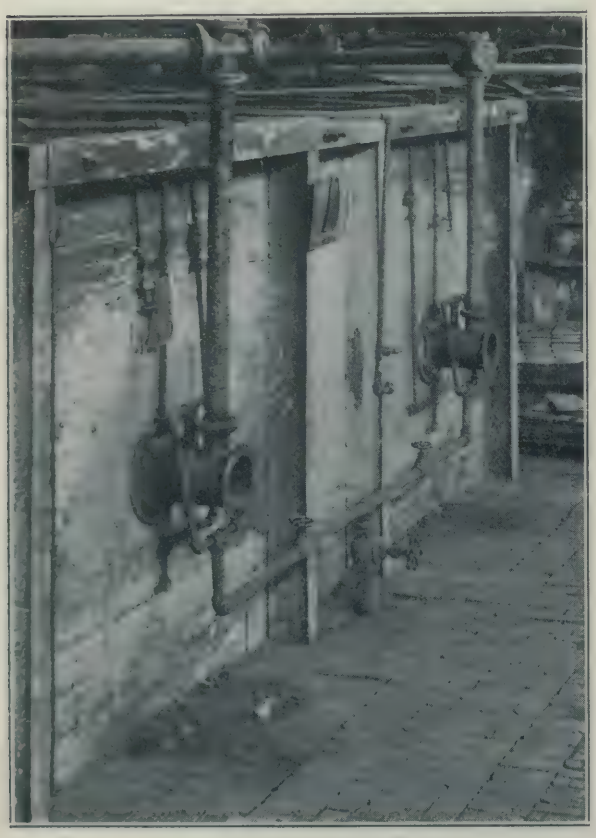
To investigate the behavior of different cutting compounds in the use of high speed steel, the Warren G. Black Oil Co., Cleveland, has been making tests in a number of machine shops equipped with automatic machine tools. The company holds that now that pure lard oil is substantially out of the question, mineral and vegetable oils have been used in a more or less unscientific manner.

The Elyria Iron & Steel Co., Cleveland, is erecting a cold rolling department in connection with its Elyria, Ohio, plant, and in about 60 days will begin the manufacture of cold and hot flat stripped steel in widths up to about 12 in. Cold rolling equipment is now being installed. Hot rolled stripped steel will be produced by mills now in use in the plant.

New Air-Carried Powdered Coal Plant

Standard Tin Plate Co. Installation—A Feature Is the Equipment to Facilitate Collecting the Suspended Coal for Transfer to Storage

POWDERED coal pulverized and distributed by the Holbeck system is being used for heating 46 sheet and pair furnaces at the plant of the Standard Tin Plate Co., Canonsburg, Pa. An interesting feature of the installation is the arrangement of coal dust col-



Burners at Rear of Sheet and Pair Heating Furnaces Showing Coal Dust and Secondary Air Supply

lectors in both the distributing and pulverizing parts of the system. This is shown diagrammatically in one of the illustrations.

The pulverized coal is delivered to a main conveying duct and is carried in suspension in a continuous current of air, with branch lines leading to the furnaces. The conveyor duct forms a closed system through a return duct leading to dust collectors and thence to the air intake to the distributing blowers. Thus the only outlet is through the branch lines to the furnaces. The installation comprises two distributing blowers with inter-connected dust collectors and four pulverizers, which deliver coal through individual dust collectors to two powdered-coal storage bins. Two pulverizers supply a single bin. The illustration shows the arrangement of equipment attached to one of these blowers and pulverizers. The work of designing and erecting the equipment was done by the Bonnot Co., Canton, Ohio, under the personal direction of A. A. Holbeck, who is its chief engineer. Alterations to the furnaces to accommodate the system were made during shut-down periods on Saturdays and Sundays.

After running the sheet and pair furnaces for a period of several months it was decided to run a branch coal-dust main to an annealing furnace, also a similar line was carried to one of the tin pots in the tin house. Additional equipment for preparing and distributing powdered coal to 18 annealing furnaces and 50 tin pots is now being installed and in a few weeks the Standard Tin Plate Co. will use powdered coal in all its heating work.

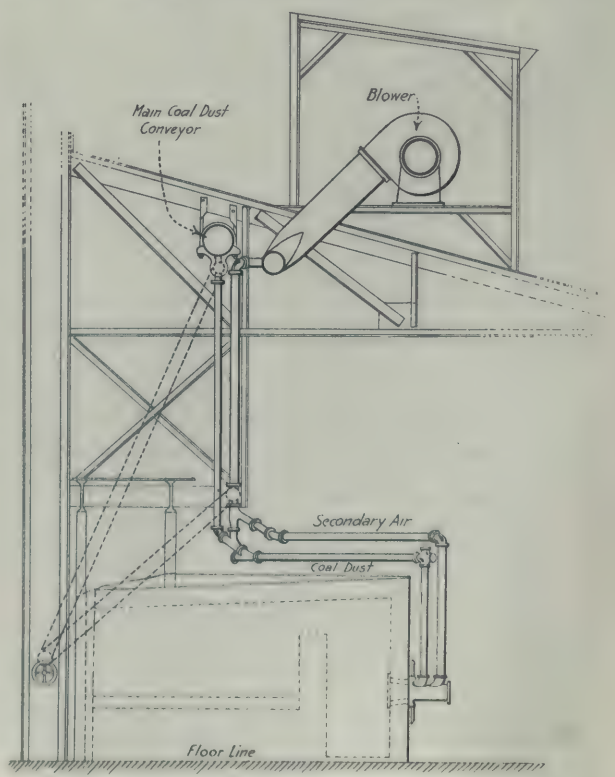
The pulverized coal plant contains three 9-in. screw conveyors placed in concrete trenches. These receive the coal from the coal storage pocket and deliver it to an 18-in. belt conveyor. After passing a magnetic separator which removes all foreign matter the coal goes to a bucket elevator. This elevates and discharges it through a spout to an automatic registering scale which weighs and drops it to a drier.

This drier, which is hand fired, removes the moisture from the coal so that only ½ per cent remains. There is not much danger of the coal taking fire as the velocity of the gases is low due to the large area of the drier. Also, the drier is provided with dust-tight rings at each end to prevent dust leakage.

From the drier the coal is conveyed by a screw conveyor to the two dried-coal bins, one being placed between two Bonnot pulverizers. Each pulverizer has a capacity for pulverizing 2500 lb. of coal per hour to a fineness of 95 per cent through a 100-mesh screen and 85 per cent through a 200-mesh screen.

After being pulverized the fine coal dust is drawn through an air separator on the top of each pulverizer and discharged into dust collectors, one for each pulverizer. From these the coal dust drops to the storage bins while the air is drawn back to the pulverizers maintaining a partial vacuum in them. This, it is said, insures an absolute quality of fineness of grinding and incloses the system so there is no escape of coal dust to the atmosphere. Also the combustible gases released by pulverizing the coal are kept in the system and delivered to the suction piping of the distributing blowers.

The powdered coal is fed to a cast-iron high pressure distributing blower along with air in such proportion that it is carried by suspension through pipes to the



A Branch Line from the Coal-Dust Conveyor and One from the Secondary Air Supply Unite at the Burner at Rear of Furnace. Provision for regulation by the operator and the elevated blower for the secondary air line are shown

different furnaces at a velocity of approximately a mile a minute. The coal dust and air traveling through the pipe form a non-combustible mixture which requires

additional air for combustion of the coal. This is furnished under a small blast pressure at the coal burner.

The amount of coal dust and air fed to the distributing blower is governed by a regulator which in turn is governed by the volume of air flowing through the line so that irrespective of varying demands on the system a constant mixture of coal and air will be delivered to the distributing duct. The regulator controls the speed of a variable speed motor which drives the screw feeding coal to the blower. A float controls the free air admitted to the blower with the coal dust.

The distributing pipe for the 46 sheet and pair furnaces is 1480 ft. long and is carried up and over and through the roof trusses with branches dropping down at each furnace to supply the burners. The method of dropping a branch pipe to the burner and also the manner in which the supply of coal and secondary air are controlled by the furnace operator are illustrated.

Approximately 600 lb. of coal, it is said, were required per ton of steel heated with hand firing while with powdered coal this was found to be reduced to 280 lb. per ton.

The Vogt Bros. Mfg. Co., Louisville, Ky., has been denied an exemption from city taxes for a period of five years in a decision in the Circuit Court there. The contention of the company that as a new enterprise it was entitled to the exemption offered by the city was set aside by the court which held that although the bulk of the products of this $400,000 plant were new, the fact that it continued to make two articles made in an old concern which it took over is a bar to the exemption. The Vogt company in organizing bought the old National Foundry & Machine Co., and is continuing the manufacture of steam pumps and fire hydrants which were a feature of that concern's business. The exemption from city taxes is not as important a matter as it used to be, for the new Kentucky tax law provides exemption from local and county taxation of all machinery used in manufacture, all products in the course of manufacture and all raw materials assembled for manufacture.

Annual Outing of New England Iron and Hardware Association

The New England Iron and Hardware Association held its annual fall outing at the Tedesco Country Club, Swampscott, Mass., Sept. 18. About 70 members and guests enjoyed the occasion. The golf tournament, which has become established as one of the features of the annual outing, saw some lively contests for the handsome prizes contributed by the Bethlehem Steel Co., Cambria Steel Co., Standard Horse Shoe Co., Wilbur Sargent Locke of Carnegie Steel Co., and Wilbur B. Ayer. The winners were W. H. Hunter, Murray Boutwell, R. H. Sanderson, H. W. Stratton and Chester C. Butts. The tournament was under the charge of W. S. Locke, Fred H. Butts, Butts & Ordway Co., and Harry L. Doten, Austin & Doten. At the dinner Vice-President Charles W. Henderson, Arthur C. Harvey Co., presided and spoke feelingly of the president of the association, Wilbur B. Ayer, Belcher & Loomis Co., Providence, whose continued illness prevented his attendance at one of the most enjoyable outings in the history of the organization.

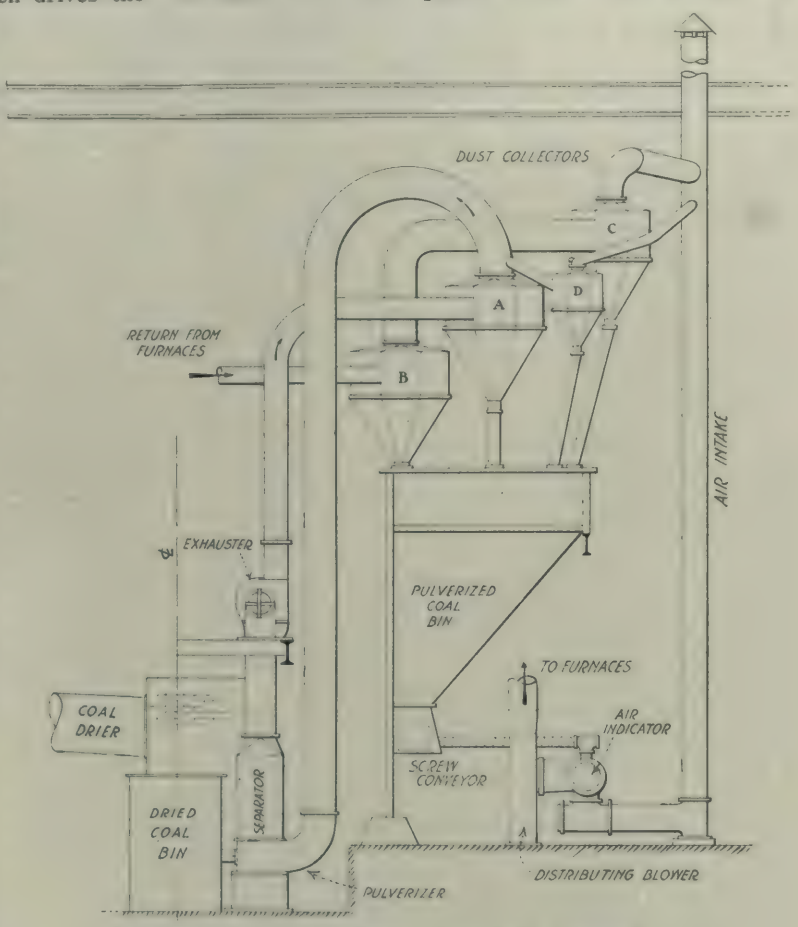
The Wellman-Seaver-Morgan Co., Cleveland, has recently completed the installation of an electrically operated moveable car dumper at the Swedeland, Pa., blast furnaces of the Alan Wood Iron & Steel Co.

SERIOUS COAL SHORTAGE

Cleveland Manufacturers May Be Compelled to Close Their Plants

The coal situation in Cleveland has become so serious that many manufacturers say that it will be necessary to shut down their plants unless relief is afforded shortly. The matter was taken up last week by the Industrial Development Committee of the Cleveland Chamber of Commerce, of which Walter D. Sayle, president of the Cleveland Punch & Shear Works Co., is chairman. A meeting of the manufacturers was held to discuss the situation and later the coal operators held a meeting with the committee. The coal operators complained that the railroads failed to supply the mines with an adequate number of cars and that the movement of coal is slow. Price fixing by the Government and the drafting of miners for military service were named by the coal men as contributory causes of the shortage.

The Chamber of Commerce committee will hold a meeting with representatives of the transportation companies, Sept. 27, and after this meeting President Sayle will name a joint committee embracing all the interests affected, and this committee, after discussing the problem, will prepare a statement of facts and a suggestion of remedies and will place the matter before Government officials in Washington.



Dried coal after pulverization is delivered through an air separator to the main collector A, from where it falls to the coal storage bin. A screw conveyor carries it from here to a distributing blower, which takes in air through the air intake and delivers the mixture to the main coal-dust conveying duct. Coal dust not taken by the furnace continues through the conveying duct, which returns to dust collectors B and C. These are open to the air intake, but the coal settles to the bin

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The Harrisburg, Pa., district draft exemption board has been notified by Quincy Bent, general manager Steelton, Pa., plant, Bethlehem Steel Co., that exemption would be asked for by the company for only 11 of the 9505 employees at the Steelton plant, of which 2435 are subject to draft and 423 have already been called.

Hearing on Federal Control of Steel

Chairman Davies Suggests Suspending or Canceling Existing Contracts

How Competitive Buying Pushed Prices of Iron and Steel to Present Levels—No "Relief" for Private Consumers Unless the President Is Given Power to Fix Prices for the Public—Plate Mills Buy High-Priced Pig Iron

WASHINGTON, Sept. 25.—A strong indorsement of the basic proposition embodied in the Pomerene bill, authorizing the President to fix the price of iron and steel for the private consumer as well as for the Government and the Allies, was given by Federal Trade Commissioner Joseph E. Davies at a hearing on the measure before the Senate Committee on Interstate Commerce on Sept. 21. Mr. Davies spoke for the commission, which was also represented by Commissioner Victor Murdock, Special Counsel Arthur W. Fairchild, and Dr. Francis Walker, chief economist, and James Wooster, chief accountant on steel.

Mr. Davies told the committee of the work done by the commission pursuant to the President's order to ascertain the cost of steel as a basis for the determination of the price of that commodity when purchased by the Government, thus making the first public statement on this important subject, and pointed to the difficulties which the commission had encountered and which would embarrass administrative officers when undertaking to fix a price that would be sufficiently high to induce small producers to develop their output to the maximum, but that would not yield exorbitant profits to the big, fully integrated concerns. Mr. Davies dwelt with special emphasis upon the necessity for some method of federal control of the industry, that would protect the private consumer from the effect of price-fixing for Government purchases only, which, he said, would be certain to aggravate existing conditions, as the large demands of the Government would have to be taken out of a fixed supply, leaving a shrunken residue to be competed for by private consumers.

Steel Supply Taken Up by Contracts

Mr. Davies also expressed the opinion that it would be exceedingly difficult to enact a law that would provide genuine relief to the private consumer of steel in view of the fact that a large percentage of the output of steel for many months to come, possibly a year, is covered by contracts at very high prices. Consumers who, to protect themselves, have bought materials at prices current during recent months, would be at a disastrous disadvantage with those less forehanded should Congress authorize the President to fix steel prices for private users as well as the Government. Mr. Davies did not specifically advocate a provision in the bill for the abrogation of existing contracts; but, while urging the necessity for radical action for price control, he indicated the belief that it could not be made genuinely effective unless some action were taken respecting contracts now in force.

In an informal discussion among members of the committee which followed Mr. Davies' testimony, Senator Pomerene declared that it would be futile to undertake to find constitutional support for the proposed legislation in anything but the plenary power which Congress may give to the President to wage war. The whole bill, he said, must be treated as an exercise of the President's war power, amply warranted by existing conditions.

Steel Companies Do Not Respond

At the close of the hearing, Chairman Newlands asked whether any one representing the steel producers was present and desired to be heard, and as there was no response he read to the committee a brief letter of invitation which he said was sent out on Sept. 19 to the officers of the United States Steel Corporation, Bethlehem Steel Co., Pittsburgh Steel Co., and Lackawanna Steel Co. Senator Pomerene expressed the hope that representatives of some of the leading steel producers would come before the committee to offer an explanation of the recent unprecedented rise in the price of steel products and intimated that he was prepared to examine any such witness at considerable length. The committee then adjourned, subject to the call of the chair.

There was no consideration by the committee of the effect of the price agreement arranged by the War Industries Board with several leading steel producers, as its terms had not been announced at the time of the hearing.

Commissioner Davies, in beginning his testimony, reviewed briefly the various steps in the manufacture of pig iron, beginning with the production of the ore, coal, etc. He then took up in detail the results of the investigation ordered by the President into basic costs of manufacture. Continuing, he said:

Integrated and Non-Integrated Producers

"We found in the steel industry that, generally speaking, there are four classes of production in steel. The classes are based on the degree of integration of the processes. There is one class that owns its iron ore and owns the transportation facilities, the railroads to the upper lake port and steamers down to the lower lake ports, and then has it transported to blast furnaces. It owns the blast furnaces, produces its pig, owns its rolling mills and owns its plants that produce the finished product. So it is completely integrated. Such companies produce steel, of course, more cheaply than any of the others.

"The next class is the class that have to buy their iron ore or their coke in part or entirely, so that that class loses profits in the process which the first class gets on the production of iron ore and coke. Its costs figure up to that degree higher.

"Then there is the third class that buys its pig iron and starts its manufacturing process with pig iron that is bought. Its costs are still higher. Of course you can readily see that if class one—the most highly integrated class—can produce pig iron at, for instance, $16 or $18 a ton, it is in a position where it can make steel much cheaper than the class that has to buy its pig iron at a $35 contract price, or possibly a $50 or $54 market price, which now obtains.

"Class four is the class that buys its steel billets or steel ingots and rolls plates and shapes or other products out of the steel that it buys. It has the highest cost of all four.

A Centralized Industry

"Another fact that we find in the steel industry that is different from any other industries, is that it is probably one of the most highly centralized of all industries in the country. The total capacity of the country in pig iron is approximately 40,000,000 tons. Sixty per cent of all that pig iron is produced by 12 companies in the United States. The number of companies making steel ingots—which have a total capacity of 43,000,000 tons in the entire country—is about 200. Seventy-two per cent of all the steel ingots produced are produced by 13 companies in the United States.

Steel ships are made out of steel shapes and steel plates. A steel ship is really a steel box. The shapes are the heavy steel that go to make the structure and the plates make the sides; about 70 per cent of the steel used in the ship is plates, while structural shapes (and bars) make up 30 per cent.

"Now, of the total shapes produced in the United States 84 per cent is produced by 5 companies. Of the plates produced in the United States 66 per cent is produced by 7 companies; of steel bar production 62 per cent is produced by 8 companies. So that the industry is centralized to a very remarkable degree in the hands of a very few companies. To that extent, of course, it might be more easily subject to central government control or regulation. There are 6000 coal mines in the United States."

Cause of Price Advances

Mr. Davies here reviewed the rise in price of the leading steel commodities from 1895 to August of this year. Continuing, he said:

"The causes for this very remarkable advance in prices, we believe to be two at least. In the first place, there have been very marked increases in costs. Wages have increased; and I noticed in the morning paper that the United States Steel Corporation has made another additional 10 per cent wage advance for all of its employees. It has been stated, and I think it is sustained by the judgment of our experts, that a 10 per cent wage advance by the United States Steel Corporation means an increase in price of steel of about $1.50 a ton. Wage advances have been as high as 40 or 50 per cent these last two or three years. So if there have been four increases of 10 per cent by the United States Steel Corporation, the increase in cost of steel to that corporation would be about $6 a ton by that increase.

"The second principal reason, as we view it, for the present high prices is the fact that there has been a tremendous demand for steel, and the supply of steel relatively is limited, and it takes time to build steel plants. The production has been increased, or will be increased, probably 500,000 tons as to sheets and plates by the first of the year, but generally speaking the available supply is constant and the demand has been tremendous. For instance, a vast amount of shipping has been destroyed, as we know, and there is a great demand for steel both for the Allies and for our own uses. The government demand for steel for ships, I understand, will be in the neighborhood of from 4,000,000 to 6,000,000 tons. That increase takes out of the available supply for industrial and commercial uses a very much larger factor than has ever been taken out before. That reduces the amount that will be available for domestic and private consumption."

"Have you in mind what was the normal consumption of steel by the Government prior to this year?" asked Senator Pomerene.

"I do not know," replied Mr. Davies, "but I should say it was not one-fifth of the present consumption. I think that a conservative estimate."

"As these prices have advanced I imagine the use of steel for industrial and domestic purposes has diminished while the Government's use has increased. Is that not a fact?" asked Chairman Newlands.

Competitive Buying of Steel

"That would be so," replied Mr. Davies, "provided the demand were a constant and normal demand and not an increasing demand, but I do not think it is so in the present condition. The commercial and industrial worlds have never had such demands for their production as now. There has never been such a demand for steel as within the last year, and the demand is such that it takes absolutely no cognizance of price. That is to say, if a man has a contract which he is obliged to meet, and if he has a large force of men—2500 we will say—and an organization which it has taken him years to build up, he has to have steel in order to keep his plant going and to keep his organization from being disrupted and scattered. So he asks for steel and he says the price is a secondary consideration with him. What he wants is steel. The result is that the price of the commodity bears no relation whatsoever to the cost of its production, and prices have gone up on steel, not so much because the producers have exacted a high price for their product, perhaps, as the fact that the buyers are competing with each other for the same production, and if there are six or eight buyers for one commodity and they cannot get it any place else, they will bid against each other and bid the price up. So that the market, so far as the price of steel is concerned, has been a runaway market, so to speak.

"In our judgment, that is one of the big factors in the increase, or one of the principal reasons for the increase of price of steel production."

Government Needs 5,000,000 to 6,000,000 Tons

"In speaking of the Governmental demand for steel during the last year," asked Senator Cummins, "do you mean to include the foreign demand as well as the domestic demand—I mean the demand of the foreign governments as well as our own?"

"I was advised as long ago as ten weeks that the demands of the Government for the past year were 3,500,000 tons," replied Mr. Davies, "and in conference with the War Industries Board, Judge Lovett, Mr. Brookings and Mr. Baruch, on Monday last, it was stated by Mr. Replogle, who was handling steel for Mr. Baruch, that the total of requirements for the coming year would be in the neighborhood of 5,000,000 or 6,000,000 tons. I do not know whether that included the requirements of the Allies or not, but my judgment is that it did not, and that that is the requirement of this Government alone. As to that I would not be definite."

Increased Sheet and Plate Capacity

"What is the capacity of the industry at this time as compared with a year ago or two years ago?" asked Senator Cummins.

"I think the capacity has been somewhat extended," answered Mr. Davies, "but I understand that of that character of steel which the Government needs principally, which is sheets and plates, it has increased about 500,000 tons up to the first of January.

"But the kind of steel that the people use generally, with respect to that it has increased much more, has it not?"

"I doubt very much whether the capacity has increased substantially, because it takes time to put up the plants. It has increased, but relatively I do not think it is a very large increase. The amount of steel that is produced for shapes I think is about 3,200,000 tons and the amount for plates about 5,300,000 tons; so the production of steel for plates and shapes is about 8,500,000 tons. The principal requirements of the Government come from that character of production, so that the ratio of six to forty does not adequately show the degree to which the Government invasion of the market will affect the market as to private consumers. In other words, the amount taken out, 6,000,000 tons, will affect the market very substantially as to the requirement of ordinary industry, because it is the same class of steel they largely use."

"Has this increase in the demand for shapes and plates, and the like, diminished the capacity of the mills for the production of structural steel for building, for bars for merchants and for rods and nails, and the like of that?" asked Senator Cummins.

"It has in this way; that in order to get the steel for plates and shapes which the Navy and the Shipping Board will require, it will be necessary to take steel that would ordinarily be used in bridge construction, building construction and that class of products that you have described in order to supply the needs of the Government for shipbuilidng and the needs of industry for shell steel and other things which have a greater priority than, for instance, the construction of buildings has."

Not Iron Ore but Steel Scarcity

Senator Cummins: "That is, they have not enough iron ore to supply the entire demand?"

"They cannot produce enough steel to supply the entire demand. The blast furnaces and the steel rolling mills are being put up as rapidly as they can be, but it takes time to get them going and to get their

plants organized. I think it should be stated in fairness that they are having trouble with labor also. They claim that their labor is less efficient than it was, that a great many of their men are being taken away."

"Have you any idea of what additional amounts of capital have been put into plants for the production of steel and pig-iron during the period of the war?" asked Chairman Newlands.

"I know that about 500,000 tons additional capacity for plates and shapes have been put up, and that the average investment required per ton of plates and shapes would be about, at the outside, $50, so that it would be in the neighborhood of $25,000,000 in that particular, and I dare say a great deal more construction than that represents has been started.

"To summarize, the fact is that the price situation that we are now confronting is largely due to increase of cost, and those increases are proceeding month by month. The last costs that we had were in June, 1917. The costs increased every month from Januray, 1917, up, and the costs in August were undoubtedly higher than the costs in June. For instance, pig iron for the United States Steel Corporation in 1917 cost $1.27 more than in 1916; shapes in May cost $5 more than in 1916; plates, $8 more than in 1916.

"Now, there have been increases in cost in labor, but they do not begin to represent the increases in costs that have affected these prices. When class two is considered, that buys its ore, that has to pay more for its ore than the United States Steel Corporation, and class three which buys pig iron at $35 or $50 a ton, of course the cost of plates and shapes goes up tremendously, and so it goes up all along the line. The highest cost of basic materials is translated into steel higher costs in the final finished product, but there are increases in cost in addition to these increases in the price of basic materials, and those costs are increasing, but the increases in costs have neither absolutely nor relatively been anywhere near commensurate with increase of price, and you cannot account for the increase in price by the increase in cost, and you must account for the increase in price in part, at least, because of the competitive buying of people who have to have steel."

Steel Corporation's Increased Costs

"I do not want to disturb the order of your argument," suggested Senator Cummins, "but if you could take a fully integrated company, the United States Steel Corporation, for example, and begin with the iron ore, not counting the value of the ore in the ground, but begin with the production of the ore, and state what added cost there is in taking ore from the ground and putting it on the docks at lake ports, and transporting it to the blast furnaces, so that we would know the increase in cost of a ton of pig iron to that company, and then follow that pig iron through the various forms that it takes in manufacture, it would give us a very comprehensive as well as a logical conception of what the added costs have been, and what their effect ought to be in the price."

"Suppose I give you this," responded Mr. Davies. "If coal costs, we will say, $2, the conversion cost of that coal into coke would probably be $1.25, the oven profit on coke would probably be 25 or 50 cents, including overhead; that would make the coke at the oven about $5 on present standards. Then, if you were to take the iron ore, and freight and take two tons of ore and one ton of coke, as your pig iron would be made up of two tons of ore at $5, which would be $10, and one ton of coke at $5, which would make the total $15, and then your freight on your coke and ore to the blast furnace would be about $2.75 to $3, your limestone about 60 cents, and your cost above, probably $2, which would bring the total cost of the pig iron to about $19 or $20 a ton. Then you would add to that your profit per ton in order to get your profit on investment.

"That is not the integrated concern. Now, to the integrated concern the cost of pig iron would be about $16 a ton. That is, the saving it would make on intercompany profits would be about that difference. If you take out inter-company profits from your book cost of $16 a ton for pig iron, you would reduce their costs to approximately $12 a ton, so that the integrated concern that owns its ore, that owns each stage in the process up to the manufacture of pigs, could make the pig iron at a net cost of about $12 a ton, whereas the concern that had to buy its ore and buy its coke and pay its freight at these prices will be paying about $25 a ton."

"In 1902-06 the average cost of plates and sheets, including inter-company profits, was $22; in 1910, for the same class, $22.50. That is the highly integrated concern. In 1916 the average cost was $27.44, which excluded inter-company profits. In 1917 the cost in May or June was $34. That excludes inter-company profits."

Senator Cummins Sees Large Profits

"I wanted, as a conclusion to this inquiry that I have been making," said Senator Cummins, "to have it appear that for a form of steel which costs one of these fully organized companies $34 a ton, the company is now charging $179 a ton."

"The United States Steel Corporation," said Mr. Davies, "is selling as high as 4.5c. and 5c. a pound. I was told by one of their officials that they did not sell at a higher price than 4.5c.; that they had been offered as high as $11 a hundredweight and had refused it."

"You have the costs now, including inter-company profits, on shapes and plates. The Bureau of Corporations made an estimate in 1913 of the investment necessary to produce a ton of plates, and then stated what the profits per ton of plates would be required to be in dollars, to bring a certain profit in per cent on the investment required to produce it, and the margin over cost of $7.28 on plates, this item that you figured, would then yield a per cent on estimated investment of 2.8 per cent. A margin of $15 would bring a return on investment of 18 per cent. That can be figured out, a margin in profit, if those plates, we will say, cost $40, including inter-company profits to-day, and were sold at $160, that would leave a net profit of $120, and the profit on investment would be very close to 100 per cent per year."

Profit Compared with Investment

"Is there such an increase of plant, in order to cover this emergency, as to warrant any such profit?" asked Chairman Newlands. "In other words, is the risk of plants, which are now being constructed to meet the demand, being idle after this emergency is over, sufficient to warrant so large an increase of profit?"

"This estimate of investment required to produce a ton of pig iron plates and shapes," replied Mr. Davies, "was based upon the investment cost at normal times, where the building costs were probably lower than they are now, and if you were to take present investment costs, they of course would be very much higher; but for the great bulk of the production the old investment costs are the costs upon which it should be computed, because their plants were going concerns."

"Is there any danger of any part of that new investment cost being scrapped after the war?" asked the chairman.

"Of course that is a matter of judgment. There are opinions both ways. My own judgment would be there is not any danger of its being scrapped. I think the use and need of steel will be much greater after the war than it was prior to the war, but that factor should be considered in making a price."

Costs Compared by Years

Taking up in detail the results of the recently concluded inquiry, begun at the President's direction, to ascertain the cost of producing steel in basic forms, Mr. Davies said:

"The cost in 1902-1906 of lake ore, Mesaba, was $2.45; 1910, $2.28; 1916, $3.14; average for 1917, $3.16. Coke, 1902-1906, $1.64; 1910, $1.54; average for 1916, $2.62; average for 1917, $3.22, an increase in cost of almost 100 per cent on coke.

"The average cost of pig iron in 1916 to closs 1, the concerns that own their iron ore and own their coke, was $10.15; their average cost in 1917 was $13.62, an increase of about $3.50 a ton over 1916, which was about the average they obtained normally theretofore. In class 2, the concerns that had to buy their iron ore and

buy their coke, the average cost for 1916 was $16 and the average cost for 1917 was $21, a net increase this year of $5.

"On steel shapes, the average cost in 1916 of class 1, the highly integrated companies, was $27.44; in 1917 it was $34.66. To class 2, the class that had to buy its iron ore and coke, in 1916 the cost was $31.30; 1917, $43.11, an increase of about $11. Lastly, to the class that had to buy its pig iron, the cost in 1916 was $42, as contrasted with the average normal price of $27 theretofore, and in 1917, $48, which was $6 more than in 1916.

"On plates, the average normal cost was about $27 in 1916, while in 1917 the average was about $35. In class 2, those that bought their iron ore and coke, the cost in 1916 was $37, and in 1917, $46. You will note the wider spread as you go up in the higher classes. In class 3, the class that buys the pig iron, it cost them to produce plates $38 in 1916, average, as against $27 normal, and $53 in 1917, a jump of $15 this year over last year. They are paying higher prices for that pig iron this year than last. In class 4, the class that bought its semi-finished product, the cost in 1916 was $51 and the cost in 1917 was $78."

How Costs Were Found

"The manner in which we conducted this cost inquiry was briefly thus: We took each one of the basic materials, ore, coke, pig iron, ingots, plates and shapes. We got the average costs that obtained in 1902-06 and 1910; then we got the 1916 costs; then we got the 1917 costs, and then we got the present prevailing prices; then we computed. We gave in our report the profit per ton of product in dollars that would be necessary to make a certain return, we will say of 12 per cent on the investment required to produce that ton.

"For instance, in iron ore our costs cover 85 per cent of the production of the country. The average cost for Mesaba ore at lower lake ports in 1902-06 was $2.45 per gross ton; the average profit during that period on all the ore sold was 44c. per ton. The present quotation on all lake ores is $1.60 a ton higher than in 1910, whereas the increases in the average cost were from 70 to 88c. a ton. The price has doubled. The cost increased 77c.; the price increased $1.50. Profits that had been generally taken for a period of five years on lake ore were 44c., 44c. to 50c., which would give a profit of 12 per cent on the investment required to produce a ton of ore. On present costs, 90 per cent of Mesaba ore costs $3.94 or less at lower lake ports. We took the large percentage because these figures were needed in order to furnish a base, I presume, for price and it is perfectly apparent that if you fix a flat price, unless you fix the price high enough, you will not get the production.

Coke and Pig Iron Costs

"For the five year period the average profit on all Connellsville beehive coke was 51c. a ton; the average cost for that five year period, 1902-06, was $1.46 a ton. In 1917 the average cost of Connellsville coke was $3.10 a ton. Eighty-five per cent of Connellsville coke from merchants' ovens cost $4.08 and from 90 per cent of the steel companies' ovens the cost was $3.10. Eight to 12 per cent profit per ton, as computed by the Bureau of Corporations on the steel companies' investments in 1910, would necessitate a profit on the cost of coke to about 50c. a ton.

"For the period 1902-06 on pig iron the average book costs of Northern pig iron were $14.04; the average profit of all companies for that period was $2.05 on all pig iron. On that basis it is computed that they make about 12 per cent on the investment required to produce it.

Profits Vary Widely

"In 1917 84 per cent of the pig iron produced by the steel companes' furnaces cost $15.92 or less; 82 per cent of the Northern merchant furnaces pig iron cost $19 or less.

"Now, the profit per ton in dollars in relation to investment: It has been estimated by the Bureau of Corporations in its reports heretofore made, that on a basis of 12 per cent on the investment the margin of profit above cost per ton of pig iron would range from $1.19 to $2.08. A profit of $2.50 on pig iron would bring a return on the investment of 12 per cent."

"What is to be said of these people who have been selling it at $55 a ton?" asked Senator Cummins.

"A concern that sells it at $55 a ton, whose costs are $15 a ton, would be making a profit of $40 a ton, which would be in the neighborhood of 180 or 200 per cent profit," replied Mr. Davies.

"Assuming $50 a ton profit is made on steel, do present prices indicate as much as that?" asked Chairman Newlands.

"For some companies, yes, Senator; but you must bear in mind the costs vary."

"Take the United States Steel Corporation?"

"Take the most highly integrated company and plates and shapes at current prices, they make a great deal more than $50 a ton."

"Very well. If the entire business were integrated, as the business of the United States Steel Corporation is, and $50 a ton were made on every ton of the 40,000,000 tons produced annually, that would be $2,000,000,000 profit, would it not, which would amount annually to more than one-half of the total capitalization?"

"I think that is approximately correct. But in fairness it should be said that the price that will give the highly integrated concern $50 profit may not give the little fellow, the disintegrated class, the poor fellow, 5 per cent. In other words, if you are going to have the little fellow produce you have got to fix a flat price that will necessarily give the low cost man a very large margin of profit, $50 we will say, in order to make it possible that the little fellow can live."

Cheapening Raw Materials for Small Producers

"There is another way by which the condition can be ameliorated," suggested Senator Cummins. "If you fix the price of iron ore at a reasonable figure, or fix the price of pig iron at a reasonable figure, then the little fellow will not suffer if there be a reasonable price fixed for the finished product."

"That is, of course, true," assented Mr. Davies, "but I think you will find that if the prices are fixed right straight through on the basis at which 85 or 90 per cent of the production could be produced at—you must not starve production, because production is as important as price in steel—I think you will find that the same margins will obtain, although the spread would not be quite as wide. In other words, if you fix the price of pig iron at $25, say, so as to get the little producer of pig iron in as well as the big producer, the low cost producer would be making a very large margin of profit out of the investment, whereas the little, high cost producer of pig iron would be making a very small margin of profit, and there would be some who could not produce pig iron at all."

"That is true," commented Chairman Newlands. "There is necessarily a spread, because there is a certain economy in production that can be secured in the fully integrated concern that cannot be secured in the small individual concern; but that spread will not be very great if the three classes that you have named, the second, third and fourth classes, are able to buy their raw materials at reasonable prices. I think there are a good many instances in which a steel concern, if permitted to buy its pig iron at a fair price, could produce its finished product at a less cost than the United States Steel Corporation, giving the Steel Corporation profit for the various steps it takes in the production. While as a general principle you are right, we cannot endure a situation in which the smaller people are compelled to pay these enormous and unreasonable prices for their raw material. I think that is one of the great objects to be aimed at in this legislation."

Ore and Coke and Pig Iron High

"I agree with you entirely," responded Mr. Davies. "If the prices of the basic materials, iron ore, coke and pig and ingots and billets were fixed so that the class four man could get them at that price, it would reduce his cost very materially. The high prices of $68 and $92 cost, which we have found in some of the small

companies, are largely reflected in the high cost for metallic mixture, that is, the high cost of their material. Still, if you were to take the basic prices and fix them on a plane which would bring in 90 per cent of the production, you would still get your price for plates and shapes so high that it would bring a very large margin on investment, probably as high, to be conservative, as 36 per cent for the highly integrated man, where the little man would be making a profit of say 10 per cent, or some of them would make no profit at all.

"I do not want to leave a misapprehension on this. There are blast furnaces to-day whose costs for pig iron run up much higher than $20. There are merchant furnaces that pay as high as $6 or $7 for their ore, that is, $14 for the ore, for a ton of pig iron and as high as $16 for their coke. That will be $28 for coke and ore, and probably $3 or $4 for conversion costs and overhead, so their costs would come up per ton to $32 and $34. But that is due to the fact, as you have suggested, that the cost of ore and cost of coke is so high."

Steel Corporation Profits

"Do you know," asked Chairman Newlands, "what the steel output in tons of the United States Steel Corporation is?"

"About 15,000,000 tons finished product," answered Dr. Walker. "The Steel Corporation produces about 20,000,000 tons of ingots."

"If the United States Steel Corporation produces 20,000,000 tons annually of steel and the profit is $50 a ton, that would make $1,000,000,000 annual profit," said Senator Cummins. "Now, it is not contended that the steel trust does make that amount in profit, is it?"

"The Bureau of Corporations report states on supporting facts," answered Mr. Davies, "that when the United States Steel Corporation was organized with a capital of $1,400,000,000, of which $400,000,000 was common and the rest divided up between bonds and preferred stock, that the real value of the properties was in the neighborhood of $700,000,000. Since that time the United States Steel common stock has gone from around the 20's up to as high as 136, and has built up a surplus of over $400,000,000, so that undoubtedly any water that obtained in 1901, when it was organized, has been solidified by the profits that have been turned back into investment and capital account, and the United States Steel Corporation, by reason of its integration and its efficiency, on any flat price that is made, will make a very large percentage of profit; and even the figure that you name roughly, I should say would not be possibly out of line, because if the price of plates or shapes, or the price of pig is fixed at such a point that the production of the country will come out, because it can be made at the price fixed, it will have to be so high that the United States Steel Corporation will be making a very large profit, whereas the little producer will be making a small profit.

"The salient facts that our investigation have disclosed are the very wide margins of cost between the high and low cost producer in the industry; the fact that the prices in the market have been determined largely not by costs but by competitive buying, by people who require steel, there being a very large demand and a limited supply; the fact that costs are increasing; the fact that if any price is fixed to produce production it will have to be a price that will induce the high cost man as well as the low cost man to produce.

Old Contracts at Low Prices

"Then we have also found that a very large amount of the production is not getting these high market prices, and does not represent all profit, because there are a large number of old contracts outstanding at low prices. On the other hand, we find that a very large amount of material has been contracted for at high prices for the future, so that the producer has low contract prices that obtained before and now he is selling at higher contract prices, and it would not avail the general public any to have this legislation which you are contemplating enacted unless some provision was made to bring relief to those who are now under contract for basic materials at high prices. If the prevailing high prices of $50 for pig have obtained for contracts to manufacturers who are manufacturing steel, an the price of pig was put down to $25, we will say, or $30 or lower, the man who was under contract to buy $50 pig would be at a distinct disadvantage because of his forehandedness in making provision for his wants as opposed to the man who got the $25 pig, which was fixed. So that unless contracts for high priced basic commodities are suspended, or power is given to some agency to suspend them in this legislation, a large amount of the benefit would be destroyed and, more than that, a great deal of inequity would arise because of the differentials in price, the government price on the one hand and the contract price on the other.

"Those are the salient facts that we have deduced from these cost figures."

A Puzzle in Profits

"I am a little bit puzzled," said Chairman Newlands, "because I have an impression in my mind that in recent debates it was stated that the war profits of the United States Steel Corporation would amount to $226,000,000 for last year. I am trying to reconcile that comparatively small amount of war profits with the assumption that the United States Steel Corporation, producing 20,000,000 tons of steel annually and selling it at an average profit of $50 per ton, would have a profit of $1,000,000,000."

"Allow me to suggest," said Senator Pomerene, "that the war profit is a profit over and above the average profits of the steel company for the years 1911, 1912 and 1913."

"And, Senator," added Mr. Davies, "I think you are going on a misapprehension. There is no $50 profit on steel ingots, because steel ingots do not cost nearly that much and they are converted into other products, which require additional investment to produce. I presume that if the United States Steel Corporation could sell all of its billets at the current market price that obtained a couple of months ago, of $100, and their costs on steel billets were in the neighborhood of $35 to $40, that they would make just exactly what you say they would make. As a matter of fact, they have not sold all of their product at that high price, and they have sold a large part of their product at low contract prices which obtained in the past, and they have refused, I am told, to sell some of their product, plates and shapes, at a price higher than $5 a hundredweight, which would be $100 a ton, practically, on the theory that it was an unhealthy and unstable condition for the market to get into."

Public's Exaggerated Ideas

At this juncture Mr. Wooster suggested that the public might gather from some of the statements made at the hearing that the Steel Corporation was making profits much in excess of those actually secured. While the market prices of the leading commodities were very high the Steel Corporation was at present refusing much business because obliged to fill contracts made at lower prices, and which have at least six months to run. Mr. Davies also disclaimed having said the Steel Corporation made $50 per ton on its output.

"I understand," said Chairman Newlands, "and I am not suggesting that anything you said was misleading at all; but we want the facts to go out to the public as they are, and the average man, hearing of these high prices for steel, will assume that those prices would be currently received for the current product, and then it is a very easy calculation to make out enormous profits, and I think it is advisable that this inquiry should be clear of any exaggerated impression given to the public mind."

Effect of High Steel on Consuming Industries

Senator Pomerene then took up the subject of the effect of high prices of steel upon the industries of the country. Addressing Mr. Davies he said:

"I want to call your attention to another feature of this case which more than anything else has prompted me to favor some legislation along this line, and that is the effect that this high price of iron and steel is going to have upon the industries of the country; I mean that class of industries which use iron and steel

for their raw material, and if your studies have covered that branch of the question, I should be glad to have your views respecting it."

"It is very apparent," said Mr. Davies, "that these high prices and the projected coming into the market of the United States as a big buyer, are going to have a very serious effect upon the general manufacturing interests of the country; indeed, it is not only upon the manufacturing interests, but upon the consuming public, because where a man buys steel for the purpose of manufacturing, he passes his cost on to the consumer. As a manufacturer of stoves said, the other day, when he came up and complained to us, he hoped that this steel situation could be disposed of; that he was a large manufacturer of stoves and had 400 or 500 men in his employ, and that he had contracted for pig. He had been buying pig iron for $50 a ton, but could not get any contract at all at any price for his requirements for the next four months. He stated that he could get the pig, but the price would be open—he could not get any price to be determined by the people furnishing the pig. He said, 'I have to make my price list based on the price I pay for pig; when I send a man out to the retailer, for the purpose of selling stoves, he must be able to quote him the price. I do not care what the cost of pig is, I can translate it into the cost of the stove and make the consumer pay for it, but I must have the price of pig; I do not care whether it is $50 or $75, but I must add it on to the price of my stoves.'

"If he can get the pig iron, its cost does not concern him very much, unless he is under contract to deliver in the future at a certain price."

Cannot Pass All Costs On

"But there are certain consumers," suggested Senator Cummins, "to whom you cannot pass on the cost so quickly—certainly this increased cost. Take the man who is putting up a big building. He finds that the structural steel has advanced from $35 to $40 a ton to $140, and he does not build. He can wait. Again, take the case of a county or municipality that is about to put up new bridges, and they take account of the increased cost of material, and they conclude to build no new bridges, and make the old ones last for another year. These are but examples of tens of thousands of instances in which progress and construction and development have practically ceased in this country, according to my observation."

Public May Still Pay High Prices

"Yes, sir; that is undoubtedly true," assented Mr. Davies. "There is one factor that I think should be suggested in answer to Senator Pomerene's suggestion and that is one we have given a great deal of thought to, and that is the condition that the industrial part of our country is going to find itself in after this 5,000,000 or 6,000,000 tons of steel has been taken out of the market by the Government. If a price is fixed by agreement with the Government that shall apply also to the public—because, as I understand, the general consensus of opinion is now that the Government has power to fix the price of steel and other commodities for Government purchase, but it is questionable whether there is any power in the President of the United States to fix the price of steel for the general domestic consumers and private industries—if a low price is fixed for the Government, the situation will be aggravated as to the general public, because, with 5,000,000 or 6,000,000 tons taken out of the market, there will be a still less available supply; the demand will be just as keen or intensified, because the public realizes a large amount of its supply is going, and it will fear that prices will mount still higher, not because of any disposition of the steel makers to crowd in and take their profits, but because of the fact that the buyers will go in and bid against each other to get the steel, and will bid any price to get the steel, and force the price up.

Some Producers Will Profiteer

"If a situation develops where the Government fixes the price for steel and fixes it by agreement, so that it will extend the benefit to the public as well as the Government, a question then arises as to whether any such agreement will stand up under the economic pressure of buyers who will be bidding against each other, in the absence of legislative power and authority to make it effective. We found in the news print situation, where we entered practically into an agreement with the industry that we would arbitrate the price of news print and would distribute the paper and fix the price, that after the price was fixed at $2.50, which was a fair price, and after a large proportion of the manufacturers had agreed with us to abide by that price to the general public, we found that a certain portion of them—a small minority—would not come in and they proceeded to sell their paper at just as high prices as the market could give. They could sell it all, and it disadvantageously affected the men who were in the agreement to hold the prices down for the benefit of the public. It was, therefore, quite natural for a man to say, 'I am willing to be a patriot, but not a goat, and if this man is going to make a fortune for his family, because he does not consider the public interests, why should I hold the price down to $2.50?'

"Because we lacked the power and authority to enforce the agreement, that effort resulted in a failure, to the extent it was a failure. So with steel, I fear, if any voluntary agreement is made to protect the public on the same basis as the Government is protected as to the price, that the economic pressure and the pressure of human nature will bring about still higher prices for the public. I think we are all in accord, in the Trade Commission, on the proposition that to bring any substantial permanent relief to the public on prices of this kind, if it is necessary that some agency should be clothed with power and authority to make their determination effective."

Protest from Stove Makers

Senator Pomerene here obtained permission to place in the record certain letters from iron and steel manufacturers which he said had an important bearing upon the problem under consideration. The first of these letters was addressed to the Senator by the Taplin-Rice-Clerkin Co., Akron, Ohio, manufacturer of stoves, furnaces and ranges, and demanded to know how the business interests of the country could be kept running full blast unless manufacturers can sell their finished product at reasonable prices. The writers declared that in their own case they were obliged to name prices which they considered almost prohibitive and beyond the reach of the wage-earner to pay, because they themselves were compelled to pay so much for their raw materials.

"Why were the railroads refused their 15 per cent increase in freight rates?" the writer asked. "I believe the Interstate Commerce Commission decided that their earnings of the past year did not justify additional toll from the public. This is a good argument, and I appeal to you that you apply the same argument against the metal, coal and coke companies as was used against the railroad companies."

A Pig Iron Prospectus in Evidence

One of the documents placed in the record by Senator Pomerene was a prospectus issued by the Bird Coal & Iron Co., with offices at 206 S. Wabash Avenue, Chicago, and with a blast furnace at Talledega, Ala., in which the statement was made that pig iron could be made at from $12 to $14 a ton and that well located producers could make great fortunes selling their output at less than current market prices. In reply to a letter addressed to this company by C. E. Bell of the C. S. Bell Co. of Hillsboro, Ohio, Glen C. Bull, vice-president and treasurer of the Bird Coal & Iron Co., stated that that company figured its labor cost per ton of iron at $2, cost of mining brown ore at from $1 to $1.25, which would be substantially reduced by the use of the steam shovel, and the mining and loading of red ore at less than $1.25. The cost of putting the company's own coal on the cars was figured at $1.25 and freight at 38 cents. The company used one and a half tons of coal for a ton of coke and 1.33 tons of coke for each ton of pig. Assembling these figures the company claimed to make pig considerably under $15.

Legal Aspects of the Pomerene Bill

Following the reading of these letters, Arthur W. Fairchild, special attorney for the commission, discussed at some length the legal and constitutional aspects of the Pomerene bill. He gave it as his opinion that price-fixing and regulation would not be admitted to be a taking of property without due process under the Fifth Amendment of the Constitution, but that it would be, assuming the exigency, within the power of the Government to fix the price and to regulate production, shipment, distribution and apportionment of products without taking the property. On the other hand, if the Government should actually commandeer a plant or the output it would constitute such a taking of property as, under the constitution, would require just compensation.

Several members of the committee debated the legal aspects of the bill at considerable length, after which Commissioner Davies drew the committee's attention to what he said was one of the most important phases of the problem. "I am firmly of the belief," said he, "that the full measure of relief that you expect to bring to the public by this proposed legislation will not ensue provided actual contracts that have been entered into in good faith prior to the fixing of price remain in force.

Three-fourths of the Coal Under Contract

"In the matter of coal, we find that some 75 to 80 per cent of the coal production of the country has been contracted for, apparently in good faith, prior to the fixing of the maximum price. I say 'apparently' for some of it is in good faith and some is not, and the Federal Trade Commission is now investigating it upon the direction of the fuel administrator. If these contracts stand, they will leave the fuel administrator in the situation where his price control will affect approximately only 15 to 25 per cent of the coal—that is, the coal which the domestic consumer and small industrial consumer are using—with the result that the relief which was anticipated has not come and the Fuel Administrator is now trying to bring about some change in that situation, as I understand it, by getting some of the contract coal released."

"Do you believe we can cancel outstanding contracts without making compensation?" asked Senator Cummins.

"Suspending" Contracts Proposed

"It is the same question," responded Commissioner Davies, "regardless of whether you make compensation or not. To bring the relief that you expect to give the public you must suspend these contracts."

"I do not quite understand the word 'suspend,'" said Senator Cummins. "Do you mean at some future time the contracts are to be revived and performed?"

"It has been suggested by some members of the War Industries Board," replied Mr. Davies, "that these contracts might possibly be suspended and revived after this exigency has disappeared."

"But we would have to act at the will of the persons who make these contracts," suggested Senator Cummins. "You should not suspend them and when conditions have changed require either party to perform them. And is it not true that, in view of the fact that the buyers of a large part of this fuel are in competition with each other, they must be able to buy on even terms or they cannot compete with each other?"

"That is absolutely correct," answered Mr. Davies; "and if you have contract prices for pig iron to-day at $54 a ton and the Government should fix a price on pig iron at $25, the man who has been provident and taken care of his wants for the future by entering into a contract for six months will be penalized because the cost of his basic materials will be so much higher than those of the man who has not been provident."

"It seems to me," commented Senator Cummins, "that no matter what the consequences may be, if we are going to try to restore business to anything like its normal condition and give everybody an even chance, we must cancel these contracts."

"I think that is the idea," assented Mr. Davies.

Plate Mill Pig Iron at $55

"And yet," said Senator Kellogg, "every railroad company buys its nuts, bolts and plates and all its iron practically on yearly contracts. There is not a great deal of $55 a ton iron in the country."

"It is quite remarkable," said Mr. Davies, "the extent to which it has been contracted for at high prices in the last two months. There are a number of manufacturers who have come to us and said they have contracts for iron at $55. There are two very large plate men—and the plates of the country are produced, at least 90 per cent of them, by eight companies—and as to these two we took their May costs on plates and found that they ranged from $37 to $49, and they stated to us that if they had to buy at the present contract rates their cost for plates would run up to $54 and $62. One of the large plate concerns has already contracted for pig iron at over $50 up to next June, according to a statement it has made to us."

Chairman Newlands suggested that, in view of the universal use of iron and steel and of the power of the national Government to declare that any necessary article is "of public use," the Government might make such a declaration as to iron and steel and regulate it in interstate commerce. The national Government, he said, had never sought to regulate the use of water or electricity or gas in interstate commerce, but he was sure there was no doubt about its right to do so. Senator Pomerene expressed the belief, however, that the safest way to handle the matter was to base the action of Congress upon the President's war power.

W. L. C.

Hardinge Bros. to Build in Future

Hardinge Brothers, Inc., 1770 Berteau Avenue, Chicago, manufacturers of precision bench lathes and attachments, watchmen's portable clocks, watchmakers' tools and special machinery, have bought a plot of land and prepared plans for a factory in Berteau Avenue opposite their present location. The firm now occupies the second and fifth floors of the Deagan Building, the second floor having been taken and filled with new machinery a short time ago. Despite the additional room, the firm is again cramped for space. The business was established in 1890. Building operations will not begin until the cost of building materials become nearer their normal level.

In sending out its comprehensive and expensive catalogs, the firm also sends a slip on which the following is printed:

"We are believers in the old saying: 'Willful waste brings woful want.' We do not hesitate to send you this catalog for the asking and will cheerfully send you more if you want them, but if you find it is not exactly what you expected and have no use for it, please pass it to some machinist or factory superintendent, or return it to us by mail and we will reimburse you for the postage."

Canada is playing a big part in the shipbuilding industry of the world. No less than 74 steel boats of all kinds were under construction in the Dominion during July and August, these having a gross tonnage of 126,949. Of these, 25 are being built on the Atlantic coast, 30 on the Great Lakes and 19 on the Pacific coast. These do not include the large number of subchasers and other boats being regularly shipped to Britain by Canadian shipbuilding concerns.

FIFTH WAGE ADVANCE

U. S. Steel Corporation Again Grants Increase to Its Employees

E. H. Gary, chairman of the board of directors, United States Steel Corporation, last week announced that another increase of 10 per cent in wages of employees of the corporation would be made Oct. 1. This is the fifth advance granted by the Steel Corporation since the beginning of 1915. It is expected that independent steel companies will follow the corporation and make a similar announcement as to wages at an early date. Some of the smaller companies may, however, hesitate on account of the new schedule of prices announced at Washington. The White House announcement stated that it was agreed that there should be no reduction in wages, but nothing was said about any advance in the present schedule.

Jones & Laughlin Steel Co.'s Strike Unsettled

PITTSBURGH, Sept. 26—(*By Wire*).—The strike against the Jones & Laughlin Steel Co. still is unsettled; the trouble at the Eliza blast furnaces at Pittsburgh, which later involved the Soho blast furnace, continues. The strikers have been trying for a week or more to involve the Southside works, but without success. Some men at the Southside works have gone out, and while the plant is running only partially, it is due to lack of pig iron, the six Eliza and Soho furnaces still being banked.

Indications are that the trouble will be settled in a few days and the men return to work on the same working terms as before with the exception that the company will likely grant a general advance in wages to correspond with the advance by the Steel Corporation to be effective on Oct. 1. The Aliquippa Steel Works and blast furnaces have not been involved in the trouble in any way and are operating to utmost capacity.

General Advance Assured

PITTSBURGH, Sept. 26—(*By Wire*).—All the leading steel companies in the Pittsburgh, Youngstown and Wheeling districts will make a general advance of 10 per cent to take effect Oct. 1 the same as the Steel Corporation advance. This puts common labor at most blast furnaces and steel works on a basis of $3.30 per day for a day of 10 hours.

Inquiry for Sheet Bars

PITTSBURGH, Sept. 26—(*By Wire*).—The Bethlehem Steel Co. has an inquiry out for 60,000 tons of sheet bars, but is not likely to buy until the price of tin plate is fixed for next year.

The American Steel Cleaning Co., Cleveland, has been incorporated with a capital stock of $50,000 to engage in the contracting business in cleaning steel with high-pressure sand blast, using the Evans portable sand blast equipment. The company plans, among other work, to engage in the cleaning of the hulls of ships. A. E. R. Schneider is president, Albert Carter, vice-president and general manager; H. E. Humbel, treasurer and Frank J. Sullivan, secretary. The company's offices are at 240 Rockefeller Building, Cleveland.

The Homestead Valve Mfg. Co., Homestead, Pa., has almost completed the rebuilding of its manufacturing plant and office buildings, thereby adding about 75 per cent to its space. The company has added new machinery and equipment, especially in the foundry, where the production has been almost doubled in a short time.

PRIORITY IN STEEL ORDERS

First General Circular Issued—Three Classes Are Announced

WASHINGTON, Sept. 25.—The Priorities Committee of the War Industries Board of the Council of National Defense yesterday made public the contents of its first general priority circular, giving directions as to priority in orders and work for all individuals, firms, associations and corporations engaged in the production of iron and steel and in the manufacture of products thereof.

Under the set of regulations prescribed by the committee, all orders and work are divided into three classes: Class A, comprising "war work; that is to say, orders and work urgently necessary in carrying on the war, such as arms, ammunition, ships, etc., and the materials required in their manufacture"; Class B, comprising orders and work "which, while not primarily designed for the prosecution of the war, yet are of public interest and essential to the national welfare, or otherwise of exceptional importance"; Class C, comprising all orders and work not embraced in Class A or Class B.

Orders and work in Class A will take precedence over those in Class B, and both these classes will be given priority over Class C, irrespective of the date the orders were received. Class A and Class B will in turn be separated into subdivisions to be designated as Class A1, A2, A3, A4, etc., and Class B1, B2, B3, B4, etc., each composed of orders within the class which are regarded respectively as of greater moment and to be given precedence in accordance with its serial number. All materials required in the manufacture of an article or in the prosecution of any work will be entitled to take the class of such article or work unless otherwise specified.

For the administration of the regulations, certificates will be issued by the Priorities Committee upon application, specifying the classification of the order or work. Certificates of a subsidiary nature will be issued upon request for the furnishing of material and articles required in manufacturing the article or prosecuting the work ordered.

War orders of the Allies as well as of the United States will be placed in Class A. In the case of those already contracted for, all orders placed prior to the date of the circular by the War or Navy Department or the Emergency Fleet Corporation of the United States will be classed as subdivision A1 of Class A, unless otherwise ordered. Orders already placed by the Allies for war materials will be classed as subdivision A2 of Class A, unless otherwise ordered.

Applications for Class A certificates will be made to the committee by the contracting officer or agency of the United States, or, in the case of the Allies, by their authorized agent. Applications for subsidiary certificates covering materials, articles or work required in the manufacture of Class A products will be made by the contractor to whom the principal Class A certificate has been addressed.

Applications for Class B certificates will be made to the committee by the individual, firm, or corporation for the expedition of whose contract the priority order is desired; while subsidiary certificates for materials will as in the case of Class A certificates be applied for by the contractor to whom the principal Class B certificate has been addressed.

All orders henceforth will be classed as Class C unless covered by certificates of the Priorities Committee. No certificates will be issued for Class C orders.

The Priorities Committee is composed of Robert S. Lovett, chairman; Maj. Gen. J. B. Aleshire, George Armsby, Rear Admiral N. W. Mason, Edwin B. Parker, J. Leonard Replogle and Rear Admiral A. V. Zane. R. T. Demsey is executive secretary.

The Youngstown Pattern Co., Youngstown, Ohio, has increased its capital stock from $20,000 to $30,000 to provide more funds for plant extensions and working capital. The company is building a new plant 28 x 30 ft. which will nearly double its capacity.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the DAVID WILLIAMS CO., 239 West Thirty-ninth Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: Equitable Building. Philadelphia: Real Estate Trust Building. Cleveland: Guardian Building. Cincinnati: Mercantile Library Building.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year. Entered at the New York Post Office as Second-class Mail Matter.

Steel Prices Fixed—A New Era

The uncertainty as to Government prices for steel products that for more than two months has held the trade in suspense has been ended in a way that may well prove to be epoch-making in the industry. Thirty representative producers of iron ore, coke, pig iron and finished steel products conferred with the War Industries Board at Washington on Friday and a tentative price schedule was made up covering the three raw materials named and plates, shapes and bars, the products in which the Government's war requirements are largest. On Monday the President announced the fixing of these prices and the agreement of the producers that they should apply equally to purchases by the Government, its Allies and the public, thus meeting the President's call in his well remembered proclamation of July 12 for "one price for all."

It should be said, to begin with, that the six prices named are to be followed shortly by others, which will cover the entire industry so far as the products of blast furnaces, steel works, and rolling mills are concerned. Presumably scrap will also be included. Billet and sheet bar prices must be fixed, differentials for the various grades of pig iron will be worked out from the $33 base for No. 2 foundry iron and basic, at Northern furnace, and in line with bars at 2.90 cents, shapes at 3 cents and plates at 3.25 cents, prices will be named applying to Government, Allied and public buyers of rails, sheets, wrought pipe, tin plate, wire and other products.

While Monday's announcement ended the long uncertainty as to Government prices, it was by no means enlightening as to the immediate course of the steel market. The trade is full of questions to which there are as yet no authoritative answers. The men who conferred at Washington at the invitation of the War Industries Board, represented 80 to 90 per cent of the country's steel ingot production, probably a like percentage of the Lake Superior ore output, much more than a majority of the coke shipments from the Connellsville field and a large share of the merchant pig iron production in addition to that of the steel companies. They had no authority to bind the industry as a whole, but it need scarcely be said that anything they agreed to would by that token be well-nigh established.

There was on record the desire of the President that an end be put to the excessive steel prices produced by the war and that the Government, the Allies and the public be treated alike. Broad powers had been put in the President's hands for war emergencies, powers which constructively might be made to cover the whole steel price problem. Immediately overhanging the situation was the Pomerene bill for complete Government control of iron and steel, similar to existing control of food and fuel, and it was known to have the Administration's sanction. Another factor was the desire of the War Industries Board as well as of the President to have the readjustments in steel come through the co-operation of producers rather than by coercion. Finally, but highly important, was the desire of leaders in the steel trade to aid the Government in any readjustment that would forward the country's war aims.

While the new prices on plates, shapes and bars are lower than some of the steel conferees were prepared to accept, particularly in view of the Steel Corporation's last advance of 10 per cent in wages, which other producers have followed without question, it is to be considered that they are not far from the average prices on contract shipments in the past six months, on which the profits of integrated companies as well as of some that are but partly integrated have been quite satisfactory. With the readjustments on coke and pig iron, some companies of the latter class will still do fairly well. There will be certain hardship to a number of plants that must buy pig iron, even at the new $33 price.

The extent of the reductions from existing market prices was exaggerated in the official statement given out at Washington. Spot coke was $12.50 last week, rather than $16, and in putting pig iron at $58 the statement went to an extreme, since $50 or less has been the recent level.

What will happen to the orders on the books of steel companies taken at prices above those agreed upon? The question has come from every quarter of the market in the past two days and has thrown the whole trade into confusion. The Lever bill provided that all existing coal contracts should

be carried out at the stipulated prices. But contract buyers of $4 and $5 soft coal would be at a serious disadvantage in competing with new buyers of such coal who paid but $2. The Federal Trade Commission found that 75 to 80 per cent of the coal production was under contract, "apparently in good faith," when the new price was fixed, and meantime no $2 coal is offered. The fuel administrator is now trying to have some of these contracts canceled.

In the case of steel, while considerable sales of plates were made all the way from 4 cents to 11 cents, and there are heavy tonnages of bars on the books at more than 2.90 cents and of shapes above 3 cents, large shipments are yet to be made of bars at prices close to the new basis, while 3-cent shapes have not disappeared from the books. On contracts still running at higher than the new prices the old question of price revision on a falling market must be squarely met. If a producer makes new sales at the prices just fixed he may find difficulty in persuading a competitor of the new buyer that he should continue to pay $10 or $20 a ton higher. Buyers under contract will not be able to get material from sellers other than those having their contracts, as has always been possible when prices have slumped, following a boom. In plates, as the Government plans to take a large percentage of the total output, the complication on contract readjustments will be less than in bars, for example. A fact of no small significance is that on many contracts for finished steel settlements are on the basis of current market quotations. On these the new prices would apply promptly.

But details of the new régime are unimportant in comparison with the fact that the highly complicated problem of steel prices is in process of being solved by agreement. The producers of steel saw great harm to the industry in some recent Government proposals based on costs of the most highly integrated companies. They have undertaken an entirely new alignment of prices on a cooperative basis which plainly marks the beginning of a new era.

It need not be expected that by a violent wrench values in all lines of production and consumption will be adjusted to the new basis. But it is also to be said that the iron and steel men who agreed to these prices at Washington have a keen sense of the obligation resting on them to "carry on." Having pledged themselves to give the public the same prices as the Government, they have set to work to make their word good. They know the difficulties are many, but the spirit in which they will work out the problem is that of finding a way to execute the Government program rather than of finding how not to carry it out.

It is to be kept in mind that the prices just fixed are subject to readjustment three months hence and meanwhile the advocates of Government control of iron and steel during the war will watch closely the course of the industry. There is every warrant for the prediction that the producers of steel, having agreed to the Government's plan—a thing that only a week ago seemed impossible—will in like manner rise to any situation that may grow out of their new responsibilities.

The Steel Industry's Wage Advance

The wage advance in the iron and steel industry announced in the case of the Steel Corporation to become effective Oct. 1, is the fifth advance of approximately 10 per cent made since the war started. The four preceding advances became effective on Feb. 1, May 1 and Dec. 15 of last year and on May 1, 1917.

In THE IRON AGE for July 20, 1916, there was reproduced a chart which had been prepared by the Republic Iron & Steel Co., showing, in comparison with market prices of steel products, the prevailing wage rates for common labor in the steel mills of the Central West between 1899 and 1916. From April, 1899, to July, 1916, there were but two wage reductions, the first covering the period from June, 1894, to May, 1905, and the second covering 60 days only, beginning in April, 1909. Outside of the advances that were offset by these reductions, there were six up to and including the one early in 1913. The common labor wage rate in 1913-4-5 was shown to have been about $1.95, or 26 per cent more than the rate in 1907, and 35 per cent more than the rate in 1902. The five successive advances that have taken place recently, if set at 10 per cent each, would make about 60 per cent altogether, and thus the total advance in less than ten years has been about 102 per cent.

While some comment has been made upon the fact that wages are increased in the iron and steel industry at a time when prices are declining, it is to be observed that the vital fact is that prices realized upon shipments are increasing, owing to the completion of the older and lower-priced orders. This increase promises to continue for some time to come, and open market prices could continue to decline for quite a while, at the moderate pace of the past few weeks, before the two items would come together.

The United States Steel Corporation's annual statement of tonnage output, wages and salaries paid, etc., furnishes a suggestion as to wage costs per ton in the case of a fully integrated producer, and one that on the whole has carried labor-saving operations in the majority of its plants, to the modern limit. The data for the Steel Corporation for 1916, with the increases over 1915, are given below:

	1916	Increase
Tons steel for sale	15,460,792	31.5 per cent
Number employees	252,668	32.2 per cent
Total salaries and wages	$263,385,502	49.0 per cent
Salaries and wages, per day	$3.36	11.6 per cent

Dividing the total salaries and wages paid by the number of tons of steel produced for sale would give about $17 per ton. It is to be noted, however, that the salary and wage cost, including the conducting of transportation, which engaged nearly 10 per cent of the employees, and the manufacturing of such other products as cement, spelter, etc., and excluding the salaries of executives, etc., is still less per ton of steel. It does not represent an average, however, as the 15,460,792 tons of steel products for sale included such widely different items as 1,881,526 tons of blooms, billets, slabs and sheet and tin plate bars, 1,786,642 tons of sheets and tin plates, 1,338,892 tons of welded and seamless

tubular goods, and 95,096 tons of spikes, bolts, nuts, rivets and washers.

As the three wage advances of 1916 became effective, respectively Feb. 1, May 1 and Dec. 15, only about one-half the effect, approximately, was reflected in the statement for 1916, which deals with totals or averages. A year's operation based on the rates about to become effective would show approximately $23 instead of the $17 computed from the 1916 returns.

Producers employing less labor-saving machinery than the mills and furnaces which carry this practice to the extreme are at a disadvantage, when wage advances occur, in that their costs are increased in larger measure. They have but one clear offset, and that is that in times of depression, when prices are very low and works must close, they lose less in interest on investment than do the manufacturers who employ capital rather than labor.

Exemptions Needed for War Deliveries

For its own protection as well as that of the manufacturer the Government should act as speedily as possible to insure the exemption from military duty of skilled mechanics whose services are needed in the shop for the proper execution of war orders. Men skilled in the production of the tool-room equipment needed in every arsenal and navy yard and of which our supply is wofully inadequate should be left to pursue their work on Government orders, in view of the fact often reiterated that the war must be won by machines and of the further fact that we lack machines of the requisite kinds.

The manager of a Middle Western plant manufacturing precision tools, for the production of which workmen of unusual skill and experience are required, said lately with no inconsiderable show of heat, as he walked through one of his shops:

> The Government is pounding us for deliveries, yet is taking our best men away, and against our protest. Three have gone, and that man over there, the best finisher I have in the shop, is to be the next. Here is a machine—if it is ever finished—that is wanted at Norfolk, and there is one for Frankford.

This manager's appeals to the local exemption board had been without result, and to his protest sent to Washington no satisfactory reply had been received, despite the fact that the machines he has under construction for the Government are as important as guns themselves.

Once realized, the condition should be smoothed out quickly, and small or moderate-sized shops doing important Government work should receive as fair a hearing as that accorded to large and powerful ones. The smaller shops are harder hit, proportionately, for the reason that their smaller working force lacks flexibility. Doing one kind of skilled work, they may have but a few men, and when the best of these are taken the shop is crippled, the result being delayed delivery and, it is no exaggeration to say, distress of mind on the part of good citizens trying to serve their country with their brains, technical knowledge and experience.

This country should profit by the experience of its European Allies and not be compelled to recall from the ranks men who are needed for the preparatory work at home.

British Check on Electric Steel

World progress in electric steel has been given a sudden check. The order of the British authorities, referred to elsewhere in this issue, suspending except under license work on unfinished or contemplated installations of electric furnaces has come as a surprise. Outside of the United States no country has made more rapid progress since the war in this important industry than Great Britain, unless it be Germany, concerning which details are lacking. Not only did the British electric steel production in 1916 more than double the 1915 output, but in number of furnaces Great Britain held second position, having passed Germany. So far this year equally rapid strides have been made both in output and equipment, the furnaces in that country exceeding 120 as compared with 88 in 1916.

Some of the reasons given for the new order are scarcity of labor and materials, electrodes and current, but principal emphasis is put on the statement that such plants are non-essential to war requirements. It is a question if an error has not been made in considering electric steel or electric furnaces unnecessary under war conditions. For most purposes the British authorities evidently regard acid open-hearth steel, which is produced there in large quantities, sufficiently good for war purposes. For certain castings for automobile, motor truck and airplane construction, nothing better can be made than electric steel, with its unusual dynamic and static endurance under stress. For airplanes, electric steel furnishes unusual shapes, light and strong, not equaled by other steels, especially after modern electric heat treatment. As for tool steel, no better vehicle exists than the electric furnace; for making large quantities of high speed and other steels safely and of uniform quality it easily outstrips the crucible furnace. The demand for tool steel for machining shells and projectiles is very heavy.

A new phase of this question is the ready adaptability of the electric furnace for making high-grade pig iron. Under present conditions in Great Britain this opportunity should have considerable weight. The low-phosphorus iron required to keep England's large acid open-hearth furnaces in operation is growing scarcer, and earnest efforts are being made by the authorities to substitute basic iron. This involves a change of acid furnaces to basic—a difficult matter in present times. It would seem that serious consideration should be given to the conversion of the probably large quantities of British scrap munition steel, borings, etc., into pig iron in electric furnaces. In any case, there is no better medium for economically using borings and small scrap steel than the electric furnace, whether the desired product be steel or pig iron.

In view of the fact that since the announcement of Government prices on Monday no transactions have been reported in pig iron in some market centers, THE IRON AGE for the first time omits quotations on some grades of pig iron from its "Comparison of Prices."

Benzol and Toluol Markets

Present production of toluol, though the largest in the history of the United States, is not all that the Government requires and steps have been taken by the Council of National Defense to devise ways and means of increasing production. By-product ovens have been installed by nearly all of the steel plants in the country in a position to do so, so that any large increase in production must come from the gas companies, which are now being urged to recover benzol and toluol. The United States Steel Corporation is putting in a few new by-product ovens, which will be in operation shortly after the first of next year. Companies which produce toluol are delivering practically their entire output for Government use, and the use of our allies, at $1.50 per gal. It is estimated that fully 90 per cent is going into explosives, the remaining 10 per cent being used in dyestuffs, intermediates and pharmaceutical products. The toluol as rapidly as produced is delivered to chemical manufacturers for conversion into trinitrotoluol. Existing contracts have from six to 12 months to run, and the first that expire, which will be in March, will be promptly renewed, according to present indications. This Government is regulating the amounts of toluol which its allies shall receive. Prices in the open market for limited quantities available are about $1.75 per gal.

In benzol, the situation is somewhat easier. The large production of toluol has brought about a correspondingly large production of benzol, which is in excess of immediate requirements. Another factor which has weakened the market is the reduction in quantities exported to France. Scarcity of bottoms has made it necessary to store some of the benzol consigned to France in this country, and in some instances that country has ordered its conversion here into picric acid. Thus plants which otherwise would be engaged in making picric acid for the United States Government are working on French contracts, and consumption of benzol is therefore not as large as it would be if ships were available to carry consignments to France. Prices have eased in the past month from 55 to 60 cents per gal. to 50 to 55 cents, the inside price being usually for fairly large lots on contract.

The sulphate of ammonia market is strong. The by-product ovens are delivering their output to fertilizer manufacturers on contracts, which generally have some time yet to run. Prices are largely nominal, and such lots as are available in the open market have been quickly sold, chiefly for export, there having been a good demand from other countries.

Will Build Coke Ovens

The Steel Co. of Canada, Hamilton, Ont., has awarded contracts to the Wilpute Coke Oven Corporation of New York, for the installation of by-product coke ovens at the company's plant at Hamilton to cost $1,500,000. From this it is evident that the easing up now in process as regards munitions orders has in no way affected adversely the company's plans for extending the scope of its peace-time operations through the medium of plant betterment both as to facilities and general equipment.

The annual meeting of stockholders of the Youngstown Iron & Steel Co., whose entire capital stock is owned by the Sharon Steel Hoop Co., Sharon, Pa., was held in Youngstown, Ohio, last week. All former officials and directors were re-elected as follows: Severn P. Ker, president; G. W. Short, first vice-president; W. G. Kranz, second vice-president; J. Reid Evans, secretary and treasurer. C. B. Cushwa, H. W. Heedy, J. O. Pew, G. F. Danielson and F. C. Perkins with the above constitute the board of directors. The officials and directors of the Sharon Steel Hoop Co. and the Youngstown Iron & Steel Co. are the same. C. B. Cushwa is general manager of the plant of the Youngstown Iron & Steel Co., and two 80-ton open-hearth furnaces are being added to that plant.

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Steel Prices Are Fixed by Agreement

Government, Allies and the Public Put on the Same Basis—War Industries Board to Supervise Output of Steel Mills—Pig Iron at $33

WASHINGTON, Sept. 25.—President Wilson yesterday gave his formal approval to a scale of prices to govern the sale of iron ore, coke, pig iron and steel bars, shapes and plates to the Government, the Allies and the American public. On Sept. 21, a uniform price was fixed for copper. While in both cases the prices fixed were presumably based upon costs of production ascertained by the Federal Trade Commission, as a matter of fact they were agreed upon at conferences between the leading producers and officials of the War Industries Board.

The price of copper was fixed at 23½c. per pound. The iron and steel schedule was as follows: Iron ore at lower lake ports, $5.05 per gross ton; coke at Connellsville, $6 per net ton; pig iron, $33 per gross ton; steel bars (Pittsburgh-Chicago), $2.90 per hundred pounds; shapes, $3, and plates, $3.25. The announcement concerning the steel prices was made by the committee on public information shortly after noon yesterday, in the form of the following bulletin:

"The President has approved an agreement between the War Industries Board and the steel men, fixing the following prices, which become effective immediately, and are subject to revision Jan. 1, 1918, viz.:

Commodity	Basis	Price Agreed Upon	Recent Price	Reduction—Amount	Reduction—Per Cent
Iron ore	Lower Lake ports	$5.05 g.t.	$5.05 g.t.	.....	...
Coke	Connellsville.	6.00 n.t.	16.00	$10.00	62.5
Pig iron	.....	33.00 g.t.	58.00 g.t.	25.00	43.1
Steel bars	Pittsburgh-Chicago..	2.90 cwt.	5.50 cwt.	2.60	47.3
Shapes	Pittsburgh-Chicago..	3.00 cwt.	6.00 cwt.	3.00	50.0
Plates	Pittsburgh-Chicago..	3.25 cwt.	11.00 cwt.	7.75	70.5

"It was stipulated, first, that there should be no reduction in the present rate of wages; second, that the prices above named should be made to the public and to the Allies, as well as to the Government, and, third, that the steel men pledge themselves to exert every effort necessary to keep up the production to the maximum of the past, so long as the war lasts.

"Measures will be taken by the War Industries Board for placing orders and supervising the output of the steel mills in such manner as to facilitate and expedite the requirements of the Government and its Allies for war purposes, and to supply the needs of the public according to their public importance and in the best interest of all, as far as practicable.

"A spirit of co-operation was manifested by the steel men, and no doubt is entertained that every effort will be made to bring the production as nearly as possible up to the extraordinary demands resulting from the war."

The above is printed just as given out. The designation "cwt." is an error. It should be "100 lb."

The Copper Price

A similar announcement concerning the fixing of the price of copper f.o.b. New York stated that the rate agreed upon was "subject to revision after four months."

"The War Industries Board," the copper bulletin continued, "felt that the maintenance of the largest production should be assured, and that a reduction in wages should be avoided. The stipulation that present wages shall not be reduced compels the maintenance of the highest wages ever paid in the industry, which without such stipulation would, with the reduction made in the price of copper, be reduced under the sliding scale so long in effect in the copper mines. Within this year copper has sold as high as 36c. per pound, and the market price would now be higher than it is had it not been well known for some weeks that the Government would fix the price.

"The principal copper producers throughout the country have evinced an admirable spirit, and for weeks have promptly supplied every request of the Government for copper without awaiting decision as to price and agreeing to accept the price which the board should ultimately fix. The proper departments of the Government will be asked to take over the mines and plants of any producers who fail to conform to the arrangement and price, if any such there should be."

Conference Agreement on Steel

The agreement as to steel prices was made after two full days' conferences at the headquarters of the Council of National Defense, presided over by Bernard M. Baruch and participated in on behalf of the Government by Robert S. Brookings, buyer of finished products, and J. Leonard Replogle, assistant to Mr. Baruch in the purchase of steel, and on behalf of the producers by Judge Gary of the United States Steel Corporation, and representatives of other steel companies who have heretofore been members of the steel committee of the Council of National Defense. There were numerous inquiries as to the particular kind of iron ore upon which the price was fixed; also as to the grade of pig taken as a basis, but no public explanation was given. While all officials of the Federal Trade Commission were very reticent respecting the agreement, it was evident that some of them at least consider the price of pig iron as compared with plates to be proportionately high and as calculated to render it difficult, if not impossible, for small producers to buy pig at the controlled price and make plates to sell at $3.25 per hundred pounds.

Pomerene Bill May Not Be Pressed

Interest in the announcement of controlled prices for iron and steel was greatly increased by the disclosures made by Joseph E. Davies of the Federal Trade Commission in the hearings before the Senate Interstate Commerce Committee on Senator Pomerene's price-fixing bill, reported elsewhere in this issue, in which the commissioner pointed out the adverse effect upon small producers of high controlled prices for ore and pig iron and warned the committee that no real measure of relief could be afforded steel consumers which did not provide for the abrogation of contracts for raw materials made in recent months at unprecedented prices.

Considerable speculation is being indulged in as to whether the promulgation of controlled prices by the War Industries Board will put an end to the agitation for the passage of the Pomerene bill. Certain advocates of the measure, including its author, take the view that a voluntary agreement between the War Industries Board and the representatives of a few big corporations is a less satisfactory basis upon which to proceed than would be a well conceived statute giving the President full power to enforce any schedule of controlled prices that might be determined upon. There

is no doubt, however, that the inclusion in the agreement announced yesterday of the requirements of the American public, as well as those of the Government and the Allies, will reduce the probability of action on the Pomerene bill, at least at the present session.

W. L. C.

Opinions of Producers on the Fixed Prices

Elbert H. Gary, chairman United States Steel Corporation, had the following to say regarding the Government's findings on steel prices:

"The base prices for iron ore, pig iron and the leading steel products in which the Government is especially interested, as fixed by the President, while much lower than the prevailing market prices and considerably below the expectations of manufacturers, yet, taking everything into consideration, I believe are fair and reasonable and come within the conditions named by the President in his proclamation issued last June.

"These prices were probably made in accordance with the recommendation of the War Industries Board, which gave a patient hearing to the steel representatives and made an exhaustive study of the whole subject. While the manufacturers may feel a sense of disappointment they, nevertheless, appreciate the courteous and frank treatment on the part of the board, and they will cheerfully acquiesce and do everything possible to maintain production to the maximum as long as the war continues; and they will not decrease the wages of their workmen under present conditions."

E. A. S. Clarke, president Lackawanna Steel Co., said that the prices were fair, and added that now that uncertainty over Government action was over, the producers were in position to go ahead under full speed. "The steelmakers are now able to cut their cloth to fit the measure," he stated, "and while the prices are not as much as were expected in some quarters, still they are high enough to enable the producers to maintain output at current levels. Steel men have the opportunity of 'doing their bit' in keeping production on a scale great enough to win the war. That is the most important thing.

"There are, perhaps, old steel plants whose production costs are so high that not much profit can be made at the prices named by the President, and there also are plants which have been reopened after long idleness in order to take advantage of the high prices of the last two years, whose operations may be adversely affected. But taking the industry as a whole I should say that the return promised by the fixed prices was satisfactory."

Coke Price will Keep Up Production

Scott Stewart, general manager of W. J. Rainey, who is secretary of the coke committee created by the Council of National Defense, comments as follows: "The $6 price on furnace coke fixed by the President after conference with the War Industries Board, while not as high as the operators may feel entitled to receive, is nevertheless a price sufficiently high under present conditions to stimulate the industry by removing the uncertainty heretofore existing in connection with adverse governmental price fixing. The fair and broad-minded attitude shown by the President and the War Industries Board in dealing with this question is an assurance that the coke operator need now have no fear of Governmental action detrimental to the industry and undoubtedly every effort will be made not only to maintain but if possible to increase coke production in order to do our part in accomplishing the successful termination of the war."

Views from Pittsburgh

PITTSBURGH, Sept. 25.—Edmund W. Mudge, president Edmund W. Mudge & Co., Ella Furnace Co., Claire Furnace Co., Reliance Coke Co. and the Westmoreland Connellsville Coal & Coke Co., large factors in coal, coke, ore, pig iron, steel and other products, gives his views as follows:

Will Sell at Government Prices

"In reply to your request for expression of opinion on the prices arranged between the manufacturers and the Government on iron and steel articles, such as coke and iron ore, would say that our different interests are entirely satisfied with the base prices arranged for in Washington. We consider them extremely fair for all concerned, the large manufacturer and small manufacturer. The schedules that were worked out and others that are contemplated should allow every manufacturer of iron and steel to make a fair profit and should allow the maximum production that can possibly be produced in this country. We feel, however, that some adjustment should be made by the Government on coal prices, as their figure of $2 is most too low to secure the maximum production and reasonable profit that is absolutely necessary under the present extraordinary condition of affairs.

"We feel that the war purchasing commission, under whose jurisdiction the Government prices for steel were arranged, showed from the start a splendid disposition to be fair with the pig iron and steel interests, both large and small, and did its utmost to arrive at the base price that would be eminently fair to all concerned. Robert S. Brookings, who was prominent in the conference in Washington last week as the Government representative, was splendidly informed and won at once the entire confidence of the steel manufacturers in session. He put forth the position of the Government in a way that commanded the highest admiration of everyone in the session. I deem it a great privilege to state that the entire resources of all the companies of which I am head are absolutely at the disposal of the Government. Our pig iron and other products that come under the Government prices we intend to sell absolutely at those prices, and we stand ready to aid the United States Government in its war for democracy in any way that we may be called upon."

Coal Price Too Low

James A. Campbell, president Youngstown Sheet & Tube Co., Youngstown, Ohio, one of the largest producers in the country of coal, by-product coke, pig-iron, Bessemer and open-hearth steel, and in fact nearly all kinds of finished steel, gives his view of the Government steel prices as follows:

"My opinion is that the prices, while rather low, will stabilize the steel business of the country and in the end will be a good thing for most of the producers and the consumers. Some steel plants which are not self-contained and do not have their own supply of pig iron and raw materials will be obliged to make some sacrifice, but the Government stands ready to assist them in every way in order to enable them to provide the different products they manufacture at a price that will enable them to make at least a small profit. These plants will not be obliged to pay the excess war profits like those that are self-contained, and after these taxes are paid all steel companies, whether large or small, will be on the same basis. The coke price I regard as being a very fair one. I think the Government price of $2 on coal is entirely too low, and should be advanced to at least $4 per ton, or higher. I think the Government is showing a commendable disposition to be absolutely fair with the big steel interests, and in conclusion I do not think that any just criticisms can be made on the prices it has established on the fundamental articles of iron and steel manufacture. In turn, the steel manufacturers stand shoulder to shoulder to help the Government in every way they can with their steel plants and blast furnaces and all other resources they have."

H. D. Westfall, general manager of sales La Belle Iron Works, Steubenville, Ohio, large manufacturer of pig iron, open-hearth steel, plates, pipe, steel sheets, steel cut nails and other products, also a large coal and ore producer, gives his views as follows:

"We are inclined to regard the prices just announced as being ultimately fair and reasonable, al-

(*Continued on page* 778)

Iron and Steel Markets

STEEL TRADE IN CONFUSION

Pig Iron Sold at $33 and Coke at $6

Mills So Heavily Booked that New Finished Material Prices Have Little Immediate Effect

Since the announcement on Monday of the prices agreed upon by the Government and leading steel producers the trade has been in utter confusion. Surprise that the prices were agreed upon rather than imposed by the Government was followed by excited efforts to get details which thus far are lacking, and to determine the status of contract prices. In the meantime business practically stopped.

While only six products are named in the announcement, including the three forms of finished steel which the Government will buy most largely, prices on other products will be worked out and put into effect later. On billets, a pivotal intermediate product, strangely omitted from the first list, a $15 advance over pig iron may fairly be expected. In two of the products not yet fixed—wire and wrought pipe—the market prices lately maintained by the leading producer would be nearly in line with the new schedule on plates, shapes and bars.

Because of the large tonnages on the books of the steel mills, much of it at higher prices, there is the view that the new schedule will have little effect for some time on private transactions. Yet there are contracts on which monthly settlements are based on current market quotations. These will automatically be adjusted to the agreed prices and the effect of this on other contracts is not to be overlooked. But the situation is unlike that of past declines, since buyers who might fail to specify on their contracts cannot now find hungry mills waiting to supply them.

For manufacturing consumers of steel whose products have not advanced in proportion to steel, the new prices meet a situation that was increasingly difficult. But now there loom up the priority regulations from Washington and the prospect that with increased buying from the Allies at the low prices, there will be less material for distribution to non-war industries. Government control of steel works output is tightening steadily and it is intimated that even licenses to buy may in time be required.

Much of the upheaval over the new agreement was due to the vagueness of the Washington statement. The iron ore price of $5.05, it develops, applies to non-Bessemer Mesaba ore and is the same as the contract price for 1917 shipments. The $33 pig iron price, it is explained, is for basic or No. 2 foundry iron at Northern furnace. On other grades differentials will be worked out by the pig iron committee. On Southern iron the furnace price will be made low enough to allow for freight to the North.

That the prices named at Washington are to be made effective promptly on new transactions appears from the quoting of basic pig iron at $33 at Valley furnace by two producers in the Central West and by the sale of 5000 tons of Bessemer iron at $36.30 at furnace, the tentative differential on Bessemer being put at 10 per cent over basic. Several producers of foundry iron announce their willingness to book orders at $33 for No. 2, as against $50 one week ago.

Coke producers have started off at once to establish the $6 basis. On two contracts which call for the fixing of the price according to the market from day to day, shipments of furnace coke have already been made at $6. However, the coke trade is well booked ahead, and there will be no large amount of $6 coke available for some time. Only recently long-time contracts were entered into at $8.50, and these are expected to be carried out.

The raising of the Government price on coal is pointed to by the $6 price for coke and by the fairness of the agreements on copper and steel, and $2.50 and $2.75 are suggested prices, a new argument for the advance being furnished by the extravagant demands of the bituminous miners.

The steel and other committees of the American Iron and Steel Institute will resume their activities within a week, now that the industry has been put upon a co-operative basis, and the prices of all iron and steel mill products will then be worked out. Apparently the Government expects the large producers, under their agreement to stimulate production, to find a way to supply raw materials to the smaller producers in certain lines, particularly plates, so that they can take their share of Government and Allied contracts.

It is estimated that 7,000,000 tons of steel products for the Government and its Allies will be scheduled in the next 60 days to be provided for by the steel companies in the coming year.

The offering in the United States of Canadian billets has been cited as an indication of supply there overtaking demand. Yet it is known that the British Government is inquiring for 400,000 tons of shell steel from the United States and has yet to take 600,000 tons on existing contracts in this country.

Larger buying by France and Italy are talked of, now that prices have been fixed. A recent sale of 4000 tons of open-hearth billets for Italy was made at $60 at mill. Railroad requirements of these countries are considerable and there is still the staggering railroad and equipment program that must be undertaken for Russia. Domestic railroads are practically covered for 1918 and some rail orders are already on the books for 1919.

Pittsburgh

PITTSBURGH, Sept. 25.—(*By Wire*).

Elsewhere in this issue are printed the views of a number of the leading pig iron and steel producers in the Pittsburgh, Youngstown and Wheeling districts on the new Government prices for iron and steel. These views are a unit in declaring that, as a whole, the prices

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Sept. 26, 1917.	Sept. 19, 1917.	Aug. 22, 1917.	Sept. 27, 1916.
No. 2 X, Philadelphia...	....	$50.00	$53.00	$19.50
No. 2, Valley furnace....	*$33.00*	50.00	53.00	18.50
No. 2 Southern, Cin'ti...	....	49.90	49.90	17.40
No. 2, Birmingham, Ala.	....	47.00	47.00	14.50
No. 2, furnace, Chicago*.	....	54.00	55.00	18.00
Basic, del'd, eastern Pa..	*45.00*	48.00	50.00	19.75
Basic, Valley furnace....	*33.00*	42.00	52.00	19.00
Bessemer, Pittsburgh....	*37.25*	50.95	53.95	22.95
Malleable Bess., Ch'go*..	....	55.00	55.00	19.00
Gray forge, Pittsburgh..	....	46.95	46.95	19.20
L. S. charcoal, Chicago..	....	58.00	58.00	19.75
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	38.00	38.00	38.00	33.00
O.-h. rails, heavy, at mill	40.00	40.00	40.00	35.00
Bess. billets, Pittsburgh..	*60.00*	65.00	80.00	45.00
O.-h. billets, Pittsburgh..	*60.00*	65.00	80.00	45.00
O.-h. sheet bars, P'gh....	*70.00*	75.00	85.00	45.00
Forging billets, base, P'gh	*90.00*	100.00	115.00	69.00
O.-h. billets, Phila.	*70.00*	75.00	90.00	48.00
Wire rods, Pittsburgh...	*85.00*	90.00	90.00	55.00
Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	4.935	4.935	5.185	2.659
Iron bars, Pittsburgh....	4.75	4.75	4.75	2.60
Iron bars, Chicago.....	4.50	4.50	4.50	2.35
Steel bars, Pittsburgh...	4.00	4.00	4.00	2.60
Steel bars, New York....	4.195	4.195	4.695	2.769
Tank plates, Pittsburgh..	8.00	8.00	9.00	4.00
Tank plates, New York..	8.195	8.195	10.195	4.169
Beams, etc., Pittsburgh..	4.00	4.00	4.00	2.75
Beams, etc., New York..	4.445	4.445	4.669	2.769
Steel hoops, Pittsburgh..	5.75	5.75	5.75	3.00

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Sept. 26, 1917. Cents.	Sept. 19, 1917. Cents.	Aug. 22, 1917. Cents.	Sept. 27, 1916. Cents.
Sheets, black, No. 28, P'gh	8.50	8.50	8.50	3.00
Sheets, galv., No. 28, P'gh	9.50	9.50	10.00	4.25
Wire nails, Pittsburgh...	4.00	4.00	4.00	2.60
Cut nails, Pittsburgh....	4.65	4.65	4.65	2.60
Fence wire, base, P'gh..	3.95	3.95	3.95	2.55
Barb wire, galv. P'gh....	4.85	4.85	4.85	3.45
Old Material, Per Gross Ton:				
Iron rails, Chicago.....	*$40.00*	$44.50	$40.50	$19.25
Iron rails, Philadelphia..	43.00	43.00	45.00	20.00
Carwheels, Chicago	*30.00*	32.50	29.00	11.75
Carwheels, Philadelphia..	32.00	32.00	34.00	15.50
Heavy steel scrap, P'gh.	33.00	33.00	31.00	16.50
Heavy steel scrap, Phila.	30.00	30.00	33.00	14.75
Heavy steel scrap, Ch'go.	*30.00*	31.00	30.00	16.25
No. 1 cast, Pittsburgh..	30.00	30.00	30.00	15.00
No. 1 cast, Philadelphia.	30.00	30.00	33.00	16.00
No. 1 cast, Ch'go (net ton)	*18.00*	24.00	24.00	12.25
No. 1 RR. wrot, Phila...	43.00	43.00	45.00	20.00
No. 1 RR. wrot, Ch'go (net)	34.00	34.00	34.00	16.50
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	*$6.00*	$12.50	$15.00	$3.00
Furnace coke, future....	*6.00*	8.50	10.00	2.85
Foundry coke, prompt...	...	13.50	14.00	3.25
Foundry coke, future....	...	12.00	12.50	3.50
Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.	*23.50*	26.25	26.50	28.00
Electrolytic copper, N. Y.	*23.50*	26.25	26.50	28.75
Spelter, St. Louis.....	**8.25**	8.12½	8.50	8.75
Spelter, New York.....	**8.50**	8.37½	8.75	9.00
Lead, St. Louis.....	7.82½	7.87½	10.50	6.85
Lead, New York.....	*7.95*	8.00	10.62½	7.00
Tin, New York.....	**62.00**	61.75	61.75	38.62½
Antimony (Asiatic), N. Y.	15.00	15.00	15.00	11.00
Tin plate, 100-lb. box, P'gh.	$12.00	$12.00	$10.00	$5.75

are fair to the steel trade, and while somewhat lower than was generally expected, they will not work a hardship to the leading makers of pig iron and steel products, but to the smaller concerns that are not self-contained in the matter of ore, coke and pig iron, they will allow only a very moderate margin of profit. This will be offset, however, by the fact that the larger steel companies which enjoy the lowest costs will be compelled to turn back to the Government their excess profits over their smaller competitors, so that in the end, both large and small pig iron and steel producers will be practically on the same basis as regards net profits after all Government taxes have been met. To the large steel companies that have been furnishing immense quantities of steel to the Government for many months on the basis of 2.50c. for steel bars and shapes, and 2.90c. for steel plates, chief among these being the Carnegie Steel Co., the Government prices will really allow a larger amount of profit. This statement may sound unreasonable, but it is true that the Government prices on steel plates, shapes and bars are on the average at least $5 per ton higher than the Carnegie Steel Co., Jones & Laughlin Steel Co. and many other concerns have been realizing from sales to the Government for many months past. The self-contained steel interests will be able to make satisfactory profits at the Government steel prices, and will be in position to turn over to the Government large excess profits as their contribution to meeting the stupendous expenses of carrying on the war. The Government will realize from the smaller steel interests that are not self-contained only a moderate excess war profit tax, and perhaps from a very few of the smallest steel companies they may not be able to realize in their operations for some months to come more than the profit allowed them by the Government, before the excess war tax starts. It is a remarkable fact that since the Government started to buy war steel, the United States Steel Corporation alone has furnished 78 per cent of all the steel in various forms bought by it, and it is also true that for some months, 90 per cent of the entire output of plates, shapes, bars and other materials made by the Carnegie Steel Co. has been going to the Government, mostly on direct orders, but a small amount on indirect orders. The consensus of opinion is that Government steel prices will have the immediate effect of stabilizing not only the steel business, but all business in general. For nearly two years, the steel business has been on a fictitious basis, brought about largely by the fact that domestic consumers were bidding against each other with the mills, trying to get their orders placed. This ran up prices on pig iron, billets, sheet bars and finished to absolutely unheard of figures. It now seems that the day of 10c. plates, 5c. to 6c. steel bars and other prices in proportion has gone, and that the steel business will quickly return to a safe, sane basis. The new Government prices on steel do not affect existing contracts on any materials that were made at flat prices, but on sliding scale contracts for pig iron and other materials, most of which are based on prices quoted in THE IRON AGE, they will be affected in the fact that average monthly prices from this time on will be much lower. The Government price of $6 per ton on coke is regarded by coke producers as very liberal, but it is recognized that a spread of $4 per ton between prices on coal and coke is too great and the chances are that within a very short time, the Government will revise its price of $2 per ton on bituminous coal named some time ago, and place it probably on a $2.75 or $3 basis. The producing and consuming steel interests are now digesting the new Government prices, and it may be a few days before business starts off at the new price. However, there have been transactions in Bessemer and basic at the $33 price for basic and $36.30 for Bessemer, and several producers of foundry iron announces they are ready to sell regular customers at the $33 price. There is no change to note this week on billets and sheet bars, but these are likely to be lower in the near future. In regard to coke, three or four of

the leading producers have already accepted the $6 price named by the Government and are now quoting $6 per net ton at oven for prompt and contract furnace and foundry coke. Two leading coke producers, whose coke has a very high reputation in the trade, and who have contracts with several leading consumers of blast furnace coke, the price to be fixed from day to day, are billing their coke from Monday, Sept. 24, at $6 per net ton at oven. These same coke producers now have large contracts on their books for first half of next year and over all of next year, at $8.50 and $9 per net ton at oven, and these contracts will not be disturbed in any way by the price fixed by the Government, as they were made at a flat price.

Pig Iron.—The $33 price on basic and No. 2 foundry iron is already in effect so far as Valley producers are concerned. Two of the largest makers of basic iron in the Valley are now quoting $33 at furnace, and say they will not charge one cent less or one cent more than that price. A tentative differential of $3.30 per ton in favor of Bessemer iron was made over basic, which puts the price of Bessemer iron at $36.30, Valley furnace. By carefully going over records it was found that for nine years ending 1916 the average differential in favor of Bessemer iron over basic was 10 per cent. It was also found that the average price of basic iron this year up to this time was $40.40 at Valley furnace, while the average price of Bessemer iron was $44.35 for the same period, or about 10 per cent. It was therefore decided to make a tentative differential of 10 per cent in favor of Bessemer iron over basic, this being subject to revision later when a pig iron committee to be appointed has worked out the differentials, and this puts the tentative price of Bessemer iron at $36.30 Valley furnace. A local interest has sold 5000 tons of Bessemer iron to a Youngstown consumer at $36.30 Valley furnace for October delivery. It is expected that other sales will go through this week on the basis of $33 for basic and $36.30 for Bessemer. Up to this writing no sales of foundry iron are reported at the Government price of $33, but several large producers have indicated that they have adopted the price, and will take contracts for No. 2 foundry iron at $33 when they are offered. Nothing has been done as yet in fixing differentials on malleable Bessemer iron, gray forge and low phosphorus iron, but these will be worked out by the committee that will have in charge the matter of fixing the differentials. We therefore omit this week quoting prices on malleable Bessemer and forge, the nominal price of forge being practically the same as basic but not yet announced. We now quote standard Bessemer iron at $36.30; basic, $33; No. 2 foundry, $33, all at Valley furnace, the freight rate for delivery in the Cleveland or Pittsburgh districts being 95c. per ton.

Billets and Sheet Bars.—Before the Government announced its prices on steel there were some negotiations on for soft open-hearth billets and sheet bars on the basis of about $65 for billets and $75 to $80 for sheet bars. However, when the Government prices came out these negotiations were quickly called off, and now consumers are waiting until the steel trade adjusts itself to the lower price named, believing they will be able to buy billets and sheet bars at much lower prices in the very near future. No sales have been made in the past week, but there would be no trouble to-day in securing soft Bessemer and open-hearth billets at $60 or less and soft Bessemer or open-hearth sheet bars at $70 or less, maker's mill, Pittsburgh. We therefore quote soft Bessemer and open-hearth billets at $60 and soft Bessemer and open-hearth sheet bars at $70, f.o.b. mill Pittsburgh. However, these are purely nominal prices, with absolutely nothing being done in the way of sales. Prices on forging billets are also nominal at $90 or less, Pittsburgh. Recently there was a sale made of about 4000 tons of open-hearth billets for shipment to Italy on the basis of $60, Pittsburgh. The sale is said to have been made by a New York exporting house.

Ferroalloys.—In the face of the puzzling conditions existing in the steel trade since the Government fixed its prices, the inquiry for all grades of ferroalloys has practically ceased and any consumers that may be in need of material are inclined to wait until the market has settled down and more is known as to what prices are likely to rule on the different grades. In the absence of any sales since last week we make nominal quotations of $400 per ton on 80 per cent domestic ferromanganese for prompt delivery, but no doubt a lower price would be made in a firm inquiry. For first half of 1918 delivery the price is $350 per gross ton at furnace. We quote 18 to 22 per cent spiegeleisen at $80 to $82.50 per gross ton, delivered.

We quote 9 per cent Bessemer ferrosilicon at $89, 10 per cent $90, 11 per cent $95, 12 per cent $100, 13 per cent, $105, 14 per cent $115, 15 per cent $125, and 16 per cent $135. We now quote 7 per cent silvery iron at $79 to $84, 8 per cent $80 to $85, 9 per cent $81 to $86, 10 per cent $82 to $87, 11 and 12 per cent $83 to $88. All f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having a uniform freight rate of $2 per gross ton for delivery in the Pittsburgh district.

Steel Rails.—There is no new buying of light sections of standard rails, and none is expected until the market has adjusted itself to the new position created by the announcement of the Government prices on steel. Nominal prices on light rails and regular prices on standard sections are given on page 771.

Structural Material.—The Government price of 3c. fixed on shapes and angles is regarded by the producers here as eminently satisfactory and will allow a good margin of profit. The trade seems also satisfied with the new price, but admits that the chances of getting material from the mills are more hopeless than before from the fact that Government orders and also orders for the Allies will continue to have priority, and any material left after these demands are satisfied will be available for domestic consumers. The McClintic-Marshall Co. has taken 15,000 tons of fabricated steel for Philadelphia subway sections and also for 100 bridges, each 43½ ft. long, for the Belgian Government. It is said that Government orders booked by the Blaw-Knox Co. of Pittsburgh, which were first given as 11,000 tons, are very much larger than this quantity. We do not hear of any sales as yet at the Government price of 3c. so far this week. So we adhere to our former prices. These are given in detail on page 771.

Plates.—The Government price of 3.25c. on sheared plates is regarded by the plate mills as being fairly liberal, and consumers also take the same view of it. It is a fact that the Carnegie Steel Co. and the Jones & Laughlin Steel Co. have been for months furnishing very large quantities of plates to the Government at the price of 2.90c. fixed some months ago. The Carnegie Steel Co. is turning out at present about 60,000 tons of sheared plates per month and fully 90 per cent of this output is going to the Government. The output of plates by the Carnegie company would be larger were it not for the fact that it is short of steel ingots. Plate mills are filled up for several months ahead, and it may be some little time before they accept orders at the new price of 3.25c., at mill. So far, we have not heard of any business placed at this figure and until this is done we must naturally repeat prices in effect before the Government fixed the 3.25c. price. We therefore quote sheared plates, ¼ in. and heavier at 8c. to 9c. for delivery over the remainder of this year, but it is not likely any more new business will be done at these figures. On the other hand, any new orders placed must be at the fixed price of 3.25c., at mill.

Sheets.—The Government did not fix any new prices on sheets, but a readjustment of the whole sheet market to a lower basis is likely within a very short time. Consumers are certain to hold off buying as long as they can and while the sheet mills have free lance in quoting any prices they choose, there is not likely to be very much business done on the basis of prices in effect recently. It is quite likely that in the future, prices on sheets will be regulated entirely by the old recognized law of supply and demand. We repeat former prices on sheets, which are purely nominal as follows: Numbers 3 to 8 blue annealed sheets 8c. to 8.50c.; No. 28 Bessemer black 8.50c. to 9c.; and No. 28 galvanized 9.50c. to 10c., f.o.b. Pittsburgh, in carloads and larger lots. Prices on smaller lots from warehouse carry the usual advances. Nominal prices on sheets are given in detail on page 771.

Tin Plate.—It is expected that early in October the tin plate manufacturers will announce prices on tin

plate for delivery in first half of 1918, and possibly for delivery over all of next year. Before this is done, however, there will be conferences at Washington, as the tinplate manufacturers are working closely with Food Administrator Hoover and will be guided largely by his suggestion as to the price to be fixed. If the tin plate makers can assure themselves of a supply of sheet bars over all of next year, they may agree to name a price on tin plate for delivery for the same period, but this will depend entirely on a satisfactory price and delivery being secured on sheet bars. New inquiry is light and on small lots for prompt shipment, primes are bringing $12 to $14 per base box, Pittsburgh. Prices on terne plate are given on page 771.

Hoops and Bands.—Only small lots for prompt shipment are being sold, consumers being covered over the remainder of this year and some through the first quarter of next year, but specifications are not very active. Lower prices on hoops and bands are likely in the near future. We quote steel hoops in small lots for prompt shipment at about 5c., and steel bands at about 5c. to 5.25c., extras on the latter as per the steel bar card.

Wire Rods.—The domestic demand is active and export inquiry is also heavy. Several fairly large lots of soft open-hearth rods have been sold lately for shipment to Canada on the basis of $85 to $90 at a mill. Two leading makers say their excess output of wire rods is about sold up and they have very few to sell over the remainder of this year. A sale of 400 tons of high-carbon rods made from special quality acid open hearth steel, is reported at $115 maker's mill. Prices on rods are given in detail on page 771.

Wire Products.—The new demand for wire and wire nails is dull and specifications are quiet. The export demand for wire nails is active, and recently there have been sales that netted the mills $4.50 and up to $4.75 at mill. Thus far, the independent mills show no inclination to lower their prices on wire nails and wire to put them in line with prices of the leading interest. Prices on nails and wire being quoted by the independent mills, the American Steel & Wire Co. price being $16 per ton lower, are given on page 771.

Iron and Steel Bars.—The Government has fixed the price of steel bars at 3c. at mill, but whether this also applies on iron bars has not been determined. It will take some little time for the bar trade to adjust itself to the new price, and in the meantime sales are not likely to be very active, but on any new business in steel bars the mills are bound to quote the Government price of 3c. at mill. What price the mills that roll iron bars will establish on their product has not been given out, but probably will be within a few days. We do not hear any sales as yet at the new price of 3c. on steel bars. so that mill prices in carloads and larger lots on iron and steel bars as given on page 771 are purely nominal and would not be paid on new orders.

Shafting.—This is one item of finished steel that has not been affected as yet by the Government prices on steel, and whether it will be later remains to be seen. The consumers will likely hold off placing new orders until the market has settled down to the new basis of prices given out by the Government. It is not unlikely that prices on shafting may show some decline. For the domestic trade discounts on shafting remain at 10 and 5 per cent off list, sales to the Government being made at much lower figures.

Railroad Spikes and Track Bolts.—Very few new orders are being received for spikes or track bolts. and the market will likely remain quiet until readjustment in prices has taken place. It is not believed that prices of railroad spikes will be maintained on the present basis, and this is also true of track bolts. Nominal prices on railroad spikes and track bolts are given in detail on page 771.

Nuts and Bolts.—The domestic demand for nuts and bolts is dull, but the Government is a heavy buyer, having lately distributed among the makers what is said to be the largest single order for bolts ever given out. Consumers expect lower prices on nuts and bolts in the near future. Discounts in effect are given on page 771.

Cold Rolled Strip Steel.—Consumers are holding off buying, and the new demand is dull and specifications against contracts are not very active. The Government is a fairly heavy buyer of cold rolled strip steel at prices somewhat lower than are quoted to domestic users.

On contracts, mills are quoting 9c. at mill, but on small current orders prices range from 10c. up to 12c. at mill. Terms at 30 days, less 2 per cent off for cash in 10 days when sold in quantities of 300 lb. or more.

Rivets.—New buying is dull and consumers are likely to hold off still more in placing orders, believing that prices will be lower. Prices in effect on rivets are $5.25 for structural and $5.35 for cone-head boiler per 100 lbs. f.o.b. Pittsburgh for delivery over remainder of this year.

Wrought Pipe.—What effect the Government prices on steel will have on the iron and steel pipe market remains to be seen, but it is very probable that a readjustment in prices on all kinds of iron and steel pipe to a lower basis will follow. The new demand is not active, and jobbers are working off their stocks as fast as possible in the belief that the market will be lower in the near future. The Government is still a heavy buyer of steel pipe, its orders being distributed among the different mills based on their capacity, and also on whether they are self-contained. Discounts on iron and steel pipe are quoted by the independent mills, but which are now nominal to some extent. Prices of the National Tube Co., being considerably lower, are given on page 771.

Boiler Tubes.—The situation in this material is unchanged. Mills rolling iron and steel tubes are sold up for a year or more, and heavy premiums are being paid for tubes for fairly prompt shipment. There are no regular prices on either iron or steel tubes, these continuing to depend entirely on the quantity wanted, sizes and delivery. Nominal discounts, but which are very much below actual prices ruling, are given on page 771.

Coke—The fixing of the price by the Government on furnace coke of $6 per ton is generally regarded by the coke trade here as a fair price, and one that will leave to the coke producers a very good profit. In fact, the price of $6 was $1 to $2 per ton higher than was generally expected by the coke trade would be fixed. The fact that run-of-mine coal is $2 per ton at oven, and coke $6, leaves too great a differential, and as the Government fixed both prices, it is regarded as very probable that within a very short time the fuel administrator will anounce a new and higher price on coal, possibly $3 per net ton at mine. For the past several weeks, coke producers have been getting under cover and contracting for as much of their output of coke as they could. Some contracts are for six months' delivery from Jan. 1 and others for a whole year from that date. These contracts were made in various ways, some on the basis of 5 to 1, and others 4½ to 1, basic iron being used as the basis, or, in other words five tons of coke for the price of a ton of basic iron, and 4½ tons for the price of a ton of basic iron after the latter reaches a certain figure. There were also large contracts for furnace coke made at $8 and $8.50 flat for the entire year, and in several cases, $9 was paid for high grade furnace coke. One contract was for 10,000 tons per month at that price for six months from Jan. 1, and another was for 20,000 tons per month over all of 1918. A leading Youngstown, Ohio, coke consumer is said to have closed for about 25,000 tons per month for the first six months of 1918 at $6 per net ton at oven. Why this contract was made at a price so much lower than other consumers of coke paid has not been explained, but it is insisted that the contract was made, and at the price of $6 per net ton at oven. The concern in question is building some by-product coke ovens that will be ready about the middle of 1918, and when these are finished, it will be self-contained in coke and able to make all the coke it needs for its blast furnaces. The Government price of $6 per ton on coke does not affect contracts in any way, and the concerns that have covered on their coke at $8 and $9 per net ton at oven,

will no doubt be perfectly willing to pay this excess in order to get their coke. Producers will see to it that contracts at these prices are filled promptly as far as possible, and any concerns to which they sell coke at $6 per ton, will likely get what is left after the high priced contracts have been filled. We now quote the Government price of $6 per net ton at oven on all grades of blast furnace and foundry coke for spot shipment and on contract. Several leading coke companies have signified their intention of selling furnace and foundry coke at the $6 price when they can do so.

Old Material—The Government has not fixed any prices on scrap nor was it expected that it would. Scrap is a material that is peculiar to itself, in the fact that it is a product sold through dealers, and it is recognized that prices ruling are the prices that must be determined entirely by the law of supply and demand. It is believed there will be a shortage in the supply of pig iron, and steel melters will have to use more scrap in order to keep up their output. If the demand for scrap is active, higher prices are bound to rule. It was not regarded as feasible for the Government to fix prices on scrap, as there are too many different kinds and too wide differentials existing between the different grades. In fact, some grades of scrap sell for about one-third what other grades bring, and a flat price on all kinds of scrap was utterly impossible. In the meantime, nothing is being done in the scrap trade in the way of sales, and it will probably be several weeks, or longer, before there is any active movement. Prices are purely nominal in the absence of sales, but are reported as being firm. Scrap used for steel melting purposes is scarce, and a large purchase would probably very quickly have the effect of putting up the market. Under present conditions, we can only repeat former nominal prices as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$33.00 to $34.00
No. 1 foundry cast	30.00 to 31.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	38.00 to 40.00
Hydraulic compressed sheet scrap	25.00 to 26.00
Bundled sheet scrap, sides and ends, f.o.b. consumers' mill, Pittsburgh district	23.00 to 24.00
Bundled sheet stamping scrap	21.00 to 22.00
No. 1 railroad malleable stock	26.00 to 27.00
Railroad grate bars	18.00 to 19.00
Low phosphorus melting stock	42.00 to 45.00
Iron car axles	45.00 to 46.00
Steel car axles	45.00 to 46.00
Locomotive axles, steel	52.00 to 53.00
No. 1 busheling scrap	24.00 to 25.00
Machine-shop turnings	21.00 to 22.00
Cast iron wheels	31.00 to 32.00
Rolled steel wheels	36.00 to 37.00
*Sheet bar crop ends	41.00 to 42.00
Cast iron borings	22.00 to 23.00
No. 1 railroad wrought scrap	32.00 to 33.00
Heavy steel axle turnings	23.00 to 24.00
Heavy breakable cast scrap	24.00 to 25.00

*Shipping point.

Chicago

CHICAGO, Sept. 24.

On the eve of a great readjustment in prices, unquestionably far-reaching and of the greatest importance, the trade is at sea. The first information that came over the wires was meagre and unsatisfying inasmuch as it was not made clear whether the new prices for pig iron, plates, shapes and bars were to be extended to the general public, and in the absence of this important detail mill executives and sales managers said they had no changes to announce in their prices. As for selling, they could not if they would, for the public was not buying, and will not until the atmosphere has cleared. Innumerable questions have been asked and many suppositions advanced, mostly having to do with the fulfilment of contracts and the questions of freight rates, the new order apparently giving the Western mills all the best of it in this territory. The representatives of the Southern furnaces are wondering how they are going to fare if an arbitrary price for iron at furnace is fixed. It costs them approximately $4 to get iron to this market, whereas Northern furnaces can deliver in Chicago for 50c. per ton. Buyers of old material have withdrawn from the market. Scrap has declined quite generally and a further tumble is predicted.

Pig Iron.—The market as it existed up to to-day can be summed up quickly by saying that there has been no business worthy of the name, with none expected until the Government price is digested. Now that the price has been announced, there will be no business until both sellers and buyers find themselves. Up to the moment of writing, essential details of the Government's move are lacking, and the trade is asking questions right and left. It will be some days, in the general belief, before conditions will have settled. The price announced—$33—is presumably for No. 2 foundry, and, what about low phosphorus, charcoal, the silveries and other choice grades? is asked. The great majority of consumers—knowing that something was coming—have been waiting. Sales have been insignificant, and practically confined to resale iron. The representatives of furnaces insist that their quotations were not lowered. In one quarter, it is admitted that resale Southern No. 2 has been let go at $48, furnace, as compared with the $50 as quoted by the producer. Another report is that resale Southern has sold as low as $41, Birmingham. A week ago, Northern iron was offered by a producer at $54, furnace, a consumer refusing to take it at that level. Under prevailing conditions, only conjecture can be written. The quotations given below are nominal and apply to what has been quoted in the past week as published in last week's IRON AGE. What will prevail from to-day on remains to be seen. The quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 1 to 4	$58.00
Lake Superior charcoal, Nos. 5 and 6, Scotch and No. 1 soft or special	60.50
Northern coke foundry, No. 1	54.50
Northern coke foundry No. 2	54.00
Northern coke foundry No. 3	53.50
Northern high-phosphorus foundry	54.00
Southern coke No. 1 f'dry and 1 soft	55.00
Southern coke No. 2 f'dry and 2 soft	$52.00 to 54.00
Malleable Bessemer	54.00
Basic	54.00
Low-phosphorus	$85.00 to 90.00
Silvery, 8 per cent	77.50 to 82.50

Ferroalloys.—At noon to-day 80 per cent ferromanganese was quoted at $375 for the last half and $350 for the first half.

Plates.—The leading independent mill has continued to quote 8c., Pittsburgh, or 8.189c., Chicago, and had made no change late this afternoon following receipt of the Government's figure of 3.25c., Pittsburgh or Chicago. One Government inquiry of the week called for 15,000 tons, immediate delivery, the inquiry coming from the War Industries Board. An Ohio mill has been out of the market on plates 72 in. and wider, except where it could buy slabs and billets from other mills wherewith to make them. For narrow plates it has quoted 8.189c., Chicago. The market has been dull, consumers waiting for governmental action.

For Chicago delivery out of stock jobbers quote 10c.

Structural Material.—A few small building propositions have been let as follows:

Avery Co., 12 panel roof truss, Peoria, Ill., 189 tons, to Christopher & Simpson Co.

United States Government, storehouse at St. Julien's Creek, Va., 105 tons, to Kellogg Structural Steel Co., Buffalo.

Ohio & Colorado Smelting & Refining Co., structural steel for wedge flue system, Salida, Col., 139 tons, to unknown.

Linde Air Products Co., plant at Denver, Col., 106 tons, to Union Foundry Co., Chicago.

Ray & Gila Valley Railroad, Mineral Creek bridge near Ray, Ariz., 156 tons, to American Bridge Co.

A theater at State and Lake Streets, this city, for which the plans are out, calls for 1000 tons of standard and 1500 tons of Bethlehem shapes, and it may be that this project presages some noteworthy activity in building. Sellers have been a unit in quoting 4.689c., Chicago, and up to late this afternoon had not officially changed their quotations, although conversant with the Government price of 3c., Pittsburgh or Chicago. They

were waiting to be informed officially of the new price, also were asking if it were to be extended to the general public.

For material out of stock jobbers quote 5c.

Sheets.—The market became easier in the week, No. 28 galvanized being quoted at 9.689c. to 10.189c., Chicago, and No. 28 black and No. 10 blue annealed at 8.189c. to 9.189c., Chicago. The principal local producer, however, has quoted 8.689c. to 8.939c., Chicago, for both grades. Business has admittedly been dull.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 10c.; No. 28 black, 10c., and No. 28 galvanized, 11.50c.

Bars.—Though iron bars and rail carbon steel bars are not specified in the meager news at hand to-day, the makers are wondering how their products will be affected. Meanwhile they quote 4.50c., Chicago, for iron bars, and 4.25c. to 4.50c., Chicago, for rail carbon. A good aggregate of small inquiries has been received in the week, one Eastern mill turning down orders for mild steel bars, the quotation for which has been 4.50c., Pittsburgh, or 4.689c., Chicago. The Government price is 2.90c., Pittsburgh or Chicago.

We quote prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c. to 5c.; reinforcing bars, 4.50c. base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Old Material.—The impending announcement of prices as fixed by the Government caused the market to become very soft. Dealers assert it to be in bad shape, some predicting that the week will bring a wholesale and radical decline in prices. Consumers appear to be of the same opinion for they withdrew from the market on Saturday. Prior to the announcement of the Government's price on pig iron and various steel products, a decline was shown in almost every item on the list. The railroad offerings were light, moderate-sized lists being issued by the C., B. & Q., the St. Paul, the C. & Gt. W. and the Rock Island Lines. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$40.00 to $42.00
Relaying rails	50.00 to 55.00
Old carwheels	30.00 to 31.00
Old steel rails, rerolling	38.00 to 39.00
Old steel rails, less than 3 ft	34.00 to 35.00
Heavy melting steel scrap	30.00 to 31.00
Frogs, switches and guards, cut apart	30.00 to 31.00
Shoveling steel	29.00 to 30.00
Steel axle turnings	20.00 to 21.00

Pet Net Ton

Iron angles and splice bars	$38.00 to $39.00
Iron arch bars and transoms	40.00 to 41.00
Steel angle bars	27.00 to 28.00
Iron car axles	42.00 to 43.00
Steel car axles	41.00 to 42.00
No. 1 railroad wrought	34.00 to 35.00
No. 2 railroad wrought	30.00 to 31.00
Cut forge	30.00 to 31.00
Pipes and flues	20.00 to 21.00
No. 1 busheling	23.00 to 24.00
No. 2 busheling	17.00 to 17.50
Steel knuckles and couplers	35.00 to 36.00
Steel springs	40.00 to 41.00
No. 1 boilers, cut to sheets and rings	18.00 to 19.00
Boiler punchings	32.00 to 33.00
Locomotive tires, smooth	36.50 to 37.50
Machine-shop turnings	16.00 to 17.00
Cast borings	16.00 to 17.00
No. 1 cast scrap	23.00 to 24.00
Stove plate and light cast scrap	18.00 to 18.50
Grate bars	16.50 to 17.50
Brake shoes	17.00 to 18.00
Railroad malleable	29.00 to 30.00
Agricultural malleable	25.00 to 26.00
Country mixed scrap	17.00 to 18.00

Wire Products.—Makers are wondering if they are on the eve of a change; meanwhile the leading interest continues to quote on the basis of 3.20c. for nails, with the independents at 4c. On the latter basis we quote per 100 lb. to jobbers:

Plain fence wire, Nos. 6 to 9, base, $4.189; wire nails, $4.189; painted barb wire, $4.339; galvanized barb wire, $5.039; polished staples, $4.339; galvanized staples, $5.039; all Chicago, carload lots.

Rails and Track Supplies.—Under the circumstances the market is nominal. We quote:

Standard railroad spikes, 4.50c. to 5.25c., base; small spikes, 4.75c. to 5.50c. base; track bolts with square nuts, 5.50c. to 6c., all in carloads, Chicago; tie plates, $70 to $90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base (nominal); open hearth, $40 (nominal); light rails, 25 to 45 lb., $70; 16 to 20 lb., $71; 12 lb., $72; 8 lb., $73; angle bars, 3.25c., base.

Bolts and Nuts.—The makers have yet to determine what effect the Government's prices will have upon their product. For prices and freight rates, as yet unchanged, see finished iron and steel, f.o.b. Pittsburgh, page 771.

Store prices are as follows: Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to ⅞ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to ⅞ x 6 in., 40-2½; larger sizes, 30-5; hot pressed nuts, square, $2.50, and hexagon $2.50 off per 100 lb.; lag screws, 50 per cent off.

Cast-Iron Pipe.—Lower prices for pig iron will be welcomed by the makers of cast-iron pipe inasmuch as their high level has brought the market to a standstill. St. Louis has taken bids on 1000 tons, but has not placed the business. No change has been made in the prices which follow:

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., $68.50; 6 in. and larger, $65.50, with $1 extra for class A water pipe and gas pipe.

Cleveland

CLEVELAND, Sept. 25.

The pig iron and steel market is completely unsettled as a result of the announcement of the new prices named by the Government. Sellers will not quote prices until the situation is cleared up and nobody wants to buy. Producers and selling agencies have received no information regarding the price adjustments further than the brief announcement of the new prices, and it is expected that it will be several days before sellers will get their bearings and know what prices to quote, and until buyers come into the market. Nominal quotations on various steel products will not be changed until it is definitely known what the new prices will be. It is the general opinion of the trade that high priced pig iron contracts will stand, but that unless there is a readjustment of steel prices, there will be a wholesale cancellation of prices on steel products.

Iron Ore.—Under the Government price regulations, ore prices have been fixed for 1918 at this year's basis. There is feeling among some ore men that these prices are not high enough and that the prices should not be established until costs are more definitely determined. When ore prices for this season were named last November, basic pig iron was selling at $25.50, and foundry iron at $26 to $27 in the Valley, but the market was very strong at the time and both grades advanced to $30 the following week. The present prices were reestablished with the idea that the ore-carrying charge next season will be $1.10 free delivered from the ports at the head of Lake Superior or the same as the bulk of the season chartering for 1917, although the wild rate has been $1.50 for several months. It is understood, however, that if there should be a reduction in the ore-carrying rate, a corresponding reduction will be made in the price of ore, so that the consumer rather than the shipper would be benefited. It is possible that the carrying charges for ore will be established by the Interstate Commerce Commission. We quote prices delivered at lower Lake ports for 1917-1918 as follows: Old range Bessemer, $5.95; Mesaba Bessemer, $5.70; old range non-Bessemer, $5.20; Mesaba non-Bessemer, $5.05.

Pig Iron.—While pig-iron producers generally regard the $33 price fixed by the Government for foundry and basic pig iron as fair, some furnace men feel that the Government should have established prices only for iron for its own uses and that prices to the general consumers should have been allowed to readjust themselves. One Cleveland producer expressed the opinion that the Government should have cancelled all contracts and that all shipments should be made hereafter at the new prices. It is pointed out that producers generally are well filled up on old high-priced orders and that consumers will be unable to buy at the new prices until the old orders are filled. There is

little iron left for this year's delivery. Hence the new prices will have little effect before next year. Many foundries have purchased no iron for the first half of next year and will have a decided advantage over competitors who have purchased iron at $50 and higher. While many of the foundries that have bought iron for the first half have taken contracts for castings based on high priced pig iron, it is claimed that these foundries will have trouble in getting buyers of castings to specify for castings under the high priced contracts. Pig-iron producers declare that present contracts will not be readjusted at the new price basis. At present, some producers are shipping $19 and $20 iron on first half contracts still unfilled, and have $25 iron on their books for the last half. It will be necessary for them to supply the iron on these contracts and they claim that it will be entirely unfair to readjust high priced contracts on the $33 basis. It is stated that the average price of last quarter iron shipments will be from $28 to $29, or considerably under the new price. Local selling agencies have no information on readjustment of Southern, silvery and low phosphorus iron. The market has been quiet during the past week as well as being limited to a few small lots of foundry iron at $52, Valley furnace, for shipment to Cleveland consumers. Two inquiries for basic iron from a Southern steel territory are pending aggregating about 10,000 to 15,000 tons for early shipment. We quote nominal prices, delivered Cleveland, as follows, pending readjustment of prices on the new basis:

Bessemer	$50.95 to $52.95
Basic	42.30
Northern No. 2 foundry	52.75 to 52.90
Southern No. 2 foundry, nominal	49.00 to 54.00
Ohio silvery, 8 per cent silicon, nominal	81.62
Standard low phos. Valley furnace, nominal	80.00

Finished Iron and Steel.—There is a decided lack of uniformity in the views expressed by the steel trade in regard to the Government's adjustment of prices. Some feel that the Government should have fixed prices only for steel for its own requirements and that had this policy been followed, there would have been a gradual readjustment of prices to the trade to a lower level without causing the startling market upheaval that has developed. Others say that the new prices are too low. Some express approval of the Government's action, believing that with lower prices there will be a decided revival in the demand for manufactures in certain lines in which business has been materially curtailed by the high price of steel. It may generally be said that buyers welcome the Government's readjustment of prices, although some who have large stocks or high-priced contracts may suffer. With the various conflicting views, the opinion appears to be almost unanimous that the Government regulation means that there must be an adjustment of old contracts or cancellations. Mills are already getting requests for adjustment of contracts with the threat of cancellation if they are not adjusted. Sellers, on the other hand, maintain that mills are sold up so far ahead that buyers will be unable to get shipments of low-priced steel for a long time and that it will be necessary for them to continue to take the high-priced material. The market is expected to be at a standstill for a few days until the situation clears up, but should mills be asked for quotations to-day, they would name either old prices or decline to quote. Independent mills having contracts for sheet bars and slabs at high prices are likely to suffer materially from the price readjustment. Some of these have contracts for high priced sheet bars and slabs and now face the danger of being required to convert these into finished products at greater reduced prices.

Coke.—While the Government has established $6 as a price for standard Connellsville furnace coke, no price has been named for foundry coke, but it is expected that there will be the usual differential. A heavy volume of business in furnace coke contracts for the last half has been booked during the past few days at $8 to $8.50. In foundry coke sales of standard Connellsville makes are reported at $12.50 for prompt shipment, and $10 for the first half. It is claimed that available supply of coke has been so well cleaned up that consumers will have difficulty in securing coke at the reduced prices.

Bolts, Nuts and Rivets.—Bolt, nut and rivet makers do not look for an early reduction in the price of their products because of the new steel prices. They have high priced contracts for their raw material and say that should they go in the market to-day and attempt to buy steel bars at the new price, they would be unable to do so. At present they are having great difficulty in getting deliveries on high priced steel contracts. We quote rivets at 5.25c., Pittsburgh, for structural, and 5.35c. for boiler rivets. Bolt and nut discounts are as follows, round lot buyers being allowed 5 to 10 per cent discount from these prices:

Common carriage bolts, ¾ x 6 in., smaller or shorter, rolled thread, 35 off; cut thread, 30 and 5, larger or longer, 20. Machine bolts, with h. p. nuts, ⅝ x 4 in., smaller or shorter, rolled thread, 40; cut thread 35; larger and longer, 25. Lag bolts, cone point, 40. Square h. p. nuts, blank, $1.90 off list; tapped, $1.70 off list. Hexagon, h. p. nuts, blank, $1.70 off; tapped, $1.50 off. C. p. c. and t. hexagon nuts, all sizes, blank, $1.25 off; tapped, $1 off. Cold pressed semi-finished hexagon nuts, 50 and 5 off.

Old Material.—The market is at a standstill as a result of the adjustment of pig iron and steel prices by the Government on a lower basis. It is generally conceded that prices of all grades of scrap will be reestablished at a sharp decline from recent quotations, but there is considerable difference of opinion as to how much lower the prices will be. At present, no prices are being named, either by producers, dealers or consumers, and it will probably be two or three days or longer before the market adjusts itself to the new conditions. As soon as word reached dealers relating to the fixing of prices, they withdrew price offers for material for which negotiations had not been closed. The market was quiet during the week and prices unchanged, with the exception of heavy melting steel, which was marked down about $1 a ton. Pending establishment of new prices, we quote former prices, f.o.b. Cleveland, which are now merely nominal:

Per Gross Ton

Steel rails	$32.00 to $33.00
Steel rails, rerolling	44.50 to 45.50
Steel rails, under 3 ft	35.00 to 36.00
Iron rails	42.50 to 43.50
Steel car axles	50.00 to 51.00
Heavy melting steel	32.00 to 33.00
Carwheels	30.50 to 31.50
Relaying rails, 50 lb. and over	50.00 to 60.00
Agricultural malleable	24.50 to 25.00
Railroad malleable	32.00 to 33.00
Light bundled sheet scrap	24.00 to 25.00

Per Net Ton

Iron car axles	$46.50 to $47.00
Cast borings	18.50 to 19.00
Iron and steel turnings and drillings	18.00 to 18.50
No. 1 busheling	27.00 to 28.00
No. 1 railroad wrought	41.50 to 42.00
No. 1 cast	27.00 to 28.00
Railroad grate bars	22.00 to 23.00
Stove plate	21.00 to 22.00

The Stalnaker Steel Co., recently organized to engage in the scrap iron business, has elected H. D. Stalnaker president, H. G. Stalnaker, vice-president, and F. S. Easterly, secretary. The company is capitalized at $250,000 and has its main office at 1126 Permanent Bank Building, Pittsburgh, and a Cleveland office at 1112 Citizens Building. H. D. Stalnaker is in charge of the Pittsburgh office and H. G. Stalnaker has charge of the Cleveland office. The Stalnaker brothers formerly represented The Ohio Iron & Metal Co., Chicago, in the Pittsburgh and Cleveland territories. This company will retire from business as soon as its present orders are cleaned up.

The new plant of the Pottstown Steel Products Co., Pottstown, Pa., will be devoted to the production of stacks, tanks and similar products. It is expected to place the works, now in course of erection, in operation by the first of November.

Cincinnati

CINCINNATI, Sept. 25.—(*By Wire.*)

Pig Iron—Information as to the Government's move for setting the price of pig iron, steel and coke came so suddenly that local firms are unable to formulate any course to take care of the future. Contracts will be filled and it is interesting to note that some iron is now being shipped on orders far enough back to command a price of $24 Birmingham. Late advices from a reliable source develop the fact that the agreement made at Washington yesterday is only binding on those who made it and on others who are willing to accept the new prices. Existing contracts are in no way affected, unless by special agreement between buyer and seller. This late information has acted as a quieting influence, but has done nothing to bring out any trading. Melters of foundry iron are turning to scrap for relief, and lately have bought only a limited tonnage of high silicon pig iron to complete their mixtures. There is no movement on the part of foundrymen, who have lately bought iron to carry them over the next four months, to cancel their orders. The production of iron is steadily declining and consumers appear to be satisfied with their old contracts, especially when they are assured of getting the metal on schedule time. Just now furnace operators are paying more attention to obtaining a supply of coke than to selling pig iron for future shipment. Sales last week included 500 tons of Southern iron to an Indiana melter and 600 tons to a Northern Ohio consumer, both for this year's shipment. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, nominal prices, as follows:

Southern coke, No. 1 f'dry and 1 soft.	$51.40 to $52.40
Southern coke, No. 2 f'dry and 2 soft.	49.90 to 50.90
Southern coke, No. 3 foundry	49.40 to 50.40
Southern coke, No. 4 foundry	48.90 to 49.90
Southern gray forge	48.90 to 49.90
Ohio silvery, 8 per cent silicon	87.26 to 91.26
Southern Ohio coke, No. 1	54.76 to 55.76
Southern Ohio coke, No. 2	54.26 to 55.26
Southern Ohio coke, No. 3	53.76 to 54.76
Southern Ohio malleable Bessemer	54.26 to 55.26
Basic, Northern	54.26 to 55.26
Standard Southern charcoal	56.90 to 57.90

Finished Material.—The local jobbers are selling nails at $3.90 per keg base, which is 10c. per 100 lb. below the independent mill prices at Pittsburgh. Little business is reported and it is only occasionally that an order is received for a full carload. Barb wire from stock is unchanged at 5c. a lb. The volume of business reported by the local warehouses for structural material has held up very well, although no large orders are being placed for either structural shapes or reinforcing concrete rods. We quote store prices as follows: Iron and steel bars, 5c.; twisted steel bars 5.05c.; plates ¼-in. and heavier, 10c. and No. 10 blue annealed sheets 10c. The price of No. 28 black sheets remains at 8.65c. and No. 10 galvanized 10.65c.

Old Material.—Prices are gradually sagging and a reduction is reported that averages about 50c. a ton on nearly all of the low grades of scrap. The demand from the mills is slack, while offerings are reported this week to be above the average. Borings and turnings are holding their own fairly well, but transactions here are limited to less than car load quantities, thereby causing lower prices to be quoted in this market than in the Pittsburgh district where carload tonnages are under negotiation.

The following are dealers' prices, f.o.b. cars southern Ohio and Cincinnati:

Per Gross Ton	
Bundled sheet scrap	$19.00 to $19.50
Old iron rails	33.50 to 34.00
Relaying rails, 50 lb and up	45.50 to 46.00
Rerolling steel rails	35.50 to 36.00
Heavy melting steel scrap	29.50 to 30.00
Steel rails for melting	29.50 to 30.00
Old carwheels	28.50 to 29.00
Per Net Ton	
No. 1 railroad wrought	$30.50 to $31.00
Cast borings	13.50 to 14.00
Steel turnings	13.50 to 14.00
Railroad cast	21.00 to 21.50
No. 1 machinery cast	24.50 to 25.00
Burnt scrap	14.50 to 15.00
Iron axles	43.50 to 44.00
Locomotive tires (smooth inside)	37.00 to 37.50
Pipes and flues	17.00 to 17.50
Malleable cast	22.50 to 23.00
Railroad tank and sheet	16.00 to 16.50

Coke.—Coke for prompt shipment was becoming scarcer before the Government price was announced and as a consequence spot prices were still around the high level reached about 30 days ago. Connellsville 72-hr. coke was bringing from $13 to $15 per net ton for prompt shipment and contract figures were from $13 to $14. The shortage of coke in the Wise County and Pocahontas fields is attributed to the large shipments of coal on old contracts. The scarcity of labor has induced many operators to pay particular attention in filling their customers' requirements for coal rather than working up this fuel into coke. The situation in the New River district is only a trifle better as far as shipments of coke are concerned than in the Wise County and Pocahontas fields.

Birmingham

BIRMINGHAM, ALA., Sept. 26.

(*By Wire*)

Alabama iron operators are preparing to put the Government's new pig iron prices into vogue. It will be several days before a definite schedule in detail is arrived at.

(*By Mail*)

Pig Iron.—Actual trading in furnace pig iron has been greatly reduced. Consumers are waiting on the Government and makers are pushed to deliver on contracts and are not seeking business. A middle western consumer was offered 1918 iron by two Birmingham furnace interests at $47.50. Another furnace interest turned down an offer of $46 for 1000 tons for 1918 delivery. A Texas consumer offered $50 for a car of spot iron. There was a resale of export iron left over at New Orleans at $46, the equivalent of $44.60 Birmingham. This iron is to go to Italy. The freight is 5c. per pound, which will make the iron cost delivered in Italy $175. The amount involved is 1300 tons. It is understood that about 15,000 tons of resale iron at ports passed hands at from $43 to $46. The amount still available is said to be rather small. One maker reports no inquiries in two weeks. Another maker has sold less than 2000 tons of iron in three months. It is an absolutely stagnant period and will be until Washington does something. Trussville furnace is ready for the torch, but unable to go into operation on account of lack of raw material, which was not forthcoming by the end of the week. Agents of Birmingham iron companies writing from the different sections in the north, east and middle west report the same lack of business as characterizes this district. The feature of the market is the depletion of Alabama yard stocks, which now aggregate less than 140,000 tons, of which 80,000 tons is foundry due to customers. Warrants have dwindled to about 20,000 tons. Altogether stocks may be considered as nil so far as the market is concerned. The reduction in stocks in August was 51,000 tons. At this rate the yards bid fair to be soon bare. Furnace interests are not yielding any point, because in their well sold-up condition they do not have to, but they are prepared to make considerable concessions as soon as the Government fixes a basis. Spot meanwhile brings $50 and 1918 iron around $47 to $48. We quote for prompt delivery per gross ton f.o.b. Birmingham district furnaces as follows:

No. 1 foundry and soft	$49.50 to $50.00
No. 2 foundry and soft	48.00 to 50.00
No. 3 foundry	47.50 to 48.00
No. 4 foundry	47.00 to 47.50
Gray forge	46.00 to 46.50
Charcoal	55.00 to 56.00
Basic	48.00 to 50.00

Cast-Iron Pipe.—There remains a dearth of municipal orders, but the plants of the Birmingham district are fairly busy on orders from the Government, which have been continuous for some time. There has been no change in prices. We quote per net ton f.o.b. Birmingham district yards, as follows: 4-in., $63; 6-in. and upwards, $60, with $1 added for gas pipe and special lengths.

Coal and Coke.—The coal miners have not shown a disposition to work more than four days per week, and many of them have not returned to work. The

output is much less than it ought to be, and in instances furnaces are banked a few days at a time for lack of fuel. Ore miners are also working irregularly. Mines are booked to capacity and find it difficult to make deliveries. Coke is selling at $12.50 on contracts and at $15 for spot with furnace coke bringing $8.

Steel Bars.—Steel bars in car lots, f.o.b. Birmingham, are quoted 4.75c. to 5.00c.; iron bars, 4.20c. to 4.40c.

Old Material.—The old material market is marking time with one or two items on the list a trifle softer this week and bringing $1 lower prices. We quote per gross ton, f.o.b. Birmingham district dealers' yards, as follows:

Old steel axles	$32.00 to $33.00
Old steel rails	24.00 to 25.00
No. 1 wrought	26.00 to 27.00
No. 1 heavy melting steel	20.00 to 21.00
No. 1 machinery	24.00 to 25.00
Car wheels	23.00 to 24.00
Tram car wheels	20.00 to 21.00
Stove plate	17.50 to 18.00
Shop turnings	11.00 to 12.00

Philadelphia

PHILADELPHIA, Sept. 25.

Following the announcement from Washington of Government control prices, business in iron and steel in this market came to a complete standstill. To-day everybody, buyer and seller alike, was "sitting tight" and waiting for more light on the new situation. Sales offices in many instances had received no instructions from furnaces and mills and in the absence of such instructions declined to make commitments. The only sale reported at a control price was a small lot of furnace coke at $6, ovens. News of the prices fixed by the Government was received with mingled satisfaction and criticism. Pig iron producers seem reconciled to the $33 price which applies to No. 2 X foundry and basic irons, with prices on other irons subject to corresponding regulation by a committee of the American Iron and Steel Institute. Two sales of basic iron, one of 5000 tons and one of 4500 tons were made last week by eastern Pennsylvania furnaces at a delivered price of $45. Prices fixed for plates, shapes and steel bars have created more or less dissatisfaction, especially among the smaller producers. Mills which roll plates, shapes or bars from semi-finished material, which they buy in the open market, claim they are seriously discriminated against and may be forced out of business. A local plate mill is reported to have recently contracted for slabs at $100 per ton and obviously cannot afford to roll plates to sell at 3.25c. That further regulation of prices will come to protect such small producers appears probable. An awkward situation has also been created for jobbers who have contracted ahead, and the impression prevails that some adjustment of this must also be made. The Government is expected to place large orders shortly for finished steel which will fill many mills to capacity for many months and render placing of private business extremely difficult. The coal and coke shortage continues a serious hindrance to capacity production at mills in this district.

Pig Iron.—Two important sales of basic iron marked the period just preceding the announcement of a Government control price. Eastern Pennsylvania furnaces sold 5000 and 4500 tons to two different mills at a delivered price of $45. Several other deals, involving smaller tonnages, were under way when news was received of the price-control agreement, and then all business was stopped pending receipt of selling instructions from furnaces. At the conferences in Washington, there was not time, it is said, to fix prices on all irons and the $33 maximum price applies to No. 2 X foundry and basic irons at furnace. This rate of price reduction will be applied to the other irons by a special committee of the American Iron and Steel Institute, due consideration to be given the usual trade differentials and extras. Discussion at Washington at first was based on $35 pig iron, which was the price asked by the furnaces. The Government held out for $30 and the $33 agreement was in the nature of a compromise. In the Washington conferences there seemed a unanimity of opinion that the spread between pig iron and ingots ought to approximate $7.50 per ton and that the spread between pig iron and billets ought to be $15 and between billets and plates an additional $15. Pig iron producers do not regard the new price unfavorably, providing they can obtain coke at $6, ovens. Existing contracts, which average about $35 to $36, will not be disturbed, either as to price or deliveries, but regular month-to-month customers will get their usual requirements, it is said, at the control price. For the present, at least, furnaces will not be disposed to consider new business, having sufficient tonnage on their books to keep going until well after the first of next year. In the absence of definite information as to what the prices will be on other than No. 2 X foundry and basic iron, we quote no market prices this week.

Coal and Coke.—Blast furnaces and steel mills in the eastern Pennsylvania district are still seriously hampered by shortage of coal and coke. Coal miners are being paid such high wages that they are satisfied to work three or four days a week, with consequent reduction in mine output. Shortage of cars adds to the demoralization, which threatens to force suspension of work at some furnaces and mills at almost any time. The $6 control price on blast furnace coke is reported to be satisfactory in every way, and the fact that it was fixed at this fairly generous figure is pointed to in some quarters as an indication that soft coal prices may soon be revised upward. It is held to be the intention of the Government, however, to maintain a sufficient differential between coal and coke to stimulate the capacity production of coke. A small tonnage of spot furnace coke was sold to-day at the control price of $6. Price fixing on foundry coke is still to be done, and probably will represent a difference upward of about 50c. a ton. Contracts for foundry coke for next year were closed last week at $10.50 to $11. Spot foundry coke for the remainder of this year is quoted at $13, ovens.

Ferroalloys.—Makers of ferromanganese were frankly surprised by the fact that no control price was fixed by the Government for their product and they believe that such regulation may still come. Meanwhile, the market has weakened perceptibly and a lot of 100 tons was sold a few days ago at $340, spot, and several spot lots were booked at $350. Still lower prices are probable. Under present conditions, it is not expected that there will be any contracting ahead. Spiegeleisen has also weakened to $78 to $80, furnace, and undoubtedly better could be done. A Western inquiry for 4000 tons is reported to have been placed here at $75 for delivery during the remainder of this year.

Billets.—Though no control price on billets, slabs and blooms has been settled upon, it is generally believed that there will be a reduction of prices to about $50 for open-hearth and Bessemer re-rolling billets and about $55 for forging billets, with the usual trade differentials and extras on allied products. Offerings of open-hearth re-rolling billets were made last week at $70, Pittsburgh, and forging billets at $75. Pending further developments in the price situation, trading will undoubtedly remain at a standstill, which will not be disturbing to the leading producers, who are sold up so far ahead that they have had little to offer for some weeks past.

Sheets.—Prices of sheets are weaker, but there is no business. It is generally believed that a control price will be announced by the Government. The market is weak at the following Pittsburgh base prices: No. 10 blue annealed, 8c. to 8.50c.; No. 28 black, 8c. to 8.50c.; No. 28 galvanized, 10c. to 10.50c.

Structural Material.—The mills are well sold ahead and are not disposed to take on much new business at this time at the Government price of 3c., Pittsburgh. Some criticism of this price is heard, especially among the smaller producers, and the naming of Chicago as a basing point is regarded here as a discrimination against the Eastern Pennsylvania district in selling in the Chicago territory.

It is intimated that quotations for structural material may henceforth be made on the basis of the

cost for the fabricated material. There has been no attempt and probably will be none to regulate the fabricating costs, and fabricators may charge any price they like. Steel contracts for the new Philadelphia subways and for the buildings to be erected by the Tacony Ordnance Corporation are still pending. The Stone & Webster Engineering Corporation, Boston, has awarded contracts for 32 buildings, totalling about 13,600 tons, to a number of fabricators as follows: United States Steel Products Co., eight; Hedden Iron Construction Co., four; Belmont Iron Works, four; Decatur Bridge Co., three; Lewis F. Shoemaker & Co., three; Hay Foundry & Machine Co., six; McClintic-Marshall Co., one; Levering & Garrigues, one; the Eastern Bridge & Construction Co., one; the Ferguson Steel & Iron Co., one.

Plates.—There was no acceptance of business in plates to-day except some small orders which were mailed before the announcement of the Government price, and the buyers of these lots seemed willing to let the order stand even when given at a price several cents in excess of the Government price. Small plate mills in this district are placed in a decidedly awkward position by the control price, especially those which roll plates from billets or slabs which they buy in the open market. One concern is reported to have contracted for slabs recently at $100 a ton and obviously cannot afford to sell its plates at 3.25c. A maker of plates from slabs said that with billets and slabs at about $50, Pittsburgh, which has been mentioned as a probable figure under the control plan, it would not more than break even. Other mills which have their own furnaces, but which are now loaded up with low-priced Government business, also complain that their production costs exceed or equal the price which the Government and the larger steel producers agreed to. Last week several inquiries for export, including one of 15,000 tons, were turned down. It now becomes a matter of interest whether the mills will be willing to book export business, especially for Japan, which has been a persistent buyer, at the price the Government has named. It is interesting to note that some of the smaller shops which buy plates are getting in line to take Government work because they cannot get material for private work, and in some cases have been threatened with a shut-down. The Emergency Fleet Corporation will keep a large number of these shops going on supplying boilers for the new merchant fleet now building. The new price for plates is 3.25c. for the tank quality, with the usual trade differentials and extras on other grades to be adjusted by a committee of the American Iron and Steel Institute.

Iron and Steel Bars.—Steel bar mills in this district have sufficient business on their books to keep going until the first of the year, when the new control price may be readjusted. In view of such readjustment, buyers will not commit themselves beyond the first of the year and sellers will probably not accept any next-year business. Jobbers and others who hold contracts for the remainder of the year were telephoning to sales offices to-day to learn whether contracts would be revised on the basis of the new price, but in the absence of definite instructions from mills no information could be given. We now quote steel bars on the basis of 2.90c., base Pittsburgh. The only large business closed just prior to the announcement of the new price was several orders for Japan aggregating nearly 5000 tons, which were booked at 4.50c., Pittsburgh, and it was asserted that these orders will stand.

Old Material.—Handlers of scrap material were thrown into a near-panic by the announcement of control prices on steel and pig iron. They immediately telegraphed their agents to withdraw all offers both for buying and selling, and this condition of desuetude will probably remain for several days, or until some light can be obtained which will reflect the probably future course of the market. The opinion of most dealers is that when trading is resumed it will be at a level from $2 to $5 lower than those quoted below, which we repeat from last week's issue. Some take an optimistic view of the situation, however, and hold that at the new price pig iron may be scarce, and that this will bring about an increased demand for scrap material, thus steadying the market. Such consideration, however, is more for the future than the present. A sale of heavy melting steel was made a couple of days ago at $34, but after the price announcement probably not over $25 could have been obtained had anyone been willing to buy. We quote nominal prices per gross ton delivered in the Pennsylvania district as follows, with the prospect that more definite prices will be established by negotiation between buyer and seller:

No. 1 heavy melting steel	$30.00 to $32.00
Steel rails, rerolling	41.00 to 43.00
Low phosphorus heavy melting	40.00 to 43.00
Old iron rails	43.00 to 45.00
Old carwheels	32.00 to 34.00
No. 1 railroad wrought	43.00 to 45.00
No. 1 forge fire	23.00 to 24.00
Bundled sheets	23.00 to 24.00
No. 2 busheling	16.00 to 17.00
Machine shop turnings (for blast furnace use)	17.00 to 19.00
Machine shop turnings (for rolling mill use)	20.00 to 21.00
Cast borings (for blast furnace use)	17.00 to 19.00
Cast borings (clean)	22.00 to 23.00
No. 1 cast	30.00 to 32.00
Grate bars	21.00 to 22.00
Stove plate	21.00 to 22.00
Railroad malleable	32.50 to 35.00
Wrought iron and soft steel pipes and tubes (new specifications)	30.00 to 32.00

Buffalo

BUFFALO, Sept. 24.

Pig Iron.—Producers are not yet undertaking to equalize price schedules to the basis of the Government regulating price of $33 per ton announced late to-day, and such furnacemen as have expressed themselves on the subject since the announcement of the price fixed by the Government intimate that it is not likely that they will be able to do so until they can secure coke at a figure under the present high level, which is 60 per cent above the regulation price of $6 per ton fixed by the Government. Until this situation is changed, and the question of obtaining material straightened out, it will be difficult to make quotations; although it is expected demand will be intense. There has been very light buying during the past week, awaiting the Government's impending action. A few hundred tons of No. 2 X foundry have been sold at $53, and small tonnages of other foundry grades and malleable have been taken at prices ranging between $53 and $55, according to grade. Pending adjustments which may be made later to conform to Government regulation the price schedule remains in statu quo, continued from last week's report, as follows, f.o.b. furnace, Buffalo:

High silicon irons	$55.00 to $56.00
No. 1 foundry	54.00 to 55.00
No. 2 X foundry	53.00 to 55.00
No. 2 plain	52.00 to 54.00
No. 2 foundry	51.00 to 53.00
Gray forge	51.00 to 53.00
Malleable	53.00 to 55.00
Basic	54.00 to 55.00
Lake Superior charcoal, f.o.b. Buffalo	55.00 to 60.00

Finished Iron and Steel.—Both new demand and specification on existing contracts have fallen off during the week and many sales agencies report it has been the dullest period they have experienced during the summer and fall season. The only special feature of interest that developed during the week was an inquiry for export purposes covering about 1000 tons of boilers which, however, has not yet been placed. It is understood that most of the independent mills are following the lead of the principal interest in the raising of wages of employes ten per cent. This action, it is expected will stimulate production, which has been falling behind of late, due to shortage of labor.

Old Material.—Owing to rumors that the price for heavy melting steel had been fixed by the Government at $25 per ton, the market is unsettled, and more or less "at sea"; as dealers hardly believe this price would be established if the price of pig iron had been fixed at $33 by Government regulation, as was announced late to-day. In quotations made during the week dealers have strictly adhered to last week's schedules, demand having been active, and for some commodities in excess of supply. In a few instances, sales have been made at advances over last week's prices. Dealers, as a rule are inclined to hold their stocks and

not let go of scrap materials very easily, unless the Government forces them to sell. It is difficult, dealers state, to obtain sufficient help to sort and load material at yards, and, this coupled with scarcity of cars, is retarding shipments. Price schedules remain nominally unchanged from a week ago, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$31.50 to $32.00
Low phosphorus	41.00 to 42.00
No. 1 railroad wrought	43.00 to 44.00
No. 1 railroad and machinery cast	30.00 to 31.00
Iron axles	45.00 to 47.00
Steel axles	45.00 to 47.00
Carwheels	35.00 to 36.00
Railroad malleable	32.00 to 33.00
Machine shop turnings	18.00 to 19.00
Heavy axle turnings	26.00 to 27.00
Clean cast borings	20.00 to 21.00
Iron rails	43.00 to 44.00
Locomotive grate bars	20.00 to 21.00
Stove plate	21.00 to 22.00
Wrought pipe	28.00 to 29.00
No. 1 busheling scrap	28.00 to 29.00
No. 2 busheling scrap	18.00 to 19.00
Bundled sheet stamping scrap	20.00 to 21.00

St. Louis

ST. LOUIS, Sept. 24.

Pig Iron.—The news of the governmental action with relation to iron and steel prices did not reach St. Louis in time to develop any discussion of the effect on the local market and, of course, there was no action in the market upon which the price-making decisions could be said to bear. During the week the tendency in all respects was that which has prevailed for the past several weeks—to await the action reported today, and in consequence there has been a minimum of transactions. Sales as made were in small lots and for immediate needs or for special uses requiring particular analyses. Some offerings were reported of foundry grades a little below the market, but these were usually found to be resale iron on which the price quoted was for immediate acceptance and not available more than 24 hours, if that long.

Old Material.—In the scrap market, there was even less of life than during the preceding week, as there was practically no call for scrap from the consumers, and the dealers found very little occasion to trade among themselves, even for needed material. In addition there were no lists out from railroads or industries and therefore no local incentive to increase interest in the market. Rolling mills are willing to buy small lots at bargain prices, but will make no long commitments. No steel demand at all was apparent and foundry grades show weakness. These conditions applied to practically everything in the list, with locomotive tires probably the softest of all the items quoted. We quote dealers' prices, f.o.b. consumers' works, St. Louis industrial district, as follows:

Per Gross Ton

Old iron rails	$40.25 to $40.75
Old steel rails, rerolling	38.00 to 38.50
Old steel rails, less than 3 ft.	37.00 to 38.00
Relaying rails, standard section, subject to inspection	50.00 to 55.00
Old car wheels	31.50 to 32.00
No. 1 railroad heavy melting steel scrap	30.50 to 31.00
Heavy shoveling steel	29.00 to 29.50
Ordinary shoveling steel	26.00 to 26.50
Frogs, switches and guards cut apart	30.50 to 31.00
Ordinary bundled sheet scrap	20.50 to 21.00
Heavy axle and tire turnings	20.00 to 21.00

Per Net Ton

Iron angle bars	$39.00 to $39.50
Steel angle bars	28.00 to 29.00
Iron car axles	44.50 to 45.50
Steel car axles	42.50 to 43.00
Wrought arch bars and transoms	41.50 to 42.00
No. 1 railroad wrought	35.50 to 36.00
No. 2 railroad wrought	33.50 to 34.00
Railroad springs	31.50 to 32.00
Steel couplers and knuckles	36.50 to 37.00
Locomotive tires, 42 in. and over, smooth inside	39.00 to 39.50
No. 1 dealers' forge	26.50 to 27.00
Cast iron borings	16.50 to 17.00
No. 1 busheling	25.00 to 25.50
No. 1 boilers, cut to sheets and rings	21.50 to 22.00
No. 1 railroad cast scrap	21.00 to 21.50
Stove plate and light cast scrap	16.00 to 16.50
Railroad malleable	29.00 to 30.00
Agricultural malleable	24.00 to 24.50
Pipes and flues	22.50 to 23.00
Heavy railroad sheet and tank scrap	18.00 to 18.50
Railroad grate bars	18.50 to 19.00
Machine shop turnings	17.50 to 18.00
Country mixed scrap	16.50 to 17.00

Finished Iron and Steel.—In finished products the problem still continues to be one of delivery of material already contracted for and the urgency of the calls for shipments continued with very little relief, rather a tendency toward still further deferment of delivery. Movement shows further decrease in all classes of material affected by Governmental demand. The warehouses are finding it increasingly difficult to meet the calls of customers who are willing to pay the prices asked and report that the shipments of the wanted classes of material under their contracts with the mills are becoming slower with each succeeding week. Stocks on hand are well down to the bottom of supplies on hand. For stock out of warehouse we quote as follows: Soft steel bars, 4.55c.; iron bars, 4.50c.; structural material, 5.05c.; tank plates, 10.05c.; No. 10 blue annealed sheets, 10.05c.; No. 28 black sheets, cold rolled, one pass, 10.35c.; No. 28 galvanized sheets, black sheet gage, 11.75c.

Coke.—In coke the situation was entirely based upon spot demand and prices were held at the last prevailing high prices with very little selling, as melters in this section are not in particularly sharp need of coke.

New York

NEW YORK, Sept. 26.

Pig Iron—There was very little activity in the pig iron market prior to the announcement of the $33 price made by agreement of Government officials and representatives of the iron and steel business. A New Jersey foundry was in the market for 1000 tons for early delivery, but no other tonnages of importance were pending. After the price-fixing announcement was made, inquiries ceased and no quotations were obtainable from sellers, who notified their customers that pending an adjustment of differentials on pig iron, no quotations would be made. The general feeling is that differentials and other details will be adjusted and that new prices will be established by practically unanimous agreement, although there is no law to compel the selling of pig iron at any price or to allow Government officials to fix a definite price. In the absence of transactions, we repeat last week's prices for tidewater delivery in the near future as follows. These are, of course, entirely nominal:

No. 1 foundry	$45.75 to $50.75
No. 2 X	44.75 to 49.75
No. 2 plain	43.75 to 45.75
Southern No. 1 foundry	50.75 to 51.75
Southern No. 2 foundry and soft	50.25 to 51.25

Ferroalloys—The market for ferromanganese continues extremely quiet and is unchanged at $375 for delivery for any position this year with $350 asked for delivery next year. These quotations refer entirely to the domestic product, it being practically impossible to buy the British alloy for any delivery. Transactions in the domestic market are confined to a few small lots, mostly for delivery this year, and inquiry for any position is not large. It is reported that one large consumer deferred his inquiries for his next year's needs until the Government prices for steel were made public. Indications are not encouraging as to the receipts of ferromanganese from Great Britain. Reports furnished THE IRON AGE show that imports of the alloy in August did not exceed 1200 tons, the lowest for any month in the last year and a half. Private advices from Great Britain also are to the effect that the manganese ore problem there is a serious one, and that one ferromanganese producer has been obliged to divert some of his ore supplies to his competitors. Press reports from Brazil state that a tax of 8 per cent seaboard is to be placed on manganese ore exports. This is figured to mean an advance of 4c. per unit over present prices if made a law. Spiegeleisen continues quiet at $80 to $82.50, furnace, for this year. The 50 per cent ferrosilicon market is quiet and steady with $200 asked for material desired this year, and $140 to $175 for 1918 requirements.

Finished Iron and Steel.—The price announcement of the President on Sept. 24 is the all-absorbing topic. It is so general in terms that the trade has not yet decided how to take it and sales offices are without any advices whatever from company heads as to how to proceed. Inquiries from buyers have generally been merely in the nature of requests as to what actually is meant and no quotations have been made on a basis of these prices.

One buyer, however, has offered 8c. for 400 tons of plates for export on which a license is said to have been obtained and 1250 tons of plates to be put in storage on the Pacific Coast have been offered at 9c. Opinions as to the effect of the prices are widely divergent. A few hold that they are to be regarded as maximum and that new business is to be taken at these prices and that in that event there may be some revision of prices on existing contracts, largely with the idea that otherwise buyers on contracts would be unduly penalized, assuming it possible to get deliveries substantially as good on the new prices. Others believe that the law of supply and demand will be given free play and that premium prices will continue to exist in the case of urgent needs. Meanwhile the trade is waiting for more specific information, including prices on billets and slabs, and is without intimation as to whether other iron and steel products will also come under the fixed-price arrangement. Doubt is expressed as to the status of brokers, such as those who have been the intermediaries between mills and consumers who require time for payment. There are many questions for which the answers are not yet forthcoming. We quote below the prices ruling last week but they are not necessarily representative of the market at the moment inasmuch as nothing is being done. We quote mill shipments of structural material at 4.445c. to 5.195c., New York; of plates at 8.195c. and higher, New York; steel bars over the rest of this year at 4.195c. to 4.695c., New York, and iron bars at 4.945c. From New York district warehouses steel and iron bars and shapes are sold at 5c. to 5.50c. and plates at 8c. and higher.

Fabricated Steel—Among contracts which have been closed for buildings in the Eastern section of the country may be mentioned the following: 1400 tons for the Watertown Arsenal, to the New England Structural Co.; 200 tons for a power house for the Niles-Bement-Pond Co., Plainfield, N. J., to the Guerber Engineering Co.; 600 tons for the National Sugar Co., Yonkers, N. Y., to the Hedden Iron Construction Co.; 350 tons for the Musical Mutual Protective Union, New York, to A. E. Norton, and 400 tons at Stamford, Conn., for the Springfield Perch Co., to the Eastern Bridge & Structural Co.

Old Material—Before the announcement of the price on pig iron and finished materials at Washington, there was increased activity in the old material market and prices of heavy melting steel were somewhat higher than they had been recently. The result was that some brokers overbought and when the announcement came from Washington, found themselves with considerable tonnages of scrap on their hands. The market is at a standstill and no quotations are being made. We quote nominal prices of brokers as follows to New York producers and dealers, per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$28.00 to $28.50
Old steel rails (short lengths) or equivalent heavy steel scrap	28.00 to 29.00
Relaying rails	63.00 to 65.00
Rerolling rails	37.00 to 38.00
Iron and steel car axles	43.00 to 44.00
No. 1 railroad wrought	39.00 to 40.00
Wrought-iron track scrap	30.00 to 31.00
No 1 yard wrought long	30.00 to 31.00
Light iron	8.00 to 10.00
Cast borings (clean)	19.00 to 20.00
Machine-shop turnings	16.00 to 17.00
Mixed borings and turnings	15.00 to 16.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long)	28.00 to 30.00

For cast-iron scrap, dealers in New York City and Brooklyn are quoting as follows to local foundries per gross ton:

No. 1 machinery cast	$30.00 to $31.00
No. 1 heavy cast (column, building material, etc.)	26.00 to 27.00
No. 2 cast (radiators, cast boilers, etc.)	26.00 to 28.00
Stove plate	18.00 to 19.00
Locomotive grate bars	18.00 to 19.00
Old carwheels	31.00 to 33.00
Malleable cast (railroad)	30.00 to 31.00

Cast Iron Pipe—On 310 tons of 20-in. pipe for Jersey City, bids were opened Tuesday as follows: R. D. Wood & Co., $58.34; John Fox & Co., $58.55; Warren Foundry & Machine Co., $64; Donaldson Iron Co., $64.30; United States Cast Iron Pipe & Foundry Co., $64.75. The contract doubtless will be awarded to R. D. Wood & Co. Cast iron pipe companies naturally are keenly interested in the $33 price on pig iron, announced at Washington, but prices have not been changed and nominal quotations are on carload lots of 6- and 8-in. and heavier $65.50 per ton and $68.50 on 4-in.

IRON AND INDUSTRIAL STOCKS

Stocks Advance After Announcement of Prices Named at Washington

Last week in the stock market there was some irregularity, but on the whole the trend was upward. The fixing of the price of copper at 23½c. had a favorable effect. Most of the leading stocks recorded gains during the week, including the following: Baldwin Locomotive Co., 1⅞; Bethlehem Steel Co., 7⅞; Lackawanna Steel Co., 2; Republic Iron & Steel Co., 2¼; United States Steel Corporation, 3¼.

When the announcement concerning fixing of prices on iron ore, coke, pig iron and steel products was made Monday, the effect was good on the stock market and the upward trend was general. Among the stocks which recorded advances were the following:

American Car & Foundry Co., 1¼; Bethlehem Steel Co., 1¾; Republic Iron & Steel Co., 2⅜; Midvale Steel Co., 1; United States Steel Co., 2; United States Steel preferred, ¼. Railway equipment concerns and those engaged in the manufacture of automobiles and accessories also reported advances.

Most stocks made further gains Tuesday, but the upward movement was checked by the high interest rate on call loans.

The range in prices on active iron and steel stocks from Wednesday of last week and Tuesday of this week was as follows:

Allis-Chal., com.	22¼ - 26	Int. Har. Corp., com.	69 - 72
Allis-Chal., pref.	81⅞ - 82⅛	Lacka. Steel	81 - 86
Am. Can, com.	40 - 44⅜	Lake Sup. Corp.	15½ - 17⅜
Am. Can, pref.	100½ - 102⅛	Lima Loco.	56 - 57
Am. Car & Fdy., com.	69 - 73¾	Midvale Steel	49⅜ - 53
Am. Car & Fdy., pref.	109	Nat.-Acme	32 - 33
Am. Loco., com.	60½ - 64½	Nat. En. & Stm., com.	43 - 45¾
Am. Loco., pref.	101¼ - 101½	Nat. En. & Stm., pref.	93½
Am. Rad., com.	295	N. Y. Air Brake	120 - 129¼
Am. Ship, com.	88¼ - 92¾	Nova Scotia Steel	93 - 95¾
Am. Steel Fdries.	65 - 68	Pitts. Steel, pref.	97⅜ - 99⅛
Bald. Loco., com.	58⅝ - 66	Pressed Stl., com.	62 - 64¼
Bald. Loco., pref.	100¼ - 101	Ry. Steel Spring, com.	45 - 47½
Beth. Steel, com.	93¾ - 98½	Republic, com.	79 - 85
Beth. Steel, class B	91½ - 97¾	Republic, pref.	100⅛ - 101½
Carbon Stl., com.	88 - 90	Sloss, com.	44 - 46½
Cent. Fdry., pref.	44	Sloss, pref.	88¼
Charcoal Iron, com.	7⅞ - 8⅛	Sup. Steel	39½ - 48
Chic. Pneu. Tool	63 - 64	Sup. Steel, 1st pref.	100½
Colo. Fuel	44 - 47	Transue-Williams	40⅛ - 44¼
Cruc. Steel, com.	68 - 75¼	Un. Alloy Steel	42½ - 44
Cruc. Steel, pref.	95½ - 96¾	U. S. Pipe, com.	17 - 17¾
Gen. Electric	138⅞ - 148	U. S. Pipe, pref.	50
Gt. No. Ore. Cert.	32½ - 36	U. S. Steel, com.	106½ - 113¾
Gulf States Steel	96 - 104	U. S. Steel, pref.	116⅛ - 117
Int. Har. of N. J., com.	110 - 112	Va. I. C. & Coke	58 - 60
		Westing. Elec.	44½ - 47¾

Industrial Finances

Reports presented at the annual meeting of the Waukesha Motor Co., Waukesha, Wis., indicated that the total volume of business during the last fiscal year approximated $2,250,000 and prospects for the new year are for an increase of 50 per cent. The company has an authorized capital stock of $1,000,000 and employs 600 men, with a monthly payroll in excess of $50,000. The capacity of the plant has been increased 100 per cent. during the year. All officers and directors were re-elected as follows: President, C. A. Haertel; vice-president, E. R. Estberg; secretary and general manager, Harry M. Horning; treasurer, S. A. Perkins; director, C. W. Newbury.

The Smiley Steel Co., Inc., 120 Broadway, New York, has increased its capital from $5,000 to $50,000.

It is announced at Duluth that a mortgage for $2,500,000 against the Webb Iron Co.'s mine near Hib-

bing, Minn., has just been paid off by the Shenango Furnace Co. The property is now free of incumbrance after seven years of operation. Bonds for the amount mentioned and secured by mortgage were issued in 1910 and were purchased by the Pittsburgh Trust Co. Under the terms of the agreement, the Shenango Furnace Co. operated the property and paid the trust company a royalty of 25 cents a ton on ore mined. The mine has been operated upon a scale sufficient to admit of the royalties taking up the mortgage far in advance of the 20-year period stipulated.

H. S. Kimball, president Remington Arms-Union Metallic Cartridge Co., has announced that the Remington company has just completed an adjustment of its Russian rifle contract on a very satisfactory basis, which concludes its difficulties with respect to this contract and materially improves the financial condition of the company.

At a meeting of the stockholders of Milliken Brothers, Inc., New York, held at Richmond, Va., September 20, it was voted to dissolve the corporation. As an initial move in the dissolution plan the directors declared a distribution of $10 per share, payable Oct. 1. The company recently disposed of its steel and iron plant at Milliken, Staten Island, to the Downey Shipbuilding Corporation, organized to take over and rebuild the works for a shipbuilding plant. The company was established in 1857 and for many years had its works at Clinton and Bryant Streets, Brooklyn, N. Y. With the intention of operating a plant for rolling shapes, the property was acquired at Mariners' Harbor, Staten Island, and given the name of Milliken.

The Eagle Lock Co., Terryville, Conn., has declared an extra dividend of 1 per cent, payable Oct. 2. The past year the stock has yielded an aggregate of 13 per cent. No announcement has been made of the proposed increase of capitalization from $1,000,000 to $5,000,000, recently approved by the stockholders. It is expected that following the December meeting of the directors an increase to at least $3,000,000 will be announced. The company is building a large number of homes for its employees.

The Pittsburgh Rolls Corporation has made application to list on the Pittsburgh Stock Exchange $1,500,000 common and $500,000 preferred stocks (par value $100 per share) and $1,000,000 first mortgage 6 per cent convertible sinking fund gold bonds.

On Oct. 1 the Struthers Furnace Co., operating a 400-ton blast furnace at Struthers, Ohio, and through its subsidiary, the Struthers Coal & Coke Co., owning 235 acres of Fayette county, Pa., coal land and 200 beehive ovens, will retire $75,000 of first and collateral trust 6's, of which $50,000 will be in advance of maturity. On Oct. 2, 1911, the company authorized a bond issue of $1,000,000 and issued at that time $750,000, payable semi-annually, April 1 and Oct. 1, at the rate of $25,000. In consequence of this advance retirement, $350,000 of these bonds will have been paid off at the end of the sixth year of the issue, leaving outstanding an even $400,000 of bonds. The company has a capital stock of $1,000,000, on which it resumed payment at the annual rate of 10 per cent last October.

Dividends

The American La France Fire Engine Co., Inc., quarterly, 1½ per cent on the common, payable Nov. 15, and 1¾ per cent on the preferred, payable Oct. 1.

The American Laundry Machinery Co., quarterly, 1½ per cent on the common, payable Dec. 5, and 1¾ per cent on the preferred, payable Oct. 15.

The American Screw Machine Co., quarterly, 1¾ per cent and extra 1 per cent, payable Sept. 29.

The American Seeding Machine Co., quarterly, 1 per cent on the common, and 1½ per cent on the preferred, both payable Oct. 15.

The Billings & Spencer Co., quarterly, 2 per cent and extra 3 per cent, both payable Oct. 1.

The Colt's Patent Fire Arms Mfg. Co., quarterly, $3 per share, payable Oct. 1.

The Hendee Mfg. Co., quarterly, 1¾ per cent on the preferred, payable Oct. 1.

Manning, Maxwell & Moore, Inc., quarterly, 1½ per cent, payable Sept. 29.

The Nova Scotia Steel & Coal Co., Ltd., quarterly, 2 per cent on the common, payable Oct. 15.

The Steel Co. of Canada, Ltd., quarterly, 1½ per cent on the common, and 1¾ per cent on the preferred, both payable Oct. 1.

The Trumbull Steel Co., quarterly, 1½ per cent and extra 2 per cent on the common, and quarterly 1¾ per cent on the preferred, all payable Sept. 30.

Great Bridge Completed

TORONTO, ONT., Sept. 24.—The successful completion of the Quebec Bridge across the St. Lawrence River is a memorable event, in which not merely all Canadians but all scientists and engineers the world over should be permanently interested. It is the greatest cantilever bridge so far constructed, and it will probably remain long unrivalled on account of the difficulties experienced in the process of its construction. It was begun 11 years ago, but its completion was delayed by two accidents. After the collapse of one of the cantilever arms or brackets on Aug. 29, 1907, the bridge was re-designed and the engineers determined to avoid the menace of collapse from cantilever arms of such great length by building the central span on pontoons, floating it down the river and hoisting it into place. This section of the bridge was completed in 1916 and at the time of being hoisted into position it collapsed, the whole section falling into the river below. A new span was then built and the work of hoisting it into place was commenced on Monday, Sept. 17, and was successfully completed and bolted into place on Thursday, Sept. 20. The pre-eminence of this bridge among others of its class is, for the time, fixed by the connecting length of the central span, 1800 feet.

Greaves-Etchells Electric Furnaces

The following installations of Greaves-Etchells electric furnaces are announced by the Electric Furnace Construction Co., Philadelphia: The Steel Corporation of South Africa, two 5-ton furnaces; the Sociedad Espanola de Construction Naval, Madrid, Spain, two 10-ton and one 6-ton furnace. A 2-ton furnace was recently started at the plant of Kayser Ellison & Co., Sheffield, England, on special aeroplane steels and 28 heats from cold stock in a new furnace are reported to have been obtained from Monday noon to Friday evening.

The wage distribution for August in the Youngstown, Ohio, district, totaled $5,634,982, as compared with $5,253,626 for July, $5,795,064 for June and $3,888,129 for August, 1916, according to bank figures. This disbursement brings the total for the first eight months to $41,070,906, as compared with $28,148,082 for the corresponding 1916 period, and shows how plant extensions and frequent wage advances have affected payroll disbursements over the 12 months, in the Youngstown, Ohio, district.

The Patterson-Kelley Co., Inc., has been formed to succeed the firms of Frank L. Patterson & Co. and Benjamin F. Kelley & Son. The new company will continue along the same lines as the two organizations which it succeeds, viz., the heating of water and the manufacture of water heaters. Offices will be maintained at 26 Cortlandt Street, New York.

The Winchester Repeating Arms Co., New Haven, Conn., has resumed working on a night shift and it is reported that the working force will be increased to 20,000 employees.

Fisher Brothers & Co., 297 Morris Avenue, Bronx, New York, metals and scrap iron, have increased their capital from $10,000 to $100,000.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 19.5c.; Philadelphia, 18.5c.; Boston, 21.5c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c.; Denver pipe, 76.1c.; minimum carload, 46,000 lb.; structural steel and steel bars, 76.1c., minimum carload, 40,000 lb.; Pacific coast (by rail only), pipe, 65c.; structural steel and steel bars, 75c., minimum carload, 60,000 lb. No freight rates are being published via the Panama Canal, as the boats are being used in transatlantic trade.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in., angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 4.00c.

Wire Products

(Prices of independent mills)

Wire nails, $4 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire, $4.05 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.95; galvanized wire, $4.65; galvanized barb wire, and fence staples, $4.85; painted barb wire, $4.15; polished fence staples, $4.15; cement-coated nails, $3.90 base, these prices being subject to the usual advances for the smaller trade all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 43 per cent off list for carload lots, 42 per cent off for 1000-rod lots, and 41 per cent off for small lots, f.o.b. Pittsburgh.

Nuts and Bolts

Discounts in effect for large buyers are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days.

Carriage bolts, small, rolled thread, 40 per cent; small cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 40 and 10 per cent; small. cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent with c. p. nuts, 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq. blank, $2.10 off list, and tapped, $1.90 off; hex., blank, $1.90 off, and tapped, $1.70 off; nuts, c. p. c. and t. sq. blank $1.70 off; and tapped, $1.50 off; hex. blank, $1.60 off, and tapped, $1.40 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Wire Rods

Soft Bessemer and open-hearth rods to domestic consumers at $90 to $95; high-carbon rods made from ordinary open-hearth steel $95 to $100, and special steel rods with carbons running from 0.40 to 0.60, $100 to $110 at mill; above 0.60 carbon, $115 to $120.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $7.00; ⅝ in., 7/16 in. and ½ in., $7.00 base. Boat spikes are occasionally quoted $7.00 to $8.00, all per 100 lb., f.o.b. Pittsburgh, but some makers are quoting higher. Track bolts with square nuts, 7c. to 7.50c. to railroads, and 8c to 8.50c., in small lots, for fairly prompt shipment.

Steel Rails

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails, and on carload and smaller lots, 4c. to 4.25c. at mill. Light rails, 25 to 45 lb., $75 to $80; 16 to 20 lb., $80 to $81; 12 and 14 lb., $82 to $83; 8 and 10 lb., $83 to $84; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard Bessemer rails, $38; open-hearth, $40, per gross ton, Pittsburgh.

Tin Plate

Effective July 31, prices on all sizes of terne plate were advanced from $2 to $2.50 per package and are now as follows: 8-lb. coating, 200 lb., $16 per package; 8-lb., coating, I. C., $16.30; 12-lb. coating, I. C., $17.50; 15-lb. coating, I. C., $18.25; 20-lb. coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 4c. to 4.50c. for delivery late this year, and 4.50c. to 5c. from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c., railroad test bars, 5.25c. in carload and larger lots f.o.b. mill.

Wrought Pipe

The following discounts on steel are to jobbers for carload lots on the Pittsburgh basing card in effect from May 1, 1917, all full weight, except for LaBelle Iron Works and Wheeling Steel & Iron Co., which quote higher prices, and National Tube Co., which adheres to card of April 1.

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛, ¼ and ⅜	42	15½	⅛ and ¼	23	+4
½	46	31½	⅜	24	+3
¾ to 3	49	35½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	42	29½	2	26	12
2½ to 6	45	32½	2½ to 6	28	15
7 to 12	42	28½	7 to 12	25	12
13 and 14	32½	..			
15	30	..			

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	38	20½	⅛, ¼ and ⅜	22	5
½	43	30½	½	27	14
¾ to 1½	47	34½	¾ to 1½	33	18
2 to 3	48	35½			

Lap Weld, extra strong, plain ends

2	40	28½	2	27	14
2½ to 4	43	31½	2½ to 4	29	17
4 to 6	42	30½	4½ to 6	28	16
7 to 8	38	24½	7 to 8	20	8
9 to 12	33	19½	9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

Nominal discounts on less than carload lots, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap-Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in.	28	1¾ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3¼ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in.	No quotations
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths. Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net or 2 per cent discount in 10 days:

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer

	Cents per lb.
Nos. 3 to 8	8.00 to 8.50
Nos. 9 and 10	8.25 to 8.50
Nos. 11 and 12	8.50 to 8.75
Nos. 13 and 14	8.75 to 9.00
Nos. 15 and 16	9.00 to 9.25

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	8.30 to 8.80
Nos. 22 and 24	8.35 to 8.85
Nos. 25 and 26	8.40 to 8.90
No. 27	8.45 to 9.00
No. 28	8.50 to 8.95
No. 29	8.55 to 9.05
No. 30	8.65 to 9.15

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11	8.50 to 9.00
Nos. 12 and 14	8.60 to 9.10
Nos. 15 and 16	8.75 to 9.25
Nos. 17 to 21	8.90 to 9.40
Nos. 22 and 24	9.05 to 9.55
Nos. 25 and 26	9.20 to 9.70
No. 27	9.35 to 9.85
No. 28	9.50 to 10.00
No. 29	9.75 to 10.25
No. 30	10.00 to 10.50

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	7.80 to 8.30
Nos. 17 to 21	7.85 to 8.35
Nos. 22 to 24	7.90 to 8.40
Nos. 25 to 27	7.95 to 8.45
No. 28	8.00 to 8.50
No. 29	8.05 to 8.55
No. 30	8.05 to 8.55
Nos. 30½ and 31	8.10 to 8.60

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin.	Lead		Spelter	
		Electro-	New	New	St.	New	St.
Sept.	Lake	lytic	York	York	Louis	York	Louis
19	26.25	26.25	61.62½	8.00	7.87½	8.37½	8.12½
20	26.25	26.25	61.25	8.00	7.87½	8.37½	8.12½
21	23.50	23.50	61.27½	8.00	7.87½	8.50	8.25
22	23.50	23.50	....	8.00	7.87½	8.50	8.25
24	23.50	23.50	62.25	7.95	7.82½	8.50	8.25
25	23.50	23.50	62.00	7.95	7.82½	8.50	8.25

NEW YORK, Sept. 25

There is practically no buying of copper at the Government control price of 23.50c. The market is dull and virtually nominal at that quotation. Tin is dull but slightly higher. Lead is offered by independent producers at 7.95c. and buyers are holding off. Spelter is unchanged, being strong and confident as to future. Antimony is dull.

New York

Copper.—The fixing of a price for copper by the Government at 23.50c. has cleared the atmosphere to some extent, but has left in its trail a number of difficulties which must be straightened out before normal trading becomes possible. One of the questions yet to be settled is, are prime Lake, arsenical Lake, electrolytic and casting copper all to take the same price—23.50c.? Producers are in doubt on this point and are not selling. In the absence of notable sales, the market may be quoted nominally at the control price. There has been a better inquiry since the control price was announced, but little business has been done for the reason that producers are not yet aware of what the Government's requirements will be and as all Government orders must take precedence, they do not want to commit themselves at this time. A solution of the problem of resales of copper by jobbers and retailers must also be found. At present jobbers and retailers do not know whether they are permitted to sell at a profit above the control price or not. Some of these have copper which has cost them up to 32c. or over and it is not yet known whether they are to be permitted protection against loss.

Tin.—On Sept. 19 and 20 the market was nearly stagnant, though one seller claims fair sales. On Sept. 21 more interest was shown by buyers and at the close of the day there were several inquiries, but not much business was placed. Monday, Sept. 24, was also quiet and the total sales are estimated at from 100 to 125 tons. Yesterday (Tuesday) cables from abroad were greatly delayed and business came to a dead stop, with only one sale reported, a 25-ton lot for future shipment from the Far East. A report was received here Monday that the British Government had placed an embargo for the month of October on shipments of tin from the Straits Settlements, but this lacks confirmation.

Lead.—Following the action of the leading producer in reducing the price of lead to 8c., independent makers showed an inclination to cut below this figure, and on Monday and Tuesday of this week quotations were to be had at 7.95c., New York. This tendency of the independents to make offerings at a lower price has checked whatever large buying might have been done, buyers evidently hesitating to place orders until it has been determined whether the bottom has been reached. Should the independents reduce prices still further, say to 7.75c., it is predicted that it might have the effect of placing all buyers in a still more positive waiting attitude. The needs of consumers are emphasized by the fact that throughout the week there have been urgent inquiries for small lots for prompt shipment, and it is asserted that these tonnages were in many instances badly needed and will simply tide consumers over until they make up their minds that it is a safe time to buy. Large buying must eventually be done. The quotation yesterday in the outside market was 7.95c., New York, or 7.82½c., St. Louis.

Spelter.—The general tone of the market is unchanged; it continues strong and confident as to the future. Prices have advanced a point in the past week and are now 8.25c., St. Louis, or 8.50c., New York, for prime Western for early delivery. For delivery later in the year the market is from ⅛c. to ¼c. per lb. higher, but very little business is reported as being done for these positions, producers manifesting an unwillingness to commit themselves beyond early deliveries. For the latter fair transactions are reported as quietly negotiated at the prices quoted above. The fact that lead has fallen to the Government level and that a fairly satisfactory copper price has been announced by the Government are stabilizing influences.

Antimony.—Chinese and Japanese grades continue obtainable at 15c. to 15.50c., New York, duty paid, but demand is small and the market is dull.

Aluminum.—The market is unchanged and inactive with 41.50c. to 42.50c., New York, asked for No. 1 virgin metal, 98 to 99 per cent pure.

Old Metals—The market came to a complete stop when the Government fixed the price for Ingot Copper. Sellers will not part with their metal at less than the old prices and buyers are loathe to purchase on this basis with the Government 23½c. price in effect.

There does not appear to be much stock in the hands of dealers and as the metal they have was purchased on the higher basis buyers for spot material are likely to be obliged to pay the prices asked. We are quoting, nominally, the same prices as last week with the exception of lead, which is lower. We quote:

	Cents per lb.
Copper, heavy and crucible	26.50 to 27.00
Copper, heavy and wire	25.50 to 26.00
Copper, light and bottoms	22.50 to 23.50
Brass, heavy	18.00 to 18.25
Brass, light	14.00 to 14.25
Heavy machine composition	25.00 to 25.50
No. 1 yellow rod brass turnings	17.25
No. 1 red brass or composit.on turnings	19.00 to 21.00
Lead, heavy	7.50
Lead, tea	7.00
Zinc	6.50

Chicago

SEPT. 24.—Dealers in copper decline to quote on futures, or on any material that is not actually in stock. For what metal they have on hand they ask 27c. to 28c., whether it be Lake, electrolytic or casting. General conditions have been knocked sky-high by the Government's action in fixing 23.50c. as the producers' price. Some efforts to get copper at that level have been unavailing, and jobbers are doubtful as to what is going to happen. They are of the belief, however, that trading from store cannot be stopped. The one certain thing is that the official price will hold down the market. The other metals have been dull. We quote as follows: Casting, Lake and electrolytic copper, 27c. to 28c.; tin, carloads, 63c.; small lots, 65c. to 66c.; lead, 7.95c. to 8.50c.; spelter, 8.25c.; sheet zinc, 19c.; antimony, 17c. to 18.50c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 22.50c.; copper clips, 21.50c.; copper bottoms, 21c.; red brass, 21c.; yellow brass, 16c.; lead pipe, 6.75c.; zinc, 6.25c.; pewter, No. 1, 35c.; tinfoil, 42c.; block tin, 47c.

St. Louis

SEPT. 24.—Non-ferrous metals were decidedly quiet during the week and the Missouri product closed to-day: Lead, carload lots, 7.87½c. to 7.92½c.; spelter, 8.25c. to 8.37½c. for carload lots. For less than carload lots the prices were: Lead, 10c.; spelter, 9c.; tin, 66c.; Lake copper, 30c.; electrolytic copper, 29.50c.; Asiatic antimony, 18c. The Government's price fixing on copper has not yet affected the small lot market at this point. In the Joplin district zinc blende was rather quiet and shipments were lighter than usual because of the car shortage prevailing. Prices ranged, basis of 60 per cent metal, $65 to $75 per ton, with the second grade ores $1 to $2 per ton cheaper than the week before. The average for the district for the week was $69 per ton. Calamine was quiet at $35 to $42 per ton, basis of 40 per cent metal, with the average for the district at $38 per ton. Lead ore was quiet at $90 per ton, basis of 80 per cent metal.

Industry United to Aid the Government

War Convention at Atlantic City Makes a Strong Expression in Favor of Cooperation in Handling Present Economic Problems

Readers of THE IRON AGE are chiefly interested in the proceedings of the Atlantic City convention of the Chamber of Commerce of the United States last week because the spirit of that convention was typical of what is the dominant note in all industry and of business in these war days. There were probably 1500 delegates in attendance, most of them representing Chambers of Commerce. Banking, shipping, exporting, jobbing and retail interests were prominently represented. Not many iron and steel manufacturers were seen, but there was a good sprinkling of manufacturing consumers of steel representing various lines of metal working.

There were three days of addresses and discussions, all dealing with problems thrust upon business by the entrance of the United States into the war. The one thought that more than all others permeated the sessions was that of co-operation between business and the Government. The revolution in the thinking of officials at Washington brought about by the nation's going to war and that led heads of departments at Washington to call for help from the very business men whom before they had opposed, was alluded to in one way and another many times as the sessions went on. Secretary Lane and Secretary Baker made ringing addresses which evoked an enthusiastic response. Secretary Wilson in a group session reiterated what has been brought out frequently concerning relations of employers and employees, that there should be no change in conditions of employment (referring particularly to union or open shop conditions) during the war. There was a very general expression, however, in informal talk among the delegates to the effect that labor had not been slow to take advantage of war conditions to make any change it was able to bring about.

Concentrating Government Buying

Addresses by Lord Northcliffe and Food Administrator Hoover attracted large and eager audiences. Chairman Scott of the War Industries Board, Walter S. Gifford, director of the Council of National Defense, and Waddill Catchings, chairman of the committee of the National Chamber in co-operation with the Council of National Defense, brought out forcibly the lessons thus far learned from the more intimate co-operation of business men with the authorities at Washington.

There was a strong sentiment in the convention in favor of the concentration of Government buying in the hands of one board with full power and one of the resolutions of the convention called for such a change.

Foreign Trade to the Front

The difficulties exporters have had since embargoes were placed on many products were alluded to at one of the sessions and one speaker favored the granting of export licenses with no stipulated time, but revocable at any time by the license board. Chief of the difficulties now encountered are those due to the inability of export companies to place business with any assurance of getting deliveries in the 60 days' leeway granted at present.

President James A. Farrell of the Steel Corporation brought out in a thoughtful address the part played by the export trade in the winning of the war. The problem of maintaining exports after the war was dealt with in several strong addresses, John D. Ryan, president Anaconda Copper Co., showing how ill-prepared most of the manufacturers of the United States would be at the end of the war to compete with other countries to hold a business in which they had been but opportunists in the past three years. The passage of the Webb bill, permitting American manufacturers to co-operate in foreign trade, was strongly urged and a resolution to that effect was passed.

Sherman Act Suspended

Alba B. Johnson, president Baldwin Locomotive Works, brought a ringing response from the convention to his reference to the Sherman act. It may almost be said that the men who attended this convention considered that the Sherman act has been practically suspended by the Government in its invitation to business men in all lines to get together in respect to prices and the distribution of their product in war time. Mr. Johnson said that for 20 years the nation has been offering up a sacrifice to the false god of unlimited competition. The altar on which the sacrifice has been offered, he said, is the Sherman act. It has already been demonstrated that the Sherman act will not stand the strain of war conditions, the Government itself having eliminated competition in the endeavor to insure fair prices.

Mr. Ryan pointed to foreign trade as the only means of employing after the war the millions of men who are now supplying munitions and all other war equipment.

Industries Should Organize for Co-operation

As to the means by which business can co-operate with the Government, it was the consensus of the speakers that the various industries and trades should be represented at Washington by committees, regardless of the composition of committees already serving as auxiliary to the Council of National Defense. It was urged that wherever an organization of manufacturers existed in any industry, that organization should at once take steps to create a committee, taking care to have a representation on such committee of any firms in the industry not belonging at present to any manufacturers' organization.

At one of the group meetings, William Butterworth, president John Deere Plow Co., Moline, Ill., told how the Government was able, with the co-operation of wagon manufacturers, to place orders for 34,000 army wagons without disturbing the market either for the steel or the lumber required by such an unprecedented order. A similar example of fine service was found in the shoe trade, in which there had been the fullest co-operation on the part of manufacturers with the committees at Washington which negotiated army contracts.

The resolutions adopted by the convention were the siftings from more than 100 proposals submitted for indorsement, representing nearly every conceivable phase of the economic problems growing out of the war. It was declared to be the spirit of American business, no matter how fundamental might be the change in the relation of the Government to business, that the Government should have the power during the war to control prices and the determination of production for public and private needs "to whatever extent may be necessary for our great national purpose." The formation of a general committee of industry, representing all branches, was recommended, this committee to assist the Government in connection with purchases. A later adjustment board to handle all major disputes was urged. A resolution was also passed favoring the suspension of laws which prevent foreign vessels from engaging in coastwise trade.

Consumers of Steel Confer

Just before the convention adjourned announcement was made from the platform that at the request of Zenas W. Carter, Cleveland, representing the metal lath manufacturers, a conference of manufacturing consumers of steel would be held immediately in the convention hall. A number of representatives of metal-working industries responded. In addressing them Mr. Carter said that a number of users of steel desired that some action be taken looking to their representa-

tion in any conference at Washington at which prices to be fixed by the Government were considered. It was the view of some present that it was then rather late to start such a movement, as the announcement of Government prices might be expected any day. No action was taken, but it was urged by several manufacturers that correspondence be undertaken at once between various organizations in the industries using steel products with a view to making the influence of consumers felt in future adjustments of prices. The opinion was expressed that the prices about to be announced at Washington would be subject to change within a few months and meantime users should select representatives who could properly present the case of consumers.

PERSONAL

G. B. Wickersham, vice-president and general manager of the Diamond Forging & Mfg. Co., N. S. Pittsburgh, Pa., has resigned, effective Oct. 1, to become vice-president and general manager of the Louisville Steel & Iron Co., Louisville, Ky., manufacturer of iron and steel bars and black and galvanized steel sheets. Mr. Wickersham has been connected with the Diamond Forging & Mfg. Co. since it was organized seven years ago, and under his efficient management the company has been very successful. His successor has not yet been appointed.

Perley R. Prescott, consulting engineer for the Erie City Iron Works, Erie, Pa., will sail for Japan, Oct. 12, to be employed by the American Trading Co. in installing engineering plants in that country.

William B. Curtis, assistant sales manager of the conduit department of the Youngstown Sheet & Tube Co., Youngstown, Ohio, has been made a first lieutenant in the Officers' Reserve Corps of the Federal Ordnance Department, and has reported to Washington.

James E. Ferguson, president of the Ferguson Steel & Iron Co., Buffalo, has been commissioned a captain in the United States Signal Corps and appointed manager of inspection for the district of western New York and northern Pennsylvania, which will include the cities of Buffalo, Rochester, Syracuse and Hammondsport. He will have charge of inspection of all aeroplanes, automobiles for war purposes, telegraph and radio instruments made in this district. In the four years since Mr. Ferguson organized the Ferguson Steel & Iron Co. he has built up a very extensive business in the fabrication of structural steel and in the warehousing and distribution of bars, plates, structural shapes, etc., rendering it necessary to enlarge the capacity of the plant several times from the original structure of 100 by 150 feet to structures covering four and one-half acres. His time and ability are now at the command of the Government for $1,800 per year.

Frank W. Brooke, recently metallurgist with the Ludlum Steel Co., Watervliet, N. Y., has joined the staff of the Electric Furnace Construction Co., Philadelphia, as a director, taking charge of the construction and operation of the Greaves-Etchells furnaces. He will be assisted by G. W. Ketter, who has installed a number of furnaces of various types, particularly the ten Heroult furnaces for the British Forgings Co., Ltd., Toronto, Canada. Mr. Brooke had earlier connection with the operation of the Grönwall-Dixon furnace at the plant of John A. Crowley & Co., Detroit.

W. E. Keplinger, president of the Peters Cartridge Co., Cincinnati, has been elected president of the Cincinnati Business Men's Club, succeeding Col. F. W. Galbraith, Jr., who resigned because of military duties.

Archibald Johnston, vice-president Bethlehem Steel Co., was overwhelmingly nominated as candidate for mayor of the recently chartered city of Bethlehem, Pa. Because of the large vote for Mr. Johnston, his name will appear alone on the ballot at the general election in November, assuring his election.

George O. Klaiss has resigned his position at the Steelton, Pa., plant, Bethlehem Steel Co., to become assistant superintendent of the forge shops at the Easton plant, William Wharton, Jr., Co.

W. K. Hart, Jr., Midland, Pa., has been appointed manager of the Midland Improvement Co. and the Midland Water Co., vice W. C. Rice, resigned.

Harry G. Fawcett, advertising manager Chain Belt Co., Milwaukee, for several years, resigned Sept. 15 to engage in advertising business in Milwaukee.

C. E. Doud, Chicago manager of the industrial furnace department of Strong, Carlisle & Hammond, Cleveland, has received a commission as first lieutenant in the Ordnance Officers' Reserve Corps. He left Chicago Sept. 22 for service at Watervliet, N. Y.

H. H. Peck, formerly western sales agent for the Scullin Steel Co., with headquarters at Seattle, has completed his enlistment as sergeant of the ambulance section attached to the American Red Cross Military Hospital No. 1 at Neuilly S/Seine and has been commissioned as first lieutenant in the Ordnance Officers' Reserve Corps. His address is care of Ordnance Advance Depot, No. 1, American Expeditionary Forces, France, via New York.

R. E. Blazo has been transferred from the Boston office to the Philadelphia sales office of Rogers, Brown & Co., pig iron and coke.

William S. Boyd of the purchasing department of the Crucible Steel Co. of America, Pittsburgh, has resigned to become purchasing agent of the Page Woven Wire Fence Co., Monessen, Pa.

J. B. Beall, for the past two years manager of factory sales for the Wayne Oil Tank & Pump Co., Fort Wayne, Ind., has been assigned to the management of a new branch office located at Cleveland. J. D. Rauch, formerly treasurer of the American Steel Dredge Co., Fort Wayne, and for the past two months engineer Wayne Co., has been appointed manager of factory sales.

C. L. Altemus has been appointed manager of the metals department of the Pacific Commercial Co., 11 Broadway, New York, in charge of iron and steel and other metals. The company is engaged in exporting, particularly to the Far East. Mr. Altemus was for about 10 years with the Cambria Steel Co., part of that time in the metallurgical department in special research work and later in the sales department, and was subsequently New York manager of the American Steel Export Co. when that organization was still a part of the Cambria Steel Co.

A. W. Payne has been placed in charge of the branch office which the Crane Packing Co., Chicago, maker of the John Crane flexible metallic packing, has established in the Woolworth Building, New York.

H. H. Barbour, district sales manager of the Lackawanna Steel Co., New York, is now on leave in Washington associated with J. Leonard Replogle in priority work for the War Industries Board. George Prendergast, of the New York office of the Lackawanna Steel Co., is acting district sales manager in Mr. Barbour's absence.

The Asbestos Protected Metal Co., Pittsburgh, announces the opening of a sales office in the Union Central Building, Cincinnati, under the direction of J. C. Lathrop.

The Wilkoff & Vaughn Co., Inc., 50 Church Street, New York, dealer in scrap material, has opened an office in Philadelphia in the Widener Building. A. Brice Moore has been appointed manager.

P. A. von Mohrenschildt, New York, American representative and purchasing agent for Nobel Brothers Petroleum Production Co., Petrograd, Russia, will leave for Russia on Sept. 29 to make a report on the condition of the petroleum industry in the United States. Mr. von Mohrenschildt, in view of the fact that oil well supplies, and especially casings, are very scarce in the United States, is concerned over the difficulty of buying the supplies and casings of which Russia is greatly in need. While in Russia he will seek to arouse interest in an endeavor to better the shipping facilities between the United States and Russia. On account of the large Russian Government orders which have been placed in

this country, almost all the space on steamers sailing to Archangel is taken by such shipments, leaving but 150 to 250 tons capacity to be assigned to private freight on each ship, although there is now in New York and vicinity more than 800,000 tons of freight consigned to private buyers in Russia. These buyers are operating exclusively for Russian national defense, but there is no prospect of moving this freight to Archangel. The other large Russian ports are closed to private freight. Mr. von Mohrenschildt was connected for several years with the business department of THE IRON AGE.

STEEL PLANT POWER COSTS

Problems in Their Determination and Distribution—The Question of By-Products

That a standard method of electric power cost accounting be adopted by steel mills was urged by W. O. Oschmann, engineer of the Oliver Iron & Steel Co. and chairman of the power committee of the Association of Iron and Steel Electrical Engineers at a recent Pittsburgh meeting of that association. He pointed out that present electric power station accounting methods give cost data which are not easily analyzed or compared to the cost of purchased power. He held that the important requirements of a steel mill electric power accounting system are: proper charges against the consuming departments for the cost of power, and proper credits to the departments delivering by-products used by the power plant for the value of the by-products.

The distribution of power costs, he found, after an examination of the accounting systems of several steel companies, should be based upon the cost of delivered power rather than the cost of generated power, the cost of delivered power being the cost of power as furnished to the yards and buildings of the various departments. This cost is the cost to generate or price paid for purchased power plus the cost of delivery to the consuming departments, and includes the cost of repairing and maintaining the lines, cables, transformers, substations, conduits, towers, etc., between the generating stations and the consuming departments, though new work such as installing lines for mill extension, etc., is not included.

Where some departments receive all or part of their power from substations, it is necessary to add to the cost of producing the current the cost of operating the substations. The departments which receive power directly from the generating station should be charged with their share of the cost of producing and distributing the current and the cost of the remainder of the power furnished by the generating station should be charged to the substations, the cost of operating the substations being added to this amount. The departments which receive current from the substations should be charged their pro rata share of this cost. Plants having storage batteries feeding into lines supplying several departments should have the battery station accounted for in the same manner as substations, provision being made for the credit received from the sale of sediments and old plates. Current supplied by the storage battery station should carry an additional charge to cover battery replacements. In all cases the charge to the department should be the cost of producing current plus the cost of furnishing the current to the consuming department.

An accounting system applicable to a central station power plant, according to Mr. Oschmann, probably would not be suitable to steel works, and he suggested that a steel mill power accounting system should include: 1, cost of steam; 2, cost of electric current generated; 3, cost of electric current supplied from generating stations; 4, cost of electric current supplied to consuming departments.

Credits for By-Products

The use of the by-product energy, he explained, requires large investment in machinery and equipment, and great care must be exercised in order that the cost of electric current is not made inaccurate due to charging to the generating station account, items of investment, operation and maintenance which should be charged to the furnace department or vice versa. Two of the difficult problems are to properly credit the furnace department for gas furnished and the steam department with the steam distributed.

All operating and maintenance charges which develop from the utilization of by-product energy, he held, should be deducted from the value of the energy obtained, so that proper credit can be given the department furnishing the energy and to avoid unjust burdens being placed upon the departments utilizing the waste energy. He pointed out that when steam is obtained from waste heat boilers, the maintenance charge is usually high, but the steam delivered into the steam system is equal in value to a like amount of steam furnished by the central boiler plant or plants. The furnace supplying heat to the boiler, therefore, should be credited with the total value of the steam furnished less the charges of operating and maintaining the boiler.

Where blast-furnace gas is used to generate steam the same method could be employed. The cost per 1000 lb. of steam as supplied by coal-fired boilers being known, the value of all the steam generated by the entire boiler plant, less the total cost of operating the plant, can be credited to the furnace department. In his opinion valuing furnace gas on the basis of the steam or kilowatt-hours produced would be more accurate than a valuation on a B.t.u. basis. Blast furnace gas has no tangible market value. Due to the large quantities required to furnish an appreciable amount of energy it is necessary to use the gas within a reasonable distance of the furnace. To compel the utilizing department to locate apparatus to favor the furnace and then charge the gas at a B.t.u. value does not seem reasonable. Also, when furnace gas is burned under boilers the boiler efficiency, he said, is reduced. On a B.t.u. basis he believes that furnace gas to-day is probably twice as valuable as it was two years ago and that the price of a kilowatt-hour as generated or purchased has not increased to as great an extent.

Pittsburgh and Nearby Districts

The Huessener Engineering Co., Oliver building, Pittsburgh, has recently booked orders for five boilers for the E. & G. Brooke Iron Co., Birdsboro, Pa.; four for the Delta Chemical Co., Wells, Mich.; a repeated order for Ella Furnace Co., West Middlesex, Pa.; five boilers for the Hanging Rock Iron Co., Hanging Rock, Ohio; two for the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., and five for the Union Furnace Co., Ironton, Ohio. The Huessener Engineering Co. has taken up the manufacture of burners for puddling furnaces, brick kilns, etc., and so far has received orders for burners for puddling furnaces for the Kittanning Iron & Steel Co., Kittanning, Pa., for drag furnaces for the Buffalo Bolt Co., Buffalo, and for brick kilns for John H. Ward & Son, Pittsburgh.

The county commissioners of Pittsburgh have awarded a contract to the Van Dorn Iron Works, Cleveland, for steel furniture for the Law Library in the new City-County building in Pittsburgh, for the sum of $29,238. The Canton Art Metal Co., has received a contract for steel furniture for the same building, amounting to $2796.

The Virginia Chain Co. has been organized with a capital of $40,000 to operate a chain factory at Parkersburg, W. Va. The incorporators are John Marshall, C. D. Forrer, M. E. Heihle, E. A. Brast and J. W. Romine.

The Pittsburgh Knife & Forge Co., Pittsburgh, recently bought considerable ground adjacent to its plant on which it will make some large additions and considerably increase its capacity.

The Jennison-Wright Co., Toledo, Ohio, manufacturer of Kreolite wood block flooring, has opened an office in charge of S. C. Conway in rooms 501-502 Keystone Bank Building, Pittsburgh.

FOUNDRY CONVENTIONS

Joint Opening Session at Boston, Monday, of the Two Foundry Associations

The movement to establish satisfactory cost accounting in the foundry industry is gaining considerable headway, judging from the presidential address of J. P. Pero of the American Foundrymen's Association at the opening session Monday afternoon, Sept. 24, in Paul Revere Hall, Mechanics Building, Boston. Mr. Pero, who is identified with the Missouri Malleable Iron Co., East St. Louis, explained that the association's committee on foundry costs had completed arrangements with a firm of accountants to install a simple, practical and efficient cost system in the plants of the members who wish to become subscribers to the foundry cost movement. It was gratifying to the association, he said, and to the committee, of which Vice-president Benjamin D. Fuller is chairman, to report 102 subscribers to this system and a total subscription of over $7,000.

Mr. Pero's address as well as that of Jesse L. Jones, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., president American Institute of Metals, were features of the session, which as has been the custom for some years is a joint one of the ferrous and non-ferrous technical bodies, signalizing the beginning of foundry week as it may be called. The two associations are holding simultaneous sessions and at the same time is an exhibition in Mechanics Building of equipment and supplies for foundry and machine shops.

President Pero's Address

At the outset of his address, Mr. Pero linked himself with some interesting foundry association history. "Previous to this meeting, he said, "we have held but one convention in New England, at Boston in 1902, fifteen years ago. Fifteen years before the Boston convention, and nine years before the first convention of the A. F. A., the New England Foundry Foremen's Association was organized in Springfield, Mass., in 1887. That, so far as I have been able to learn, was the first association of this kind ever organized. It numbered in its membership the leading foundry foremen of that period in New England, some of whom are here to-day, while others are represented by their descendants. It was my good fortune to conceive the idea of such an association, perform the preliminary work for the first meeting and preside at the opening session of that, the first association organized for the purpose of interchange of views and experiences in foundry practice and for the general uplift of the foundry trade. I do not make this statement in a spirit of egotism, but merely to relate an interesting fact in the history of the industry and to explain to you the pleasure and pride I feel in occupying the highest office in this great organization."

"As foundrymen," he continued, "we point with pride to the wonderful progress made in foundry practice in the past twenty-five years, and as members of the A. F. A. we are justly proud of the prominent part our society has played in contributing to the present state of excellence. We have accomplished much, but I predict that those of you who attend our session twenty-five years hence will marvel at the gigantic strides made during that period, even as we now in retrospect wonder at the progress already made."

THE MATTER OF APPRENTICES

He spoke also on the apprentice problem, in part as follows: "One of the supposedly important features of progress during the past twenty-five years in the foundry, as well as in other industries, is known as specialization; but specialization, like many other seemingly good things, has its limitations, and we are at last beginning to realize that specialists are not thorough mechanics. As a consequence, we now face a problem of the utmost importance. It matters not to us whether the present condition has been brought upon us by the desire of the employer for increased production, or decreased cost, or both, or whether the attitude of the labor unions in restricting the number of apprentices is responsible for existing conditions. This we know, that unless steps are taken to make the foundry industry more attractive to our young men and an efficient system of training and indenturing of our apprentices is adopted, we will have very few capable all-around molders in the next generation." He counted much on the work of the committee representing the association on the Conference Board on Training of Apprentices.

Address of President Jones

Mr. Jones, in his address, mentioned the progress made in non-ferrous technology since the beginning of the war. "Possibly I may safely assert," he said, "that greater advances have been made in that time than in the previous decade. Foremost I may mention the commercial production of electrolytic zinc. Previous to the war the market for high-grade zinc was rather narrow. With the placing of munitions contracts which called for brass with less than 0.1 per cent lead, the demand was greatly augmented and the price mounted rapidly as the firms making high-grade zinc by distillation processes did not have the capacity to supply the unusual market. This resulted in a number of firms engaging in the manufacture of electrolytic zinc, it even being found profitable to cast anodes from prime western spelter and electrolytically refine them. In some cases a purity of 99.98 per cent has been obtained. It will be interesting to users to see whether the electrolytic zinc is able to compete in purity, uniformity and price with the high-grade distilled zinc. If the two processes give equally good results there should be a broader market for high-grade zinc after the war, when prices are lower and supplies abundant. The thin, tough coating that this grade of zinc gives warrants its extensive use in hot galvanizing. It can also be used advantageously in high-grade manganese bronze, aluminum alloys, sheet brass, die cast alloys, etc."

"Instead of the production of electrolytic zinc cathode sheets," he continued, "the product can be converted into zinc dust. As this zinc dust is very pure, it opens the way for improvements in the sherardizing process, the purer the zinc coating on an iron or steel article, the better it will be protected from corrosion.

"The production of electrolytic zinc has resulted in the accumulation of large amounts of slimes or residues high in cadmium. Electrolytic cadmium has been produced experimentally from these slimes and I would suggest active research work in developing new uses on a large scale for metallic cadmium.

ELECTROLYTIC TIN

"Quite recently the production of electrolytic tin has been announced. The difficulty of obtaining Straits tin makes the advent of the electrolytic tin doubly welcome. In the electrical industry, in particular, extremely pure tin is essential as the connectors of electrical apparatus are its most vital parts and require the use of the highest grades of tin obtainable.

"The demand for alloys for aeroplane work has brought magnesium into prominence. This metal, which came entirely from abroad, can now be had in any desired amount from American makers. The extreme lightness of its alloys with aluminum, the high speed at which they can be machined and their relative cheapness bulk for bulk should result in a constantly increasing demand for magnesium.

"The scarcity and high price of antimony has led to the development of a novelty in the shape of electrolytic babbitt. This contains no antimony or tin necessarily, but consists of lead hardened by small amounts of the alkaline earth metals—barium, calcium, etc.

THE CRUCIBLE PROBLEM AND THE ELECTRIC FURNACE

"The crucible makers of the United States have been much handicapped by inability to obtain the Ceylon graphite and Klingenberg clay they formerly used. One prominent manufacturer when asked if any trouble was being had with his goods replied epigrammatically, 'Wherever you find a crucible maker in these days, you find a man very much chastened in spirit.' With characteristic American energy and ingenuity, however,

they have already so adapted the clays and graphite which are available that very fair results are being obtained except possibly on the larger sizes of crucibles.

"The high price of crucibles has led to the very rapid extension of electric furnace melting for nonferrous metals. Both the carbon resistor and induction type of furnace seem to be doing satisfactory work in melting brass for rolling into sheets for cartridge cases, etc. For foundry work where light castings are run and hot metal required not so much progress has been made. The use of the arc type furnace by a number of manufacturers for the making of tempering alloys or hardeners may also be noted. These alloys are used for the introduction of small amounts of high melting point metals into aluminum alloys and the various bronzes.

CAST COPPER FOR SHELL BANDS

"Recently, when the demand for copper driving bands was so urgent that the tube mills could not meet it, a number of foundries succeeded in producing very satisfactory copper castings for this purpose. When rolled into bands, physical characteristics equal to those found in the drawn tubes were obtainable. In the opinion of many ordnance experts these bands because they are rolled radially are superior to those cut from tubes which are drawn lengthwise. The greatest care is required in order to obtain copper castings that will be sound and clean."

Mr. Jones said that the American Institute of Metals had 282 active members and 64 associates, which includes 28 corporation memberships, each having three members. The last two members received are Dr. H. M. Howe and Sir Robert Hadfield. The association has decided to issue a quarterly journal instead of the annual volume of proceedings. Dr. Paul E. Merica, Washington, D. C., is the editor.

Official Reports

The report of the board of directors told of the financial success of the foundry and machine exhibition at Cleveland last year, the first undertaken by the American Foundrymen's Association itself. A final profit of $6,829.60 was shown. A refund was made to the exhibitors of 10 per cent of the cost of their space. Also, $1,000 was transfrered to the technical department of the association and the American Institute of Metals was awardd $166.50, the distribution being based upon the proportionate registration of the two organizations at Cleveland. In addition to the exhibition profits the unexpended portion of the entertainment fund subscribed to by foundrymen of Cleveland and vicinity, manufacturers of foundry equipment and supplies, etc., amounting to $335.86 was contributed to the American Foundrymen's Association for research work.

Through the year the board moved to organize a nonferrous section, either by absorbing the membership of the American Institute of Metals, or separately, if such amalgamation cannot be effected. Later a committee appointed to perfect an amalgamation reported that the American Institute of Metals had decided not to lose its identity by merging with the American Foundrymen's Association. It was voted that from the 1917 exhibition and thereafter no distribution or appropriation for technical activities be made from exhibition profits to the American Institute of Metals, but that the latter organization share in the entertainment privileges the same as in the past.

A plan was approved which provides for the raising of a fund to be subscribed by the members of the Association participating in the work of the foundry costs committee and the employment of a cost expert to prepare a uniform system of cost accounting to bear the endorsement of the American Foundrymen's Association, Inc., and which is to be installed personally by the cost accountant to be employed by the cost committee. Propositions covering this work were received from Scovell, Wellington & Co., Boston, C. E. Knoeppel & Co., New York, and Searle & Nicholson, New York.

The board, following out the recommendation of the Cleveland meeting, adopted the Government standard for sieves as prepared by the U. S. Bureau of Standards.

Secretary-Treasurer Backert, in his annual report, mentioned that the membership in the fiscal year ended June 30, 1917, passed the 1000 mark, the enrolment on that date being 1017. The actual paid membership was 970, a gain in paid membership for the year of 5½ per cent. He told of the transition in a year from an unincorporated voluntary association to an incorporated organization. Membership is now individual and not by company, as heretofore.

Electrochemists and Electric Manufacture of War Supplies

One of the features of the fall meeting of the American Electrochemical Society at Pittsburgh, next week, Oct. 3 to 6, will be a session devoted to the application of electrochemistry and electric furnaces to the manufacture of war supplies and munitions. Some of the society's members, who have been active in the advisory work in connection with national preparedness, have been asked to take part in this meeting. It is expected that it will prove one of the most interesting features, being both patriotic and scientific.

There will be the usual reading and discussion of papers on the mornings of Thursday and Friday. The afternoons of those two days will be devoted to excursions to various industries, including the American Zinc & Chemical Co., Langeloth, Pa.; the research laboratories of the Youngstown Sheet & Tube Co., Youngstown, Ohio, and the American Sheet & Tin Plate Co., Pittsburgh; the new building of the U. S. Bureau of Mines, the Mellon Institute of Industrial Research, the Republic Chemical Co., Neville Island (detinning of tin scrap), and various by-product coke ovens. Saturday is devoted to an all-day excursion on a special train with a complimentary luncheon, visiting the Westinghouse Electric & Mfg. Co., East Pittsburgh; the National Tube Co., McKeesport, and the large 25-ton electric furnace making steel at the Carnegie Steel Co.

Alexander Dow, president Detroit Edison Co., will deliver an address on Thursday evening on the "Production of Steam from Coal," illustrated by lantern slides. This is regarded as of special interest because of the attention which has been given the subject on account of the shortage of water power at Niagara Falls and the possible necessity of some industries there seeking additional sources of power.

Large Imports of Manganese Ore

Manganese ore imports continue large. For July they were 53,437 gross tons, bringing the total for the year to Aug. 1 to 370,227 tons, as compared with 318,965 tons to Aug. 1, 1916. The present import rate is now 52,889 tons per month, comparing with 52,779 tons per month to July 1, 1917. Unless the monthly rate increases for the rest of the year, the total for 1917 will fall short of the total for the fiscal year by about 12,000 tons. It will be 634,668, as compared with 656,088 tons. The total for 1916, however, was only 526,525 tons, which will be exceeded this calendar year.

The Indianapolis Chamber of Commerce has opened a branch office in Washington for the convenience of the Government when seeking information concerning the facilites of Indana manufacturers for makng war material and supplies. The chamber is completing a survey of the state, so as to have a list of every plant capable of assisting the Government in this direction. The general plan is to have large manufacturers take large contracts and sublet to smaller companeis. All the machinery has been listed. The survey shows that in Indianapolis alone more than 200 plants can manufacture war supplies. In order to pay the bureau expenses the Indianapolis Chamber of Commerce is to get a per centage commission on contracts secured through its bureau for Indiana manufacturing plants.

The Poole Engineering & Machine Co., Woodberry, Md., has asked bids on a gun shop to be built at Texas, Md., to cost about $500,000.

Steel Prices Are Fixed by Agreement

(*Continued from page 757*)

though somewhat less on finished products than we thought they should be. We believe that these rates will stimulate business throughout the country, and doubtless can be maintained. We were also very much pleased at the reception accorded steel manufacturers by the War Industries Board, who certainly conveyed the impression to us that they wish to do the right thing for steel makers."

An official of one of the leading steel companies had the following to say: "The prices fixed by the President for steel will be accepted loyally by the manufacturers, even with the knowledge that such prices will bear heavily on many mills not entirely self-contained. The President, however, has opened the door for a revision if such a result is shown necessary, by limiting the time to Jan. 1, which gives evidence of his intention to be fair. Whether the prices will bring out a maximum tonnage, with the scarcity of labor, shortage of cars and excessive cost of necessary supplies, can only be determined later. The enormous tonnage required by our Government and Allies, and demanding priority shipment, will probably restrict to a large extent the production of commercial steel, both domestic and foreign."

Differentials from Base Prices

The vice-president of one of the larger steel companies in the Central West gives his ideas as follows:

"It is believed that the prices announced by the authority of the President are in some particulars higher than those which he had in mind before he learned the results of the conference, and it is gratifying to the manufacturers who presented the figures to know that the President believed their statements, as very little change has been made in the figures announced from those submitted as the product of the best judgment of the iron and steel manufacturers. The iron and steel trade is to-day rapidly adjusting itself to the radically changed conditions, feeling that business has been stabilized and put in the best possible shape to meet the war demands.

"A great many adjustments are to be made, of course, such as the establishment of location bases where the base prices will apply and also the establishing of differentials in the varied line of products which grow out of the base articles from iron ore up. The price on iron ore is based upon the 1917 price of non-Bessemer Mesaba ore, f.o.b. Lake Erie docks, and the various grades of ore will take their places in the price list with reference to the base ore. What may be understood by the base price on coke is the maximum price on the best qualities, with a possibility of lower prices for the inferior grades. The price of pig iron seems to be based upon the value of basic and No. 2 foundry irons. Differential prices will be made on one side of the line, possibly for gray forge; on the other, for standard Bessemer, malleable Bessemer, low-phosphorus, ferro silicon, etc. It is presumed that much of this work will be prepared by the committee of the American Iron and Steel Institute, subject to approval of the Governmental board passing upon the main subject.

Many Contract Prices Adjusted

"Many contracts for iron and steel automatically have their prices adjusted upon receipt of the President's decision in the matter, because much iron and steel is sold upon prices which are established from month to month. Concern is expressed in some quarters as to the validity of contracts for many of the products made recently at high prices and it is very reasonable that doubt should be expressed as to the permanency of such contracts. But a few weeks ago, few steel men realized that they would come to agree with the President that the people should be entitled to the same price for their products as might be granted to the United States Government and its Allies, yet, on Friday, the idea of the President was adopted unanimously. The same people can just as reasonably say to-day that the Government cannot abrogate contracts which in its view may interfere with bringing out the greatest volume of product and still we may look forward to some adjustment being brought about in these things also, just as reasonably as we can look back to the process by which many of our ideas were upset by the conclusion of last Friday's meeting in Washington.

"The broad principle to keep in mind at all times is that the winning of the war is the main thing for all people to strive for whatever sacrifices are necessary in the judgment of the President to bring that about."

Security Values Should be Sustained

Isaac M. Scott, president Wheeling Steel & Iron Co., Wheeling, W. Va., a large producer of ore, coal, pig iron, Bessemer steel, steel pipe and tin plate, states that in his opinion the Government prices on steel while lower on several items than expected are in the main, fair and acceptable to the steel industry. The prices named will allow the self-contained steel mills to realize good profits, and place them in position to contribute in the form of excess profits a good part of the expense of the Government in prosecuting the war. The knowledge that Government prices would be very much lower than the premium prices obtaining for so long has been in possession of the steel trade for a long time, and the prices named have been largely discounted for some weeks in the stock market. The prices should really prove a strong factor in sustaining stock values, and are not to be regarded in any way as a bear argument.

W. S. Horner, president National Association of Sheet and Tin Plate Manufacturers, Oliver Building, Pittsburgh, and director of the American Rolling Mill Co., Middletown, Ohio, gives his views as follows: "The statement from Judge Gary given out on Monday evening reflects my views on these prices, which I believe to be eminently fair to the pig iron and steel producers, also to the Government, its Allies and domestic consumers as well. The pledge of the manufacturers that wages will not be disturbed and the highest possible maximum output be secured shows clearly the absolutely friendly relations existing between the steel trade and the Government. It bespeaks for the Government the strong support the steel trade can give it in the matter of turning out war steel, best delivery and the closest co-operation that can be given. The new prices are bound to stabilize the steel business and place it on a safe basis."

Views from Chicago

CHICAGO, Sept. 25.—The steel industry is to-day in a chaotic state. Men everywhere are giving voice to conjecture, doubt and divergent views in their effort to absorb the full import of the news on price fixing from Washington. Local mills have wired their branch offices not to quote on plates, shapes and bars, although the action was not based on any intention of immediate revision of prices, but on uncertainty. Branch offices of Eastern mills are anxiously awaiting advices from headquarters. Meanwhile they will not sell. Sales managers are being deluged with questions, many from consumers wanting to know about the operation of contracts under the new regime. Although it has been many times stated that the new prices are for the general public, as well as for the Government and its allies, the statement is not unanimously accepted and will not be until the official text is received. It was noted by some that telegraphic reports said the new prices should be made to private consumers not that they shall be made, it being pointed out that the imperative was not used. It is asserted that self-contained mills can do well at the new prices, and it is a fact that representatives of the larger interests are not finding fault. The representative of a mill which buys its pig iron, large quantities of scrap, etc., said:

"We would not complain if the new prices were for the Government and its allies, even in view of another wage advance, but how is it fair to us who must enter the open market and buy pig iron while other companies control both ore and iron? The mills owning ore have an advantage because they can keep wages up. They have a profit before we can start. In dull times

the smaller mill has the advantage because it can pick up cheap iron and scrap here and there and does not have the big overhead of the larger mill to carry. We will not quote pending some clearing of conditions."

The executive of a large independent mill said: "From the point of view of the self-contained steel company the price is fair to the Government. Of course these prices would mean a much lower yield, yet we would be satisfied if we could operate at their levels indefinitely, provided costs do not advance much beyond their present levels. On Oct. 1 we shall advance wages 10 per cent."

Arguing that if the new prices were for the Government and its Allies alone, the public would suffer, a steel man pointed out that it was not the purpose of the Government to inflict hardship on the private consumer, but to help him with the low rate applying to the Governments.

New Prices for Best Interests of All

The representative of a manufacturer using large quantities of steel took an optimistic view as follows: "In the long run the new prices will be in the best interests of the steel manufacturers as well as all buyers, as steel prices were getting to a point which inflicted a great hardship to various leading industries. If the rise had not been stopped, it would have eventually brought disaster through the collapse of the entire manufacturing activity. Lower prices mean additional activity for the implement manufacturers, car builders and various other industries. The building trade can now afford to buy freely. Incidentally, "I do not believe," he said, "the mills are so completely sold up as has been intimated. The railroads have been unable to buy cars, but they can do so at the new prices. In individual cases the new figures will work some hardship, but it is to be remembered that policies must not be fixed for temporary effect but for ultimate results. The prices fixed are to my mind fair to producer and consumer and if not mandatory will do more harm than good. The crux of the situation is that the United States is at war and every individual must govern himself accordingly. Sacrifices for the common good must be made. Prices of commodities other than those named I believe will work out automatically. If pig iron is low, scrap will adjust itself. Of course those who are loaded up with scrap will suffer. So far as possible contracts should be readjusted. I believe the Administration has handled the situation in admirable fashion by beginning at the foundation. For the moment there is no business in highly finished products."

Implement Makers' Views in the Making

In the absence of the executive chairman of the National Implement and Vehicle Association, General Manager E. W. McCullough did not care to talk at length in view of the questions yet to be settled. The executive chairman has been in Washington and will reach Chicago Sept. 27. There is some question whether the price fixing will materially help the implement manufacturers, one reason being that most of them are covered for the remainder of the year, another being that it may make deliveries more difficult to procure and deliveries are regarded as more important than price. Many industries which have been practically out of the market will seek bars. Mr. McCullough said that the implement makers would come in Class B, designated by the War Industries Board to include industries indirectly related to the war and as such entitled to some preference. He said the 2.90c. base was of course more attractive than what they had been paying.

A company making rail carbon steel bars and shapes states that it already has refused to make any changes in its contracts and will await developments before making further quotations.

Prices Not Yet Regarded as Maximum

An executive of a large local mill said the prices had been fixed on certain basic products and that inasmuch as Judge Gary has said the prices are fair, they should be so considered. He believed the ultimate working out of the agreement would be beneficial to the small mills doing a finishing business. Deliveries will continue to determine prices, where products are difficult to procure. A man wanting sheets, for instance, will pay the asking price if he must have them.

Warehouse Prices

A representative of Joseph T. Ryerson & Son stated that his company was waiting for definite information. Business was good, but their stocks were not up to normal, nearly all sizes being badly broken.

A representative of A. M. Castle & Co. said that in his opinion the jobbing warehouses would continue to get material where, when and at what price they could, acting as clearing houses for the trade. To keep their stock at its allowable minimum level they had been compelled to pay bonus prices and to get material from all sources including other warehouses. Their prices to the consumer are predicated on what they themselves paid and their interpretation of the new prices is that they apply to the mills. The company's contracts will be filled on the original basis for the reason that the material involved has been bought and it is coming forward. With the mills filled with orders for months to come it does not appear that the public will derive immediate benefit from the new prices, at least that portion of the public which buys in small lots.

No pig iron was sold to-day. From the representative of the leading producer, no statement was forthcoming. Many consumers of iron wanted to know where they stood with regard to their contracts, also if contracts for castings based on pig-iron prices would be affected. The general belief was that contracts would be subject to no change. So many ramifications presented themselves that sellers decided merely to sit tight and await further information. The agent of the leading Southern producer was informed that his company had no iron to sell, which can be interpreted to mean they also were waiting. It was admitted that any attempt to revise contracts would result in a mass of confusion. Yet most of the iron people asserted that once the plan gets working, it will be a good thing.

In scrap there is no market, all prices having been shattered, and prominent dealers said there must be a complete readjustment. It is not expected that contracts will be changed, although there may be some annulments through subterfuge of rejection. It is believed the mills will agree on a reasonable price, probably about $25 in the East and $22 in the West for melting steel. Unless the price is made reasonable, scrap will not come out. All prices of a week ago were held to, though considered strictly nominal, this applying to iron and steel, both from first hands and jobbers.

Co-operative Regulation with Government Approval

CLEVELAND, Sept. 25.—Chairman John A. Topping of the Republic Iron & Steel Co., who is in Cleveland to-day, made the following expression: "The steel settlement as I see it will have a wholesome effect on the steel business because the principle of co-operative regulation has been established with Government approval. Of course, present abnormal profits will be substantially reduced but a runaway market condition has been prevented and prosperity extended. Furthermore, stability in future values should be conserved by providing a basis for orderly liquidation for the post-war period."

Superior Steel Corporation Earnings

The Superior Steel Corporation, Union Arcade Building, Pittsburgh, works at Carnegie, Pa., has declared an initial dividend of $1.50 quarterly on the common stock, payable Nov. 1. Earnings for seven months to Aug. 31, averaged better than $250,000 monthly. Orders ahead fully justify the belief that for last five months of year they will exceed this figure. Company's cash position is strong and raw materials are contracted for at favorable prices. Dividends of $8 per annum are being paid on first and second preferred stocks and in addition the company has retired about $1,000,000 of the preferred stocks this year out of earnings. It is known several directors favor a distribution on the common at this time.

RECORD-BREAKING WAGES

Steady Upward Trend in the Youngstown District Mills

YOUNGSTOWN, OHIO, Sept. 24.—Rollers are now earning on an average about $700 a month and correspondingly high wages are paid to all of the other iron and steel mill workers. The puddlers are earning $13,30 a ton, and it is recalled that the prevailing rate for boiling was as low as $3.50 a ton in Pittsburgh and the Mahoning Valley in 1893.

One of the good signs during these prosperous times is that the steel workers, sheet mill men and puddlers are saving their money, placing their cash allowance over and above living expenses in the sound savings banks of this city, buying good gilt-edged Government bonds and purchasing homes. Many a mortgage has been burned during the past two years and homesteads released from debt.

While iron and steel workers agree that wages are good—higher within the past two years than ever before in the history of the trade in America—yet they point to the lean years and low wages that came regularly at intervals before 1914. From 1893 to 1899, times were backward throughout the country and mill work was poor in the Mahoning Valley. Then came such consolidations as the Republic Iron & Steel Co., and later the United States Steel Corporation. In the autumn of 1900, the Youngstown Sheet & Tube Co. was incorporated. From that time on, the steel trade has not had such violent changes. Only two bad strikes in the sheet industry within the past decade have occurred to mar this record.

When the European war broke out, steel manufacturers turned to the manufacture of shrapnel bar. Steel billets used in ammunition making brought a high price at the mills. This making of steel into ammunition caused a shortage for the manufactured product and sheet and tinplate plants suffered, many being closed down at intervals. To help the situation, about three years ago sheet and tinplate workers took a reduction amounting to about 14 per cent, so as to keep the mills going.

Bi-Monthly Examinations

However, for the past two years, business in these departments has been good. Much of the prosperity of the men is due to the bi-monthly examinations of the sales sheets of the big mills, which provide a schedule of wages based on the selling price of bar iron, steel sheets and tinplate. This plan was first inaugurated many years ago to give iron and steel workers the benefit of a rising market; also to adjust wages in a declining market, this being considered the most equitable basis on which to fix a just compensation for the toilers, as well as protecting the mill owners.

The present princely wages of sheet and tinplate workers, which have risen more than 32 per cent within the past three months, are caused by the demand for sheet steel and tinplate, due largely to America's plunge into the war requiring the building of ships and cantonments, increasing the manufacture of auto trucks and supplying cooking utensils for the military camps.

When the existing wage scale of the Amalgamated Association of Iron Steel and Tin Workers with the manufacturers was agreed upon, the base rate for sheets in the market was fixed at $2.15 a hundred pounds. With tinplate, $3.50 for a box of 100 lb. was the base. The base rate for the bar iron scale was a 1c. card. The reason for the wage advances can be clearly understood with August 30, 1917, examination showing that bar iron was selling on a 2.75c card; on Sept. 10, steel sheets were selling on an average 5c. card, and tinplate was selling at $7.75 a box of 100 lb.

The following compilation shows how the wages of sheet and tinplate workers and puddlers have advanced under the 60 days settlements through 1916 and 1917:

Jan. 14, 1916, sheet workers received advance of 2 per cent; no change in the wages of tinplate workers.

Puddlers wages were based on a 1.40c card which entitled them to $6.90 a ton during January and February of that year.

The next settlement, in March, gave sheet workers an advance of five points, or 7½ per cent, and tinplate workers 3 per cent. Bar iron was selling on a 1.85c. card, which entitled puddlers to $8.80 a ton.

On May 10, 1916, sheet workers received an advance of 7½ per cent and tinplate workers none. The wages of puddlers increased to $9.30 on a card of 1.95c.

In July of the same year, the next examination gave sheet workers 6 per cent advance, while tinplate workers received 8 per cent. Sept. 10, the examination gave sheet mill workers an increase of two points and tinplate workers 3 per cent. Puddlers' wages advanced to $9.55 a ton on a 2c. card.

Nov. 10, 1916, sheet mill workers received an increase of 1 per cent. Tinplate workers got the same wage concession.

More Increases Come

At the examination held Jan. 10, 1917, sheet workers' wages were advanced one point and tinplate workers' 3 per cent. The wages of puddlers advanced 75 cents a ton, on a 2.15c. card.

At the following examination March 10, the wages of sheet mill workers jumped 15 per cent and tinplate workers about 14 per cent. Wages of puddlers advanced about $1 a ton, on a 2.35c. card.

It developed in the examination of May 10, 1917, that sheet workers were entitled to an increase of 15 per cent and tinplate workers to about 16 per cent. At the following examination July 10, sheet mill workers drew an increase of 16½ per cent and tinplate workers 22 per cent. The wages of puddlers advanced to $12.30 a ton.

At the August, 1917, examination puddlers' wages advanced to $13.30 a ton, on a 2.75c. card. Tinplate workers received Sept. 10 another increase of 16 per cent and sheet workers 16½ per cent. Wages of sheet mill workers were found to be 89 per cent above the base at the close of the September examination.

During the Civil war when iron was selling as high as $168 a ton, puddlers received for a few months from $8 to $9 a ton. It was not until May, 1916, that this rate was exceeded by puddlers of the present day. Iron workers of long ago recall that the nailors, the men who ground and took care of the knives in the nail machines, where cut nail factories were maintained, were considered the proud princes of the trade in their day. Nailors received as high as $18 and $20 a day. Then came the guide mill rollers in charge of two and three mills, earning from $50 to $60 a day at a period when money counted for much more than to-day. In the eighties there came a strike which did away with the two-job system and then the rollers had their earnings reduced correspondingly.

News of the Labor World

A special bulletin has been issued by the Industrial Commission of Wisconsin to employers of the State, which calls attention to the fact that poor shop lighting is one of the principal causes of accidents and results in much waste and inefficiency. The bulletin gives shop superintendents information regarding good lighting at minimum expense, and urges that adequate natural light be provided to avoid use of artificial illumination during the day-time.

Riveters at the plant of the American Bridge Co., Edge Moor, Md., have received an increase of four cents per hour.

The Pennsylvania & Reading Railroad has advanced the wages of shop employees at its Rutherford, Pa., shops two cents an hour; piece work men at the shops will receive an increase of 6 per cent on earnings.

The Philadelphia & Reading Railroad has advanced the wages of employees at its Reading, Pa., shops from one to three cents an hour. About 3000 men are affected.

The Pennsylvania Railroad is now employing a number of women at its shops at Todd's Cut, near Wilmington, Del., as machinists' helpers. The local plants of the Pullman Co. and the Eastern Malleable Iron Co., in the same district, are also engaging women for shop work formerly handled by men. At both

plants the women are being trained to execute the lighter branches of work in the machine shops. The du Pont Powder Co. has arranged for the employment of more than 200 women at its Carney's Point plant.

The Aluminum Goods Mfg. Co., Manitowoc and Two Rivers, Wis., and Newark, N. J., has posted notices in its three plants that the company will continue in force the policies of all employees who may be called to serve in the new National army, which were presented to them last April, under the group insurance plan. The company will continue to pay the premiums and in case of misfortune, the full amount of the policy will be paid to the specified beneficiary.

The Aluminum Castings Co., Manitowoc, Wis., has filled the depleted ranks of its foundry force with girls and young women, about 25 of whom now are employed at core-making.

About 75 of the 100 machinists employed by the P. H. and F. M. Roots blower works, Connersville, Ind., went on strike, Sept. 17, after waiting two weeks for a 10 per cent increase in wages. The company is holding conferences with its former employees.

The General Fire Extinguisher Co., Providence, R. I., has taken out group insurance for about 1400 employees. The employees will be covered for $500 each after six months' service, $600 after the first year, and $100 additional each year thereafter.

The strike of puddlers at the plant of the Reading Iron Co. has recently been settled by advancing the wages from $9.75 to $11 per ton. When the men went on strike they demanded $11.50 per ton and later increased this to $12 per ton.

The John Wood Mfg. Co., Conshohocken, Pa., has voluntarily advanced the wages of employees about 10 per cent, to extend over a period of six months.

The E. I. du Pont de Nemours Co. has increased the wages of all employees at its Gibbstown, N. J., plant 10 per cent. This is the third advance in wages at the works in two years, besides a special bonus allotment.

About 300 employees of the Morse Chain Co., Ithaca, N. Y., declared a strike, Sept. 18, with demand for higher wages.

Chrome Ore Shipments from California

There has been considerable activity in the production of chrome ore in the West ever since the war started, California being the largest producer. Oregon and Wyoming have mined small amounts, with a small production coming also from Canada and Maryland. The most accessible California fields were worked in 1915 to nearly their fullest extent, and 1916 practically exhausted all the easily accessible chrome deposits in that State. This year, however, some other deposits have been opened up, notably those in Del Norte county, which have been recognized for some time to be the largest deposits in the State. It is a difficult matter to transport the ore there by trucks or teams to seaboard, the port being Crescent City, which has no rail connections. The ore must be hauled down from this port to San Francisco and then by rail to the Eastern consumers and the mining, hauling and transportation is a serious problem. R. D. Adams of San Francisco is working the Del Norte chrome deposits and it is estimated that there are at least 7000 tons of this valuable ore in the deposits, which will be shipped out this year.

The McLain Carter Furnace Co., Milwaukee, has been organized by David McLain, 705 Goldsmith Building, Milwaukee, inventor of the McLain system of manufacturing semi-steel. The capital stock of the new company is $5,000, and the objects are to design, construct and market open-hearth furnaces and other melting devices and appliances. Frank Carter, Fred G. Schmidt and Earl F. Rosendahl appear as corporators with Mr. McLain, who has been engaged in the practice of foundry engineering for several years.

OBITUARY



G. BURTON HALL

G. BURTON HALL, for 15 years an official of the Cortland Grinding Wheel Corporation, Cortland, N. Y., died Sept. 19, after several months' illness with pernicious anemia. He traveled extensively in the interests of his company, forming many of the selling agencies now connected with the company. His first territory previous to 1909 was in the Southern States, but for the last eight years he had worked in Western territory, covering Duluth, Denver, St. Louis, Detroit and other centers, with headquarters at Chicago. The interment was in Springfield, Mass.

RUSSELL DALE, for the past five years manager of sales of the Rich Tool Co., Chicago, died Sept. 22 from the effects of a bullet wound inflicted by a negro employee of a garage in Chicago. Mr. Dale had occasion to reprove the negro who, without warning, got a revolver and fired. Prior to being connected with the Rich Tool Co., Mr. Dale was Chicago manager for the Carpenter Steel Co. He was 43 years old, and leaves a wife and one daughter.

RICHARD BIEFELD, vice-president Otto Biefeld Co., Watertown, Wis., and for more than 25 years prominent in the structural iron and boiler manufacturing industry of the Northwest, died Sept. 14 after a long illness. He was born in Saxony, Germany, on Aug. 16, 1859, and went to Watertown with his brother, Otto, in 1882, in which year the present Biefeld shops were established.

JOHN W. STODDARD, 79 years, a lifetime resident of Dayton, Ohio, died at his home in that city Sept. 18. He was president of the Dayton Automobile Co. until the time of its absorption by the Maxwell Motor Car Co. At one time he was also president of the American Stoker Co., Dayton, and at the time of his death he was a director in several prominent Ohio manufacturing firms.

WILLIAM WALLACE MELVIN, 76 years old, a resident of Brooklyn, N. Y., for 45 years, died Sept. 16 of heart failure at his home in that city. Mr. Melvin was born in Elizabeth, N. J., and was for 51 years connected with the sales department of the New Jersey Zinc Co.

A Patriotic Company

All of the officials of Coleman-Shoemaker-Mead, Inc., Philadelphia, dealer in new and rebuilt machinery, and five other important men have voluntarily entered the service of the United States and the company will suspend its business after its present stock of machinery has been disposed of. In addition to the general machinery business carried on by the company, it is district representative of the Ames Iron Works, which will carry on its business in the office now used by Coleman-Shoemaker-Mead, Inc., until the end of hostilities, at which time it is the intention of the Ames Iron Works to have its present representative resume that relation. The shop at Tacony, Pa., will also be closed. The men who have gone into the service are as follows: R. F. Coleman, president, first lieutenant, Ordnance Department; F. F. Shoemaker, vice-president, United States Naval Reserves; C. S. Groove, 3rd, captain, U. S. Marines; Leonard Tissot, quartermaster, U. S. Naval Reserve; Rudolph Leibic, U. S. Naval Reserves; R. M. Harper, machinery inspector, U. S. Naval Shipping Board; Paul Tiers, Medical Corps, Naval Reserves.

SALES CONTRACTS AND THE LAW

Rights of Buyers and Sellers Are Determined by Courts

By A. L. H. Street

Duty of Rescinding Buyer.—A purchaser of machinery is not entitled to cancel his purchase on the ground of fraudulent representations made by the seller's representative, unless he returns or offers to return the machinery at the place where it was delivered to him by the seller. (Kansas Supreme Court, June 9, 1917. Aultman & Taylor Machinery Co. vs. Schierkolk. 165 Pacific Reporter, 854.)

Actionable Character of Machinery Seller's Representations.—The seller of machinery under warranty as to its condition or efficiency is liable in damages for a breach of the warranty, regardless of the fact that the statements in question may have been made in good faith. A representation by a manufacturer that a machine when equipped with certain attachments will develop certain power is actionable, if untrue, it not being regarded as a mere expression of opinion. (Minnesota Supreme Court, June 29, 1917. Helvetia Copper Co. vs. Hart-Parr Co. 163 Northwestern Reporter, 665.)

Buyer's Remedy Against Defect in Machinery.—A buyer of machinery by retaining and using it, after learning of defects in it, waived any right to rescind his purchase when later sued for the price. His only remedy was a counterclaim for the amount necessary to so repair the machinery as to make it conform to the condition it was represented as being in at the time of the sale. (Mississippi Supreme Court, May 14, 1917. Alig vs. Lackey. 75 Southern Reporter, 139.)

Phases of Machinery Warranties.—The fact that a buyer of machinery has signed a memorandum indicating satisfaction with machinery delivered to him is not conclusive against him on the question whether the machinery was in the condition represented by the seller, the memorandum being merely evidence to be weighed against the buyer in case of controversy. Failure of the buyer of a machine to give notice in writing within ten days of discovery of a defect, as required by the contract of sale, does not preclude him from rescinding his purchase on account of defects of which the seller had actual notice. But under a contract calling for a sale of two machines, and expressly stating that the agreement shall be divisible as to each, failure of one to come up to the warranty under which it was sold does not entitle the buyer to cancel as to both, if the other does conform to the warranty and can be used without the defective one. (Washington Supreme Court, June 4, 1917. J. I. Case Threshing Machine Co. vs. Scott. 165 Pacific Reporter, 485.)

Implied Warranties of Fitness of Things for Buyer's Intended Use.—Where a seller of articles, acting at the request of the buyer, undertakes to furnish goods suited to particular use, there is an implied warranty by the seller that the goods will be reasonably well adapted to that use. But where the articles are merely sold by description, without any view to the buyer's intended use of them for any particular purpose, the seller is not liable for any failure of the goods to prove suited to the buyer's needs, if they conform to such description. Hence, if plaintiffs, desiring tubing to be used in a certain oil well, relied upon the judgment of the defendant, as seller, that certain tubing should be used and bought the necessary quantity, failure of the tubing to prove to be appropriate for the intended use gives the buyer a valid claim against the seller. And if the contract called for tubing of certain material and weight, but tubing of lighter weight and inferior quality was furnished by the seller and innocently used by the buyer, resulting in destruction of the well through breaking of the tubing, the seller is liable for the resulting loss. (West Virginia Supreme Court of Appeals, May 23, 1917. Schaffner vs. National Supply Co. 92 Southeastern Reporter, 580.) So the seller of a water pump impliedly warrants that it is reasonably well adapted to the purpose of pumping water, but a warranty that a pump would lift 500 gallons of water each minute from a well was not broken where failure to attain that capacity was due to abnormal conditions and the filling of the well with loose sand which disturbed operation of the pump. (California Supreme Court, May 16, 1917. Smith-Booth-Usher Co. vs. Los Angeles Ice & Cold Storage Co. 165 Pacific Reporter, 430.)

Contracting Parties Must Agree on Terms of Payment.—There was no enforceable contract for a sale of aluminum bars under verbal negotiations, subject to confirmation by letters, where the letters differed on the point as to whether payment was to be made in cash or through sight draft. (New York Supreme Court, Appellate Term,. May 29, 1917. Harris vs. Walker M. Levett Co. 165 New York Supplement, 317.)

Oral Modification of Written Contracts.—A written contract for sale of drill presses, to be delivered May 1, was subject to modification by a later verbal agreement under which the time for delivery was extended to May 10 in consideration of a two per cent deduction from the price originally agreed upon. (New York Supreme Court, Appellate Division, May 4, 1917. Ballard vs. Friedeberg. 164 New York Supplement, 912.)

Validity of Payment to Seller's Agent.—Even if a sales agent was not authorized under his arrangements with his principal to collect for goods sold by him, omission of the principal to object to expressed intention by a customer to make payment to an agent precluded the principal from afterward denying the agent's authority in this respect as against the customer. (California District Court of Appeal, April 3, 1917. Fred Medart Manufacturing Co. vs. Weary & Alford Co. 165 Pacific Reporter, 35.)

Salesman's Authority to Close Contract.—If a manufacturing company, after initiating negotiations to sell iron work to a customer, wrote the latter that it was sending a salesman to call upon him, the company impliedly held the salesman out as being authorized to make a binding contract of sale. (Arkansas Supreme Court, March 26, 1917. Chattanooga Roofing & Foundry Co. vs. Porter. 193 Southwestern Reporter, 797.)

Verbal Explanation of Written Contracts.—Although a written contract for a sale of machinery or other personal property cannot be contradicted as to its plain terms by showing some oral negotiations at variance with such terms, it is always permissible to explain ambiguities in written instruments. Hence, under a written contract for a sale of a "boiler and attachments thereto," oral statements will be received by a court to show what things were intended to be sold under the designation, "attachments." (Georgia Court of Appeals, June 18, 1917. Strickland vs. McElveen. 93 Southeastern Reporter, 24.)

Acceptance of Pipe Sold—Rights of Non-Resident Corporations.—Under a contract for a sale of pipe to be used by a city for waterworks purposes, with provision for testing the pipe to the satisfaction of the water commissioner after being laid, final acceptance of the material by the city cannot be based upon the fact that a representative of the city tested the pipe while it was in the process of manufacture. The statutes of Missouri, which forbid non-resident corporations to do business in the State without first obtaining a license to do so, do not apply to a company having no place of business in the State and merely filling a contract for sale of goods to be shipped into the State, where the contract is fulfilled by loading on cars in another State goods conforming to the agreement. (Missouri Supreme Court, June 30, 1917. City of St. Louis vs. Parker Washington Co. 196 Southwestern Reporter, 767.)

Damages for Refusing to Receive Goods.—Where on a buyer's refusal to receive goods bargained for, the seller is able to dispose of them at once in the market, he cannot hold the buyer liable for enhanced damages resulting from a decline in market values. But, regardless of actual damage, a seller is always entitled to recover at least nominal damages for the buyer's unjustified refusal to accept delivery. (Massachusetts Supreme Judicial Court, June 29, 1917. Centennial Electric Co. vs. Morse. 116 Northeastern Reporter, 901.)

SHIPBUILDERS ARE BUYING

Fore River Plant to Be Greatly Enlarged

Chester and Merchant Companies to Purchase Punch-Shop Equipment—$600,000 Tool Order Placed in Chicago Market

Buying of machinery and machine tools for Government work took another spurt in the past week with the issuing of a list of requirements for a complete new shipbuilding plant to be built by the Fore River Shipbuilding Corporation adjoining its present yard at Quincy, Mass., where torpedo boat destroyers will be built for the United States Navy. The inquiry covers 300 or more machine tools, plate-working machines, hydraulic machines, etc., which will cost about $1,000,000. Another list will follow covering the crane requirements. It is said that 54 cranes, including a good many of the I-beam type for hoists, will be purchased.

Another interesting development of the week was the placing of a blanket order with the Chicago office of Manning, Maxwell & Moore, Inc., by the Minneapolis Steel & Machinery Co., Minneapolis, Minn., which will require about $600,000 worth of machine tools to take care of large shell contracts.

The Chester Shipbuilding Co., Chester, Pa., and the Merchant Shipbuilding Corporation, Bristol, Pa., have issued lists of punch-shop machines, the former list covering 30 machines and the latter 60. Bids have already been taken and orders will be placed soon.

The American International Corporation has opened a temporary purchasing office in the Bellevue-Stratford Hotel, Philadelphia, and will, it is understood, soon place orders for cranes and punch-shop machinery for its shipyard at Hog Island. The Lackawanna Bridge Co., 2 Rector Street, New York, will buy equipment for the plant which it will establish on the Newark Meadows in co-operation with the Submarine Boat Corporation.

The Federal Shipbuilding Co. will issue additional lists soon, covering further requirements, including cranes and machine tools. The Lake Torpedo Boat Co., Bridgeport, Conn., is buying for the Housatonic Shipbuilding Co., Bridgeport, in which Simon Lake, the submarine builder, is interested.

Other shipbuilding purchases are expected as a result of the plan of the Navy Department to provide for expansion of present shipbuilding facilities to take care of the construction of 150 torpedo boat destroyers.

The orders placed by the J. G. White Engineering Corporation, New York, are said to have totalled 736 machine tools, all of which will be shipped to the Brasier and Renault automobile factories in France, there to be used on airplane engine work for the United States Government. Italian airplane engine factories are expected to be in the market soon for tools. Edoardo Fucito, an engineer, Hotel Seville, New York, will buy eight grinders for shipment to an Italian airplane engine works.

Buying on the lists recently issued by the General Vehicle Co., Long Island City, N. Y., and the Simplex Automobile Co., New Brunswick, N. J., is still pending.

The Lincoln Motor Co., operated by Henry M. Leland and son, and the Packard Motor Car Co., both of Detroit, have placed orders aggregating $200,000 in the Cleveland market. Among their purchases were 50 multiple spindle drilling machines.

New shell contracts have been given out recently by the Government. In addition to large contracts received by the Minneapolis Steel & Machinery Co., as mentioned above, the American Shell Co., Paterson, N. J., and the American Clay Machinery Co., Bucyrus, Ohio, have received contracts. The American Shell Co., which has taken over the shell department of the East Jersey Pipe Corporation, will, it is understood, make 2,000,000 shells and will work three 8-hr. shifts per day. Some new equipment may be bought.

The Pennsylvania Railroad Co., Philadelphia, is continuing its buying for a locomotive shop for the Government in France.

The Eisemann Magneto Co., Brooklyn, is in the market for machine tools. The Safety Car Heating & Lighting Co. is buying for its Jersey City plant, where electric axle lights for railroad cars are manufactured.

Mitsubishi Goshi Kaishi, 120 Broadway, New York, will purchase equipment for steel plants in Japan, where shipbuilding companies are planning to roll their own plates and shapes instead of depending upon a supply from the United States, from which they are now cut off by embargo.

The Erie Forge Co., American Brake Shoe & Foundry Co. and the Westinghouse Electric & Mfg. Co. have bought tools in the Cleveland market in the past week. Manufacturers of aluminum products in Cleveland vicinity have received inquiries from the Government for 1,000,000 to 2,000,000 aluminum army canteens. The Kelly-Springfield Truck Co., Springfield, Ohio, has received a contract from the Army Signal Corps for 3000 chasses at an aggregate cost of nearly $4,000,000.

The Poole Engineering & Machine Co., Baltimore, Md., has bought six cranes of 10 to 30-ton capacity from the Shaw Electric Crane Co. for its gun-machining plant. Walter Scott & Co., Plainfield, N. J., who have a gun carriage contract, have bought two 10-ton cranes. The Stone & Webster Engineering Corporation has placed an order for five cranes for the Watertown Arsenal and has also bought a 90-ton traveling crane for the Philadelphia Electric Co. The Penn Seaboard Steel Corporation, Chester, Pa., will buy four 30-ton cranes and the General Electric Co. will buy several smaller cranes for various shops and a 75-ton crane for export to Russia.

New York

NEW YORK, Sept 25.

Inquiries covering equipment for a complete new shipbuilding plant to be built by the Fore River Shipbuilding Corporation adjacent to its present plant at Quincy, Mass., and to be used for the construction of torpedo boat destroyers for the United States Navy, have been sent out. Cranes, plate-working machinery, hydraulic machinery and probably 300 or more machine tools will be required. The crane list, it is understood, will cover about 54 cranes of various types, many of which are to be small I-beams with hoists. Purchases to be made will total $1,000,000 or more. In view of the plans of the Navy Department to build about 150 destroyers, and the necessity for expansion of present shipbuilding facilities to take care of this work, it is expected that other shipbuilding companies may come into the market soon for large requirements.

The Chester Shipbuilding Company, with plant at Chester, Pa., and the Merchant Shipbuilding Corporation, with plant at Bristol, Pa., are both in the market for punch-shop machinery. The Chester list covers about 30 machines and the Merchant list contains 60. Bids on the former closed on Sept. 22 and on the latter will close Sept. 26.

The American International Corporation, 120 Broadway, has opened a temporary purchasing office in the Bellevue-Stratford Hotel, Philadelphia, and will, it is understood, soon place orders for cranes and punch-shop machinery. Boom-type cranes or derricks will be used for the shipways. The Lackawanna Bridge Co., 2 Rector Street, will purchase equipment for the shipbuilding plant which it will build on the Newark Meadows in co-operation with the Submarine Boat Corporation.

The Federal Shipbuilding Co., 54 Dey Street, New York, has not yet issued lists of additional requirements, including cranes and machine tools. The Lake Torpedo Boat Co., Bridgeport, Conn., is making purchases for the Housatonic Shipbuilding Co., same city, in which Simon Lake, the submarine boat builder, is interested.

Orders placed by the J. G. White Engineering Corporation, New York, for airplane work in France are said to have been as follows: 126 grinders, 194 lathes, 60 turret lathes, 97 milling machines, 45 automatic lathes, 17 boring mills, 2 tool grinders, 885 drill presses, 57 gear cutters, 53 miscellaneous tools—a total of 736. These tools are going into the plants of the Brasier Automobile Co. and the Renault Automobile Co. instead of into a new plant, which it was at first understood would be built in France for the United States Government, and will be used for building and repairing American airplane engines. There have been "feelers" put out during the past week by airplane engine makers in Italy, who will probably require a large number of machine tools for expansion of that country's airplane-building program. Edoardo Fucito, engineer, Hotel Seville, New York, is in the market for eight grinders, which are to be shipped to an airplane engine factory in Italy. The General Vehicle Co. and Simplex Automobile Co. lists for airplane engine work are still pending. A complete reorganization of the executive force of the Simplex Automobile Co. is said to have delayed purchasing by that company.

The American Shell Co., which has taken over the shell department of the East Jersey Pipe Corporation, Paterson, N. J., has received a Government contract for about 2,000,000 shells and will work three 8-hr. shifts. Some new equipment will probably be bought.

The Pennsylvania Railroad Co., Philadelphia, is still placing orders for equipment for the Government locomotive shop to be erected in France.

The Eisemann Magneto Co., Brooklyn, has taken increased floor space in the Bush Terminal and is in the market for machine tools. The Safety Car Heating & Lighting Co., New York, is buying for its plant in Jersey City, where an electric axle light for railroad cars is manufactured.

Some of the smaller machine tools are in better supply and in a few instances can be delivered from stock. This is true especially of certain makes of lathes up to 24 in. There is still a pronounced scarcity of all large tools and among the smaller tools radial drills, milling machines and drill presses of standard makes are not to be had for early delivery. Grinders, which until recently could be had in two or three months, are now four or five months off.

Purchases of steel-making equipment for use in Japan will be made in this country. Shipbuilding interests in that country are planning to make their own steel and roll their plates and shapes instead of depending on the United States, which now has an embargo against shipment of plates. Mitsubishi Goshi Kaishi, 120 Broadway, New York, expects to buy rolling mill equipment, cranes, etc.

It is reported that the United States Government may soon make large purchases of locomotive and gantry type cranes for terminal facilities on the Atlantic seaboard. Crane business is exceedingly active. Several good-sized crane contracts have been closed during the past week. The Poole Engineering & Machine Co., Baltimore, bought three 10-ton, two 15-ton and one 30-ton overhead electric shop cranes from the Shaw Electric Crane Co. for use in machining heavy guns for the United States Navy. Walter Scott & Co., Plainfield, N. J., who have a contract for gun carriages, have bought two 10-ton cranes from the Milwaukee Electric Crane & Mfg. Co. The Milwaukee company has also received an order from the Stone & Webster Engineering Corporation for five 10 and 20-ton cranes for the Watertown Arsenal. Three other cranes of 30 and 40-ton capacity are still to be bought. Bids were closed recently. The Stone & Webster Engineering Corporation has also bought one 6-motor 90-ton electric traveling crane for the Philadelphia Electric Co., Philadelphia. The American Smelting & Refining Co. has placed an order for a 1½ cu. yd. grab bucket crane for use at Omaha, Neb. The General Electric Co. will buy several small cranes for Schenectady, West Lynn and Pittsfield plants and a 75-ton crane for export to Russia. The Penn Seaboard Steel Corporation, Chester, Pa., will buy four 30-ton cranes and steel-making equipment.

The Hollingsworth Wheel Co., Hagerstown, Md., is in the market for a machine to roll or cut threads 1 in. long on bolts or rods ¼ in. in diameter.

The New York Air Brake Co., Pearl Street, Watertown, N. Y., is planning for changes in machinery and equipment at its Beebe Island plant for the manufacture of fuses of the French type. Heretofore the works have been used for the production of fuses of English type.

The Canisteo Iron Works, Canisteo, N. Y., has been incorporated with a capital of $15,000 to operate a foundry and metal-working plant. H. M. Baker and M. R. and O. M. Auerbach are the incorporators.

The Covert Gear Co., Buffalo, has increased its capital from $1,000,000 to $1,500,000.

The Lake Shipbuilding Co., Ganson Street, Buffalo, has increased its capital from $63,000 to $160,000.

The American Ammunition Co., Paulsboro, N. J., has awarded a contract for the erection of a new three-story plant to cost about $25,000. The main office is at 25 Broad Street, New York.

The Standard Fuse Corporation, Paulsboro, N. J., manufacturer of airplane parts, cannon primers, etc., is having plans prepared for the erection of additions to its plant. The company reopened its works September 20, which had been closed since April.

The Pennsylvania Shipbuilding Co., Gloucester City, N. J., is having plans prepared for the erection of several one-story shop buildings in connection with its new shipbuilding plant. The entire works are estimated to cost about $1,000,000. George F. Pawling & Co., 1438 South Penn Square, Philadelphia, are engineers.

The Lund & Weiss Co., East Orange, N. J., has been incorporated with a capital of $10,000 to manufacture motors. Edward P. Lund, Arthur J. Weiss and Frank Tunstead, East Orange, are the incorporators.

The A. P. Smith Mfg. Co., Norman Street, East Orange, manufacturer of waterworks machinery, will build a one-story addition to its plant.

The Crocker-Wheeler Co., Ampere, East Orange, manufacturer of electrical machinery, will erect a one-story addition to its plant to cost about $10,000. It will also build a new one-story structure at 485 Fourth Avenue, Newark, to cost $20,000.

The Goldschmidt Thermit Co., Jersey City, N. J., manufacturer of welding apparatus, will build a one-story extension to its plant on Johnston Avenue.

The Federal Iron & Metal Co., Jersey City, has been incorporated with a capital of $1,000,000. David A. Newton, 243 Washington Street; Edward A. Wardley and Charles W. Broadhurst are the incorporators.

The Davis-Bournonville Co., Van Wagnen Avenue, Jersey City, manufacturer of acetylene welding and cutting equipment, has acquired a factory, about 140 x 150 ft., on West Side Avenue, near Broadway, for an extension to its works.

The Belgian Art Iron Works, 299 Barrow Street, Jersey City, has been incorporated with a capital of $5,000 to manufacture iron and metal specialties. Benjamin F. Chadsey, Jersey City; George H. Van Emburg, 142 Delevan Avenue, Newark; and Louis B. Doyle, 444 Milwood Street, Brooklyn, are the incorporators.

The General Electric Co., Newark, N. J., has awarded a contract for the erection of a four-story addition to its plant on Boyd Street to cost about $14,000.

The Newark Scissors Works, Newark, has been organized to operate a plant at 43 Lawrence Street. Theodore Steinbach, 532 South Eleventh Street, and Fritz Everts, 290 Waverly Avenue, head the company.

The Rice-Macrae Motor Truck Co., Newark, has been incorporated with a capital of $10,000 to manufacture motor trucks. Frederick T. Macrae, 228 Halsey Street, and A. L. Rice are the incorporators.

The Patent Metal Co., Newark, has been incorporated with a capital of $25,000 to manufacture metal products. Thomas J. Walsh, 51 Belleville Avenue; J. H. Walsh and Jacob Kanster, Newark, are the incorporators.

C. Yungling & Son, Newark, have been organized to manufacture grates. Charles H. Yungling, 1166 Broad Street, heads the company.

The Newark Flush Valve Co., Newark, has been incorporated with a capital of $125,000 to manufacture valves. R. Donaldson Brown, 828 Broad Street; N. W. Benedict and Theodore McC. Marsh, Newark, are the incorporators.

The Vulcan Steam Forge Co., Buffalo, N. Y., has completed plans for an addition to its plant at Rano Street and the Lackawanna Railroad.

Extensions are to be made to the plant of the Sill Stove Works on Oak Street, Rochester, N. Y. Its capital has recently been increased from $100,000 to $200,000 to afford additional manufacturing facilities.

A concrete addition, 66 x 200 ft., is to be made to the plant of the Brooks Locomotive Co., Dunkirk, N. Y.

An addition is to be made to the plant of the Stewart Motor Corporation, Buffalo, at East Delavan Avenue and the New York Central Railroad Belt Line.

The Buffalo Dry Dock Co., Buffalo, will build a one-story addition, 100 x 100 ft., to its machine shop at its plant at Buffalo River, Ganson Street and the Buffalo Creek Railroad.

The Buffalo Truck & Tractor Co., Buffalo, has been incorporated with a capital stock of $150,000 to manufacture motor-trucks and tractors. The incorporators are E. H. Oversmith, S. B. Simpkins and George B. Burd, Erie County Bank Building.

The Hires Condensed Milk Co., Chas. Brougham, president, 913 Arch Street, Philadelphia, Pa., has let contract for the erection of a factory, 150 x 642 ft., at Binghampton, N. Y., for the manufacture of tin cans.

The United Paper Board Co., Sidney Mitchell, president, 171 Madison Avenue, New York, has let contract for the construction of a power house at Lockport, N. Y., 35 x 100 x 100 ft.

The Gooley & Edlund Co., Cortland, N. Y., is having plans drawn for a foundry building.

The Bridgeford Machine Tool Works, Winton Road, Rochester, N. Y., has let contract for erection of a one and two-story machine shop, 120 x 214 ft., and has plans prepared for a central heating plant, one story and basement.

The Volney Paper Co., Fulton, N. Y., has had plans drawn for an engine house, 35 x 49 ft., one story and basement.

The Foster Specialties Co., Buffalo, C. B. Foster, 8 Eighteenth Street, manager, is having plans completed for a foundry and machine shop, 60 x 80 ft., six stories.

The Harry E. Campbell Co., manufacturer of ornamental iron and bronze work, 8 West Fortieth Street, New York, has changed its corporate name to Campbell Architectural Iron Co., Inc. Thomas Cochran, of the firm of J. P. Morgan & Co., is a member of the new board of directors. Other executive officers remain the same. The capital stock has been increased to $475,000.

John H. Barker has entered business for himself as manufacturers' representative with an office at 95 Liberty Street, New York. Mr. Barker aims to solicit orders for complete electrical equipment of factories with a side line in such apparatus as cranes and electrical industrial trucks for inside factory use. He has been connected with the Diehl Mfg. Co. for eight years, the last two of which he was sales manager, being appointed from manager of the New York office of the company.

New England

BOSTON, Sept. 24.

The Springfield Aircraft Corporation, which is to be chartered under Massachusetts laws, has leased the Wason Car Works, Springfield, Mass., and will begin the manufacture of airplanes. It is reported that the company expects to have from 1400 to 1500 men at work by January. The general manager will be Ralph K. Blair, a retired artillery captain of the British Army, who was formerly connected with the Curtiss Co. and the Canadian Aeroplanes Co., Toronto.

The Framington Screw Works, Boston, has been incorporated with capital stock of $50,000. George C. Colt is president and Harry H. Marshall, 32 Dorchester Avenue, treasurer.

The Pilling Brass Co., Waterbury, Conn., has negotiations in progress for the sale of the plant. It is reported that the Liggett interests, which now control the Connecticut Brass Co., Mixville, Conn., will be the new owners. The Pilling Co. was founded in 1907 and has had a rapid growth. It moved into a model new plant in 1912 and a large addition is in process of erection.

The Chelsea Foundry Co., Chelsea, Mass., has been incorporated with capital stock of $35,000. Edward F. Maguire is president and Morris M. Broomfield, 27 School Street, Boston, treasurer.

The plant of the New Machine Co., Danbury, Conn., was damaged by fire with a loss of about $5,000 Sept. 17.

The Doane Automatic Machine Co., Springfield, Mass., has been incorporated with authorized capital stock of $50,000. The directors are C. Lee Straub, president and treasurer; Robert C. Cooley and M. D. Graves.

The Bullard Engineering Works, Inc., Bridgeport, Conn., has been incorporated with capital stock of $50,000 by E. P. Bullard, Jr., S. H. Bullard and A. H. Bullard. This corporation will operate the new Government gun plant, which is being established by the Bullard Machine Tool Co.

The Gilbert & Barker Mfg. Co., Springfield, Mass., has awarded a contract for a power house, 57 x 93 ft.

The New Remington Rifle Co., Bridgeport, Conn., incorporated two weeks ago, has been organized with Henry S. Kimball, president; John P. Murray, secretary, and Fred W. Abbott, treasurer. The stock is owned solely by the Remington Arms-Union Metallic Cartridge Co.

The Union Hardware Co., Torrington, Conn., is planning to erect an addition, about 100 x 180 ft.

The Porcupine Co., Bridgeport, Conn., has increased its capital stock from $50,000 to $150,000.

The Frisbie Motor Co., Middletown, Conn., is adding 60 ft. to its plant.

The Colt's Patent Fire Arms Co., Hartford, Conn., will build a forge shop to cost $30,000, boiler house to cost $100,000 and oil house to cost $4,500.

The Tips Aero Motor Co., Woonsocket, R. I., has been incorporated with authorized capital stock of $100,000. The incorporators are Maurice A. Tips, Joseph Guerin, Edmond H. Guerin and T. Guerin. It is reported that the company will build a plant.

The American Steel & Wire Co. has purchased 24 acres of land adjoining its South Works, Worcester, Mass., to provide for future plant extension.

The Suffolk Castings & Supply Co., Boston, has been incorporated with authorized capital stock of $25,000. J. J. Richards is president and Lolo B. Ellis, Waverley, treasurer.

The F. A. Hall Co., Inc., Providence, R. I., has been incorporated with capital stock of $25,000, to manufacture machinery. The incorporators are Frederick A. Hall, 46 E. George Street; William H. Margerison and Edward F. Hall.

The United States Airplane & Engine Co., Bridgeport, is to build a plant 74 x 300 ft., one story. A section, 32 x 90 ft., will be two stories to provide for an office, drafting room and classrooms.

The Paterson Forge Co., East Main Street, Bridgeport, Conn., will build a one-story addition, 40 x 90 ft., to cost about $8,000.

The J. N. Lapointe Co., Pequot Avenue, New London, Conn., manufacturer of broaches and broaching machinery, has commenced the construction of a three-story machine shop to cost about $40,000.

Philadelphia

PHILADELPHIA, Sept. 25.

A continuation of buying by companies which will manufacture gun forgings for the United States Government has been the principal feature of the local machinery market during the past week. There has been a noticeable dropping off in miscellaneous inquiries, according to some dealers, and many of the smaller machine tools, especially lathes up to 24 in. are in better supply, and in some instances can be had for prompt delivery.

The Tacony Ordnance Corporation, Tacony, Pa., has about completed its purchases of machine tools, but will not close until some day this week for the 14 cranes it will require. The Taylor-Wharton Iron & Steel Co. has covered nearly all of its requirements and the same is true of the Standard Steel Works Co.

The Keystone Emery Mills, manufacturer of abrasive wheels, 4329 Paul Street, Philadelphia, has awarded a contract for the construction of a one-story addition, 30 x 100 ft. at Paul and Church Streets.

The United States Navy Department, Bureau of Yards and Docks, Washington, D. C., has commenced the erection of a new plant, about 400 x 400 ft., to cost about $1,000,000, at the League Island Navy Yard for the manufacture of airplanes.

J. R. Kearns and A. Murphy, Philadelphia, have incorporated in Delaware the Cook Gearshift Co., with capital of $1,000,000, to manufacture gear-shifting devices for gas engines.

The Girard Smelting & Refining Co., Tioga and Richmond Streets, Philadelphia, has had plans prepared for a two-story addition, about 40 x 112 ft.

The Pennsylvania Chemical Works, Washington Avenue, Philadelphia, will build an addition to its power plant to cost about $25,000.

The Taylor-Wharton Iron & Steel Co., Philadelphia, has awarded a contract for the construction of a one-story forge shop, about 120 x 280 ft., at its Tioga plant, Fifty-second Street and Grays Ferry Avenue, to cost about $70,000.

The Trenton Malleable Iron Co., Trenton, N. J., specializing in the production of iron and brass castings, will build a two-story pattern shop on New York Avenue.

The Delion Tire & Rubber Co., Trenton, N. J., has begun work on the first of three additions to its plant on Whitehead Road, to cost about $85,000. The buildings will be one and two stories, 50 x 75 ft., 50 x 120 ft., and 25 x 75 ft. It is planned to have them ready for occupancy Feb. 1.

George F. Pawling & Co., engineers, 1438 South Penn Square, Philadelphia, are preparing plans for the erection of a new shipbuilding plant for the Newfoundland Shipbuilding Co., Harbor Grace, N. F., to cost about $500,000.

The Cox Traveling Grate Co., Port Carbon, Pa., manufacturer of grates and iron and steel castings, has removed its headquarters to Hazleton. The works will be retained at the present location.

The Conestoga Motor Truck Co., Woolworth Building, Lancaster, Pa., is having plans prepared for the construction of a one-story, brick and concrete building about 60 x 200 ft. Wayne M. High, Reading, is architect.

The De Lorenzo Aeroplane Co., Donora, Pa., has been incorporated in Delaware with capital of $1,000,000 to manufacture aircraft. John De Lorenzo, Gust Celagis, Donora, and E. Green, Johnstown, Pa., are the incorporators.

The Lehigh Valley Railroad is planning to enlarge its locomotive shops at Hazleton, Pa.

The Delaware Marine Motors Co., Wilmington, Del., has been incorporated with a capital of $50,000 to manufacture marine engines and motors. William H. Murray, H. Roy Freck and David J. H. Bacon are the incorporators.

The Frick Company, Waynesboro, Pa., has started the erection of a plant for the manufacture of its new gas tractor. A structure 60 x 90, two stories, will be built. The company hopes to have tractors for demonstrating purposes ready within the next 30 days, but the new plant will not be completed for several months.

Baltimore

BALTIMORE, Sept. 24.

The Redman-Vane Shipbuilding Co., Baltimore, recently organized, has acquired the shipbuilding plant of J. S. Beacham & Brother on the Key Highway. The new company plans extensions and improvements, including machine shop equipment and facilities for repair work. J. C. Redman heads the company.

The Consolidated Gas, Electric Light & Power Co., Baltimore, is preparing plans for an addition to its power plant at Westport to have a capacity of 50,000 kw. and is to be ready for service in about 18 months. With other improvements and extensions in the company's plants and system, the work is estimated to cost about $5,500,000.

The Virginia Chain Co., Parkersburg, W. Va., has been incorporated with a capital of $40,000 to manufacture chains. J. W. Romaine, John Marshall and M. E. Hiehle are the incorporators.

A new electric power plant to cost about $40,000 will be installed at the works of the Greenbrier Colliery Co., Sevy, W. Va. J. Wade Bell is manager.

The Maryland Shipbuilding Co., Lexington Street Building, Baltimore, is expected to begin the construction of vessels in the near future.

The Baltimore Dry Dock & Shipbuilding Co., Baltimore, will build a two-story shop, 50 x 50 ft., at the foot of Fort Avenue.

The Bartlett-Hayward Co., Scott and McHenry Streets, Baltimore, will build a one-story brick addition, 30 x 142 ft., at Parkin and McHenry Streets.

The Richmond Engineering Co., Richmond, Va., of which H. S. Grigsby is manager, will construct a two-story mill to manufacture stacks, tanks, etc.

Cincinnati

CINCINNATI, Sept. 24.

Several local firms participated in the large order for machine tools placed last week by the J. G. White Engineering Corporation, New York. The Government has issued a comparatively large list of machine tools, wanted for shipment to repair shops in France which calls for 24-in., 26-in. and 32-in. lathes. This makes three lists for Government requirements, two being from munition contractors. Machine-tool makers have submitted estimates on all lists and are somewhat apprehensive concerning deliveries should they be accepted.

Bookings for various machines have lately been received for shipment to Spain, one firm reporting an order for 20 portable electric drilling machines. A number of lathes have also been exported to the same country through New York houses.

The Superior Electric Mfg. Co., Cincinnati, a new organization, has purchased the electric motor and repair business of the Reno-Kaetker Electric Co., 610-616 Baymiller Street. The Reno-Kaetker Electric Co. has opened offices at 41 Main Street, and will continue the manufacture of motor-driven swing saws. F. A. Colville is general manager.

The Rapid Electrotype Co., Cincinnati, has increased its capital stock from $50,000 to $150,000, and is having plans prepared for a new plant at McMicken Avenue and Race Street.

The American Valve & Meter Co., Cincinnati, will erect an addition to its plant on Spring Grove Avenue estimated to cost $10,000. It will be used mostly as a storage and shipping department.

Contract for the one-story addition, 50 x 300 ft., to the plant of the Worthington Pump Corporation, Carthage Place, Cincinnati, has been let to Austin & Co., Cleveland.

The Niles Tool Works Co., Hamilton, Ohio, whose foundry has been closed for several months, has resumed operations with a reduced force that is gradually being augmented. The only dispute between the company and its molders was the question of recognition of the union.

The Cullen & Vaughn Co., Hamilton, building contractor, has purchased the plant of the East Avenue Planing Mill Co., and will remove the equipment to its central plant.

The Dayton Welding Co., Dayton, Ohio, has been incorporated with $10,000 capital stock by W. L. Blackwell and others. It was heretofore operated on a partnership basis.

The New Favorite Mfg. Co., Columbus, Ohio, has been incorporated with $25,000 capital stock to manufacture household specialties. Erwin R. Jones is one of the principal incorporators.

The Rolf Heater Mfg. Co., Columbus, has recently made an addition to its plant to house a metal welding and machine repair department.

It is reported that the Atlas Portland Cement Co. will erect a cement plant at West Charleston, Ohio.

Chicago

CHICAGO, Sept. 24.

One of the largest deals negotiated in this territory in recent months was the placing a few days ago of a blanket order with Manning, Maxwell & Moore, Inc., for machine tools valued at about $600,000, required by the Minneapolis Steel & Machinery Co., Minneapolis, Minn., for the execution of shell orders. Reference to some of these orders has been made heretofore, but it appears that the company will be called on to supply more shells than has been generally understood. The company will have the benefit of experience on similar work on foreign orders.

Dealers are doing an excellent business, with buying mostly of the miscellaneous order, the aggregate being very satisfactory. There is no rush to buy, but in the past few days the smaller shops have been more active in seeking tools. For heavy tools there is a large demand, but transactions are greatly impeded by far-off deliveries, a natural result of heavy buying on the seaboard which has filled tool-builders' shops to overflowing. Large second-hand machines are quickly taken after they reach dealers' warerooms, in some cases before there has been any opportunity to clean and overhaul them. An extraordinary demand for slotting machines has developed.

As a result of the widely known lack of various new tools machines ancient enough to be considered relics are making their appearance on the market. Dealers will not buy these machines, but in some cases owners ask that they be taken on consignment in the hope that some one in distress will take them.

Pressure from Washington has been brought not infrequently in the effort to secure the delivery of new tools to manufacturers who have war orders in hand.

A contract has been let for a one-story reinforced concrete factory extension, 40 x 70 ft., to cost $10,000, for the Goldsmith Brothers Smelting & Refining Co., 5844 Throop St., Chicago.

The Royal Enameling & Mfg. Co., 826 West Madison Street, Chicago, manufacturer of stamped ware, will erect a one-story machine shop, 76 x 100 ft., at Desplaines, Ill., to cost $12,000. Contracts have been awarded.

Contracts have been awarded for the construction of a one-story addition to a factory at 1726 to 1734 North Kolmar Avenue, Chicago, D. J. Hauptman, 5325 Kenmore Avenue, owner, to cost $18,000. The plant is occupied by the Boss Nut Co., Inc., manufacturer of bolts and nuts.

The Apex Electric Mfg. Co., 1410 West Fifty-ninth Street, Chicago, is taking bids on a one-story factory, 115 x 123 ft., at West Fifty-ninth and Bishop Streets, to cost about $25,000.

A one-story factory, 75 x 125 ft., to cost at least $25,000, is to be erected at 1646-1650 Walnut Street, Chicago, for the Jewel Electrical Instrument Co.

The Howe Mfg. Co., Chicago, maker of the Howe spotlight and other lighting devices, has leased for a period of 10 years a four and one-half-story and basement fireproof building at 115-123 East Ontario Street, Chicago; also a two-story building adjoining.

The car manufacturer, reported a week ago to have purchased 32 acres at Hammond, Ind., on which to build a plant for making tank cars, was the Keith Car Co., 122 South Michigan Avenue, Chicago. It is planned to start construction at once.

Building permits have been issued to the Standard Forgings Co., Indiana Harbor, Ind., for the construction of extensions, including machine shops, which will cost about $200,000.

Construction work on the proposed new $2,000,000 transfer yard at Gibson, to be built by the New York Central, Indiana Harbor Belt and Michigan Central railroads, will be deferred until after the war because of the high cost of building materials.

The James A. Brady Foundry Co., Chicago, which recently completed a new foundry, has increased its capital stock from $25,000 to $300,000.

The Power Transmitting Co., Peoria, Ill., has been incorporated with a capital stock of $200,000 by H. H. White, Emil Kramer and R. V. Ralph.

The Southern Illinois Machine & Foundry Co., Murphysboro, Ill., has prepared plans for a foundry and forge shop to cost about $35,000.

The Mitchell Machinery Co., Peoria, will build an addition to its plant.

Six buildings are being constructed at Spirit Lake, Duluth, for the Dougall-Duluth Shipbuilding Co., which include two machine shops, a carpenter shop, power house, office building and storage warehouses. It is expected that late this fall or early in the winter the first keel will be laid.

The A. S. Ford Munitions Co., Chicago, has been incorporated in Delaware with capital of $1,500,000 to manufacture machine guns, rifles, etc. C. H. Dye, R. W. Plummer and H. P. Dickenson, Chicago, are the incorporators.

Milwaukee

MILWAUKEE, Sept. 24.

Machine-tool builders, especially those specializing in milling machines, are getting further behind on deliveries as the result of the enormous demand for the execution of Government contracts. It is stated that the maximum capacity of shops will be required for fully 18 months to fill orders now booked.

The shipbuilding industry in this section is expanding to a heretofore unheard of degree. A new yard is to be established at Milwaukee and another at Green Bay, Wis.

Although high prices of machinery have been responsible for a slackening in the demand for electric power plant equipment, it is announced that a project involving $500,000 will be undertaken at Stevens Point, Wis., before the close of the year.

The labor situation is satisfactory. The employment of women in metal-working industries is increasing.

Carl Hartmann, Green Bay, Wis., of the Hartmann-Greiling Co., founder and machinist, is organizing a shipbuilding company among local capitalists, which will establish new yards on Green Bay, Lake Michigan, for the construction and repair of steel and wooden ships. A site, 350 x 500 ft., has been purchased at the mouth of Fox River, and two berths accommodating vessels 260 ft. long and 40 ft. beam, will be installed. The new organization, it is said, will be closely identified with the Hartmann-Greiling Co., which has Government contracts for refitting and rebuilding Lake steamships for ocean service, and will also do considerable foundry and machine work for the new company. The new yards are to be ready about the middle of 1918 and will employ from 90 to 100 workmen.

The DePere Mfg. Co., DePere, Wis., which has a Government contract for water-tube, high-pressure marine boilers of 200 hp. each, will make a number of additions to its plant. The working force will be increased to 100 or 125. Ward Clark is general manager.

The Wohlrab Gear Co., Racine, Wis., has been incorporated with a capital stock of $75,000 to manufacture gears, transmissions and other machinery parts. The incorporators are Paul Wohlrab, Charles Kreuzke and Max W. Heck, attorney.

The Appleton Auto Body Co., Appleton, Wis., has awarded the general contract for its new plant at Spencer Street and Pierce Avenue, costing about $25,000.

The Plymouth Motor Mfg. Co., successor to the Steiner Mfg. Co., Plymouth, Wis., has completed its reorganization and elected the following officers: President, George W. Brickbauer; vice-president, H. J. Goelzer; secretary, Gus W. Schiereck; treasurer, E. M. D. Korte. The plant is being enlarged to afford increase in the production of stationary and portable farm and general-purpose engines.

The Crank Shaft Valve Movement Corporation, Green Bay, Wis., has been incorporated with a capital stock of $300,000 to manufacture internal combustion engine devices, engines and other crank machines. The incorporators are Sylvester Duquaine, A. L. Cannard, Jules Gerard, John Findeisen and Julian Cannard.

The Olin Mfg. & Supply Co., Superior, Wis., has been organized with a capital stock of $15,000 to manufacture cutlery and hardware. The incorporators are J. A. Olin, John Jepson and H. G. Pickering.

Scheidewind & Zehms, Sheboygan, Wis., have awarded contracts for the erection of a brick machinery repair shop, 44 x 96 ft., at Indiana Avenue and South Fourteenth Street.

The Milwaukee Tool & Forge Co., Milwaukee, has been incorporated with a capital stock of $12,000 by George F. Phillips, R. L. Wheeler and George Haubert.

The Kohler Co., Kohler, Wis., manufacturer of bathtubs and enameled sanitary ware, will erect a three-story reinforced concrete addition to its plant, 80 x 215 ft. Plans are being prepared by Brust & Philipp, architects, 506 Free Press Building, Milwaukee. Walter J. Kohler is general manager.

The Keller Pneumatic Tool Co., Fond du Lac, Wis., is transferring its drafting and tool-making departments to the new plant at Grand Haven, Mich., and expects to complete the removal of the tool, lathe and grinding, drill press and screw machine departments within two months. The pneumatic tool department will be the last to be transferred. C. W. Hobson, assistant general superintendent, is in charge of the Grand Haven works.

The Otto Biefeld Co., Watertown, Wis., founder and machinist, will start work on the construction of a foundry and machine-shop addition as soon as it is assured of the extension of spur tracks to the site recently purchased.

Detroit

DETROIT, Sept. 24.

Increased activity in the manufacture of automobile trucks in this section, due to Government contracts, has resulted in an active demand for machine tools. The brass, copper, aluminum, and gray iron industries have improved accordingly.

Labor is well employed and manufacturers generally are busy. A number of important buildings are planned for the near future and rumors of large industrial construction work and plant extensions are more numerous.

The General Motors Co., Pontiac, Mich., will build 1000 1½-ton chassis for the Army Signal Corps to cost $1,989 each.

The Doble-Detroit Steam Motors Co., Detroit, has leased for a period of five years a three-story and basement building, with 52,000 sq. ft., at Fourth and Porter Streets, formerly occupied by the Boles Iron Works.

The J. E. Boles Iron & Wire Works has completed a new plant at 288 Milwaukee Avenue, Detroit. It manufactures ornamental iron, structural steel, truck frames, fire escapes, etc., and has a capacity of 50,000 tons per annum. J. B. Mansfield is vice-president and general manager.

The Universal Truck Body Co., Jonesville, Mich., is erecting a new factory and enlarging its force.

The Lapeer Truck Co., New Haven, Mich., has purchased eight acres of land for the erection of a factory.

The Armstrong-Whetstone Co., Lapeer, Mich., is now turning out an automobile trailer.

The General Motors Co., Detroit, has completed plans for the construction of a new drop forge plant to cost about $300,000, and consisting of three one-story buildings, 160 x 600 ft., 75 x 600 ft. and 65 x 300 ft. It is also arranging for the erection of new factory in Flint, Mich.

The plant of the Edward F. Lyon Co., Detroit, has been equipped to manufacture axle shafts for automobiles.

The Zenith Carbureter Co., Detroit, is building a four-story addition, which will increase its output 80 per cent.

The Hess-Pontiac Spring & Axle Co., Pontiac, Mich., will construct two additional factory units within a short time.

The National Spring & Wire Co., Albion, Mich., has sold its plant at Windsor, Ont., to the McGregor-Banwell Co., Ford City, Ont., manufacturer of wire fences.

The Parker Rust-Proof Co. of America, Detroit, will establish a factory in St. Louis for the manufacture of its product. Clark W. Parker, Detroit, is president.

The Ford Motor Co., Detroit, will erect a four-story addition to Plant A.

The Petoskey Pump Co., manufacturer of rotary pumps, Petoskey, Mich., has broken ground for an addition, 40 x 80 ft.

The Jordon & Steele Mfg. Co., Charlotte, Mich., manufacturer of pump supports, is erecting a new factory. Frank P. Town, Charlotte, is president; J. S. Edmonds, vice-president and manager, and Bert L. Taylor, secretary and treasurer.

The Van Buren Brass Foundry, Sturgis, Mich., was totally destroyed by fire last week with a loss of $20,000.

The Lincoln Motors Co., Detroit, recently formed by Henry M. and Wilbur C. Leland for the manufacture of airplane motors, is rushing work on a large factory in Detroit. The Common Council has given the company permission to close two blocks of a city street to allow continuous building.

Work has begun on the construction of an addition to the plant of the Grand Rapids Textile Machinery Co., Grand Rapids, Mich., to cost $8,000.

The Manistee Shipbuilding Co., Manistee, Mich., is planning to commence operations at its new shipbuilding plant early in October. The company is a subsidiary of the Northern Transportation Co., Baltimore, Md.

Cleveland

CLEVELAND, Sept. 24.

The placing of large orders for machines for airplane work has been the feature of the market the past week. The Lincoln Motor Co. and the Packard Motor Car Co., Detroit, which have taken large contracts for Liberty motors, have been heavy buyers and placed orders through a Cleveland machinery house for about 50 multiple spindle drilling machines aggregating about $200,000.

A new inquiry has come from the Fore River Shipbuilding Corporation for 17 turret lathes, 10 being large machines. The placing of a large amount of machinery equipment is pending in Erie, Pa., for the plants of the Erie Forge Co., the American Brakeshoe & Foundry Co. and the Westinghouse Electric & Mfg. Co. The demand for single tools and small lots continues very active.

Some buyers are now insisting on placing orders where they can secure definite price quotations rather than at prices ruling at the time of delivery, as stipulated in the selling contracts of many manufacturers.

The local labor situation has become very acute on account of many drafted men going to the army cantonment at Chillicothe the past week.

Manufacturers of aluminum products have received an inquiry from the Government for 1,000,000 to 2,000,000 aluminum canteens.

The Kelly-Springfield Truck Co., Springfield, Ohio, will build 1225 3-ton truck chasses for the Army Signal Corps at $3,100 each.

The Cleveland Planer Co., Cleveland, has been incorporated with a capital stock of $300,000 and has taken over the plant of the Cleveland Planer Works, maker of Cleveland open side planers. The business has been conducted for a number of years by G. W. Ford and James G. Dornbirer. Mr. Ford has been in poor health and has disposed of his interest. Mr. Dornbirer continues with the company as manager. The officers are Frank S. Shields, president; J. A. Camm, vice-president, both of whom are associated with the Cleveland Milling Machine Co. and also have a controlling interest in the Cleveland Machine Tool Works Co.; J. L. Whitelaw, treasurer, and James Sarrell, secretary.

The American Clay Machinery Co., Bucyrus, Ohio, has recently taken a Government order for large shells for the Navy Department. It is enlarging its foundry department and has under consideration the building of a new steel foundry.

The Kanter Metal Stamping & Mfg. Co., Cleveland, has purchased the plant formerly occupied by the National Lamp Works, Conneaut, Ohio, and plans to move to that city.

The Williams Foundry & Machine Co., Akron, Ohio, has been reincorporated with a capital stock of $2,500,000. The officers are J. K. Williams, president; F. E. Holcomb, vice-president and general manager; C. Franz, treasurer, and William Leary, secretary.

The Woodward Machine Co., Wooster, Ohio, will dismantle its foundry at Orville, Ohio, and move it to Wooster, where a new building, 80 x 110 ft., is being erected.

The Falls Rivet Co., Kent, Ohio, will enlarge its plant by an addition, 80 x 100 ft., part of it two stories.

The Mason Tire & Rubber Co., Kent, Ohio, has placed contracts for the erection of two additions, 40 x 84 ft., two stories and basement, and 61 x 109 ft., part of the latter to be two stories and basement.

The Turnbull Motor Truck & Wagon Co., Defiance, Ohio, incorporated recently with a capital stock of $1,000,000, will shortly begin the manufacture of motor trucks. W. O. Allen is president and general manager; A. J. Colt, vice-president; Charles C. German, treasurer, and T. T. Shaw, secretary.

The Buckeye Machine Co., Lima, Ohio, has increased its capital stock from $50,000 to $100,000. In addition to making gasoline engines it plans to manufacture a new type of oil engine for irrigating purposes.

The Gilliam Mfg. Co., Canton, Ohio, has increased its capital stock from $800,000 to $1,500,000 and will make extensions to its gray and malleable iron foundry.

The Conneaut Metal Works, Conneaut, Ohio, is planning extensions to its plant made necessary by taking Government orders.

The Conway Stove Co., Bellevue, Ohio, has purchased the business of the Hunter Mfg. Co., maker of automobile accessories.

The Central South

LOUISVILLE, KY., Sept. 24.

A marked increase in the number of inquiries and orders received is reported by local manufacturers of power equipment and machinery, as well as distributors of motors. Hoisting engines and crane equipment are particularly active. Coal is in poor supply and labor is scarce and inefficient.

The Roy C. Whayne Co., Louisville, is in the market for a second-hand belt-driven air compressor, about 12 x 12 in., 100 lb. pressure.

The Flat Lick Coal Co., Pineville, Ky., is in the market for a hoisting engine, 20 x 25 hp., with boiler, drum and 250 ft. of ½-in. cable.

The Southern Machinery Exchange, Somerset, Ky., is in the market for a complete four-sided planer and matcher.

The White Oak Veneer & Lumber Corporation, Kingsport, Tenn., will rebuild its plant, damaged by fire with a loss of $50,000.

The plant of the Johnson City Boiler & Tank Co., Johnson City, Tenn., has been purchased by the Government, according to an announcement by Henry Ehret, president. It will be dismantled at once and the equipment shipped to the Slidell Shipbuilding Co., Slidell, La., and to the Marrell-Stevens Shipbuilding Co., Jacksonville, Fla.

Indianapolis

INDIANAPOLIS, Sept. 23.

The Jenkins Vulcan Spring Co., Richmond, Ind., has been incorporated with $750,000 capital stock to manufacture automobile springs. The directors are Thomas B. Jenkins, Edwin Schiele, Robert G. Zetrouer, John M. Lontz, George E. Seidel, Samuel E. Swayne and James A. Carr.

The Insley Mfg. Co., Indianapolis, manufacturer of structural iron work, contractors' equipment, machinery, etc., has been incorporated with $750,000 capital stock. The directors are William H. Insley, Carl S. Wager, Ferdinand L. Pfeiffer, Alvin C. Rasmussen and R. C. Kaster.

The Indiana Portland Cement Co., Indianapolis, has been incorporated with $1,000,000 capital stock to manufacture Portland cement. The directors are Adam L. Beck, Peter Martin, George A. Frash, W. H. Hart, Arthur T. Howe, John H. Love and Marshall Beck.

The Benbridge Foundry, Terre Haute, Ind., has been incorporated with $25,000 capital to do a general foundry busi-

ness. The directors are Richard W. Benbridge, H. C. Benbridge and Ben H. Cooper.

The Arc-Flame Mfg. Co., Jeffersonville, Ind., has been incorporated with $10,000 capital stock to manufacture plumbing supplies. The directors are James E. Howard, Allen L. Voiers and Fayette C. Dorsey.

The Pioneer Brass Works, Indianapolis, has increased its capital stock from $10,000 to $70,000.

The Mount Vernon Electric Light & Power Co., Mount Vernon, Ind., has increased its capital stock from $5,000 to $100,000.

The American File Renewing Co., Anderson, Ind., has changed its name to the Continental File Corporation.

The Standard Ignition Co., Elkhart, Ind., has been incorporated with $200,000 capital stock to manufacture magnetoes, parts and electrical devices. The directors are Andrew H. Beardsley, Martin E. Crow, William H. Foster, John F. O. Stratton and Edward B. Zigler.

The Studebaker Corporation, South Bend, Ind., has awarded the contract for the construction of a power plant, 87 x 123 ft., to cost about $100,000.

St. Louis

ST. LOUIS, Sept. 24.

The Farmers' Concrete Post Co., Oklahoma City, Okla., has been organized with $100,000 capital for the manufacture of concrete posts, etc. E. D. Wrinkle is general manager.

Beaver City, Okla., will purchase about $8,000 worth of electric generating equipment.

The Metzner Stove Repair Co., Kansas City, Mo., has been incorporated with a capital stock of $80,000 by Melford Loeb Peter H. Wagner and others for the manufacture of stove parts and repairs.

The Republic Oil & Refining Co., Shreveport, La., J. W. Atkins, president, will equip an oil refining plant involving an investment of $250,000.

The Osage Mutual Oil & Refining Co., Pawhuska, Okla., with capital of $150,000, will equip a plant with a daily capacity of 2500 bbl. and is receiving bids for centrifugal pumps, pipe cutters and threaders, boilers, engines, etc.

The Vernon Parish Lumber Co., Pawnee, La., will equip a band and circular sawmill with a daily capacity of 125,000 ft. J. H. Kurth, Jr., is manager.

The Kansas Sheet Steel & Tubing Co., Kansas City, Mo., has been organized with a capital stock of $1,000,000 by W. S. Randall, Portland, Me; F. A. Armstrong, Wilmington, Del., and C. M. Egner, Elkton, Md. A plant will be installed.

The Tucker Duck & Rubber Co., Fort Smith, Ark., will install wood-working and steel stamping machinery to manufacture camp equipment. Punch-presses, tumbling machines, grinders, etc., are wanted.

The Gulfport Shipbuilding Co., Gulfport, Miss., has been organized with W. T. Stewart, president, and will establish a plant at once.

The sugar refinery of the Leinster Plantation Co., Bunkie, La., has been burned with a loss of $200,000. It will be rebuilt and new machinery bought.

The Canners Supply Co., Jackson, Miss., is in the market for crushing and extracting machinery.

The Solid Steel Scissors Co., Fort Smith, Ark., is planning for the installation of new machinery at its works.

Texas

AUSTIN, Sept. 22.

Industrial activities continue unusually brisk. The situation in Mexico continues to improve and heavy orders for farming machinery and small tools are being placed with dealers throughout the State.

The Midland & Northwestern Railway Co. Midland, has awarded a contract for the construction of machine shops and round house to C. A. Stark, Midland.

The City Commission, Abilene, will install a large pumping plant in connection with the municipal water supply system.

The Charles Mfg. Co., El Paso, manufacturer of metal building materials, is to be moved to San Antonio, where a plant equipped with the latest machinery will be installed.

The Mammoth Wind Mill Mfg. Co., Las Cruces, has been incorporated with a capital stock of $500,000 to manufacture wind mills. The incorporators are the J. L. La Driere, Las Cruces; Zeno La Driere and Jeroy Henry, Douglas, Ariz.

The Southern Ice & Cold Storage Co., San Antonio, has awarded contract to the York Mfg. Co., York, Pa., for the construction of an ice factory with a capacity of 165 tons per day.

F. W. Heldenfels and C. A. Heldenfels, Beeville, have acquired a site at Rockport upon which they will construct a shipbuilding plant. Government contracts have been acquired for four wooden hulls, each to cost $300,000.

California

SAN FRANCISCO, Sept. 18.

While some machinery houses have noticed no diminution in the volume of business, there has on the whole been a slackening of orders since the first of September, especially in the demand for smaller tools. Shops have been limiting orders to actual necessities because of the threat of the iron workers' strike which became a reality yesterday.

The Pacific Coast Shipbuilding Co., Oakland, recently incorporated, has secured a site of 2800 ft. at Bay Point, where a plant with a minimum capacity of 100,000 tons of steel ships will be erected. John T. Scott, for many years superintendent of the Union Iron Works, and more recently with the Moore & Scott Iron Works, will be superintendent. It is stated that about $1,500,000 will be spent in building and equipping the plant.

J. H. Stelling, San Francisco, has bought the plant of the Christofferson Aircraft Co., Redwood City, for $20,000.

The American Shipbuilding Co., Martinez, has been incorporated with a capital stock of $500,000 by Fairfax Crosby, Harry Blair, J. B. Salituri and W. M. Jones.

The H. P. Anderson Shipbuilding Co., San Francisco, has been incorporated with a capital stock of $200,000 by H. P. Anderson, A. G. Kazebeer, C. L. Wold, C. B. Carlson and E. F. Henderson.

The Western Gas Engine Corporation, Los Angeles, has changed its name to the Western Machinery Co.

The United States Shipbuilding Co., Los Angeles, has been incorporated with a capital stock of $3,000,000 by Benjamin F. Graham, Donald Barker, J. M. O'Brien, T. B. Young, G. E. Jones, Isaac Lord and C. H. Evans. A plant will be erected at a cost of approximately $350,000 at San Diego.

The American Aircraft Co., Los Angeles, has been incorporated with a capital stock of $10,000 by Joseph Mattingly, Roy Bower and H. S. King.

The Murray Mfg. Co., Oakland, will erect a machine shop at a cost of about $10,000.

The Automatic Controller & Mfg. Co., Ogden, Utah, has been incorporated by Cleveland Redfield, J. W. O'Brien, T. L. Whitehill and William J. Stone to manufacture electrically-operated mechanical devices.

A new electric power plant to cost about $400,000 will be constructed in the San Gabriel Canyon, near Azusa, by the United Light & Power Co., Los Angeles, to have a capacity of about 6000 kw. G. W. Gilbreth is engineer.

The Burdette Oxygen Co., Los Angeles, successor to the Western Oxygen Co., manufacturer of oxygen and air products, is having plans prepared for a one-story plant, about 60 x 75 ft., on Fifty-seventh Street, near Santa Fe Avenue.

The Improved Valveless Pump Co., Los Angeles, has been organized to operate a works at 316 East Third Street. Frank F. Ambrose heads the company.

The Moreland Truck Co., 1701 North Main Street, Los Angeles, has commenced the erection of the first unit of its new plant at Burbank. The new works, to cost over $500,000, will be devoted in part to the manufacture of tractors of both high wheel and caterpillar types suitable for light and heavy work, ranging from 30 to 75 hp.

The National Compressed Air Machinery Co., Los Angeles, has been organized to operate at 418 East Third Street. F. A. Hatfield, 1427 Carrol Avenue, heads the company.

The Pacific Northwest

SEATTLE, WASH., Sept. 18.

Aside from labor troubles the lumber market has improved. The demand for shipbuilding purposes is increasing, and it is expected will continue throughout the fall.

Labor troubles are being experienced in Portland shipyards, although the matter had not developed into a strike. Strenuous efforts are being made for a settlement without a walk-out.

The West Coast Chemical Co., Seattle, manufacturer of dyes, has purchased 200 acres at Cumberland, Wash., on which it will erect a plant for the manufacture of coal-tar products.

The Hydraulic Appliance & Equipment Co., Seattle, has been awarded a contract by the National Pump Co. for the manufacture of rotary pumps, costing $35,000. The Hydraulic company will install about $7,000 worth of additional machinery.

E. M. Miner announces that he has sold the Newport Iron Works, Newport, Wash., and has established the Miner Machinery Exchange, at 907 North Howard Street, Spokane, Wash., where a line of machinery, tools and supplies will be carried.

The Premier Engine Works, Portland, Ore., has been incorporated with $200,000 to manufacture machinery and build ships. The incorporators are J. C. Pierce, George H. and Charles B. Bailey and A. C. Luetgert.

The Cœur d'Alene Hardware & Foundry Co., Wallace, Idaho, has increased its capital stock from $500,000 to $1,000,000.

The Sumner Iron Works, Everett, Wash., has received a contract from the Emergency Shipping Board for marine engines, to cost $240,000. The plant will work 24 hr. per day for the next six months.

Plans have been completed by the Olympic-Portland Cement Co., Seattle, for the construction of a coal pulverizing plant in Bellingham.

The Seattle Chain Works, Seattle, recently reorganized with H. E. Woolley as president and general manager, will erect a plant, consisting of two V-shaped buildings, 50 x 14' ft. and 50 x 112 ft., to cost $55,000. An office building and coke house will also be built. The company will manufacture studding chains and cables for ships and various grades of hoisting, conveying and machine chains.

The Three-Ply Veneer & Box Co., Kirkland, Wash., has completed plans for its proposed veneering plant which, it is stated, will cost $250,000. The main building will be of concrete, 150 x 450 ft.

The Northwestern Electric Co., Portland, contemplates the erection of a power plant on the White Salmon River, to cost $400,000.

The Pacific Marine Iron Works, Portland, is operating part of its new plant and is constructing boilers for Government steamers. Within 60 days the remainder will be in operation, and will turn out a triple expansion engine of 1600 hp. and four boilers monthly.

The Columbia River Shipbuilding Co., Vancouver, Wash., has purchased seven acres of land, which will be used for immediate extensions to its plant.

The Automatic Nut-Lock Co., Seattle, has been incorporated for $100,000 by Frank E. Gilbert, S. S. Hoover and C. J. Perret.

A. C. White, Bonners Ferry, Idaho, will erect a sawmill on Coleman Creek to have a capacity of 25,000 ft. per day.

The Union Timber & Products Co., Port Townsend, Wash., has secured a site nearby on which a wooden shipbuilding plant will be erected, also a sawmill to cut ship timber.

The Ducrest Stump Puller Co., Seattle, has purchased a site on Dearborn Street, on which it will erect a plant.

Canada

TORONTO, Sept. 24.

The Canadian Linderman Co., has rented the factory of the Tobin Arms Co. at Woodstock, Ont., and will install machinery at once for operation day and night on an order received for $14,000,000 worth of munitions for the United States Government. The main office of the company is in Muskegon, Mich., and its Woodstock plant has been running day and night on war orders. With the new plant just acquired it is expected that 500 men will be employed.

J. B. Mackenzie, Georgetown, Ont., is in the market for an electric motor, 5 to 7½-hp., 220 volts, 25 cycle

The McKinnon Industries, Ltd., St. Catharines, Ont., has been incorporated with a capital stock of $1,000,000 by Lachlan E. McKinnon, Walter A. Notman, John W. McKinnon and others to manufacture iron, steel, brass, machinery, fittings, etc.

The Wallace Shipyards, North Vancouver, B. C., has let the contract for the erection of a foundry on Industrial Island, B. C., to Hodson & King, Vancouver. Building operations will commence immediately.

The Pacific Dredging Co., Vancouver, B. C., has completed two buildings in connection with its plant on Industrial Island. It is the intention to erect three other buildings, including carpenter, pattern and machine shops.

Construction work will begin at once on a plant on Industrial Island, Vancouver, B. C., for the Shaake Machinery Co., New Westminster, B. C. Gardner & Mercer are the architects.

The Canadian Vickers, Ltd., Montreal, will manufacture deck machinery in space formerly devoted to the manufacture of shells.

Jacob Hux, Rodney, Ont., is in the market for an upright steam boiler, 2 to 4-hp.

Three Rivers, Que., will commence work immediately on the construction of a pumping plant and reservoir. R. S. & W. S. Lea, 10 Cathcart Street, are the engineers.

The Goderich Mfg. Co., Goderich, Ont., will rebuild its plant, recently destroyed by fire with a loss of $90,000.

Plans are being prepared for the erection of a factory addition for the A. R. Whittall Canadian Co., Ltd., 7400 Mullins Street, Montreal, tin can manufacturer. Sydney Comber, 511 St. Catharine Street West, is the architect.

The Oak Tire & Rubber Co., Oakville, Ont., will build a plant for the manufacture of automobile tires, etc., and proposes to commence building operations at an early date. Frank Low is managing director.

Eugene, Julien & Cie, Ltd., 1200 St. Valier Street, Quebec, will build a concrete block and brick boiler house to cost $9,000.

The St. John Shipbuilding Co., St. John, N. B., has engaged J. L. Smith, engineer, to prepare plans for a shipbuilding plant at St. John. Construction work will begin at an early date.

The Miner Rubber Co., Yamaska River, Que., will build a power house to cost $5,000.

Cushing Brothers, Ltd., Duchess and Ninth Streets, Saskatoon, Sask., will be in the market this winter for 100 gasoline engines, etc.

The plant of the Eastern Steel Co., Trenton, N. S., manufacturer of shells, was destroyed by fire Sept. 19 with a loss of $125,000.

Government Purchases

WASHINGTON, Sept. 24.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, opening dates unassigned, schedule 1488, for three geared head, 16-in. engine lathes; schedule 1487, for four motor-driven 15-in. centrifugal pumps, all for Philadelphia; schedule 1475, opening date Oct. 2, for one boring and turning mill for Norfolk, Va.; schedule 1497, until Oct. 16, for four 32-in. sliding presses, one radial drill, one 5-ft. universal radial drilling machine, two universal motor-driven machines, 10 engine lathes, eight quick change engine lathes, two triple geared engine lathes, 12 quick change engine lathes, one heavy duty geared head engine lathe, one motor-driven engine lathe, one boring and turning mill, one vertical boring and turning mill, one 53-in. standard boring and turning mill, one motor-driven scythe boring mill, one 24-in. heavy duty shaper, one crank shaper, one 16-in. heavy crank shaper, one motor-driven reversing planer, one motor-driven reversing planer, 30 by 30 in. by 10 ft., one motor-driven radial drill, two 14-in. single spindle sensitive drills and two single spindle drills, for Boston.

Bids were received by the Bureau of Supplies and Accounts, Navy Department, Washington, for furnishing material and supplies for the naval service as follows:

Schedule 1732½, Construction and Repair, Class 71, Philadelphia—Motors, Bid 2, $964.40; 3, $953.40; 5, $1,015; 7, $1,068; 9, $954; 14, $962.70; 15, $1,067; 18, $978.50; 20, $981.25; 21, $980.

Schedule 1733½, Construction and Repair, Class 72, Philadelphia—One milling machine, Bid 8, $975.

Schedule 1728½, Construction and Repair, Class 73, Philadelphia—One aeroplane propeller turning lathe, Bid 8, $3,063 and $3,190.

Schedule 1735½, Construction and Repair, Class 74, Philadelphia—One self-feed rip and edging saw, motor-driven. Bid 6, $1,255.96, $1,315.96, $1,520.96, and $1,580.96.

Schedule 1439, Steam Engineering, Class 62, Philadelphia—One motor-driven lathe, Bid 114, $21,000. Class 63, Philadelphia—One molding machine, Bid 55, $3,950; 86, $4,401; 91, $4,190; 120, Item 1, $907.50.

Schedule 1456, Steam Engineering, Class 64—One stamping press, motor driven, Bid 16, $4,910; 79, $4,325; 89, $3,285; 106, $6,200; 108, $3,695.

Schedule 1457, Steam Engineering, Class 65, Providence—One universal milling machine, motor driven, Bid 89, $3,794.

Names of the bidders and the numbers by which they are designated are as follows:

Bid 6, J. A. Fay & Egan Co., Cincinnati; 8, Manning, Maxwell & Moore, 19 W. Forty-sixth Street, New York; 16, E. W. Bliss Co., Adams and Plymouth streets, Brooklyn, N. Y.; 55, Herman Pneumatic Machine Co., Pittsburgh; 86, The Osborn Mfg. Co. Cleveland; 89, Henry Prentiss & Co., New York; 91, J. W. Parson Co., Philadelphia; 106, The W. H. Stoll Co., Buffalo; 108, Sherritt & Stoer Co., Philadelphia; 114, Lindel-Morris Co., Eddystone, Pa.; 120, Mumford Molding Machine Co., Chicago.

It has recently come to the attention of the Navy Department that certain persons representing themselves to be manufacturers' agents or brokers have been writing to manufacturers that they are in a position to obtain contracts for them, obtain more expeditious payments, and even have the goods of particular manufacture accepted for Government use. These statements have in some cases had direct reference to purchases being made by the Navy Department under competitive bidding and public competition and are, therefore, altogether without foundation.

It is desired that all firms regularly manufacturing or marketing products used by the Navy Department bid direct and not through the medium of so-called manufacturers' agents or representatives.

THE IRON AGE

New York, October 4, 1917

ESTABLISHED 1855 VOL. 100: No. 14

791

Timken Plant for Heat-Treating Axles

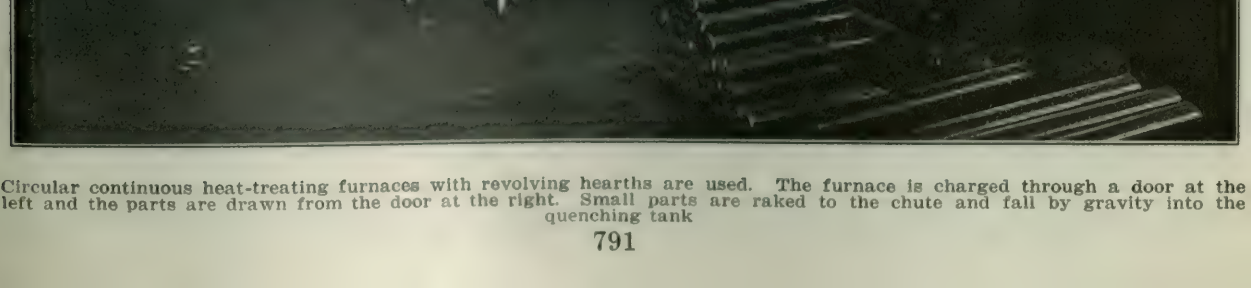
Round Furnaces with Revolving Hearths and Other Special Equipment for Reducing Costs—Producer Gas Used for Fuel

A HEAT-TREATING plant in which furnaces and other equipment of an interesting type, designed to meet special requirements and to reduce the cost of work, was recently built by the Timken-Detroit Axle Co., Detroit. One of the interesting features of this plant is the use of producer gas for firing the furnaces. Several of the heating furnaces are now fired with this gas and the remainder are being gradually changed over from fuel oil to producer gas.

The plant is designed for quality heat-treating work on the variety of parts that are used in the manufacture of an automobile axle. This includes the annealing, hardening and tempering of forgings, of parts made from shafting and small steel bars, and in fact the heat treating of all the parts that when assembled make an axle, except the steel and malleable castings.

Departing from the usual practice of having the heat-treating plant located in a special building with a high monitor roof with windows directly above for carrying out the heat and gases, the heat-treating department occupies a room with a 25½-ft. ceiling in the first floor of a three-story building, directly under a machine shop. Because of this location window space for ventilation is limited to swinging sash in the sidewalls and a mechanical system of ventilation is required. The heat-treating department occupies floor space 250 ft. long and 60 ft wide. The building itself is 397 ft. long, the remaining floor space at one end being occupied by a blacksmith shop.

Along the sidewalls at one end of the plant is a battery of five producer-gas-fired carbonizing furnaces. A special feature of these furnaces is that the hearths are on the floor level for convenience in charging the carbonizing pots into the furnaces, all lifting of pots being thus eliminated. The furnaces



Circular continuous heat-treating furnaces with revolving hearths are used. The furnace is charged through a door at the left and the parts are drawn from the door at the right. Small parts are raked to the chute and fall by gravity into the quenching tank

are of the recuperative type and have 5 x 5 ft. hearths. Two of these were supplied by the W. S. Rockwell Co., and the remainder were built by the Timken company. The pots, which are of various shapes, including square and round, are charged into the furnace with a long-handled forked two-wheeled truck. Chimney pots are used for gears to provide uniform heating conditions and are cooled under asbestos lined sheet metal hoods located along one side of the room near the furnaces. These hoods have doors swinging down at the front so that the pots are entirely inclosed beneath the hoods while cooling. By following this practice the parts are cooled in a temperature that is practically uniform the year round instead of being exposed to all kinds of weather and varying temperature conditions by cooling them out of doors, and as the rapidity of cooling is uniform a uniform hardness is secured.

Some of the work is quenched at the carbonizing temperature. In that case the pots, instead of going under the cooling hood, are dumped over a grating conveniently located in front of the furnaces. The carbonizing compound drops through the grating into a receptacle beneath and the parts to be hardened are raked from the grating into a quenching tank, the top of which is on a level with the floor. There are two of these quenching tanks, one for oil, and the other for water, one on each side of the grating. The practice is to quench in the tanks if possible, but this cannot be done with parts of certain sizes and shapes, and those liable to distortion when cooled quickly. A mixing machine is used for mixing old and new carbonizing compound. Although this machine was built for other materials it is found satisfactory for the use to which it is put.

A hood extending down to the door is provided in front of each carbonizing furnace for carrying away the heat which passes into a rectangular exhaust flue above the back of each furnace. The heat from the furnace chamber also passes up through this exhaust flue. These flues connect with a large horizontal pipe that extends from over the tops of the furnaces and around the wall to the opposite side of the building where the hot air is exhausted by fans. The main exhaust pipe also passes above the cooling hoods to which it is similarly connected and the heat is drawn from these hoods. In addition to the mechanical exhaust system connected to the furnaces other equipment is provided for ventilating the room through a system of piping and large outlets directly beneath the ceiling. Hot air is exhausted from the furnaces and from the room by five American Blower Co. exhaust fans, two of these being located in the heat-treating department and three on the roof. The air supply for the furnaces and for the forges in the blacksmith shop is furnished by three General Electric centrifugal blowers, two having a capacity of 2000 cu. ft. of free air per min., each at 2-lb. pressure, and one with a capacity of 500 cu. ft. of air per min. at the same pressure. Air is supplied to the furnaces at a 2-oz. pressure.

The heat-treating furnaces are of a special continuous type designed by the company. These are circular furnaces with revolving hearths. The outside diameter of the furnace is 16 ft., and the outside diameter of the hearth 166 in. The revolving hearth, which is similar in form to a large washer,



Pinions are hardened in a quenching bench in which the gears are immersed in oil and the shanks are allowed to cool in the air, the localized hardening operation eliminating the necessity of afterward annealing the shanks were they brought to the hardness of the gears. Gears and pinions are heated in molten lead in the pot furnaces shown



The hearths of the carbonizing furnaces are on the floor level, eliminating the lifting of the carbonizing pots. A forked truck, used for charging the furnaces, is shown in the foreground. This illustration also shows the hoods in front of the furnaces and the flues and pipes above for carrying away the heat which is exhausted by fans

is 2 ft. 10 in. wide. Mounted on one side of the furnace is a small vertical steam engine which drives the hearth by a pinion and rack on the bottom of the hearth, with the necessary speed reduction through gears to provide the slow speed required. Parts to be heat treated make one circuit of the furnace, the hearth making one revolution in from 60 to 140 min., the speed depending upon the parts to be heat treated.

There are two of these furnaces located near the center of the heat-treating department, and they are used both for heating for quenching and for heating for drawing. One of these furnaces is now fired with producer gas. A large combustion chamber, 8 ft. in diameter, is located in the center of the furnace. Hot gases pass through ports over the top of the hearth, out through ports adjoining the outer wall, under the hearth and through a flue under the floor to a stack. The furnace blast is slightly preheated by passing through a pipe under the center of the furnace and back through a parallel pipe.

The furnace is charged through a door above the hearth on one side and the work is discharged through an adjoining door. The discharge door adjoins the quenching tanks beneath the two furnaces. There are two of these tanks, side by side, one for oil and one for water, each 12 ft. long, 4 ft. wide and 4½ ft. deep. Small parts are raked from the furnace upon a movable chute on which they slide into the quenching tank. A pneumatic hoist, mounted on an I-beam so that it can be moved from one tank to the other, is suspended over the tanks for lifting out the baskets of hardened parts. In general practice parts go from one furnace to the quenching bath, and then to the second furnace for the drawing heat. The capacity of each heat-treating furnace is about four times that of furnaces of the standard type.

For general heat-treatment work there are, in addition to the rotating furnaces, six furnaces of the company's design of the semi-muffle type with 5 x 5 ft. hearths. These are generally similar to the carbonizing furnaces except that the hearths are 30 in. above the floor level. They are placed in two rows, four on one side and two on the other facing each other. The blast for the furnaces is preheated and there are exhaust flues in the front and rear to secure a greater uniformity in temperature. Between the furnaces are two oil and water quenching tanks into which parts are carried by chutes from the furnace doors. These quenching tanks are 8 ft. long, 4 ft. wide and 4½ ft. deep. They are served by a pneumatic hoist.

The pyrometer system includes control signal lights which are flashed over the furnaces from the central station pyrometer booth. Rare metal thermocouples are used. The central station also has a Leeds & Northrup Co. recording Potensionmeter which records the temperature of the 16 furnaces connected to the system. The thermocouples in each furnace are checked each week against a standard thermocouple and the Potensionmeter. A standard time and standard temperature are specified for heating each part, controlled by the operator of the central station booth by the colored signal lights.

Gears and pinions are heated in molten lead in six pot furnaces and gears are quenched in two Gleason hardening machines, the gear being clamped in dies affixed to plungers that immerse it in an oil bath when the machine is tripped, this method of hardening being used to prevent distortion. Special equipment, designated as a quenching bench, is provided for hardening pinions. This consists of six circular receptacles about 6 in. in diameter, in which oil is kept in circulation by a small pump. In operation a spider or support in each quenching tube is raised by a lever above the oil surface, the pinions are placed on the spiders, the reverse movement of the lever lowers the spiders carrying the pinions down into the oil, automatically putting the oil into circulation. The pinions are immersed to a depth that leaves the



View in Producer House Showing the Three-Section Gas Producer. The generator appears in the background at the left and the tar extractors in the foreground at the extreme right

threaded end of the shank standing out above the oil, where it is allowed to cool slowly in the air. By this method of localized hardening the teeth of the pinions are brought to the required hardness and the shank is kept soft. Otherwise it would be necessary to anneal the shank after hardening the whole pinion. This department also includes three cyanide hardening furnaces.

The miscellaneous heating equipment includes five small furnaces of the semi-muffle type and a special rotary furnace in which the work to be hardened is placed in a hopper at one end, passes through a spiral course and drops from the bottom of the furnace to a quenching tank beneath. This furnace is used for heat treating and annealing small parts such as bushings and washers. Adjoining the heat-treating department is a tool-hardening department equipped with several Hoskins electric furnaces for the heat treatment of high-speed steel.

The oil-cooling system includes direct-connected centrifugal pumps which draw the oil from the quenching tanks and force it through a series of small brass pipes in a cooling tank through which water is kept in circulation in an opposite direction. The water from the cooler goes into the water quenching tanks and from there to a cistern, which is a source of supply for the boiler house and plant fire system. Thus the water supply is conserved. The oil-cooling system was supplied by the Schutte & Koerting Co.

The gas producer plant adjoins the forge shop and is some distance from the heat-treating department. This plant, which was supplied by the Smith Gas Engineering Co., is a three-section producer consisting of two end sections and one intermediate section with a capacity of 18,000,000 B.t.u. per hr. at rated load with an overload capacity of 20 per cent for 2 hr. The gas is guaranteed to have a heating value of 140 B.t.u per cu. ft. when the plant is operated at the rated load with the bituminous coal used. The gas is cooled and cleaned in glass wool tar extractors before being delivered to the distributing main. The gas is carried to the forge shop in a 24-in. spiral riveted galvanized iron pipe and a 12-in. line carries it from there to the heat-treating department. From the latter 4 and 6 in. feeders supply the furnaces at a pressure of 1¼ and 1½ oz. per sq. in. The only change required in substituting producer gas for fuel oil in the furnaces was the enlargement of the passages from the combustion chamber to the hearth. The company is at present using producer gas in the forge shop in an experimental way, and expects eventually to substitute this for oil in the forge shop furnaces.

Census of Engineers Completed

WASHINGTON, Oct. 2.—As the result of a careful census just completed by the Bureau of Mines, 7500 mining engineers and metallurgists and 15,000 men engaged in various chemical industries have been classified for the Council of National Defense, according to the character of the work in which each one claims proficiency. The classification includes not only specialists in various branches of mining, metallurgy and chemistry, but embraces a sub-class of men who have had experience in various foreign countries. It is not the purpose of this census to enable the bureau to act as a clearing house for technical men in obtaining commercial positions, but to secure a record that will be available whenever the Council of National Defense desires to call upon these professions for assistance. "The war to-day," says Director Van H. Manning of the Bureau of Mines, "is one in which chemists and engineers play a far greater rôle than ever before. The products of the mines, furnaces, factories, and chemical plants are being so rapidly consumed that the highest possible skill is required to keep pace with the destruction everywhere apparent. In the organization of a great army, many classes of specialists are needed, and the problem is to get the best qualified men for each place."

The work of conducting this census was carried on in co-operation with the American Institute of Mining Engineers and the American Chemical Society.

Algoma Steel Co. Activities

The Algoma Steel Corporation, Sault Ste. Marie, Ont., is building another blast furnace, which, when completed, will have a capacity of 400 tons of pig iron per day. It is expected that the furnace will be completed by the first of the year. The company's work at the present time is confined purely to the turning out of 4.5 and 6-in. shells, and contracts on hand will keep the plant working to capacity for some months to come. The company recently completed its open-hearth furnace at the Soo plant, with a capacity of 75 tons per hearth, or about 200 tons per day. This makes the tenth open-hearth furnace which the company has in operation as well as the duplex furnace, which has proved most satisfactory.

The Granby Consolidated Mining & Smelting Company, with plants at Granby and Anyox, B. C., plans extensive improvements to its properties at a cost of $1,250,000 to $1,500,000. A new by-product coke plant will be built to supply the company's needs.

The Bramcote Foundry & Machine Co., Pottstown, Pa., will double the capacity of its plant soon. An annex has just been completed in the molding department, and excavations are now being made for a new machine shop, 48 by 120 ft.

The Norfolk Development Co., Quincy, Mass., has awarded a contract for 100 houses to be occupied by employees of the Fore River Shipbuilding Corporation.

AIRCRAFT BOARD FORMED

Given Official Standing and Important Powers by Congress

WASHINGTON, Oct. 2—A long step forward in the development of the aircraft program of the War and Navy Departments was taken during the past week, when both houses of Congress passed and President Wilson signed the bill formally creating the Aircraft Board. Heretofore the work of the board has been done by a committee of the Council of National Defense, but in view of the serious technical problems to be considered and the responsibility resting upon the men engaged in their solution because of the colossal appropriation of $640,000,000 for this work, it was deemed advisable to give the board a statutory standing and to render it a permanent division of the executive departments.

The new law provides that the board shall be composed of nine members and shall include a civilian chairman, the Chief Signal Officer of the Army and two other Army officers to be appointed by the Secretary of War; the Chief Constructor of the Navy and two other Naval officers to be selected by the Secretary of the Navy, and two additional civilian members. The chairman and the civilian members are to be appointed by the President and confirmed by the Senate. The civilian members are required to serve without compensation.

The board is empowered, under the direction and control of the Secretaries of War and the Navy, "to supervise and direct, in accordance with the requirements prescribed or approved by the respective departments, the purchase, production, and manufacture of aircraft engines, and all ordnance and instruments used in connection therewith, and accessories and materials therefor, including the purchase, lease, acquisition, or construction of plants for the manufacture of aircraft, engines, and accessories: Provided, That the board may make recommendations as to contracts and their distribution in connection with the foregoing, but every contract shall be made by the already constituted authorities of the respective departments." The board is also authorized to employ clerks and such technical experts and advisors as may be necessary, to fix their salaries and to rent quarters, but the total amount to be spent for these purposes shall not exceed the appropriation of $100,000 carried by the bill. It is understood, of course, that this appropriation covers merely the administrative work of the board in Washington, the larger appropriation heretofore made being available for designing, manufacturing and testing airplanes and all their adjuncts.

The Aircraft Board has called a special two-day meeting for Thursday or Friday of this week of representatives of all interests concerned in the manufacture of aircraft to place definitely in effect a series of standards for airplane fittings which has been worked out by the Aeronautic Standards Committee of the Society of Automotive Engineers, acting in cooperation with the board. The army and navy as well as aeronautical manufacturers and engineers will be represented, and the meeting is expected to advance a common simplified practice in airplane parts and appliances and in specifications of materials in both branches of the service and throughout the country. The progress of the standardization work is expected to have a constant influence in advancing the work of producing airplanes in quantity.

Included in the list of subjects for which standards have been established by the committee and which will be finally passed upon at the coming meeting are dope and varnish, engine testing specifications, inspection methods, machine gun mounting, propeller ends, safety belts, non-ferrous alloys and steel alloys. The committee has previously determined standards for many important fittings, such as stick and wheel controls, bearings, engines, supports, magneto dimensions, screws and bolts of various types, various grades of steel, and heat treatments.

The Society of Automotive Engineers Committee has been working in close co-operation with the International Standards Board, composed of American and Allied representatives, of which F. G. Diffin is chairman, and which is working on the problem of establishing common material specifications and fitting standards for the Allies and the United States. In most cases the International Standards Board will probably find it possible to adopt for international practice the major standards established by the Society of Automotive Engineers Committee, while the latter in turn can accept standards which the International Standards Board has already worked out. The work is thus being carefully correlated, leaving each free to turn to separate fields without duplication.

As one example of the simplification which has resulted from the work of the standards committee, there were formerly six or eight different sizes of airplane wheels manufactured in this country, each requiring a different tire and different adjustments without any compensation in efficiency. This number was first reduced to five, then to three, and now will probably be reduced to one size with a new design of rim to take two different sizes of tires, varying with the weight of the machine.

New Institute Members

The following have been elected to membership in the American Iron and Steel Institute, subject to occurrence of vacancy:

S. T. McCall, secretary-treasurer, American Manganese Steel Co., Chicago; H. H. Newson, director of purchases, Standard Parts Co., Cleveland; Robert W. Waltenbach, vice-president, McMyler-Interstate Co., Bedford, Ohio; Joseph B. Andrews, president, The Andrews Steel Co., Newport, Ky.; Paul Sturtevant, banker, director of American Rolling Mill Co., Pittsburgh; Louis J. Lind, vice-president, Witherow Steel Co., Pittsburgh; Dan J. Ryan, president and general manager, Allyne-Ryan Foundry Co., Cleveland; Michael J. Sweeney, vice-president and treasurer, Allyne-Ryan Foundry Co., Cleveland; James Harvey Williams, president, J. H. Williams & Co., Brooklyn, N. Y.; William P. Witherow, president, Witherow Steel Co., Pittsburgh; Joseph A. Krantz, secretary, Reeves Mfg. Co., Canal Dover, Ohio; John Goodin Carruthers, assistant manager of sales, Carnegie Steel Co., Cincinnati; Francis S. MacIlvaine, metallurgical engineer, Lukens Steel Co., Coatesville, Pa.; Louis Follet, president, Standard Tin Plate Co., Canonsburg, Pa.; Arthur J. Krantz, treasurer, Reeves Mfg. Co., Canal Dover, Ohio; Sterling P. Delano, sales manager, Linde Air Products Company, New York; Peter Richard Foley, general manager of sales, Eastern Steel Co., Philadelphia; Joseph Warner, president and general manager, Warner Iron Co., Nashville, Tenn.; Ernest Hallock Webb, president, The Webb Wire Works, New Brunswick, N. J.; William Dalton, general manager, Washington Steel & Ordnance Co., Washington; Henry C. Dubois, manufacturer of ferromanganese, Philadelphia; Oden H. Wharton, president, Crucible Steel Co. of America, Pittsburgh; Banks Hudson, general manager, Princess Furnace Co., Inc., Glen Wilton, Va.

The Bradford-Ackerman Corporation, Forty-second Street building, New York, announces that it has been appointed the Eastern sales office for Young Brothers Co., Detroit. The sale of Young ovens, for japanning and drying purposes, will, in the future, be handled by this Eastern office for the New England States, New York, New Jersey, Maryland, Delaware and Eastern Pennsylvania. An engineering department will likewise be available for manufacturers in the East who are interested in quick drying and baking processes, and special oven designs will be offered to meet various requirements.

The Williamsport Wire Rope Co., Williamsport, Pa., has recently completed the installation of a new wire-drawing plant, to be used exclusively for works production. The company is operating at full capacity, giving employment to more than 200 hands.

The Philadelphia office of Joseph T. Ryerson & Son has been moved from 423 Commercial Trust Building to 1103 Widener Building.

New Bill to Control Iron and Steel Prices

Revised Draft of the Pomerene Measure Made by the Federal Trade Commission Will Be Pushed for Passage

WASHINGTON, Oct. 2.—The Pomerene bill providing specific statutory authority for the President to control the prices and, if necessary, the distribution of iron and steel for the Government, the Allies and the American consuming public, was taken up for consideration in executive session by the Senate Committee on Interstate Commerce on Sept. 28, and after exhaustive discussion a decision has been reached to refer the measure to a subcommittee to redraft the bill, with a view to its early presentation to the Senate with a recommendation for its passage. The Federal Trade Commission has presented to the committee a revised draft of the Pomerene bill embodying a number of modifications intended to remove constitutional objections and to reinforce the power of the President to administer the act. This draft will form the basis of the work of the subcommittee. It is the expectation of the advocates of this legislation that the full commitee will report a bill to the Senate before adjournment and that the measure will then rest on the calendar until Congress meets on Dec. 4, when there will be sufficient time to consider the bill and pass it in both houses before the arrangement concerning basic prices of iron and steel products recently promulgated by the President expires on Jan. 1 next.

Price-Fixing Does Not Dispose of Pomerene Bill

The meeting of the Senate Committee on Interstate Commerce on Sept. 28 for the consideration of the Pomerene bill was well attended and there was an exceedingly interesting discussion of the provisions of the measure and of the testimony presented to the committee by Commissioner Davies and his associates of the Federal Trade Commission at the hearing on Sept. 21. There appeared to be general unanimity as to the proposition that the President's action in fixing certain steel prices in no way relieves the necessity for the ultimate passage of a broadly grounded statute dealing with the whole subject. Members of the committee drew attention to the fact that the arrangement made between the War Industries Board and certain leading men in the steel industry will remain in force but three months, when it will be subject to revision.

Senator Pomerene declared it to be his opinion that the representatives of the steel industry, who negotiated the price schedule with the War Industries Board, could only speak for certain large interests and did not represent and cannot bind the smaller producers of the country. This point he urged with considerable emphasis, calling the committee's attention to the fact that whatever the powers of the President may be, in default of a specific law on the subject, many good lawyers are prepared to contend that manufacturers whose products are in effect commandeered at certain fixed prices under the President's proclamation will have an action against the Government if such prices represent less than cost plus reasonable profit.

Recourse of Manufacturers Against Government

This phase of the case has received considerable attention at the hands of the Federal Trade Commission and is discussed in a memorandum prepared for the Senate Committee by Arthur W. Fairchild, special attorney for the commission in the steel investigation. Mr. Fairchild says in part:

"Considerable doubt has been expressed by lawyers, particularly those who have given the matter any thought, as to the effect of the Fifth Amendment of the Constitution upon Legislation of this kind; that is, that part of the amendment which requires the payment of just compensation for private property taken for public use. The query has been made as to what will be the result if the Government should see fit to take over the steel plants or should see fit to commandeer, by process provided in the law, viz., the creation of a buying and selling agency, all the output of a plant, buying it for the Government and reselling it again.

"Let us suppose, for instance, that under the Lever act the Government should see fit to take over the coal output of the country and distribute it by purchasing and selling agencies, which say to the owners of the mines, 'We will pay you $2 per ton for your coal,' and the coal should be purchased at that price and resold at that price plus a margin of profit. Query: May the producer with any reason claim that this $2 does not represent an adequate compensation in the light of the existing conditions? Can he say, 'We had a market for our coal at very much higher prices; we had a demand far exceeding the supply; we had economic conditions which would doubtless result in still higher prices, and the Government has paid us only $2 for our coal. We are entitled to the difference.' In other words, is there a question or a possibility that the Government may be called upon, at the end of the war, to pay to the owners of the plants, or the owners of property commandeered, a much larger amount than the price which has been fixed by the Executive?

Police Power or Appropriation?

"There are, of course, two pertinent powers of government. There is the national police power, or perhaps more properly the war power, and the power of eminent domain which permits in the one case an impairment of property and even its destruction for the common good, and the other, which permits the Government to take it for its own use upon payment of an adequate price. Police power and the power to take have been, through all the cases, very clearly differentiated. If the exercise of power is the exercise of a police power, which seems akin to the war power, it may result in great impairment of property and may result, in cases, in total destruction of property, but for that impairment or destruction the Government is not obliged to recompense. On the other hand, if the Government 'takes' property and appropriates it to its own use, then, under the Fifth Amendment, it is obliged to pay just compensation.

Possible Methods of Taking Steel

"So the question is for the Executive primarily, and for the legislative department. What steps may be taken without complicating the situation; without injecting into it further than necessary the possibility of the Government later being obliged to pay larger sums than the sums fixed for the property and plants?

"Under this act, as I view it, there are four possible methods which may be employed: First, the price-fixing method; second, the regulation method—regulation of production, distribution and apportionment; third, the commandeering of plants upon paying a fair rental, and fourth, the purchase of the output, really a pooling of it, and the resale to the public generally.

"Briefly I may say that it has seemed to me, with such short consideration as I have been able to give it, that price fixing and regulation would not be deemed a 'taking' of property under the Fifth Amendment; that it would be, assuming the exigency, within the power of the Government to fix the price and to regulate the production and shipment and distribution and apportionment of products without taking the property in a constitutional sense.

Commandeering Means Compensation

"On the other hand, if the Government should see fit to actually commandeer the plant, or actually com-

mandeer the output, then it would seem a taking, under the Constitution, which would require just compensation. Of course, in estimating that just compensation, if the Government should see fit to adopt either of the two latter courses, there must, if the rules applicable to eminent domain should obtain, probably be taken into consideration all of the elements that enter naturally into a determination of an adequate compensation. On the one hand, there would be the present high prices, the over-demand, or demand exceeding the supply, and the possibility or probability of future enhanced prices; but, on the other hand, there should be taken into account the economic exigency, the possibility of a disruption of the industry, because of these war conditions, and the whole possible ultimate effect of these conditions upon the industry which, of course, in the end but for the Government action, might result in disaster to it.

"So I take it that if, short of confiscation, an administrative officer or designated board should fix a compensation, a court would be very loath to alter that finding, because the weight which must be given this or that element is one of fact or mixed law and fact, and the court ordinarily does not modify a finding which is based upon a disputed fact. But the question is there, nevertheless, and the executive officer or board will naturally wish to avoid it. Therefore, in preparing this bill it would seem important to have the powers, short of taking of property, very accurately defined and given.

Piecemeal Commandeering

"There is another thing that occurred to me: This bill, of course, is fashioned after the Lever act, and that act provides for the taking over of plants and businesses of coal producers. The steel industry differs, of course, radically from the coal industry, in that there are so many different products of the industry, and the industry is integrated to such an extent that it really, in certain instances, is a combination of a very large number of different industries into one. The language of the bill, as it stands, might be taken as requiring the commandeering of the whole plant and business of any given company, if any is to be commandeered. I can conceive of a case where the Government might desire to take over perhaps only a small portion of the plants or business of particularly a highly integrated company, and my suggestion would be to broaden out the power conferred by inserting in the bill, after the word 'appurtenances,' the words 'or any part,' so that the Government might take over one branch of a particular company instead of being required to take over the entire thing."

Text of the Trade Commission Bill

Mr. Fairchild's views, as outlined above, are reflected in the text of the bill submitted to the committee on behalf of the Federal Trade Commission, which, because of the attention this important matter is now commanding in the steel trade, will be examined with interest. It is as follows:

POWER TO FIX PRICES

Be it enacted, etc., That by reason of the existence of a state of war it is essential to the national security and defense for the successful prosecution of the war and for the support and maintenance of the Army and Navy to assure an adequate supply and equitable distribution at reasonable prices and to facilitate the movement of iron ore, iron, steel, and their products, and because thereof the President of the United States shall be, and he is hereby, authorized and empowered, whenever and wherever in his judgment necessary for the efficient prosecution of the war and for the purposes aforesaid, to fix the price of iron ore, iron, steel and their products wherever and whenever sold, either by producer or dealer, to establish rules for the regulation of and to regulate the production, sale, shipment, distribution, apportionment, or storage thereof among dealers and consumers, domestic or foreign. Said authority and power may be exercised by him in each case through the agency of the Federal Trade Commission during the war or for such part of said time as in his judgment may be necessary.

POWER TO TAKE PLANT

That if, in the opinion of the President, any such producer or dealer fails or neglects to conform to such prices or regulations, or to conduct his business efficiently under the regulations and control of the President as aforesaid, or conducts it in a manner prejudicial to the public interest, then the President is hereby authorized and empowered in every such case to requisition and take over the plant, business, or property, and all appurtenances or any part thereof belonging to or operated by such producer or dealer as a going concern, and to operate and handle or cause the same to be operated and handled in such maner and through such agency as he may direct during the period of the war, or for such part of said time as in his judgment may be necessary.

That any producer or dealer whose plant, business, property, and appurtenances shall have been requisitioned or taken over by the President shall be paid a just compensation for the use thereof during the period that the same may be requisitioned or taken over as aforesaid, which compensation the President shall fix or cause to be fixed by the Federal Trade Commission.

SEVENTY-FIVE PER CENT DOWN

That if the prices so fixed, or if, in the case of the taking over or requisitioning of the plant, business, property, and the appurtenances, or any part thereof, of any such producer or dealer, the compensation therefor as determined by the provisions of this act be not satisfactory to the person or persons entitled to receive the same, such person shall be paid 75 per centum of the amount so determined, and shall be entitled to sue the United States to recover such further sum as, added to said 75 per centum, will make up such amount as will be just compensation in the manner provided by section 24, paragraph 20, and section 145 of the Judicial Code.

While operating and handling, or causing to be operated and handled, any such plants or business and appurtenances thereof, the President is authorized to prescribe such regulations as he may deem essential for the employment, control, and compensation of the employees necessary to conduct the same.

GOVERNMENT PURCHASE OF ENTIRE PRODUCT

Or if the President of the United States shall be of the opinion that he can thereby better provide for the common defense and the purposes aforesaid and whenever, in his judgment, it shall be necessary for the successful prosecution of the war, then he is hereby authorized and empowered to require any or all producers of iron ore, iron, steel and their products in any section of the United States, or in the entire United States, to sell their products or designated portions thereof only to the United States through an agency to be designated by the President, such agency to regulate the resale of or to resell such iron ore, iron, steel, and their products or designated portions thereof and to regulate and fix the prices thereof, and to establish rules for the regulation of and to regulate the production, shipment, distribution, apportionment, or storage thereof among dealers, consumers, domestic or foreign, and to make payment of the purchase price thereof to the producers thereof, or to the person or persons legally entitled to said payment.

That within fifteen days after notice from the agency so designated to any producer of iron ore, iron, steel and their products that his or its output or portions thereof is to be so purchased by the United States as hereinbefore described, such producer shall cease sales or shipments of said product upon his own account and shall transmit to such agency all orders received and unfilled or partially unfilled, showing the exact extent to which shipments have been made thereon, and thereafter all shipments shall be made only on authority of the agency designated by the President, and thereafter no such producer shall sell any of said products except to the United States through such agency, and the said agency alone is hereby authorized and empowered to purchase during the continuance of the requirement the output of such producers.

That the prices to be paid for such products so purchased shall be based upon a fair and just profit over and above the cost of production, including proper maintenance and depletion charges, the reasonableness of such profits and cost of production to be determined by the Federal Trade Commission, and if the prices fixed by the said commission of any such product purchased by the United States as hereinbefore described be unsatisfactory to the person or persons entitled to receive the same, such person or persons shall be paid 75 per centum of the amount so determined and shall be entitled to sue the United States to recover such further sum as added to said 75 per centum will make up such amount as will be just compensation in the manner provided by section 24, paragraph 20, and section 145 of the Judicial Code. All such products so sold to the United States shall be sold by the United States at such uniform prices, quality considered, as may be practicable and as may be determined by said agency to be just and fair.

Any moneys received by the United States for the sale of any such iron ore, iron, steel, and their products may, in the

discretion of the President, be used as a revolving fund for further carrying out the purposes of this section. Any moneys not so used shall be paid into the treasury as miscellaneous receipts.

TRADE COMMISSION COST INQUIRY

That when directed by the President, the Federal Trade Commission is hereby required to proceed to make full inquiry, giving such notice as it may deem practicable, into the cost of producing under reasonably efficient management at the various places of production the following commodities, to wit: Iron ore, iron, steel, and their products.

The books, correspondence, records and papers in any way referring to transactions of any kind relating to the mining, production, sale, shipment or distribution of all producers or other persons whose iron ore, iron, steel, or their products have or may become subject to this act, and the books, correspondence, records and papers of any person applying for the purchase of iron ore, iron, steel, or their products from the United States shall at all times be subject to investigation by the said agency, and such person or persons shall promptly furnish said agency any data relating to the business of such person or persons which said agency may call for, and said agency is hereby authorized to procure information with reference to the business of such producers and the customers therefor in the manner provided for in sections 6 and 9 of the act of Congress approved Sept. 26, 1914, entitled "An act to create a Federal Trade Commission, to define its powers and duties, and for other purposes," and said agency is hereby authorized and empowered to exercise all the powers granted to the Federal Trade Commission by said act for the carrying out of the purposes of this act.

Having completed its inquiry respecting any commodity in any locality it shall, if the President has decided to fix the prices at which any such commodity shall be sold by producers and dealers generally, fix and publish maximum prices for both producers and of dealers in any such commodity, which maximum prices shall be observed by all producers and dealers until further action thereon is taken by the commission.

In fixing maximum prices for producers the commission shall allow the cost of production, including the expense of operation, maintenance, depreciation, and depletion, and shall add thereto a just and reasonable profit.

In fixing such prices for dealers the commission shall allow the cost to the dealer and shall add thereto a just and reasonable sum for his profit in the transaction.

PENALTY FOR HIGHER PRICES

Whoever shall, with knowledge that the prices of any such commodity have been fixed as herein provided, ask, demand, or receive a higher price, or whoever shall, with knowledge that the regulations have been prescribed as herein provided, violate, or refuse to conform to any of the same, shall, upon conviction, be punished by a fine of not more than $5,000 or by imprisonment for not more than two years, or both. Each independent transaction shall constitute a separate offense.

Nothing in this section shall be construed as restricting or modifying in any manner the right the Government of the United States may have in its own behalf or in behalf of any other Government at war with Germany to purchase, requisition, or take over any such commodities for the equipment, maintenance, or support of armed forces at any price or upon any terms that may be agreed upon or otherwise lawfully determined.

Existing Contracts an Obstacle

The question uppermost in the minds of those who are studying this problem with a view to adjusting it through legislation is the disposition of existing contracts, which, according to the investigation made by the Federal Trade Commission, cover a very large amount of the current production and run from six months to a year into the future. Commissioner Davies, in his statement before the Senate Committee published in THE IRON AGE last week, emphasized this feature, and Dr. Walker, the chief economist of the commission, who for the past two years has made a special study of the steel industry, has dwelt upon it in a statement supplementing Commissioner Davies.

"Assuming the Government would fix the price of pig iron at $25," says Dr. Walker, "there would be a great difference in the cost of production of those who bought at the Government price and those who bought on the existing bona fide contracts, which would, in my judgment, upset any reasonable price-fixing scheme that the Government might decide on for future steel production; hence, it would appear that these bona fide contracts, if allowed to continue, would completely upset a successful scheme of price regulation at any reasonable figure. No man could compete with a difference of $10 per ton in the cost of pig iron against him, let alone a difference of $25 which would occur in some instances."

Proposed Cancellation of Contracts

Chairman Newlands, who has constantly had in mind the idea that the consumption of iron is so universal that Congress possesses the constitutional power to decree it to be a public use, has frankly suggested the cancellation of all outstanding contracts. "If the Government," he said, "has the power to decree this to be a public use and the courts should sustain the exercise of that power, all contracts would be abrogated. I assume that a water company is a purely private organization, supplying its customers with water, if it has not as yet been decreed to be a public use and subject to public regulation; but just as soon as that declaration is made, at that moment all contracts and all persons have a right to resort to the public utility for the commodity upon equal terms. Therefore, my mind is directed to this as the possible solution of the whole question, whether we could not simplify it by confining the regulation purely to iron ore, pig iron and steel billets or steel plates, upon the assumption that the basic price of these things being fixed and being reasonably fixed, all the products in which they enter will be sold at a reasonable price."

To this suggestion Dr. Walker takes exception. "In the present state of the steel market," he said, "as a matter of practical study, I should not anticipate that that would be the consequence. We find it illustrated in the steel market at the present time. The prices of ore are comparatively high—higher than ever before. The prices of coke are very high—unheard-of prices. They have produced a high cost of pig iron; but, even taking those prices of ore and coke, translating them into the cost of pig iron, as it is done for those who have to purchase it, and getting a very high pig-iron cost on that account, we do not find the price of pig iron corresponds even to that high cost, but is away above this high cost of pig iron.

Prices Out of All Relation to Cost

"In other words, the same factor that has made the coke price out of all proportion to the cost of coke makes the pig-iron price high out of all proportion to the cost of pig iron, made even by the people who are paying the highest prices for raw material. And so in successive stages we find with certain costs of steel that the price of shapes is one thing and the price of plates very different, although normally the cost of shapes and plates is approximately the same, and normally their prices have been about the same; in fact, one familiar with the past prices of the articles knows that ordinarily they were quoted at the same level, especially if there was any general agreement about what the prices ought to be among the producers.

"Now, take the price of shapes to-day. I do not remember the exact figures, but it is about one-half the price of plates. Why? Not on account of different conditions in cost of crude steel, but on account of different demand conditions for these different articles. The same thing that has put the price of pig iron away above the cost of even high-cost pig iron has put the price of plates away above even the high cost of plates and much higher than the price of shapes, which normally, and even under present conditions, has for the same mill the same cost approximately as plates. So you can not rely on fixing a basic price to get an even proportionally reasonable price of successive products, and the illustration of plates and shapes is one of the very best illustrations you could pick out. And taking them as typical is a mistake; plate prices are away out of proportion to any products of a similar degree of manufacture."

Extent of Steel Price Fixing

Another exceedingly interesting phase of this subject to which members of the Senate committe are giving attention is the question as to how far Government price-fixing should go in the listing of steel com-

modities. In reply to a question as to "how far it would be necessary to go in fixing the prices of the various successive products in order to insure justice both to the Government and to the public," Dr. Walker gave it as his opinion that the category should include "all semi-finished steel, including blooms, slabs and billets, sheet bars, plates, rails and shapes, merchant bar and skelp for rolling tubes, rolled and drawn tubes, galvanized sheets, tin-plate and numerous additional items."

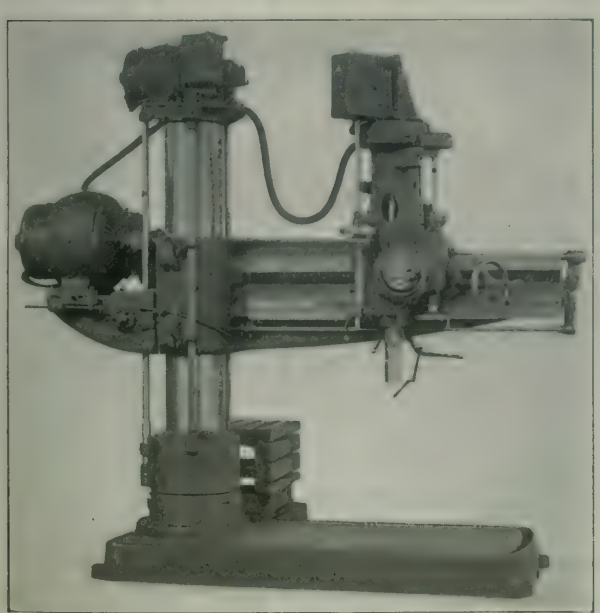
The committee's attention has also been called to the fact that in England the Government has established the prices of more than a hundred items, including the typical products of nearly every important plant. The Trade Commission has investigated the practical operation of the British law and finds it to have been successful, but to require a very large administrative force, chiefly because of the minute detail into which the control has been ramified and which extends to builders' hardware and a considerable variety of small completely finished articles.

For the convenience of its members the Senate Committee has reproduced the tables and chart showing iron and steel prices for the nineteen-year period, 1898-1916, which appeared in the Jan. 4 issue of THE IRON AGE. The printed report of the recent hearings will also contain the controlled prices for iron and steel products fixed by the British Government. W. L. C.

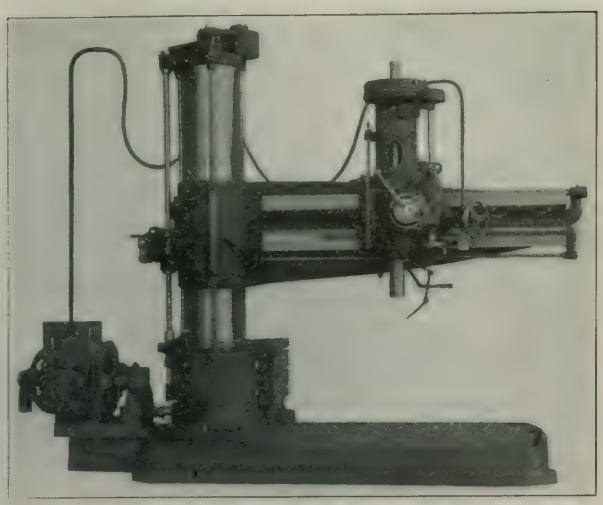
Motor-Driven Radial Drilling Machines

Some interesting arrangements of adjustable-speed motor drive for radial drilling machines have been developed by the Cincinnati Bickford Tool Co., Oakley, Cincinnati, Ohio. This type of drive can be applied to practically all of the machines built by this company, the two illustrated being perhaps as good examples as any of the extent to which this form of drive has been developed. Both machines are of the plain type and the equipment includes a plain table, an arrangement for supplying cutting lubricant to the drill point, and an air-operated device for clamping the arm in place on the column.

One of the machines, which is built with 4, 5 and 6 ft. arms, is driven by an adjustable-speed motor mounted on the arm and geared directly to the arm shaft. This motor has a speed range of 3 to 1 and the controller for it is mounted on the drilling head on the arm. A constant-speed reversing compound wound motor mounted on the top of the column provides for the raising and lowering of the arm. The operation of this motor is controlled by a reversing switch actuated by a square shaft equipped with the builder's patented interlocking device and a dynamic brake resistance. The



Motors Mounted on the Arm and Column Drive the Drill and Raise or Lower the Arm



An Adjustable Speed Motor with a Smaller One for Speed Regulation Attached to It Is Provided for a Line of Plain Radial Drilling Machines with 4, 5 and 6 Ft. Arms

wiring for this motor is led in through a revolving connection in the base of the column and runs up through the center to the top.

The other machine, which is also built with 4, 5 and 6 ft. arms, has an adjustable-speed motor with a starter and a smaller one for speed adjustment attached to the larger motor. The speed control is of the Reliance remote push-button type, the starting and stopping buttons being mounted on the head of the machine.

In addition to the motor-drive arrangements illustrated, three other types of drive can be supplied. These are a belt and cone pulley and through a gear box, either with or without an electric motor.

New Steel Foundry at Massillon

The Massillon Steel Casting Co., Massillon, Ohio, recently organized with a capital stock of $250,000, has commenced the erection of its new steel foundry which it expects to have in operation about Dec. 1. One unit, 100 x 100 ft., will be built at present and arranged with a view of adding additional units later. In addition, two other buildings will be built, one for cleaning and annealing and the other for pattern storage. The foundry will be equipped with a two-ton convertor and a Whiting cupola. A Chicago Pneumatic Tool Co. two stage air compressor, with a capacity of 750 cu. ft. of free air per minute, will be installed to furnish blast for the sand blast machine, a General Electric centrifugal compressor for the cupola and a No. 5 Root positive pressure blower for the converter. The plant will be served by a five-ton Bedford Foundry & Machine Co. crane. Complete molding machine equipment will be installed, this including seven Osborn, Tabor and Herman machines. The product of the plant will include steel castings of 200 lb. in size and under. E. H. Birney is president, Fred H. Snyder, vice-president, I. M. Taggart, treasurer, and A. H. Anthony, general manager.

The Northern Iron Co., Plattsburgh, N. Y., recently suffered a $50,000 loss by fire at its Standish, N. Y., blast furnace. The machine shop, carpenter shop and some of the trestles and storage bins were destroyed. Temporary repairs were made, so that the blast furnace operations were resumed one week from the day of the fire. It will require about six weeks to replace the destroyed buildings, and meanwhile the company will operate its furnace at a somewhat reduced capacity.

The Union Iron Works, Erie, manufacturers of steel boilers, has let a general contract for a new boiler and power house. The concern states the only equipment it needs for the new plant is a small coal-handling proposition, as there will be no new equipment put in the plant, this being merely a removal to a new site of the old equipment. The building will be one story high, 58 x 89 ft. in size and will cost about $15,000.

VERTICAL STEEL STORAGE

Racks in New Detroit Warehouse of Union Drawn Steel Co.

A STEEL storage warehouse designed for conservation of space and convenience and economy in handling cold drawn steel was built recently in Detroit, Mich., by the Union Drawn Steel Co., Beaver Falls, Pa. The greater part of the stock is stored in upright racks, which are of a special design, rigidly built to withstand heavy loads. The racks were adopted in preference to flat storage racks for the reason that much larger tonnages can be kept and handled in a given space. The warehouse has a capacity of 10,000 tons of steel, and it is said to be the largest warehouse in the country carrying cold drawn steel exclusively.

The warehouse is located at Joseph Campau and Guoin streets, and occupies a reinforced concrete, brick and steel building, 131 x 138 ft. in size and providing 17,600 sq. ft. of storage space. The front is two stories in height, providing an office room on the second floor, 60 x 40 ft., in addition to a smaller warehouse office on the first floor. Sufficient window space is provided to assure light in all parts of the warehouse. The windows are factory ribbed glass in steel sash. The roof is of concrete, and the floors are of 7-in. concrete reinforced on 3-in. centers, and above the concrete master builders' cement is laid. Under all racks there are solid trench walls extending 3 ft. into the ground and heavily reinforced. These walls are separate from the floor itself, so that should the weight cause the racks and their foundations to settle the surrounding floor would not be affected.

The building is divided crossways into three bays. The center bay has a steel truss roof and is used for handling material and loading. The two side bays are for storage. An electric traveling crane with a 50-ft. span is to be provided in the center bay. The ceilings of the side bays are 18 ft. in height. Railroad sidings extend on both sides of the warehouse and material is brought in on one side and loaded out on the opposite side. Two Packard trucks, each of 2 tons capacity, are provided for city deliveries.

Vertical racks are provided in the two side bays for the storage of all material up to 1⅝ in. in diameter. Larger sizes and short sections are stored in flat racks. The upright racks are built back to back at a slight pitch, the main members meeting at the top where they are securely bound together. There is a 4-ft. 1-in aisle between each pair of racks. The racks are 26 in. deep and are divided into sections 42 in. wide, each section having a capacity for storing 10 tons of steel in lengths up to 16 ft. Each rack section may be subdivided into smaller sections by means of pins placed in holes provided in supporting angles at the back of the racks.

The racks are built of 7-in. channels at the back and 2 x 2 x 3/16-in. angles at the front, the angles being bolted to the channels with bolts in 1-in. pipe as spreaders. The upright angles and bolts provide the partitions between the rack sections. The horizontal cross members at the back of the racks consist of 6-in. channels at the base and five 3½ x 3½ x ¼-in. angles between the base and the top. These are bolted to the channels by the long bolts that extend through to the front of the racks. The racks are supported at the bottom by 18-in. U-bolts sunk into the concrete and at the top they are built into the side wall at one end to eliminate possible swaying. To add to the strength, braces are provided between the vertical members near the base. This construction furnishes a space 40 in. wide for the flat storage of steel between each two racks. An angle is placed across the front of the base to prevent stock from slipping out. The racks are sufficiently strong to permit the loading to capacity on one side and leaving the racks on the opposite side empty.

An unusual feature in the warehouse is the providing of steam pipes under the racks beneath the cross braces and also beneath the flat racks. These are connected from overhead lines with the warehouse heating system, and keep the temperature at about 65 deg. in the coldest weather so that condensation of moisture on the stock that would otherwise cause rust is prevented. The racks were fabricated and erected by the American Bridge Co.

The warehouse equipment includes a portable shop crane of 2 tons' capacity, two Cochrane & Bly motor-driven circular saws with a capacity for cutting up to 6 in. in diameter and 5-ton Fairbanks portable scales of the rolling mill type.



Space is conserved in the new cold drawn steel warehouse of the Union Drawn Steel Co. by storing stock up to 1⅝ in. in diameter in vertical racks which are heated beneath to prevent the stock from rusting

The stock carried includes 0.40 to 0.50 per cent carbon axle steel, 0.15 to 0.25 carbon open-hearth case hardening steel, 3½ per cent nickel and 1½ per cent chrome nickel steel; 0.15 to 0.25 carbon open hearth steel in all sizes and shapes, Bessemer steel for screw stock, and shafting and flats in both Bessemer and open hearth steel.

Reorganizes Sale Department

The Cleveland Brass & Copper Mills, Inc., which placed its plant at Euclid, Ohio, in operation a few days ago, has organized its sale department under the management of B. M. Gardner, secretary and sales-manager, and in addition to its main office in Cleveland will maintain a branch office in the Dime Bank Building, Detroit, Ellicott Square Building, Buffalo, Railway Exchange Building, Chicago, and Reibold Building, Dayton, Ohio. The plant will produce sheets and rods in brass, copper and bronze. The company is financed largely by Cleveland capital, and at its head is H. C. Osborn, who is also president of the American Multigraph Co. Some of the other directors are actively connected with large industrial enterprises in Cleveland. B. F. Brusstar is in charge of production, having resigned his position as general manager of the Detroit Copper & Brass Co. to become connected with the Cleveland mill. In addition to six years spent at the Detroit plant, he was in charge of the brass mill department of the Winchester Repeating Arms Co. for 14 years, after an earlier training with Randolph, Clowes & Co. and other New England mills. The plant, which is modernly equipped, was designed and erected under the supervision of Westinghouse, Church, Kerr & Co.

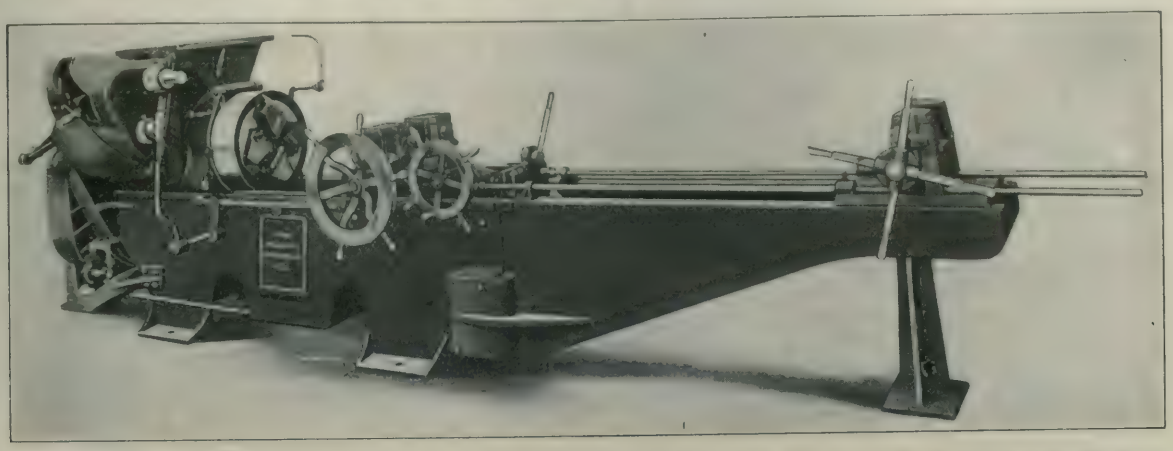
Canadian Iron and Steel Production

TORONTO, ONT., Oct. 1.—The total production of steel ingots and direct castings in Canada in the first six months of the current year amounted to 836,149 short tons, an increase of 246,596 tons, or 42 per cent over the corresponding period of 1916. The average monthly production was 139,858, as against 98,259 in the first half of 1916. A new high record in output was reached during May of 155,346 tons, but the June figures show a falling off of about 18,000 tons. Pig iron output from returns covering all producers was 586,998 short tons, as against 562,097 for the corresponding six months of last year. Imports from the United States have been on a considerably larger scale. The imports of steel ingots and direct castings for the first six months of this year amounted to 139,640 short tons, against 47,493 for the same period of 1916. In pig iron the increase was from 29,801 tons last year to 38,858 tons for the present year.

The Lenni Steel Co., Philadelphia, has opened an office at 130 South Fifteenth Street, and plans for a new plant will soon be announced.

Threading Machine for Staybolt Tubes

A recent addition to the extensive line of machinery which has been developed for use in shipbuilding plants is a machine for threading hollow staybolt tubes that



Hollow Staybolt Tubes Ranging from 6 to 8 Ft. in Length and from 2¾ to 3½ In. in Diameter Are Threaded by a Recently Developed Machine

was designed and built by the Landis Machine Co., Waynesboro, Pa. Tubes ranging from 2¾ to 3½ in. in diameter and from 6 to 8 ft. in length are handled by the machine. An auxiliary bed and carriage are provided to enable both ends of the tubes to be threaded as well as serving as a support for the tubes during the operation.

The main bed of the machine has an extension one fitted into it which in turn supports an auxiliary carriage. Threaded grips which are used in timing the threads on the ends of the tubes, as well as supporting them, are fitted to the carriage. A lead screw attachment, which is relied upon to insure accurate work and the perfect starting of the thread, is provided, together with a pitch indicator to show the correct position for engaging the lead screw nut. The builder's all steel rotary die head is used in the machine, which was designed and built for a large shipbuilding plant. A constant-speed, alternating-current motor drives the machine through an arrangement of chain and sprockets in connection with a mechanical speed change box.

In operation the tube which is to be threaded is gripped in the vise of the regular carriage and the thread cut in the customary way. After all of the tubes have been threaded on one end, a master tube threaded on both ends with a continuous thread is placed in the machine. The grooves or serrated surfaces of the chasers are made to fit the thread already cut on one end of the master tube and the other end is gripped with the threaded grip in the auxiliary carriage, care being taken to have the grips loose enough to adjust themselves longitudinally to mesh with the thread on the master tube. After the master tube is gripped in the extension carriage, the threaded grips are securely clamped in the auxiliary carriage vise jaws. The lead screw nut on the main carriage is then thrown in and the tubes to be threaded are gripped in the regular vise of the main carriage. In this way, the chasers, the lead screw and the threads on the staybolt tubes will all be timed. The master stay tube is now removed and replaced by the tubes that have been threaded on one end, the thread which has already been cut being placed in the threaded grip on the auxiliary carriage. The lead screw nut is engaged when the pitch indicator on the main carriage shows the correct position for the engagement of this nut. The second end of the tube is threaded in the regular way, thus giving a continuous thread on both ends of the tube.

On Friday, Sept. 28, the first billets were rolled in the new electric steel plant of the United States Electric Steel Co., at Connellsville, Pa. When running full, this plant is expected to turn out about 75 tons of electric steel per day in the form of billets, which will be sold in the open market.

How Malleable Iron Has Improved*

Demonstrated by Series of Tests Covering 17 Months from Many Makers—Marked Gain in Uniformity

BY ENRIQUE TOUCEDA

DATA indicating the progress that has been made in the past few years in the improvement of malleable iron can best be obtained by tabulating the results of many hundreds of tests, starting from the time they began to be systematically conducted, presenting the averages in suitable form.

While prior to November, 1915, tensile test bars were sent to me by the various companies for whom I am consulting engineer, with frequency, but at odd intervals, it was not until the date referred to that it was decided to send on test bars daily which would fairly represent the product of each day's run.

Condensed Test Data

The record first presented consists of the average ultimate strength and elongation of all bars received during the last two months of 1915; of all bars received during the whole of 1916, and of all bars received during the first five months of 1917.

To the end that you may obtain a clearer idea of what these tests indicate than if you were furnished simply with the average ultimate strength and elongation of the total number of bars received during these various periods, the results have been classified for your convenience into various grades, as shown in Table 1. About 18 separate companies furnished these bars. Therefore, this data is not derived from tests of bars sent by one or two companies, but by a very significant number.

and in 1917 to 1.68 per cent. Only 2.40 per cent of the bars exceeded 52,000 lb. per sq. in. ultimate in 1914, as against 16.76 in 1916, and 18.49 per cent in 1917. In 1914, 72.35 per cent of the bars exceeded 44,000 lb. per sq. in., while in 1915, 86.42 per cent, and in 1917, 88.85 per cent exceeded that figure.

When the great difficulty that has been encountered by the manufacturer within the past six months in securing suitable coal and iron for his purpose is considered, the continued improvement in 1917 is certainly remarkable, as the handicap has been large.

Relation of Elongation to Strength

Another important fact that can be gathered from the data in Table 1 is one to which I called attention for the first time in my paper read at the Cleveland meeting last year—that malleable iron of good quality is very different from other ferrous products in one partciular, in that its elongation increases with its ultimate strength. Prior to the discovery of this fact it had invariably been assumed by all writers on this subject that the reverse was true.

One of the most serious shortcomings in malleable iron in the past has been its lack of uniformity. I consider the improvement that has been accomplished in this direction within the past few years to have much more far-reaching effect on the user of this metal, and to be of greater importance to him than the ability of the founder to obtain high strength and ductility. A

Table 1.—Summary of Tests of Malleable Iron Made in 1915, 1916 and 1917

	Per Cent of Bars Under 40,000 Lb. T. S.	Per Cent of Bars Between 40,000 and 42,000 Lb. T. S.	Per Cent of Bars Between 42,000 and 44,000 Lb. T. S.	Per Cent of Bars Between 44,000 and 46,000 Lb. T. S.	Per Cent of Bars Between 46,000 and 48,000 Lb. T. S.	Per Cent of Bars Between 48,000 and 50,000 Lb. T. S.	Per Cent of Bars Between 50,000 and 52,000 Lb. T. S.	Per Cent of Bars Over 52,000 Lb. T. S.
Nov., Dec., 1915:								
Av. ult. lb. per sq. in.	5.80	9.47	12.38	21.44	21.15	16.22	11.05	2.49
Av. elongation per cent in 2 in.	4.91	6.55	7.38	8.87	9.47	10.17	11.27	13.38
Year 1916:								
Av. ult. lb. per sq. in.	2.57	3.65	7.36	13.64	18.26	21.57	16.61	16.76
Av. elongation per cent in 2 in.	5.78	6.88	7.48	8.33	9.14	10.28	11.61	12.72
First 5 months 1917:								
Av. ult. lb. per sq. in.	1.68	2.75	6.72	12.83	20.53	20.22	16.78	18.49
Av. elongation per cent in 2 in.	5.78	7.37	8.20	8.72	10.11	11.51	12.97	14.94

All bars ⅝-in. diameter, and similar in all particulars to the tinsile test bar recommended by the A. S. T. M. in its specifications for malleable iron.

Looking over my records prior to the year 1914, in which there is abundant data, it was found that the average ultimate strength and elongation would approximate about 38,000 lb. and 3.50 per cent elongation, respectively, though there are occasional instances of a 46,000 and 48,000 lb. ultimate with a 6 or 7 per cent elongation. On looking over these old records it is found that the test bars then submitted were of many different dimensions varying anywhere from ½ to 1 in. in diameter, while some were square and others rectangular in section. For this reason it is hardly possible to gather from this data any conclusions which can be compared accurately with the material that has passed through my hands since the beginning of 1914.

It will be noted in Table 1 that the proportion of the 1915 bars that failed to test up to 40,000 lb. was 5.80 per cent. In 1916 this ratio dropped to 2.57 per cent,

high ultimate strength is not always specified owing to the belief on the part of some that when the ultimate strength is in the neighborhood of 42,000 lb. per sq. in. the machine tools can be speeded up to a considerably higher rate than is possible when working with metal having ultimate strengths around 48,000 to 50,000 lb. This is a matter we will not discuss at the present time. If the individual record of many of the manufacturers, the results of whose physical tests are included in the data in Table 1, were examined, it would be found that they have made a practically uniform iron day in and day out for a period covering many months. Those whose showing is more erratic are improving.

The figures in the following tables, with one exception, were taken from the records of different companies covering iron made by them in June, this year. These data demonstrate the uniformity in the quality of the material from many consecutive heats, illustrating the fact that the manufacturer of malleable iron who is well posted in malleable practice has full control of his product. The day of "hit or miss" has passed.

*From a paper presented at the annual meeting of the American Foundrymen's Association at Boston, Sept. 26, 1917. The author is a consulting metallurgist, Albany, N. Y.

A Record Test for Elongation

The exception referred to is Table 5, in which is recorded a run of 17 consecutive heats made in February, this year. The average ultimate strength of the 17 bars is 52,784 lb. and the average elongation is 17.88 per cent, in spite of the fact that two of the bars contained a slight shrink which made them fail prematurely. In this set there are four bars with over 21 per cent elongation; one with 24.22 per cent, and one with 27.34 per cent. We have tested many bars within the past two years having an elongation as high as 24 per cent, but it is believed that 27.34 per cent is the record elongation of any malleable iron test bar ⅝-in. diameter yet produced. I might add that the reduction of area of this bar was 22.71 per cent. The data in this table are furnished you because they clearly demonstrate what is possible to achieve along the line of quality and uniformity, the goal toward which we are aiming.

Table 2.—Malleable Tests for One Foundry in June

Bar	Ultimate Strength, Lb. Per Sq. In.	Elongation, Per Cent	Bar	Ultimate Strength, Lb. Per Sq. In.	Elongation, Per Cent
1	46,032	8.59	9	46,540	8.59
2	50,631	8.59	10	48,761	7.03
3	46,700	8.59	11	51,012	9.38
4	50,213	8.59	12	49,255	7.81
5	46,917	7.03	13	47,706	7.81
6	48,344	7.03	14	52,422	7.81
7	47,324	6.25	15	50,733	9.38
8	54,028	9.38	16	47,444	9.38

Table 3.—Malleable Tests for Another Foundry in June

Bar	Ultimate Strength, Lb. Per Sq. In.	Elongation, Per Cent	Bar	Ultimate Strength, Lb. Per Sq. In.	Elongation, Per Cent
1	50,338	12.50	7	51,938	14.84
2	51,734	16.41	8	49,899	14.84
3	52,343	18.75	9	51,476	14.84
4	52,011	15.63	10	52,780	11.72
5	50,937	13,28	11	50,400	9.38
6	50,700	10.94			

Table 4.—Malleable Tests for a Third Foundry in June

Bar	Ultimate Strength, Lb. Per Sq. In.	Elongation, Per Cent	Bar	Ultimate Strength, Lb. Per Sq. In.	Elongation, Per Cent
1	51,179	10.94	13	47,125	9.38
2	48,150	8.59	14	47,125	7.81
3	50,365	11.72	15	46,755	10.94
4	47,385	10.16	16	49,242	10.94
5	49,640	10.94	17	49,480	10.94
6	47,455	9.38	18	49,650	12.50
7	50,550	14.84	19	49,410	9.38
8	48,310	13.28	20	49 305	10.16
9	48,935	18.75	21	49,870	10.94
10	51,303	11.72	22	48,845	12.50
11	48,420	11.72	23	49,470	11.72
12	49,080	12.50	24	48,765	15.63

Table 5.—Malleable Tests for One Foundry in February

Bar	Ultimate Strength, Lb. Per Sq. In.	Elongation, Per Cent	Bar	Ultimate Strength, Lb. Per Sq. In.	Elongation, Per Cent
1	55,032	21.09	10	51,380	11.72
2	53,908	21.09	11	51,978	24.22
3	54,706	21.09	12	52,506	17.97
4	52,010	17.19	13	52,477	17.19
5	50,321	10.94*	14	50,097	14.06
6	54,867	17.19	15	49,910	12.50*
7	54,283	13.28	16	52,204	17.97
8	53,537	21.09	17	52,311	17.97
9	55,804	27.34			

*Test bar broke in fillet.

As I have made mention of no tensile tests aside from those made on the standard tensile test bar recommended by the A. S. T. M., it may be of interest to record the results of tests on bars with different-sized sections. Some four months ago six sets of bars cast from the same heat and of the following sizes were sent me:

Set No. 1, 12 bars, ⅝-in. diameter.
Set No. 2, 6 bars, ¾-in. diameter.
Set No. 3, 6 bars, ⅞-in. diameter.
Set No. 4, 6 bars, 1 -in. diameter.
Set. No. 5, 6 bars, 1⅛-in. diameter.
Set. No. 6, 6 bars, 1¼-in. diameter.

The average results are as follows:

Set Marked	Ultimate Strength, Lb. Per Sq. In.	Elongation, Per Cent
No. 1— ⅝-in	52,141	15.62
No. 2— ¾-in	48,062	10.54
No. 3— ⅞-in	47,107	9.37
No. 4—1 -in	47,317	11.56
No. 5—1⅛-in	47,148	9.69
No. 6—1¼-in	46,592	9.69

This table should serve as a complete answer to those who maintain that, when malleable iron exceeds ⅝-in., it cannot be made strong or ductile. Our experience indicates that provided a casting is sound, high quality malleable iron can be produced to-day just as easily in sections around 1¼ in. thick as in the case of ⅝-in. sections. With increased thickness there naturally comes increased difficulty in removing all the shrinks, but we have within the past few years made great strides in the direction of securing perfect soundness in thick and intricately designed castings.

Great progress has been made in improving the physical properties of malleable iron solely and only because of a determination on the part of the manufacturers to systematically improve each step in the process.

The World's Platinum Supply

In 1916 the crude platinum mined in Colombia, estimated at 25,000 oz., was refined in the United States, and reports received from domestic refiners show that 28,088 oz. of metals of the platinum group was recovered by them from all sources, foreign and domestic, of which the bulk, 24,518 oz., was platinum. The following table shows the estimated output of crude platinum of the world during the last three years, in troy ounces. Borneo and Sumatra produced 200 oz. in 1913, but no figures are available since that date.

	1914	1915	1916
Canada	30	100	60
Colombia	17,500	18,000	25,000
New South Wales and Tasmania	1,248	303	222
Russia	241,200	124,000	63,900
United States	570	742	750
Total	260,548	143,145	89,982

Cement for Firebricks

A firebrick coment for which saving in time of laying the bricks and long life of the joints are claimed has been placed on the market by the Wilbride Co., Norwood, Pa., under the trade name of Amalgam. The bricks are merely dipped in the cement. This does away with the usual buttering or covering of the bricks before they are laid. When used as a lining it is claimed that the covering of the lining bricks with the cement results in an increased life of the brick.

In view of the demand for castings made under laboratory control and the consequent enlargement of the bronze department of the Titanium Alloy Mfg. Co., Niagara Falls, N. Y., this department has now been organized as a separate unit known as the Titanium Bronze Co., Inc. The company makes a specialty of worm gear blank castings for worm-driven trucks and has developed titanium-aluminum bronze for service in which heretofore English gear bronze or some similar grade of phosphor bronze has been used. The company is also die casting aluminum bronze for small motor truck and passenger car parts such as latches, cams, windshield parts and small gears.

The property of the United States Molybdenum Co. Cooper, Me., has been sold to H. S. Predmore and A. S. Gunn, New York, who are reported to represent large interests. The property is to be developed on an extensive scale and a 500-ton mill is projected to replace the 20-ton mill now operated. There is a large deposit of ore, it is said, but the mining and smelting operations have never been financially successful.

Negotiations have been instituted by the German War Office for greater co-operation among the small steel and iron rolling mills for the duration of the war. It is proposed to amalgamate several mills in the hope of increasing capacity and reducing the number of employees. Similar suggestions with regard to copper were made some time ago.

The Stanley Works, New Britain, Conn., will buy and outfit an ambulance for use with the American Expeditionary Forces. Employees in the main plant and the branches in Chicago, New York, Bridgewater, Mass., and Niles, Ohio, will be invited to subscribe.

Rushing the Construction of Ship Yards

Busy Scenes on the Delaware River — American International Corporation Asks for 25,000 Men— Other Companies Have Extensive Building Programs

SCENES at Hog Island, on the Delaware River, just outside of Philadelphia, are the busiest that can be imagined. Thousands of men are at work leveling ground, laying out new roads and tracks, erecting temporary wooden buildings and doing a vast number of other necessary things to prepare for a shipbuilding plant, which is destined to break world records in the rapid construction of steel ships. The American International Corporation, which is erecting this plant for the Emergency Fleet Corporation, has asked the Federal Employment Bureau in Philadelphia to obtain 25,000 men as quickly as possible. In view of the shortage of labor, it may be difficult to find this number of workmen, but the American International Corporation will employ all the men it can get in order to lay the keels of its first ships within four months from the date of the signing of the contract.

Temporary offices have been opened in the Bellevue-Stratford Hotel, Philadelphia, occupying the entire seventh floor, but larger quarters are being fitted up at 142 North Broad Street, Philadelphia, and will be occupied soon. Walter Goodenough, Boston, chief engineer of the Stone & Webster Engineering Corporation, is general manager of the new shipbuilding plant and has under him a large staff of engineers and department executives who have been recruited from the staffs of the Stone & Webster Engineering Corporation, the American International Corporation and the New York Shipbuilding Corporation.

Many Shops Will Fabricate

Fifty steel shipways will be erected on the 900-acre Hog Island site as soon as material can be obtained from the fabricating shops. A large number of such shops have been engaged to fabricate the steel for the ships, which will be assembled as rapidly as modern facilities and the ingenuity of the corporation's engineers can make possible. After the first ship is launched, one will follow about every alternate working day. These will be 5000-ton ships. Although the corporation's contract with the Emergency Fleet Corporation at present provides for only 50 ships, additional contracts will follow as soon as the necessary funds have been authorized by Congress.

Equipment for the new yard is being purchased rapidly. A contract has just been closed with the American Hoist & Derrick Co., St. Paul, Minn., for 500 stiff-leg derrick of 5-ton capacity at 80-ft. radius and 500 hoisting engines. The cost of this equipment is $2,400,000, and it is the largest single order of its kind ever placed in this or any other country. Eight derricks will be used for each shipway, and the remainder will be utilized for other work in the yard. The corporation's first plans provided for the utilization of overhead traveling cranes, but it was found impossible to obtain a sufficient number of such cranes within the time specified. Deliveries of the derricks and hoisting engines will be begun Dec. 1. The corporation will also purchase about $150,000 worth of pumps and $68,000 worth of air compressors, having received bids on these last week. Not much plate-working machinery will be required, as 85 per cent of the steel entering into the construction of these ships will be fabricated in shops scattered all over the country.

Plant Will Be Temporary

The shipbuilding plant will be a temporary structure. Shop buildings will not be erected with the idea of permanency, and buildings will not be erected at all except where absolutely necessary for housing purposes.

The American International Corporation, despite its lack of previous shipbuilding experience, has ample facilities and brains to draw upon for such work. The corporation was organized in 1915 and one of its avowed purposes was "the enlargement of the system of ocean transportation under the United States flag." The companies controlled by the American International Corporation are the Allied Construction Machinery Corporation, the Allied Machinery Co. of France, the Allied Machinery Co. of America, the Allied Sugar Machinery Corporation, Carter, Macey & Co., Ltd., the China Corporation and the Siems-Carey Railway & Canal Co. Affiliated with the corporation are the National City Bank of New York, Stone & Webster, the New York Shipbuilding Corporation, the International Mercantile Marine Co., W. R. Grace & Co., and the Pacific Mail Steamship Co.

Ship Assembling Plant

It is said that the plans of the Submarine Boat Corporation and the Lackawanna Bridge Co. for the similar ship assembling plant which they will erect on the Newark Meadows have not been worked out so rapidly, but the plant will be built along about the lines the American International Corporation has adopted. In all probability, the Lackawanna Bridge Co. will build the derricks needed for the shipways at this plant, and hoisting engines will be bought wherever they can be procured for quick delivery.

The Merchant Shipbuilding Corporation and the Chester Shipbuilding Co., affiliated companies, are making important additions to their plants at Bristol and Chester, Pa., to take care of Emergency Fleet Corporation contracts for fabricated steel vessels. The steel for these plants will be fabricated by the American Bridge Co. and assembled in the same way as in the American International Corporation and Submarine Boat Corporation plants. The Bristol plant, which was purchased some months ago from the Standard Cast Iron Pipe & Foundry Co., is undergoing large and important changes. Twelve steel shipways, each 420 ft. long, to accommodate vessels of 9000-ton deadweight, are being erected. Present buildings on the property are being rebuilt for their new uses and several new buildings are being put up. The building formerly used as a gray iron foundry is being turned into a pipe shop and when altered will be 125 x 185 ft., one story. The building housing the blacksmith shop and boiler shop will be 60 x 285 ft., one story; the machine shop, 80 x 220 ft., one story; the pattern and joiner shop, 53 x 153 ft., two stories; the power house, which is now 75 x 150 ft., will be tripled in size. The two cast iron pipe foundries, 100 x 464 ft., one story, are being converted into punch and frame-bending shops. Two steel runway sheds are to be rebuilt into a shipwright shed, 94 x 175 ft.; a new joiner shop will be 75 x 300 ft., two stories, and there will be a new storehouse, 200 x 300 ft., three stories, the third floor to be used as a mold loft. There will be several smaller buildings.

New Equipment To Be Added

Twenty-four cranes were in the plant when it was bought and the machine shop was well equipped, but considerable new equipment will be added, some of which has already been purchased. About 100 new machine tools will be bought, 60 of which were bid on last week. The equipment for the new power plant will cost more than $1,000,000 and will include air compressors, generators, converters, boilers, coal conveyors, steam turbines and electrical equipment of various kinds. Twenty-four revolving traveling cranes with luffing boom each of 10,000 lb. capacity at 91 ft. radius and 30,000 lb. capacity at 54 ft. radius, for shipways, were recently bought from the Edward F. Terry Mfg. Co., New York, and two will be used for each shipway A contract has also been closed recently with the

Champion Iron Co., Kenton, Ohio, for five gantry cranes with 85 ft. span, and eight locomotive cranes of the Brown-hoist conveyor type. Yard locomotives for handling equipment have also been bought.

The Merchant Shipbuilding Corporation expects to lay the keel of the first fabricated ship on Dec. 1. After the first ship is launched, one will follow every 10 days. This plant has a contract for 40 steel ships, which are to be completed within 18 months. It will be four months from Dec. 1 when the first ship is launched.

All material for these ships, such as engines, boilers, etc., will be purchased from other companies so far as possible in order to expedite delivery to the Emergency Fleet Corporation.

American Merchant Fleet

The Chester Shipbuilding Co. plant at Chester, Pa., was already well equipped when the plans for an American merchant fleet were first made, but everything possible is being done to make possible the rapid construction of ships. A new punch shop, 180 x 510 ft., one story, with one half of the building having a second story to accommodate the mold loft, is being erected; also a new joiner shop, 75 x 250 ft., and a new shipwright shop, 94 x 175 ft., both one story. All buildings are of steel and concrete construction. The Chester Shipbuilding Co. recently purchased the plant of the Duplex Paper Co. on adjoining property and is converting a large building, 200 x 350 ft., one story, into a power house, machine shop, pipe shop and blacksmith shop. New equipment is being purchased, but more will be bought soon. The Chester Shipbuilding Co. has just bought three 10-ton gantry cranes with 85 ft. span and five shop cranes, three of 5-ton, one 7½-ton and one 15-ton capacity from the Champion Iron Co., Kenton, Ohio, for shop purposes.

The shops which are yet to be provided with equipment are the pipe shop, blacksmith shop, machine shop and woodworking shop at both plants.

Sidney A. McLean, who until recently had charge of inside shipbuilding for the Fore River Shipbuilding Corporation, Quincy, Mass., has been appointed works manager by the Merchant Shipbuilding Corporation. W. Averill Harriman, son of the late E. H. Harriman, controls the majority of stock in both the Merchant and Chester companies.

The Fore River Shipbuilding Corporation, Quincy, Mass., which will erect a new plant for the Navy Department, will build 75 torpedo boat destroyers of the 150 which the plan of Secretary of the Navy Daniels provided for. The Union Iron Works, San Francisco, has 40 under way or contracted for, including several which have been under way for some months, and others are being built by the Bath Iron Works, Bath, Me.; the New York Shipbuilding Corporation, Camden, N. J.; the William Cramp & Son Ship & Engine Building Co, Philadelphia, and the Newport News Shipbuilding & Dry Dock Co., Newport News, Va. The new plant to be built by the Fore River Shipbuilding Corporation will be complete in every particular and so far as possible will be independent of other manufacturers in the production of turbines, boilers and other destroyer equipment. A scarcity of gear cutting machines is one serious difficulty that stands in the way of rapid completion of turbines. Many turbines are being built for destroyers by the General Electric Co. and the Westinghouse Electric & Mfg. Co.

The Eastern Shore Shipbuilding Corporation, whose president is R. R. Livingston, engineer, 2 Rector Street, New York, has purchased the plant of the White Shipbuilding Co., Sharptown, Md., and has had plans prepared by the Hamilton & Chambers Co., architects, 29 Broadway, New York, for additional shops to cost about $150,000. The shipbuilding company will erect the buildings itself. Contracts are said to have been closed for three cargo-carrying vessels, and the yard will be equipped also to do considerable repair work. Mr. Livingston told THE IRON AGE that new equipment for the plant would undoubtedly be bought, but he was not prepared at this time to give details.

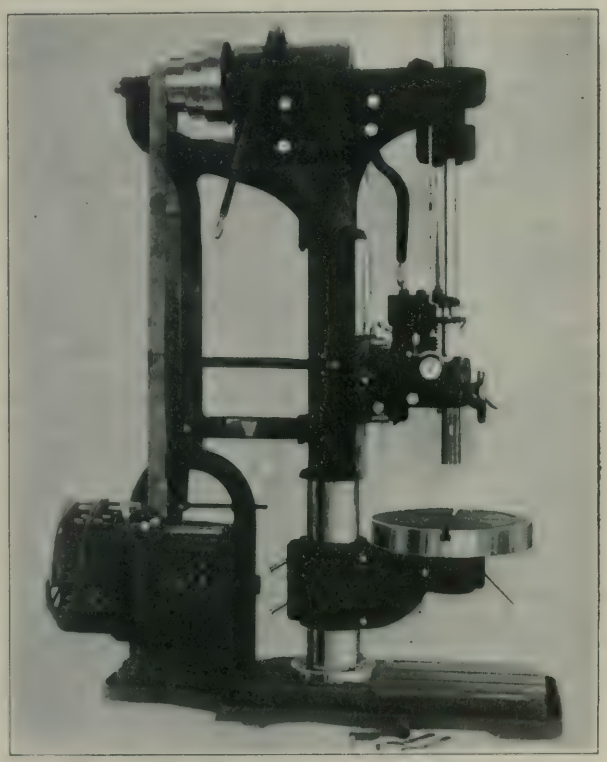
The strike of machinists at the Lake Torpedo Boat Co., Bridgeport, Conn., has been settled through officials of the Navy.

A New 25-In. Upright Drilling Machine

A 25-in. vertical drilling machine having an improved friction quick return has recently been put on the market by the Weigel Machine Tool Company, Peru, Ind. The operating levers are placed in the form of a pilot wheel consisting of four levers, any one of which engages or disengages the feed at will. An automatic stop which is positive in its action can be set to throw out the feed at any predetermined depth.

The base of the machine is heavy and well ribbed underneath to prevent any spring. It has an oil pan of ample size extending entirely around the outer edge. Four T-slots are formed in the base for clamping the work when the drilling is done on the base. The column is tubular in section and has a large bearing for the table arm, as well as a very wide bearing for the sliding head. The table arm has a large bearing on both the hub of the table and on the column. It is raised and lowered by a rack and pinion actuated through a worm and a worm gear. The bore for the hub on the table is large enough to use a compound table without making any change.

The back gear of this machine is of the friction type. It is positive in its action and easily operated by a lever conveniently located at the front of the machine.

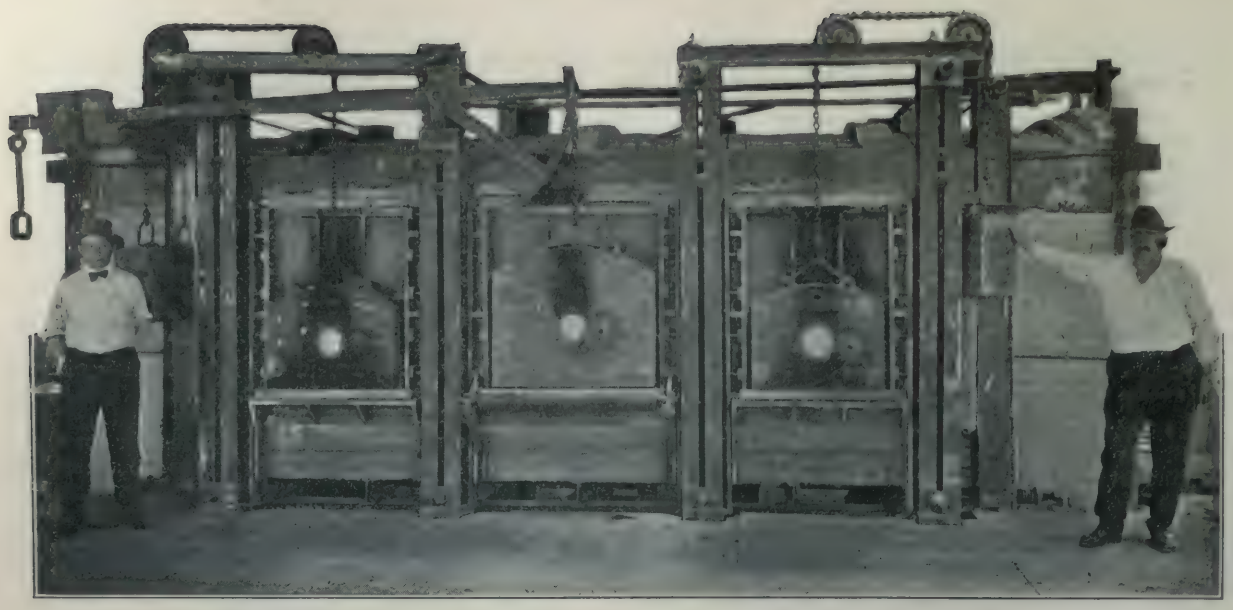


The Grouping of the Operating Levers Into a Four-Lever Pilot Wheel Provides a Ready Means for Engaging the Feed or Throwing It Out

All gears are entirely covered and run in oil tight box, thus insuring good lubrication. The spindle is provided with eight feeds ranging from 0.0040 to 0.0432 in. per revolution, and the changes are obtained by sliding gears. Any feed is easily and quickly obtained by convenient levers and the feed is indicated by a plate attached to the machine.

The machine can be furnished with a friction tapping attachment, which is placed directly on the spindle and has a reverse of 2 to 1 for backing out the tap. It can be quickly disengaged when no tapping is to be done.

The lower cone pulley is entirely covered by a cast housing and the tight and loose pulleys have an adjustable cast guard. A belt shifter is furnished with all machines when desired. This is claimed to be a new feature on drilling machines and saves the operator considerable time in shifting the belt by hand. The machine can also be equipped for direct or belted motor drive.



The 5-Ton Open-Hearth Furnace Gives a Daily Output of 20 Tons of Castings

A CONCRETE FOUNDRY BUILDING

Equipment and Practice of the American Machine & Manufacturing Co., Atlanta, Ga.

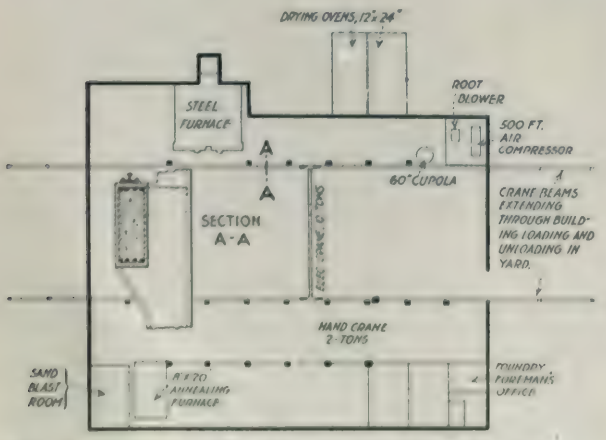
A REINFORCED concrete foundry building has been completed at Atlanta, Ga., for the American Machine & Mfg. Co., builder of oil mill machinery and maker of castings. The foundry is equipped to make gray iron as well as steel castings and forms part of a plant which includes a machine shop building, not yet fully completed.

The accompanying plan will give an idea of the departments and apparatus of the foundry. It is noteworthy that the main crane runway of 50 ft. span extends through the building to a yard at each end, openings being provided to allow the 10-ton crane installed to pass. The openings are provided with roller curtains so that they may be closed in times of rain or cold weather. One end of the building is of temporary construction of wood and space is available for an extension of 200 or even 300 ft. as business conditions justify.

A 60-in. cupola is installed and the iron foundry has a daily capacity of 15 tons to operate on special heavy machine, loam castings, chilled rolls and special chilled castings. The iron capacity is large enough to take on contracts to an amount of 10 tons daily of gray iron casting work. In this connection a fireproof pattern vault equipped with the Grinnell automatic sprinkler system has been provided.

A 5-ton McLain open-hearth furnace has been installed and there is space for additional 10 or 20-ton furnace. The stack for the furnace gases is of brick and is built large enough to take care of the additional open-hearth capacity. With the present furnace three-5-ton heats are obtainable in 10 hr. and 7½-ton heats are found possible when operating on heavy work. The plan is to operate the furnace on two 12-hr. shifts, pouring the heavy work at night, molds for which are made in the day period, and pouring the light work in the day time, giving thus a daily output of approximately 20 tons of steel castings. The machine shop and manufacturing plant will use about 5 tons of these castings per day so that the company may also contract its surplus output of 10 to 15 tons of steel castings per day.

G. S. Evans, formerly of the Lenoir Car Works, Lenoir City, Tenn., is actively interested in the company.



Plan of Combined Steel and Iron Foundry and Detail of Concrete Column Crane Supports

The Iron and Steel Institute's Fall Meeting

The fall meeting of the Iron and Steel Institute was held in London, Sept. 20 and 21. The following was the official program of papers for reading and discussion:

"Present Practice in Briquetting of Iron Ores," G. Barrett and T. B. Rogerson.
"Microstructure of Commercially Pure Iron between Ar_3 and Ar_2," W. J. Brooke and F. F. Hunting.
"The Influence of Heat Treatment on the Electrical and Thermal Resistivity and Thermoelectric Potential of Some Steels," E. D. Campbell and W. C. Dowd.
"New Impact Testing Experiments," G. Charpy and A. Cornu-Thenard.
"Heat Treatment of Gray Cast Iron," J. E. Hurst.
"Effect of Mass on Heat Treatment," E. F. Law.
"Investigation Upon a Cast of Acid Open-Hearth Steel," T. D. Morgans and F. Rogers.
"The Acid Open-Hearth Process," F. Rogers.
"The Eggertz Test for Combined Carbon in Steel," J. H. Whitely.
"Failure of Boiler Plates in Service and Investigation of Stresses Occurring in Riveted Joints," E. B. Wolff.

Expansion of the British Steel Industry

About $75,000,000 (£15,000,000) additional capital has been invested in the British steel industry since the war started, according to the report of the British Steel Smelters' Society. Production does not satisfy the needs of the Government, it is stated. The additional plant and the demands of the military authorities have caused a shortage of labor and many men have been brought back from the army to help to supply the deficiency.

The Worthington Pump & Machinery Corporation announces the opening of a new branch sales office in the American Trust and Savings Bank Building, Birmingham, Ala., to take care of a part of the large territory hitherto controlled by the Atlanta office. Edward Stauverman, formerly with the Atlanta office, will be in charge of the Birmingham office.

The Cheever Iron Ore Co., Port Henry, N. Y., is planning for the construction of a new iron ore dock to cost about $100,000. A. E. Hodgins is general manager.

FABRICATION IN TRANSIT

Decision of Unusual Importance by Interstate Commerce Commission

WASHINGTON, Oct. 2.—The broad principle is laid down in a decision just announced by the Interstate Commerce Commission that a common carrier cannot legally deny fabrication-in-transit service at any given point reasonably well located for such purpose on carload shipments of certain iron and steel articles there to be fabricated into material for the construction of towers, tanks, standpipes, steel riveted pipes and smokestacks, while contemporaneously according such service under tariffs to which such carriers are parties on carload shipments of similar iron and steel articles fabricated at other points for use in the construction of bridges or buildings. Unusual significance attaches to this ruling because of the fact that there is now in prospect a very large increase in the number of fabricating plants in the country to provide material for the building of standardized ships, for the extension of navy yards and naval stations, and for buildings involved in the expansion of numerous manufacturing plants engaged in ordnance work.

The complainant in this case, the Chicago Bridge & Iron Co., maintains a plant at Greenville, Pa., on the line of the Erie Railroad, where it is engaged in fabricating iron and steel articles into material for use in the construction of towers, tanks, standpipes, steel riveted pipes and smokestacks. It alleges, first, that existing schedules, although otherwise construed by the defendant carriers, provide a fabrication-in-transit service at Greenville and, second, that if these schedules do not so provide, the carriers' failure to accord such service is unreasonable, unjustly discriminatory and unduly prejudicial. Reparation therefore is demanded for the refusal of the carriers up to the present time to accord such service. It is further shown that from the time that the complainant's Greenville plant was erected in 1910 until Feb. 1, 1916, when the present rules became effective, the fabrication-in-transit service now sought was accorded by the carriers.

The present transit rules provide for the application of through rates plus a transit charge of 1½ cents per 100 pounds, on certain iron and steel articles, viz., angles, bars, beams, bolts, castings, channels, columns, girders, plates, nuts, rivets, rods, tees, and zees, shipped in carloads to Greenville, there fabricated into "material for the iron and steel framework or sections of bridges or buildings" and reshipped in carloads. The complainant contended that towers, tanks, standpipes, steel riveted pipes and smokestacks are "buildings" within the meaning of the tariff and for that reason its shipments are entitled to the fabrication-in-transit service. With this view the Interstate Commerce Commission does not agree. The transit rules under consideration, the commission holds, were suspended and withdrawn in the fabrication-in-transit at Greenville, Pa., case, decided some months ago. For this reason reparation is denied.

Concerning the broader proposition, however, that the complainants are entitled to fabrication service at Greenville in view of that accorded competitors at other points, the commission makes a comprehensive ruling of interest to the entire steel trade.

"Iron and steel articles for use in the construction of towers, tanks, standpipes, steel riveted pipes, and smokestacks," says the decision, "are of necessity fabricated at mills far removed from the sites of such structures and it is essentially inexpedient to set up at the destined sites the necessary machinery for fabrication. This is true also of structural iron and steel for use in bridges and buildings, and it is this 'circumstance and condition of things which has warranted the extension of the privilege to this particular industry.'

"Apparently no distinction can be made between the circumstances and conditions surrounding the transportation of complainant's material and those surrounding the transportation of material for use in the iron and steel framework of bridges and buildings. This is true not only of those conditions directly affecting transportation, but also of the commercial circumstances which bear upon the desirability of a fabrication-in-transit service. The only substantial difference between fabricated material for use in bridges and buildings and fabricated material for use in towers, tanks, standpipes, steel riveted pipes, and smokestacks is the use to which they are put, and it has long been held that rates cannot be predicated upon the proposed use of the commodities transported."

Upon this record the commission decides that while, under the circumstances, the carriers' failure to accord fabrication-in-transit service in the past cannot be held to be unreasonable *per se*, nevertheless, "the failure to accord such service, while contemporaneously according it under tariffs to which defendants are parties on similar iron and steel articles fabricated at other points into like material for use in the construction of bridges and buildings, is and for the future will be unduly prejudicial to complainant and its traffic in violation of section 3 of the act to regulate commerce."

Gun for Removing Open-Hearth Slag

The Rivet Cutting Gun Co., 220 East Second Street, Cincinnati, has recently perfected a flexible gun for digging slag from open-hearth slag pockets.

The apparatus consists of a cylinder measuring 3 x 26 in. in which is an 8-lb. floating piston that strikes a blow on the head of the cutting bar extending inside the cylinder. The piston is returned by the introduction of air pressure at the bottom through the pipe shown on the outside. The force of the air entering the gun via the air intake located at the top of the cylinder is controlled by the operator by a three-way valve through the air intake port. It is claimed that the operator can deliver either a very light stroke or a very hard blow, and after a little practice an ordinary workman can operate the three-way valve so fast that as high as 125 strokes per minute can be obtained.



Slag Is Dug Out of the Pockets of Open-Hearth Furnaces by an Air-Actuated Cutting Bar 26 In. Long

The manufacturer points out that by the use of this slag gun no hard physical labor is required and that it will loosen the slag many times quicker than is accomplished in the ordinary method of using a sledge hammer and bar. Attention is also called to the fact that the temperature in the slag pockets of the machine some times runs as high as 150 deg. Fahr., so that workmen cannot stand much physical exertion in a heated atmosphere.

The construction of the tool is very simple and it has no complicated parts to get out of order. An air pressure of 75 lb. and higher is recommended to secure the best results.

Hardening Carbon and Special Steels*

Effect of Chromium, Copper and Nickel on the Penetration of the Hardening—Copper Increases the Depth in Copper Steels

BY L. GRENET

THE difference between the influence of the heat treatment at the surface and in the center of steel pieces, which is very considerable in the case of carbon steels but small in steels in which the hardening effect has penetrated deeply, justifies the stipulation which, for some time past, has been introduced into specifications to the effect that after hardening, but before the removal of the pieces for testing, the ends of certain pieces, such as gun parts, should be cropped.

The minimum rate of cooling required to render the influence of quenching efficacious varies to an enormous extent, according to the quality of the steels concerned. The rate of cooling necessary to secure the hardening of special steels is lower than that necessary to secure the hardening of ordinary carbon steels. The penetrative influence of heat treatment is, therefore, more efficacious in the case of special steels than in carbon steels, and this, as is well known, constitutes one of the chief characteristics of the special steels.

As a further consequence of the ease with which the special steels can be tempered, it is possible to harden certain of them by mild quenching operations such as oil and air tempering, which occasion little deformation or cracking.

The copper steels have already been investigated, notably by Brustlein in France and by Stead in England. The present author has devoted himself more especially to ascertaining the influence of copper on the depth of the hardening effect, particularly in the presence of chromium. His experiments have been made on crucible steels from Firminy. The more interesting results have been summarized in Tables 1, 2 and 3. The following facts have been observed:

When, apparently, the percentage of nickel is below 5 per cent, steels containing above 4 per cent of copper forge badly. Confining the observations to forgeable steels, copper, by itself, while slightly increasing the depth of penetration of the hardening effect, does not increase it sufficiently to confer on steels the property of air tempering, even when small parts, such as 10 millimetre square bars, are concerned. If the amount of nickel that could be introduced into the steel be limited to 4 per cent the same conclusions would be reached.

In the presence of chromium the copper increases, fairly noticeably, the depth of the penetration of the hardening effect to the extent of rendering the employment of chromium-copper steels a matter of practical interest. (Table 2.) It has only been upon steels containing both chromium and copper that the more extended experiments, of which an account is about to be given, have been made.

None of the chromium-copper steels prepared by the author possess the property of undergoing transformation (the γ to α transformation) at low temperatures, nor, therefore, that of hardening when the cooling is exceedingly slow, whereas, chromium-nickel steels rather high in nickel (4 per cent of nickel and 1.5 per cent of chromium) possess this property. (See Table 2). The addition of 4 per cent of copper to a steel (No. 10) containing 2.52 per cent nickel and 1.59 per cent chromium does not likewise communicate to it the property of hardening on very slow cooling during annealing. (Table 3.)

The addition of nickel to steels containing chrominum and copper allows of the depth of the penetrative influence of quenching being increased, but only to the detriment of the property of softening by annealing. Having due regard to the size of the pieces and the use to which they are to be put, there is an advantage to be derived from the introduction of a more or less high proportion of nickel into steel.

The simultaneous addition of copper, nickel, and chromium to a steel permits of the easy preparation of steels which possess a tendency to deep penetration of the hardening effect sufficiently marked to render the air-hardening of large enough pieces (for example, gearings) efficacious, without such steels losing the property of becoming softened by the orthodox annealing processes employed in the case of ordinary carbon steel. (See Table 3.) These two properties, (*a*) depth of penetration of hardening effect, and (*b*) facility for softening on annealing, can be obtained among steels the composition of which may vary within fairly wide limits.

According to the tests carried out by the author the chromium-copper and chromium-nickel-copper steels possess, after hardening and tempering, practically the same mechanical properties (tensile and impact) as chromium-nickel steels having approximately the same carbon percentage and the same penetrative capacity for hardening. (Table 4.) The chromium-copper steels, however, assume, on quenching at somewhat low temperatures, a rather coarser grain on fracture than that exhibited by nickel-chromium steels; there is therefore more danger of their becoming burned.

Steels Containing High Percentages of Chromium

The special steels most commonly employed generally contain more nickel than chromium, because the somewhat violent action of chromium, which is liable to lead to cracks while quenching, is dreaded. The author conceives it useful to recall a few statements he made on a former occasion in this connection.

Table 1—Analyses of the Steels Investigated in Percentages

	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9	No. 10	No. 11	No. 12	No. 13	No. 14	No. 15
Carbon	0.59	0.57	0.31	0.37	0.36	0.38	0.34	0.35	0.35	0.40	0.62	0.51	0.37	0.38	0.47
Silicon	0.19	0.33	0.34	0.14	0.14	0.12	0.20	0.15	0.18	0.16	0.17	0.23	0.17	0.23	0.20
Manganese	0.54	0.60	0.46	0.26	0.20	0.19	0.28	0.21	0.22	0.24	0.61	0.38	0.57	0.36	0.36
Chromium	1.82	1.77	1.46	1.74	1.61	1.49	1.60	1.52	1.38	1.69	1.51	1.49	0.41	0.47	1.84
Nickel	0.00	0.00	0.00	0.00	2.16	2.90	3.93	2.02	2.60	2.52	2.37	1.80	2.62	1.60	3.30
Copper	0.00	1.15	0.00	4.14	0.00	0.00	0.00	2.40	2.15	4.04	0.00	1.00	0.00	1.40	1.24

These steels contain traces only of phosphorus and sulphur. They all underwent the transformation on heating below 775 deg. Quenched in water from a temperature of 790 deg., small parts showed Brinell hardnesses of 600 and upwards.

The rate of cooling required to lower the transformation temperature in the neighborhood of ordinary temperatures, that is to say, in order to produce hardening, varies within enormous limits. It is very difficult to ensure uniform cooling during quenching, even when all the factors acting on the rate of cooling are rigorously defined. It is similarly very difficult, when metals which require a rapid rate of cooling are treated, to ensure a uniform degree of hardening.

If, on the contrary, metals which undergo energetic hardening on air-cooling are employed, it is obvious that when they are cooled in a liquid in which the cooling effect is more rapid the hardening will still be energetic and uniform, if the conditions of the cooling vary.

Steels containing at least 1.4 per cent chromium and a little copper or nickel are, in these circumstances, of a kind that can be quenched in a liquid between the temperature of 120 deg. and 350 deg. (real colza oil does well) without the energy of the cooling varying much, and in these circumstances there is not much fear of cracks developing.

Generally speaking pieces of medium thickness (30 mm. or less) are susceptible of being so treated, if made from air-hardening steels. Such metals soften very well on ordinary annealing and after annealing

*From a paper presented at the May meeting of the Iron and Steel Institute in London. The author is a metallurgist at Firminy, France.

are easy to machine. Naturally if it be desired that the hardening effect should penetrate to the core in very thick pieces, or, if air-hardening is to be adopted, metals should be employed which have a greater susceptibility to the penetrative effect of hardening.

Table 2—Influence of Copper on the Depth of Hardening in Chromium Steels Not Containing Nickel

Treatment	Brinell Hardness Nos.			
	Steel No. 1	Steel No. 2	Steel No. 3	Steel No. 4
Cooled in stil lair from 790° on sq. bars 10x10 mm	312	512	....	477
Cooled in still air from 790° on sq. bars 20x20 mm	241	364	....	....
Cooled in still air from 790° on sq. bars 30x30 mm	234	255	....	....
Cooled in still air in bundles of four bars 30x30 mm	....	....	....	269
Cooled in still air at 820° on sq. bars 10x10 mm.	340	555	....	477
Cooled in still air at 820° on sq. bars 20x20 mm.	255	512	....	477
Cooled in still air at 820° on sq. bars 30x30 mm.	261	255	....	302
Cooled in still air in bundles of four bars 30x30 mm	....	....	....	269
Cooled in still air at 870° on sq. bars 10x10 mm.	555	555	207	555
Cooled in still air at 870° on sq. bars 20x20 mm.	444	600	....	512
Cooled in still air at 870° on sq. bars 30x30 mm.	321	600	....	512
Cooled in still air in bundles of four bars 30x30 mm	....	....	....	444
Annealed at 820 deg.	163	217	187	170

From Table 2 it will be seen that the chromium steels not containing copper (Nos. 1 and 3) harden only with difficulty on cooling in air. Steel No. 3, even when quenched in the forms of bars 10 mm. sq. from a temperature of 870 deg., only possess a hardness of 207. Before steel No. 1 attains distinct hardening in air-cooled bars of 10 and 20 mm. sq. section a temperature of 870 deg. has to be reached. With bars 30 mm. sq. air-quenching, even from 870 deg., is not very effectual. On the other hand steels Nos. 2 and 4, which contain copper and chromium, when in bars of 10 mm. section, become air-hardened when a temperature of 790 deg. has been reached. Square bars 20 × 20 mm. air-harden after heating to 820 deg. and bars 30 × 30 mm. harden in air after heating to 870 deg. In the case of steel No. 4 it has even been established that, on heating to a temperature of 800 deg. bundles of even four bars each 30 × 30 mm. sq. can be effectually air-hardened. It will be seen that the presence of copper does not prevent softening on annealing at a high temperature.

Table 3—Influence of Copper on the Depth of Hardening in Chromium-Nickel Steels

Treatment	Brinell Hardness Nos.					
	Steel No. 5	Steel No. 6	Steel No. 7	Steel No. 8	Steel No. 9	Steel No. 10
Cooled in still air from 790° in bundles of four bars 30x30 millimetres square	269	321	387	340	418	477
Cooled in still air from 820° in bundles of four bars 30x30 millimetres square	286	321	418	402	477	512
Cooled in still air from 870° in bundles of four bars 30x30 millimetre squares	321	350	444	444	477	477
Annealed at 820°	179	207	269	207	207	196

From Table 3 it will be seen that the chromium-nickel steels not containing copper (Nos. 5 and 6), which soften well on annealing, do not possess the property, in thick pieces, of air-hardening.

Steel No. 7, containing chromium and nickel but no copper, air-hardens well but does not soften well on annealing. Steels 8, 9 and 10, containing chromium, copper and nickel, air-harden even in thick pieces and soften well on annealing.

A Summary

Copper increases the depth of the hardening effect in steels.

The influence of copper in the presence of chromium is marked. One per cent of copper suffices to confer on steels containing 1.5 per cent of chromium an interesting degree of capacity for sustaining the hardening effect in point of depth.

The action of the copper is more limited than that of nickel. All the chromium-copper steels prepared by the author, containing less than 3 per cent of nickel, soften on annealing at high temperatures, and consequently do not harden on quenching when the rate of cooling is very slow.

The simultaneous employment of copper, nickel and chromium alows of semi-hard steels being prepared which can be hardened by air-cooling on largish pieces and yet softened by the ordinary annealing methods used for carbon steels. The limits of chemical composition within which such steels should fall are wide enough to render their manufacture easy.

The chief influence of copper, like that, indeed, of other special elements, is to increase the depth of the penetrative influence of the quenching, and consequently the efficacy of heat treatment in the interior of the pieces subjected thereto.

Apart from this influence on the depth of penetrative influence of quenching the author has failed to detect any other useful effect of copper on the properties of steel.

Table 4—Tensile and Shock Tests on Chromium-Nickel Steels and on Chromium-Copper Steels With or Without Nickel

Steel	Temperature of Tempering, Deg.	Elastic Limit, Kg. per Sq. Mm.	Tensile Strength, Kg. per Sq. Mm.	Elongation per Cent	Resilience (Charpy Drop Weight)	Brinell Hardness Nos.	Grain of Shock Test Bar
No. 2. Copper and chromium but no nickel.	450	.....	....	....	2.40	418	Crystalline
	600	.....	....	....	12.86	302	Fibrous
	650	.....	....	....	19.15	269	Fibrous
No. 7. Chromium and nickel but no copper.	450	Not recorded	158.0	7.0	9.10	387	Crystalline
	600	91.0	102.3	15.0	18.30	286	Fibrous
	650	68.3	88.3	17.5	26.60	241	Fibrous
No. 9. Chromium, copper, and nickel.	450	Not recorded	155.0	7.0	6.20	430	Crystalline
	600	98.4	107.0	11.0	11.90	302	Fibrous
	650	80.2	89.0	14.0	21.70	255	Fibrous
No. 11. Chromium and nickel but no copper.	450	149.0	164.1	5.0	2.40	418	Crystalline
	600	107.8	125.7	10.0	7.20	340	Crystalline and fibrous
	650	91.7	109.0	13.0	15.60	302	Fibrous
No. 12. Chromium, copper, an nickel.	450	Not recorded	166.2	4.0	4.30	431	Crystalline
	600	104.2	112.4	10.5	18.30	302	Fibrous
	650	.....	....	....	25.80	269	Fibrous
No. 13. Chromium and nickel but no copper.	450	Not recorded	130.9	7.0	13.80	340	Coarse crystals
	600	78.6	90.8	13.5	24.2	255	Fibrous
	650	.....	....	....	33.2	228	Fibrous
No. 14. Chromium and copper but no nickel	450	132.3	134.6	7.0	9.1	340	Crystalline
	600	85.5	96.4	11.0	24.2	286	Fibrous
	650	.....	....	....	28.3	228	Fibrous
No. 15. Chromium, copper, and nickel.	200	Not recorded	219.0	6.0	.....	...	.....

Steels Nos. 2, 7, 9, 11, 12, 13 and 14 were tested in bars 160 mm. long, cut from a forged bar of 30 × 30 mm. square section. After treatment they were either notched for the resilience tests (the notch being a round one of 8 mm. diameter) or machined to round bars 13.8 mm. in diameter and 100 mm. long between punch marks, for the tensile tests. The elastic limit was determined roughly by observing the slowing down in the rate of the rise of the mercury column. The Brinell hardness was ascertained by means of a ball 10 mm. in diameter at a pressure of 3000 kg. and applied to the surface of the bars used for the shock tests. Both the shock and tensile test-pieces were quenched, from a temperature of 800 deg., in oil at about 50 deg. They were kept for about half an hour at the tempering temperature, after which they were quenched in cold oil.

As an exception the tensile test-piece of steel No. 15 was taken from a forged round of 20 mm. diameter. It was completely turned down, before testing, to a diameter of 13.8 mm. It was cut to 100 mm. length between punch marks and after machining was quenched from 800 deg. in oil at 150 deg. and tempered for one hour at 200 deg. The tests shown in this table show the properties of steels containing copper to be practically the same, both on quenching and tempering, as those of steels not containing copper.

The Diamond Mfg. Co., Pittston, Pa., is moving to Wyoming, Pa., where it will occupy a larger plant, the main shop of which is 60 x 160 ft., and equipped with the latest machines for the perforation of metals. The company will also operate at Wyoming a brass and bronze department handling metals of all alloys. In the near future, the company expects to install a rolling mill, in which it will not only make its own billets, but will roll them and furnish sheets to the trade. Growth of the business necessitated the change.

Rapidly Creating New Merchant Marine

Many Vessels Now Under Contract and Some Will Soon Be in Service—Rates of Compensation for Requisitioned Property Announced

WASHINGTON, Oct. 2.—The Emergency Fleet Corporation now has under construction 1039 ships, with a total dead-weight capacity of 5,924,700 tons, and as soon as the pending deficiency appropriation bill is signed by the President additional contracts will be placed aggregating 5,000,000 tons, according to a statement made public by Rear Admiral Capps, general manager of the corporation.

During the past two months the Emergency Fleet Corporation has awarded contracts for 118 wooden vessels of 3,500 tons dead-weight capacity each to 27 different shipyards. There had previously been awarded contracts for 235 wooden vessels of similar type to the above and for 58 vessels of composite construction, thereby making a total award to date of 411 wooden and composite vessels of an aggregate dead-weight tonnage of 1,460,900.

The designs for machinery have been completed for the manufacture of engines, boilers and other articles of equipment for these vessels, for which the facilities available of machine shops and boiler works throughout the country have been availed of. Specifications have been prepared and negotiations outlined and initiated for the assembly and installation of machinery in wooden vessels, the most of which have been or are being constructed as "hulls only."

Great difficulty has been experienced on the Atlantic coast in obtaining suitable lumber for these ships, and it is expected that there will be greater delay in their completion than was expected when this movement was begun, notwithstanding every possible effort on the part of the corporation and its contractors.

Since Aug. 1 there have been awarded contracts for 155 steel cargo vessels of 1,076,800 tons dead-weight tonnage, distributed among six shipyards. The most important of these contracts are for vessels of the so-called fabricated type, and special shipyards are being prepared for them.

Third Government Yard

The Shipping Board announces the signing of the formal contract for the third Government owned shipyard, which has been awarded to the Merchant Shipbuilding Corporation. Unlike the contracts with the American International Corporation and the Submarine Boat Corporation, this contract covers vessels of 9000 tons each, 40 of which are embraced in the initial order. The estimated cost of these vessels will be about $150 per ton and the expense of fitting up the yard will be in the neighborhood of $20,000,000. The preliminary orders under the three contracts now aggregate 140 ships, but will be increased to approximately 400 as soon as Congress has provided the necessary money.

Contracts for the boilers and machinery and steel construction of these vessels have already been placed, and the contractors are actively at work in the preparation of the sites for the assembling of these ships. The best efforts of the Emergency Fleet Corporation are devoted to expediting these great shipbuilding projects.

Previous to Aug. 1 70 steel cargo vessels of 587,000 tons total dead-weight capacity had been contracted for. These vessels were distributed among 10 shipyards. Therefore, at the present time the total number of steel vessels under construction for the United States is 225, with a total aggregate dead-weight tonnage of 1,663,800.

Requisitioned Vessels

By proclamation of Aug. 3, 1917, the Fleet Corporation, under authority delegated by the President, under the provisions of the emergency act approved June 15, 1917, requisitioned all vessels under construction in the shipyards of the United States of 2500 tons dead-weight capacity and above. By this act the United States acquired a total number of 403 vessels, determined by the progress reports obtained from the various shipyards to be actually under construction; in many cases, where keels had not actually been laid, engines, boilers, equipment and materials, all of which were also requisitioned, are in various stages of progress; and in comparatively few cases contracts existing for vessels not actually begun, which may or may not be proceeded with, as the merits of each case, compared with what is desirable construction, are considered.

The total dead-weight tonnage under construction thus acquired, and on which orders have been issued to proceed with the maximum expedition, exceeds 2,000,000 tons dead-weight.

There are now under construction for the Emergency Fleet Corporation:

Type of Vessel	Number of Vessels	Total Dead-weight Tonnage
Wood	353	1,253,900
Composite	58	207,000
Steel	225	1,663,800
Requisitioned	403	2,800,000
Grand total	1,039	5,924,700

In addition to the above Congress in a pending bill is authorizing the construction of additional vessels whose total dead-weight capacity will be nearly 5,000,000 tons. Plans for the major portion of these additional vessels are now in course of preparation and many of them will be of special types adapted to particular necessities of war, and while substantially cargo carriers, will have much greater speed than the cargo vessels now under construction.

Regulating Supply of Material

The corporation has ascertained from the builders of requisitioned vessels their demands for structural steel, machinery and various items of equipment and is endeavoring to regulate the supply of these items to provide for the individual needs of the shipbuilders in accordance with their program of capacity, so far as the country's resources are available. And it is apparent that with the similar needs of the naval service and the War Department, every mechanical resource of the United States, with considerably increasing development will be necessary for the realization of this program and what must follow in continuation of it.

With the passage of the pending bill, the Congress will have authorized $1,799,000,000 for the Shipping Board and the Emergency Fleet Corporation and the actual appropriations made, including those in the pending bill, reach a total sum of $1,085,000,000.

The realization of the plans of the Shipping Board will mean the complete rehabilitation of the American merchant marine in the foreign trade. The United States has to-day 458 ships of over 1,500 dead-weight tons each with an aggregate tonnage of 2,871,359 either engaged in or capable of participating in foreign trade. There are also 117 ships of a tonnage of 700,285 of German and Austrian origin that have been taken over and put into the overseas trade. The 400 steel ships of more than 2,000,000 tons which have been commandeered and are now being completed under contracts in American yards will add another important factor and with the tonnage contracted for by the Emergency Fleet Corporation there will be a total by the end of 1918 of more than 1,600 ships aggregating 9,200,000 tons to carry the foreign commerce of the United States as compared with the overseas marine of 1,614,222 tons on June 30, 1914, scarcely a month before the European war began. Even these large figures do not represent the completed work of the Shipping Board and they must be increased by approximately 5,000,000, which will be built under the

pending appropriation bill; hence it would appear that when the board's plans have been fully worked out, the representation of the United States in the foreign trade will exceed 14,000,000 tons.

Rapid Increase in Size

The tonnage referred to includes only cargo vessels in the overseas trade and is exclusive of that engaged on inland waters, unsuitable coastwise ships and small craft operating along the coast and in bays and harbors. It is therefore practically certain that within the next two years the American merchant marine will show an increase of nearly 150 per cent as compared with its status on July 1, 1916. In point of efficiency, however, the increase will be much greater, as practically all the additions will be cargo carrying vessels of modern design of fair speed and with thoroughly up-to-date equipment.

The speed with which construction work is now proceeding and the harmony existing between the Shipping Board and the Emergency Fleet Corporation since their reorganization have greatly impressed Congress and there is every disposition to grant all the money that can be utilized for ship construction. The Congressional leaders are especially pleased with the early deliveries guaranteed in the contracts already made. The fleet in prospect is already becoming a reality. Several of the commandeered ships are now taking cargo, and others will leave the ways in increasing numbers with each succeeding month. The ships for which the Shipping Board has contracted are under construction and the first launching is expected within 60 to 90 days. These vessels will be rushed to completion and will be closely followed by others in increasing numbers. Both the board and the Congressional leaders believe that by early spring a sufficient number of vessels will have been added to our overseas marine to render the work of the submarines negligible.

The U-boat warfare is now at the lowest ebb reached since it was begun last February. According to cabled reports received here, there were sunk by mines or submarines during the week ending Sept. 22, but 13 British merchantmen of 1600 tons and over and only two vessels of less than 1600 tons. In the aggregate, this is the smallest number of vessels destroyed during any one week since the submarine campaign was undertaken. The smallest previous aggregate was during the week ending Aug. 12, when 14 vessels of 1600 tons and two of less than 1600 tons were destroyed. During the past month there has been a steady decline in the destruction of British merchantmen, both in the number of vessels and aggregate tonnage.

Rates of Compensation

The Shipping Board has announced the rates of compensation to be paid to the owners of vessels requisitioned under the proclamation of Aug. 3. They are as follows:

Cargo boats and tankers.—Over 10,000 tons deadweight capacity, Government form time charter, $5.75 per dead-weight ton; 8001 tons to 10,000 tons, $6; 6001 to 8000, $6.25; 4001 to 6000, $6.50; 3001 to 4000, $6.75; 2500 to 3000, $7.

Vessels of speed in excess of 11 knots to be allowed 50 cents per ton dead-weight per month for each knot or part of a knot over 11 knots.

For passenger steamers the board adopted a two-fold basis of classification, Class A consisting of steamers with a capacity of over 150 passengers, and Class B consisting of steamers with a capacity of from 75 to 150 passengers. Steamers falling in both classes are further classified according to speed. The rates for passenger steamers are as follows:

Class A.—Ten to 11 knots, Government form time charter, $9 per ton gross register; 12 knots, $9.50; 13 knots, $10; 14 knots, $10.50; 15 knots, $11; over 15 knots, $11.50.

Class B.—Ten to 11 knots, Government time charter, $8 per ton gross register; 12 knots, $8.50; 13 knots, $9; 14 knots, $9.50; 15 knots, $10; over 15 knots, $10.50.

In announcing the requisition rates, Bainbridge Colby of the Shipping Board made the following statement:

The foregoing rates will become operative on Oct. 15, 1917. The vessels embraced in the requisition, except in so far as actually required for Government service, will be left in the hands of the present owners to be operated for Government account, but subject at all times to such disposition as the board may direct.

A certain number of the requisitioned vessels, which are required for the continuing and exclusive service of the Navy and Army, will be taken over on a bare ship basis. The rate of hire on this basis has been fixed by the board at $4.15 per dead-weight ton for cargo boats, and $5.75 per ton gross for passenger steamers of 11 knots speed, with an additional allowance of 50 cents per ton for each knot in excess of 11 and up to 16 knots.

All the foregoing rates are tentative. The board will carefully examine the results of operation under the requisition rates and from the results, as certified by expert examiners, will determine upon such revisions as fair and equitable treatment of the owners of the requisitioned vessels may require. Revisions will be made, if reasons therefor are found to exist, at intervals of not more than 90 days.

As to insurance, the Government will assume the war risk, and in some instances, the marine risk as well. In cases in which for any reason it is more convenient for the Government to assume the marine risk, the usual rate for each insurance will be deducted from the charter hire.

Edward F. Carry, a car manufacturer of Chicago, has been appointed director of operations for the Shipping Board. He will be immediately in charge of the operation of the Government's merchant fleet and will name three assistants, one each to direct operations on the Atlantic, the Pacific and the Gulf. Mr. Carry is now a member of the Wage Adjustment Board recently appointed by the Shipping Board to handle labor disputes. The active work of the director of operations will begin Oct. 15, when the Government will formally take over merchant vessels about to be requisitioned.

W. L. C.

Large Steel Companies Grant 10 Per Cent Advance

During the past week many of the leading steel companies announced a general advance of 10 per cent in wages, effective from Oct. 1, the same as given out recently by the United States Steel Corporation. These include Republic Iron & Steel Co., Sharon Steel Hoop Co., Brier Hill Steel Co., Youngstown Sheet & Tube Co., Valley Mold & Iron Corporation, Shenango Furnace Co., Sharpsville, Pa.; Claire Furnace Co. and Ella Furnace Co., at West Middlesex, Pa.; National Malleable Castings Co., Sharon, Pa.; Cambria Steel Co., Johnstown, Pa., employing about 18,000 men, and LaBelle Iron Works, Steubenville, Ohio.

Dedication of McKinley Memorial

Friday, Oct. 5, will be observed as a holiday in the Mahoning Valley when the McKinley Memorial building at Niles will be dedicated and the statue of the martyred president unveiled. Former President W. H. Taft, Senators Pomerene and Harding and Governor Cox will be the principal speakers.

The General Electric Co., East Lake Road, Erie, Pa., has commenced the erection of additions to its local works to cost about $1,850,000. The structures will consist of a two-story machine shop, about 240 x 800 ft., to cost $750,000; seven-story pattern shop, 75 x 300 ft., costing about $800,000; and one-story foundry, 300 x 300 ft., costing $300,000, to specialize in the production of gray iron castings. The Henry Shenk Co., Twelfth Street, has the contract for erection.

The Atlas Crucible Steel Co., Dunkirk, N. Y., specializing in the manufacture of crucible tool steel, is planning for extensive additions in its plant to increase the present capacity. The extensions will include a new rolling mill, machine shop, laboratory, transformer station and other structures.

The Dunham Co., located at Berea, Ohio, since 1859, has moved its general offices to 801-804 Hippodrome Building, Cleveland. The foundry and other plant will remain at Berea.

SAFETY SURVEY MADE

Engineers Appointed and Assigned to Government Plants

The members of the United States Employees' Compensation Commission, soon after they took office last March, began to appreciate that in order to administer the compensation act satisfactorily, it would be necessary for them to know the conditions with regard to hazards in various Government plants. The commission held a conference with L. R. Palmer, president of the National Safety Council, an organization which includes in its membership some 3200 of the leading industries and nearly all the safety engineers in the United States. A plan for a safety survey of Government plants was agreed upon and C. W. Price, field secretary of the National Safety Council, was made director of the survey. The country was divided into six districts with six district directors, men of wide experience and well equipped to bring to the Government plants the valuable experience of the large industries which have done efficient work in accident prevention. Under these district directors were appointed 25 safety engineers to assist in making the survey, all having tendered their services to the Government without salaries. The directors of the survey as a rule were cordially received and in navy yards, arsenals and other plants commandants and officials expressed their interest in the movement and their appreciation of the necessity of adopting better methods of promoting safety. It was found that Government plants were as a rule far inferior in safety regulations to private industrial works, largely because Government plants have been outside of insurance and state inspection.

As a result of the survey, it was decided that an experienced safety engineer should be placed in charge of each of the important navy yard plants of the Government and this decision has been heartily approved by Assistant Secretary of the Navy Roosevelt. Thirteen engineers of high character and possessing a thorough knowledge of safety work, as well as experience in organizing and promoting it, have been appointed as follows, the name of the new post and previous employment being given in each case:

Capt. Howard Tilson, Frankford Arsenal, Frankford, Philadelphia; formerly with Conkling, Price & Webb, Chicago.

J. L. Price (Box 212, Albany, N. Y.), Watervliet, Sandy Hook and Picatinny Arsenals, address Watervliet, N. Y.; formerly with Anaconda Copper Mining Co., Butte, Mont.

Russell H. L. Guerrant, Rock Island Arsenal, Rock Island, Ill.; formerly assistant casualty manager American Steel Foundries, Chicago.

Herman Behr (21 Falmouth Street, Belmont), Springfield and Watertown Arsenals, address Watertown, Mass.; formerly technical assistant director American Museum of Safety, New York.

Chester E. Rausch, Portsmouth Navy Yard, Portsmouth, N. H.; formerly with Massachusetts Employees' Insurance Association.

Thomas Stanion, Boston Navy Yard, Charlestown, Mass.; formerly assistant superintendent White Sewing Machine Co., Cleveland.

Raymond Heath, Washington Navy Yard, Washington, D. C.; formerly in National Compensation Service Bureau, having charge of inspection and safety work in New Jersey.

Kenneth E. Berray, Charleston Navy Yard, Charleston, S. C.; formerly with Pickands, Mather & Co., Cleveland.

A. H. Lintz, Norfolk Navy Yard, Norfolk, Va.; formerly assistant to superintendent in construction of new coke by-product plant, American Steel & Wire Co., Pittsburgh.

Clarence E. Ralston, Mare Island Navy Yard, Vallejo, Cal.; formerly with the Jones & Laughlin Steel Co.; Pittsburgh.

Frederick T. Crossley, Bremerton Navy Yard, Puget Sound, Wash.; formerly with the Mutual Fire Insurance Co., Boston, as inspector in fire prevention work.

Oliver J. Smith, League Island Navy Yard, Philadelphia; formerly manager Chicago office National Workmen's Service Bureau.

Albert S. Regula, New York Navy Yard, Brooklyn; formerly technical assistant to the director, American Museum of Safety, New York.

Although the directors are just starting in their work some progress has already been made since the inauguration of the survey. This was particularly true in the Brooklyn Navy Yard, where in a few months the number of accidents has been decreased nearly 40 per cent.

Canada Worried by United States Embargo

TORONTO, Oct. 1.—The serious situation developing in Canada as a consequence of the United States embargo on export, except under licenses, of pig iron, iron and steel plates, chrome nickel steel, boiler tubes, steel billets, tin plate and other raw materials of iron and steel manufacture was discussed last week with the Minister of Trade and Commerce, Sir George Foster, by a representative deputation of Canadian iron and steel manufacturers at Ottawa, Canada. The Washington embargo prevents the importation into Canada of these basic requirements of the industry unless it is shown they are necessary for munitions work or other win-the-war purposes. The increased war order business of the United States has placed a drain on the limited supplies hitherto available, and Canada's difficulties in securing iron and steel material from across the border are now greater than ever. The shortage of raw material for domestic use threatens to cause a temporary shutting down of some Canadian plants, or at least a restricted output and short shifts. That would materially affect the whole industrial prosperity of Canada. It is possible that steps will be taken under Government supervision to conserve and co-ordinate iron and steel supplies and secure as far as possible a distribution of the limited supplies obtainable, covering a program for the next six months or so. A Dominion controller of steel and iron may be appointed for this purpose, with duties analogous to those of the Canadian fuel controller. Meanwhile it was decided to secure an inventory of immediate Dominion requirements, with a view to making representation to Washington, and also to ascertain the needs for co-operative action along drastic lines.

New Penn Seaboard Foundry

The Penn Seaboard Steel Corporation, Philadelphia, will build a new foundry at Chester, Pa., 95 x 380 ft., one story. Plans have been drawn and contracts soon will be let. The building will be of steel and concrete with steel sash and tile roof. It will be equipped with three 30-ton, 75-ft. span cranes of the standard bridge type. The new foundry is to take the place of the property which the Penn Seaboard Steel Corporation recently sold to the American Locomotive Co., which was formerly known as the Seaboard Steel Casting Co. The new foundry will adjoin the Penn Steel Castings & Machine Co. plant of the Penn Seaboard Steel Corporation. The corporation has two other plants, one at New Haven, Conn., formerly the National Steel Castings Co., and another at Newcastle, Del., formerly known as the Baldt Steel Co. In all three plants the corporation has 15 open-hearth furnaces, and there will be no increase in furnace capacity on account of the new foundry.

The efficiency of galvanized iron firedoors made by the Edwards Mfg. Co., Cincinnati, was demonstrated at a recent fire on the Locust Street pier of the Baltimore & Ohio Railroad, Philadelphia. The fire destroyed the roof of the pier, together with six automobiles and a pile of lumber in storage. The doors remained in position and, with the exception of the overhead shaft sagging down approximately one ft. in the center from excessive heat and the melting and warping of malleable iron gears in some cases, freight and passenger cars on adjacent tracks were not damaged.

The Columbia Steel & Shafting Co., Pittsburgh, has established a direct branch sales office in New York City at 295 Broadway, in charge of Tracy F. Manville as district manager of sales. Mr. Manville has been identified with the finished steel industry for a number of years and for the past three years has been associated with the company's Eastern sales department at Boston.

Foundry Meetings in Boston Last Week

A Notable Exhibition and Important Papers, Many Having a Bearing on War Problems, Feature the Annual Gathering This Year

HOW important Foundry Week is to the foundry industry is indicated in the subjoined account of the technical meetings and of the exhibition of foundry equipment and machinery held in Boston last week. A number of the papers read before both the American Foundrymen's Association and the American Institute of Metals, the latter dealing with non-ferrous rolling mill and foundry questions had special application to war problems. One of the contributions was a treatise on making cast-iron shells, of which it appears large quantities are at present being made by France, and another told of the steel-making practice of one of our arsenals in making castings required to meet the demand of portability and resistance to shock. A notable session on malleable practice marked the week, and an advanced step was made in the movement to bring about standard cost accounting in foundries. Finally mention should be made of the stand which the American Foundrymen's Association took in passing resolutions looking to the formation of a War Service Bureau of the association to assist the Government, if co-operation is sought, in the conduct of the war.

The reports and addresses of the joint opening session held on Monday, Sept. 24, were reviewed in the issue of Sept. 27.

Co-ordination and Co-operation

R. A. Bull, Duquesne Steel Foundry Co., Coraopolis, Pa., presided at the Tuesday session of the American Foundrymen's Association. The first paper was read by H. R. Atwater, Osborn Mfg. Co., Cleveland, on "The Foundry from the Viewpoint of the Sales Engineer." Mr. Atwater said that his statements applied particularly to foundries having duplicate work, and he added that the introduction of molding machines, sand handling devices and conveying equipment for handling molds and carrying the hot metal had in the past five years virtually revolutionized the method of producing castings. Simply forcing up prices is not the way to increase wages permanently or pay the present high wages. Only by speeding up production can the wage demands of labor be met. It was his opinion that the success or failure of modern equipment and particularly of molding machines depended on the co-operation of the supervising executives in every department. Only by such co-operation can the necessary analysis of cost of production on given patterns, the proper rigging of the patterns and the flasks to be used, and the establishment of a proper price basis on a quantity production be obtained. It is not possible to secure a largely increased production unless the operator is to share in the increase.

The speaker cited foundries where the sole thought in the installation of modern equipment was the reduction in molding price that could be secured and where the belief existed that the cost of equipment should be returned to its owners in a few weeks or at most a few months. A foundry that suffers because the foreman or other executives do not know the possibilities of the equipment, the amount of production that should be obtained and the wages that should be paid is the foundry that does not get satisfactory production from its equipment.

The labor unit must be considered, he emphasized, because it usually follows that men will go where the most modern equipment is furnished and where they are required to perform the least amount of labor at the highest prices. The hope of the foundry in the future must be in installing power equipment and in teaching laborers to operate machines that will produce the largest possible output and net the operator more money than he can earn elsewhere.

F. J. McGrail, Struthers-Wells Co., Warren, Pa., in a paper on "The Relationship of the Engineering Department to the Pattern Shop and Foundry," made a strong plea for a better and a more enthusiastic co-operation and a larger degree of consultation among the executives of these departments. "There has not been the same advance in foundry practice that there has been in the demand made upon the foundry." Conferences would obviate many of the costly changes which it is some times necessary to make on account of disproportionate metal sections and designs and the many incorrect methods of constructing and assembling patterns and core boxes. He pointed out that with many new and difficult problems continually coming up, a low labor cost in the pattern shop does not necessarily imply a low labor cost in the foundry.

In a lively discussion following the reading of this paper Stanley G. Flagg, Jr., Philadelphia, drew a distinction between the work of the foundryman which is an art and that of the engineer which is a science, and C. H. Gale, Pressed Steel Car Co., McKees Rocks, Pa., pointed out the obligation of the foundryman to show the engineer the practical side of the production of castings. John W. Langston, works manager G. & C. Hoskins, Ltd., Sydney, New South Wales, who came from Australia to attend the convention, told of the apprentice system in Australia and how it produced men who could be truly termed well-rounded engineers rather than specialists in a single branch, because their training is a blend of all the branches. President Pero spoke of the necessity of teaching apprentices the business of making castings, including a training in all those departments which influence the design and production of castings. He deprecated the policy of many concerns in pitting one department against another as regards departmental costs and expressed his belief that the lack of collaboration between the pattern shop and the foundry is common and productive of many troubles. Dr. Richard Moldenke, Watchung, N. J., said that the engineer is pushing the foundry and will push it still further. The foreign practice of placing engineers in charge of foundry operations has its advantages. Certain desirable changes in the physical properties of castings such as control of the hardness and limitation of expansion under the influence of heat are engineering problems that foundrymen will be compelled to solve in the immediate future.

Co-operative Shop Training

A paper on "Co-operative Shop Training," by W. B. Hunter, Fitchburg High School, Fitchburg, Mass., aroused keen interest. B. D. Fuller, Westinghouse Electric & Mfg. Co., Cleveland, spoke of the work which is just being undertaken in Cleveland and made a plea for a stronger interest on the part of employers in the public schools and a fuller and more intelligent use of the public school plants of the country.

Mr. Hunter said that ten years' trial of the co-operative trade training system in Fitchburg, Mass., has demonstrated its efficiency. Parents, the boys and their employers are all pleased with the results. The city may well say that it is a dividend paying proposition, for the pay these boys receive while at work is from four to five times the cost of instruction. Wages are 10 cents per hour for first period of 825 hr., 11 cents per hour for second period, 12 cents per hour for third period, 13 cents per hour for fourth period,

14 cents per hour for fifth period and 15 cents per hour for sixth period. That is, beginning the second year in the Fitchburg high school, the boy while working receives a raise after every period of 825 hr. His shop term is 30 weeks long and school term 20 weeks long per year. The shop rules and regulations apply in every particular, while the apprentice is at work, the same as the school rules apply while in school.

Our foundries, he added, have had difficulty in getting apprentices for some time. The Putnam Machine Co. advertised a one year's course for apprentices over 21 yr. in different branches of foundry practice, giving a rate of 30 cents per hour for the first six months and 35 cents an hour for the next six months. Applicants were carefully scrutinized by the superintendent and required to sign a bond with responsible surety for faithful service. Twenty-three accepted for the one year term. So many applicants continued to apply that a 2-yr. bond was executed and signed by many, and it is even possible to secure them for a 3-yr. term. It is very evident by this that we have got to offer more money than has been the case in the past.

Start Made on a Standard Cost System

A Feature of Activity Among Members of American Foundrymen's Association—Progress in Industrial Education

THE presentation of the committee on foundry costs, which had to go over to the Thursday morning session, was presented in outline by the chairman of the committee, Benjamin D. Fuller. He told how C. E. Knoeppel & Co., New York, had been engaged to install in foundries subscribing to the plan "a standard cost system." Estimating the possibility of 100 subscribers at the outset for a total of $8,000 to $10,000, it was decided to adopt the following schedule of charges:

Foundries employing up to 40 molders and coremakers, $50.
Foundries employing from 40 to 200 molders and coremakers, $1.25 for each molder and coremaker employed.
Foundries employing more than 200 molders and coremakers, $250.

Mr. Fuller reported a total of 102 subscriptions amounting to $7,246.25, and cash payments representing 25 per cent of total subscriptions, of $1,950.68.

The plan of procedure, the printed report explains, provides for the preparation of a cost system that may be applied to steel, gray and malleable iron foundries



BENJAMIN D. FULLER
President American Foundrymen's Association

and to plants making castings for the jobbing trade as well as solely for their own consumption. It is to be printed and distributed to subscribers in the form of serially numbered pamphlets. Then a representative of C. E. Knoeppel & Co. will visit the foundries of the subscribers to facilitate the introduction of this system and to outline methods whereby it may be worked into the cost system already in effect. Following the visit, each subscriber will receive a written report which will give in detail the methods whereby the standard foundry cost system can be adapted to the cost-keeping system in this plant. In addition, each subscriber will be permitted to continue to receive service from C. E. Knoeppel & Co. by correspondence for a period of one year.

The agreement provides for the payment to C. E. Knoeppel & Co. of 80 per cent of the total subscriptions paid into this fund, the remaining 20 per cent to be retained by the association to defray the cost of conducting the campaign for enlisting the interest of members and to cover the cost of printing and publishing the standard cost system in pamphlet form. Twenty-five per cent of the cost of this work is to be paid to C. E. Knoeppel & Co. at the time of the adoption of the standard foundry cost system; 25 per cent after the personal visit has been made to each of the plants by the expert; 25 per cent after reports have been submitted to each one of the subscribers, and the final 25 per cent payment is to be made when the work with each individual plant has been completed. It was decided to divide each subscription into four payments. It is believed that before many months the fund will attain a total of $10,000. As heavy traveling expenses will be incurred in introducing this system outside of the industrial centers, it was decided to make an extra charge, covering traveling and other expenses, to plants located west of the Mississippi River, south of the Ohio River and outside of the province of Ontario in Canada.

The report gives a list of subscribers to this fund on Sept. 1. Besides Chairman Fuller the members of the committee are: C. R. Messinger, Sivyer Steel Casting Co., Milwaukee; H. J. Koch, Fort Pitt Steel Casting Co., McKeesport, Pa.; J. Roy Tanner, Pittsburgh Valve Foundry & Construction Co., Pittsburgh; C. H. Gale, Pressed Steel Car Co., McKees Rocks, Pa., and A. O. Backert, Secretary, Cleveland.

Following the presentation of the report, Mr. Knoeppel, in a brief address, said that in about two weeks he expected to meet with the committee. He emphasized the special problems which manufacturers will soon be called on to meet. He said they must plan to convert their plants to manufacture the products of special necessity; that they must arrange to replace many of their present employees with women and children, besides providing the special working conditions thus necessary; that they must look forward to arranging for two or perhaps three shifts and to provide for more efficient production, and that they must look forward to the probability of cooperating with manufacturers in their own territory, particularly on labor questions. In the intense commercial struggle which he expects after the war he asserted that manufacturers may look forward to the 8-hr. day and the possibility of stipulations against bonus or piecework methods. He accepted estimates that at present 90 per cent of manufacturers now fix their prices on an arbitrary basis, while the remaining 10 per cent use an accurate cost basis, while in Germany the conditions are just reversed.

Progress in Industrial Education

A progress report on industrial education was submitted by the association's committee on the subject, Frank M. Leavitt, University of Chicago, Chairman. C. E. Hoyt, Lewis Institute, Chicago, a member of the committee, has held conferences with a group of foundry foremen in Chicago, looking to the conduct of apprentice classes under the auspices of the public schools, but a satisfactory course of instruction has yet to be drawn up. The report expressed the hope that through the assistance of C. B. Connelley, Carnegie Institute, Pittsburgh, also a member of the committee,

an experimental class may be organized in connection with the public schools of Pittsburgh. Stewart Schrimshaw, supervisor of apprentices for Wisconsin, has been added to the committee.

Arthur L. Williston, Wentworth Institute, Boston, Mass., discussed briefly the industrial education question at the general session on Friday from an angle somewhat different from that taken up by the association's own committee, which is working, as he expressed it, on details, and from that taken by the National Industrial Conference Board. He made the point that something is necessary to get everybody back of the movement to bring about public industrial education and a general resolution to this effect was passed by the association.

A paper on micrometallography for the foundry, by Robert J. Anderson, Cleveland Metal Products Company, Cleveland, was read by title.

Session on Gray Iron Casting Work

France Making Over 1,000,000 Cast-Iron Shells Daily— Sand Blasting, Facing Sands and Briquetting Borings

THE gray iron session, scheduled for Thursday morning, was given over in part to general topics, including the standard cost system question, reviewed in the foregoing. A. W. Walker, past-president, presided.

Facing Sands

In a paper on fine facing sands C. P. Karr, associate physicist, Bureau of Standards, Washington, D. C., reported some tests on sands regarded as more or less suitable for facing molds. The investigation was undertaken to ascertain if there is available in this country a sand which may take the place of the imported French sand now growing scarce and costly. He enumerated the important requisites as being a high melting point, a fine texture, a low moisture content and a high tensile strength, or, in foundry parlance, a good bond.

In a paper on mixing and blending foundry facing sands, R. F. Harrington, Hunt-Spiller Mfg. Corporation, Boston, gives the results of a series of tests on methods for the purpose of reducing the consumption of new sand. Experiments were made on various mixtures blended by hand, in a paddle-type mixing machine, and in a muller. They indicated that the muller produces the best results and permits of the use of a maximum amount of old material, with a corresponding reduction in new sand consumed.

Using Briquetted Borings

In a paper entitled "Briquetting Foundry Borings," A. L. Stillman, General Briquetting Co., New York, described tests made with various mixtures of cast iron for miscellaneous castings and for locomotive cylinders. The results of the tests are taken to show that briquets have a very definite and promising future in foundry practice. He says that briquets in no way injure the product of the cupola and that their use effects economy. He predicts that the low price of borings in the briquetted form as compared with the cost of heavy iron scrap will encourage the use of briquets.

Dr. Richard Moldenke urged that the future of briquetting lies in the combination of foundries in a given center in the ownership or operation of a central briquetting plant. He mentioned a case in Europe where 25 foundries operated a central plant of this kind, this plant returning to each foundry the borings which it had sent for briquetting. He recounted the disadvantages and advantages of using briquetted borings and predicted that briquetting has got to come because in the future one pound of iron has got to go further than ever before. S. D. Sleeth, Westinghouse Air Brake Company, said that his company had given up the process partly because of the present high cost of borings, but told also of the hard castings which sometimes resulted and of the melting loss experienced. Dr. Moldenke pointed out how some of these difficulties are met and told how he had advised against the earlier practice of making briquets 7 in. in diameter.

Shells of Cast Iron

A paper on "Cast-Iron Shells in Permanent Molds" was presented by Edgar A. Custer, consulting engineer, Philadelphia, now a major in the ordnance division of the U. S. Army. He introduced his subject by pointing out superior effectiveness of the cast-iron shell in attacking earthworks. He maintained also that the efficiency of a shell fired against troops is dependent almost entirely upon the character of its fragmentation, in which particular cast-iron shells have been shown to be much more satisfactory than forged-steel projectiles. Cast-iron shells, with proper foundry procedure, can be easily made in enormous quantities, he claimed. France, he said, is making over 1,000,000 rounds a day at present in dry-sand molds. The cost of steel forging for a 4.7-in. shell he put at over $7, and a cast-iron shell of similar size at a little over $2.

To achieve uniform and satisfactory quality the permanent mold, in the development of which the author has taken a leading part, is recommended. The details of making shells in permanent molds he discussed, and the methods by which difficulties may be overcome. A résumé of the French specifications for cast-iron shells is given.

In the discussion material for hand grenades was touched on, and Mr. Fuller referred to some experiments in a bomb proof. When grenades of cast iron were exploded nothing resulted in the way of destruction, and there was scarcely anything save a powder of cast iron. With malleable iron large fragments resulted, and some of them went through the 1-in. pine box like bullets.



W. M. CORSE
President American Institute of Metals

A paper on the seasoning of gray iron castings by L. M. Sherwin, Brown & Sharpe Mfg. Co., Providence, R. I.; one entitled "Factors in the Economical Production of Small Cores in Large Quantities," by Prof. R. E. Kennedy, University of Illinois, and one on the effect of high sulphur in gray iron castings by T. Mauland, International Harvester Co., Chicago, were read by title. A paper on the modern centrifugal cupola blower was presented by a representative of the General Electric Co.

Sand Blasting

An address on sand blasting was made by H. L. Wadsworth, American Foundry Equipment Co., Cleveland. The labor scarcity of recent years and stringent

health laws, he said, had now caused as much consideration to be given to sand blast equipment as has been given to cupolas and cranes. While the art was discovered by America it has been developed by Germany, but he felt that the Germans had gone too much into automatic apparatus, and that the American apparatus is simpler. In planning a new foundry he emphasized the importance of calling in an expert in sand blasting and emphasized that it is best to put money in good equipment at the outset. He outlined the various classes of apparatus and admitted that the most efficient method of cleaning castings, especially of cored work, is the hand method, though in some cases ordinary tumbling is cheaper. Hand sand-blast method is efficient except in the case of the lightest castings, because the scale may be hard in parts and intensive cleaning of such parts is needed. He spoke of the popularity of the rotary tables, especially in automobile plants, including the type in which the worker remains outside of the sanding chamber, viewing the work through a copper mesh screen.

He felt that the foundry is coming to use fine hard white sand, but that careful study is still needed in this one matter. He urged the selection of air compressors fully large enough for the work, particularly because of the increasing uses for compressed air. He felt also that a standard well-known machine should be considered, both in the matter of making repairs and of getting a good market value when necessary to sell, as for replacement. He preferred a two-stage compressor to a single stage. He called attention to the common mistake of rating compressors on the basis of displacement, as compressors of the same displacement may have efficiencies ranging from 50 to 80 per cent.

Mr. Fuller told of some experiences with sand blasting apparatus, which he regarded as a good thing to install even if nothing more than a home-made equipment could be paid for. A new sand blasting plant has been installed in the Cleveland works of the Westinghouse Electric & Mfg. Co., and in proportioning it it was decided to go beyond the generally specified air movement of five times the volume of the room per hour by arranging for ten times. The air is admitted at the top of the room and carried away at the feet of the operator. With a movement corresponding to ten times difficulties developed in keeping the air pipes in repair, as the joints of the exhaust pipes cut out in two to three weeks. Applied to the cleaning mills the jacks or stars with this heavy air movement were carried to an upper story. The air movement rate was reduced to about seven to seven and one-half times.

Oxy-acetylene welding and cutting was the subject of a paper by Stuart Plumley, Davis-Bournonville Co., Boston. It dealt in part with welds made on the machinery of damaged German vessels interned on the Atlantic coast. It is planned to review the paper in a later issue.

A paper on foundry transportation and conveying problems was presented by Robert E. Newcomb, Deane Works, Worthington Pump & Machinery Corporation, Holyoke, Mass.; one on grinding wheels by Wallace T. Montague, Norton Co., Worcester, Mass., and one on refractory materials by H. C. Arnold, University of Illinois.

War Resolutions

In connection with the war, an important step was taken by the association in passing a resolution at the Thursday session, as noted elsewhere. This resolution provided for the appointment of a War Service Board to consist of five able men prominent in the non-ferrous as well as ferrous casting industry to work with the Government, if its help is desired, in securing desired production of proper quality castings at "fair" prices. The resolution carried with it the authority to appropriate money from the association treasury and Past-President Bull intimated that fully $10,000 could be made available at this time.

The association also passed a resolution that as representing the steel, gray and malleable iron industries of the United States, it "will do all within our power to mobilize our plants and their output, placing them at the disposal of the Government and will speed-up production to the end that the needs of our Government will be more promptly met and in every other way we promise our aid and support to our country to hasten the defeat of our enemies."

A resolution on the Liberty Loan was also passed, pledging the members to "devote the same efforts to the sale of the second and succeeding issues as they so patriotically devoted to the first bond issue," and those of them employing members to "render every possible assistance to their employees in the purchase of bonds."

Two Sessions Devoted to Steel Foundry Problems

Steel Castings for Gun Carriages — Important Points Relating to Electric Furnaces—Vanadium and Small Open-Hearth Furnaces

OF the two sessions, Thursday and Friday mornings, devoted to steel foundry problems, the Friday meeting was the more prominent. Special emphasis had been laid on the paper by Major C. M. Wesson of the Watertown Arsenal, Watertown, Mass., entitled "Steel Castings for Ordnance Construction." This paper had been scheduled for the Thursday morning steel session, but was transferred to the Friday meeting to accommodate Major Wesson. In order that a large number of foundrymen could hear the paper, the steel and gray iron sessions were temporarily consolidated.

Steel Castings for Gun Carriages

That Major Wesson had devoted a great deal of time and thought to his paper is evidenced by the thoroughness with which he treated this important subject in his 35-page paper. THE IRON AGE will later print an abstract. The Major supplemented its presentation with numerous slides showing the intricacy and importance of castings needed in modern high-power gun carriages. Starting with the statement that it had been found impossible to obtain an adequate supply of these castings from commercial foundries, due to their inability to meet the specifications or to produce sound castings, or other reasons, the Government established a foundry of its own at the Watertown Arsenal early in the 90's. The first melting unit was a converter which has been in operation continuously. Since then a 15-ton tilting acid open-hearth furnace has been installed and successfully operated. The speaker announced that he hoped electric furnaces would soon be running.

Major Wesson called particular attention to the unusual shock to which ordnance castings are subjected and the consequent necessity for metal possessing sterling dynamic properties. His paper incorporates a discussion of the various specifications for the three grades of Army ordnance castings and for other material such as forgings, etc. Attention is called to the fact that chemically the specifications for castings are less stringent than the railroad or those of the American Society for Testing Materials. As a whole they are regarded by the author as reasonable, but requiring high-grade foundry practice and strict attention to details, scientific and otherwise. The paper gives an extensive table of static results obtained at the arsenal from both converter and open-hearth metal.

A large part of Major Wesson's contribution is devoted to details of the molding, melting and annealing practice of the Government plant at Watertown. Photomicrographs of good and bad metal are given. The importance of shock or dynamic tests of all metal produced was also dwelt upon by the author, who showed the extent to which his plant went into this subject, using the Charpy shock test instrument.

Discussion on Ordnance Castings

The discussion of Major Wesson's paper was worth much more time than could be devoted to it. F. Hodg-

son, Electric Furnace Construction Co., Philadelphia, congratulated the author on his delineation of the value of the use of more scientific methods in steel foundry practice. In England he said steel castings were being used extensively in place of forgings, but in the famous war tanks it had been found impossible to obtain castings that would stand the severe strains. The speaker expressed his satisfaction in Major Wesson's statement that there was a prospect of introducing the electric furnace as a medium for making important castings. He believed that there would result less trouble from slag inclusions and especially cold metal by the use of the electric process.

As to specifications, Mr. Hodgson stated that those given by Major Wesson compare favorably with the British. For the tanks, castings had been obtained having a tensile strength of 90,000 lb. per sq. in. with an elongation of 20 per cent in 2 in. and a reduction area of 25 per cent. The speaker was of the opinion that the importance of heat treatment had been exaggerated; that it was more important to make better steel. He called attention to the shortage of steel castings in both England and France and believed there was an opportunity for American foundrymen to make up this deficiency.

Discussing the question of acid or basic castings by the electric process, Mr. Hodgson claimed that good steel for aeroplanes was being made by the basic in England. Commenting in reply on this subject, Major Wesson said that investigations of basic steel for gun forgings were bringing out encouraging results, as was also steel made by duplexing from the open-hearth into the electric where the refining was basic.

Anketell M. Henderson, manager Commonwealth Steel Products Co., Ltd., Sydney, Australia, stated that ordnance specifications in that country were not so severe as those mentioned by Major Wesson, and that it was possible to meet them with the steel made there in 2-ton converters. He, however, regarded the heat treatment as all important. At the Woolwich Arsenal in England it is the practice to hold the ladle from the converter 10 to 15 min. before pouring castings, insuring a metal freer from slag and other inclusions.

In explanation of a point raised by Mr. Wilson of the Connecticut Electric Steel Co., New Britain, Conn., as to why a higher temperature for annealing was stipulated for No. 3 grade of ordnance castings as compared with the lower grades, Major Wesson said that for air cooling or quenching such a temperature was found better.

R. A. Bull, Duquesne Steel Foundry, Coraopolis, Pa., and former president of the Foundrymen's Association, closed the discussion by emphasizing the great service bestowed on the convention and the subject of steel castings in general by Major Wesson's paper. The details furnished he regarded as especially illuminating and valuable. The committee on papers was desirous of bringing to the front the attitude of the association toward the Government, the war and the supply of castings, and this had been an object in securing this important paper. The treatment of the subject from the viewpoint of ordnance experts was nearly epoch-making. Mr. Bull wished it understood that the attitude of steel foundrymen has been and is that we are all now on a different basis, but all after the same object and ready to do anything to win the war.

The Electric Furnace in the Foundry

The remainder of the Friday morning session, before and after the presentation of Major Wesson's paper, was devoted to the electric furnace. The session was opened with W. H. Janssen in the chair by the offering by the author of an abstract of the paper "Comparison of the Electric Furnace and Steel Converter for the Manufacturer of Small Steel Castings" by C. R. Messinger, Sivyer Steel Casting Co., Milwaukee, Wis.. The paper presents results of the operation of two 1-ton Snyder bottom electrode, single-phase electric furnaces installed, one in the plant of the Sivyer Steel Casting Co., Milwaukee, and the other in that of the Electric Steel Co., Chicago. Generally speaking, these furnaces have been operated with acid linings, although enough experiments were made with basic linings to reach the conclusion that this type of furnace is not adapted to basic operation, said the author. The results with acid linings have been entirely satisfactory and the costs favorable. An average of 368 heats per lining has been obtained, with a refractory cost of 7.8c. per ton of steel. The electrode cost is 70c. per ton. The power consumption has averaged 635 kw.-hr. per ton. The total costs show a slight margin in favor of the electric furnace, compared with the converter. In the East, where the freight on low-phosphorus pig iron is lower, the margin is in favor of the converter.

WAR SERVICE BOARD

Established by American Foundrymen's Association

At the session of its annual meeting at Boston held Sept. 27, a resolution was passed by the American Foundrymen's Association, as follows:

BE IT RESOLVED, That the American Foundrymen's Association does hereby authorize and direct its president to appoint a War Service Board to consist of five of the ablest men engaged in the manufacture of gray iron, malleable iron, steel and non-ferrous castings in the United States irrespective of their membership in any organization, who shall serve without compensation and shall give such assistance (as a board operating directly, or as a central board governing subsidiary boards or committees) to the Government of the United States as may be possible, with the approval of the said Government, in the securing of castings of proper quality, at desired rates of production, at fair prices, to meet the needs of said Government; and in the conducting of any investigations into the manufacture of castings considered advisable in the furtherance of objects mentioned herein; and

BE IT FURTHER RESOLVED, That the proper officers of the American Foundrymen's Association are hereby authorized, if considered advisable by the said War Service Board which shall be appointed with the approval of the United States Government, to disburse such sums as may be necessary to defray the proper expenses for conducting the work of the co-operation with the United States Government referred to in the foregoing; and

BE IT FURTHER RESOLVED, That the directors of the American Foundrymen's Association be and they are hereby authorized to take such steps as they may consider advisable to appropriate or secure whatever funds may be needed for the most effective co-operation proposed in these resolutions.

In the discussion of this paper W. R. Bean, Eastern Malleable Iron Co., Naugatuck, Conn., asked what were the principal factors in 24-hr. operation of such furnaces. Mr. Messinger's reply was to the effect that the company secured the advantage of a better rate for power and a better refractory cost.

Bottom Electrodes and Single-Phase Current

A. M. Henderson, Sydney, Australia, asked three questions: Accidents from the use of a water-cooled bottom electrode, the absorption of silicon from the acid lining and the occurrence of electrical surges from the use of single-phase current. In England, he said, there has been considerable trouble from this. Mr. Messinger, in replying, stated that as to accidents from the bottom electrode—they had experienced two serious ones, one resulting in sending one man to the hospital and the other in sending three to the same place, to say nothing about loss of metal, etc. As to silicon absorption, trouble had been experienced at first, but its regulation was a matter of practice, for uniform silicon content is possible. The question of surges, the speaker said, he knew little about. It is, however, a fact that power companies do not favor single-phase furnaces, for the load is such a small part of the total. The company furnishing power to his plant in Milwaukee has five single-phase small furnaces on its line, but it would not look with favor on a large unit.

"Recent Developments in the Application of the Electric Furnace to the Melting Problem" has been the subject of a paper by Douglas Walker, Booth-Hall Co., Chicago. It was presented in abstract by Carl H. Booth, president of the company. The paper was quite general in its nature, commenting on the change that has taken place in the last year or so in the attitude of foundrymen toward the electric furnace as a melting medium, on the various applications of the electric furnace to the foundry, on the use of electric melting units in England for producing high-grade gray iron castings, on the problem of electrically melting ferroalloys and the production of malleable iron. Basic instead of acid linings were recommended partly because of the high price of low sulphur and low phosphorus scrap. The characteristics of an ideal furnace were outlined, together with the power question and the reasons for the superiority of electric steel. The paper was not discussed.

The paper by John A. Crowley of the John A. Crowley Co., Detroit, Mich., on "Notes on an Electric Furnace Design" was presented in abstract by A. M. Minnick of the company's Detroit office. The author describes the design and construction of a 1-ton Grönwall-Dixon furnace. In choosing between a rugged, simple design and one that is more finished and complicated, the author believed good practice would recommend the former, which will require little or no attention. Also, should such a furnace break down, replacements can be made in much less time than on one of a more complicated design. The furnace described in the paper is provided with automatic electrode controls and with a specially designed tilting device, the mechanism of which is enclosed. Figures on the cost of operation were presented.

Current Flow in the Bottom Electrode

P. A. E. Armstrong, vice-president Ludlum Steel Co., Watervliet, N. Y., raised the question as to the amount of current flow through the neutral bottom electrode because in his experience he claimed there was no flow until the bath was hot, magnesite being a non-conductor. He thought, however, that bottom connections were ideal. Mr. Minnick stated in reply that he believed about 2000 amperes passed through this electrode in a 5-ton furnace of this type, but he was not sure. In reply to a question as to whether the conducting hearth was always in operation, the speaker said it was continually used in refining.

"The Electric Furnace from the Central Station Standpoint," by E. L. Crosby, Detroit Edison Co., was presented by C. F. Hirshfeld, manager of the research department of that company. An abstract is as follows:

Considerable difficulty is involved in presenting a paper under this title in a manner interesting to foundrymen. It is, of course, apparent that from a technical standpoint, the features of an electric furnace which would be found of greatest interest to the central station man or to a foundryman would be widely different. It would be vastly easier to present to a group of central station people a paper on the electrical characteristics of the electric furnace or to discuss before a society such as the American Foundrymen's Association, the general characteristics of the electric furnace with particular reference to its metallurgical features. In your consideration of the paper as presented the writer sincerely hopes you will bear in mind that the ideas he has attempted to bring out are those which it seems to him can best be developed and improved upon by co-operation between the foundry and the central station.

The author believes that the central station anticipating electric furnace business should be prepared to discuss the electrical and metallurgical characteristics of the various types of furnaces with the buyer in an intelligent manner. The writer also believes there is considerable opportunity for the standardization of the methods for obtaining power demands by central stations throughout the country. Regulation, phase balance and wave distortion are equally as important considerations to both the consumer and producer of electricity for electric furnaces as power factor, which up to date has received the most study.

The paper concludes with a discussion of the economics of the electric furnace from the standpoints of both the steel foundryman and the central station, it being pointed out that under existing conditions the foundryman may get back his initial investment in a few months, whereas the producer of the electrical energy must look to the long future.

Little time was left for discussion on this paper, as it was presented after the joint meeting which heard Major Wesson's paper. F. T. Snyder, inventor of the Snyder furnace, argued for single-phase current and its advantages.

The other steel session, held Thursday morning, was devoted to miscellaneous subjects connected with steel foundry problems. It was presided over by A. H. Jameson, Malleable Iron Fittings Co., Branford, Conn.

Vanadium in Steel Castings

The first paper called for was "The Use of Vanadium in Steel Castings," by J. Lloyd Uhler, metallurgist Union Steel Castings Co., Pittsburgh, who read an abstract. The author shows that vanadium has been used by steel makers extensively only in the last few years; that it acts in the steel on both the oxygen and nitrogen at high temperatures, combining with them, eliminating them or neutralizing their harmful effects, and that it acts so as to knit the crystals more closely together, causing the pearlite and ferrite to appear in smaller aggregations and making a denser steel. Some interesting results are presented of tests on vanadium steel castings made to take the place of forgings in marine turbines.

The chairman called on Edwin F. Cone, associate editor THE IRON AGE, to open the discussion. Mr. Cone stated that his own experience in making many heats some years ago of vanadium steel castings, particularly locomotive frames, corroborated the testimony of Mr. Uhler in his paper. Vanadium, added to plain mild carbon steel, does cause a denser metal and one containing finer crystals, particularly in the green or unannealed condition. He asked the author what heat treatment was used generally on such castings in his plant. Mr. Uhler replied that it was simple annealing, that is, soaking at the recalescent point followed by slow cooling in the closed annealer.

In reply to a question regarding the feasibility of ladle additions of the ferrovanadium, Mr. Uhler stated that it was their practice to add the ferrovanadium always to the bath of the open-hearth furnace, the metal referred to in the paper being acid open-hearth steel, made in 25-ton heats. He never favored adding the alloy to the ladle. The loss, he said, was not large when added to the bath, it being his experience that by adding 0.22 per cent vanadium it was possible to finish the steel at 0.19 per cent vanadium.

Use of Vanadium Steel Scrap

Mr. Uhler also stated that it was the company's practice to segregate all vanadium steel scrap in the foundry and recharge it as scrap in regular heats, that by so doing it was possible to recover from 0.03 to 0.06 per cent of the original vanadium. Mr. Cone testified that he had intended to ask Mr. Uhler regarding this

point because he had found in his previous experience referred to that by so collecting and using such scrap it was possible to recover at least as much as Mr. Uhler had stated, thus offsetting in part some of the loss necessarily accompanying additions of the alloy to the bath.

Asked by Mr. Cone whether the ferromanganese additions were also made in the bath, a practice recognized by many as the best, Mr. Uhler stated that while he believed in adding this alloy also to the bath, owing to its scarcity and high price he had been obliged to put 50 per cent of it in the ladle. To do this he had caused it to be broken into small pieces, had placed it in a hopper directly over the spout, where it became preheated to a considerable extent before use. It was then allowed to fall into the spout as the metal flowed from the furnace.

Mr. Cone stated that he had found that the incorporation of about 0.18 to 0.20 per cent vanadium in ordinary mild carbon steel castings raised the elastic ratio from 60 per cent to 70 per cent after simple annealing and asked Mr. Uhler if that was also his experience. The author replied that such was the case.

Small Open-Hearth Furnaces

In the absence of the author, the chair asked Mr. Cone to present the paper "A Description of a Small Open-Hearth Furnace," by David McLain, McLain's System, Milwaukee, Wis., which he did in abstract, calling attention to the importance of such small units and suggesting a discussion as to the percentage of loss, the quality of the metal and its uniformity. An abstract of the paper is as follows:

The author recounts some exceedingly interesting experiences in the early days of the steel foundry business. The operations of William Hainsworth of Pittsburgh, who established the first Bessemer steel foundry in this country, are described in some detail. Throughout his life, Mr. Hainsworth was confident a successful small open-hearth furnace could be built, and he spent thousands of dollars experimenting with apparatus of this character. He never, however, succeeded in realizing his ambition.

The McLain-Carter small open-hearth furnace, which this paper describes in detail, is built in sizes ranging from one to five tons. Oil fuel is used. The oil consumption is stated to be 65 to 70 gal. per ton of steel. The roof, it is claimed, will stand for 500 to 700 heats, with the furnace turning out high-temperature, fluid metal.

Mr. McLain, who was present after his paper had been presented, said, in response to questions, that for small light sections no larger than a 2-ton heat was advisable, but that his furnaces will melt up to 5 tons. As many as four 4-ton heats can be made in 12 hr. He placed the melting loss at 8 to 10 per cent and claimed that as good metal could be made as in any large open-hearth or other process. He added that on Sept. 10 there were 7 such small furnaces operating in the United States.

Mr. Henderson stated that in his converter foundry in Australia it was the practice to run the manganese content of the steel to 0.85 to 0.90 per cent for ordinary work, with the manganese at 1.00 per cent to 1.10 per cent for small sections. They had no trouble in securing an elongation of 34 per cent in 2 in. and a reduction of area of 45 to 60 per cent. The sulphur ran about 0.04 per cent, with the phosphorus at 0.06 per cent. This was offered as a comparison to Mr. McLain's statement that in his furnace the metal averaged about 0.24 per cent carbon, 0.66 per cent manganese, with the silicon at 0.28 and the sulphur and phosphorus around 0.035 to 0.045 per cent.

New Way to Burn Oil

"A New System of Burning Crude Oil" was the subject of a paper by W. A. Janssen, production manager Canadian Steel Foundries, Montreal, which he presented in abstract. The author stated that in the new system the air is preheated and subsequently mixed with oil in definite proportions, creating a combustible gas which is forced into the furnace under positive pressure, resulting in perfect combustion. The preheater is cast iron and is provided with flues for the passage of waste gases which form the source of heat. The vaporizer is a hollow cast-iron fitting having baffles to insure an intimate mixture of oil and air, and thorough vaporization in the furnace. For perfect combustion 25 cu. ft. of free air per min. per gal. of oil burned per hr. are required, resulting in oil economies of 40 per cent.

In the discussion A. M. Henderson stated that he had seen it in operation, and that the flame was not a cutting one; that it was suited to many metallurgical operations. He asked whether it had been used for burning coal tar, to which Mr. Janssen replied that it had successfully, with no carbon deposition.

Standard Sleeves and Stoppers

The report of the A. F. A. committee on steel foundry standards embraced recommendations as to the proper size of sleeves and stoppers. It was presented by Chairman Janssen and was adopted without dissent by the meeting.

Important Meeting of Malleable Iron Producers

Application of Powdered Coal to Melting Furnaces and Difficulties of Machining Some Malleable Iron Discussed

NO more important or successful session on malleable iron has ever been held by the association than the one this year. This was generally conceded by all and was emphasized by President Pero, who was the chairman of the meeting on Wednesday morning devoted to this subject. He expressed his appreciation of the interest shown and stated that it has been potently manifest only in the last two years. Several years ago such meetings would have been impossible; free interchange of ideas was then regarded as the revealing of trade secrets.

Powdered Coal for Malleable Furnaces

Pulverized coal in malleable practice was a topic on which two papers of importance were presented. They were freely discussed. The "Application of Pulverized Coal to the Air Furnace," by W. R. Bean, Eastern Malleable Iron Co., Naugatuck, Conn., and the "Application of Pulverized Coal to Malleable Melting Furnaces," by Joseph Harrington, advisory engineer, Chicago, were both presented in abstract by Mr. Bean.

Mr. Bean in his paper called attention to the lack of uniformity of metal due to hand firing and the need of mechanical firing. Mechanical stokers in his opinion have not solved this problem, but the use of pulverized coal gave promise of success. Results of tests covering 36 heats in an air furnace fired with pulverized coal were given. One point emphasized was that the coal may to advantage be different from that used for hand firing in that the coal in which the fusing point of the ash is low has certain advantages over coal in which the ash has a high fusing point. Ash with a low fusing point will deposit earlier as slag. Pulverized coal furnaces offer an opportunity for the employment of waste-heat boilers, together with the possibility of using silica brick in furnace linings. The principal advantages derivable are: Less exhaustive labor, the clinker problem solved, lower fuel cost, smoke elimination, more efficient use of waste-heat boilers and a reduction in cost of furnace maintenance.

Mr. Harrington in his paper pointed out the ease with which a charge can be melted rapidly when using powdered coal and that flame temperatures exceeding 3000 deg. are possible. The deterioration of refractories was no greater than in ordinary firing. The powdered coal jet does not impinge directly on any brick work and its controllability is a feature. When using powdered coal, there is an actual diminution in the burning out of carbon of some 2 to 5 per cent, making it possible to reduce the amount of new pig in the charge.

In the discussion of Mr. Bean's paper, Stanley G.

Flagg, 3rd, Stanley G. Flagg & Co., Philadelphia, mentioned the desire of many to get away from gas coal, due to present conditions, and asked if oil was not less difficult to apply as well as cheaper than powdered coal. Mr. Bean pointed to the experience of open-hearth men as the reply. One such user of powdered coal had said that he would not change back to oil with oil at 2c. per gal. He had not found it as satisfactory as hand firing because of more oxidation and insufficiently high temperatures. There are complications, he knew, but at least 11 malleable foundries are now using powdered coal for one purpose or another.

Prof. Enrique Touceda said he did not understand how one can use silica brick in a process that is not continuous due to spalling of the brick, thus increasing the cost of maintenance. He knew of one company making wrought iron which changed from coal firing to powdered coal, with the result that the brick did not stand up. He believed in powdered coal for making cement, but the production of malleable iron is not a continuous process. Mr. Bean replied that a furnace would be maintained at a temperature so as to protect the brick between heats; that the amount of fuel necessary for this was not great. As to cost of maintenance—in 11 consecutive heats using powdered coal no repairs were necessary; there was but little damage to side walls, the greatest being at the bridge wall.

Fuel and Uniformity of Product

Mr. Pero called attention to the timeliness of the paper from a labor standpoint in the desire to get away from hand firing, for in St. Louis in hot weather this was a serious consideration. An argument not brought out against hand firing was uniformity of product. From his own experience he could state positively that he was getting better control of chemical content by the use of oil than from forced draft hand firing and better and quicker heats. His company is about to equip three more furnaces with oil. While there is no economy of oil over coal, there are the factors of decreased cost of labor and less furnace repairs—the great point, however, he claimed was uniformity of product. "I am bitterly opposed to hand firing. I am not familiar with the use of powdered coal, but with oil I know exactly when to expect a heat finished."

"Those who have used both oil and powdered coal," said Mr. Bean in answering Mr. Pero, "prefer the latter. They can point the flame wherever they desire." The sulphur content does sometimes cause trouble, but other elements can be so regulated as to offset it easily and satisfactorily, he said. Good malleable iron is made to-day high in sulphur. The cost, however, is in favor of the coal. In his experience with powdered coal he had found the combustion more nearly perfect.

Mr. Pero closed the discussion with the statement that only recently had oil been adapted to malleable furnaces, that at first he did not know how to burn it, but had found that no bridge wall was an advantage with the use of little pressure but a good volume of air.

The discussion of the second paper on powdered coal, that of Mr. Harrington, was introduced by Mr. Flagg, who desired to know what disposition was made of the fine ash and whether it did not spread itself over the neighborhood. Chicago has watched this carefully, Mr. Bean replied, and had reported favorably. Powdered coal had been adopted to get away from the smoke nuisance. Usually most of the dust fuses and more skimming is necessary with about 1600 lb. of ash removed from a 20-ton heat. Mr. Bean favored a preliminary combustion chamber. At the plant of the American Iron & Steel Mfg. Co. (now part of the Bethlehem Steel Corporation), Lebanon, Pa., where over 100 furnaces fired with powdered coal are in use, ash is reported as no detriment.

Mr. Bean reported on temperatures that he had taken with a Fery pyrometer. At the bridge wall he had found the range to be 2800 to 2950 deg. Through the side wall the same temperatures were discovered by the use of a thermocouple. At the stack base the temperature was 2500 deg.

Malleable Iron Difficult to Machine

The matter of certain difficulties in machining malleable iron was introduced by A. T. Jeffrey, Dayton Malleable Iron Co., Dayton, Ohio, who presented in abstract his paper, "Troubles Encountered in Machining Malleable Iron: Causes and Remedies." There are five distinct varieties of iron from which one or more of these complaints may arise. They include pure, hard, white iron; under-annealed iron; iron cooled too quickly; burned iron and iron that is sometimes called hard but is really tough and stringy.

In summarizing, said the author, it may be stated that the fundamental or underlying cause of trouble with malleable iron in the machine shop is generally due to a lack of scientific study of the material in question along practical lines and to the lack of active co-operation by the users of malleable iron. Designing engineers have neglected to familiarize themselves with the properties and peculiarities of malleable iron, due largely to the meager amount of authoritative information in print, and their unwillingness to accept the statements of men who are well informed but are perhaps unable to express themselves fluently and who are the operative heads of our best malleable foundries. In many instances bad designs are changed with reluctance, although the engineer is becoming more alive every day to the advantage and necessity of close co-operation with the practical man in the foundry. As in other spheres, therefore, co-operation should be our watchword, and with intelligent effort and hearty co-operation between producer and user, most of our troubles will disappear.

C. H. Gale, Pressed Steel Car Co., Pittsburgh, confessed that he had had considerable experience regarding complaints as to hard metal; that nine-tenths of his product was strong and tough, with the rest less strong and easily machinable. Customers had complained that the metal was too hard to machine and had offered as an example a curl of iron 12 in. long. In each case it was by no means hard but soft and tough and the company had refused to accept it as defective.

Mr. Flagg was certain that often complaints as to non-machinability due to hardness were often traceable to the use of the wrong tool. The metal was tough and not hard. In some cases it was possible to bend such a casting nearly double, proving its ductility and softness as well as its toughness.

Carbon Losses in Annealing Malleable Iron

The subject of carbon losses in malleable iron annealing was brought up by the paper by Joseph B. Deisher, T. H. Symington Co., Rochester, N. Y., entitled, "Comparative Carbon Losses in Malleable Iron Annealing by Muffle and Pot Oven Methods." The paper dealt with many of the factors entering into the annealing of malleable castings in muffle and pot ovens. According to the author, the safe annealing temperatures are from 1450 to 1650 deg. Fahr. for pot ovens and from 1500 to 1700 deg. for muffle ovens. Mr. Deisher believes that the 60 hr. usually considered necessary to completely dissolve the iron carbide are not actually required and that the best practice is to bring the castings to the highest temperature at the beginning of the anneal, such temperature to be held until the iron carbide is dissolved, and then drop to 1400 deg., which is considered favorable for the precipitation of the graphitic carbon. In a comprehensive discussion of the advantages and disadvantages of the pot and muffle ovens, the author concludes that the conversion rather than the removal of carbon in the anneal produces ductility. This contention seems to be borne out by the results of tests made with castings which were annealed in mild packing, strong packing and without packing.

Mr. Deisher in further explanation said that one great objection to malleable castings was the inability to get them in a hurry. The question of getting castings in less time was important, and it had been asked whether the rate of cooling could not be controlled to accomplish this. The point is not the control of the cooling but the quickening of the time of dissociation of the iron carbide. The control of temperature is important, so as to cut down the time of this dissociation.

Mr. Gale, in reply to a suggestion as to the scale often found on annealed malleable castings, said that this was often as low as 0.09 per cent in combined carbon with practically no graphitic carbon present.

As to the temperature ranges for annealing, it was asked whether it was better to keep near the maximum or the minimum as outlined in the paper. Mr. Deisher replied that the maximum should be maintained for

about 30 hr. when there is the most dissolution, but at the end this should not be maintained; it should gradually diminish to 1600 deg. at about the middle of the annealing period or until the carbide is dissolved.

How Malleable Iron Has Improved

The extent to which malleable iron has improved was well illustrated by a paper by Enrique Touceda, consulting engineer, Albany, N. Y. He presented an abstract of his paper, "How Malleable Iron Has Improved," which is printed in part in this issue. The author emphasized his contention that one of the most serious shortcomings of malleable iron in the past has been its lack of uniformity. "I consider the improvement accomplished in this direction in the last few years to have much more far-reaching effect with the user of the metal and to be of greater importance to him than the ability of the founder to obtain high strength and ductility." He expressed his appreciation of Mr. Pero's narration of his experience as to uniformity from the use of oil as a fuel.

In reply to a question, Prof. Touceda said that the tests in Table 5 had to do with iron containing 0.10 per cent sulphur. Replying to a question by Mr. Flagg as to whether the unusual elongations of Table 5 were from iron melted in the open hearth, Mr. Touceda said that they were all air furnace iron and regular test bars from a fine run.

Two papers on the application of waste-heat boilers to the malleable melting furnace were not presented in the absence of the authors. One was "The Theory of the Modern Waste-Heat Boiler and Possible Application of Such Boilers to the Malleable Melting Furnace," by A. D. Pratt, Babcock & Wilcox Co., New York, and the other was "Application of Waste-Heat Boilers to the Malleable Melting Furnace," by C. D. Townsend, Danville Malleable Iron Co., Danville, Ill.

Session on General Foundry Questions

Relation Between Employer and Employee and Development of a Safety Code Considered—Officers Elected

THE session of Wednesday morning opened with the reading of a paper by J. F. Kent, American Cast Iron Pipe Co., Birmingham, Ala., entitled "Improving the Relationship Between Employer and Employee." The author outlined the methods by which cleanliness is encouraged, medical treatment is administered, physical examinations conducted, Y. M. C. A. work organized, and thrift and education promoted. Statistics are given to show the results of this work.

R. A. Bull in the discussion suggested that foundries had made a great mistake in the past by not providing conveniences for their men. Where welfare was being done there could be no greater error than always to be reminding the men of the work done for their benefit. This is a fatal mistake because such things must and should speak for themselves.

William Judson Kibbe, employment specialist, Cleveland, who was to have been heard Tuesday, followed with an enlightening talk on "How Character Analysis Solves the Man Problem." Departing widely from the paper which had been printed in advance, his address, couched in some of the virile language of the day, pointed out that the most efficient plants are those where the men are happy and on the right jobs. The first great need is to teach executives how to understand the other fellow. "The biggest job in your plant of to-morrow awaits the man who is to select your employees," he continued. In a strong plea that his auditors get the new viewpoint in employment work, the speaker expressed the conviction that no machine is better than the man behind it. "In the matter of cost pertaining to machinery, merchandise, labor, etc.," he continued, "we demand perfect knowledge; in other words, we are very scientific in the running of our business, for we find that we cannot succeed unless we operate our business upon a scientific basis, that is, organizing our knowledge pertaining to our business. In the face of this truth, why should we go on blindly employing men with no regard to their fitness or efficiency? The time has now arrived when industry demands to know more about this problem and it has set its face toward it with a grim determination to master it at all cost."

Safety Code Question

The next number on the program, which was the report of the A. F. A. committee on safety, sanitation and fire prevention, provoked a discussion which at times waxed warm. This was due to the safety code reported by the committee. The point at issue was that there should not be two safety codes before the legislatures of the country, one backed by the American Foundrymen's Association and the other by the National Founders' Association. It developed that efforts to get the committees of the two organizations together had been futile. The Massachusetts foundrymen present were especially solicitous that only a common code should be supported by the two organizations and in their remarks outlined the great struggle which had been gone through in Massachusetts previous to the adoption of a new safety code for foundries the past year.

C. L. Newcomb, Deane Works, Worthington Pump & Machinery Corporation, Holyoke, Mass., advocated that the code should be put over another year for further consideration and that foundrymen who were familiar with the New York, Pennsylvania, New Jersey and Massachusetts codes should be included in the committee.

Stephen French, Athol Machine Co., Athol, Mass., suggested that the members did not take interest enough in the code to study how its rules were to affect their own plants. He believed that as a result of the efforts of local foundrymen, the new Massachusetts code was the best now in existence. He urged that a common code be adopted because of the good effect upon the legislatures of a united front.

Dr. Richard Moldenke pointed out that the A. F. A. committee had all the codes before them for consideration and had drawn up a code that was as fair to the men as to the employers, which could not be said of some of the other codes. With the workmen behind the rules their enforcement would be easy.

The matter was adjusted at one of the Friday sessions, but meanwhile the discussion had consumed so much time that adjournment immediately followed. Secretary Backert at the Friday meeting reported that in the matter of safety sanitation and fire protection, a committee of three had been appointed to meet with a committee of three of the National Founders' Association, and the code that is then developed would be submitted to the members for a letter ballot. The committee of the association is composed of Earl B. Morgan, Norton Co., Worcester, Mass.; Ralph H. West, West Steel Casting Co., Cleveland, both members of the safety, sanitation and fire prevention committee, and President B. D. Fuller.

Directors and Officers

The subjoined list of directors were elected and at a subsequent meeting of the board, Benjamin D. Fuller was elected president, Stanley G. Flagg, 3d., vice-president, and A. O. Backert, secretary-treasurer. The directors are:

H. R. Atwater, Osborn Mfg. Co., Cleveland.
A. O. Backert, Penton Publishing Co., Cleveland.
R. A. Bull, Duquesne Steel Foundry Co., Pittsburgh.
Henry A. Carpenter, General Fire Extinguisher Co., Providence, R. I.
H. E. Diller, General Electric Co., Erie, Pa.
Stanley G. Flagg, 3d., Stanley G. Flagg & Co., Philadelphia.

Benjamin D. Fuller, Westinghouse Electric & Mfg. Co., Cleveland.
Alfred E. Howell, Phillips & Buttorff Mfg. Co., Nashville, Tenn.
C. E. Hoyt, Lewis Institute, Chicago.
W. A. Janssen, Canadian Steel Foundries, Ltd., Montreal.
S. T. Johnston, S. Obermayer Co., Chicago.
J. F. Kent, American Cast Iron Pipe, Birmingham.
V. E. Minich, Sand Mixing Machine Co., New York.
J. P. Pero, Missouri Malleable Iron Co., East St. Louis, Ill.
Maj. Joseph T. Speer, Pittsburgh Valve, Foundry & Construction Co., Pittsburgh.
H. B. Swan, Cadillac Motor Car Co., Detroit.

American Institute of Metals Meetings

Boston Convention Discloses Progress Made Toward Use of Domestic Clays in Crucibles—Shrapnel Bullets

COMPREHENSIVE and timely, the papers presented before the American Institute of Metals at its annual convention in Boston last week proved valuable contributions to metallurgical literature. The crucible situation, in view of the impossibility of obtaining clay from Klingenberg, and the electric furnace development for nonferrous metal melting, were topics indicating notable progress. Nonferrous metals used in shrapnel manufacture appear also to have presented metallurgical and chemical difficulties which, according to views brought out, have been largely overcome.

Domestic Clays for Crucibles

Clays and graphites used in the manufacture of crucibles were discussed by Prof. A. V. Bleininger, Bureau of Standards, Washington. His paper, in his absence, was read by G. C. Stone, New Jersey Zinc Co., New York. The paper paid particular attention to domestic materials, some of which the author said approach the Klingenberg varieties in quality. Though no single American clay has yet been found a suitable substitute for those from Germany, he believes possible a combination of domestic varieties to form a product which will excel them.

Differentiation between crucibles for brass and for steel melting as to composition, he pointed out, is not clear. However, it appears that clays for steel melting need not possess as low a vitrification temperature, but must have a higher overfiring temperature and greater refractoriness. He also emphasized that all the factors in the construction of the crucible body and the various destructive agencies tending to shorten the life of the crucible are not understood.

Crucibles which are being dried, he declared, should be maintained for at least several days at a temperature of, say, 300 deg. Fahr. before being placed in the furnace. In Europe the crucibles on being taken from the drying kiln are sometimes covered with a water proof coat such as tar or pitch dissolved in turpentine. He also believes that preheating of the crucible before putting it into the first heat is often too abrupt, the temperature change too violent and that the ideal method would be to place crucibles in a special furnace kept heated by the waste gases of the melting furnace where the furnace could be heated up uniformly to somewhat below red heat.

The Present Crucible Situation

M. McNaughton, Jos. Dixon Crucible Co., Jersey City, N. J., discussing the present crucible situation, stated that because of the lull in the metal business the plumbago supply is larger at present than at any previous time. However, shipping difficulties, he said, may later cause scarcity. The crucible problem, he believes, cannot be solved in the laboratory, but necessary information for improving the product must come from actual service. The real problem is to find a substitute for German clay and so far progress in this line has only been in the elimination of unsatisfactory material. Results obtained by early attempts to use domestic clay were unsatisfactory. In certain cases the average heats secured were four or five as against 25 to 35 previous to the war. At the present time from 15 to 25 heats is the range of average service of size of crucibles No. 80 when used in standard rolling mill service. The conditions as to the supply of both these materials, clay and plumbago, he said, are much more satisfactory than they were a year and 18 months ago, and the annoying shortage which prevailed during 1916 will not occur again as a result of insufficient works capacity. Crucibles, he believes, are now of much better quality on an average than during that period and the same number of crucibles will melt a much greater quantity of metal. He advised the use of crucibles as small as possible.

The Electric Furnace for Nonferrous Metals

Discussing the melting of yellow brass in induction furnaces, G. H. Clamer, Ajax Metal Co., Philadelphia, urged that manufacturers select electric furnaces particularly adapted to the work in view. No type of furnace, he said, is without restrictions and none is generally applicable to all work.

Regarding points in design, he emphasized that pinch effect and low power factor are to be avoided, and with a view to the latter the primary and secondary coils should be as close together as posible. The extreme pinch effect and low power factor obtained in the open channel type of electric induction furnaces, he believes, precludes their use for alloys of nonferrous metals.

He described the Ajax-Wyatt furnace as consisting of a horizontal bath of molten metal communicating with a vertical "V" channel, which, through the utilization of what he terms the Joule effect and motor effect, stimulates circulation of metal analogous to that of water in a boiler. Brass composed of 60 per cent copper and 40 per cent zinc he said is being melted without volatilization and to accomplish this the circulation of molten metal must be sufficiently rapid. A 30-kw. Ajax-Wyatt furnace has, he explained, a power factor of 85 per cent and a 60 kw. one a power factor of 72 per cent, the load factor during operation being 100 per cent. The quality of the product he believes equals that from crucibles, and turnings and sawings have been melted with a minimum of segregation. He added that in melting yellow brass a 30-kw. furnace will produce from 100,000 to 200,000 lb. before requiring relining; that the cost to reline is $60, and that melting 60-40 brass 6½ to 9 lb. of metal are melted per kilowatt-hour in a 30-kw. furnace, and 9½ to 11 lb. in a 60-kw. furnace based on the weight of metal cast.

Dwight D. Miller, Society for Electrical Development, New York, pointed out that a large field is available to the electric furnace in nonferrous metal work, the object being to develop a furnace with high thermal efficiency that will melt yellow brass and obviate volatilization. He said that the electric furnace also would provide the foundry with means for obtaining daily furnace records and better technical control, and would make less likely diseases related to the industry.

The General Electric Co., he said, has a furnace which will shortly be used for melting red brass on either one, two or three-phase current. It is of the smothered arc type and has both pyrometer and wattage means of control. In melting red brass a temperature of 2200 deg. Fahr. is reached and 325 kw.-hr. per ton is required, an efficiency of 70 to 77 per cent and a power factor of 96 to 98 per cent being obtained.

The Northrop furnace of the induction type he described as a new departure which has been operating experimentally for one year. It appears to handle any kind of metal and to be capable of changing to various mixtures. It takes an oscillating current from condensers at 10,000 volts, and, he explained, has no iron core, the crucible being placed in the induction coil.

A furnace promising success, he said, is the Hering pinch effect furnace, while the Ajax-Wyatt furnace and the Baily, Rennerfelt, Hoskins and Snyder are in commercial use.

The simplicity and reliability of the Baily furnace, he believes, has been proved. The Otis Elevator Co., he declared, has a Baily electric furnace for annealing steel castings which operates on two-phase current, takes a 1200-lb. charge and develops a temperature of 1500 deg. Fahr. to 1850 deg., starting from 750 deg., the cost per ton of metal being $7 and the power being on 19½ hr. However, he believes that the Baily furnace is inherently sluggish because of its large heat storage capacity, which, he said, is sufficient to allow the Lumen Bearing Co. to make its last heat on the stored heat of the furnace.

Two Snyder furnaces of 480-kw. capacity, he stated, are being used by the Chicago Bearing Metal Co. and have a power factor of 60 per cent, take a 2000-lb. charge of heavy leaded bronze, and require 300-kw.-hr. per ton.

The Rennerfelt furnace, he said, has not been successful on yellow brass. However, with Monel metal he claims it produced no loss of metal in three heats, the charge being 945 lb.

When using a pyrometer on heats he believes readings can be obtained quickly only when the couples are permanently installed. Dr. H. W. Gillett, United States Bureau of Mines, Ithaca, N. Y., stated that whether the spout on the electric furnace properly be left partly open or entirely closed depends on the kind of charge and the condition of operation. He believes that it is possible to install a pyrometer to show the temperature of the inclosure but difficult to put the couple in the metal. Sufficient control, he said, may be obtained by watching and regulating the power consumption. He has experienced trouble with sticking electrodes when melting charges high in zinc.

Briquetting Nonferrous Scrap

The briquetting of nonferrous metal scrap was discussed by A. L. Stillman, General Briquetting Co., New York. It is evident, he said, that if light scrap can be treated to equal heavy scrap economy will result. The briquet and bale, he emphasized, are distinctly different, the one calling for short easily fed borings and the other long flexible material. In the manufacture of briquets he believes it generally advisable not to use binders, as these, though sometimes apparently harmless, often introduce metallurgical complexities. Lead alloys and babbitt metals, he said, are easy to briquet by pressure alone and copper, aluminum and their alloys, notably brass and also iron and steel, after preliminary packing to remove included air, can be made into briquets by building up of extreme pressures which develop a strong bond of adhesion. In the case of hard bronze, milk of lime has proved an aid to briquetting.

First in importance he places the expulsion of included air in making briquets. Sudden application of force will not accomplish this and some concerns, he stated, have successfully used a slowly operated hydraulic press. He believes the most successful method of briquetting is the Ronay process, which, he said, has been adopted by the Chase Metal Works and the Scovill Mfg. Co., both of Waterbury, Conn. The author further remarked that when scrap contains oil the greater part of the oil is removed by pressing; also when foreign material is present a binder is required. Mr. Stone said that he has used a press on scrap containing foreign material with satisfactory results.

Dr. Gillett, in a paper on negative experiments on waste core sand, pointed out that experiments made on burnt core sand gave no promise for the commercial utilization of burnt sand; neither did they throw any light on the process of deterioration of the sand. In the particular sand used no benefit was derived from burning off the carbon, and heating new sand to a comparatively low temperature increased the amount of oil needed.

Stellite was discussed by Elwood Haynes, Haynes Stellite Works, Kokomo, Ind. He said that he has made cast stellite bars capable of withstanding greater pressure than high speed tool steel, and has found the addition of iron necessary when used in saws. He advises consumers not to remelt the material, as melting in graphite crucibles adds excessive carbon, and he suggested that old material for remelting be returned to the factory. The crucible method of melting stellite, he said, was being used exclusively in the factory, the electric furnace which was installed not having proved satisfactory. Jesse L. Jones, Westinghouse Electric & Mfg. Co., East Pittsburgh, remarked that by coating stellite with manganese bronze it may be welded to steel.

Bullets for Shrapnel

Harold J. Roast, Jas. Robertson Co., Ltd., Montreal, described some irregularities met with in the manufacture of British shrapnel composed of 12.5 per cent antimony and 87.5 per cent lead. In melting and mixing these metals, he said, first a little lead is melted in a pot to conduct the heat, then antimony is added and finally the remainder of the lead. Rods drawn from this, he stated, showed considerable variation in composition due to the segregation of the antimony on standing in the cylinder of the rod press for cooling, though the mixture in the melting pot was continually stirred. Casting slugs in a special water-cooled mold he found obviated this segregation.

In casting bullets, he pointed out, the predominant cause for variations in weight is variance in size of bullets and if the mixture in the melting pot is kept properly mixed no variation in composition will be experienced. Variation in the analyses of antimonial-lead alloys as made by the manufacturer and inspectors, he said, led him to investigate the cause. He prepared a sample of lead and antimony of known composition, which he subsequently had analyzed by four different analysts. The results received, he said, did not agree, two analyses rejecting the bullets and the other two accepting them.

C. P. Karr, Bureau of Standards, Washington, said that he has used antimony in powdered form, thereby improving the metal, but that this was done in laboratory work and not commercially. Mr. Roast believed that the likelihood of losses of antimony in powdered form would make this method impractical. He also explained that he prevents segregation of metal by constant stirring of the molten mass in the pots from bottom upward with an iron skimmer, together with the means previously described. Other discussion indicated that stirring from the bottom and up is necessary to homogeneity.

Charles Pack, Doehler Die Casting Co., Brooklyn, N. Y., explained that he uses a circular stirrer which throws the metal upward. He believes that temperature of the metal is important, and that when this is low trouble may be experienced. He is now having trouble with the use of American antimony. W. A. Cowan, National Lead Co., Brooklyn, believes that the proper method of preventing segregation is by heating first the metal of lower melting point, in this case lead, to a temperature above the melting point and then dissolving in this the metal of higher melting point, or in this case antimony. Mr. Roast stated that he has been using Chinese antimony.

Products of Aluminum

F. G. Shull, Aluminum Co. of America, Boston, discussing recent industrial uses of aluminum, stated that for a long time it has been considered difficult to die-cast aluminum, but that now this problem seems to have been solved, as there are several companies that claim to be successfully die-casting this metal. Another recent development, he said, is the subjecting of sand castings to a very high pressure to render the metal more dense and increase its strength. This, he explained, is being done in making parts for timing devices of shrapnel. The most interesting development in the aluminum industry, he believes, is the rolling of high alloy rods in practically all commercial sizes, which process tends to work the entire mass of the rod so that the finished material is homogeneous. This rod, he believes, will find a field in automatic machine and turret lathe products.

Test Bar Results Inapplicable to Castings

Differences in results obtained from tests on samples taken from actual castings and those made on test bars were pointed out by W. M. Corse, Titanium Bronze Co., Niagara Falls, N. Y. He described results of a series of tests made on alloys of copper and tin showing that the tensile strength of the casting was consistently and considerably lower than those of test bars taken from the same heat. In one case the test bar showed 42,200 lb. per sq. in. and the casting only 27,200 lb. Also the per cent elongation was consistently low for castings. A test of aluminum bronze, he said, showed 92,000 lb. sq. in. tensile strength for the test bar and only 78,000 lb. for the casting.

He urged that designers refrain from using test bar results in their calculations and substitute instead values obtained from castings. He also emphasized that average results from tests should not be used for minimum requirements as these cannot always be obtained in practice.

Paul McKinney, United States Naval Gun Factory, Washington, pointed out the necessity of educating the designer to Mr. Corse's viewpoint. Engineers, he said, are prone to follow Kent's "Mechanical Engineers Pocket Book," and in consequence good castings are sometimes rejected without justifiable cause. A cast test bar, he explained, is theoretically correct from a casting viewpoint, and may be expected to give better results than is obtainable from castings which do not have theoretically correct feeders or provision for shrinkage and are also likely to be porous.

Mr. Corse added that photomicrographs were not taken of the test samples but he believes that these would show defects in the shrinkage of the castings. High shrinking alloys, he explained, will show up such defects without the aid of the microscope, but low shrinking alloys will not, as in them the shrinkage is inter-crystalline and the shape of the casting is retained, so that to the naked eye it may appear perfect. Another point suggested in the discussion was that shrinkage may be compensated for by annealing.

Fluxes for Nonferrous Metals

The use of fluxes in brasses was discussed by E. D. Frohman, S. Obermayer Co., Pittsburgh, whose paper was read by H. S. Gulick, More-Jones Brass & Metal Co., St. Louis. The use of fluorspar and lime in brasses, he believes, is wrong and charcoal placed on top of the metal, he said, will eliminate oxides. His company has a product which he stated produces carbon monoxide to reduce oxides.

Mr. Gulick, commenting on the paper, said fluorspar is not a direct reducing agent but acts to liquify the slag especially when used in iron. He questioned the practicability of using charcoal as suggested, and expressed the opinion that several fluxes on the market have no real value as such. He cited one case where a flux contained 95 per cent silica and was claimed effective on aluminum. He believes that manganese and phosphorus must be used in badly contaminated metals.

Jesse L. Jones regarded the Obermayer product as effective. When coke and clay are ground and added, he said, a good covering is obtained which prevents oxides. W. Frank, Damascus Bronze Co., explained that he has had considerable trouble with slag in melting furnaces, but that the Obermayer's solution is now keeping them clean. G. H. Clamer, Ajax Metal Co., Philadelphia, pointed out that removal of sulphur is important as well as the removal of oxygen and that when sulphur is present without oxygen it is more deleterious than when oxygen is present. This, he said, is true in iron as well as copper.

Some troublesome experiences with a scrap reclamation plant, particularly in the use of slags, were described by W. H. Parry, National Meter Co., Brooklyn, N. Y. In the discussion, Mr. Roast said that the fluxes which Mr. Parry found unsatisfactory have been successfully used on other work. He also believes that the reflecting pyrometer determines temperatures at local points with sufficient accuracy. Mr. Parry added that the spillings and slags used in the reclamation plant are put through cinder crushers so there is as little slag as possible in the charge. He also removes all removable dust and mixes one part of fine material with two parts of coarse and gets good results.

John P. Goheen, Brown Instrument Co., Philadelphia, stated in his discussion of pyrometers that no tube covering for a pyrometer couple can be immersed in molten brass. He also showed a Japanese protecting tube which is being used.

Economies in Foundry Practice

Dr. C. F. Hirshfeld, Edison Illuminating Co., Detroit, discussing the subject of electrically heated core ovens, stated that variations in strength of cores of 30 per cent were obtained by slight variations in baking conditions, and that the use of electricity should lessen this variation. All apparatus required for using electricity, he said, is developed and available.

H. M. Lane discussed brass foundry core making. Because of the value of the final product, he said, brass manufacturers have paid little attention to core making, yet considerable saving can be realized in this work. He has accomplished this, he explained, in one case by eliminating walking, and in another by rearranging apparatus to make material more accessible, in the latter case reducing the force from 11 to 7 men. To use a lift truck, he pointed out, the floor should be smooth and he has for some floors found desirable the use of steel. Rubber wheels on lift trucks, he declared, have been used by him with satisfaction, no trouble being experienced in the baking room. He found that in the breakage of cores 5 per cent occurred in hand handling and 2 per cent in rack handling.

Secretary's Report and New Officers

The report of the secretary, W. M. Corse, showed an increase in membership over that of last year. At present he said the society has 282 active and 64 associate members, a total of 346 and an increase of 69 members. Twenty-eight corporations are now members whereas last year only 19 were included. The society, he added, has adopted the plan of issuing a quarterly journal.

Officers elected for the ensuing year follow:

President, W. M. Corse, manager, Titanium Bronze Co., succeeding Jesse L. Jones, Westinghouse Electric & Mfg. Co., East Pittsburgh.

Secretary and treasurer, Fred L. Wolf, manufacturing engineer, Ohio Brass Co., Mansfield, Ohio.

Vice-Presidents: William B. Price, chief chemist, Scovill Mfg. Co., senior vice-president; George K. Burgess, Bureau of Standards, Washington; H. J. Roast, Jas. Robertson Co., Ltd., Montreal; J. P. Salter, Ohio Brass Co., Mansfield, Ohio; W. A. Cowan, National Lead Co., Brooklyn, N. Y.; H. S. Gulick, More-Jones Co., St. Louis; C. W. Johnson, Westinghouse Electric & Mfg. Co.; H. A. Wentworth, American Zinc Lead & Smelting Co., New York; F. L. Antisell, Raritan Copper Works, Perth Amboy, N. J.; G. M. Fritch, American Brass Co., Kenosha, Wis.

Exhibit of Equipment for the Foundry Industry

Leading Points of Products Shown in Boston Last Week for the Foundry and Machine Shops

THE Foundry Exhibition that held so large a part of the interest of the visitors to the joint convention of the American Foundrymen's Association and the American Institute of Metals at Boston, will pass into history as one of the most notable in the annals of the foundry industry. Its chief interest lay not alone in the new products shown, but also in the excellence of the decorations and in the increased number of exhibitors who ten or twelve years ago would hardly have dreamed that a foundry or a foundry manager

would be sufficiently important to warrant the time and expense involved in some of the exhibits this year.

New products were fewer in number than in former years. Various causes contributed to this condition. Transportation difficulties delayed new machinery that would have been shown, but the great pressure of the past year for increased production has temporarily put a stop to new development, especially in machinery lines. Several of the exhibits suffered on account of the fact that the Government is now absorbing most of the output and most of the energy of builders of equipment.

The daily program in one respect emphasized the war spirit. Each morning the American, British and French flags were unfurled to the martial strains of bugles blown by members of the Marine Corps. Flown from hollow staffs, they rippled in breezes created by General Electric blowers and the American flag shone resplendent in the rays of a Western Electric-Davis floodlight thrown upon it from the nearby booth of the American Lighting Co. Flowers and potted plants made a scene of beauty where the uninitiated had expected to see a dull and drab array of machines, pig iron, coke, sand and the usual foundry equipment. Even the working exhibits were made attractive.



Grand Hall, Part of Which Is Here Shown, Was One of the Four General Divisions of the Exhibit

In this review we can only emphasize the products which were new to the foundry craft or new to the delegates because they had not been shown in former exhibitions. Simplification of operation, refinement of construction and increased protection of moving parts against the attrition of sand and dirt were new talking points.

Molding Machines

A new machine shown by the American Molding Machine Co., Terre Haute, Ind., was of the jolt rock-over type. The rock-over feature is new. The mold rocks up on a center at the foot of the rocker arm, but as it begins to descend an auxiliary arm automatically takes up the load on a second center, doing away with springs entirely. An automatic latch and an oil-balancing cylinder play their part in controlling the rocking operation. The rocker arm clears the table so that a 5-ft. mold can be made on a 3-ft. table. After the mold is turned over it rests upon a hinged socket member which automatically compensates for any irregularities of the flask or mold and does away with the need for any hand leveling operation. A single cylinder performs both the jolt and drawing operations and the mold is balanced at the center so that little force is required to rock it over.

Another new machine shown by the same company was a jolt stripper. This machine utilizes but one piston to jolt and draw the pattern. In the stripping operation the flask is raised to its full height by four rods and the pattern is drawn by exhausting the air from the cylinder. Spring-actuated dogs automatically engage milled slots in the four steel stripping rods. The machine has no auxiliary cylinders and no bell cranks or levers and an extra long guide permits extreme pattern draft.

The Herman Pneumatic Machine Co., Pittsburgh, is making a jar-squeeze machine, either portable or stationary, which is operated by a single cylinder for both jarring and squeezing, has an automatic control valve and also has an improved locking device to provide rapid and easy adjustment of the sqeezing head. It has a single piece base and resilient jarring surfaces. The company also showed two sizes of plain jarring machines.

An interesting machine developed especially for the Ford Motor Co. was shown by Henry E. Pridmore, Chicago. This is a jolt-stripper in which the jolting mechanism is motor driven and the stripping plate operated by air. The gears actuating the jolting mechanism run in oil and the control of speed is by means of a friction clutch. Four 4-in. air cylinders perform the stripping operation and the size shown has a 6-in. draft. The pattern shown on the machine was a Ford housing. A sectionalized aluminum model of an electric jolt-ramming machine aroused much interest. Several other models of the well-known line of this company were in operation and a variety of castings were shown.

The William H. Nicholls Co., Inc., Brooklyn, N. Y., had in operation a combination jolt-squeeze-stripping plate machine in which the pattern was drawn by a gravity device. A power squeezer and a jolt-squeezer were also in operation. This exhibit was to have included a jolt-squeezer with a new rollover device, but this particular machine was lost in transit—a fate which marred several other exhibits. This exhibitor also showed daily in a nearby theater a film of molding and foundry operations in several foundries.

A power squeezer shown by the Berkshire Mfg. Co., Cleveland, Ohio, is equipped with an air vibrator, an improved knee valve, and has as a special feature a hinged lift for rolling the cope out of the way so that the pattern plate can be removed for core setting and the cope returned to position.

The United States Molding Machine Co., Cleveland,



A Glass House Was Used to Illustrate the Efficiency of Automatic Sprinklers

Ohio, besides its regular line of plain and combination machines, exhibited a new jolt, pattern-drawing machine used in connection with a stripper.

One of the most unique machines exhibited was shown by the E. J. Woodison Co., Detroit. This was a new type, all motor-driven machine with the motor mounted on a column placed beside the table. The roll-over is operated by a cable running on a drum on the cam-wheel shaft. The jolt is produced by a cam-wheel mechanism and a special feature of the machine is a dial registering the number of blows. It is claimed that this device, in connection with the simplicity of the other features of the machine, enables it to be operated by a man of the handy-man type as the pattern can be marked with the number of blows necessary for correct ramming and no experimental work is required the next time the pattern is put into use. The pattern is drawn by a socket wrench attached to a shaft, this operation being done after the mold is rolled over.

The Mumford Molding Machine Co., Chicago, showed only a model of its plain squeezing machine with a variety of drawings of its latest model, but announced that it has three new machines under development and expects to place the first of these on the market in about three months.

Richey, Browne & Donald, Inc., Maspeth, N. Y., showed a roller-ramming machine. The machine in operation was a small model and a similar model of the company's sand handling apparatus was also displayed in operation.

Comprehensive exhibits of their varied lines of plain and combination machines were also made by the Osborn Mfg. Co., Cleveland; the Arcade Mfg. Co., Freeport, Ill.; the Midland Machine Co., Detroit, and the B. & B. Mfg. Co., Indianapolis, Ind. Many of these machines had minor improvements added in the year. Details of these and other exhibits appeared in the Sept. 20 issue of THE IRON AGE. The International Molding Machine Co., Chicago, and the E. H. Mumford Co., Elizabeth, N. J., showed photographs of the machines made by them. Vibrators were shown by the Malleable Iron Fittings Co., Branford, Conn.; the Federal Foundry Supply Co., Cleveland, and the Buckeye Products Co.



An Obelisk of Fuel Was a Feature of a New England Exhibit

Sand Blasting Apparatus

The magnitude of the sand-blasting exhibits rarely failed to create comment by visitors. The big machines, many of them in operation, were an unfailing source of interest and the many varieties displayed were in themselves indicative of the fast-growing importance of this method of cleaning castings. The trend toward sand-blasting equipment which permits the operator to perform his work without exposure to the dust was manifest. Even if the actual exhibits had failed to carry conviction of the possibilities of the apparatus, the photographic evidence of the large installations in some of the most famous foundries of the country could not have failed to stimulate the interest of possible users.

In the "Humane" sand blast room, shown by the American Foundry Equipment Co., New York, the work is loaded upon a rotary table and the operator, while viewing the work through a bronze screen, directs the sand stream upon it from a nozzle inserted through a split rubber curtain. Another new machine, not before shown by this company, is an automatic sand blast tumbling barrel. This is a self-contained unit operating on the pressure system which is claimed to produce a large saving in air consumption. The sand tank is located in a pit below the machine and there is no elevating system required. An automatic filling valve is a special feature. When the machine is in operation the air pressure closes this valve, but as soon as the pressure ceases, the valve automatically opens and permits the sand to flow from the hopper into the tank. An automatic release valve permits the air to exhaust from the sand tank when the machine is not in operation, thus preventing clogging of the blast lines. Other standard types of sand blast equipment were also shown.

The New Haven Sand Blast Co., New Haven, Conn., besides showing its sand blast barrels, exhibited a new type of mixing valve in which the sand entered through two ports in the side of the mixing chamber instead of the top, thereby eliminating the possibility of choking the valve by an excessive accumulation of sand in the sand feed pipe.

A revolving-barrel sand-blast machine was shown by the Brown Specialty Machinery Co., Chicago. The sand flows by gravity from the main hopper to the auxiliary hoppers and thence to the nozzles, insuring a positive feed. The air consumption is claimed to be notably low. Other large exhibits of sand blast equipment were made by the W. W. Sly Mfg. Co., Cleveland; the Mott Sand Blast Mfg. Co., Inc., Brooklyn, N. Y.; the Hoevel Mfg. Corporation, New York; the J. W. Paxson Co., Philadelphia, and the MacLeod Co., Cincinnati.

Photographs of sand-blast machinery were shown by the Whiting Foundry Equipment Co., Harvey, Ill., and the Pangborn Corporation, Hagerstown, Md. The latter exhibit was an unusual photographic display, as it showed not only enlarged photographs of the apparatus made by the company and the new plant in which the machines are built, but also a large collection of photographs of installations in foundries in many parts of the country. Especially interesting were the installations at the plant of Isaac G. Johnson & Co., Spuyten Duyvil, N. Y., and the Pratt & Whitney Co., Hartford, Conn., and a view of the dust exhauster-arrester at the Buick Motor Co., Flint, Mich., which exhausts the air from eight sand blast rooms, separating the dust and returning the air directly into the factory.

Sand blasting materials were shown by the Harrison Supply Co., Boston; the Pittsburgh Crushed Steel Co., Pittsburgh; the Portage Silica Co., Youngstown, Ohio,

and the United States Silica Co., Chicago. W. F. Stodder, Syracuse, N. Y., displayed the Cyclone sand blast nozzle.

Core Ovens and Binders

Several exhibitors proved that the makers of core ovens have not been idle the past year. Several new core binders also made their appearance.

The oven that was the most radical departure from the ordinary kind was located in the exhibit of the General Electric Co. This was an electrically heated oven made by the Oven Equipment & Mfg. Co., New Haven, Conn., and equipped with General Electric heating elements. A close control of temperature is obtained through the automatic action of a pyrometer made by the Taylor Instrument Co., Rochester, N. Y., allowing for precise baking of cores of varied constituents for special purposes.

A new exhibitor was the G. S. Blodgett Co., Inc., Burlington, Vt. Three galvanized sheet-steel ovens with air-cell asbestos linings were shown. These are designed to burn either gas or coal. The ovens have been employed for japanning and enameling.

The Foundry Equipment Co., Cleveland, displayed a combination unit of a Coleman rolling drawer oven and a portable rack oven. The door of the latter section was hung on a separate frame and one locking device locked the door at four points at one operation. Although only 1 in. thick, it was claimed that the insulation was equivalent to 10 in. of firebrick.

A core oven displayed by the W. W. Sly Mfg. Co., Cleveland, included two units of six 8-in. drawers each. A special feature is the ease with which by the removal of a few parts drawers of any required height can be substituted for the 8-in. drawers. The grids roll on small trucks, the axles of the trucks traveling in slots in the grids. The trolleys by which the front of the drawers is supported have roller bearings and have three wheels. An exhibit of its Acme core ovens was made by the Monarch Engineering & Mfg. Co., Baltimore, Md.

Three new core binders were the Kordek brand, displayed by the Corn Products Refining Co., New York; the Corul brand, shown by the Swan & Finch Co., New York; and the Argentine brand shown by the Werner G. Smith Co., Cleveland. New forms of vent waxes for cores were shown by the United Compound Co., Buffalo, N. Y.

Sand Handling Equipment

The Sand Mixing Machine Co., New York, had its older type of traveling machine in active operation most of the time, but had also on display a new machine that is a departure in many respects from the former model. It has a device for piling the sand alongside of a bench or machine after cutting.

In the exhibit of the Great Western Mfg. Co., Leavenworth, Kan., in the last two days of the convention, appeared a new type of gyratory riddle designed to be swung from a column or wall on a hinged bracket to permit riddling directly over a mold. This machine is hardly out of the development stage yet, but its designers foresee for it a field auxiliary to that of the various types of gyratory riddles of which this company is one of the prominent makers. Electric sand shakers were also shown by the Champion Foundry & Machine Co., Chicago; Brown Specialty Machinery Co., Chicago, and Chicago Pneumatic Tool Co., Chicago. A large sand muller was shown in operation by the National Engineering Co., Chicago. Its well-known core sand mixer was shown in operation by the Blystone Mfg. Co., Cambridge Springs, Pa. A special type of sand handling machine was shown in a small operating model by Richie, Browne & Donald, Inc., Maspeth, N. Y.

Molding, facing and core sands were shown by several exhibitors, both producers and supply houses. The Albany Sand & Supply Co., Albany, N. Y., gained much attention by its exhibit of a Crawford range, cast in Albany sand by the Walker & Pratt Mfg. Co., Boston. The J. W. Paxson Co., Philadelphia, drew attention to the mechanical methods of sand production at various banks controlled by the company by means of an automatic projectorscope.

Conveying Equipment

Man shortage has aroused an interest in conveying equipment to-day that is probably as great as in that of any other part of a modern foundry equipment.

One of the new things shown was a light capacity hoist made by the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., to fill the need for a hoist to lift loads a little too heavy for one man, but too light for the economical use of the standard larger types of hoists. The hoist shown was designed especially for cleaning and core room use and is made in three sizes, 500-lb., 1000-lb. and 2000-lb.

The Curtis Pneumatic Machinery Co., St. Louis, had an exhibit of pendant vertical cylinder air hoists; a horizontal rope compounded cylinder air hoist suspended from single I-beam trolleys; a single I-beam hand-operated bridge crane with trolley, and a single I-beam bracket jib crane. The Whiting Foundry Equipment Co., Harvey, Ill., showed one of its latest improved designs of electric crane trolley which has all gearing inclosed. Cyclone high-speed chain blocks were displayed by the Chisholm-Moore Mfg. Co., Cleveland, in connection with Matchless trolleys.

The Abell-Howe Co., Chicago, had in operation an American electric hoist and made a special feature of the Howe detachable-tongue one-man trucks. American high-speed chain and Union pressed steel rivetless chain were also included in this exhibit. The Lewis-Shepard Co., Boston, showed the varied uses and large capacity of the Jacklift master trucks. The Lamson Co., Boston, had a special installation of its gravity roller conveyors adapted for carrying molds, cores, castings, pig iron, etc. In connection with this was shown its booster type of conveyor designed to elevate material to a height necessary to give a good pitch for the gravity roller conveyor, or to convey materials from one floor to another. Another part of this display was an exhibit of the Lamson pneumatic carrier system for conveying messages and reports. The Hayward Co., New York, had a set of photographic views of its Hayward buckets.

General Foundry Equipment and Supplies

As usual, the displays of foundry supplies were numerous and varied. As was to have been expected, the larger displays were by local exhibitors, many from distant cities turning their booths into rest rooms and showing little except photographs and literature.

The Cutter & Wood Supply Co., Boston, had a comprehensive display of the many lines of foundry equipment, tools and materials of which they are agents. The S. Obermayer Co., Cincinnati, Ohio, occupied a large space and showed a variety of small supplies as well as power and foot-power sprue cutters, rosin mill and other machinery. The J. W. Paxson Co., as a part of its display, had a new tool called a "core buster." This tool is air-driven and its special feature is a clutch to hold the tool in a fixed relation to the cylinder when in operation digging out cores. Stanley Doggett, Inc., New York, made a special display of Facamold, a facing compound composed of graphitic soapstone, which it is claimed will do the work of graphite at considerably less cost.

[Pressure on space makes it necessary to hold for next week's issue a review of the machinery and other exhibits.]

Because of lack of coal for its by-product coke plant, one-half of the Cleveland plant of Corrigan, McKinney & Co. has been shut down for more than a week and there is no prospect of an early resumption. One-half of the coke ovens, 102 ovens, are thus out, two blast furnaces are banked, and six of the open-hearth furnaces are not in operation.

The Smiley Steel Co., Inc., has removed from 120 Broadway to larger offices at 111 Broadway, New York, and will occupy rooms 916-918 at this address. The company has recently increased its capital from $100,000 to $1,000,000.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the DAVID WILLIAMS CO., 239 West Thirty-ninth Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: Equitable Building. Philadelphia: Real Estate Trust Building. Cleveland: Guardian Building. Cincinnati: Mercantile Library Building.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year. Entered at the New York Post Office as Second-class Mail Matter.

Steel Resales and Commissions

The machinery involved first and last in carrying out the new Government program on iron and steel prices is highly complex. In formulating a schedule of rules that shall apply to sales of iron and steel by others than producers, the Government will have to recognize that these factors are divided into different classes and that no one rule will apply to all. These middle interests or selling agents must be recognized as a part of the machinery by which business is conducted.

The authorities at Washington have not thus far addressed themselves seriously to this subject. In copper, in coke, in pig iron and in steel they have negotiated only with producers, and hints that have been dropped indicate that the importance of other classes of business men in these industries has not been fully grasped. For instance, the announcement a fortnight ago regarding the agreement on copper contained the statement that the copper producers "would take the necessary measures, under the direction of the War Industries Board, for the distribution of the copper to prevent it from falling into the hands of speculators who would increase the price to the public." Again, during the negotiations between the Washington authorities and the steel producers the question was asked steel producers whether it would be feasible to eliminate sales of steel to jobbers.

It is of the utmost importance that Washington should recognize that a rule applicable to one class of business may be altogether inapplicable to another class. Thus there is no relation whatever between the dealer in coke and the dealer in steel bars or plates. Either may be called a dealer or a jobber, but there is the additional divergence that in coke there has commonly been business done on a brokerage basis, whereas in steel bars there is practically no brokerage business.

One of the primary distinctions to be made is on the basis of the method in which the business is done and the means adopted for providing compensation for the service rendered to industry. Thus in the case of coke there is the factor who operates in furnace coke practically as a broker, buying at one price and selling at another, the difference between the prices being tacitly recognized as a brokerage even though it is not thought of in terms of a percentage, the sales being made indiscriminately to one blast furnace or another, while there is also the dealer in foundry coke, who transacts business in technically the same manner, but really has his regular customers, who always buy through him. In pig iron the factor sometimes acts purely as a merchant, buying at one time and selling at another, while in other cases the factor is sales agent for a furnace, with or without exclusive territory, and is paid a commission, which in essence is in the same category as the salary that would be paid a sales manager. Then there is the jobber in steel products, who is in substance a dealer, with his goods behind the counter.

In the matter of prices there is a wide range. The coke dealer or broker may frequently buy at an inside price, somewhat lower than that at which the coke operator would sell direct to a consumer, while the jobber in steel products frequently pays a higher price than that at which the mill sells direct to a large consumer. It is the usual case in a rising market that the mills sell bars, sheets, etc., for shorter periods to jobbers than to manufacturing consumers, and thus the jobber pays the higher price, yet his business is profitable because he renders service by furnishing deliveries.

There is normally much more speculation in the non-ferrous metals than in iron and steel commodities. It is important that speculation be prevented, but it could easily occur that restrictions quite necessary in the case of one commodity would work great injury in the case of another commodity. It is conceivable, for instance, that if copper producers were forced to sell to all inquirers at 23½ cents the supplies would be bought up by speculators and the price to the public would be increased. There is no such prospect in the case of steel bars and very little prospect in the case of pig iron.

The great class of business men who are neither producers nor consumers of coke, pig iron and steel products have been puzzled, since price-fixing began, to determine what treatment is to be accorded them, and what restrictions there will be upon their activities. The manner in which the prices on iron ore, coke, pig iron, bars, shapes and plates

were announced at Washington has tended to increase the confusion, as these commodities were mentioned together, as if the prices for them had been reached in the same manner, whereas the legal fact is that the Administration had full power, under the Lever act, to fix the price of coke, whereas in the case of the other commodities it depended upon a mutual agreement. Coke dealers naturally concluded that it would be illegal for them to sell coke at a price higher than $6 but assurances from Washington indicate that they will be allowed to charge a fair commission.

Some dealers in pig iron at once reached the conclusion that it would be improper for them to sell pig iron at higher than the prescribed prices, although they were not parties to the agreement, and when the Government has no authority to punish a violation of the price agreement, on the part of a producer, it certainly has no authority to question the sale of pig iron by a merchant or a consumer. The motive of such holders of pig iron who refrain from selling may be one of patriotism, a desire to further the general work in which the Government is engaged. It is not for the best interest of business that all such transactions should be foregone, and there should be regulations whereby desirable business will be encouraged and enabled to pay its way.

The normal function of one who transacts business in a commodity which he neither produces nor consumes is that of finding the buyer effecting the sale. When he is paid for the service he is paid, in essence, by the former owner, not the new owner. In recent times in the turning of trade practice upside down this man frequently has been paid for buying the commodity. Necessarily, in the reform in the market that has been undertaken, he must be set back to his original position and made to perform his normal function. In the case of coke, the price of which is absolutely fixed, the commission must in future come from the coke producer, unless the Government should establish a dealer's margin, and latest advices are that this probably will be done. Unlike the case of furnace coke, the great bulk of the foundry coke is sold through dealers, and in fixing the necessary differential between furnace coke and foundry coke the Government should recognize this fact and make the differential sufficient to include the dealer's compensation.

The jobber in steel products stands in a totally different position. He buys at what is essentially a wholesale price and sells at what is essentially a retail price. Government prices being fixed are nothing to him except as buying prices, and one of the uncertainties of this jobber is whether he will even be enabled to buy at the fixed price. If the problem of the jobber is attacked scientifically and upon the principles of good business, the matter of distribution will be found to be of prime importance. The general public must be protected against the condition of prices being fixed, and there being no place at which a purchase can be made, and that part of the public which normally buys from the jobber must be protected by the jobber being furnished the material for distribution. The Priority Board should work hand in hand with the producers and should also be receptive to the representations that may be made by buyers, the distributers as well as the manufacturing consumers.

Coke a Dominant Factor

Nothing has been clearer than that the production of pig iron in the past ten months or more has been simply a function of the production of coke. The statistics have shown that since our production last October at the rate of 113,189 tons of coke and anthracite iron daily, or 41,000,000 tons a year, including charcoal iron, the production has been less than the capacity of the furnaces available. Half a dozen new furnaces were completed soon enough thereafter to have made a distinct impression upon the total output, and yet, in general, production has been markedly less, month by month, than the output a year earlier.

There has been some criticism of the $6 coke price fixed last week by the President, on the ground that it was quite high relative to the price that had previously been fixed upon bituminous coal; but the whole operation of marshalling industries for the furtherance of the war is one of give and take, and if a $6 price encourages the production of coke the vital element is given proper recognition. There has been an interesting divergence of opinion expressed as to whether the fixing of this price, to supplant the very fancy prices formerly obtained, will operate in itself to increase or decrease the production.

One principle should be accepted—that when the blast furnacemen and steel producers have so freely consented to a radical reduction in their selling prices, they should have the co-operation of all the Government agencies, to the extreme limit, in the direction of their output being increased. Their profit per ton is substantially fixed by the price agreement entered into, and their tonnage should now be made as large as possible, both for the successful prosecution of the war and as a measure of economic justice to the iron and steel producers, for steel production has suffered just as pig iron production has suffered.

Apart from considerations growing out of the price regulation there are prospects of a material increase in coke production through the completion of additional by-product ovens in various districts, the most important single operation being the Steel Corporation's plant at Clairton, the first unit of which is expected shortly to be in service. There is reason to hope that the close of the Lake coal shipping season will result in better coal supplies, so that all by-product ovens may be fully served with coal. Given an adequate supply of coke, the blast furnaces can probably produce pig iron at the rate of about 42,000,000 tons a year, in the long run, against the average of about 39,000,000 tons this year. One threatening element is that with the frequent bankings that have had to be resorted to of late, furnace linings have been abused and many furnaces will not show the tonnage per lining they have achieved in the past. Relining jobs are particularly difficult at this time.

The Machine-Tool Industry and the War

The tax upon the machine-tool industry of the country resulting from the tremendous war program of the nation is beyond all precedent. The volume of purchases to equip munition plants which took Allied war contracts in 1915 and 1916 was exceptional, but it has been surpassed or soon will be by the demands which have arisen since our Government declared war.

The recent announcement from Washington that the machine-tool requirements of new ordnance plants would approximate $25,000,000 is but one concrete measure of present huge demands. The purchases of machine tools for the airplane program alone run into many millions of dollars, while the making of projectiles, shells, rifles, machine guns, ammunition, gun carriages and mounts, marine engines, gun sights and submarine periscopes—all apart from the torpedo-boat destroyer program of the Navy Department and the merchant-ship program of the Federal Shipping Board—have combined to create an unprecedented situation in the machine-tool trade.

Rising costs have kept pace with increasing demands until now some tools are selling at two or three times their normal value. In most instances prices to-day represent higher cost of labor and raw materials, but fictitious values are not unknown and are not surprising, in view of the fact that consumers have been bidding against each other for tools of which there is a marked scarcity. Prices have also been inflated by speculation, which the builders have vainly sought to prevent.

Deliveries, too, have been advanced farther and farther by the preference given to Government orders, so that manufacturers now engaged on Government work must wait a year to two years for some much-needed tools. Indeed, the situation has become a desperate one for a good many manufacturers, some having deliberately sought Government contracts in the hope that thereby they might receive special treatment in the matter of machine-tool deliveries.

With machine-tool plants loaded up with orders for many months ahead, it is remarkable that the Government plans have been carried out with so little interruption. So many tools have been commandeered for Government work that machine-tool men themselves have been wondering how future requirements are to be taken care of. As there are few tools left to commandeer, questions of priority must now arise with greater frequency.

When representative tool builders were hastily summoned to New York recently to submit propositions on a thousand tools for a Government airplane motor plant in France, the query, "Where will the Government get the tools?" was general; but the situation was met successfully, as previous ones have been and the tools were obtained in the shortest time on record for such a large order. This work took priority over many other Government projects and in many instances deliveries in 30 days were required.

Production of tools, while not keeping pace with demand, has been quickened to a large extent. Various means have been employed—night shifts, bonuses for overtime and larger individual production, also the "farming out" of work. The result is that the nation's output of machine tools has been doubled and possibly in exceptional instances trebled in volume.

Many of the plants for which machine tools are now required in such large numbers are admittedly but temporary. They will be dismantled after the war, as some Canadian munitions plants are already being dismantled. The condition of the machine-tool trade after the war, therefore, is a matter to which builders are giving serious thought, as they have done for the past two years whenever peace talk was in the air. It is certain that thousands of machine tools will be thrown upon the second-hand market when war demands have ceased; but this does not greatly disturb makers, for at the same time there are indications that prosperity for the machinery trade will last for at least a few years after the war.

Considering the domestic situation first, it seems probable to many in the trade that there will be a good demand after the war for tools, both from those now engaged on Government work and those not so engaged. The first class are driving their equipment hard, and much of it must be replaced by new when peace readjustments take place. Then there are certain shops which have bought second-hand machinery during the war because of difficulties in obtaining new machines. These concerns will doubtless be a large buying factor when conditions get back to normal. Some manufacturers, moreover, are not reaping golden war profits, and, therefore, are not able to pay present war prices for tools. These must eventually renew their equipment.

Large foreign buying is also counted on as a factor after the war. At present there are many unfilled orders from abroad. Even before the embargo, American builders of tools were indifferent to a large part of the foreign inquiry, but this must be taken care of when it is possible to obtain assurance of shipments.

From the machine-tool builders' point of view, the situation presents very satisfactory aspects, with raw material costs as the most serious of the unfavorable circumstances. Government work seems likely to keep plants going to capacity for a year or more regardless of the duration of the war.

CORRESPONDENCE

Helping the Enemy

To the Editor—In the editorial in the issue of Sept. 13 entitled "Playing Into Enemy Hands," THE IRON AGE suggests that the advocates of the metric system are ignorant of the complexities of manufacture and of the disastrous effects of a wholesale change in shop standards.

There is no question of this ignorance. Let anyone who doubts it recall the names of those prominent in the metric organization and he will find few who have other than professional occupations. Their work is mostly research. One evidence of their ignorance of the complexities of manufacture has recently been pointed out by F. A. Halsey. He calls attention to the fact that the metricists are now proposing the retention of our actual dimensions, expressing them in metrical equivalents.

Dr. Kunz in stating that "American manufacturers and American soldiers, if called for service in France, would encounter grave difficulties because of this lack of a unified system of measurement" has grasped only half of his opportunity. Certainly he should advocate the adoption by the United States of the French language, for what is more lacking among the Allies on the western or any other front than a unified expression of speech. He forgets that what unifies all of those forces is a singleness of purpose, and this will overcome all grave difficulties. H. D. MURPHY.

Jersey City, N. J., Oct. 1, 1917.

MACHINERY CLUB OPENS

New Chicago Organization Started Under Most Auspicious Conditions

The formal opening of the club rooms of the Machinery Club of Chicago took place on the evening of Sept. 29, the event being the fruition of hard work during 18 months by a small group of machinery and supply men. Their efforts, under the leadership of Clyde W. Blakeslee, of the Abrasive Co., have created an organization with over 500 members, housed in comfortable and attractive quarters in Machinery Hall, Washington and Clinton streets. A dinner, at which 200 were seated, followed inspection of the rooms. Mr. Blakeslee, president of the club, presided, and in the course of the evening elicited applause by reading the following telegrams:

Upon the auspicious occasion of the dedication of the new club rooms of the Machinery Club of Chicago, the Machinery Club of the City of New York wishes to extend cordial greetings of fellowship and good will, and to express the confident hope that your effort to contribute to the convenience and comfort of the men identified with the machinery interests of the great city of Chicago will win enduring and abounding success.

THE MACHINERY CLUB OF THE CITY OF NEW YORK,
HENRY PRENTISS, President.

The following reply was sent:

We, the members of the Machinery Club of Chicago, desire most sincerely to accept your very kind and courteous greetings. Please rest assured we appreciate the spirit expressed by the New York Machinery Club, from whose origination the foundation was laid for the Machinery Club of Chicago.

MACHINERY CLUB OF CHICAGO,
CLYDE W. BLAKESLEE, President.

David Ballard, an honorary member, who formerly represented the Jones & Lamson Machine Co. in the Chicago territory, went from Washington to attend the opening. Called upon by Mr. Blakeslee, he made a short but effective speech. By a standing vote, on a resolution offered by Herbert Nunn, Cleveland Automatic Machine Co., the members expressed their appreciation of the work done by the club's officers and committees. Mr. Blakeslee, in responding, said no city exceeds Chicago as a factor in the distribution of machine tools. For the club he asked unstinted support, saying that the members would benefit not only themselves but the city. He spoke of the many discouragements encountered in the work of organization, but persistency has won, and the roster of members totaled 522, with the club free of debt.

Recognition was given to several who had put forth unusual effort to make the club a success, and a most popular vote was that making Palme (Dad) Knudsen a life member in return for the service he had rendered. He is connected with L. S. Starrett & Co. The chief speaker was Henry R. Rathbone, a lawyer of Chicago, whose patriotic speech aroused enthusiasm. A telegram from W. H. Taylor was read, as follows:

As president of The Iron Age Publishing Co., I wish to extend congratulations and best wishes to the Machinery Club of Chicago.

The club has been presented a victrola by E. L. Essley, E. L. Essley Machinery Co., Chicago; a "grandfather" clock by Hoggson & Pettis Mfg. Co., New Haven, Conn., and a lamp by H. A. Stocker, Stocker-Rumely-Wachs Co., Chicago.

Norton A. Booz, Machinists' Supply Co., is secretary and F. Le Roy Peterson, Hendey Machine Co., chairman of the house committee.

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Working Out the Prices of Steel Products

Manufacturers Preparing a Schedule of Pig Iron and Finished Materials

Committees of Council of National Defense Have Dissolved and Now Act as Members of American Iron and Steel Institute—Many Trade Questions Present Difficulties That Will Be Overcome

Work is being pushed vigorously on the adjustment of prices on various grades of pig iron and various forms of semi-finished and finished steel products, in line with the announcement made last week at Washington of Government prices on iron ore, coke, pig iron, plates, shapes and bars. After the lists have been made, iron and steel manufacturers will confer again with the War Industries Board and it is expected that prices on the full list of products will be announced by the President next week.

An important development in the co-operation of manufacturers with the Government is that members of the various iron and steel and metal committees heretofore connected with the Council of National Defense are resigning and these committees will go out of existence. So far as iron and steel manufacturers are concerned, their future activities will be in the direction of gathering and supplying information and they will act as committees of the American Iron and Steel Institute.

Iron and steel manufacturers have been engaged in the past week in the compilation of data to be presented to the War Industries Board at Washington and to be made the basis of fixing prices on various iron and steel products not contained in the list promulgated on Monday, Sept. 24. The members of the steel committee were in conference in New York on Saturday, Sept. 29, and on Monday, Tuesday and Wednesday of this week. The pig iron committee met in New York on Tuesday and an adjourned session was held on Wednesday.

As stated above, the iron and steel manufacturers are no longer acting as subcommittees of the Council of National Defense. The question of compliance with section 3 of the Lever act has been gone over, and as indicated in another column Director Gifford of the Council of National Defense has called on the members of all committees to declare in writing their interest in various contracts for iron and steel recently made with the Government. In view of the complication of the machinery of such declarations and because of the question raised as to the compliance with the Sherman act, it was deemed best for the iron and steel manufacturers to resign from all connection with committees which were in any way under Government or Government advisory auspices. These manufacturers are now acting as committees of the American Iron and Steel Institute for the purpose of furnishing information to the War Industries Board, but have no connection, advisory or otherwise, with the awarding of any contracts.

Inquiries have been coming in the past week from users of steel in all parts of the country to large manufacturers, and the office of THE IRON AGE has had a plentiful share, consumers of steel showing a great desire to know whether purchases could be made at the new prices and also whether there would be steel available for general uses after the Government and the Allies had made their requisitions.

Contracts to Be Carried Out

It was definitely provided in the Lever act for the regulation of food and fuel markets that the fixing of prices by the Government should not affect contracts already in existence. This principle was fully recognized in the negotiations between iron and steel manufacturers and the War Industries Board at Washington on Sept. 20 and 21, and it was reiterated at the sessions of the two days that existing contracts should be carried out at the prices stipulated. The difficulties in the execution of this program are well known. In the Senate committee hearing on the Pomerene bill, as reported fully in THE IRON AGE last week, and as referred to further in our Washington correspondence elsewhere in this issue, Government abrogation of existing contracts was seriously proposed, so that the industry might be rapidly adjusted to the reduced prices. It is questionable that Congress will consider such a revolutionary step with all the liabilities the Government would incur in attempting to abrogate contracts.

But it is to be said at the same time that there is strong pressure from various quarters to make the new prices the basis of values of ultimate products into which iron and steel enter. One of the arguments in this connection, as presented by Dr. Walker in the Senate committee hearing, and given in another column, is that a manufacturing user of steel products who was taking out material under an old and high-priced contract could not compete with a manufacturer not so bound who could go into the market and get steel at the new prices. One answer is that users of steel who are under contract are not paying much if any more for their material than the Government has agreed to pay under the new arrangement. Many of them have been only recently receiving shipments at less than these figures. Much of the misunderstanding at Washington on the price situation in steel is due to the mistaken idea that manufacturers of products into which iron and steel enter have been paying approximately the prices prevailing in the past six months for iron and steel for early delivery.

The New Prices and Public Buying

Some buyers of steel have been asking, as though they expected an answer offhand, how soon the mills would sell material for early delivery on the new basis. The answer is far from easy. In the first place, most steel manufacturers are sold ahead for a number of months—some manufacturers for six months on some products, though there are those in certain lines who have avoided long commitments and chosen rather to get the benefit of the higher prices on early deliveries. All sorts and conditions of order books exist, depending on the seller and the product. The Steel Corporation, as is well known, is committed far ahead, both to the Government and the public.

Priority Steel of Large Volume

But overtopping every consideration and making all calculation highly difficult, as to the supply of steel for manufacturing consumers, is the unknown factor of the Government's and the Allies' requirements in the next six months. It is known that in plates they will take substantially the output in ship and boiler quality, leaving for general consumption, including plates for cars and other railroad purposes, a comparatively small

amount. In structural shapes, when existing contracts and Government buying are subtracted, little will be left for the general market for a good many months. In bars, the public should not fare badly, but here shell needs will cut a large figure and general contract engagements will leave little for sale in early months at the new prices. Tin plate is well taken up on contracts that are strictly under Government oversight. In sheets, wire products and pipe, war needs are not a great factor relatively, but a factor to be considered is the amount of ingot steel that will be diverted from mills in these lines to satisfy the demand for shell forgings.

It is plain, with the war program carried out on the scale announced, and particularly with the stupendous demand for ship steel, that the execution of contracts now on the books of the steel manufacturers will leave no large amount of steel to be sold to the public in the next six months. But, as indicated above, that is not saying that manufacturing business will not receive a large amount of steel on their contracts in the next six months at prices averaging close to those already fixed by the Government.

Chicago and Pittsburgh Basing

In the list of prices of the six commodities announced by the President last week, the prices on plates, shapes and bars were given as for Chicago or Pittsburgh delivery. No arrangement for a common price for Chicago and Pittsburgh was agreed to by the manufacturers nor was the subject discussed, and it is not their intention to change from the long established practice of making Pittsburgh the basing point. How the dual basing came to be incorporated in the President's announcement has not been explained, but the matter has caused considerable comment in the trade.

Illinois Manufacturers Ask Information

Under date of Sept. 26, Samuel M. Hastings and John M. Glenn, president and secretary, respectively, of the Illinois Manufacturers' Association, Chicago, sent the following telegrams, one to Frank A. Scott, Chairman War Industries Board, and the other to Chairman E. H. Gary of the United States Steel Corporation:

"E. H. Gary, United States Steel Corporation, New York.

"How soon can the steel companies begin to supply your products in addition to the needs of the Government on basic prices established by the Government? Our manufacturers do not know how to make prices on their products to their customers for either immediate or future delivery. What is the attitude of the steel and iron producers going to be toward existing contracts for steel and iron which were placed at prices above those agreed upon by the steel producers and the Government?"

"Frank A. Scott, War Industries Board, Washington, D. C.

"Consumers are demanding immediate reduction in the prices of finished iron and steel products in proportion to Government basic prices. Members of the Illinois Manufacturers' Association claim they cannot get steel and iron from mills at the prices set by the Government for immediate delivery. What can be done to correct the general impression that the prices fixed will have the immediate effect of correspondingly reducing prices of all products made of steel and iron? Is it true the product of all the steel mills is contracted for six months ahead? Is it true that the Government demand for metals will consume these products by April 1, 1918? Did the Government in fixing the prices give any consideration to the manufacturers who produce goods made of steel and iron for domestic consumption? Has any decision been arrived at between the Government and the steel and iron producers in those cases where existing contracts for steel and pig iron are at higher prices than those agreed upon?"

What answers, if any, were received by the senders of the above telegrams THE IRON AGE is not informed. It is probably well within the bounds of truth to say that no man in the United States has the answers to all the questions the Illinois gentlemen have crowded into their telegrams. All that can be gathered from the developments of the past week indicates that the majority of the iron and steel men who were in Washington on Sept. 20 and 21 had no more conception than the Government's representatives had of the effect in detail of the price fixing on either the sellers or the buyers of steel. The procedure is so revolutionary and the interests affected so varied and so widely ramifying that no little time will be required for any exact appraisal of effects.

FIXED PRICES COMPARED

With Those of Four Years Before the War Demand Developed

The relation between the fixed prices announced at Washington on Sept. 24 and the average for the four years before the export demand growing out of the war forced the rapid advances is shown in the accompanying table. The averages, which are those of THE IRON AGE quotations, cover some products for which prices have not yet been fixed but will be of particular interest when the supplementary announcement is made.

Iron and Steel Prices for Years 1911 to 1914, inclusive.

	1911	1912	1913	1914	Ave. for 4 Years	Govt. Price
Prices in Dollars per Gross Ton						
Mesaba ore, non-Bessemer	3.50	2.85	3.40	2.85	3.15	5.05
No. 2 X foundry pig iron, Philadelphia	15.21	16.03	16.54	14.73	15.63	33+
No. 2 foundry pig iron at Chicago furnace	14.83	15.32	15.85	13.60	14.90	33
No. 2 foundry pig iron, Cincinnati	13.67	14.93	14.90	13.41	14.23	....
Bessemer pig iron, Pittsburgh	15.71	15.94	17.12	14.89	15.92	36+
Basic pig iron, Valley furnace	13.07	13.92	14.71	12.87	13.64	33
Bessemer steel billets, Pittsburgh	21.42	22.39	25.79	20.08	22.42	....
Prices in Cents per Pound						
Soft steel bars, Pittsburgh	1.26	1.29	1.55	1.15	1.31	2.90
Beams, Pittsburgh	1.32	1.32	1.50	1.15	1.32	3.00
Plates (tank), Pittsburgh	1.31	1.33	1.50	1.14	1.32	3.25
Wire nails, Pittsburgh	1.70	1.64	1.70	1.56	1.65	....
No. 28 black sheets, Pittsburgh	2.04	2.00	2.20	1.88	2.03	....
Tin plate, Pittsburgh	3.62	3.45	3.55	3.28	3.47	....

MAKERS AND WAR CONTRACTS

Director Gifford Calls for Filing of Declarations of Interest

WASHINGTON, Oct. 2.—The Council of National Defense has issued an order binding upon all members of its advisory or co-operative committees, outlining the course to be pursued by members in making recommendations for the awarding of contracts or the placing of orders for war material. The order, which is based upon the recently announced opinion of the Attorney General as to the proper construction of section 3 of the Lever food control law, is as follows:

The function of all advisory or co-operative committees of industry of the Council of National Defense is to advise and furnish information to the director of the Council of National Defense, the War Industries Board, or members thereof, when called upon to do so or upon the committee's own initiative, regarding industries in their relation to the war needs of the United States and the allied governments.

In view of section 3 of the food control law, of Aug. 10, 1917 (copy attached hereto), no advisory or co-operative committee, member, agent or employee thereof shall

(a) Solicit, induce or attempt to induce persons or officers authorized to execute or direct the execution of contracts on behalf of the United States to make any contract or give any order for the furnishing to the United States of work, labor,

(*Continued on page* 854)

Iron and Steel Markets

TO FIX ALL STEEL PRICES

Full Schedule Expected Next Week

Meanwhile Buying Is Practically Suspended—Export Prices Not Regulated

The steel trade has been given up wholly to a discussion, at times excited, of the terms and effects of the agreed prices on six products as announced from Washington, but as yet little light has been shed on the situation. Buying and selling are practically out of the question, and steel committees of manufacturers have been in daily session in New York this week working out prices on the full line of products in proper relation to those already fixed. Another conference at Washington will follow and next week the President will announce prices on the various grades of pig iron, on semi-finished steel and a long list of rolled products.

Many manufacturing users of steel have urgently asked when the new prices will be quoted to the public, whether contracts at higher prices will be readjusted, and what chance private business will have as the Government closes in upon the mills with an increasing volume of priority orders.

In all the confusion it is clear that the new prices will figure but little in general business for weeks. The decrees of the priority committee at Washington really control the industry and while Government demand centers on a few lines, that control affects the supply of steel available for other finished forms. On the question of contracts manufacturers quite uniformly answer that these are to be enforced in the same way as the Lever act provided for the carrying out of fuel contracts.

Foundry pig iron sales on the $33 basis have been negligible. The largest reported is of 2000 tons of No. 3 iron at $32 at eastern Pennsylvania furnace, this being in line with $33 for No. 2 foundry. No new sales of Bessemer or basic iron were made, but the announced September averages of $45.45 on Bessemer and $41.34 on basic at Valley furnace indicate that sales at the new prices late in the month were enough to pull down the average materially.

Some producers of Southern iron expect to adhere to a $33 Birmingham basis, in spite of a $4 freight to the North, where the same price is to prevail, arguing that the supply of iron will not be equal to the demand.

The fact that only manufacturers have agreed to the new prices has brought up the question of the jobbers' margin and some regulation there is looked for. Already it has been decided at Washington that coke brokers may charge a commission above the $6 price.

In finished material further large purchases have been made by the Government at the new prices, and the British Government's negotiations for 400,000 tons of shell steel are of special interest. The Washington Government has figured on an unheard-of scale in the machine tool market, and contracts just reported aggregate many millions.

That the established prices may not uniformly prevail is indicated by transactions in which unprecedented extras have been paid, particularly for plates. There is no provision, moreover, against sales of rejected war material as scrap at prices higher than the schedule.

A notable development of the week are the wholesale resignations of iron and steel manufacturers from committees of the Council of National Defense, because of questions again raised as to the legality of such service in view of Government contracts with steel companies. The manufacturers' committees now making up new price schedules are acting as committees of the American Iron and Steel Institute.

Pig iron production again fell off slightly, the September total being 3,133,954 tons for 30 days, or 104,465 tons a day, against 3,247,947 tons in August, or 104,772 tons a day. Poor coke and repeated banking for lack of fuel are causing the blowing out of more furnaces for relining, there being a net loss of ten furnaces last month. The estimated capacity of the 347 furnaces active Oct. 1 was 107,250 tons a day, against 110,165 tons a day for the 357 furnaces in blast one month previous.

While the new low prices for steel do not apply to export business apart from sales to the Allies the enforcement of export embargoes leaves the outlook for extra profit on foreign trade not particularly attractive.

Large rollings of steel plates on the Japanese contracts are being shipped to the Pacific Coast for storage, evidently in the expectation that the embargo is to be lifted, though there is no inkling of the outcome of diplomatic negotiations on this matter. There is little likelihood of any early relaxation of the export restrictions on tin plate.

On new projects some fabricators are figuring on the basis of the fixed price of 3 c. for the plain material, but there is the fear that mills will require authorization of the priorities committee before accepting orders.

The reported payment of $140 a ton for fabricated material for Government shops to be erected in France, representing a spread of 4c. from the Government price on plain material, is considered significant. It is observed also that it is possible to get bids on fabricated material but not on plain material.

Pittsburgh

PITTSBURGH, Oct. 2 (*By Wire*).

A great many questions are being asked in the iron and steel market and very few are being answered. The agreement that was reached between the Government and the iron and steel producers ten days ago fixed merely a basis for prices, and there is a long list of commodities for which prices are eventually going to be worked out. A series of meetings of steel producers starts to-day, the object of which is to arrange a list of prices for wire products, tubular goods, sheets, etc., which will be in conformity to the prices originally agreed upon, 2.90c. for bars, 3c. for shapes and 3.25c. for plates. These prices will be submitted to the War Industries Board, and if approved by that body will be

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Oct. 3, 1917.	Sept. 26, 1917.	Sept. 5, 1917.	Oct. 4, 1916.
No. 2 X, Philadelphia...	$33.75	$	$53.00	$19.75
No. 2, Valley furnace...	33.00	33.00	52.00	19.00
No. 2 Southern, Cin'ti...	....	....	49.90	17.40
No. 2, Birmingham, Ala.	....	....	47.00	14.50
No. 2, furnace, Chicago*	....	....	55.00	18.50
Basic, del'd. eastern Pa.	....	45.00	50.00	20.00
Basic, Valley furnace..	33.00	33.00	48.00	19.50
Bessemer, Pittsburgh....	37.25	37.25	51.95	23.45
Malleable Bess., Ch'go*..	....	....	55.00	19.00
Gray forge, Pittsburgh..	....	....	46.95	19.95
L. S. charcoal, Chicago..	....	....	58.00	19.75
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	....	38.00	38.00	33.00
O.-h. rails, heavy, at mill	....	40.00	40.00	35.00
Bess. billets, Pittsburgh..	....	60.00	75.00	45.00
O.-h. billets, Pittsburgh..	....	60.00	75.00	45.00
O.-h. sheet bars, P'gh	....	70.00	80.00	45.00
Forging billets, base, P'gh	....	90.00	100.00	69.00
O.-h. billets, Phila.....	....	70.00	90.00	48.00
Wire rods, Pittsburgh...	....	85.00	90.00	55.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	....	4.935	5.185	2.659
Iron bars, Pittsburgh...	....	4.75	4.75	2.60
Iron bars, Chicago.....	....	4.50	4.50	2.35
Steel bars, Pittsburgh...	....	4.00	4.00	2.75
Steel bars, New York....	....	4.195	4.195	2.919
Tank plates, Pittsburgh..	....	8.00	8.00	4.00
Tank plates, New York..	....	8.195	8.945	4.169
Beams, etc., Pittsburgh..	....	4.00	4.00	2.75
Beams, etc., New York..	....	4.445	4.445	2.869
Steel hoops, Pittsburgh..	....	5.75	5.75	3.00

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Oct. 3, 1917. Cents.	Sept. 26, 1917. Cents.	Sept. 5, 1917. Cents.	Oct. 4, 1916. Cents.
Sheets, black, No. 28, P'gh	....	8.50	8.50	3.10
Sheets, galv., No. 28, P'gh	....	9.50	10.00	4.25
Wire nails, Pittsburgh..	....	4.00	4.00	2.60
Cut nails, Pittsburgh....	....	4.65	4.65	2.60
Fence wire, base, P'gh..	....	3.95	3.95	2.55
Barb wire, galv., P'gh...	....	4.85	4.85	3.45
Old Materials, Per Gross Ton:				
Iron rails, Chicago.....	*$36.00*	$40.00	$44.50	$19.25
Iron rails, Philadelphia.	43.00	43.00	45.00	20.00
Carwheels, Chicago.....	*24.00*	30.00	31.50	11.75
Carwheels, Philadelphia.	*29.00*	32.00	34.00	15.50
Heavy steel scrap, P'gh.	33.00	33.00	34.00	17.50
Heavy steel scrap, Phila.	*25.00*	30.00	31.00	15.00
Heavy steel scrap, Ch'go.	*27.00*	30.00	31.00	16.25
No. 1 cast, Pittsburgh...	30.00	30.00	30.00	15.00
No. 1 cast, Philadelphia.	*28.00*	30.00	32.00	16.00
No. 1 cast, Ch'go (net ton)	*21.00*	23.00	24.00	12.50
No. 1 RR. wrot, Phila....	43.00	43.00	45.00	20.00
No. 1 RR. wrot, Ch'go (net)	*30.00*	34.00	36.00	16.75
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	$6.00	$6.00	$13.50	$3.25
Furnace coke, future....	6.00	6.00	10.00	3.00
Foundry coke, prompt...	....	....	14.50	3.25
Foundry coke, future....	....	....	12.50	3.75
Metals,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.	23.50	23.50	25.25	28.25
Electrolytic copper, N. Y.	23.50	23.50	25.25	28.50
Spelter, St. Louis.....	*8.12½*	8.25	8.00	9.50
Spelter, New York.....	*8.37½*	8.50	8.25	9.70
Lead, St. Louis.....	7.82½	7.82½	10.12½	6.85
Lead, New York.....	7.95	7.95	10.25	7.05
Tin, New York	*60.50*	62.00	61.00	39.25
Antimony (Asiatic). N. Y.	15.00	15.00	14.50	10.00
Tin plate, 100-lb. box, P'gh.	....	$12.00	$12.00	$5.75

announced to the public. Very little business has been done in the pig iron, unfinished steel and finished steel markets in the past week, but this condition involved little change in the volume of business because the market had been extremely quiet before the price fixing began. In bars, shapes and plates there has been practically no business done. There has been considerable inquiry, but, as the mills are well sold up, they have refused to quote. In the products for which prices have not yet been fixed there has been some business done, but on the whole not nearly as much as formerly. The National Tube Co. has booked business in the past week in about the same volume as formerly, but its prices are far below the open market and its sales are made to regular customers only. In sheets, the market has become practically stagnant, as buyers expect to get their material eventually at much lower prices. Some important questions are being raised as to what principles should govern the holders of material who are not producers. Several middle interests in pig iron have expressed the opinion that they should not sell at above the agreed maximum prices, although they were not parties to the agreement. In the case of coal and coke, prices for which are fixed under the Lever Act, rather than by mutual agreement, it seems to be obligatory upon brokers or merchants not to sell at above the prices prescribed by the Government, although in some official circles in Washington the opinion has been expressed that in the case of material purchased before the price was fixed the holder is entitled to sell at a profit. The condition of market prices being fixed by the Government is so altogether novel both buyers and sellers feel themselves quite in the dark as to the course trade will pursue, but it seems to be the common opinion thus far that there will be little trading until the major part of the business now on the books of producers has been worked off, exception being made, of course, on orders that are placed by the Government or by those who are making various wares for the Government. Buying of this sort promises to be heavier than ever in the near weeks, as orders for the Government's allies can be placed freely, now that the matter of prices upon such orders is settled. Production of pig iron and of steel are at about the same rate as formerly. While production usually increases at this time of the year on account of favorable weather, the production now is altogether a matter of coke supply, which has been about the same in the past week as for several weeks past. While there has been very little coke offered in the open market since the Government fixed the price, the operators have been shipping fully on their contracts, as well as on sales for short delivery periods made just before the price was fixed, and open market offerings are expected later to become more plentiful.

Pig Iron.—In the absence of actual sales, and while pending adjustments of differentials for special grades are still under discussion, it is hard to determine the market on anything aside from basic, No. 2 foundry, and the agreed price on Bessemer. The only inquiry noted this week is on No. 2 foundry for last quarter on which a local interest wants 3000 tons. A Cleveland inquiry for 1000 tons of malleable for October and November delivery is still out. One consumer has offered $33 at the furnace for gray forge iron, but on advice has not closed. Furnaces are keeping in mind the preferred classes, and are giving strict attention to credit considerations, since the Government has set its price. It has been suggested to the price-fixing committee that in establishing the new differentials, the open market price over the past eight months or a year be taken as a basis, and the average percentage over the price of basic iron be taken as the differential over the Government price of $33 at the furnace on special grades, such as gray forge, malleable, low phosphorus and silvery. The $36.30 price made last week on Bessemer has not been received with general satisfaction. The average prices for September as announced by W. P. Snyder & Co., were $45.4506 on Bessemer and $41.344 on basic, both at Valley furnaces.

We quote standard Bessemer iron at $36.30, basic $33, No. 2 foundry $33, all at Valley furnace, the freight rate to Cleveland or Pittsburgh districts being 95c. per ton, and omit quotations on forge, malleable and low phosphorus in the absence of action by the price-fixing committee.

Billets and Sheet Bars.—Aside from a single sale of 1000 tons of 4 x 4 in. soft open-hearth billets at $60, Pittsburgh, no actual sales have been reported, although there has been considerable inquiry in an effort to further feel out the market. This inquiry includes a considerable tonnage of plate mill slabs and some sheet bars, but there has been no inclination to close until after further information has been received in regard to Government price fixing. The committee is expected to make its recommendations within the next week, and establish the differential on ingots, billets, sheet bars and slabs. In the absence of definite prices, we continue to quote soft Bessemer and open-hearth billets at $60 or less, and sheet bars at $70 or less, maker's mill, Pittsburgh. Forging billets are nominally quoted at $90. A local interest is reported to be in the market for about 5000 tons of grooved skelp.

Ferroalloys.—The unsettled condition of the general market is also reflected in the various ferroalloys and aside from a reported sale of 25,000 tons of ferrosilicon to the Carnegie Steel Co., by Electro Metallurgical Co. of Niagara Falls, N. Y., for all of 1918, no further transactions have been reported. On 80 per cent domestic ferromanganese for prompt delivery, we quote $375, and on future contract $350 to $375. We quote 18 to 22 per cent spiegeleisen at $80 to $82.50 per gross ton delivered, and pending adjustments repeat our former quotations on ferrosilicon and the silveries.

We quote 9 per cent Bessemer ferrosilicon at $89, 10 per cent $90, 11 per cent $95, 12 per cent $100, 13 per cent $105, 14 per cent $115, 15 per cent $125, and 16 per cent $135. We now quote 7 per cent silvery iron at $79 to $84, 8 per cent $80 to $85, 9 per cent $81 to $86, 10 per cent $82 to $87, 11 and 12 per cent 83 to $88. All f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having a uniform freight rate of $2 per gross ton for delivery in the Pittsburgh district.

Steel Rails.—Readjustment of rail prices is looked for with the new recommendations of the American Iron and Steel Institute committee, and pending this announcement no rail activities are expected. Nominal prices on light rails and regular prices on standard sections are given in detail on page 845.

Structural Material.—The new prices on shapes and angles have not resulted in the mills taking on additional business. The facts are mills are not booking any tonnage aside from the Government requirements, and their specified obligations are steadily going down. The leading fabricating interests report not having taken on any business during the past week, and while several tentative inquiries as to whether new orders would secure material are out, no new business, as far as we can learn, has been done at the Government price.

Plates.—The vast majority of plate mill tonnage on the books is subject to Government direction and the priority board has been asked to decide the sequence in in which the requirements of the Army, Navy and Shipping Board are to be filled. Because of conflicting demands from the various branches of the service, there has been a great deal of confusion and some delay, and local mills have been informed that the shipbuilding and naval program tonnage so far ordered has by no means predicated the immense tonnage that will actually be placed, and indications are that Class A and Class B requirements will take practically the entire plate capacity for a long time ahead. There are no new car inquiries, but a local interest has asked for early deliveries on plate for a large number of 55,000-gallon oil tanks to be shipped abroad, knocked down, for the Allies. In view of the fact that any new orders placed must be at the Government's price, we quote sheared plates ¼ in. and heavier at 3.25c. at mill.

Sheets.—Consumers have shown no inclination to buy prior to the Government fixing the new sheet price. The inquiry has been light, and mills have not taken on any new business for next year. We repeat former prices on sheets, which are purely nominal, on page 845.

Tin Plate.—The double uncertainty as to the price of sheet bars and contemplated Government action has further delayed opening the books for first half of 1919 and until something more definite can be learned on these points the trade is simply marking time, and we continue to quote nominal prices of $12 to $14 per base box, Pittsburgh, on primes. Prices on terne plate are given on page 845.

Hoops and Bands.—With a certainty of lower prices in the near future there has been practically no new inquiry, and inasmuch as consumers are covered over the remainder of this year, and some through the first quarter of next, there is no incentive for action at this time.

Shafting.—Government demands are coming in to shafting makers in increasing volume, and indications point to a still heavier demand from the outside as soon as the Government price has been placed on this material. Indication of greater strength is shown by a stiffening in price pending Government regulation. For the domestic trade discounts on shafting range from 10 to 5 per cent off list, although sales to the Government have been made at a much lower figure.

Railroad Spikes and Track Bolts.—This market is very quiet and awaiting readjustment in prices. Nominal prices on railroad spikes and track bolts are given in detail on page 845.

Nuts and Bolts.—The leading maker has made an adjustment in prices on hot pressed square and hexagon nuts in an effort to adjust prices on the same plane with bolts, and reports a decided improvement in both ship material and requirements of the general trade over the past ten days. This branch of the trade reports that inasmuch as it has not yet received the benefit of reductions on its raw materials, there is nothing in the situation to warrant reduction in the selling prices. Discounts in effect are given on page 845.

Wrought Pipe.—The Government demand is unusually heavy and is getting the preference in every direction. Unusually big specifications have been received on both merchant pipe and boiler tubes for emergency fleet work, and distribution is being taken care of by the tubular goods committee. The leading interest is booked ahead for practically 70 weeks.

Boiler Tubes.—There are no regular prices on either iron or steel tubes, mills being sold up for over a year, although odd lots have been out in the open market at heavy premium prices from time to time. Nominal discounts, which are very much below actual prices ruling but are shown pending Government prices, are given on page 845.

Old Material.—The scrap market is unsettled and unsteady, and while there have been no actual transactions to test it, there are evidences of weak spots in several directions, and both consumers and dealers are anxiously awaiting the action of the price fixing committee in regard to old material. Practically none is being offered and under present conditions we repeat our former nominal quotations.

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$33.00 to $34.00
No. 1 foundry cast	30.00 to 31.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin Pa.	38.00 to 40.00
Hydraulic compressed sheet scrap	25.00 to 26.00
Bundled sheet scrap, sides and ends, f.o.b. consumers' mill, Pittsburgh district	23.00 to 24.00
Bundled sheet stamping scrap	21.00 to 22.00
No. 1 railroad malleable stock	26.00 to 27.00
Railroad grate bars	18.00 to 19.00
Low phosphorus melting stock	42.00 to 45.00
Iron car axles	45.00 to 46.00
Steel car axles	45.00 to 46.00
Locomotive axles, steel	52.00 to 53.00
No. 1 busheling scrap	24.00 to 25.00
Machine-shop turnings	21.00 to 22.00
Cast iron wheels	31.00 to 32.00
Rolled steel wheels	36.00 to 37.00
*Sheet bar crop ends	41.00 to 42.00
Cast iron borings	22.00 to 23.00
No. 1 railroad wrought scrap	32.00 to 33.00
Heavy steel axle turnings	23.00 to 24.00
Heavy breakable cast scrap	24.00 to 25.00

*Shipping point.

Coke.—While the Government price of $6 has been generally accepted and a few transactions have been reported on this basis, several complications have arisen which have delayed a real try-out of the market. Chief among these was the position taken by middlemen, who questioned their right to charge a commission above the $6 rate for handling this business, but a committee went to Washington, consulted Dr. Garfield, and reports that a reasonable commission will be allowed. Ovens are shipping heavily on contracts, but it is thought a larger tonnage of spot coke will come out within the next month than has been shown since the price was fixed. Many of the new contracts do not start before Jan. 1. During the past few months there has been considerable open tonnage on which the ovens have been selling at the prevailing high prices, and while it is undoubtedly true that some of this was closed in anticipation of Government price fixing, there are still some fair tonnages that are not under contracts. For the week ending Sept. 22, the Connellsville *Courier* gives the output of the two Connellsville regions as 355,102 tons, an increase over the previous week of 5427 tons. We quote the Government price of $6 per net ton at oven on all grades of blast furnace and foundry coke for spot shipment and on contracts.

Chicago

CHICAGO, Oct. 1.

The iron and steel trade is calmer to-day than it was a week ago immediately following the announcement of prices for a few basic products, but when one seeks information, the muddle caused by the news seems to be but little changed. The mills are not quoting on plates, shapes and bars, but these and other steel products probably can be obtained, at the so-called government prices, where they exist, provided priority certificates are held by the buyers. Some doubt is expressed as to how the priority feature can be intelligently worked out in view of the complexities of the situation, and the fact that war requirements are far-reaching. Interest attaches to the question whether the new steel prices will apply to export orders apart from those from the Allies, plates being excepted because of the embargo on their export. An authority expresses the opinion that the new and low prices are not for the private buyer in the allied countries, although the allied governments may benefit from them. He holds further that none of the few neutral countries are to be benefited. The Japanese are more eager than ever for plates, and willing to pay almost any price for them. Jobbers take the stand that their obligations to the mills must be filled before they can give the public the benefit of lower prices. Like so many consumers, they, too, are contractors for material, and it is generally held that not only must contracts be adhered to, but that the Government itself must insist upon their fulfilment. A sale of two carloads of Southern foundry iron to a Rockford, Ill., buyer has been made at $33, Birmingham, a qualifying fact being that the seller had failed in the delivery of other iron. It is not ascertained that any other sale has been made, at any price, both Northern and Southern producers asserting they have none to sell. One large Southern producer has no fault to find with the price, and other makers are not complaining, except in regard to the failure of production to equal previous estimates, causing them to be behind in deliveries, therefore unable to handle new orders. The basis for charcoal iron is expected to be about $35.50, f.o.b. furnace. The old material market is at sea. The mills are not interested in buying, and the price table is based on opinion, rather than on transactions. Only a renewal of activity can readjust price levels in a satisfactory way. That the old quotations are shattered is agreed on all sides. Three carloads of coke were placed in this vicinity at $6, plus 50c. for handling.

Pig Iron.—It is admitted by important sellers that if any Northern No. 2 foundry were available for shipment to the several melters who want prompt iron, no price higher than $33 furnace would be obtained. But not only do the iron firms say they have no iron that is not under contract, but they point to the extent to which furnaces are failing to meet former estimates of production. No longer is resale iron offered to any noticeable degree, and no furnace would undertake to supply a melter unless the Government specifically indicated that his requirements should be cared for. Such a one would get his iron, and get it at $33, but it would be taken from some other purchaser, thereby delaying further the fulfilment of a contract. The principal producer in the South continues to report it has no iron to sell, all of its product being absorbed by its contract obligations; therefore it has no price. Another large Southern producer is on record as saying that the "Government" price of $33 is satisfactory, but it is not taking new business because it is behind in its deliveries, and for this reason declines to quote. A large part of the Southern iron under contract was booked at prices from $32, Birmingham, upward. The only reported business, since the Government price announcement, wherein $33 figured as the price, involved two carloads of Southern iron placed with a Rockford, Ill., foundry on the basis of $33, Birmingham, equal to $37, Chicago, but it is said that this transaction was qualified by the fact that the seller owed other iron on which he could not make delivery, and was endeavoring to retrieve himself. Incidentally it may be said that a few second-hands are willing to let their holdings go at figures over the official price, but dealers are fearful at handling this iron. The question of contracts is uppermost in the minds of sellers, despite that part of the announcement of last week which said that contracts would be unaffected. It is argued that the Government itself must support contracts or producers will not have the wherewithal to pay the impending war taxes. On the other hand, they are being questioned as to the inviolability of contracts, not only those for iron but for castings. In regard to the latter it is pointed out that for some time to come iron which was bought on contract and at prices exceeding that recently fixed will be going into castings, and it is unfair to propose that the price of the latter be predicated on $33 iron when none of the latter can be had and contracts must be carried out. Meanwhile there is a good inquiry for foundry iron in quantities from 200 to 1000 tons, all for prompt shipment. The silveries are much wanted, but the Ohio makers are not quoting. With regard to grades other than foundry, all now hinges on the forthcoming fixing of differentials by the official pig-iron committee. Following is the statement of a producer of charcoal iron:

> In the first place, we have only a very small tonnage of iron which we can sell and deliver prior to July 1 next. This tonnage we will sell at the price agreed to between representatives of the furnace interests and a committee representing the Government at a conference in Washington, D. C., last week, in conjunction with a pig-iron committee which was created for the purpose of arranging a schedule of prices for low phosphorus and other special irons, using as a basis the price of $33 for No. 2 foundry. As to just what these differentials will be, I have no definite or reliable data, except that in the case of charcoal pig iron, it has been suggested that it should command an advance of $2.50 a ton over No. 2 foundry, or $35.50, furnace. This price probably would cover grades 1 to 4 inclusive. The Scotch and lower silicon grades would probably be fixed at a somewhat higher price. We have heretofore been holding these latter grades at $2.50 per ton above the normal grades. If this differential should continue, the price for Scotch and No. 6 grades would be $38 per ton, f.o.b. furnace.

Another maker of charcoal iron stated: "One fundamental fact which sticks out above all others is that Uncle Sam has a big job on his hands, and it is up to all of us to pitch in and help him out."

A Western maker of low phosphorus is holding all inquiries in abeyance pending the fixing of differentials. The difficulty of giving prices which will justly and adequately serve all interests is evident. There can be no question about the prices of two weeks ago having been abandoned—the question is what prices have taken their place? Theoretically, the price for Northern No. 2, high-phosphorus, basic and malleable Bessemer is $33, furnace. Actually, the conditions already referred to stand in the way of business being done at this level, at least for the time being. Therefore all prices in the fol-

lowing table are nominal, some because of inactivity, others because they have been left behind. For the grades named above, $54, furnace, is no longer the quotation. The quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton.

Lake Superior charcoal, Nos. 1 to 4	†$58.00
Lake Superior charcoal, Nos. 5 and 6, Scotch and No. 1 soft or special	†60.50
Northern coke foundry, No. 1	*33.50
Northern coke foundry, No. 2	*33.00
Northern coke foundry, No. 3	*32.50
Northern high-phosphorus foundry	33.00
Southern coke No. 1 f'dry and 1 soft	†55.00
Southern coke No. 2 f'dry and 2 soft	†52.00
Malleable Bessemer	*33.00
Basic	*33.00
Low-phosphorus	†$85.00 to 90.00
Silvery, 8 per cent	†77.50 to 82.50

*Fixed by agreement, but nominal.
†Not yet changed, but new prices pending.

Ferroalloys.—For ferrosilicon, the quotation is about $3.60 per unit, up or down. Fifty per cent is almost impossible to procure. Blast-furnace ferrosilicon is in active demand. The quotations for 80 per cent ferromanganese range from $375 for the last half to $350 for the first half, but these prices presumably will be revised at Washington.

Plates.—All prices made by the mills have been withdrawn. It is possible that a limited amount of plates might be secured at the Government price of 3.25c., Chicago, by a private buyer, but to get them he would be obliged to present a priority certificate showing that he had the backing of the Government. Japanese interests are willing to pay almost any price to insure getting plates, but, of course, both the priority rule and the embargo stand in the way. Large jobbers have not changed their quotations and do not expect to do so until they have discharged their obligations to the mills from whom they purchased. Meanwhile they are being asked right and left for material at the prices announced a week ago, their customers, however, usually being tractable when explanations are made. The warehouses cannot sell for less than they paid.

For Chicago delivery out of stock jobbers quote 10c.

Structural Material.—An influential architect, having in mind the sold-up condition of the mills and the diversion of steel to uses other than building, expresses the opinion that it will be some time before the public receives the benefit of the official price of 3c., Chicago, for shapes. The leading makers are not quoting, and if they did supply shapes, it would be virtually at the direction of the Government. The only letting announced this week involves 218 tons given to the American Bridge Co. for a school at Virginia, Minn. Jobbers, for reasons already stated, quote unchanged prices.

For material out of warehouse the quotation is 5c.

Bolts and Nuts.—Buyers continue to wait. No business has been done in the past week, but orders are accumulating and a rush of buying is sure to ensue as soon as the price atmosphere clears. For prices and freight rates see finished iron and steel f.o.b. Pittsburgh, page 845.

Cast Iron Pipe.—St. Louis has placed 1000 tons with the American Cast Iron Pipe Co. Wauwatosa, Wis., has placed 100 tons with a contractor. Minneapolis is about to place 150 tons, and St. Cloud, Minn., will place 275 tons Oct. 4. Prices are unchanged.

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., $68.50; 6 in. and larger, $65.50, with $1 extra for class A water pipe and gas pipe.

Sheets.—Given priority certificates, sheets are obtainable, the quotations ranging from 8.189c. to 8.689c., Chicago, for No. 10 blue annealed; 8.189c. to 9.189c. for No. 28 black, and 9.689c. to 10.189c. for No. 28 galvanized, all of these prices being soft. Jobbers' quotations are unchanged.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 10c.; No. 28 black, 10c., and No. 28 galvanized, 11.50c.

Bars.—The leading makers of steel bars are not quoting. A prominent maker of bar iron and rail carbon bars has not sold a pound in the past week, but holds to the quotations of a week ago, and is marking time pending some Government action on its product. It will insist that its contracts will be carried through as written, although consumers already have asked modifications. It asserts that it cannot profitably sell iron bars at 2.90c., Chicago, the official quotation for mild steel bars, pointing out the cost of handling, relative slowness and smaller volume of production, cost of labor, material, etc. As to rail carbon bars, a great deal depends on the price at which rerolling rails settle. Meanwhile the producer referred to, and others, adhere to the nominal quotations of 4.50c., Chicago, for iron bars and 4.25c. to 4.50c. for rail carbon.

We quote prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c. to 5c.; reinforcing bars, 4.50c. base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Old Material.—In a few instances dealers have bought material to fill old contracts, but this trading has been insignificant. The mills are not buying, and there is really nothing on which prices can be predicated save the statements of dealers as to what they believe scrap to be worth. Figures so obtained are given in the table below, and with them the assertion is made that despite the radical reductions recorded, no mill will pay them at the present juncture. The prices given are used because they are the best obtainable—the old quotations have been completely discarded. The general opinion is that the Government will not attempt to fix the prices of scrap, but that these will be left to work out their own salvation when ultimate finished material prices are known. The Northwestern, Great Northern and Pennsylvania Lines West are offering lists which will close this week, but the prices obtained will not make the market, though they may afford some indication. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$36.00 to $37.00
Relaying rails	50.00 to 55.00
Old carwheels	24.00 to 25.00
Old steel rails, rerolling	36.00 to 37.00
Old steel rails, less than 3 ft.	29.00 to 30.00
Heavy melting steel scrap	27.00 to 28.00
Frogs, switches and guards, cut apart	27.00 to 28.00
Shoveling steel	24.00 to 25.00
Steel axle turnings	17.00 to 18.00

Per Net Ton

Iron angles and splice bars	$34.00 to $35.00
Iron arch bars and transoms	38.00 to 39.00
Steel angle bars	24.00 to 25.00
Iron car axles	40.00 to 41.00
Steel car axles	40.00 to 41.00
No. 1 railroad wrought	30.00 to 31.00
No. 2 railroad wrought	27.00 to 28.00
Cut forge	27.00 to 28.00
Pipes and flues	19.00 to 20.00
No. 1 busheling	21.00 to 22.00
No. 2 busheling	15.00 to 15.50
Steel knuckles and couplers	31.00 to 32.00
Steel springs	31.00 to 32.00
No. 1 boilers, cut to sheets and rings	18.00 to 19.00
Boiler punching	30.00 to 31.00
Locomotive tires, smooth	34.00 to 35.00
Machine-shop turnings	15.00 to 16.00
Cast borings	14.00 to 15.00
No. 1 cast scrap	21.00 to 22.00
Stove plate and light cast scrap	18.00 to 18.50
Grate bars	15.00 to 16.00
Brake shoes	15.00 to 16.00
Railroad malleable	26.00 to 27.00
Agricultural malleable	22.00 to 23.00
Country mixed scrap	16.00 to 17.00

Wire Products.—Prices are unchanged, the leading interest quoting on the basis of $3.20, Pittsburgh, for nails, the independents asking $4. As a result of the price announcement of last week, many uninformed consumers have asked to be supplied at lower than the quoted prices, but without the desired result. We quote on the basis of $4 for nails per 100 lb. to jobbers.

Plain fence wire, Nos. 6 to 9, base, $4.189; wire nails, $4.189; painted barb wire, $4.339; galvanized barb wire, $5.039; polished staples, $4.339; galvanized staples, $5.039; all Chicago, carload lots.

Rails and Track Supplies.—Deliveries of standard section rails are in some instances four months in arrears, a consequence of the Government demand for steel, and it is feared that some of the railroads will find themselves in a tight place for repair material this winter. No price changes are reported. We quote:

Standard railroad spikes, 4.50c. to 5.25c., base; small spikes, 4.75c. to 5.50c. base; track bolts with square nuts, 5.50c. to 6c., all in carloads, Chicago; tie plates, $70 to $90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base (nominal); open hearth, $40 (nominal); light rails, 25 to 45 lb., $70; 16 to 20 lb., $71; 12 lb., $72; 8 lb., $73; angle bars, 3.25c., base.

Cleveland

CLEVELAND, Oct. 2.

Iron Ore.—A strike of 10,000 seamen on the Lakes Oct. 1 was averted by the action of the Lake Carriers' Association, the Lake Seamen's Union and affiliated organizations in accepting a compromise agreement drawn by the United States Shipping Board. The Lake Seamen got only one of their six demands, and that for an increase in wages from $72 to $95 a month for able seamen and from $57.50 to $60 for deckhands for the months of October and November. Vessel men were firm in refusing to recognize the seamen's union and nothing of the kind was contained in the compromise agreement. The new wage scale is the highest ever paid. While some doubt has been expressed it is generally understood that the base price of ore named in the price agreement will apply to the 1918 sales, but subject to modification should the vessel rate for ore be changed. Mining companies have advanced wages of miners 10 per cent following the recent advance of the Steel Corporation. Many of these advances went into effect Oct. 1. Iron ore shipments fell off somewhat in September, the Lake movement amounting to 9,536,549 gross tons as compared with 10,146,786 in August and 9,600,786 tons in September, 1916. The total movement to Oct. 1 was 46,060,103 as compared with 48,816,650 tons for the corresponding period a year ago. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, $5.95; Mesaba Bessemer, $5.70; old range non-Bessemer, $5.20; Mesaba non-Bessemer, $5.05.

Pig Iron.—Producers have accepted the $33 price agreed upon by the Government and leading steel producers for basic and foundry iron, and announce that quotations will be on that basis. Various questions are still in the balance and until these are cleared makers are declining to quote prices. As far as can be learned, there has not been a quotation made on any grade of iron by any of the furnaces or selling agencies in the Cleveland territory since the price adjustment. Sellers are in doubt as to whether there is to be any differential between the Valley price and Lake furnace price and what is to be the differential between the different grades and what is to be the price of Southern iron. The price fixing has stimulated inquiry, mostly in lots of 500 tons and under. This is apparently coming from consumers who have been holding off waiting for price regulation, and is for iron both for the last quarter and first half. The possibility of a price change on Jan. 1 is a factor and sellers may not make quotations for next year's delivery for some time. Producers feel there is nothing to lose by not naming prices for a few days and some will decline to sell any more basic iron for this year's delivery, expecting Government orders for all they have left to supply steel plants making Government material. The Westinghouse Electric & Mfg. Co. is inquiring for 1000 tons of malleable iron for its Cleveland plant for this year's delivery and an inquiry from the Pittsburgh district is pending for 2000 to 3000 tons of No. 2 and No. 3 foundry iron for the last and first quarters. A Cleveland selling agency yesterday sold 400 tons of prompt shipment southern Ohio iron in this territory, the buyers to pay the price to be established for this grade, probably $33, furnace. We quote, delivered, Cleveland, as follows:

Bessemer	$37.25
Basic	33.30
Northern No. 2 foundry	33.30
Ohio silvery, 8 per cent silicon, nominal	31.62
Standard low phos. Valley furnace	80.00

Coke.—Most producers are sold up and have withdrawn from the market. There is some inquiry for foundry coke both for prompt shipment and contracts. We quote standard furnace Connellsville coke at $6 per net ton at oven.

Finished Iron and Steel.—The two features of the market in which buyers have shown the greatest interest since the fixing of prices are whether they will be able to secure a readjustment of old contracts and increasing anxiety about getting deliveries on material already bought. The delivery situation is getting worse every day because of the increasing demand of the Government. Mills are apparently taking a very firm stand against any revision of contract prices and in reply to numerous inquiries from the trade are advising that all the old contracts will stand. Leading mills are declining to quote prices as they expect the Government will require any additional tonnage they may have available, and buyers realize that it is likely to be a long time before they will be able to secure any steel at the Government prices. Some of the smaller plate mills are not adhering to the 3.25c. Government price. One Cleveland mill that has slabs under contract at high prices is quoting plates at 7.50c., Pittsburgh, and made several small lot sales at that price in the week. The same mill is quoting light plates at 6.50c. for No. 10. Another Cleveland plate mill has made no quotations since the new prices were named. Another plate mill has quoted the Government price with a $85 a ton extra instead of the $2 a ton extra for the material inquired for, and another has quoted the Government price with a 7.50c. extra for quick shipment. Some inquiries for sheet bars have come out, but are regarded as market feelers in view of the fact that prices on some finished steel have not yet been adjusted. Quotations of $75 on sheet bars and $112 on forging billets have been named. A sale of light rails is reported at $80. Mills are quoting hard steel bars for reinforcing work at 4c., but buyers have been quoted a slightly lower price for material out of stock. The bar iron market is firm, with 4.50c. the usual quotation. Sheet prices which have not been readjusted as yet have eased off and small lot sales are reported at 8c. for No. 28 black and No. 10 blue annealed and 10c. for No. 28 galvanized. Most consumers are waiting for the announcement of the new sheet prices. Warehouse prices on sheets have declined $10 per ton, black and blue annealed now being quoted at 8.50c., and galvanized at 10c. No change has been made in other prices. Bars are quoted out of stock at 4.50c. to 5c. and structural material at 5c. to 5.25c.

Bolts, Nuts and Rivets.—The demand for bolts and nuts is light as consumers are holding off, awaiting an expected price adjustment. Recent prices are being maintained. Makers say that because of the priority orders of the Government they will be unable to get steel for a long time at prices lower than their present contracts, and that if bolt and nut prices are reduced the Government must make arrangements with the mills so that bolt and nut works can get lower priced steel. Rivet manufacturers are about in the same position in respect to getting their raw material and have received notices from the mills of a curtailment in rollings because of the increasing demands of the Government. Recent prices are being maintained and some business is being booked in small lots. Some contract business is also being placed for the fourth quarter. We quote rivets at 5.25c., Pittsburgh, for structural, and 5.35c. for boiler rivets. Bolt and nut discounts are as follows, round lot buyers being allowed 5 to 10 per cent discount:

Common carriage bolts, ¾ x 6 in., smaller or shorter, rolled thread, 35 off; cut thread, 30 and 5, larger or longer, 20. Machine bolts, with h. p. nuts, ⅜ x 4 in., smaller or shorter, rolled thread, 40; cut thread, 35; larger and longer, 25. Lag bolts, cone point, 40. Square h. p. nuts, blank, $1.90 off list; tapped, $1.70 off list. Hexagon, h. p. nuts, blank, $1.70 off; tapped, $1.50 off. C. p. c. and t. hexagon nuts, all sizes, blank, $1.25 off; tapped, $1 off. Cold pressed semi-finished hexagon nuts, 50 and 5 off.

Old Material.—The expected drop in scrap prices came quickly after the announcement of the new pig iron and steel prices. The market is still in an unsettled condition with prices tending downward. Heavy melting steel has declined about $5 a ton, and other grades are from $1 to $5 a ton lower. The new prices have been established by dealers in transactions among themselves to cover short sales, there being little if any buying by the mills. The first sales of heavy steel scrap after the announcement of new prices for pig iron and steel were at $30, but prices declined to $29 and then to $28, at which the last reported sales were made. A sale of 750 tons of busheling was made last week at a reported price of $27, but this grade is now being

offered at $25. Rerolling steel rails have sold at $41. Some dealers are still expecting that the Government will regulate scrap prices. Dealers' prices, f.o.b., Cleveland, are as follows:

	Per Gross Ton
Steel rails	$27.00 to $28.00
Steel rails, rerolling	40.00 to 41.00
Steel rails, under 3 ft	31.00 to 32.00
Iron rails	35.00 to 36.00
Steel car axles	45.00 to 46.00
Heavy melting steel	27.50 to 28.50
Carwheels	27.00 to 28.00
Relaying rails, 50 lb. and over	50.00 to 60.00
Agricultural malleable	22.00 to 23.00
Railroad malleable	27.00 to 28.00
Light bundled sheet scrap	22.00 to 23.00

	Per Net Ton
Iron car axles	$44.00 to $45.00
Cast borings	17.25 to 17.50
Iron and steel turnings and drillings	17.00 to 17.50
No. 1 busheling	25.00 to 26.00
No. 1 railroad wrought	35.00 to 36.00
No. 1 cast	25.00 to 26.00
Railroad grate bars	20.50 to 21.50
Stove plate	20.00 to 20.50

Cincinnati

CINCINNATI, Oct. 2—(*By Wire*).

Pig Iron.—Information as to the correct schedule of prices agreed upon by the Government and leading pig-iron producers is so indefinite that activity has been suspended as far as new contracting is concerned. No sales are reported of either furnace or resale iron and while there are a small number of inquiries out for iron to be shipped this year, quotations are refused because in most cases there is no iron to offer and on that available no price has been made. As far as this territory is concerned, no $33 iron has been sold for shipment from any district. A perplexing problem yet to be solved is the price of Southern iron at furnace. It is generally understood by melters that the Government agreement calls for a price of $33, Birmingham. This may be incorrect, and if the usual differential in freight rates is taken into consideration, the final agreement on quotation of Southern iron on the present Government basis will be considerably below the figure named. Little or no interest is taken in iron for the first half delivery, but tentative propositions are under consideration providing for a supply to be shipped in that period and to be invoiced to the customer at the rate adjusted by the Government for that delivery. No contracts have been made on this basis thus far. Melters are urging forward shipments on old contracts and none has asked to cancel contracts made before the Washington meeting. As no sales have been made, prices are not published this week.

(*By Mail*)

Finished Material.—The jobbers have been receiving a large number of inquiries from both local and out-of-town customers asking for present prices on different kinds of finished material. To all of these letters they have replied that no changes have been made, or contemplated for the present. The mills would be unable to make delivery of either bars or plates. All warehouse figures are unchanged. Business has slowed down considerably, but there is yet a fair volume from customers badly in need of the material ordered. The jobber's price on nails is somewhat weaker, and as low as $3.80 per keg, base, has been done on some desirable business. The general quotation is $3.90. Barb wire is moving slowly at 5c. a lb. Local store prices are as follows: Iron and steel bars, 5c.; twisted steel bars, 5.05c.; ¼-in. plates and heavier, 10c.; No. 10 blue annealed sheets, 10c. So far the nearby mills have not changed quotations on black and galvanized sheets and No. 28 sheets are quoted at 8.65c., and galvanized sheets at 10.65c., f.o.b. cars, Cincinnati or Newport, Ky. Very little business is being done at these figures.

Coke.—No new business is reported by the local sales representatives, and while it is understood that the oven operators are willing to accept $6 per net ton at oven for any coke that can be shipped, just now few of them are able to sell at any figure because they are already so far behind on old contract business. The situation is easing up a little bit in the Connellsville district and shipments are moving forward a trifle more promptly. In the Wise County, Pocahontas and New River fields there is no change in the situation. It is reported, but not confirmed, that an embargo has been placed on Ashland coke crossing the Ohio River, and if this rumor is correct, it is calculated to curtail the output of furnaces on this side of the river, which are drawing a supply from that district.

Old Material.—The market is very weak and heavy reductions have been made on nearly all kinds of scrap. The revised figures named represent the changes made up to the present writing, but daily reductions are expected until the pig-iron market is somewhat settled. Business is very light and dealers are not disposed to add to their yard stocks under present unsettled conditions. The following are dealers' prices, f.o.b. cars, southern Ohio and Cincinnati:

	Per Gross Ton
Bundled sheet scrap	$19.00 to $19.50
Old iron rails	33.50 to 34.00
Relaying rails, 50 lb. and up	45.50 to 46.00
Rerolling steel rails	34.50 to 35.00
Heavy melting steel scrap	26.50 to 27.00
Steel rails for melting	26.50 to 27.00
Old carwheels	26.00 to 26.50

	Per Net Ton
No. 1 railroad wrought	$29.50 to $30.00
Cast borings	13.00 to 13.50
Steel turnings	13.00 to 13.50
Railroad cast	20.00 to 20.50
No. 1 machinery cast	24.00 to 24.50
Burnt scrap	14.00 to 14.50
Iron axles	41.00 to 41.50
Locomotive tires (smooth inside)	33.50 to 34.00
Pipes and flues	17.00 to 17.50
Malleable cast	20.50 to 21.00
Railroad tank and sheet	14.50 to 15.00

Birmingham

BIRMINGHAM, ALA., Oct. 2—(*By Wire.*)

While no actual sales are announced, furnace companies in the Birmingham district maintain the Government rate is $33 f.o.b. furnaces and inquiries are being answered. It is expected that differentials will be settled this week in Washington. All companies here declare sales previously made will require the iron for the rest of the year.

(*By Mail*)

BIRMINGHAM, ALA., Oct. 1—Production of pig iron in the Southern territory will not be disturbed and every effort is being made to get delivery on existing contracts. Consternation over the Government schedule of prices for iron and steel was short lived and better feeling now prevails. Manufacturers of pig iron in the South are waiting for a fuller explanation of the terms of the schedule, especially for differentials to be straightened out. In the meantime, the output at furnaces will be kept at a maximum; in fact, the Trussville furnace will be making iron in the next few days and work of rehabilitating and repairing furnaces in the Sheffield territory is well in hand. Southern pig iron at $33 per ton f.o.b. furnaces will permit of a reasonable profit, but would make it difficult to compete with Northern iron. Investigations show that there are thousands of tons of iron sold for delivery during the last three months of this year and into 1918 at a price $40 and better. It is a fact also that there is a large tonnage to be delivered under $33 per ton. One of the principal companies in the Birmingham district has an aggregate of no less than 125,000 tons on the books sold for delivery during the next nine months, beginning Oct. 1, at prices ranging from $40 up to $45. Production of iron during the past month has not been up to expectations by reason of an unsteadiness in the raw material supplies. Increase in wages effective Oct. 1, more settled conditions among labor and more labor, it is figured, will bring about better production of coal, coke, ore and other products.

Old Material.—The scrap iron and steel, old material, market in the South is feeling an effect of the Government fixing of prices for iron and steel and a pronounced fall in prices is looked for. One of the larger consumers of scrap in the South has notified dealers that it will not begin to pay the prices that

have prevailed heretofore for scrap. Heavy melting steel will be one of the principal products to feel the effects of the bombardment.

Old material prices are given, nominally, as follows:

Old steel axles	$32.00 to $33.00
Old steel rails	24.00 to 25.00
No. 1 wrought	25.50 to 26.00
Heavy melting steel	20.50 to 21.50
No. 1 machinery	24.50 to 25.00
Car wheels	23.00 to 24.00
Tramcar wheels	20.00 to 21.00
Stove plate	18.50 to 19.00
Shop turnings	15.00 to 16.00

Philadelphia

PHILADELPHIA, Oct. 2.

The Philadelphia market is marking time. The only interests which have fallen promptly into line with the new Government prices are the producers of pig iron. A few sales have been made, notably 1000 tons of gray forge iron at $33, furnace, and a total of 1000 or more tons of No. 2 X foundry iron in small lots at the same price. In view of the fact that no price has yet been fixed on other grades, sales cannot be negotiated except with the price left open, as was the case with a sale of 200 tons of standard low phosphorous iron. Sales of furnace coke have entirely ceased, offices here having been notified by their principals that they have none now to offer. Ferromanganese has declined sharply as a result of expected price-fixing, and sales at $325 for spot delivery have been made. There are no developments in finished material so far as sales are concerned. So far as could be learned, not a pound of plates, structural material or plates has been sold at the new prices, though several thousand tons of steel bars were sold for export to the Far East at prices ranging from 4.50c. to 4.75c.

Coke.—When the new price was announced, coke sellers here seemed satisfied and a few spot lots of furnace were sold at the $6 quotation. Later, however, sales agencies were notified to make no commitments. Before the new price went into effect, the coke producers found it profitable to sell considerable quantities at the spot prices, which were higher than the contract prices, but now the situation is reversed and it becomes more profitable for them to ship on contracts than to sell at the control price. In justification of the policy now being followed by the coke manufacturers, it is pointed out that since the new price was announced the Fuel Administration has sent them many priority orders, some of which are confusing and conflicting, and that until the situation is straightened out, little, if any, coke will be available in the open market. One sales office took an order last week from a regular customer for a small tonnage of foundry coke, with price to be fixed later, but business in foundry coke is generally at a standstill and probably will remain so until the control price, which is expected to be about 50 cents a ton above that of furnace coke, is definitely determined.

Ferroalloys.—In anticipation of further Government price fixing which will affect ferroalloys, the price of ferromanganese has declined and sales have been made during the week for spot delivery at as low as $325. About 1000 tons in small lots were sold in this market, and the highest price reported is $350. Spiegeleisen is still quoted at $78 to $80, furnace, but is weak at that price and probably lower could be done.

Sheets.—Expectation of Government price fixing has checked all business except some small lots needed for immediate use, which are reported to have been sold at prices previously reported: 8c. to 8.50c., Pittsburgh, for No. 10 blue annealed; 8c. to 8.50c. for No. 28 black, and 10c. to 10.50c. for No. 28 galvanized.

Pig Iron.—There were several sales of pig iron in this market during the past week at the new prices. One lot of 1000 tons of gray forge iron was sold at $33, furnace. A Virginia furnace sold about 600 tons of No. 2 X foundry at the control price and other offices sold small lots, the total sales of foundry iron possibly reaching 1000 to 1200 tons. A foundry in this district is reported to have made a resale of a small tonnage of No. 2 X foundry iron at $40. Two hundred tons of standard low phosphorous iron was sold at price to be fixed later in accordance with the decision of the pig-iron committee now considering the new schedules. There were a number of inquiries, some of them for next year, which developed the fact that none of the furnaces seems to know how it stands with regard to taking contracts for delivery beyond Jan. 1. Consumers express a desire to see this question settled speedily, so they can make their own price schedules. There have been suggestions from consumers that the furnaces take contracts for next year on an open-price basis, but this the furnaces do not seem willing to do, as they fear a price revision on Jan. 1 which might send price of iron so low that they could not operate at a profit. The opinion is advanced in some quarters that there is nothing to prevent furnaces from contracting as far ahead as they like at the $33 base price, but the answer generally to this suggestion is that the furnaces are not willing at this time to take on much tonnage for forward delivery at the $33 price, deliveries of which might interfere with deliveries of iron already under contract at higher prices. Inquiry among representatives of furnaces as to the average price of iron shipments now being made reveals that this average varies considerably at different furnaces. In most instances, it is above $30 and some of the furnaces which have been blown in during recent months will average $40 to $45 per ton. This is particularly true of a few Virginia furnaces. Lack of fuel is worrying furnaces and because of the fear that some may be forced out of blast on this account it is predicted in sales offices that comparatively little spot iron will now be available. It is said that furnaces will pile up reserve stocks in anticipation of any emergency which might leave them short of iron and therefore unable to make deliveries on existing contracts. There have been few, if any, attempts to cancel contracts, consumers on the other hand generally urging quick deliveries for work they have in hand. As their product has been sold at a price based on their pig-iron contracts, their chief concern is not with prices but with deliveries. Some of the offices here will now quote prices only at furnace and those which sell Alabama iron predict that the price of Southern iron at furnace will be the same as for a similar grade of iron at a Northern furnace, and that no concessions will be made to equalize freight rates. We quote the following standard brands, at furnace (freight rate to destination must be added):

Eastern Pennsylvania No. 2 X foundry	$33.00
Gray forge	33.00

Structural Material.—Since the fixing of prices, large requisitions have been received by mills from the Government for ship shapes and material for the shops which will fabricate buildings to be erected for the Army in France. The fact that the Government let a large number of buildings at a cost of $140 per ton for fabricated material is taken as an indication that it will make no attempt to limit charges for fabrication even for its own work. Some mills which have their own fabricating shops are prepared to quote on fabricated material, though deliveries are somewhat uncertain, but of plain material they have nothing to offer, reserving what excess over contracts they may produce for the Government, whose requirements, it is asserted, will be heavy from now on. The Tacony Ordnance Corporation has let 1750 tons of fabricated material for its new gun forging plant at Tacony, Pa., to the Belmont Iron Works at a price reported to be considerably above the new Government price for plain material. We quote 3c., Pittsburgh, base, with the usual trade differential and extras.

Plates.—Except for Government account, nothing has been done in plates in this market at the new price. It is rumored in the trade that one or two mills are continuing to accept business at the old prices, but this rumor lacks confirmation. The smaller mills are still insisting that they cannot come out whole at the new price. Those which roll plates from slabs, which they have contracted for at high prices, will probably not lose on business which they had booked prior to the price announcement, but should the Government give

them orders for plates at the 3.25c. price they would obviously face a perplexing problem. In such an instance, it is pointed out, they would undoubtedly ask the Government to furnish them with the material from which to make their plates. A producer of plates from the pig iron insists that it cannot profitably make 3.25c. plates from pig iron which costs $33, and some of its iron contracts are at higher figures than this, though the average is probably less. Regarding the possibility of domestic consumers of plates not on Government work getting orders filled a plate mill operator made this statement: "Most mills are filled up for the remainder of this year and several months into next year with Government orders, direct and indirect, so that with this condition there will be practically nothing new booked until the mills work down their order books and have a chance to establish a policy based on the new conditions. The commercial trade is perfectly willing, in fact, anxious, to pay higher prices for plates and is clamoring to get orders on the books of the mills, but on account of the situation as just explained is unable to place business." Some of the plate mills which some time ago booked considerable Japanese business are now rolling the plates for shipment to Pacific Coast ports, where they are to be stored pending a settlement of the embargo. A steel export company, which has large Japanese orders, estimates that probably 100,000 tons are now being rolled at different mills throughout the East. It is predicted that the Government may soon make an announcement permitting the exportation to Japan of plates which were bought prior to July 15, when the embargo went into effect. It is admitted that there is nothing substantial to base this prediction upon, but the fact that the Japanese are paying money to have the plates rolled, and the further fact that one or more railroads, the Union Pacific in particular, have agreed to accept shipments to the Pacific Coast are pointed to as significant indications of what may develop. It is intimated that the policy of the Government will be to release only those plates which are for ships actually under construction in Japan, but none for ships under contract, work on which has not yet been started. We quote 3.25c., base, but are without knowledge of any sales at this price.

Billets and Slabs.—Billets and slabs remain nominally on the basis of $70 for open-hearth re-rolling billets, though none has been sold in this district since the announcement of Government control prices on other products. A small tonnage of slabs for spot delivery was offered to a number of consumers at $85, but no one was found who wanted them badly enough to pay this price. Though prices on open hearth and Bessemer re-rolling billets will probably be fixed at about $15 above pig iron prices, or about $48, we continue to quote $70 as a nominal price.

Iron and Steel Bars.—In view of the probability of Government price fixing on bar iron, some of the makers in this district have shown a willingness to accept contracts for the remainder of this year and first quarter of next year at prices ranging from 4.25c. to 4.50c., Pittsburgh. Consumers who wish to be sure of future supply have apparently not hesitated at these prices, though knowing that any price the Government will fix will undoubtedly be lower. Against these new contracts the bar iron mills have placed orders for wrought scrap and borings and turnings. Some of the larger producers of bar iron, who are well sold ahead, adhere to previously quoted prices of 4.75c. to 5c., Pittsburgh. There is no domestic business in steel bars, but one company here last week sold several thousand tons for export to the Far East at prices ranging from 4.50c. to 4.75c., for delivery this year. Mills show no disposition to consider new contracts based on the new Government price of 2.90c., Pittsburgh. Their output for some months is well covered by contracts, which, with Government orders, place them in a position where they prefer to do nothing with regard to additional business for the present.

Rails.—Several lots of light rails up to 40 lb. have been sold in the past week, mostly for mines, at prices ranging from 3.50c. to 3.90c., Pittsburgh.

Wire Nails.—Nine thousand kegs of nails were sold by an Eastern Pennsylvania maker for export this year to the Far East at $4 per keg, base Pittsburgh.

Old Material.—Dealers are still somewhat at sea as regards prices and trading is largely confined to transactions among themselves, which have had a tendency to bring out lower quotations. On the monthly list of the Pennsylvania Railroad Co. issued this week, many dealers were at a loss how to bid, there being a feeling that buying is hazardous under present conditions. Except for a few sales to bar iron makers, there is no demand from the mills and brokers are pursuing a very safe policy with regard to their own purchases. The Committee on Iron and Steel Scrap of the Council of National Defense has been holding meetings with officials of the American Railways Association to devise ways of correcting existing methods of transportation of scrap for the general improvement of railroad efficiency. We quote the following delivered prices based on sales in the Philadelphia district during the past week:

No. 1 heavy melting steel	$25.00 to $28.00
Steel rails, re-rolling	41.00 to 43.00
Low phosphorus heavy melting	40.00 to 43.00
Old iron rails	43.00 to 45.00
Old carwheels	29.00 to 31.00
No. 1 railroad wrought	43.00 to 45.00
No. 1 forge fire	21.00 to 22.00
Bundled sheets	21.00 to 22.00
No. 2 busheling	15.00 to 16.00
Machine shop turnings (for blast furnace use)	15.00 to 16.00
Machine shop turnings (for rolling mill use)	18.00 to 19.00
Cast borings (for blast furnace use)	15.00 to 16.00
Cast borings (clean)	19.00 to 20.00
No. 1 cast	28.00 to 30.00
Grate bars	19.50 to 20.00
Stove plate	19.50 to 20.00
Railroad malleable	32.50 to 35.00
Wrought iron and soft steel pipes and tubes (new specifications)	29.00 to 30.00

St. Louis

ST. LOUIS, Oct. 1.

Pig Iron.—The Government fixing of prices, with no intimation as yet as to the basis of calculation of figures to be set at other markets than Pittsburgh has put an end to all transactions at this point for the present. The representatives of the furnaces have been flooded with inquiries, almost altogether on small lots, since the announcement from Washington, but no selling has been possible, as no figures have been received from the furnaces to give a basis of action in this trade territory. On contracts already in effect, however, there has been urgency in the demand for shipment and consumers are very anxious to get the material they have ordered, as needs therefor are becoming acute as the supplies on hand drop lower. Melters are by no means covered for 1918 and there is every reason to believe that there will be active buying as soon as it can be determined just how to go ahead on contracts.

Coke.—The coke situation is on all fours with that of pig iron and there has been no business in the market. Melters are fairly well covered under previous contracts, however, and therefore are not immediately concerned as to the situation. The local by-product plant is well sold ahead and therefore is cutting no particular figure in the market at the present time.

Finished Iron and Steel.—As no buying has been possible on contracts for finished products other than deliveries under specifications for material already signed up for, the fixing of prices by the Government has had no immediate effect on local conditions. No changes have been posted on finished material as yet and prices are held as heretofore. Movement out of warehouse continues very active and up to the capacity of the warehouses to meet—in some cases considerably beyond supplies on hand. For stock out of warehouse, we quote as follows: Soft steel bars, 4.55c.; iron bars, 4.50c.; structural material, 5.05c.; tank plates, 10.05c.; No. 10 blue annealed sheets, 10.05c.; No. 10 black sheets, cold rolled, one pass, 10.35c.; No. 28 galvanized sheets, black sheet gage, 11.75c.

Old Material.—Scrap is decidedly lower in tone at least, though there have been no transactions upon

which real quotations could be made. The effect of the Government price-fixing order has been to make the buyers offer lower prices, but the dealers are disposed to hold firm, believing that there will be sufficient call for scrap to hold it up well within the recent range. As a result there has been no business of consequence done during the past week. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton

Old iron rails	$38.00 to $38.50
Old steel rails, rerolling	36.00 to 36.50
Old steel rails, less than 3 ft.	35.00 to 35.50
Relaying rails, standard section, subject to inspection	50.00 to 55.00
Old car wheels	29.00 to 29.50
No. 1 railroad heavy melting steel scrap	28.50 to 29.00
Heavy shoveling steel	27.00 to 27.50
Ordinary shoveling steel	24.00 to 24.50
Frogs, switches and guards cut apart	28.50 to 29.00
Ordinary bundled sheet scrap	18.50 to 19.00
Heavy axle and tire turnings	18.00 to 19.00

Per Net Ton

Iron angle bars	$37.00 to $37.50
Steel angle bars	26.00 to 27.00
Iron car axles	42.00 to 43.00
Steel car axles	40.00 to 40.50
Wrought arch bars and transoms	39.50 to 40.00
No. 1 railroad wrought	33.50 to 34.00
No. 2 railroad wrought	31.50 to 32.00
Railroad springs	29.50 to 30.00
Steel couplers and knuckles	34.50 to 35.00
Locomotive tires, 42 in. and over, smooth inside	37.00 to 37.50
No. 1 dealers' forge	24.50 to 25.00
Cast iron borings	14.50 to 15.00
No. 1 busheling	23.00 to 23.50
No. 1 boilers, cut to sheets and rings	19.50 to 20.00
No. 1 railroad cast scrap	19.00 to 19.50
Stove plate and light cast scrap	14.00 to 14.50
Railroad malleable	27.00 to 28.00
Agriculutral malleable	22.00 to 22.50
Pipes and flues	20.00 to 20.50
Heavy railroad sheet and tank scrap	16.00 to 16.50
Railroad grate bars	16.50 to 17.00
Machine shop turnings	15.50 to 16.00
Country mixed scrap	14.50 to 15.00

Buffalo

BUFFALO, Oct. 1.

Pig Iron.—The market is at a standstill until the regular price differentials for the various grades of pig iron are worked out and determined upon from the basis of $33.00 f.o.b. cars at furnace as set by the Government for No. 2X foundry and basic iron. As a rule inquiries received, and they are numerous, are simply filed and acknowledged with the information that furnaces are not prepared to quote until the differential scale is fixed. No sales whatever have been reported for the week. Furnaces are not seeking business at this juncture, and all the iron produced is being applied on old contracts, or held in readiness to be supplied on any Government requirements that may be requisitioned for. It is therefor impossible to quote any schedule of prices at the present time.

Finished Iron and Steel.—A waiting policy is manifest on the part of mills, and all new business except such as applies directly on Government orders is held in abeyance until decision is made as to what business, aside from Government specification, is to have precedence. Government orders are becoming plentiful, and there have been many inquiries from domestic territory and from Canada, particularly for bars and shapes for agricultural and industrial purposes. Some of this inquiry, however, apparently represents the attempt of certain buyers to sound out the market with sources of supply from which they have not been accustomed to buy, in order to determine what steps, if any, they can take to relieve themselves of previous high-priced purchases. The various selling agencies, on the other hand, are under instructions from headquarters to decline to quote on practically all inquiries, and this undoubtedly will be their policy until it is clearly determined how much steel of the "A" and "B" classification will be necessary to meet the requirements of the United States Government and the Allies. This indicates a considerable scarcity of steel for use by the general public for some months to come.

Old Material.—Owing to the scarcity of heavy melting steel and some other commodities the market remains firm, although very little business has been transacted during the week. Prices of scrap materials have not been very much affected as yet by the Government's action in the fixing of prices for pig iron and finished steel. Unless some decided action is taken by the Government establishing prices on the different grades of scrap, there will be no decrease in schedules, and increased demand would undoubtedly bring quotations to a higher level. Scarcity of gondola cars and embargoes in effect at many outside consuming points have restricted movement of scrap almost to a minimum. This situation is likely to seriously interfere with mill activity and production unless some decided action is taken to have cars furnished promptly and to remove or relieve the restrictions now placed by the railroads against the movement of scrap. It is understood that the Government will take some action this week that will clarify the situation both as to any contemplated fixing of prices and the protecting of deliveries.

We continue prices in force for the past week, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$31.50 to $33.00
Low phosphorus	41.00 to 42.00
No. 1 railroad wrought	43.00 to 44.00
No. 1 railroad and machinery cast	30.00 to 31.00
Iron axles	45.00 to 47.00
Steel axles	45.00 to 47.00
Carwheels	35.00 to 36.00
Railroad malleable	32.00 to 33.00
Machine shop turnings	18.00 to 19.00
Heavy axle turnings	26.00 to 27.00
Clean cast borings	20.00 to 21.00
Iron rails	43.00 to 44.00
Locomotive grate bars	20.00 to 21.00
Stove plate	21.00 to 22.00
Wrought pipe	28.00 to 29.00
No. 1 busheling scrap	28.00 to 29.00
No. 2 busheling scrap	18.00 to 19.00
Bundled sheet stamping scrap	20.00 to 27.00

British Steel Market

Pig Iron Active and Steady—Tin Plates Firm and Ferromanganese Strong

(*By Cable*)

LONDON, ENGLAND, Oct. 3.

Cleveland pig iron is active and the stringency in hematite iron is less intense. Tin plates are firmer. Ferromanganese is idle but strong. American wire rods for October-November delivery have sold at £29 10s. with early arrivals at £28, c.i.f.

Benzol is quoted at 12d. per gal. with toluol at 2s. 4d. and solvent naphtha at 2s. 9d. We quote as follows:

Tin plates, coke, 14 x 20; 112 sheets, 108 lb., f.o.b. Wales, maximum, 30s.
Ferromanganese, £45 nominal.
Ferrosilicon, 50 per cent, c.i.f., £35 upward.
On other products control prices are as quoted in THE IRON AGE of July 19, p. 171.

(*By Mail*)

Strong Pressure for War Material—Official Prices for Plates Expected

LONDON, ENG., Sept. 11.—The predominant feature in the British industry obviously continues to be the high pressure of operations directly connected with essential war requirements, and the strain upon the steel sections is of greater intensity, with not the least prospect of any relaxation over the remainder of the year. Under the close control of the authorities, output is being urged as rapidly as possible, and seems adequate in spite of the difficulties encountered by the mills through shortcomings in fuel and skilled labor. As the great bulk of production is being requisitioned for Government work, the surplus left for industrial purposes is now very small, and merchant business is well nigh extinct. Further Government restrictions have been enforced lately in the plate and sheet markets.

There is no important change in the position of pig iron, although the tendency has shown additional firmness due to the fact that current output is on the whole more quickly absorbed, even in the case of foundry grades. The surplus supply of these is becoming comparatively light, since the output has been checked somewhat by the additional furnaces which have been put on basic iron, in accordance with an appeal made by the authorities to furnace owners. Consumers in

the Midlands and Scotland have shown more eagerness to cover themselves ahead, thus causing more stringent conditions. The supply of forge and foundry material, however, is sufficient to go round, and there is no fear of any serious shortage arising, even allowing for the continuance of exports to allies on a respectable scale.

No official statement has yet been made regarding the proposed price control in black sheets, although it is understood that the basic quotation for close annealed No. 24 galvanized sheets was recently fixed at £17 10s. net at makers' works. Some works are inclined meantime to disregard the proposed change, and still quote old prices, and business is practically at a standstill. Makers generally are full of Government work for the next few months, and simply wait developments. There is some opposition to the intended price restrictions, as makers contend that the above basis is too low, and leaves little or no profit for rolling except to big works prdoucing their own steel.

It is expected that official prices will soon be fixed for black plates. There is no change in the position of tin plates. All orders are now subject to a Government certificate at the official maximum basis of 30s. per box net at makers' works. The tone is firm, although the maximum basis is occasionally shaded for stray lots of light plates.

There is nothing new in ferromanganese, very little business having been done in the last few weeks. Sellers are rare, and hardly inclined to shade prices, which stand nominally at £80 f.o.b. for the Continent, and $375 to $400 c.i.f. for North American ports for far forward shipment. Makers are virtually out of the market.

New York

NEW YORK, Oct. 3.

Pig Iron.—The pig iron market is very slowly adjusting itself to new conditions. The sale of 2000 tons of No. 3 plain has been made to a New Jersey machinery company for its foundry at $32, furnace, and this company will probably purchase from 5000 to 10,000 tons additional for foundries which are making castings for it. For No. 2 plain $32 has also been quoted. Unlimited sales of No. 2 X are reported at $33, furnace. No sales of Southern iron are reported in this territory. Inquiries for various grades are numerous and it is believed that when the differentials on all grades are definitely established buying will be liberal. One inquiry pending is for 900 tons of 1.75 per cent to 2.25 per cent silicon and 900 tons of 3 per cent to 3.50 per cent silicon for first quarter delivery to a New Jersey foundry. For early delivery we quote as follows tidewater on those grades on which prices have been fairly established, omitting other grades for the present:

No. 2 X	$33.75
No. 3 plain	32.75

Ferroalloys.—That the price of ferromanganese will be fixed by the Government along with prices of all iron and steel products is the topic uppermost in this market. No one, however, is able to even guess at what the price may be. The quotation on the domestic alloy for delivery this year or next is now $350, though some spot material in carload lots has sold at $375. Demand is almost nothing and the market is extremely dull. Arrivals in September are reported to have been better than in either August or July when the average was less than 2000 per month. Spiegeleisen, 20 per cent, is quoted at $80, furnace. About 3000 tons is before the market. Ferrosilicon, 50 per cent, has been quoted at $140 to $165 for delivery next year, but it is believed that these prices have not been established on contracts. Some transactions are known to have been put through at $130. The Carnegie Steel Co. has covered for its 1918 requirements, which will be 20,000 tons as minimum and 30,000 tons as maximum, at a price believed to be somewhere near the above figure. For material needed this year about $200 is asked and has been obtained.

Finished Iron and Steel.—No quotations have been made at the fixed prices announced Sept. 24. With filled order books and large demands expected from the Government, mills are not committing themselves. Buyers seem to sense the situation and latterly there have been few inquiries from either domestic or export sources except in products not yet affected by a fixed price or subject to export license. Selling is proceeding in wire at prices equivalent to 4c. and higher, plain wire base, and bar iron buying is fairly active with reports that in spite of relatively high prices obtaining third quarter contracts have been pretty fully specified. About the only sizable inquiry in finished steel learned of, covers 8500 tons of standard section rails for China. It is said that fabricators on new projects are figuring on the basis of 3c., Pittsburgh, for the plain material, but mills are not expected to accept such business without a permit, the point being that if general business does not sooner or later call for licenses from the Priority Board, mills are likely to consider seriously only those for war purposes and thus authorized. The New York Shipbuilding Co. plans extensions involving 2000 tons, the Philadelphia & Reading is to build a 1500-ton bridge in Philadelphia and the Philadelphia Electric Light power house is again up for consideration. The Mount Vernon Bridge Works has been awarded 650 tons for the Chesapeake & Ohio and five additional buildings for France are to be placed by the Stone & Webster Engineering Corporation, involving a total of about 4500 tons, four to the American Bridge Co. and one to Whitehead & Kale. In the absence of new business we continue to quote the prices obtaining two weeks ago, or for mill shipments of structural material 4.445c. to 5.195c., New York; plates 8.195c. and higher, New York; steel bars over the rest of this year 4.195c. to 4.695c., New York, and iron bars at 4.945c. From New York district warehouses steel and iron bars and shapes are quoted at 5c. to 5.50c. and plates at 8c. and higher.

Cast Iron Pipe.—Prices on cast iron pipe are still held nominally at $65.50 per ton for 6 and 8-in. and heavier and $68.50 for 4-in., the reason assigned being that pipe now being offered for sale was made from pig iron bought at prices much higher than those recently announced from Washington. There is no buying of pipe, however, and the willingness of sellers to cut prices was shown in the recent bidding on 310 tons for Jersey City, reported last week, when the lowest bid was $58.34 and the highest $64.75. It is expected that revision of cast iron pipe prices will come at a not far distant date.

Old Material.—Old material prices are settling to a level in harmony with quotations on pig iron, as named in the Washington agreement. Heavy melting steel for shipment to either eastern Pennsylvania or Pittsburgh, is now quoted at $25 to $26, New York, a reduction of about $2 to $3. Nearly all grades have declined to that extent, while relaying rails are much lower and are now being quoted at $45 to $50. There is no official information as to whether the Government will take any action in regard to scrap, but it seems probable that such action will come soon. We quote prices of brokers as follows to New York producers and dealers, per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$25.00 to $26.00
Old steel rails (short lengths) or equivalent heavy steel scrap	25.00 to 26.00
Relaying rails	45.00 to 50.00
Rerolling rails	33.00 to 34.00
Iron and steel car axles	41.00 to 42.00
No. 1 railroad wrought	32.00 to 33.00
Wrought-iron track scrap	27.00 to 28.00
No. 1 yard wrought long	27.00 to 28.00
Light iron	7.00 to 8.00
Cast borings (clean)	16.00 to 17.00
Machine-shop turnings	14.00 to 15.00
Mixed borings and turnings	13.00 to 14.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long)	25.00 to 26.00

For cast-iron scrap, dealers in New York City and Brooklyn are quoting as follows to local foundries per gross ton:

No. 1 machinery cast	$25.00 to $26.00
No. 1 heavy cast (column, building material, etc.)	22.00 to 23.00
No. 2 cast (radiators, cast boilers, etc.)	22.00 to 23.00
Stove plate	16.00 to 17.00
Locomotive grate bars	16.00 to 17.00
Malleable cast (railroad)	28.00 to 29.00
Old carwheels	28.00 to 29.00

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 19.5c.; Philadelphia, 18.5c.; Boston, 21.5c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c.; Denver pipe, 76.1c.; minimum carload, 46,000 lb.; structural steel and steel bars, 76.1c., minimum carload, 40,000 lb.; Pacific coast (by rail only), pipe, 65c.; structural steel and steel bars, 75c., minimum carload, 60,000 lb. No freight rates are being published via the Panama Canal, as the boats are being used in transatlantic trade.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in., angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 4.00c.

Wire Products

(Prices of independent mills)

Wire nails, $4 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over the price of $2, and shorter than 1 in., $2.50. Bright basic wire, $4.05 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.95; galvanized wire, $4.65; galvanized barb wire, and fence staples, $4.85; painted barb wire, $4.15; polished fence staples, $4.15; cement-coated nails, $3.90 base, these prices being subject to the usual advances for the smaller trade all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 43 per cent off list for carload lots. 42 per cent off for 1000-rod lots, and 41 per cent off for small lots, f.o.b. Pittsburgh.

Nuts and Bolts

Discounts in effect for large buyers are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days.

Carriage bolts, small, rolled thread, 40 per cent; small cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 40 and 10 per cent; small. cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c., and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent with c. p. nuts, 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq. blank, $1.70 off list, and tapped, $1.50 off; hex., blank, $1.50 off, and tapped, $1.30 off; nuts, c. p. c. and t. sq. blank, $1.25 off; and tapped, $1.00 off; hex. blank, $1.25 off, and tapped, $1.00 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Wire Rods

Soft Bessemer and open-hearth rods to domestic consumers at $90 to $95; high-carbon rods made from ordinary open-hearth steel $95 to $100, and special steel rods with carbons running from 0.40 to 0.60, $100 to $110 at mill; above 0.60 carbon, $115 to $120.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $7.00, ⅝ in., 7/16 in. and ½ in., $7.00 base. Boat spikes are occasionally quoted $7.00 to $8.00, all per 100 lb., f.o.b. Pittsburgh, but some makers are quoting higher. Track bolts with square nuts, 7c. to 7.50c. to railroads, and 8c. to 8.50c., in small lots, for fairly prompt shipment.

Steel Rails

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails, and on carload and smaller lots, 4c. to 4.25c. at mill. Light rails, 25 to 45 lb., $75 to $80; 16 to 20 lb., $80 to $81; 12 and 14 lb., $82 to $83; 8 and 10 lb., $83 to $84; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard Bessemer rails, $38; open-hearth, $40, per gross ton, Pittsburgh.

Tin Plate

Effective July 31, prices on all sizes of terne plate were advanced from $2 to $2.50 per package and are now as follows: 8-lb. coating, 200 lb., $16 per package; 8-lb., coating, I. C., $16.30; 12-lb. coating, I. C., $17.50; 15-lb. coating, I. C., $18.25; 20-lb. coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 4c. to 4.50c. for delivery late this year, and 4.50c. to 5c. from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c., railroad test bars, 5.25c. in carload and larger lots f.o.b mill.

Wrought Pipe

The following discounts on steel are to jobbers for carload lots on the Pittsburgh basing card in effect from May 1, 1917, all full weight, except for LaBelle Iron Works and Wheeling Steel & Iron Co., which quote higher prices, and National Tube Co., which adheres to card of April 1.

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	42	15½	⅛ and ¼	23	+4
½	46	31½	⅜	24	+3
¾ to 3	49	35½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	42	29½	2	26	12
2½ to 6	45	32½	2½ to 6	28	15
7 to 12	42	28½	7 to 12	25	12
13 and 14	32½	..			
15	30	..			

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	38	20½	⅛, ¼ and ⅜	22	5
½	43	30½	½	27	14
¾ to 1½	47	34½	¾ to 1½	33	18
2 to 3	48	35½			

Lap Weld, extra strong, plain ends

2	40	28½	2	27	14
2½ to 4	43	31½	2½ to 4	29	17
4 to 6	42	30½	4½ to 6	28	16
7 to 8	38	24½	7 to 8	20	8
9 to 12	33	19½	9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

Nominal discounts on less than carload lots, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap-Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in.	28	1¾ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3¼ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in.	No quotations
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths. Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net or 2 per cent discount in 10 days:

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer

	Cents per lb.
Nos. 3 to 8	8.00 to 8.50
Nos. 9 and 10	8.25 to 8.50
Nos. 11 and 12	8.50 to 8.75
Nos. 13 and 14	8.75 to 9.00
Nos. 15 and 16	9.00 to 9.25

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	8.30 to 8.80
Nos. 22 and 24	8.35 to 8.85
Nos. 25 and 26	8.40 to 8.90
No. 27	8.45 to 9.00
No. 28	8.50 to 8.95
No. 29	8.55 to 9.05
No. 30	8.65 to 9.15

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11	8.50 to 9.00
Nos. 12 and 14	8.60 to 9.10
Nos. 15 and 16	8.75 to 9.25
Nos. 17 to 21	8.90 to 9.40
Nos. 22 and 24	9.05 to 9.55
Nos. 25 and 26	9.20 to 9.70
No. 27	9.35 to 9.85
No. 28	9.50 to 10.00
No. 29	9.75 to 10.25
No. 30	10.00 to 10.50

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	7.80 to 8.30
Nos. 17 to 21	7.85 to 8.35
Nos. 22 to 24	7.90 to 8.40
Nos. 25 to 27	7.95 to 8.45
No. 28	8.00 to 8.50
No. 29	8.05 to 8.55
No. 30	8.05 to 8.55
Nos. 30½ and 31	8.10 to 8.60

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York		Tin,	Lead		Spelter	
		Electro-	New	New	St.	New	St.
Sept.	Lake	lytic	York	York	Louis	York	Louis
26	23.50	23.50	61.75	7.95	7.82½	8.50	8.25
27	23.50	23.50	61.62½	7.95	7.82½	8.50	8.25
28	23.50	23.50	61.25	7.95	7.82½	8.37½	8.12½
29	23.50	23.50	....	7.95	7.82½	8.37½	8.12½
Oct.							
1	23.50	23.50	60.50	7.95	7.82½	8.37½	8.12½
2	23.50	23.50	60.50	7.95	7.82½	8.37½	8.12½

NEW YORK, Oct. 3.

The metals are dull and featureless. Copper is dead and nominal. Tin is inactive and lower. Lead is quiet and steady. Spelter is again in poor demand. Antimony is unchanged.

New York

Copper.—Buying of copper is at a standstill. Producers generally are disinclined to enter upon contracts with ordinary domestic consumers at the Government price of 23.50c. until it is known how much metal the Government and its allies will require. The fixing of a price for copper, which was expected to be a benefit to the market, has thus far resulted in a deadlock. The question as to whether the various grades of copper are all to be governed by the same price is still unsettled. Rumors were current yesterday that many if not all of the perplexing questions which confront the market as a whole would be decided within the next day or so. It is admitted that consumers desiring small lots, particularly from jobbers, are being accommodated at from 26c. to 28c. per lb. We continue to quote the Government price of 23.58c., New York, as nominal for both Lake and electrolytic. The London market has declined and was £125 for spot electrolytic and £121 for futures on Oct. 1.

Copper Averages.—The average price on both Lake and electrolytic copper for the month of September, based on daily quotations in THE IRON AGE, was 24.90c.

Tin.—The entire week has been extremely quiet and there has been considerable complaint because of delayed cables from London, which has decidedly interfered with business. The principal sales of the week were reported to have been made on last Wednesday and Thursday. On the former day 25 tons of December shipment from the Straits was sold at 57.25c. and 25 tons of January shipment at 57.12½c. On Thursday transactions involving about 100 tons were recorded, 25 tons of which were spot metal at 61.62½c. About 50 tons of December-January shipment from the Straits went at 57.35c. On Friday there were a few sales of spot metal at 51.25c. So far this week the market has been duller than at any time, with practically no sales reported up to this morning. A small quantity of spot tin has been pressed for sale at 60.50c., with difficulty experienced in making the transaction. The quotation yesterday was 60.50c., New York, but the entire market is at a standstill. Arrivals including Oct. 2 were 60 tons, with the quantity afloat 4500 tons. Deliveries of tin for September were 5402 tons, of which 2100 tons came from Atlantic ports. Metal in stock and landing Sept. 30 was 2390 tons. The London market has declined in the past few days and now stands at £245 10s. for spot Straits.

Lead.—The lead market is steadier and the downward tendency seems to have been checked. Sellers are apparently anxious for orders, but seem unwilling to make concessions. A modest business has been done at 8c., New York, which is the quotation of the leading interest, but it is reported that concessions have been made on large lots. The quotation in the outside market remains unchanged at 7.95c., New York, and 7.82½c., St. Louis. It is reported that some export sales have been made and it is believed that they are large, but no particulars are available. An interesting explanation of the recent large decline in lead is that pig lead had to come down to at least the present level in order to save the white lead industry because of the reported inroads by substitutes for lead in the manufacture of paint.

Spelter.—Since last week the market has become weaker if anything. The moderately active inquiry and buying which appeared about two or three weeks ago has given place to extreme dullness. Most large producers adhere to the previous quotation of 8.25c., St. Louis, but sales have been made slightly lower at 8.12½c., St. Louis, or 8.37½c., New York, which are now regarded as the quotations. For November-December delivery about ⅛c. to ¼c. higher is asked. On Sept. 27 the Government awarded its contract for 1000 tons of grade B spelter (99.50 per cent zinc) on which competitive bids had been asked. The American Metal Co., the lowest bidder, received the award at 10.67c. Other bids ranged from 11c. to 12.12½c. Early in September the Government fixed 12c. per pound as the price on 2,750,000 lb. of this grade of spelter, but canceled the order in order to buy in the open market. This sale at 10.67c. has weakened rather than strengthened the market. The Government is also asking for bids on 320 tons of prime Western.

Antimony.—The market continues dull. Chinese and Japanese grades are obtainable at 15c. to 15.25c. per pound, New York, duty paid.

Aluminum.—No. 1 virgin metal, 98 to 99 per cent pure, is still quoted at 41.50c. to 42.50c. per pound, New York, but there is no demand and the market is nominal.

Old Metals.—We are quoting copper nominally on the basis of the Government regulation, but it is impossible to purchase heavy crucible copper at less than 26½c. to 27c. per pound. We quote dealers' selling prices as follows:

	Cents per lb.
Copper, heavy and crucible (nominal)	23.50
Copper, heavy and wire (nominal)	23.50
Copper, light and bottoms	22.50 to 23.50
Brass, heavy	18.00 to 18.25
Brass, light	14.00 to 14.25
Heavy machine composition	25.00 to 25.50
No. 1 yellow rod brass turnings	17.25
No. 1 red brass or composition turnings	19.00 to 21.00
Lead, heavy	7.50
Lead, tea	6.50
Zinc	6.50

Chicago

OCT. 1.—There is no real market for copper, although a little is changing hands to satisfy urgent melting needs at prices ranging from 27c. to 29c. Innumerable small consumers find, to their disappointment, that they cannot get the red metal at or near the Government price of 23.50. The fact is that dealers themselves cannot get it at that figure. All of the other metals are correspondingly dull. The demand for old metals is quiet also, despite the natural belief that the scarcity of virgin copper should create a good demand for remelting scrap. We quote as follows: Casting, Lake and electrolytic copper, 27c. to 29c.; tin, carloads, 61.50c.; small lots, 63.50c. to 64.50c.; lead, 8.25c. to 8.50c.; spelter, 8.25c.; sheet zinc, 19c.; antimony, 17c. to 18.50c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 22c.; copper clips, 21.50c.; copper bottoms, 20.25c.; red brass, 21c.; yellow brass, 15.50c.; lead pipe, 6.75c.; zinc, 6.25c.; pewter, No. 1, 35c.; tinfoil, 42c.; block tin, 47c.

St. Louis

OCT. 1.—Non-ferrous metals have been rather quiet during the week and the closing quotations to-day were: Lead, 7.85c. to 7.92½c.; spelter, 8.25c. to 8.37½c.; tin, 62½c.; copper nominal because of the price-fixing situation, which has not been adjusted as to the St. Louis market; Asiatic antimony, 16c. In the Joplin district, ores were rather quiet, zinc blende selling on a range of $65 to $75 per ton, basis of 60 per cent metal, but the bulk of the ore of the Oklahoma section of the district sold around $67.50 and this reduced the average for the week for the district to about $68 per ton. Calamine sold at $35 to $42 per ton, basis of 40 per cent metal, with the average for the week for the district $37 per ton. Lead was rather weak at $90 per ton, and the average for the 80 per cent metal basis was $86 per ton.

IRON AND INDUSTRIAL STOCKS

Tightness of the Money Market Checks Upward Movement of Stocks

NEW YORK, Oct. 3.

Following the gains made the first part of last week after the announcement of prices of iron ore, coke, pig iron and some steel products, the market hesitated and during most of the week the tendency was downward. This was not attributed to any industrial condition, but almost entirely to the tightness of the money market. Getting ready to subscribe for the second great Liberty Loan undoubtedly had an influence on the money market which in turn influenced stocks.

Among the stocks which recorded advances were: Baldwin Locomotive, 1¼, and Bethlehem Steel, 2. Bethlehem Steel, class B, was active and 262,000 shares changed hands, but the quotation remained the same at the end of the week as at the beginning. The leading stocks which recorded losses during the week were American Car & Foundry, 1⅛; American Locomotive, ⅞; American Steel Foundries, 2½; Colorado Fuel & Iron, 1¼; Lackawanna Steel, 2; Pressed Steel Car, 4; Republic Iron & Steel, 1⅝; United States Steel, 1⅛; United States Steel, pref., ½.

The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com..	23½- 25½	Lacka. Steel.....	80⅛- 84
Allis-Chal., pref..	82¼- 84	Lake Sup. Corp..	16 - 17¼
Am. Can, com...	42¾- 47¼	Lima Loco.	55
Am. Can, pref...	101½-102	Lukens, 1st pref.....	100⅞
Am. Car & Fdy., com.	70 - 72¼	Midvale Steel....	50 - 52½
Am. Car & Fdy., pref.	109 -110	Nat.-Acme	32⅜- 32⅞
Am. Loco., com..	60 - 62¼	Nat. En. & Stm., com.	42⅞- 46½
Am. Rad., com.....	295	N. Y. Air Brake.	122 -124½
Am. Ship, com..	90 - 92½	Pressed Stl., com.	60 - 63¼
Am. Steel Fdries.	65 - 67	Pressed Stl., pref.....	100
Bald. Loco., com.	61½- 65½	Ry. Steel Spring, com.	46 - 48
Bald. Loco., pref.	99½-109½	Ry. Steel Spring, pref.	97 - 97⅛
Beth. Steel, com.	95 - 96½	Republic, com. ..	79½- 83¼
Beth. Steel, class B	91¾- 95⅝	Republic, pref.....	100⅞
Case (J. I.), pref.....	80	Sloss, com.	45 - 46
Central Fdy., com.....	40	Sup. Steel	44 - 47
Chic. Pneu. Tool.	61 - 62	Sup. Steel, 1st pref....	100½
Colo. Fuel	44¼- 45¼	Transue-Williams	41 - 41½
Cruc. Steel, com.	69¾- 73½	Un. Alloy Steel.	43¼- 44
Cruc. Steel, pref.	94½- 95	U. S. Pipe, com.....	16½
Gen. Electric....	138 -147	U. S. Steel, com..	107⅞-112⅜
Gt. No. Ore. Cert.	33 - 35¼	U. S. Steel, pref.	115⅝-117⅞
Gulf States Steel	95¼- 99	Va. I. C. & Coke	59 - 60
Int. Har. of N. J., com.	109¾-112	Warwick	9
Int. Har. Corp., pref...	70	Westing. Elec....	45⅝- 47

Dividends

The American Shipbuilding Co., quarterly, 1½ per cent on the common and 1¾ per cent on the preferred, both payable Nov. 1.

The Atlantic Steel Co., quarterly, 1½ per cent and extra 1 per cent, payable Oct. 2.

The E. W. Bliss Co., quarterly, 62½c. and extra $5.62½ on the common and $1 on the preferred, all payable Oct. 1.

The Canadian Crocker-Wheeler Co., Ltd., quarterly, 1¾ per cent on both the common and preferred, payable Oct. 1.

The Chicago Pneumatic Tool Co., quarterly, 1 per cent, payable Oct. 25.

The Lukens Steel Co., quarterly, 1¾ per cent on the first and second preferred, payable Oct. 15.

The National Tool Co., quarterly, 3 per cent on the common and 1¾ per cent on the preferred, payable Oct. 1.

The Otis Elevator Co., quarterly, 1¼ per cent on the common and 1½ per cent on the preferred, payable Oct. 15.

The Pittsburgh Steel Co., quarterly, 2 per cent on the common, payable Oct. 1.

The Scovill Mfg. Co., quarterly, 2 per cent and extra 10 per cent, payable Oct. 1.

The Superior Steel Corporation, quarterly, 1½ per cent on the common, payable Nov. 1.

The Westinghouse Air Brake Co., quarterly, $1.75, payable Oct. 20.

The Westinghouse Electric & Mfg. Co., quarterly, 1¾ per cent on the common, payable Oct. 31, and 1¾ per cent on the preferred, payable Oct. 15.

The Detroit Iron & Steel Co., 2½ per cent and extra 5 per cent on the common, payable Oct. 5.

The Westinghouse Electric & Mfg. Co., Pittsburgh, has begun work in its new airplane department at Swissvale, Pa., on a contract for airplane engines, which is said to amount to $17,500,000. The company is expected to make 600 engines a month. It is announced that the company will also soon manufacture hand grenades for the Government.

LICENSE NOT REQUIRED

Articles Which May Be Freely Exported Except to Territory Specified

WASHINGTON, Oct. 2.—A long list of articles, including many iron and steel products, has been announced by the Exports Administrative Board as not requiring an export license when the foreign destination is other than enemy territory or neutral territory of Europe. This is the first time the board has attempted to list specifically articles which do not require license. Feeling that this negative list, as it might be called, will be of great assistance to our export trade to many foreign countries, the board has announced its intention of keeping it up to date from time to time.

In conjunction with the publication of the list the board made the following announcement:

"The board has determined that under the President's proclamation of Aug. 27, 1917, the following articles do not require an export license at present except when shipped to Albania, Austria-Hungary, that portion of Belgium occupied by the military forces of Germany, Bulgaria, Denmark, her colonies, possessions or protectorates, Germany, her colonies, possessions or protectorates, Greece, Leichtenstein, Luxembourg, the Kingdom of The Netherlands, Norway, Spain, her colonies, possessions or protectorates, Sweden, Switzerland or Turkey (excluding any portion of the foregoing occupied by the military forces of the United States or the nations associated with the United States in the war), or any territory occupied by the military forces of Germany or her allies.

"The board has further determined that if any of these articles are subsequently classified as requiring a license, nevertheless they will in general be allowed to proceed without license when covered by ocean bill of lading or by railroad bill of lading marked 'For Export,' dated on or before the date classified. There may, of course, be some special instances where for certain reasons the embargo will have to be effective immediately, regardless of when the goods were shipped, but these cases will be rare and special attention will be called to them at the time publicity is given to the fact that they have been classified as requiring a license. All future classification lists will give the date of classification and will be given publicity so as to minimize any question in the minds of shippers or carriers as to what articles do and what articles do not require a license."

The list includes the following:

Adding machines, addressograph machinery, agricultural tools, air compressors and parts, automobiles and parts, axes, axles (wagon).

Balata sheets (used for insulating), baling press (steel), ball bearings, barbed wire, bars, iron or steel (except tool steel, high speed steel or alloy steel), bicycle supplies, blades (hacksaw), blowers and parts, boilers (range) for household purposes only, bolts, bolt clippers, brake shoes, builders' hardware.

Calipers, carriage hardware, channel pins, chucks, cobblers' tools, compressors, countersinks, crane chain, cutlery.

Die plates, dredging buckets (iron), driving chain.

Elevator repair parts, elevator machinery, enamel.

Files (except abrasive files), filing cabinets (metal), forges and accessories.

Galvanized wire, galvanized tiller rope, gas machines and fixtures, gas pipe, grate bars, gas tubes, grate bars (locomotive).

Hammers and hatchets, hand power cranes, harvester parts, hinges, hoops, steel, hydrometers, hygrometers.

Injectors, iron band, iron bars, iron castings, iron hose fittings, irons (flat), iron oil separators, iron pipe fittings, iron pipe, iron plates or sheets under ⅛ in. thick, iron rivets, iron valves, iron wire.

Jacks.

Keys.

Lawn mowers, linotype machines and parts, locomotive grate bars.

Machinery: cigarette, knitting, perforating, except for metal, mining, wool cleaning, refrigerating, enameling, braiding (for electrical wire), match making, shoe, winding, paper making, paper box, stump pulling, pharmaceutical, printing, concrete, paper wrapping, washing, sugar, stenciling, filters and parts, duplicating, cotton gin, tobacco, molding; mangle

roller blocks, malleable iron steam pipe fittings, metal fasteners, metal picture frames, metal valves, mills (grist), motorcycles.

Nails, nail wire, needles and awls.

Pipe (galvanized), plows, precision tools (hand), printing machinery, printing presses, pump jacks, pyrometers.

Radiators, rail (steel), railroad cars, railroad picks, range boilers, razor blades, rivets (iron), roofing (galv. iron, including sheets less than ⅛ in. thick).

Saw blades, screws, screw caps, screwdrivers, sewing machines, shears (hand), sheets (iron or steel under ⅛ in. thick), shoes (horse), shovels, slot machines, spark plugs, splice bars, sprockets, steam locomotives, stitching machine wire, stocks and dies, strap iron, surgical instruments, stoves, steel anvils, steel balls, steel bars (except tool steel, high speed steel or alloy steel), steel belt laces, steel (cold rolled), steel cabinets, steel forgings, steel grease cups, steel hanger frames and bearings, steel hoists, steel molding, swings, steel padlocks, steel pipe, steel plates or sheets under ⅛ in. thick, steel pulleys, steel rails, steel sash, steel shaft, steel spring cotters, steel tires for locomotives, steel wire, strap iron, steel wire cloth, steel wheel push cars, strontium bromide.

Taps and dies (if for hand use), tools (carpenters', shoemakers', steamfitters'), track bolts, tractors (farming), trailers (motor), trucks, turnbuckles (except for aircraft), typecases (printers'), typewriters, typewriter parts.

Umbrella ribs and tubes.

Valves, valve gages, gate valves, valve wheels, vises.

Water meters, water heaters, water gates, wheelbarrows, wheel hubs, wheels (car), wire (fencing, plain, cloth, galvanized, netting), wire stitchers, wrenches.

PERSONAL

James A. Morris, formerly in the auditing department of the Brier Hill Steel Co., Youngstown, Ohio, has resigned to accept a position in the auditing department of the Inland Steel Co., Chicago. Mr. Morris was connected with the Inland Steel Co., several years ago, and later he was in the auditing department of the William Tod Co., Youngstown, Ohio, now owned by the United Engineering & Foundry Co., Pittsburgh.

Frank Purnell, in the sales department of the Youngstown Sheet & Tube Co., Youngstown, has accepted a position with the Priorities Committee in Washington, where he will be closely associated with J. Leonard Replogle in the purchase of steel and munitions for the Government.

L. M. Zimmer, formerly in the sales department of the Linde Air Products Co., New York, has been promoted and transferred to the Cincinnati office. The new branch plant of the Linde company in Cincinnati is now in full operation.

Harold A. Robinson, formerly mechanical engineer of the Regal Gasoline Engine Co., Seattle, Wash., has been made superintendent of the company in place of E. E. Funk, who died a month ago.

Charles W. Schneck, who established the Schneck Machine Co., 809-811 St. Paul Avenue, Milwaukee, in 1893, has disposed of the plant and business to the Western Rope & Mfg. Co., Tulsa, Okla., and will take a long rest before resuming active business connections. Mr. Schneck will leave Oct. 15 on an extended tour of the country for the benefit of his health.

Max E. Biefeld, Watertown, Wis., has resigned as assistant manager of the American Malting Co. to become secretary-treasurer of the Otto Biefeld Co., Watertown, boiler and structural works, succeeding the late Richard Biefeld.

Charles Hart of the Delaware River Steel Co., has been elected a director of the Chester National Bank, Chester, Pa.

W. M. Kelly, for the past three years acting general foreman at the erecting shops of the Pennsylvania Railroad, Altoona, Pa., has been appointed resident inspector of trial devices for locomotives and other apparatus in the Philadelphia district, effective Oct. 1.

T. H. Letson, for 17 years sales manager in New York for the American Hoist & Derrick Co., St. Paul, Minn., who on May 1 last severed his connection with that company, has organized the T. H. Letson Co. and opened an office at 50 Church Street, New York, for the handling of hoisting and power machinery and contractors' equipment. Frederick Glander, electrical and mechanical engineer, is associated with Mr. Letson in the new business.

N. C. Walpole, Southern sales manager of the Niles-Bement-Pond Co. and the Pratt & Whitney Co., with offices in Birmingham, Ala., has been granted leave of absence for the duration of the war, and has been commissioned major in the Ordnance Department.

Christian Girl, president of the Standard Parts Co., Cleveland, Ohio, has been appointed by the Government to supervise the construction of the 40,000 Liberty trucks that are to be built for the War Department. He will remain at the head of the Standard Parts Co., but has been given a leave of absence in order to devote his time to Government service.

O. W. Black has been appointed works manager of the Fulton Iron Works Co., St. Louis, to succeed Laurence W. O'Neil, resigned. Mr. Black was for many years associated with the Republic Iron & Steel Co. For the last few years he has been works manager of that company's East Chicago plant, having had prior to that charge of its Mahoning Valley works.

Louis W. Carver, for the past two years purchasing agent for the Chester Shipbuilding Co., Chester, Pa., has become associated with the Purchasing Board of the United States Shipping Board.

Werner Anderson, New England sales agent for the Alden Coal Mining Co, has been recommended and accepted for service in the aviation branch of the U. S. Signal Corps, Mineola, L. I.

H. W. Haggerty, who has had charge of the pig iron and steel sales of Corrigan, McKinney & Co., Cleveland, has been made general manager of sales of that firm and appointments of other department heads have been made as follows: A. J. Sweeney, general manager of transportation; P. H. Owen, purchasing agent, and F. T. McCrackin, manager of the shipping department. The appointments were made to centralize authority in the different departments.

Warren W. Baker, president, and Francis S. Carr, vice-president, Pennsylvania Steel Export Co., Philadelphia, left Wednesday for Vancouver, B. C., from which port they will sail on the steamship Empress of Japan on Oct. 11 for Japan, where they will open a branch office for their company. Mr. Baker will return in January, but Mr. Carr will remain from four to six months. Philadelphia offices of the company will be removed from the Finance Building to the Widener Building.

Samuel A. Benner on his withdrawal as general sales manager of the American Steel Export Co. to become vice-president of the Federal Export Corporation was presented with a gold cigar case by the company and an ebony cane by the employees.

Frank B. Gilbreth, consulting management engineer, Providence, R. I., has been commissioned a major in the ordnance department of the U. S. Army and is to have charge of some features of construction work of the railroad which the United States is to build in France.

Major George D. Babcock, Ordnance, U. S. A., has arrived in Europe where he is in charge of ordnance supplies for the American forces in France. He is on an indefinite leave of absence from the H. H. Franklin Mfg. Co., Syracuse, N. Y., where he was production manager, and in which city he organized a branch of the National Metal Trades' Association.

Theodore L. Wagner, foreman, Stanley Works, New Britain, Conn., has resigned to become superintendent of the Stanford Steel Products Co., Milford, Conn.

John Kenney, who recently resigned at the American plant, Bethlehem Steel Co., Lebanon, Pa., has accepted a position as assistant superintendent of the Standard Iron and Steel Co., Burnham, Pa.

Robinson F. Walter, Lebanon, Pa., has been appointed chief chemist at the Prussiate plant of the Semet-Solvay Co., Cleveland. Mr. Walter is a graduate of Lehigh College, class of 1917.

Dr. Floyd Shaffer, one of the surgeons of the Bethlehem Steel Co. at the Bethlehem, Pa., plant, has been

commissioned a first lieutenant in the Medical Officers' Reserve Corps.

New Company to Make Silico-Manganese and Carbon Electrodes

A new company on the Pacific coast will soon be a producer of silico-manganese and of carbon electrodes. The Pacific Electro Metals Co., located at Bay Point, on San Francisco Bay, announces plans for producing also ferromanganese, ferrotungsten, ferromolybdenum and ferrochromium. The principal alloy made will be silico-manganese, containing 60 per cent manganese, 20 per cent silicon and 20 per cent iron. It is stated that the carbon content will be less than 0.50 per cent, with the sulphur below 0.02 per cent and the phosphorus under 0.025 per cent. This alloy was imported from England previous to the war.

Features of the carbon electrodes which will be produced are that they will be partly graphitized, that they will contain not over 1 per cent of ash and that their current density will be 60 amperes per sq. in. The company states that these will sell at the same price in the Eastern markets as other carbon electrodes.

The initial installation of the plant consist of two 3000-kw. furnaces for the production of silico-manganese and ferromanganese and three 300-kw. furnaces for the production of ferrotungsten, molybdenum and chromium. A third 3000-kw. furnace is to be in operation in January. The present installation at five furnaces will start operations some time between Oct. 15 and Nov. 1. The buildings are of reinforced concrete and the plant, occupying 55 acres, is located at tidewater with facilities of three transcontinental railroads. The Beckman & Linden Engineering Corporation, Balboa Building, San Francisco, is the engineer and manager of the new company.

Machinery Trade to Aid Liberty Loan

The Machinery and Machine Tool Trades Committee of the Liberty Loan Committee of New York has been organized and J. W. Lane, president of the E. W. Bliss Co., Brooklyn, was appointed chairman for Greater New York. Chairman Lane called together the following men to co-operate with him:

Henry Prentiss, president Prentiss Tool & Supply Co., 149 Broadway; George Doubleday, president Ingersoll-Rand Co., 11 Broadway; R. L. Patterson, president American Machine & Foundry Co., 511 Fifth Avenue; C. I. Cornell, treasurer Pratt & Whitney Co., 111 Broadway; Henry Fuller, vice-president Fairbanks-Morse Co., 30 Church Street; John H. Lidgerwood, president Lidgerwood Mfg. Co., 96 Liberty Street; A. J. Babcock, president Manning, Maxwell & Moore, Inc., 119 West Fortieth Street; Norman Dodge, vice-president Mergenthaler Linotype Co., Tribune Building; H. R. Swartz, president Intertype Corporation, 63 Park Row; George J. Low, F. M. Dyer & Co., 24 Broad Street; Charles A. Hirschberg, publicity manager Ingersoll-Rand Co., 11 Broadway.

The committee held its first meeting on Friday, Sept. 28, and elected H. R. Swartz, vice-chairman, and George J. Low, secretary, and appointed Charles A. Hirschberg publicity member. The committee has established headquarters on the sixteenth floor, 334 Fourth Avenue, and manufacturers of machinery and machine tools, as well as their employees, are asked to communicate with the secretary at that address for full information, subscription blanks and other material.

The Bowen Anchor Co. has begun the construction of a new plant at Morton, Pa., for making steel anchors for the United States Government. The following buildings are being erected: Foundry, 90 x 200 ft.; one-story pattern shop, 25 x 75 ft.; two-story office building, 25 x 45 ft. The foundry will be equipped with a 20-ton open-hearth steel furnace and will be prepared to manufacture steel anchors of all sizes. The plant will be in operation about Dec. 1 and 200 men will be employed. George W. Bowen, Swarthmore, Pa., is president of the company, which is capitalized at $500,000.

The Delays in Rifle Manufacture

WASHINGTON, Oct. 2.—The work of standardizing the equipment of the three factories of the Remington and Winchester companies engaged in producing Lee-Enfield rifles for the army, so as to secure a satisfactory percentage of interchangeability of parts, has been completed and the arms are now being delivered at the rate of 1300 per day, and will soon reach a daily rate of several thousand. The Committee on Public Information has issued the following statement prepared by General Crozier, chief of the Ordnance Bureau of the War Department:

"My attention has been called to published reports that there is a shortage of rifles at the cantonments and that three rifle manufacturing concerns have been idle duing the summer when they might have been engaged in manufacturing rifles.

"These arms companies have not been idle, but have been making extensive preparations for turning out a rifle which would give us both a reasonable degree of interchangeability of important parts and uniform ammunition. Two of them have begun deliveries.

"Two days ago the deliveries of these three factories and the two Government ones were 1200 rifles per day. The deliveries now are more than 1300 per day, and the deliveries will progressively increase. The third company, engaged until recently on British contracts, is practically ready to begin deliveries.

"I may also say that whenever a soldier is ready to go to Europe—that is, when he is trained and equipped in every other way—a modern rifle will be ready for him.

"At the outset of the war it was fully recognized and explained that we could pursue two courses—either experience a perfectly endurable delay and produce a rifle with interchangeable parts to use a standard ammunition, or produce rifles more rapidly but without interchangeability of parts and incapable of using a uniform ammunition.

"By waiting two or three months we have not only obtained a one-ammunition rifle, but a rifle with parts which may be interchanged quickly on the battlefields of Europe and which may be turned out by three factories in this country. The Ordnance Bureau is willing to stand on this basis, inasmuch as every soldier will be supplied a rifle of that type when he starts for France.

"There are now at each of the cantonments 5000 rifles suitable for drilling purposes. A rifle to each man is not imperative for purposes of drill, as the companies can drill at different hours. The main thing is to supply rifles when the trained men are ready to leave, and such rifles will be rapidly turned out now by three factories and two Government factories which have equipped themselves during the summer for the work and can supply the rifles in sufficient numbers at the required time."

OBITUARY

HON. NORMAN HALL, aged 88 years, pioneer pig-iron manufacturer, former member of Congress and active for the past half century in the business affairs of Sharon, Pa., died suddenly Saturday, Sept. 29, from heart disease at his home in that city. Mr. Hall was born at Muncy Farms, Lycoming County, Pa., Nov. 17, 1829. He graduated in 1847 from Dickinson College, and in 1851 located at Marietta, Ohio, where he was connected with a blast furnace. He later engaged in iron ore mining at Becks County, Pa. He next became interested with Boyce, Rawle & Co. at Sharon in the operation of the Hall furnace. He was engaged in the iron trade for over 40 years. In 1886 Mr. Hall was elected to Congress from the twenty-sixth district composed of Mercer, Crawford and Butler counties, carrying the district usually Republican on the Democratic ticket.

The Colts Patent Firearms Mfg. Co., Hartford, Conn., is reported to have purchased the Meriden, Conn., plant of the New England Westinghouse Co.

PRODUCTION FALLING.

September Pig Iron Output 3,133,954 Tons.

The Rate was 104,465 Tons a Day Against 104,772 Tons in August.

The rate of pig-iron production fell off slightly in September, the total for the 30 days of that month as reported to THE IRON AGE being 3,133,954 tons, or 104,465 tons a day, as against 3,247,947 tons in August, or 104,772 tons a day. The furnaces of steel companies increased their daily rate but that of merchant furnaces fell off. A large number of furnaces were compelled to blow out in the month and a smaller number blew in, the net loss being 10 furnaces. We estimate the capacity of the 347 furnaces in blast Oct. 1 at 107,250 tons a day, as compared with 110,165 tons a day for the 357 furnaces in blast Sept. 1. The output of ferromanganese increased to 42,235 tons last month as against 39,492 tons for 31 days in August.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from September, 1916, is as follows:

Daily Rate of Pig-Iron Production by Months—Gross Tons

	Steel Works	Merchant	Total
September, 1916	76,990	29,755	106,745
October	81,639	31,550	113,189
November	80,141	30,253	110,394
December	74,264	28,273	102,537
January, 1917	72,394	29,249	101,643
February	65,280	29,193	94,473
March	73,731	31,132	104,863
April	79,031	32,134	111,165
May	77,561	32,677	110,238
June	76,805	32,197	109,002
July	76,440	31,380	107,820
August	71,436	33,336	104,772
September	73,290	31,175	104,465

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces in September and the three months preceding:

Monthly Pig-Iron Production—Gross Tons

	June (30 days)	July (31 days)	Aug. (31 days)	Sept. (30 days)
New York	193,198	194,255	178,841	182,171
New Jersey	14,340	18,990	21,315	25,169
Lehigh Valley	114,465	116,432	111,583	110,418
Schuylkill Valley	94,097	94,578	91,236	75,727
Lower Susquehanna and Lebanon Valley	79,989	84,540	88,295	84,758
Pittsburgh district	651,768	664,456	664,141	638,611
Shenango Valley	171,074	174,614	164,709	140,205
Western Pennsylvania	202,145	215,192	213,731	211,513
Maryland, Virginia and Kentucky	99,238	89,603	83,233	90,466
Wheeling district	125,403	129,689	124,627	118,195
Mahoning Valley	307,829	322,165	300,740	309,570
Central and Northern Ohio	278,396	299,458	272,109	271,519
Hock. Val., Hang. Rk. & S. W. Ohio	60,866	55,186	59,577	62,499
Chicago district	489,780	503,946	503,723	457,330
Mich., Minn., Mo., Wis. Col. and Wash.	118,109	114,952	105,486	108,325
Alabama	234,259	231,738	232,355	222,687
Tennessee and Ga.	35,099	32,644	32,246	24,791
Total	3,270,055	3,342,438	3,247,947	3,133,954

The list of furnaces blown in in September includes one Susquehanna at Buffalo, one Farrell in the Shenango Valley, Punxsutawney in western Pennsylvania, Oriskany (Oct. 1) and one Virginia Iron, Coal & Coke in Virginia, one Bellaire in the Wheeling district, Irondale in Washington and Oxmoor in Alabama. Among furnaces blown out was one Susquehanna at Buffalo; Delaware River, Keystone and one Swede in the Schuylkill Valley; one Colebrook in the Lebanon Valley; one Donora, one Duquesne, one Edgar Thomson and one Monongahela in the Pittsburgh district; Claire and two New Castle in the Shenango Valley; one Bethlehem at Sparrows Point, one Mingo in the Wheeling district, one Wellston in the Hanging Rock district, one Clifton in Alabama, and Cumberland and La Follette in Tennessee.

Production of Steel Companies

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies show the following totals of steel-making iron month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons

	Pig, total production			Spiegeleisen and ferromanganese		
	1915	1916	1917	1915	1916	1917
Jan.	1,115,944	2,251,035	2,244,203	18,041	24,866	38,792
Feb.	1,237,380	2,133,845	1,829,846	13,319	23,877	32,137
Mar.	1,551,082	2,365,116	2,285,430	12,274	29,388	36,563
Apr.	1,584,111	2,316,768	2,370,937	12,337	31,862	39,595
May	1,694,290	2,408,890	2,404,380	13,440	35,844	37,701
June	1,770,657	2,295,784	2,304,155	19,200	38,597	30,829
July	1,949,750	2,306,303	2,369,630	17,854	31,353	43,884
Aug.	2,101,818	2,313,122	2,214,513	27,463	38,338	39,492
Sept.	2,129,322	2,309,710	2,198,705	23,159	29,451	42,235
Oct.	2,281,456	2,530,806	.....	23,992	34,566	.....
Nov.	2,198,459	2,404,210	.....	28,741	44,975	.....
Dec.	2,283,047	2,294,620	.....	25,004	43,470	.....

The Record of Production

Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1913—Gross Tons

	1913	1914	1915	1916	1917
Jan.	2,795,331	1,885,054	1,601,421	3,185,121	3,150,938
Feb.	2,586,337	1,888,670	1,674,771	3,087,212	2,645,247
Mar.	2,763,563	2,347,867	2,063,834	3,337,691	3,251,352
Apr.	2,752,761	2,269,655	2,116,494	3,227,768	3,334,960
May	2,822,217	2,092,686	2,263,470	3,361,073	3,417,340
June	2,628,565	1,917,783	2,380,827	3,211,588	3,270,055
July	2,560,646	1,957,645	2,563,420	3,224,513	3,342,438
Aug.	2,545,763	1,995,261	2,779,647	3,203,713	3,247,947
Sept.	2,505,927	1,882,577	2,852,561	3,202,366	3,133,954
9 mo.	23,961,110	18,237,198	20,296,445	29,041,045	28,794,231
Oct.	2,546,261	1,778,186	3,125,491	3,508,849	.....
Nov.	2,233,123	1,518,316	3,037,308	3,311,811	.....
Dec.	1,983,607	1,515,752	3,203,322	3,178,651	.....
Total, yr.	30,724,101	23,049,752	29,662,566	39,039,356	.....

The figures for daily average production, beginning January, 1910, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1910—Gross Tons

	1910	1911	1912	1913	1914	1915	1916	1917
Jan.	84,148	56,752	66,384	90,172	60,808	51,659	102,746	101,643
Feb.	85,616	64,090	72,442	92,369	67,453	59,813	106,456	94,473
Mar.	84,459	70,036	77,591	89,147	75,738	66,575	107,667	104,882
Apr.	82,792	68,836	79,181	91,759	75,665	70,550	107,592	111,165
May	77,102	61,079	81,051	91,039	67,506	73,015	108,422	110,238
June	75,516	59,585	81,358	87,619	63,916	79,361	107,053	109,002
July	69,305	57,841	77,738	82,601	63,150	82,691	104,017	107,820
Aug.	67,963	62,150	81,046	82,057	64,363	89,666	103,346	104,772
Sept.	68,476	65,903	82,128	83,531	62,753	95,085	106,745	104,465
Oct.	67,520	67,811	86,722	82,133	57,361	100,822	113,189	.....
Nov.	63,659	66,648	87,697	74,453	50,611	101,244	110,394	.....
Dec.	57,349	65,912	89,766	63,987	48,896	103,333	102,537	.....

Diagram of Pig-Iron Production and Prices

The fluctuations in pig-iron production from January, 1909, to the present time are shown in the accompanying chart. The figures represented by the heavy lines are those of daily average production by months of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron at furnace at Chicago. They are based on the weekly market quotations of THE IRON AGE.

Blast Furnace Notes

A second Iroquois furnace at South Chicago, Ill., is now in charge of the Miami Products Co., which will operate it in the production of ferromanganese. The expectation is that the furnace the Miami Products Co. has been operating for some time will be blown out for relining.

The Bird Coal & Iron Co. expects to blow in its furnace at Talladega, Ala., about Nov. 1. The improvements and repairs now under way consist of new trestle work and ore bins, and for the coke ovens new coal bins and conveyors. The boiler plant has been remodeled. By raising the furnace to a height of 80 ft. and by other changes the capacity has been brought up to 200 tons a day. The output of the coal mines will be increased from 150 tons to 700 tons per day. Work at the brown ore and red ore mines will put them in position to supply all the ore needed.

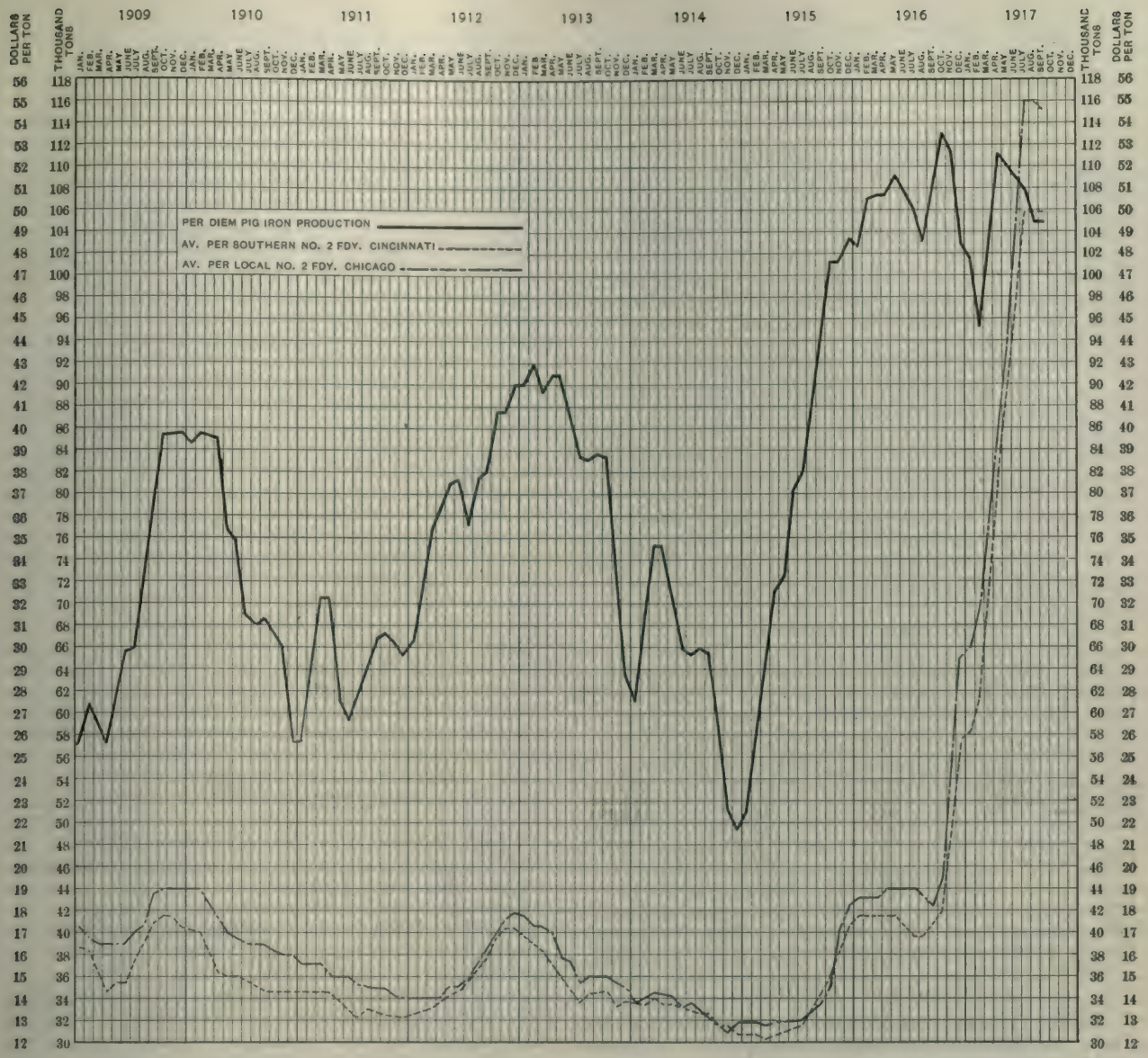


Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from Jan. 1, 1908, to Oct. 1, 1917; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron at Chicago District Furnace

Smoke Prevention Meeting at Columbus

The twelfth annual convention of the National Smoke Prevention Association was held at the Hotel Deshler, Columbus, Ohio, Sept. 25, 26 and 27, President William H. Reid, Chicago, presiding. The attendance was larger than at any previous convention and the discussions on the different papers active. The association passed resolutions recommending that while the United States Government regulates through a fuel commissioner the quantity of fuel allotted to the various industries of the country, "the supply of fuel be further conserved by the appointment of a federal fuel conservator in each State to regulate the consumption and burning of fuel."

The association offers the services of the trained combustion experts employed in the various smoke departments of the country and other combustion expert members of the association to assist in this work of fuel conservation, and it voted that a committee consisting of William H. Reid, president, W. L. Robinson, second vice-president, and W. A. Pittsford, be instructed by the association to confer with the proper government authorities and urge them to take such action as will carry out the spirit of this resolution.

The following officers were elected to serve during the ensuing year: President, William H. Reid, re-elected; first vice-president, Daniel Maloney, Newark, N. J.; second vice-president, W. H. Corbet, Michigan City, Ind., and secretary and treasurer, Frank A. Chambers, Chicago, re-elected. The association will hold its next annual convention at Newark, N. J.

Proposed Merger of Acetylene and Electric Battery Companies

A plan has been submitted to the stockholders for the merging of the National Carbon Co., the Union Carbide Co., Linde Air Products Co. and the Prest-O-Lite Co., into a new corporation with 3,000,000 shares of no-par stock. Under the plans, the new company will be known as the Union Carbide & Carbon Corporation, and will have plants in many parts of the country. The new company will have a large number of products, including calcium carbide, acetylene gas, machinery for gas production, electric batteries and other electric appliances, acetylene blow torches and automobile equipment. Myron T. Herrick, Cleveland, will be chairman of the board of directors; George O. Knapp, now president of the Carbide Co., president; J. S. Crider, Edgar Price and M. J. Carney, vice-presidents; H. E. Hackenberg, secretary, and Giles W. Mead, treasurer and vice-president.

Buildings will be erected seven miles from Jacksonville, Fla., similar to those at Army cantonments, as a training camp for newly appointed officers of the Quartermasters' Corps. The A. Bently Co., Toledo, Ohio, has received the contract for buildings. The camp will cost about $2,300,000.

The foundry of the Morency-Van Buren Brass Co., Sturgis, Mich., was destroyed by fire; loss, $35,000. It will be rebuilt larger than before.

WAR REVENUE BILL PASSED

Income Tax Provisions Follow Closely the Senate Provisions

WASHINGTON, Oct. 2.—The war revenue bill, after three weeks in Conference Committee, has been finally agreed to, the report of the conferees adopted by the House and Senate and the measure will speedily be signed by the President. Practically all the new provisions of the bill of importance to the business community go into effect at once; in fact, the income and excess profits taxes as well as several other levies in the bill are retroactive as to the entire calendar year 1917.

The measure, as it becomes a law, will raise approximately $2,600,000,000, or a full billion dollars more than the draft as originally reported by the Finance Committee. The House members of the conference scored heavily over the Senate conferees, raised numerous rates and forced back into the bill many important items stricken out in the Senate. But for the grave emergency facing the country, the Senate would probably have rejected the conference report and compelled the House to compromise many provisions, but in view of the necessities of the Government and of the prospect for further taxation, the Senate leaders have reluctantly decided to accept the House amendments.

The income tax provisions of the bill as agreed to follow closely those of the original Senate measure. In addition to the taxes now in force, a new normal tax of 2 per cent is levied upon all incomes in excess of $1,000 for single persons or $2,000 for married persons. Added to the normal tax are surtaxes which begin with one per cent upon the amount by which the total net income exceeds $5,000 and does not exceed $7,500. The additional surtaxes are as follows: $7,500 to $10,000, two per cent; $10,000 to $12,500, 3 per cent; $12,500 to $15,000, 4 per cent; $15,000 to $20,000, 5 per cent; $20,000 to $40,000, 7 per cent; $40,000 to $60,000, 10 per cent; $60,000 to $80,000, 14 per cent; $80,000 to $100,000, 18 per cent; $100,000 to $150,000, 22 per cent; $150,000 to $200,000, 25 per cent; $200,000 to $250,000, 30 per cent; $250,000 to $300,000, 34 per cent; $300,000 to $500,000, 37 per cent; $500,000 to $750,000, 40 per cent; $750,000 to $1,000,000, 45 per cent; exceeding $1,000,000, 50 per cent.

Corporations will pay an income tax of 4 per cent in addition to the 2 per cent provided by existing law.

The excess profits tax provisions of the revenue bill were completely recast by the Conference Committee. The original project of employing the English system on which to figure the amount of income subject to this tax was practically abandoned and an untried compromise system substituted. Under the plan adopted, the net profits of a corporation for the taxable year are subject to a deduction of from 7 to 9 per cent of the actual invested capital, the exact percentage depending upon the profits during the pre-war period, including the calendar years 1911, 1912 and 1913. A special exemption of $3,000 is also allowed. The profits left after these deductions are subject to the following scale of taxes:

On profits in excess of the deduction but not in excess of 15 per cent of the invested capital for the taxable year, 20 per cent; in excess of 15 per cent and not in excess of 20 per cent, 25 per cent; in excess of 20 per cent and not in excess of 25 per cent, 35 per cent; in excess of 25 per cent and not in excess of 33 per cent, 45 per cent; and in excess of 33 per cent, 60 per cent.

As a concrete illustration of the operation of the excess profits tax, a corporation may be taken having a capital of $100,000, which earned an average of $20,000 per annum during the pre-war period and will earn a similar amount during the calendar year 1917. As the profits of this concern during the pre-war period exceeded 9 per cent, the law will allow a maximum deduction of 9 per cent, which may be taken from the profits of the current year to fix the amount of taxable income. This leaves $11,000 subject to tax less the $3,000 exemption, or $8,000 net. As the earnings for the taxable year 1917 amount to 20 per cent of the capital, this corporation falls within the second "bracket" of the above schedule, which provides a tax rate of 25 per cent and which applied to $8,000 produces a tax of $2,000.

A new feature of the bill as framed by the conferees subjects all professions and occupations as well as every variety of commercial business to the operation of the excess profits tax and it is stipulated that where an individual follows a profession or occupation which does not involve the use of capital, he shall pay a flat rate of 9 per cent of all his earnings in excess of $6,000 per annum. This feature of the bill is counted upon to produce a very large sum which cannot be estimated, as the Government is without any data on the subject. The provision will very materially increase the income tax of every citizen following an occupation of any kind whose earnings exceed the exemption provided.

Important changes were made by the Conference Committee in the schedule of taxes on facilities furnished by public utilities. Under this provision, a tax of 3 per cent is levied upon all amounts paid for the transportation of freight by rail or water, and a tax of one cent for each 20 cents or fraction thereof paid on express packages. Parcel post packages, the postage on which amounts to 25 cents or more, will pay a tax of one cent for each 25 cents or fraction thereof. A rate of 8 per cent is levied upon all amounts of transportation paid by persons by rail or water and in addition a tax of 10 per cent of the amount paid for seats, berths, and staterooms in parlor cars, sleeping cars or on vessels. Telegraph, telephone or radio messages for the transmission of which a charge of 15 cents or more is imposed are subject to a tax of 5 cents each.

The sharp contest between the House and Senate as to the method of taxing the automobile industry was finally decided by the conference by imposing a flat levy of 3 per cent upon the selling price of each car, the tax to be paid by the manufacturer. The House originally fixed this tax at 5 per cent and the Senate eliminated it entirely and adopted a graduated scale of taxes to be paid annually by car owners.

Yachts, pleasure boats, power boats, etc., will pay annual taxes at the rate of 50 cents for each foot of length not over 50 feet, $1 for each foot from 50 to 100 feet, and $2 for each foot over 100 feet. Motor boats of not over 5 tons with fixed engines will pay a flat rate of $5.

The controversy as to the taxing of letters and post cards was settled by the conferees, who adopted the House rate of one cent for each letter or post card regardless of the amount of the postage thereon.

By-Product Coke Ovens in United States

One of the interesting features of the National Exposition of Chemical Industries, held at Grand Central Palace, New York, last week, was a large map in the booth of the H. Koppers Co., Pittsburgh, showing the exact number of by-product coke ovens in the United States and their locations. According to the figures compiled by the H. Koppers Co., the total number of by-product coke ovens in the country is now 10,633, of which 6611 have been built since 1908. The annual coal capacity of these ovens is 50,000,000 tons. The Carnegie Steel Co. is building at its Clairton, Pa., works the largest by-product coke plant in the world, having 640 ovens.

The Exposition occupied three floors of Grand Central Palace and was a striking demonstration of the growth of the American chemical industry during the war. Many foundries making castings for chemical plants had exhibits of their products.

Blast Furnaces Wanted for Export

Inquiries have been received in this country for three blast furnaces which can be dismantled and shipped abroad. Two 120-ton furnaces and one 200-ton furnace are wanted.

The Fertel-Dangler-Wilson Co., Cleveland, has removed its general offices from 308 Literary Road to 517 Schofield Building, that city.

GARY EXTENDS WELCOME

Address to Japanese Commission Vigorously Condemns Germany

At the reception tendered the Imperial Japanese Commission by the city of New York, Sept. 28, Judge Elbert H. Gary, chairman of the Mayor's Citizens Committee, extended a welcome to the distinguished visitors, emphasizing the esteem and good wishes which are entertained by the people of the United States for the people of Japan.

Speaking about the war, Judge Gary said that the United States will measure up to all her obligations in this international crisis. "She is mobilizing all the resources of the country for war purposes," he added. "She can, within three or four years, furnish 15,000,000 men, well trained and fully equipped for battle; and she can, within the same time, provide $100,000,000,000 without crippling her financial strength or interrupting her industrial progress. If necessary, she will do both.

"We have no lives to spare, no money to waste. We would conserve life and property whenever possible within the limits of duty and propriety. But we are happy that, at this particular time, we can be of substantial aid in defense of principles which lie at the foundation of civilization and moral progress. We are serious and sorrowful; yet we are determined and we are not despondent. And we are a united people, almost without exception supporting the President in the endeavor to administer the affairs of Government creditably and impartially. If there are any Americans who, in these days of trouble and peril, are not entirely loyal to our country, or are failing to support the President and his administration, heart and soul, such recalcitrant individuals are and for all time will be, throughout the land, the objects of pity and contempt.

"We insist our ideas are the antitheses of those entertained by the Imperial Government of Germany. If we may rely upon the writings of leading men and the reported performances of the soldiers, apparently approved by the Government, the rulers of the German Empire advocate the doctrine that any aspiration may properly be realized by the exercise of physical power —that might makes right. On the contrary, we believe we are not justified in seeking to acquire anything we desire or need unless the same is supported by the fundamental principles of right and justice.

"Germany proclaims that she is fighting for her life. This is true only in the sense that a bandit is fighting for his life when suddenly overtaken in the attempt to appropriate the property and destroy the life of a law-abiding citizen. Late developments furnish evidence that the Imperial Government of Germany for a considerable period preceding the war was conspiring to violate the rights of weak and inoffensive nations. The tyranny of this enemy of civilization is to be dreaded by the smaller nations; but we have no fear, for we are right and we are strong."

New Departure Field Day

Over 3500 men enjoyed the field day and barbecue of the New Departure Mfg. Co., Bristol, Conn., Sept. 22. The barbecue was the big feature. The New Departure band of 40 pieces and the New Departure chorus of 75 voices entertained with a concert, and there was an interesting flag-raising ceremony. Other features of the field day were a costume parade with five floats and inter-departmental athletic contests, including a ball game and a tug of war. This company is one of the industrial organizations which has been successful in the carrying out of co-operation with its employees and the stimulation of a fine *esprit de corps*.

Motor cylinders for the new Liberty airplane motors will be made of steel tubing. The Ford Motor Car Co., Detroit, is preparing to forge these from the tubing and it is stated expects to be able to turn out the cylinders either rough or finished at the rate of one every five minutes. It is expected that the Ford company will supply a large share of the cylinders in the manufacture of motors.

COMPULSORY WORK LAW

New Maryland Act Attracts Much Attention—Labor Shortage

Country-wide attention is being attracted to Maryland by the new law which compels all men between the ages of 18 and 50 years who are out of employment to register in the Superior Court. The law, which is known as the compulsory work law, is being enforced by George A. Mahone, Baltimore, director of the Compulsory Bureau, and the police. Quite a few arrests have been made, but in most cases the men taken into custody have either gone to work upon being ordered to do so or have produced certificates from their physicians showing that they are physically unfit to work.

One man who refused to accept a position which had been given to him by Director Mahone has been sentenced to 30 days in jail. He has filed an appeal, however. The law will hold until after the war. It was a special war measure passed by the special session of the General Assembly.

Serious Labor Shortage

YOUNGSTOWN, Oct. 2.—As each draft quota leaves Youngstown for Chillicothe, the training camp for the Mahoning county recruits, the labor scarcity prevailing here for some time becomes more acute. With manufacturers paying from $3.30 to $3.50 a day for unskilled labor, men are scarce.

By heroic efforts the mill and blast furnace foremen are managing to keep the plants going, many of the good employees agreeing to work overtime to fill vacancies. In the mill offices many young ladies are taking positions formerly held by young men called into the army service.

News of the Labor World

Effective Oct. 1, the Cambria Steel Co. and the Lorain Steel Co., Johnstown, Pa., have advanced the wages of employees at their steel works 10 per cent. About 15,000 men are affected.

About 800 employees at the Ashley, Pa., shops of the Central Railroad of New Jersey, who declared a strike on Sept. 15, returned to work on Sept. 24.

The United States Lock & Hardware Co., Columbia, Pa., has perfected plans to operate as a co-operative company, with provision for every employee of five or more years' continuous service with the company to become interested in the ownership. At the inception of the plan, about 90 men are affected.

Steel Plant Electrical Engineers' Meetings

The Philadelphia section of the Association of Iron and Steel Electrical Engineers has announced a series of meetings to be held at the Majestic Hotel, Philadelphia, as follows:

Oct. 6—"Automatic Telephony as Applied to Industrial Plants," by Thomas C. Thompson, Automatic Electric Co., Chicago.

Dec. 1—"Some Recent Investigations in Arc Welding," by O. H. Eschholz, research division, engineering department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Jan. 5, 1918—"Electrically Operated Bridges," by John C. Reed and Merwyn J. Hocker, electrical engineers, Bethlehem Steel Co., Steelton, Pa.

Feb. 2, 1918—"Mill Type Transformers," by Harry G. Steele, Pittsburgh Transformer Co., Pittsburgh.

March 1, 1918—"Standardized Mill Table Controllers," by John S. Rowan, Rowan Controller Co., Baltimore.

April 6, 1918—"Electricity as Used in Modern Ship Yards," by C. M. Hensen, chief electrician, ship building plant, Bethlehem Steel Co., Sparrows Point, Md.

May 4, 1918—"The Application of Roller Bearings to Cranes," by P. B. Liebermann, chief engineer, Hyatt Roller Bearing Co., Newark, N. J.

Linn O. Morrow, Nineteenth and Hamilton Streets, Philadelphia, is secretary.

Working Out Prices of Steel Products

(*Continued from page 833*)

or services, or of materials, supplies, or other property of any kind or character; if such agent or employee has any pecuniary interest in such contract or order or if he or any firm of which he is a member, or corporation, joint stock company or association, of which he is an officer or stockholder, or in the pecuniary profits of which he is directly or indirectly interested, shall be a party thereto.

(b) Make or participate in making any recommendations concerning such contract or order to any council, board or commission of the United States or any member or subordinate thereof, without making to the best of his knowledge and belief, a full and complete disclosure in writing to such council, board, commission or subordinate of any and every pecuniary interest which he may have in such contract or order and of his interest in any firm, corporation, company or association being a party thereto. Nor shall he participate in the awarding of such contract or giving of such contract.

"From the foregoing it will be seen," says Director Gifford in promulgating the order, "that in making recommendations regarding contracts or orders, every member, agent or employee interested as defined above, must not only make a written disclosure of his interest to his own committee but also himself disclose such interest in writing to persons or bodies receiving his or his committee's recommendation. Furthermore, the disclosure mentioned in paragraph (b) above must be made whether or not members participate in their committee's recommendations or actions.

"Advising or furnishing information to the director of the Council of National Defense, or the War Industries Board or members thereof does not violate the above quoted section, provided disclosure of interest as herein set out is made, as these bodies are advisory and the members thereof are not contracting officers and do not execute or direct the execution of contracts."

W. L. C.

THE JOBBER'S POSITION

Views of Secretary of American Iron, Steel and Heavy Hardware Association

What may be regarded as an analysis of the steel and iron market situation from the standpoint of the jobber is contained in a circular letter issued by Secretary-treasurer A. H. Chamberlain, Marbridge Building, New York, to the members of the American Iron, Steel and Heavy Hardware Association. In view of the concern shown in some quarters over the position of the middleman in the present era of price fixing, the letter, reprinted in part below, will prove illuminating:

Fixed Prices About Current Mill Average

It is generally agreed that the quotations announced on steel products represent a fair average of the prices recently prevailing on current mill business. In other words, few large or important buyers have had to pay much above the announced prices for material taken into stock except, of course, in the case of special requirements and urgent needs. In studying the distributers' position, it may therefore be assumed that material bought at high prices need not be regarded as raising to any great extent the average cost of stocks on hand. Either it is already placed or the quantity is small and so staple and necessary to working stock that it will readily be disposed of.

Under the conditions which have grown up in the face of the extraordinary special demand now taxing the capacity of mills and factories, it seems hardly probable that protection on material already invoiced or under contract may be expected. It is not unlikely that buyers who have material coming in at higher prices than have been announced are in such need of it that they will be perfectly willing to pay for it and will have no difficulty in selling it at a satisfactory profit. As suggested by THE IRON AGE, "the situation is unlike that of past declines, since buyers who might fail to specify on their contracts cannot now find hungry mills waiting to supply them."

Conditions Tend to Stiffen Jobbers' Prices

No one who is conversant with present conditions at the mills as regards unfilled orders not subject to cancellation, to say nothing of the embarrassments in production arising from transportation difficulties, coal and coke shortage, labor troubles, etc., can possibly look for any general relief in the scarcity of material for months to come. The first general circular issued by the Priorities Committee to all individuals, firms, associations and corporations engaged in the production of iron and steel and in the manufacture of products thereof is summarized in THE IRON AGE, Sept. 27, page 751. It makes very interesting reading and inevitably suggests that jobbers as well as all others purchasing for normal uses are virtually ignored in the calculations and will only come in for what is left after all classes of emergency requirements, including those of England, France, Russia, Italy, Belgium, etc., are fully satisfied. This makes it entirely possible that dearth of available material may easily prevent decline in the value of jobbers' stocks, whatever may be the effect of Government regulation on mill prices.

Numerous attempts to sound the market or purchase at the Government price have proved that leading mills claim that their books are full and they are in no position to accept new business of any kind. I know first hand of a manufacturer requiring 1000 tons of open-hearth steel to complete a Government war order. As soon as the price announcement was made he addressed an inquiry to practically all mills from which the material might be obtained, explaining that he required it immediately for work falling under class A of the Priorities Committee's schedule and asking special consideration and quotations. The best price that could be obtained for service which would in any way satisfy requirements was something over 5c. per pound.

Government Supervision of Labor Seems Necessary

The labor situation is in many respects more critical than ever before in our history. Labor has tasted blood and is virtually running amuck. There seems to be no limit to the demands which employers will be called upon to meet. The contagion has spread to communities removed from centers of industry, where labor conditions have heretofore been almost ideal and comparative freedom from unrest and extortionate demands has always been enjoyed. Some sort of Government supervision or control in this direction will ultimately be more necessary than regulation of prices.

To sum up, while much depends on the ultimate status of unfilled contracts and orders, it seems impossible that the Government prices, so called, can have any effect on merchants' sources of supply before the end of the year or indeed until they are subject to revision under the terms of the announcement. The worst and possibly the only effect from which distributers are likely to suffer is the stampeding of speculative jobbers who, if they would only keep their heads, sit tight and allow the situation to develop in a healthy way, would be able to effect without sacrifice and at a profit the orderly reduction in their stocks which would seem to be only reasonable and conservative. The members of our association should be able to exert a strong influence in this direction.

The Price Situation at Washington

WASHINGTON, Oct. 2.—The general committee of the steel manufacturers, which has heretofore co-operated with the Council of National Defense, is working night and day on a schedule of differentials to be applied to a large number of iron and steel products in a more advanced stage of manufacture than the basic commodities included in the list promulgated on Sept. 24. Every effort is being made to complete this list in time for its promulgation this week, but owing to the difficulties surrounding the work, it may not be published before Oct. 10. The committee is not yet certain as to how far the differentials will follow the ramifications of the industry, but it is probable that they will include prac-

tically every commodity usually quoted in the price current. It is regarded as important to cover all standard articles, but it is not thought to be practicable to include specialties or to carry refinements beyond currently quoted categories.

The committee has before it the category and controlled prices adopted by the British Government and promulgated by the Director of Steel Production, Ministry of Munitions of War, and in making up the differentials will be influenced to some extent by British experience. The British list includes no less than eight different varieties of metallurgical coke ranging in price from £1 5s. 8d. up to £2 3. Blast furnace and foundry coke are subdivided according to the region of production. Forty different varieties of pig iron are quoted in the British list at prices ranging from £4 7s. 6d. up to £9 2s. 7d. Hematite pig iron, for example, is divided into East Coast of four different grades, Scottish of two grades, Welsh of three grades and West Coast of three grades. Derbyshire, Leicestershire and Nottinghamshire pig are divided into five grades, including Nos. 1, 2 and 3 foundry, No. 4 forge and basic.

The British list also includes steel plates, angles, tees and flats, bars, small steel rounds, squares and hexagons, steel joists, rails, sheet and tin-plate bars, blooms and billets for rerolling, relayable rails, steel scrap, bar iron of standard quality in both ordinary sizes and merchant lengths, etc.

It is stated here that the category to be adopted for the United States will probably be even more detailed than the British list and will include practically everything concerning which any important question may arise.

Much interest is being manifested here by representatives of the smaller steel manufacturers in the differentials to be adopted and concerning its policy in the fixing of prices of finished products. Because of the small spread between pig iron and plates there is some anxiety as to whether the whole list of advanced products is to be so favorable for the big integrated concern and so unfavorable for the small manufacturer. Some pressure has been brought to bear upon the committee in connection with the promulgation of differentials, to revise the original list.

Small Producers and Government Business

Considerable speculation is being induged in here as to the distribution of the Government's orders. It has been repeated many times that it is the purpose of the President to prorate orders as broadly as possible and to secure some sort of a contribution from practically every manufacturer in the country. The contention is made, however, that such a general distribution would work great hardship to small producers, and the question is being canvassed as to whether the big concerns will take practically all of the business. There would be little objection to such a plan so far as the small producers are concerned. While it is understood that the differentials to be promulgated, like the original list of basic commodities, will represent prices to be conceded to the United States Government, the Allies and private consumers in this country, the point has been made that in none of the statements thus far issued on this subject has there been any mention of the private consumers of steel products doing business in the allied countries. In discussing this phase of the case, a member of the steel committee suggests that while this class of consumers has not been taken care of it will not prove a very important factor in the present problem for two reasons. In the first place, the steel embargo has cut off a very large proportion of this business and, in the second place, any manufacturer located in one of the allied countries who is doing work related, even in the remotest degree, to the war will be able to secure his steel at the controlled prices by appealing to his government, which will thereupon attend to its purchase. It is regarded as unlikely that any specific ruling will be made to take care of the comparatively small number of private consumers of steel in the allied countries who are unable to invoke the assistance of their respective governments.

W. L. C.

Pittsburgh and Nearby Districts

The Westinghouse Electric & Mfg. Co., East Pittsburgh, has decided to build a malleable iron foundry at its Cleveland plant for supplying hand grenades to the Government. The new foundry will be 160 x 260 ft. and is to be equipped with two 15-ton air furnaces. At present no equipment has been contracted for, but the company expects to place contracts soon. Prack & Perrine, Pittsburgh, have charge of the general engineering details of the new plant.

The American Sheet & Tin Plate Co. is making some additions and improvements to its plant at Leechburg, Pa. These include the erection of a new steel building to replace one of the present buildings housing a sheet mill.

Griffin Mfg. Co., Erie, Pa., manufacturer of steel strap, T and butt hinges, is erecting a steel building with steel sash, etc., the brick facing to be 150 ft. long by 56 ft. wide. The new building will be equipped with modern machinery for making the above named products.

The American Sheet & Tin Plate Co., Pittsburgh, will erect for the benefit of the women employees at its Farrell, Pa., works, a modern welfare building. The structure will be brick, with a frontage of 40 ft. depth of 72 ft., two stories in height and equipped with rest rooms, lockers, showers and a dining room to accommodate more than 100 persons. Electric stoves will be installed in the kitchen.

T. A. Gillespie & Co. of Pittsburgh and New York, have secured two very large contracts from the Carnegie Steel Co., at Pittsburgh. One is for a large pipe line for a distance of about 10 miles to be used for conveying gas from the Koppers by-product coke ovens at Clairton to the Duquesne Steel Works at Duquesne, Pa., where it will be used in the open-hearth furnaces, and also for other purposes. The other contract is for heavy railroad construction work from Clairton, where the Clairton Steel Works are located, to a point on the Union Railroad. This new railroad is to be used for delivering coal to the Koppers by-product ovens at Clairton.

The Kanter Metal Stamping Mfg. Co., of Conneaut, Ohio, has purchased the plant of the National Lamp Works. The deal involves the exchange of a 10-acre tract and the factory valued at about $240,000.

The Modern Tool Co., Erie, Pa., has started work on the erection of a new office building.

The Heppenstall Forge & Knife Co., Pittsburgh, has an inquiry out for a 36-in. or 42-in. double-head vertical boring mill.

Export License Situation

It will be practically impossible for some time to get general shipments for export on tin plate or steel plate, according to C. A. Richards, director of the Bureau of Export Licenses, Washington, D. C., who addressed a meeting held on the morning of Oct. 2 in the Hotel Astor, New York, under the auspices of the Merchants' Association of New York. In these two products, as well as fodder, he claimed, exporters may expect little relief. He explained, however, that an effort is to be made to increase the time allowance within which to take orders to make the material and get it on shipboard. The plan is to allow 90 days instead of 60. It appears that it is not merely sufficient to put the products on cars at works and that 60 days is proving too short a time, particularly on shipments to the Pacific Coast. The headquarters of the bureau are at Washington because of the frequent necessity of conferring with numerous other boards in that city. Only one copy of a license is issued, as it is assumed that the railroads and the mills, for example, will take the word of a shipper of reputation, particularly if he follows up his claim of having a license with a statement of its number.

BUYING BREAKS RECORDS

Machinery Orders Aggregate Millions

Shipbuilding, Airplane, Munitions and Other Industries Engaged on War Equipment Place Unprecedented Business

Machinery and machine-tool business either just closed or about to be closed probably surpasses all precedent. Machine-tool builders report that September was one of the best months in their history, and the large amount of business in sight, which will be placed soon, will undoubtedly make October an equally active month.

The most important buying of the past week was that done by the General Electric Co. for its Erie, Pa., plant, which it is said will aggregate $2,500,000. The General Electric Co. also bought for its other plants. The Erie Forge Co., Erie., is in the market for equipment which may cost $1,500,000, its list including 60 boring and turning lathes for rough boring and turning guns for the Government.

The Crucible Steel Co. of America, Pittsburgh, which has not been a heavy buyer in the machinery market in some time, has sent lists to New York covering a large amount of equipment wanted for shell work for the Government, which, it is understood, will be done in its Harrison, N. J., plant.

The United States Navy Department has invited bids on 61 tools for the Boston Navy Yard, including radial and sensitive drilling machines, engine lathes, boring and turning mills, planers, shapers, etc.

The Federal Shipbuilding Co., New York, which has considerable additional buying to do, is expected to issue lists this week of machine tools and cranes for its yard on the Hackensack Meadows.

The Worthington Pump & Machinery Corporation is buying for its Jeanesville plant at Hazelton, Pa., and its Blake & Knowles plant. R. Hoe & Co., New York, have placed additional orders for tools required for work on gun mounts. Walter Scott & Co., Plainfield, N. J., have bought more tools for building gun carriages. The International Arms & Fuse Corporation, Bloomfield, N. J., is reported to have obtained a Government contract for primers and may require additional equipment. The Nathan Mfg. Co., Flushing, N. Y., has issued a small list. Slocum, Avram & Slocum, Inc., New York, and the F. L. Schmidt Co., New York, are buying a number of tools.

The American International Corporation, which has opened executive and purchasing departments in Philadelphia, has become a big buyer, having placed last week the largest single contract ever given for derricks and hoisting engines, totalling $2,400,000 in value. The American Hoist & Derrick Co., St. Paul, Minn., received the contract, which is for 500 derricks of the stiff-leg type, 5-ton capacity at 80 ft. radius, for shipways, and 500 hoisting engines. This corporation received bids last week on $150,000 worth of pumps and $68,000 worth of air compressors. All of this equipment and still more to be purchased are for the Hog Island ship assembling yard, which it is building and will operate for the Emergency Fleet Corporation. It is now in the market for a large number of locomotive cranes. The Submarine Boat Corporation and the Lackawanna Bridge Co. will also use derricks for shipways at their plant now building on the Newark Meadows. The derricks, it is understood, will be built by the Lackawanna Bridge Co., but the hoisting engines will be bought in the market.

The Merchant Shipbuilding Corporation and the Chester Shipbuilding Co. are closing rapidly for about 90 punch-shop machines which they recently inquired for, 60 for the Bristol plant and 30 for the Chester plant. Considerably more equipment is to be bought by both companies, including power plant equipment, costing $1,000,000 or more, and machines for pipe, blacksmith, machine and woodworking shops. The Merchant Shipbuilding Corporation has closed a contract with the Champion Iron Co., Kenton, Ohio, for five gantry cranes, double trolley, 85-ft. span, 10-ton capacity, and the Chester Shipbuilding Co. has placed with the same company an order for three gantry cranes of the same capacity and span and five shop cranes, three of 5-ton, one 7½-ton and one of 15-ton.

The Fore River Shipbuilding Corporation, Quincy, Mass., is receiving bids for about 45 or 50 cranes, in addition to the large number of machine tools, punching and shearing machinery, hydraulic machinery, etc., for which lists were recently issued. The cranes required for the torpedo boat destroyer building program are mostly of 5 and 10-ton capacity. It is reported that the Fore River Shipbuilding Corporation will build 75 of the 150 destroyers which Secretary of the Navy Daniels' recently reported program provided for.

The Eastern Shore Shipbuilding Corporation, of which R. R. Livingston, 2 Rector Street, New York, is president, has acquired a shipbuilding plant at Sparrows Point, Md., and will erect additional buildings, for which new equipment will be required.

Authorization of the Aircraft Board by Congress is expected to speed up production of aircraft engines. Buying of machine tools by the General Vehicle Co., Long Island City, N. Y., and the Simplex Automobile Co., New Brunswick, N. J., which has been pending for several weeks on account of delay in signing of contracts with the Government, may ultimate at any moment. Purchases by these two companies will aggregate several millions of dollars. The Nordyke & Marmon Co., Indianapolis, which has a contract for 3000 Liberty airplane engines, aggregating $2,700,000, according to latest report, has been buying equipment heavily in the Cleveland market, its order for turret

lathes alone totalling $100,000. The Lincoln Motor Co., Detroit, in which Henry M. Leland and his son are the principal factors, is spending $5,000,000 in Detroit for site, plant and equipment for building Liberty airplane engines.

Detroit manufacturers are reported to hold Government contracts aggregating about $250,000,000 for airplane engines, trucks, munitions and other war equipment. It is announced from that city that the Government will soon let contracts for 40,000,000 rounds of ammunition, a part of which work a Detroit manufacturer is bidding on. The Packard Motor Car Co. is reported to have received additional contracts for motor trucks and passenger automobiles for the Army. The Detroit plant of the American Car & Foundry Co. is reported to have received a large order for artillery vehicles.

The Falls Motor Corporation, Sheboygan Falls, Wis., has taken a large order for motors and parts from the Curtiss Aeroplane & Motors Corporation, Buffalo, N. Y.

Buying in the Cleveland market is particularly active. A considerable portion of the business placed by the General Electric Co. for its Erie, Pa., plant, as above mentioned, went to Cleveland machine-tool builders, who have also bid on the large requirements of the Erie Forge Co., Erie, Pa. The Standard Parts Co., Cleveland, has been buying for its various plants, its orders aggregating more than $260,000, the bulk of which is for extensions to its Cleveland Axle plant at Canton, Ohio. The Worthington Pump & Machinery Corporation has given a Cleveland manufacturer an order for about 30 screw machines.

The Bowen Anchor Co., Morton, Pa., which is building a new plant, including an open-hearth furnace, for making steel anchors for the Government, will buy four cranes. The Groton Iron Works, New London, Conn., has asked for bids on three 5-ton cranes for its shipbuilding fabricating shop. The Stone & Webster Engineering Corporation has bought three more cranes for the Watertown Arsenal, making eight in all. The Tacony Ordnance Corporation, Tacony, Pa., is expected to close this week for 14 cranes, for which bids were recently asked. Miscellaneous crane inquiries are numerous, but considerable business is not placed because of far-off deliveries, other means of handling material being sought.

Machine-tool and crane builders do not look for nearby changes in prices as a result of price-fixing of pig iron and steel. It is believed that advances are checked, but recessions are considered improbable, at least until the expiration of existing contracts at higher prices than those which the Government has named.

New York

NEW YORK, Oct. 2.

The Crucible Steel Co. of America, Pittsburgh, which has not been a heavy buyer in the machinery market for some time, is now figuring in the New York market for a large amount of new equipment for Government shell work, which will be done, it is understood, at the Harrison, N. J., plant.

The General Electric Co. last week closed large orders for machine-tool equipment for its Erie, Pa., plant, the investment for which, it is reported, will aggregate $2,500,000. The General Electric Co. is also closing for tools for its Schenectady, N. Y., Philadelphia and West Lynn, Mass., plants.

The United States Navy Department is calling for bids on the following machine tools for the Boston Navy Yard: 1 drill, plain, radial, 6-ft.; 1 drill, plain, radial, 5-ft., motor-driven; 2 drills, sensitive, 14-in., single spindle; 2 drills, sensitive, single spindle, high speed, ball bearing; 10 lathes, engine, double back-geared; 8 lathes, engine, quick change, 20 x 12 ft.; 1 lathe, engine, quick change, motor-driven, 16 in. x 8 ft.; 12 lathes, engine, quick change, 16 in. x 8 ft.; 2 lathes, engine, triple-geared, 36 in. x 32 ft.; 1 lathe, engine, geared head, heavy duty, 48 in. x 22 ft.; 2 machines, semi-universal, 4-ft., radial drilling, motor-driven; 1 machine, full-universal, 5-ft., radial drilling; 1 mill, side boring, 36-44 in., motor drive; 1 mill, vertical boring and turning, 62 in.; 1 mill, standard boring and turning, 53-in.; 1 mill, boring and turning, 7-ft.; 1 planer, 24 x 24 in. x 6 ft., with reversing motor drive; 1 planer, 30 x 30 in. x 10 ft., with reversing motor drive; 1 planer, 42 x 42 in. x 12 ft., with reversing motor drive; 1 planer, 96 x 96 in. x 24 ft., with reversing motor drive; 4 presses, drill, upright, back-geared, 32-in. sliding head; 1 shaper, crank, heavy duty, back-geared, 24-in.; 2 shapers, crank, heavy duty, 20-in., 2-piece; 3 shapers, crank, heavy duty, back-geared, 16-in.

The International Arms & Fuse Corporation, Bloomfield, N. J., is reported to have obtained a Government contract for primers, and may require additional equipment. Walter Scott & Co., Plainfield, N. J., who have a Government contract for gun carriages, closed last week for several tools. The bulk of their purchasing was done a few weeks ago. R. Hoe & Co., New York, printing press builders, are to build gun mounts for the Government, and closed last week for additional equipment. The Worthington Pump & Machinery Corporation is buying for its Blake & Knowles plant. The Nathan Mfg. Co. is buying additional tools for its new brass plant at Flushing, Long Island. Slocum, Avram & Slocum, Inc., New York, is buying several new tools. The F. L. Schmidt Co., New York, is in the market for a number of tools for work on envelope machinery.

It is reported in the trade that additional lists of tools to be bought by the Federal Shipbuilding Co., New York, and also a list of cranes to be purchased will be issued this week.

Action by Congress authorizing the Aircraft Board and giving this board full powers will, it is expected, tend to bring out new inquiries for tools for aircraft engines, and purchasing may come soon on the lists recently issued by the General Vehicle Co., Long Island City, N. Y., and the Simplex Automobile Co., New Brunswick, N. J.

The Groton Iron Works, New London, Conn., has invited bids on three 5-ton cranes, with 38, 48 and 58 ft. spans for its fabricating shop. The Stone & Webster Engineering Corporation has placed an order for three cranes for the Watertown Arsenal, making eight in all which have been bought.

The Submarine Boat Corporation and the Lackawanna Bridge Co., which are erecting in co-operation a ship assembling plant on the Newark Meadows for the Emergency Fleet Corporation, will, it is reported, use derricks and hoisting engines for handling material on the shipways. The Lackawanna Bridge Co. may build the derricks. Hoisting engines will be purchased in the market.

The Fore River Shipbuilding Corporation is obtaining bids on 45 to 50 cranes of varous types, mostly of 5 and 10-ton capacity, which will be used in the new shipbuilding plant for torpedo boat destroyers, which this company will build for the Government adjoining its present plant. It is reported that 75 destroyers will be built in the new plant.

The Eastern Shore Shipbuilding Corporation, of which R. R. Livingston, 2 Rector Street, New York, is president, has purchased a shipbuilding plant at Sparrows Point Md., which it will enlarge. New equipment will probably be required.

Marburg Brothers, Inc., 90 West Street, New York, is in the market for a 25 to 35 ft. vertical boring mill, either new or second-hand.

The Hungerford Brass & Copper Co., 80 Lafayette Street, New York, has commenced the erection of a new building at 90-92 White Street.

The Automatic Inserting Machine Corporation, New York, has been incorporated with an active capital of $25,000 to manufacture special machinery for envelope insertion. D. O'Connor, F. W. Hanberg and A. Hartkorn, 299 Broadway, are the incorporators.

Neri & Sitra, Inc., 10 Bridge Street, New York, operating a ship works, has changed its corporate name to the National Ship Corporation.

The Amalgamated Oil-Gas Corporation, New York, has been incorporated with a capital of $600,000 to manufacture gas making machinery. A. F. McCabe, S. C. P. Dodd and A. E. Moore, 37 Wall Street, are the incorporators.

The American Malleables Co., 30 Church Street, New York, has increased its capital from $1,000,000 to $2,000,000.

The L. W. F. Engineering Co., Inc., College Point, L. I., has acquired property in the vicinity of Tenth Street for the erection of additions. It specializes in the manufacture of airplanes, particularly for Government service.

The Greene-Wolf Co., New York, has been incorporated with a capital of $20,000 to manufacture engines, etc. M. J. Baumgarten, D. Greene, and G. W. Wolf, 782 East 175th Street, Bronx, are the incorporators.

Thomas H. Dobbins, New York, and associates, have incorporated in Delaware the Dobbins Core Drill Co. with capital of $250,000 to manufacture drilling machines. Reuben S. Baldwin and Roy T. Guthman, New York, are also interested in the company.

The United States Ship Winch Co., New York, has been incorporated with a nominal capital of $5,000 to manufacture marine machinery. A. A. Schroeder, D. J. Mulqueen and S. J. Joseph, 154 Nassau Street, are the incorporators.

The New York Mitchell Motor Co., New York, has been incorporated with a capital of $100,000 to manufacture automobiles and airplanes. A. Foshay, A. G. Phaanum and R. Goldman, 1190 Madison Avenue, are the incorporators.

The Fifth Avenue Coach Co., 10 East 102nd Street, New York, has filed plans for the erection of a five and seven-story factory, about 400 x 425 ft., on 132nd Street, near Broadway, to cost $1,000,000. It will be used for the manufacture of electric motor buses. Richard W. Meade is president.

The Tuckaway Folding Ladder Co., New York, has been incorporated with a capital of $50,000 to manufacture folding ladders and metal specialties. S. Malin, G. H. A. and W. A. Kohler, 2201 Andrews Avenue, Bronx, are the incorporators.

The Judaline Machine Co., New York, has been incorporated in Delaware with capital of $100,000 to manufacture tin and metal cans and boxes. S. B. Howard, A. W. Britton and J. A. Moore, all of New York, are the incorporators.

The Foxon Graphite Co., Hague, N. Y., is said to be considering the construction of a new plant to cost about $300,000. John Rogers & Co., 25 Broad Street, New York, represent the company.

The Schencke Piano Co., 273 Rider Avenue, New York, is considering the erection of a new three-story plant, about 60 x 90 ft., on 137th Street to cost $75,000.

Taylor's Motor Corporation, New York, has been incorporated with a capital of $100,000 to manufacture automobiles and motor vehicles. E. H. Rodgers and H. R. Worthington, 37 Wall Street, are the incorporators.

The American International Shipbuilding Corporation, New York, has been incorporated with a capital of $2,000,000 at Dover, Del., to operate a shipbuilding works at Hog Island, Philadelphia. J. E. Manter and E. M. Ellsbund, New York, are the incorporators.

The Bureau of Yards & Docks, Washington, D. C., has had plans prepared for the construction of a new power plant at the naval hospital, Brooklyn, N. Y., and will soon call for bids. F. R. Harris, chief.

The Western Electric Co., Chicago, manufacturer of electrical goods, is reported to be planning for the establishment of a new manufacturing plant at New York, to cost about $500,000. It is said that the proposed works will cover over 250,000 sq. ft. Executive offices are at 195 Broadway, New York.

The Jensen Creamery Machinery Co., Long Island City, N. Y., has leased property at 18 Hunters Point Avenue for extensions.

Wilson, Roberts & Monroe, Inc., New York, has been incorporated with a capital of $100,000 to manufacture automobile engines. A. Skillman, A. G. Thaanum and A. Foshay, 120 Broadway, are the incorporators.

The Bennett Wire Co., 13 Park Row, New York, manufacturer of wire, has increased its capital from $15,000 to $75,000.

The New York Dock Co., 44 Whitehall Street, New York, has awarded a contract for the erection of a three-story, reinforced-concrete building, about 53 x 153 ft., on property recently acquired on Furman Street, Brooklyn.

The Belgian-American Mfg. Co., New York, has been incorporated with a capital of $10,000 to manufacture surgical instruments, tools, etc. F. Bloom and A. and V. Anzelowitz, 55 East Eleventh Street are the incorporators.

P. Keller & Co., 465 Greenwich Street, New York, manufacturer of machinery, has changed its name to the Merit Machine Mfg. Corporation.

A. W. Britton and S. B. Howard, 65 Cedar Street, New York, have incorporated in Delaware the Metropolitan Sewing Machine Corporation, with capital of $1,250,000.

The Imperial Slicing Machine Co., New York, has been incorporated with a capital of $12,000 to manufacture slicing machines, etc. J. H. Burnell, A. J. Murray and E. Hemming, 93 Bleecker Street, Brooklyn, are the incorporators.

The Thomas McNamara Co., Brooklyn, N. Y., operating a coppersmithing works at 106 Twenty-fifth Street, has been incorporated with a capital of $10,000. T. D. McNamara, J. Cotter and W. E. Lambden are the incorporators.

The Astoria Casket Co., Astoria, L. I., is building a new plant on Fourth Avenue to cost about $10,000.

The Universal Clutch Co., New York, has been incorporated with a nominal capital of $5,000 to manufacture clutches and machinery. B. F. Dunlap, P. J. Shields and A. O. Hoyt, 511 Fifth Avenue, are the incorporators.

The Lazear-Allen Corporation, New York, has filed articles of incorporation with a capital of $10,000 to manufacture engines, motors, etc. R. F. Allen, E. W. Lazear and F. J. Haas, 916 East 179th Street, are the incorporators.

The Keystone Brass Co., New York, has been incorporated with a capital of $10,000 to manufacture brass, copper and iron specialties. S. L. Cohen, E. A. Alafberg and G. C. Norton, 617 Fifth Avenue, New York, are the incorporators.

The McCoy Iron Works, Seaman Street, Perth Amboy, N. J., has awarded contracts for the erection of a one-story steel fabricating plant, 125 x 400 ft., on Mortimer Street, Utica N. Y., to cost about $10,000.

The Truxtun Motor Sales Co., Syracuse, N. Y., has been incorporated with a capital of $10,000 to manufacture automobile specialties. O. H. Greene, G. M. Wilson and J. H. O'Brien are the incorporators.

The Willys Morrow Co., Elmira, N. Y., manufacturer of aircraft engine parts, has awarded a contract for the construction of a new assembling and testing works on Scott Street, to consist of three one-story buildings, 185 x 360 ft., 120 x 137 ft., and 100 x 120 ft., respectively. The new plant is estimated to cost about $300,000.

The Taylor Instrument Companies, 95 Ames Street, Rochester, N. Y., manufacturer of thermometers, etc., have awarded a contract for the erection of a three-story addition, about 47 x 50 ft.

The Armstrong Rubber Co., Rochester, has been incorporated with a capital of $35,000 to manufacture automobile tires. A. L. Gilman, S. X. Newman and R. C. Schaefer are the incorporators.

The Viking Corporation, Fulton, N. Y., has been incorporated with a capital of $60,000 to manufacture airplanes. H. H. Hunter, C. M. and R. H. Allen, Fulton, are the incorporators.

The Chicago Conduit Co., Fulton, N. Y., has commenced the erection of a new plant.

The Fulton Steel Co., Fulton, has been incorporated with a capital of $120,000 to manufacture iron and steel products. G. C. Warner, H. W. McAteer, and C. W. Elhany, 233 Broadway, New York, are the incorporators.

The General Electric Co., Schenectady, N. Y., has taken bids on revised plans for the construction of a two-story brick and steel drop forge plant, about 85 x 400 ft.

The Inland Barge Co., Monroe, N. Y., has been incorporated with a capital of $500,000 to manufacture submarines and other vessels. J. A. Anderson, C. Baird and J. W. Pillow, 420 West 156th Street, New York, are the incorporators.

The Forsyth Automatic Pump Co., Rochester, N. Y., has been incorporated with a capital of $800,000 to manufacture automatic pumping equipment. G. D. Forsyth, C. W. Mackay and C. W. Gregg, 605 West 112th Street, New York, are the incorporators.

The Willis Bumper Co., Woodcliff, N. J., has been incorporated with a capital of $100,000 to manufacture automobile bumpers. Wilber De Graw, 958 Broadway, Woodcliffe, Thomas Dixon and R. C. Treiling are the incorporators.

The Federal Adding Machine Co., East Orange, N. J., has been incorporated with a capital of $10,000,000 to manufacture adding machines. Gordon Grand, Harry H. Picking, and Charles O. Geyer are the incorporators.

Henry Byrne, 392 Mercer Street, Jersey City, N. J., is having plans prepared for a new one-story machine shop, about 50 x 95 ft., to be erected on State Street at a cost of $8,000.

The Duquesne Aircraft Corporation, Jersey City, has been incorporated in Delaware with capital of $1,000,000, to manufacture airplanes. Pierre S. LeRoux, Jersey City; Nelson Lingard and Thomas Costello, New York, are the incorporators.

The Summit Cutlery Co., Jersey City, has been incorporated with a nominal capital of $4,000 to operate a local plant. Charles H. Bick, 106 Paterson Street, Jersey City; Henry Cohen, 854 180th Street, and Hugo L. Funk, 119 Bleecker Street, New York, are the incorporators.

The Pneumatic Concrete Machinery Co., 65 Fisk Street, Jersey City, has been incorporated with a capital of $75,000 to manufacture concrete mixing and conveying machinery. Allen L. Story, W. A. Kitts, Jr., and Charles R. Allison, all

of New York, are the incorporators. They have also incorporated the Vacuum Ash & Soot Conveyor Co., Jersey City, with $75,000 capital, to manufacture ash and soot conveying machinery.

The B. & S. Tool Co., 288 Davis Avenue, Arlington, N. J., has been incorporated with a capital of $10,000 to manufacture tools and implements. John Bylund, John and A. M. Stranberg, Arlington, are the incorporators.

Philadelphia

PHILADELPHIA, Oct. 2.

The American International Corporation, which is putting up a ship-assembling plant on Hog Island, Philadelphia, for the Emergency Fleet Corporation, has opened executive offices and purchasing department at the Bellevue-Stratford Hotel and will later be located at 142 North Broad Street. It has become one of the largest buyers in the East. A contract was closed last week with the American Hoist & Derrick Co., St. Paul, Minn., for 500 stiff-leg derricks of 5-ton capacity at 80 ft. radius and 500 hoisting engines, the total order aggregating $2,400,000, which is said to be the largest single order for derricks and hoists ever given to one company. Deliveries will be made beginning Dec. 1. The American International Corporation has also received bids and will award contracts soon for $150,000 worth of pumps and about $68,000 worth of air compressors. Punch shop machines, riveting tools, power plant equipment, etc., will also soon be bought. Walter Goodenough, general manager, is in charge of purchasing.

Other shipbuilding companies are also active buyers. The Merchant Shipbuilding Corporation and the Chester Shipbuilding Co., Finance Building, are closing rapidly for punch-shop machines, about 60 being required for the Merchant plant at Bristol and about 30 for the Chester plant at Chester, Pa. Other purchases to be made by these companies will include more than $1,000,000 worth of power plant equipment, including air compressors, generators, converters, coal conveyors, turbines, etc., and machines for pipe, blacksmith, machine and woodworking shops at both plants. The Merchant Shipbuilding Corporation has just bought five gantry cranes with 85 ft. span and double trolley from the Champion Iron Co., Kenton, Ohio, represented by J. N. Kinney, 30 Church Street, New York, and the Chester Shipbuilding Co. has bought three gantry cranes of the same type and five shop cranes from the same company. The shop cranes are equipped with double trolley; there is one 5-ton 85-ft. span crane; two 5-ton with 45 ft. span; one 7½-ton with 60 ft. span and one of 15-ton capacity with 85 ft. span.

The Bowen Anchor Co., which is breaking ground for a steel anchor plant at Morton, Pa., is in the market for four cranes, two of 20-ton capacity with 50 ft. span and two stationary yard cranes of 15-ton capacity with full circle swing. This company will install an open-hearth furnace and is understood to be in the market also for steel-making equipment. Steel anchors will be made for the United States Government.

The Worthington Pump & Machinery Corporation, Jeansville works, is closing for machine tools inquired for some weeks ago, which will be used on a Government shell contract. The General Electric Co. is buying for its Philadelphia plant. The Pennsylvania Railroad Co. is buying for its shops at Altoona, Pa.

The Artillery Fuse, Wilmington, Del., is understood to be making plans for adding additional equipment to take care of a Government fuse contract. This company made time fuses for heavy shells for the Allies. The Eddystone Ammunition Corporation, Eddystone, Pa., is said to be expecting a Government shell order.

The Pearce Rubber Corporation, 932 North Broad Street, Philadelphia, is taking bids for the erection of a two-story plant, about 160 x 225 ft., at Lippincott and Twenty-first Streets, to cost about $150,000. A. L. Pearson is president.

The Philadelphia Electric Co., Philadelphia, has awarded a contract to Stone & Webster, Boston, Mass., for the construction of a new brick, steel and concrete electric power plant at Beach and Palmer Streets, about 400 x 400 ft., estimated to cost, with equipment, $8,000,000.

The United States Government has taken bids for the erection of a three-story primer and artillery planing and riveting shop, 52 x 152 ft., and 25 x 38 ft., at the Frankford Arsenal, Philadelphia.

The Cook Gear Shift Co., Philadelphia, has been incorporated in Delaware with capital of $100,000 to manufacture gear shifting devices. John R. Kearns, C. A. Murphy and M. Hills, Philadelphia, are the incorporators.

The Quaker City Rubber Co., 629 Market Street, Philadelphia, has filed plans for the erection of an addition to its plant at Comly and Milner Streets to cost about $5,000.

The Bureau of Yards & Docks, Washington, D. C., is taking bids until Oct. 8, for the erection of six new buildings at the League Island Navy Yard, Philadelphia, to include a one-story, reinforced-concrete galvanizing plant, 61 x 122 ft.; oxy-acetylene generating plant, 64 x 64 ft., and other structures.

The Cobro Mfg. Co., Philadelphia, manufacturer of hooks and eyes, etc., has acquired the property of Ware Brothers, Vineland, N. J., for the establishment of a new plant.

The Bogart Co. Philadelphia, has been incorporated with a capital of $50,000 to manufacture machinery. K. M. Haun is the principal incorporator.

A one-story shop, 50 x 225 ft., for automobile repair and construction work, to cost about $23,000, will be erected by the Atlantic Refining Co., 3144 Passyunk Avenue, Philadelphia, at Twenty-sixth Street and Oregon Avenue.

The Westinghouse Electric & Mfg. Co. Pittsburgh, Pa., has leased a five-story factory, with about 60,000 sq. ft. of manufacturing space, now in course of erection at 927-31 North Front Street, Philadelphia, for the manufacture of its specialties.

The Fox Auto Radiator Co., Philadelphia, will erect a new factory on Vine, near Thirteenth Street, to cost about $8,500.

The George L. Carroll Co., Philadelphia, has been incorporated in Delaware with capital of $25,000 to manufacture automobiles and motor trucks. George L. Carroll, Alfred F. Brachm, and Harry E. Prutzman, Philadelphia, are the incorporators.

Albert Berry, 6067 Ridge Avenue, Philadelphia, will erect a new one-story shop at Ridge and Leverington Avenues, to cost about $5,000.

The Ajax Rubber Co., Trenton, N. J., will erect a one-story brick and reinforced-concrete addition to its plant on Breunig Avenue.

W. H. Nicholson & Co., 12 Oregon Street, Wilkes-Barre, Pa., manufacturers of machine tools, etc., are building a one-story addition about 50 x 117 ft., at Wood and St. Clements Streets, to cost $15,000.

A one-story power plant, about 30 x 42 ft., to cost $10,000, will be erected by the Maccar Truck Co., Scranton, Pa., at its new plant now in course of construction at Providence Road and Gilligan Street. P. Q. Sylvester is president.

The Scranton Foundry & Engine Works, Hickory Street, Scranton, has received a contract from the Government for a number of marine engines for 3500-ton vessels to be constructed by the Emergency Fleet Corporation. The units will be about 1400 hp. and cost over $50,000 each. The entire contract, it is said, totals $1,000,000. The company is occupying the plant formerly used by the Touhill Iron Works. It has recently increased its capital from $100,000 to $700,000.

The McClave-Brooks Co., Poplar Street and Park Place, Scranton, manufacturer of iron and steel castings, grates, etc., has awarded a contract for the erection of a one-story addition, about 30 x 150 ft., to cost $12,000.

Stanley G. Flagg & Co., Stowe, Pa., manufacturers of pipes and tubing have had plans prepared for the erection of a new one-story brick foundry, about 50 x 170 ft. Headquarters of the company are at 1421 Chestnut Street, Philadelphia.

Hoffman Brothers, York, Pa., operating a pattern works, are planning for immediate extensions to increase the present capacity.

The United States Gauge Co., Sellersville, Pa., manufacturer of gages, etc., is building a two-story addition, 50 x 50 ft. on Clymer Street to cost about $15,000. A new one-story tube and paint shop, about 35 x 85 ft., to cost $6,000, will also be erected.

The Titan Metal Co. Bellefonte, Pa., is planning for the erection of additions to its plant to increase the capacity for the manufacture of bronze rods and kindred specialties, a large portion of which will be for Government service. Construction has begun on a one-story addition, 60 x 260 ft., and plans have been completed for the erection of two other buildings, 50 x 150 ft. and 35 x 125 ft., respectively. It is expected to have the works in operation within 60 days, when employment will be given to more than 400 hands.

The International Motor Car Co., Allentown, Pa., has received a Government order for 1000 motor trucks, each of 8 tons capacity, which, it is said, totals $4,500,000. The work will be handled at the local plant.

The Emerson-Brantingham Co., Waynesboro, Pa., manufacturer of machinery, has received a contract from the Government for the manufacture of gun carriages. The work will be handled at the local plant. The company is planning to manufacture gasoline traction engines in four sizes at the Waynesboro works instead of at its Minneapolis plant, as heretofore, and will employ over 500 additional hands.

Baltimore

BALTIMORE, Oct. 1.

The American Propeller & Mfg. Co., 233-249 East Hamburg Street, Baltimore, Md., will build an addition to its plant.

The Poole Engineering & Machine Co., Woodberry, Md., has awarded a contract for the construction of a gun shop at Texas, Md., to Crowell, Dundhoff & Smith, Cleveland.

The Universal Safety Appliance Corporation, 1518 Warner Street, Baltimore, has been incorporated wilth $100,000 capital stock to deal in safety appliances, mechanical devices, etc. The incorporators are William H. Stout, Edward W. Salmon, Charles Buetefisch and W. Scott Hull.

The large plant of the Crown Cork & Seal Co. at Highlandtown, Md., is nearing completion and probably will be in operation soon. The building is five stories, U-shaped, and covers an area of 30,000 sq. ft. There will be a roof garden for the benefit of the employees.

The Maryland Shipbuilding Co., Lexington Street Building, Baltimore, has commenced the erection of its new shipbuilding plant, which includes shipways, shop buildings, mold plant, sawmills, etc. The company has a capitalization of $1,000,000. Thomas Benson is general manager.

The Baltimore Gas Appliance Co., Bayard and Hamburg Streets, Baltimore, has awarded a contract for the construction of a one-story addition to its foundry.

The Bureau of Yards & Docks, Washington, D. C., is taking bids for additional buildings at the new projectile works for the Government at Charleston, W. Va., estimated to cost about $35,000.

The Richmond Engineering Co., 12 South Eighth Street, Richmond, Va., manufacturer of tanks, stacks, hand forgings and sheet metal products, has awarded a contract for the erection of a new two-story plant to cost about $15,000. Plate, bar and sheet metal equipment and general machinery will be installed. E. W. Farley is president.

The Continental Automatic Sprinkler Co., Richmond, has been incorporated with a capital of $300,000 to manufacture automatic sprinklers. John Adam and William E. Word are the principal incorporators.

The North Carolina Shipbuilding Co., Morehead City, N. C., will erect a shipbuilding plant on property recently acquired. It has secured a Government contract for the construction of several 3500-ton vessels. G. D. Canfield is president.

The Carolina Power & Light Co., Raleigh, N. C., has acquired five new power sites on the Yadkin and Pee Dee rivers, in the vicinity of Badin, for the installation of new electric power plants.

The Hanes Rubber Co., Winston-Salem, N. C., manufacturer of automobile tires, is planning to double the capacity of its plant.

Chicago

CHICAGO, Oct. 1.

Features of unusual interest are lacking in this market. A good steady business is being done in miscellaneous directions with the trade well satisfied. One seller stated that the week has not been as good as the preceding one, but that he would be content if the present level is maintained. Large machines continue to be in heaviest demand.

Builders of machine tools do not look for any change in their prices as a result of the price-fixing events of the past week at Washington. It is believed that advances are checked but recessions are considered most improbable. A few prospective buyers have asked if prices would be lower in view of the pig-iron price having been fixed at $33, but seem satisfied when it is pointed out that high-priced iron will continue to go into machines through the operation of contracts. Incidentally high labor costs will support prices of finished products.

The Buda Co., Harvey, Ill., has started the construction of a manufacturing building, 80 x 260 ft. It has been an active buyer of machine tools of late.

The Inter-Ocean Refining Co., 322 South Michigan Avenue, Chicago, which recently purchased a large tract of land near Lyons, Ill., has had plans prepared for a power house, stills, filter house, kiln, pump house and other buildings. The plant will eventually cost $325,000.

George F. Poulsen, architect, 327 South La Salle Street, Chicago, is taking bids on a machine shop of mill construction, 60 x 180 ft., to be erected in Maywood, Ill., and to cost $15,000.

A contract has been awarded for a one-story and gallery factory, 61 x 180 ft., and a one-story boiler house, 40 x 65 ft., for the Raymond Brothers Impact Pulverizer Co., 1319 North Branch Street, Chicago.

Contracts have been let for the construction of a one-story and basement machine shop, 50 x 96 ft., at 2428 Lowe Avenue, Chicago, for the Octigan Drop Forge Co.

A permit has been issued to the International Harvester Corporation, 606 South Michigan Avenue, Chicago, for the construction of a one-story heat-treating building, 55 x 100 ft., at its works, 2600 West Thirty-first Street, to cost $20,000.

The Illinois Steel Co., South Chicago, will erect a one-story locomotive repair shop, to cost $15,000.

The Chicago Nipple Mfg. Co., Chicago, has increased its capital stock from $50,000 to $200,000.

The Automatic Vending Machine Co., Rock Island, Ill., has been incorporated with a capital stock of $20,000 by W. F. Bradley, S. E. Hamilton and Carl Shields.

The United States Smelting Furnace Co., Belleville, Ill., has been incorporated with a capital stock of $5,000.

The Rock Island Plow Co., Rock Island, Ill., has begun the construction of an addition to its tractor plant which, when completed, will double its capacity.

Work has been started on the $500,000 plant to be erected in East St. Louis, Ill., for the American Mfg. Co. It will employ 1000.

The Electric Machinery Co., Minneapolis, Minn., will double its capacity by constructing an addition, 64 x 122 ft., which is expected will be completed in 90 days. It has a contract for supplying electric generators to the Rock Island Arsenal, Rock Island, Ill.

The Federal Steel & Mfg. Co., Minneapolis, Minn., has purchased 12 acres and will erect a plant to cost about $500,000. The buildings contemplated consist of three machine shops, each 110 x 400 ft., and a foundry, 100 x 125 ft. The company was incorporated with a capital stock of $1,000,000 to manufacture coal briquetting machinery and expects to employ 1000 men. The officers are F. D. McClure, president; F. W. Fernholtz, vice-president and chief engineer; Frank F. Peard, second vice-president; E. G. Fernholtz, treasurer and engineer in charge of construction, and P. S. Van Bloom, secretary.

The Chicago, Burlington & Quincy Railroad, Chicago, is building a new one-story machine shop, about 40 x 120 ft., at Clyde Station, Cicero, Ill., to cost about $50,000.

The Superior Packless Valve Co., Chicago, has been incorporated in Delaware with capital of $250,000, to manufacture valves. W. E. Heagstedt, Benjamin A. Leafgreen and Charles D. Verdier, Chicago, are the incorporators.

Milwaukee

MILWAUKEE, Oct. 1.

Orders for machine-tools, cranes and other metal-working machinery continue to be absorbed by local manufacturers, although deliveries are being pressed further forward by the enormous volume of business already booked. There has been no relief from the high-pressure conditions existing for some time and if anything the situation is less favorable. Local industries are considerably relieved by the fixing of steel prices, which is expected to contribute much to stabilization, and architects are looking forward to increased building activity. Complaint is heard throughout the State that small metal-working shops are suffering from delays in deliveries of raw and finished materials, or their inability to get much-needed supplies. The growing shortage of labor contributes another strong element of uncertainty. Even the general employment of female help is providing only temporary relief, it is stated.

The Western Rope & Mfg. Co., 325-333 Robinson Building, Tulsa, Okla., manufacturer of oil-well machinery and equipment, has purchased the plant and business of the Schneck Machine Co., 809-811 St. Paul Avenue, Milwaukee, and contemplates a total investment of approximately $250,000 in this city. The Schneck shop, which has been doing a jobbing and special machinery business, is being re-equipped for the production of gas engines, boilers, etc., for oil-fields. As soon as practicable, the Western company will erect additions on acreage recently acquired near the former Schneck plant. The Tulsa works will be continued as before, except that they will be gradually enlarged for an increased production of wire rope. B. M. Gessel, general manager of the Western company, expects to spend considerable time in Milwaukee. James K. Bradley has been appointed works manager at Milwaukee.

The Crank Shaft Valve Movement Corporation, Green Bay, Wis., which has been incorporated with an authorized capital

of $300,000, intends to manufacture a gearless internal combustion engine, which has been perfected by Jules Gerard, Green Bay. For the present the company will try to interest automobile manufacturers in the motor and a plant will be established in Green Bay as soon as the volume of business warrants the investment.

The Hamilton Mfg. Co., Two Rivers, Wis., manufacturer of steel type cabinets, printers' furniture, type, etc., has purchased the Chester, Pa., steel furniture plant of the Keystone Type Foundry, Philadelphia, which will retire from business, and has sold its steel type works to the American Type Founders Co. The Chester plant will continue in operation until the Two Rivers factory can be enlarged sufficiently to accommodate the machinery and equipment.

The C. H. & E. Mfg. Co., maker of gas and oil engines and contractors' equipment, has awarded contracts for the erection of a two-story reinforced concrete and brick shop addition, 50 x 100 ft., at Clinton and Mineral Streets. Frank F. Hase is secretary-treasurer.

The Kiel Woodenware Co., Kiel, Wis., has engaged the Thomas S. Watson Co., Majestic Building, Milwaukee, to design improvements and additions to its steam generating plant. Estimates are not yet available.

The Kieckhefer Box Co., Milwaukee, which is executing large contracts for munition containers and other Government supplies, will erect a one-story addition, 190.6 x 217 ft., of reinforced concrete and brick, costing about $50,000. John W. Kieckhefer is president and general manager.

H. E. Welbourne, 662 Seventy-second Avenue, West Allis, has organized the Pioneer Mfg. Co., to manufacture molding machines and other mechanical appliances. A new plant will be erected at Sixty-seventh and Greenfield avenues early in 1918. Plans have not yet been prepared.

Mayer Bros., Antigo, Wis., who purchased the plants of the Pioneer Iron Works and International Hoist Co. about two years ago, and have been specializing in the manufacture of power hammers, have incorporated under the name of Mayer Brothers, Inc., with an authorized capital stock of $25,000. The incorporators are Louis and Lorenz L. Mayer and W. J. Evenson.

The Oshkosh Gas Light Co., Oshkosh, Wis., has engaged William Baehr, consulting engineer, 122 South Michigan Avenue, Chicago, to prepare plans for an electric light plant addition, 90 x 100 ft. William Wallen is general manager.

Edward Aylward, Neenah, Wis., has plans for a new gray iron foundry, 60 x 75 ft., to cost about $15,000 complete.

The Terra Fuel & Machinery Co., Superior, Wis., has been incorporated with a capital stock of $100,000 to manufacture machinery which will produce a fuel from ordinary clay under process discovered by Gustaf Engelbrekt, who with Theodore Meronk and F. J. Christopher, are promoting the new company. The machines are to be sold outright or on a royalty basis. Definite plans for building the machines are now being made.

The Ashland Light, Power & Street Railway Co., Ashland, Wis., will erect a 1200-hp. hydroelectric plant on the falls at the mouth of the Montreal River northwest of Hurley, Wis., on the Wisconsin-Michigan State line. The installation will cost about $100,000. The company owns hydroelectric plants at White River and Mellen, Wis., and has a steam generating plant in Ashland.

The United States Switch Co., Eau Claire, Wis., has closed contracts for a complete forge-shop equipment in Chicago and expects delivery within two or three weeks. The former plant of the Eau Claire Mfg. Co., which has moved into its new shops, is being made ready for the company and it is likely that operations may be put under way by Nov. 1. Shepherd automatic railroad and street railroad switches and Hubbard automatic switch locks will be manufactured.

Detroit

DETROIT, Oct. 1.

War contracts have stimulated the machine-tool business in this district. It is estimated that Detroit is now doing a war business of more than $250,000,000 in motor trucks, air-craft and munitions. Alonzo P. Ewing, newly appointed general manager of the Michigan Copper & Brass Works, states that the Government is about to let contracts for 40,000,000 rounds of ammunition, a large proportion of the metal for which will probably be rolled in this city.

Deliveries on milling machines, grinders and some lines of drilling machines are falling further behind, but those on standard lathes have improved.

More than 40 local manufacturing firms are bidding or intend to bid on Army and Navy supplies and it is expected that the results will stimulate the machine tool market.

Skilled mechanics are difficult to obtain. Wages are high and no labor trouble is anticipated.

The Packard Motor Car Co. is reported to have received another large order for trucks and possenger cars. The Lincoln Motor Co., headed by Henry M. Leland and his son, Wilford C. Leland, who formerly managed the Cadillac Motor Car Co., is reported to have spent more than $500,000 for a site for a new plant. Large orders have been placed for machine tools and approximately $5,000,000 is invested in the new works.

The Jordan & Steele Mfg. Co. is moving from Hastings, Mich., to its new factory at Charlotte, Mich.

The Air-O-Flex Automobile Corporation, Detroit, announces that in addition to the manufacture of 1½-ton trucks, it plans to manufacture a newly patented Air-O-Flex suspension cylinder. G. M. Walker, Jr., is president.

The plant of the Continental Motors Corporation, Muskegon, Mich., will shortly begin manufacturing two sizes of truck motors, designed according to standardized Government specifications. Benjamin F. Tobin, Detroit, is president.

The Fisher Body Corporation, Detroit, has let a contract for a one-story steel factory, 190 x 560 x 23 ft., for its aeroplane division, to cost $200,000.

The Chalmers Motor Co., Detroit, will be operated under the name it has borne for several years and not as a member of the Maxwell Motor Co., which recently took over the organization and plants of the Chalmers company.

The Victor Wire Wheel Co., Kalamazoo, Mich., which is being financed by the industrial committee of the Chamber of Commerce, has nearly completed a new plant.

The Essex Motors Co., Detroit, has been formed by members of the Hudson Motor Car organization, with a paid-in capital of $500,000, and will build a car which will not compete with the Hudson models. W. J. McAneeny is president; R. B. Jackson, vice-president; A. Barit, treasurer, and J. L. Vette, secretary. Roy D. Chapin, president of the Hudson company, is on the board of directors.

The F. W. French Lumber Co., Lansing, Mich., which has branch mills in many parts of the country, has purchased 10 acres in Lansing and will begin at once the erection of a saw mill, veneer works and handle factory.

The American Car & Foundry Co., Detroit, has closed a contract with the Government for 6500 artillery vehicles, amounting to $6,000,000. The order is additional to 10,000 already contracted for, all of which are being manufactured in Detroit.

The Belding Machine Co., Belding, Mich., has been organized with $25,000 capital to manufacture tractors and do general machine work. Henry Upholt heads the company.

The Burroughs Adding Machine Co., has let a contract for a two-story brick and steel power house at Third and York avenues, Detroit.

Cleveland

CLEVELAND, Oct. 1.

The demand for machinery to manufacture motor truck parts and airplane motors has been very heavy the past week. The Standard Parts Co., Cleveland, has purchased more than $260,000 worth of equipment for its various works, the bulk being for extensions to its Cleveland Axle plant, Canton, Ohio. The Nordyke-Marmon Co. is placing orders for a large amount of machinery for the manufacture of Liberty motors, and will also purchase about $100,000 worth of turret lathes. Inquiries from the General Electric Co. and the Erie Forge Co. for their Erie, Pa., plants aggregate about $4,000,000. The latter company, among other equipment, wants 60 boring and turning lathes up to 48 in. for rough boring and turning guns. The list of the General Electric Co. includes a large amount of heavy machinery for Government turbine work, and aggregates about $2,500,000. It is understood that both companies are having considerable trouble in getting machinery for the deliveries wanted. The Worthington Pump & Machinery Corporation has purchased about 30 screw machines from a local manufacturer, and in addition has bought other machine tool equipment. The Templars Motor Co., Cleveland, has purchased about $7 000 worth of equipment for use in assembling automobiles. The demand for turret lathes is very heavy and one manufacturer reports its September business larger than any of the previous three or four months. There is a good volume of scattered buying of various types of machines in small lots.

The Standard Parts Co., Cleveland, will enlarge its Cleveland Axle plant in Canton, Ohio, and has purchased two 7000-lb., two 5000-lb. and two 3000-lb. hammers, six trimming presses, lathes, milling machines and other machine tool equipment, and will rebuild the plant boiler house and

install new boilers. This company will also make extensions to its Hess-Pontiac Spring & Axle plant, Pontiac, Mich., expending about $45,000 for building extensions and $10,000 for equipment. In Toledo it is enlarging its Bock-Bearing plant with an addition of 100 x 225 ft. at an expense of $175,000 and will add about $50,000 in equipment, including special machinery and boiler plant equipment. Its American Ball Bearing plant in Cleveland will be enlarged by the addition of about $50,000 in equipment which will, for the most part, be special machinery.

The Glen. L. Martin Co., Cleveland, recently organized to manufacture airplanes, has elected the following officers: President, C. E. Thompson, president Steel Products Co.; vice-president and general manager, Glen L. Martin; treasurer, S. L. Mather; secretary, C. M. Osborne. In addition to the officers the directors include W. G. Mather, Charles W. Bingham, M. B. Johnson, Alva Bradley and W. D. Turner.

The Browning Co., Cleveland, will shortly place in operation a new foundry in connection with its Mansfield, Ohio, plant.

The Fairmount Tool & Forging Co., Cleveland, has been incorporated with a capital stock of $100,000 by Albert R. Homans and H. O. Gibson, who will be financially interested in the company, and others who will be more active in the management but whose names have not yet been made public. It contemplates acquiring an existing building and to manufacture small forged tools.

Corrigan, McKinney & Co., Cleveland, will build a one-story service building, 32 x 98 ft.

A. P. Schraner will build a two-story pattern shop on Payne Avenue, near East Thirty-third Street, Cleveland, and will purchase some equipment.

The Massillon Foundry & Machine Co., Massillon, Ohio, has placed its new plant on Columbia Heights in partial operation and will gradually move the remainder of its equipment from its old plant to the new quarters.

The Automatic Signal & Sign Co., 409 Rex Avenue, Canton, Ohio., has been incorporated with a capital stock of $10,000 to manufacture signals. P. G. Myers is president and John A. Wertz, secretary-treasurer.

The H. L. Hirsch Mfg. Co., maker of spraying machines, will move its plant from Canton to Greenwich, Ohio, where a new factory, 50 x 200 ft., will be erected.

The Engel Aircraft Co. has taken possession of the plant of the Niles Car & Mfg. Co., Niles, Ohio, upon which it recently secured an option, and will build airplanes. It has a capital stock of $3,000,000. The officers are H. D. Baker, Cleveland, president; A. J. Engel, vice-president and production engineer, and George S. Patterson, treasurer.

The plant of the Humphrey Pipe & Foundry Co., Bellefontaine, Ohio, consisting of three buildings, one of which is occupied by the Kauffman Metal Parts Co., has been purchased by James L. Simpson, Lima, Ohio.

The Defiance Screw Machine Products Co., Defiance, Ohio, has placed a contract with the Toledo Bridge & Crane Co. for the erection of two additional stories on a factory, 50 x 125 ft., built last year.

The Mansfield Pattern Works, Mansfield, Ohio, of which W. J. Neidhart is proprietor, will erect a new two-story plant.

Cincinnati

CINCINNATI, Oct. 1.

A few munitions contracts have recently been quietly booked by local manufacturers. Some of these are sublet, but at least one of importance was placed by the Government direct.

Orders for machine tools are still coming from shipbuilding firms, airplane makers, as well as from the steel mills. The export business is by no means dead, and quite a number of machines are being built for shipment to France. A few of these are for the French Government, but the majority are destined for repair shops that will be maintained by the American Government. Spain continues to take a few small machines.

The local labor supply is fairly satisfactory. The Niles Tool Works Co., Hamilton, Ohio, has not yet obtained a permanent injunction against the labor unions interfering with Government work that it has in hand, but a decision is expected at an early date. The foundry, which is the only branch affected, is still being operated with a reduced force.

The American Tool Works Co., Cincinnati, advises that about 95 per cent of its equipment has been removed to its new plant on Pearl Street, and that the remainder will be installed before the end of the year.

The new plant of the Steel Forging Co., Oakley-Cincinnati, is now in operation. The offices are in the Bell Block Building, Cincinnati.

Further plans of the National Lead Co., Cincinnati, whose proposed improvements were recently noted, include a large power plant.

Breese Brothers, Cincinnati, roofing manufacturers and contractors, are reported to have plans completed for a new plant to be erected on Reading Road, in the Mount Auburn district. Details are not yet available.

The Government is fitting up a repair shop at the Wilbur Wright Aviation Field, Dayton, Ohio. Nearly all the necessary equipment has been installed.

The Robbins & Myers Co., Springfield, Ohio, is increasing its facilities by installing a branch plant in the Shuey Factories Building.

Springfield, Ohio, will open bids Oct. 10 for an 18-in. x 10-ft. engine lathe.

The Wagner Engineering Co., F. A. Wagner, president, Dayton, Ohio, has recently been organized to manufacture cast-iron gears. It advises that it has a process whereby gears can be cast true to pitch and require no machining.

The McCallip Mfg. Co., Columbus, Ohio, has been incorporated with $25,000 capital stock by Wright McCallip and others. The company was formed to continue the business of the late W. W. McCallip and its principal products are wire work and special wire working machinery. Very little extra equipment will be required.

The W. E. Lamneck Co., Columbus, has increased its capital stock from $100,000 to $140,000. No immediate extensions to its furnace fittings plant are contemplated.

The Ohio Tool Co., Columbus, has sold its plant at Charleston, W. Va., and has also disposed of its Columbus factory. The tool manufacturing business will be discontinued.

The J. C. Hearn Machine Works Co., Columbus, has awarded contract for rebuilding its plant recently destroyed by fire. The new shop will be 100 x 150 ft., two stories, of brick and concrete. The company makes a specialty of dies, jigs and machine shop specialties.

The McIntyre Mfg. Co., Columbus, maker of farm tractors, is reported to have plans under way for still further extensions to its plant.

The Baltimore & Ohio Railroad Co. is reported to have made arrangements for the construction of a 12-stall roundhouse at Wellston, Ohio, and a small repair shop.

The S. H. Thomson Mfg. Co., Dayton, has increased its capital stock from $10,000 to $25,000 to take care of the manufacture of a new electrolytic oxy-hydrogen gas generator. Its plant is in the Beaver Power Building.

The Cincinnati Electrical Tool Co., Cincinnati, has removed its machinery from its former location on Evans Street to 1501-1505 Freeman Avenue. The company is increasing its capacity.

Indianapolis

INDIANAPOLIS, Oct. 1.

The General Electric Co., Fort Wayne, Ind., is taking bids for the erection of a six-story brick and concrete addition, 80 x 160 ft. Harris & Richards, Philadelphia, are the architects.

The International Airship Corporation, Gary, Ind., has taken bids for the construction of a new one-story plant, 100 x 500 ft., at Miller, Ind., to cost about $500,000. Offices of the company are at 36 South State Street, Chicago.

The American Car & Foundry Co., Indianapolis, Ind., has commenced the erection of a new foundry on Kentucky Avenue, to cost about $6,500.

Oscar Fox & Co., Fort Wayne, have purchased the Kunkle Valve Works. William Bostick, who has conducted the business since the death of his former partner, William Kunkle, will retire.

The Werra Aluminum Co., South Bend, Ind., has let contract for an addition to its plant.

The Central South

LOUISVILLE, Oct. 1.

Local inquiries for tools and motors continue to increase. The uncertain supply of coal is causing considerable anxiety to manufacturers in this district. Skilled labor in metal working plants is scarce and difficult to obtain.

The Roy C. Whayne Supply Co., Louisville, is in the market for a 9 x 12 or a 10 x 12-in. double-cylinder, double-drum hoisting engine without boiler, and also a single-drum hoist of similar size, both second-hand in good condition.

The Jonesboro Mills, Jonesboro, Tenn., is in the market for a second-hand vertical or horizontal boiler of 35 to 50 hp.

The Knoxville Ice & Cold Storage Co., Knoxville, Tenn., has been incorporated with capital stock of $70,000 by W. R. Griffin, J. P. Roddy, R. H. Gallaher, and others, and will establish a cold storage and ice manufacturing plant.

The William J. Oliver Plow Co., Knoxville, has been incorporated with a capital of $200,000 to manufacture plows and agricultural implements. S. C. House, Asa Hazen and H. F. Armstrong are the incorporators.

The R. S. Hill Co., Louisville, manufacturer of organs, is reported to be planning for the erection of an addition to manufacture airplanes.

J. M. Riley, Williamstown, Ky., is in the market for a second-hand oil engine of 25 or 30 hp.

St. Louis

ST. LOUIS, Oct. 1.

Boyd & Alexander, Jonesville, Miss., will equip a public service electric light and power plant and are in the market for machinery.

Additional equipment to cost about $12,000 will be installed in the power plant at Lumberton, Miss., under the direction of X. A. Kramer, Magnolia, Miss., engineer.

Scooba, Miss., W. S. Carter, clerk, is in the market for about $3,000 worth of electric light plant equipment.

The Armour Car Works, Meridian, Miss., will install equipment to increase the capacity of the plant.

The American Tank Co., Cushing, Okla., has added $40,000 to its capital to purchase additional equipment for its plant.

The Oklahoma Gas Generator Co., Oklahoma City, Okla., has been organized by E. H. Carter, E. E. Blake and E. A. Wales to manufacture gas generators.

The Atlas Welding & Cutting Co., St. Louis, Frank J. Bober, Q. W. Morrison and J. Podmorski interested, will equip a plant for metal welding and cutting operations.

New Orleans, La., will equip a triple section dehydrating, utilization and incinerating plant to cost about $1,250,000. Thomas S. Willis, engineer, is in charge of the work.

The Thompson Fountain Brush Mfg. Co., Kansas City, Mo., has been organized with a capital stock of $60,000 by C. L. Horning, F. H. Denise, and others, to manufacture fountain brushes.

The Fortier Electric Mfg. Co., Tulsa, Okla., has been organized with $50,000 capital to manufacture electric fixtures.

The Automatic Fender & Sales Co., St. Louis, has been organized by Ernest Schober, Walter W. Simpson, and others, to manufacture automatic automobile fenders.

The Vicksburg, Shreveport & Pacific Railroad, Monroe, La., L. B. Berelle, supervisor, will build a 7-stall round house and machine shop, and install electrically driven cranes, locomotive hoist, etc., to cost about $100,000.

Texarkana, Ark., and Texarkana, Tex., will unite in the construction of a sewage disposal plant to cost in excess of $100,000.

The Natchez Mfg. Co., succeeding the Natchez Cotton Mills, will install electric drive in the plant, and is in the market for motors.

The plant of the Triangle Milling Co., North Kansas City, Mo., has been burned with a loss of $80,000 on equipment, which will be replaced.

O. L. Collins & Son, Bank of Commerce Building, St. Louis, are reported in the market for a 100-kw. generating unit for isolated operation.

The Russell Carriage Co., Kansas City, Mo., has purchased a site for the erection of a plant to cost $30,000 to manufacture bodies for passenger automobiles. Frank T. Russell is head of the company.

The Copper Clad Malleable Range Co., St. Louis, Loyd Scruggs, president, will erect furnaces for rust-proofing and black finishing its ranges by the Swan process. Contracts for use of the patents of the Rust Resisting Black Finish Co., Bridgeport, have been closed.

The Mueck Auto Body Co., West Papin Street, St. Louis, has been incorporated with a capital of $30,000 to manufacture automobile pleasure and truck bodies, and wheels. Frank W. Mueck is president and W. Happell vice-president.

The B-B Mfg. & Drilling Co., Kansas City, Mo., has been incorporated in Delaware with capital of $500,000 to manufacture drills, bits, etc. Samuel J. Matthews, Edward L. Scott and A. M. Davis, all of Kansas City, and H. U. Bartlett, Sapulpa, Okla., are the incorporators.

The Alabama Drydock & Shipbuilding Co., Mobile, Ala., will increase the capacity of its plant. Contract has recently been awarded for the construction of two new shipways and auxiliary structures.

The Henderson Shipbuilding Co., Mobile, has recently been incorporated with a capital of $250,000 to build submarine chasers in a plant on Pinto Island. Frank Henderson is president, and W. T. Henderson, vice-president and treasurer.

Texas

AUSTIN, Sept. 29.

The demand for irrigation pumping plants and equipment is unusually heavy, many orders having been received within the last few days from Mexico.

The Dallas Power & Light Co., Dallas, has been incorporated with a capital stock of $150,000. The principal stockholder is Harry M. Durning of New York. Other incorporators are J. F. Strickland, W. D. Head and C. F. Calder, Dallas.

The City Commission, Beeville, has awarded the contract to John S. Fenner for a municipal electric light plant.

The Port Lavaca Channel & Dock Co., Port Lavaca, will construct docks and install facilities for loading and unloading ships.

The Farmers Gin Company, Enloe, will build a cotton gin to cost $16,000. W. L. Dewitt is a stockholder.

F. C. Johnstone, Houston, and Henry Piaggio, Gulfport, Miss., have acquired the foundry of R. P. Clark & Co., Houston, and incorporated the International Marine Iron Works. It is stated that the foundry will be enlarged and equipped to construct marine engines and other machinery for the shipbuilding company, of which Mr. Piaggio is at the head.

The Dallas Southwestern Traction Co. has been granted a franchise to construct an interurban electric railway from Dallas to Irving, a distance of eight miles, which will ultimately be extended to Cleburne, 60 miles.

The Island Transportation Co., Tampico, Mexico, which has been incorporated with a capital stock of $30,000,000, will build an oil refinery and a system of pipe lines. D. A. Ketchum, Charleston, W. Va., is interested.

The Sinclair Gulf Corporation will award the contract soon for the construction of an oil refinery at Houston to cost about $2,000,000. The survey for the plant is now being made. An 8-in. pipe line will be laid from Damon Mound to the refinery.

California

LOS ANGELES, Sept. 25.

The new plant to be constructed by the Cochise Machine Co., Los Angeles, will manufacture air drills and kindred equipment. It has secured a five-acre tract at Broadway and 115th Street and proposes to build extensive works. Contract for the first unit, comprising a machine shop, foundry and forge shop, has been awarded.

The Lilly-Fletcher Co., Los Angeles, has been incorporated with a capital of $20,000 to erect a shipbuilding plant. About five acres on the Wilmington Basin, Los Angeles Harbor, have been acquired. J. B. Lilly, P. B. Fletcher, C. R. Edwards and W. LeRoy Thomas, all of Los Angeles, are the incorporators.

Sudden & Christenson, shipbuilders, San Francisco, have organized the National Shipbuilding Co. to build a shipyard at San Pedro Harbor, Los Angeles. A site has been secured on the East Basin.

The Braun Corporation, 371 New High Street, Los Angeles, manufacturer of assayers' supplies, ore crushers, etc., will erect a new one-story plant, 30 x 115 ft., on East Ninth Street.

The Eby Machinery Co., Los Angeles, removed its offices Oct. 1 from the Central Building to 438 East Third Street. L. M. Meade is manager.

The Universal Electric Connector Co., Los Angeles, has been incorporated with a capital of $20,000 to manufacture electric specialties. L. O. Lieber, R. C. Hamlin and H. G. Holabird, Los Angeles, and R. H. Holabird, Berkeley, are the incorporators.

The Community Mfg. Co., Merritt Building, Los Angeles, has acquired about 20 acres at Burbank and contemplate the erection of a plant to manufacture motor trucks and farm tractors. The initial works will consist of machine shop, forge shop, foundry, assembling plant and office structures. E. G. Judah is president.

The Southern California Edison Co., 120 East Fourth Street, Los Angeles, has been granted permission to build a

new electric power plant on the Kern River to cost about $4,118,000. It will have a total capacity of 30,000 kw.

The Pacific Northwest

SEATTLE, WASH., Sept. 25.

The McAteer Shipbuilding Co. and the National Steel Construction Co., Seattle, have been jointly awarded contract for the construction of a 1200-ton steel ship for the Government, to cost $250,000. The McAteer plant formerly built wooden ships, and a number of new buildings will be erected to convert it into a steel shipbuilding plant, including a two-story boiler shop, 60 x 250 ft., and blacksmith shop. Engines for the vessel will be built in Seattle.

The Supple & Ballin Shipbuilding Co., Portland, will erect a one-story blacksmith shop, and a dock costing $15,000.

T. T. Parker, Portland, plans the establishment of a factory for the manufacture of ship knees for wooden vessels.

The Union Timber & Products Co., Seattle, Wash., has closed contracts for several wooden vessels and work will start at once on its proposed shipbuilding plant at Port Townsend.

The Crandell & Miller Machine Shop, Eugene, Ore., has been moved to Harrisburg, Ore., where new machinery will be installed.

Two additional sections will be added to the roundhouse of the Spokane, Portland & Seattle Railway at Vancouver, Wash., making eight additional engine stalls. One section of the roundhouse will be constructed as a boiler shop and equipped with the latest machinery. John Dickson is superintendent.

The F. S. Lang Mfg. Co., Seattle, stove manufacturer, has recently completed the construction of an addition to its plant and will manufacture portable kitchen outfits for use in the army.

The Mine Machinery Mfg. Co., Seattle, has been incorporated for $100,000 by J. W. Cover and J. R. McKeand to manufacture mine equipment.

The International Shipbuilding Co., St. Helens, Ore., has been incorporated, and will establish a shipyard near that city to build wooden vessels. A machine shop is included in the plans.

Star Machinery, Seattle, recently leased a large tract adjoining its plant on 1731 First Avenue, which it will use to extend operations and provide storage buildings and trackage. Heavy equipment including cranes will be installed. The company specializes in rebuilding machinery.

The Puget Sound Machinery Depot, Seattle, has purchased three acres of land at First Avenue South and Spokane Street, where, it is reported, a plant will be built in the near future. The company occupies leased land and has outgrown its present quarters.

The Elliott Bay Shipbuilding Co., Seattle, has received contracts for several full-powered, ocean-going wooden motor ships for Atlantic coast interests, to cost $1,500,000, which will keep the plant busy for two years. The company was recently incorporated for $250,000, and is a reorganization of the Elliott Bay Yacht & Engine Co. C. O. Morrow is president.

The Christopherson Airplane Co., Seattle, Wash., has been incorporated with capital of $500,000 by Otto H. Oppermann, Willis R. Lebo and Edgar C. Snyder.

The Paterson-MacDonald Corporation, Seattle, has bought the machine shop and boiler equipment of the Shand & Marcus Iron Works, Salem, Ore., which it is moving to the Seattle plant.

The Murphy Timber Co., Portland, will erect a mill near St. Helens, Ore, with a daily capacity of 1,000,000 ft.

The Hawley Pulp & Paper Co., Oregon City, Ore., will erect a pulp mill at a cost of $20,000.

Canada

TORONTO, Oct. 1.

Additions are being made to the plant of the West Lorne Motors, Ltd., West Lorne, Ont. New machinery will be installed as soon as the extensions are completed.

The Simonds Canada Saw Co., Montreal, will make additions to its plant and install new equipment to cost $5,000.

The Imperial Munitions Board, Royal Bank Building, Toronto, has commenced the erection of a building on Wallace Avenue for the construction of aeroplanes, which will give employment to 250 workmen.

The Hesscot Electric Mfg. Co., 210 Adelaide Street West, Toronto, has completed arrangements for the erection of a plant at Tilbury, Ont., to cost $100,000.

A new company in which Senator Lyman A. Holmes, president of the Romeo Founders Co., Port Huron, is interested, will commence constructoin of a plant to cost $200,000 at Sarnia, Ont., for the manufacture of automobile parts, etc.

It is reported that representatives of the Ford Motor Co. of Canada are looking for a site at St. Thomas, Ont., where it proposes to build a plant to manufacture tractors.

The Massey-Harris Co., Brantford, Ont., manufacturer of farm implements, etc., will build an addition to its plant estimated to cost $50,000.

Commissioner Freeman of Lethbridge, Alberta, announces that a steam turbine and generator will have to be purchased without delay to provide power for the increasing load. The new unit will cost $50,000.

C. B. Oliver, Salt Lake City, Utah, who represents the United Filters Co., American Filter Co. and Kelly Filter Press Co., is contemplating the establishing of a plant in the vicinity of Vancouver, B. C., to manufacture filters, or to arrange with some existing machine shop to extend its plant to manufacture the filters.

The Hosmer Stamping & Die Works, Ltd., 831 Dundas Street, Toronto, is in the market for a power press.

The Town Council, Aylmer, Ont., will purchase electrical transmission equipment, motor-driven pumps, etc. D. C. Davis is clerk.

The Tonsmore Truck Co., Ltd., Windsor, Ont., has been incorporated with a capital stock of $100,000 by Edmond D. Girardot, Charles A. Smith, James B. McLeod and others to manufacture automobiles, trucks, accessories, etc.

F. G. Morris, Ltd., Hamilton, has been incorporated with a capital stock of $100,000 by Frederick G. Morris, George W. MacNeill, Thomas R. Sloan and others to manufacture automobiles, trucks, accessories, engines, etc.

The International Harvester Co. of Canada, Ltd., Hamilton, has increased its capital stock from $1,000,000 to $15.-000,000.

The Kerr Engine Co., Ltd., Walkerville, Ont., manufacturer of valves, has leased its iron foundry department to the Standard Foundry & Supply Co., which will supply the Kerr company with all its gray iron castings.

The equipment for the pumping plant at Three Rivers, Que., will consist of three motor-driven centrifugal pumps, with provision for one or two gasoline engine-driven pumps. R. S. & W. S. Lea of Montreal are the engineers.

Walter and Charles McNeil are preparing plans for the erection of a shipyard at New Glasgow, N. S., where wooden ships will be built.

The factory of Gold Metal Furniture Co., Gunnell and Henry Streets, Winnipeg, recently destroyed by fire with a loss of $50,000, will be rebuilt and new equipment will be purchased.

Eugene Gagne will start work immediately on the erection of a hydroelectric plant at Metabetchouan, Que., to cost $40,000. J. A. Claveau, Chicoutimi, Que., is engineer.

The A. R. Whittall Canadian Co., Ltd., 740 Mullins Street, Montreal, is in the market for motors and shafting in connection with the addition to its plant for the manufacture of cans, etc.

The Allied Truck Co., Ltd., Toronto, has been incorporated with a capital stock of $40,000 by John G. Baukat, 21 Sussex Avenue; Charles E. A. Carr, 2 Toronto Street; Frederick W. Burrows, and others, to manufacture motor trucks, automobile engines, motors, etc.

Chapleau Township, Ont., will build an addition to its pumping station and install an electrically-operated pumping unit to cost $6,000.

The Oliver Chilled Plow Works, Hamilton, is in the market for an 18-ft., 300-hp. Heine water tube boiler, 150 lb. pressure, 3½-in. tubes.

The Newfoundland Shipbuilding Co., Harbor Grace, Newfoundland, has had plans prepared by G. F. Payling & Co., 1438 South Penn Square, Philadelphia, Pa., for the erection of a shipbuilding plant at Harbor Grace, to cost $500,000.

The plant of the Welland Machine & Foundries, Ltd., Welland, Ont., was damaged by fire Sept. 22 with a loss of $2,000.

Albert Kleiser & Co., Ltd., Toronto, has been incorporated with a capital stock of $150,000 by Rousseau Kleiser, 6 Wellington Street East, Toronto; William G. Lacy, Alfred W. Frogley and others, to manufacture jewelry, clocks, tools, etc.

The British Columbia Construction & Engineering Co., New Westminster, B. C., will establish shipyards on Poplar Island and build four steamers for the British Munitions Board at a cost of $1,400,000.

THE IRON AGE

New York, October 11, 1917

ESTABLISHED 1855 VOL. 100: No. 15

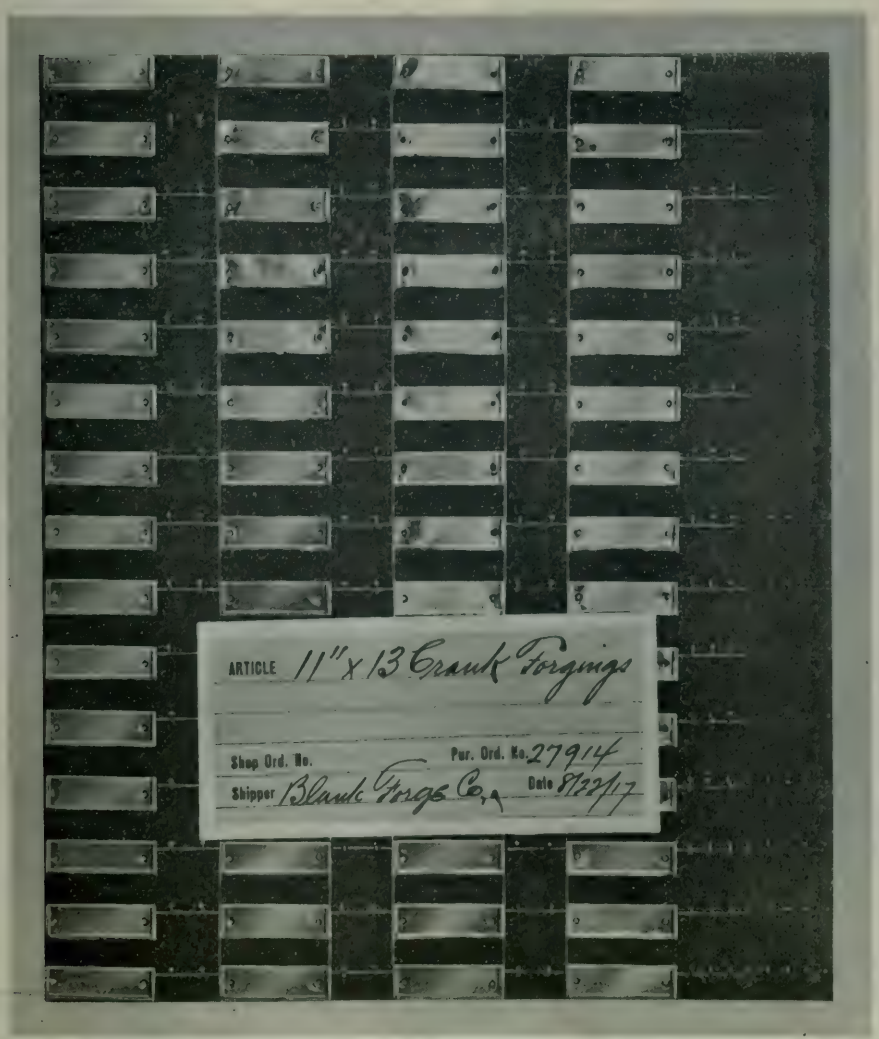
Visualizing Promises of Material Shipments

Details of Scheme Followed by a Purchasing Department to Keep Active the Follow-Up Letters Regarding Belated Deliveries

BY H. A. RUSSELL

UNDER normal conditions steel bars were shipped, if the orders were for regular sizes and specifications, in from four to ten weeks from the date of purchase. Malleable castings would come along in five to eight weeks. Pig iron and coke shipments would be made as specified by the buyer. Furthermore, shipments when made had a happy faculty of coming through in periods which were approximately uniform. The buyer knew the average number of days that a shipment would take from Pittsburgh to Philadelphia, or from Chicago to New York. Nowadays all these good old averages are obsolete. Less-than-carload shipments take much longer to reach their destination in a great many instances. Shipments that check short of a certain number of parts are more in evidence than ever before. All of these delays necessitate closer follow-up of all materials and supplies ordered.

A number of buyers use the card tickler system to keep in touch with promises of shipment of purchased materials. Others keep a list of the important orders before them all the time. In our purchasing department, we fill in a printed slip and place it in one of the cardholders on the promise board here shown. By the color we can tell





Little cards colored for different classes of purchased articles are put in the little pockets and alongside of these on pegs are placed the dates of expected shipments. To the right are pegs for cases in which several dates are set for promised shipments. The smaller board, shown at the right, is employed for holding the non-active signals.

whether the printed slip refers to certain groups of purchases. A yellow slip refers to general orders, such as belting, bolts, valves, pipe and pipe fittings, rivets, etc., also to printed matter. A blue slip covers the various items of steel such as bars, slabs, structural and special sections. A pink slip means that the items specified are either malleable or steel castings.

There are four vertical lines of the cardholders on the promise board and fifteen horizontal lines, so that sixty separate orders can be listed at the one time. In the ordinary factory there will not be more than thirty to forty items that are needed more urgently than the remaining items in the order file. The average here is about thirty, although at times the board has been well filled.

When the buyer is signing the purchase orders he can place a small *x* in the lower left hand corner of the office copy when that particular order is one which it is necessary to follow up closely. The stenographer can then fill out one of the slips of the proper color. When the slips are written out before the copies of the order are filed there can be no possibility of the order being overlooked if the following procedure is given daily attention:

Each morning, after the mail is received and the invoices covering incoming shipments are checked the buyer or his assistant consults the different items on the promise board, making such notations on a scratch pad as will serve the purpose. The memorandum is then given to the stenographer and the copies of all the orders specified on the memorandum are laid on the buyer's desk. The hurry-up and follow-up letters are then dictated and the buyer knows that no important order has been overlooked.

The material covered by certain purchase orders may not be needed very promptly when the order is sent, but later on the situation may change. At the first indication that any item of material is needed ahead of the usual course, a slip is written out and placed on the board.

When a promise of shipment is received, whether by mail, telephone or telegraph, the proper date signals are indicated on the board, on the right hand side of the item in question. It will be noted that there are two brads directly to the right of each cardholder, in the first three vertical columns. When a definite date is specified in the promise of shipment received from the seller, the first brad is used to hold the date signals, but when the promise is not definite both brads are used. For some time past the steel mills, steel and malleable foundries and others have been giving, in a number of instances, promises of shipment which covered a certain period. As an instance we had a promise of shipment covering certain steel castings which read, "We will ship these castings between May 29 and June 5. Under these conditions it is necessary to indicate the minimum and maximum dates.

When the purchase order covers a number of items all of which are needed promptly but which will not all be shipped at the same time, as in the instance of malleable castings, and it is necessary to record the promise of shipment for each item separately, then the fourth column of cardholders is used. Five minimum and maximum dates or ten definite dates may be recorded on the ten brads which are to the right of this row of cardholders.

It is often necessary to order materials from a dozen or more different sources, but all of which cover items needed for one particular customer's order. Without some definite plan to correlate these orders, the buyer may overlook some important item, or at the best it may not arrive at the factory until all the other items have been received, whereas this particular item should have been among the first to have been received. When we place a group of orders for materials and which are all needed for one factory order, the factory order number is placed on each slip and all of the slips are grouped together on the promise board. By this method the buyer can analyze the condition of each order and their relation to each other. Sometimes we use the descriptive name of the job; at other times the customer's name, in grouping the different purchase orders.

When orders are placed for printed matter the board can be used not only for the purchase order for the printed matter, but also for the necessary cuts or halftones, as sometimes the order is placed for catalogues or price lists before all the halftones are received, and unless these are followed up closely there may be a delay in getting out the catalogue or price list. The date the proof was received can also be indicated.

Once a promise is noted on the board it is not changed, even though the day has passed that is indicated by the date signals. When shipment is not made as promised and a further promise is received, then the date signals are changed to correspond with the new promise. When an invoice is received showing that complete shipment has been made, the slip and corresponding date signals are removed from the board. If it is thought advisable, these slips that are taken off the board can be placed on a smaller board and kept there until the shipment is received. This has not been necessary in our case, as a written notification or a copy of the invoice, minus prices, is sent to the production department and to the foreman of the department for which the material is intended when the item is an important one.

The small board, also here illustrated, is suspended along the wall near the promise board. This smaller board holds the non-active date signals. It is 6 in. wide by 20 in. long. The promise board is 28 x 32 in. and painted a dull or flat black. The cardboard tags showing the days of the month are $\frac{5}{8}$ x $\frac{1}{2}$ in. and are placed on the brads when in service over the month tags, which are $\frac{5}{8}$ x $\frac{7}{8}$ in. There is also another set of plain tags. These are $\frac{5}{8}$ x $1\frac{1}{8}$ in. and are used for several purposes. When in use they are placed underneath both of the other tags. Notations can be made on these longer tags as about $\frac{1}{4}$ in. projects below the month tag. Sometimes it is necessary to hold up a purchase order after it has been placed, and the word "hold" can be written on the exposed space. This prevents the possibility of the suspended condition of the order being overlooked. At other times the notation can be made that part of the order will be shipped as per the date above and the balance on the second date.

This system is not only of value to the buyer, but should he be absent for any reason, almost any one in the office could obtain all necessary information regarding the status of important material orders, and also have a complete list of all material orders pertaining to each customer's order, which information might not otherwise be so grouped that it could readily be obtained in the buyer's absence. As we all know, quick action is often needed at unexpected moments.

The war's effect on merchant shipbuilding is to be discussed at a joint meeting of the American Society of Mechanical Engineers and the Engineers' Club of Philadelphia in Witherspoon Hall, Philadelphia, on Oct. 23, by Homer L. Ferguson, president and general manager Newport News Shipbuilding & Dry Dock Co.



CONCRETE HOUSING DEVELOPMENT

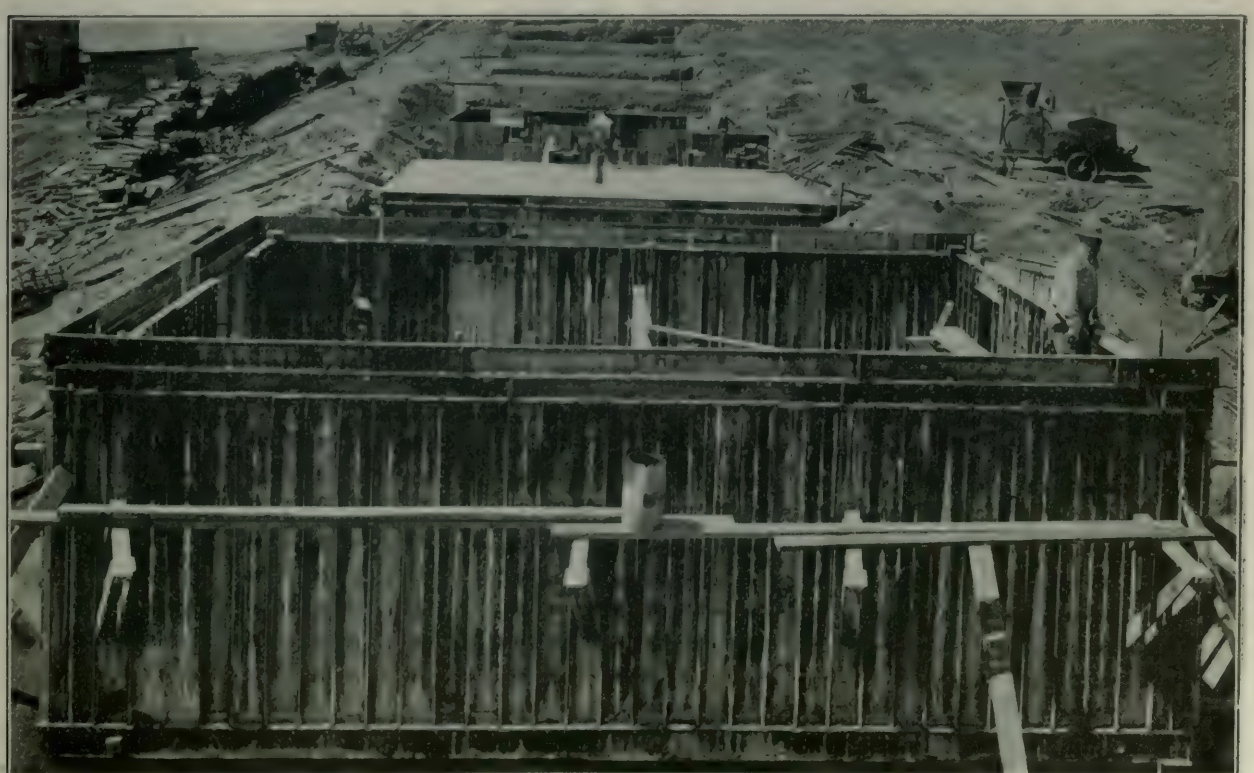
100 Houses Building at Donora for American Steel & Wire Co.

REINFORCED concrete houses to the number of 100 have been built for the American Steel & Wire Co., at Donora, Pa. There are eight different styles, containing some four, some five and some six rooms. Of these, a few are being built in pairs with party walls, and the rest are all detached. Each house has also a bathroom and a full cellar. The site is about 40 miles outside of Pittsburgh and is located on a steep hill above the Monongahela River. The property has been laid out into 156 lots. Grading was done and concrete streets with granolithic sidewalks were laid out by the American Steel & Wire Co. concurrently with the house building, which is being done by the Aberthaw Construction Co., Boston.

The cellars were excavated with a steam shovel, in hard pan and some shale. The walls and floors are of reinforced concrete. The cellar walls are 9 in. thick and the walls of first and second stories 6 in. The buildings were finished at the top with a reinforced concrete cornice in which a gutter was formed, and on top of the concrete ceilings a roof was built up of spruce framing covered with asbestos slate so that the whole of the exterior of the building, with the exception of the window and door frames, is fire resisting. The buildings are all equipped with gas furnaces and cooking ranges, wired for electric lights, and each is fitted with both watercloset and lavatory bowl with hot and cold water. The outside walls are covered with stucco. The concrete is of Universal Portland cement, local sand, and crushed slag, mixed 1:2:5 for cellar walls and street paving and 1:2:4 for the rest of the work.

Steel forms, patented by the Lambie Concrete House Corporation, were used. These consist of 9-in. channels set up vertically and connected together with clips and wedges passed through slotted holes in the flanges. At the corner of the building a 4 x 4-in. steel angle was set up and the forms lined up longitudinally by means of a steel channel used to form a belt course. This not only fastened the forms of the lower floor, but was bolted into the floor reinforcement and remained in place for a support for the second story forms and was only stripped at the last when all the concrete was poured. The steel wall forms also supported the floor forms, arrangements being made by which steel channels were bolted to the inner side of the steel wall forms upon which the floor centering is laid. Steel domes were used for floor forms. Concrete was hoisted by means of a small derrick bolted to the forms themselves and connected with the hoisting engine which operated the mixer. The usual method was to set the forms for one story wall and floor together, and to pour continually.

To form, pour, and strip each story has taken about seven days. Working at this rate, a house of two floors and cellar is completely concreted in three weeks, and with twelve sets of forms on the job, twelve houses are concreted in this period. The plumbing, heating, plastering, roofing and finish take about five weeks more, so that the houses are being completed at the rate of twelve in the first eight weeks and twelve every three weeks thereafter.



In the Ditch Dug by the Steam Shovel, Steel Forms Made Up of Channels Are Erected for the Concrete and the Spaces Between Houses Are Backfilled

Price Fixing by Edict or Agreement?

Dangers That Result from Arbitrary Action—Importance of Controlling All Factors Entering Into Costs—Questions Which Must Be Considered

BY H. V. COES*

THE writer views with considerable trepidation our recent embarkation in wholesale sociology. As he is not engaged in wholesaling or retailing or interested in any way in any of the commodities whose prices have been or are to be fixed, he feels he is somewhat qualified to deal impartially with the question.

This discussion is not to be construed in any manner as an attack on the Administration, but rather an endeavor to consider facts and to prevent, if possible, a distortion of our perspective.

War to-day is organized business. War's necessities are not peace necessities, consequently many things have to be done when a nation engages in war on a scale such as to-day that are not justified in normal times. But there is the ever present danger that measures may be taken as war's necessity that on closer scrutiny and analysis may prove to be a distortion of perspective due to viewing the measure in particular in the same picture with those gigantic measures that compose war. The armies cannot be supported in the field, financial plans cannot be worked out, or those left behind kept employed if the nation's productive facilities are strangled or jeopardized by any short-sighted or inadequate measures. The man is rash who will prophesy what will happen after the war. One thing is certain, however—people will have to be fed, clothed and housed, and this means employment which in turn means production, that means business which rests on commerce. In other words, somehow, some way, no matter what the state, national or international adjustments may bring, business—commerce—will be conducted in most instances at the same old stand. There is nothing in history to prove to the contrary. That being granted, we must be sane in our conception of wartime measures and keep constantly before us, not way back in the background, the fact that the nation's activities must not be hampered by half-measures—ill-conceived measures or unco-ordinated measures—lest the period of readjustment be made worse after the war than that necessity decrees.

Must Control Cost Factors

It seems axiomatic to the writer that price fixing presupposes price control of all the elements and factors making up the fixed price. Suppose, for example, we consider the price of coal at the mine. That seems to have caused considerable agitation. Without going into too much detail with regard to the factors entering into the cost of a ton of coal at the mine, we can list these:

(a) Labor—Productive.
Labor—Non-productive.
(b) Material—Productive.
Material—Expense.
(c) General expense.
(d) Administration expense.
(e) Selling expense.
(f) Fixed charges.

The various elements making up the main factors might be somewhat as follows:

A—1. Skilled labor.
2. Unskilled labor.
B—1. Mine rails and auxiliary material.
2. Explosives.
3. Cables, sheaves, etc.
4. Pumping supplies, etc.

There are a number of other things that have a decided bearing on the cost of production—thin vein mining vs. thick vein mining, location of vein, water conditions and the like. The manner in which the operations are financed, the character of the lease, the value of royalties, all have a decided influence on the cost.

Some Pertinent Questions

Can the Government guarantee that the wage scale for either skilled or unskilled labor will not advance?

Can it protect the mine operators against an increase in the price of mine rails, cables, cars, explosives, only a few of the things that enter into the cost of mining a ton of coal?

Can the Government fix rates for the various kinds of mining, thin vein, thick vein, the percentage of slate to raw coal, etc.?

Can it protect the operators from an increase in administrative expense due to high cost of living, with consequent salary increase?

Can it guarantee the production per dollar of labor? It is a generally well-known fact that production in many cases has decreased while productive cost has advanced.

We say, can the Government do these things? Let us say, will the Government guarantee the producer of coal, copper, pig iron, steel, flour, any of these things, the control of the major portion of those elements comprising the cost of production? If it will, it has gone all the way and a big step forward in price fixing been taken.

Some one advances the argument that the producer had to meet these conditions when supply and demand fixed the price. To a certain extent, yes; to a greater extent, no. One coal producer, for instance, might sell his product at an advance over the market because he could guarantee a certain B.t.u. content, ash content, sulphur content, percentage of moisture, etc. But unless the price classification is very carefully drawn up, based on all the conditions it is possible to ascertain, the price fixing as at present conceived is sure to work a hardship in certain directions.

The Question of Priority

There is still another phase of the question to consider—priority. This enters into some of the rate fixing plans—steel, for instance. It is the duty of every manager to keep his plant running to full capacity, if possible. A 100-ton lot of coal might probably be worth considerably more to him than the current market price, in order to keep going and fulfill his contracts. He is willing to pay a premium to get it. By price fixing he is deprived of his competitive bidding power. He presents his case to a priority board. He has been forehanded and contracted for his supplies. They have been commandeered by a railroad or by the Government. He is at bay. Does anyone believe that a priority board can pass on all the cases of this character that arise, or that it has such an adequate mechanism of stock control in its hands that it can afford the relief in the time necessary to make the relief worth while?

Before we get into wholesale price fixing, let us consider all the available means of regulation, of aiding rather than attempting to suspend economic laws, of means for regulating excess profits. In a great many instances, excess profits will prove to be a myth and the balance on the wrong side of the sheet unless the costs of production for all classifications have been very carefully and accurately determined.

It is the writer's observation that those prices fixed by mutual agreement and understanding have given less dissatisfaction, caused less interference and readjustment than those fixed by edict. In the case of those prices fixed by edict, it is reasonable to assume that all the factors entering into the price were either not known or not carefully enough considered; and that

*Gunn, Richards & Co., New York.

probably the classification was not elastic or comprehensive enough to meet the majority of cases that arose.

Summary.—If prices are to be fixed, they should be fixed by agreement and not by edict. Care should be taken to insure proper classification. Costs, if not adequately known for any given classification, should be definitely determined. Every effort should be made to control the elements comprising the cost of production. Careful consideration should be given to the necessity and advisability of fixing the price.

Great Increase in Exports of Explosives

WASHINGTON, Oct. 9.—A phenomenal movement in the exports of explosives is recorded in an exhibit prepared by the Bureau of Foreign and Domestic Commerce showing the shipments of cartridges, dynamite, gunpowder and other explosives since Jan. 1, 1913, to the end of the fiscal year which closed on June 30 last. The exhibit covers the entire period of the European war and registers a percentage increase that is believed to be without a rival in the exports of any other single class of American products.

The total exports of explosives of all kinds for the calendar year 1913, which include the first five months of the war, amounted to $5,252,077, made up of cartridges, $3,015,399; dynamite, $1,498,222; gunpowder $359,000, and unspecified articles, $651,601.

The beginning of 1915 was signalized by a tremendous expansion in the exports of all classes of explosives with the exception of dynamite. Shipments of cartridges rose to $25,408,079, gunpowder to $66,922,807, and all other explosives, including loaded shells and shrapnel, to $95,129,957, making an aggregate for the class of $188,969,893. But huge as these totals were, they were far exceeded in 1916, when the aggregate of the class rose nearly 300 per cent, every item in the list sharing in the gain, which, however, was most notable in the case of gunpowder and all other explosives. The grand total of the exports for 1916 was $717,144,649, divided as follows: Cartridges, $56,996,854; dynamite, $4,510,197; gunpowder, $263,790,851, and all other explosives, $391,846,747.

That the exports of these articles for 1917 will far exceed the enormous figures for 1916 is clearly foreshadowed in the statistics for the first six months ending June 30, last. The four classes for the first half year aggregated $414,523,991, or at the rate of nearly $830,000,000 for the calendar twelvemonth. Exports of cartridges totaled $33,311,945, dynamite $2,132,487, gunpowder $169,409,614, and all other explosives $209,679,975. Every class with the exception of dynamite shows a very substantial proportionate gain over 1916.

Asks for Central Control

WASHINGTON, Oct. 10—A petition from business to the Government asking for the creation of a central control of all Government purchases has been filed by the Chamber of Commerce of the United States. While not asking directly for the creation of a Department of Munitions, such a department was suggested in this document published to-day by the national chamber. The petition was the substance of a report drafted by a special committee of the chamber of which Waddill Catchings of New York is chairman.

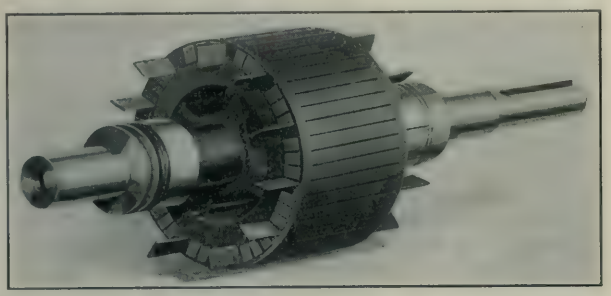
Such an appeal as this is not new to the present Administration at Washington. President Wilson undoubtedly has been told before what business desires and he has undoubtedly given some thought to the suggestion that the control be centralized. There are, furthermore, indications that the President is working along to such an end. The appeal of the Chamber of Commerce of the United States therefore comes at a most opportune moment.

The Pocahontas Pig Iron Corporation, Roanoke, Va., has been organized to operate the Graham, Va., furnace. The company plans for improvements to cost about $50,000, and expects to blow in the latter part of October, with daily capacity of about 150 tons. John B. Guernsey & Co., engineers, Roanoke, will operate the new organization.

Small Squirrel Cage Induction Motor

Squirrel cage induction motors ranging in size from ½ to 3 hp. have been developed by the Crocker-Wheeler Co., Ampere, N. J. The motors, which are designed for operation at a constant speed on 60-cycle polyphase circuits, have an interesting scheme of ventilation. Use is made of the projections of a number of rotor bars for a short distance at each end of the rotor core to serve as fans. The inside of each of the bearing shields has a pressed steel guide that separates the incoming from the outgoing air, thus enabling air to be drawn into the motor at each end through openings near the shaft and forced by the fan action of the projecting ends of the rotor bars against the stator winding, around the ends, and finally out through the holes near the outer periphery of the shield.

The bearings have sheet metal caps at the ends and self-closing oil well covers to exclude dust and dirt. The oil grooves in the bearings keep a film of oil between shaft and bearings, no matter what the direction of the belt pull. To provide an accurate belt tension adjustment, slotted feet cast integral with the stator frame are employed. The stator windings are insulated by placing the coils in insulated slots and the complete core and winding are impregnated with a special varnish to render them immune to moisture and acid fumes. After removal from the impregnating tank, the core and coils are baked and then again dipped in the varnish and baked.



Extending Some of the Rotor Bars a Short Distance beyond the Ends of the Rotor Core Is Relied Upon to Provide Ventilation in a New Squirrel Cage Induction Motor

The Iron Age in a Permanent Home

The United Publishers Corporation, New York, publisher of THE IRON AGE, has purchased the building largely occupied by it at 239-243 West Thirty-Ninth Street, through the acquisition of a majority of the stock ownership of the building. The first floor is occupied by the Times Square Station of the New York Post Office; three floors and the basement are occupied by the Federal Printing Co., which is the printing department of the United Publishers Corporation; four other floors are occupied by the publishing offices of the United Publishers Corporation, and the purchase thus guarantees to this publishing business a permanent home under desired conditions and surroundings. The building, which has eleven stories and a basement, and measures 194 ft. 6 in. in frontage and 90 ft. in depth, is located within easy access of both the New York Central and Pennsylvania Railroad terminals and is three blocks from Times Square.

Steel Company's Celebration

The Taylor-Wharton Steel & Iron Co., High Bridge, N. J., is arranging to celebrate Oct. 13, its 175th anniversary and also the twenty-fifth anniversary of the production of manganese steel. An industrial parade will be held in the morning, and games and sports for employees in the afternoon. A community clambake will be held at Riverside Park in the evening, followed by dancing.

The Pedersen Bros. Mfg. Co., Bridgeport, Conn., has been dissolved. The business will be continued by Julius Pedersen under the name of J. Pedersen Machine Co.

American Electrochemists' General Meeting

Papers and Discussions on Electric Pig Iron from Scrap, Corrosion of Steel, Pickling Steel Problems and Melting Brass Electrically

HARDLY a meeting of the American Electrochemical Society is held that does not bear some important message to the steel industry. The thirty-second general meeting, held in Pittsburgh last week, Oct. 3 to 6, was no exception. The over 325 attendants listened to many important papers relating to topics of vital consequence to industrial progress and the prosecution of the war, and they were discussed in a profitable manner. Matters relating to the electric furnace, particularly in making low phosphorus pig iron from scrap; the corrosion of iron and steel, especially copper-bearing metal; the electric melting of brass; the progress in electrochemical analysis, and a symposium on electrochemical war supplies were among the topics. The sessions devoted to papers and discussions were held on Thursday and Friday mornings, the afternoons being devoted to excursions to large industrial plants, laboratories and research institutions in which Pittsburgh abounds.

THE address of welcome on Thursday morning was one that elicited much approbation. It was given by John A. Brashear, president John A. Brashear Co., Pittsburgh, who was introduced by the chairman, Dr. Colin G. Finck, president of the society, as one of Pittsburgh's famous scientists. After calling attention to the city's advantages as a convention town and reciting in a most unique and interesting way his association with S. P. Langley, with Westinghouse and with as many as 180 celebrated scientists in his 77 years of experience, Mr. Brashear closed with the statement that we know not what is yet to come in scientific and other progress as a result of the world war.

Electric Pig Iron from Ore and Scrap Steel

One of the most interesting papers of the convention, from the practical steel standpoint, was "Electric Pig Iron in War Times," by Robert Turnbull, Turnbull Electro Metals Co., St. Catharines, Ontario, Canada. Mr. Turnbull presented an abstract of his paper. It is printed nearly in full in this issue. The author discusses the commercial possibilities of the manufacture of low phosphorus pig iron from steel scrap in an electric furnace with particular reference to post-war conditions and the reasons why electric pig iron direct from ore is not being made now in North America, although the profits appear attractive. The addition of steel scrap to blast furnaces and electric pig iron furnaces is also touched upon as a procedure which is now profitable.

Supplementing his presentation, Mr. Turnbull called attention to the analyses of his product of pig iron from scrap, pointing out that the average of the analyses given in the paper showed the sulphur to be 0.028 per cent and the phosphorus 0.030 per cent. For the last 15 days of September he said the average had been 0.019 per cent sulphur and 0.030 per cent phosphorus. Speaking of the inability to raise the total carbon above 3 per cent in the iron, Mr. Turnbull said that attempts to reach 3.50 per cent had resulted in nearly complete destruction of the roof. The load factor in making iron had been 68, including five shutdowns.

Dr. John A. Mathews, president Halcomb Steel Co., Syracuse, N. Y., after being called upon to open the discussion, said that he had had no experience in making pig iron from scrap in an electric furnace, but desired to know the economical reasons for putting steel scrap back into pig iron instead of directly into refined steel.

Canada's Shortage of Low Phosphorus Iron

Mr. Turnbull's reply was that in Canada there is a decided shortage of low phosphorus pig iron to supply the 20 or more acid open-hearth furnaces in that country of 15 to 25 tons capacity each; that it is almost impossible to get high-grade ores from the United States, and that now no pig iron is available from the States. There is therefore no other way to get such iron except to make it in this way. He made also the surprising statement that 5000 tons per month of steel borings and turnings are now being exported from Canada to the United States for use in regular blast-furnace charges. Another answer to Dr. Mathews' query was that there is good money in it.

Edwin F. Cone, associate editor, THE IRON AGE, expressed his interest in this subject and commented on the value of Mr. Turnbull's paper. He related that he had been shown very recently some physical tests of a number of bars of cast iron made by a company producing both pig iron and iron castings by this process. The bars were 1 x 1 in. and several had been tested at Columbia University. The average results showed a tensile strength of about 45,000 lb. per sq. in. with rupture at about 72,000 lb. per sq. in.—exceeding by at least 100 per cent the values of ordinary cupola gray iron castings. Mr. Cone asked Mr. Turnbull what had been his experience along this line and also whether he had made any better record than 700 kw-hr. per ton on the electric consumption, for he had been told that it was possible to produce iron by this process with a consumption of 300 to 500 kw-hr., doubting, however, the former figure.

Mr. Turnbull, in his reply, stated that steelmakers using his iron had found no difference in the quality of steel produced in the open-hearth and that he had no record of tests of the iron itself as cast. It was a fact, however, that the pigs were much tougher than ordinary low phosphorus iron and harder to break, rendering it necessary to be careful in making the pig beds and the connections between each pig. As to current consumption, his measurements recorded in the paper covered a period and were taken on the peak. He believed it possible, however, to make iron on a consumption of 500 kw-hr. per ton on integrated power.

In further reference to Doctor Mathews' remarks, Mr. Turnbull said that Canadian steelmakers were also very reluctant to change their acid to basic open-hearth bottoms as a solution to the problem of scarcity of pig iron. This would involve great expense and loss in time.

The Combined Carbon and Electrode Consumption

Asked by Mr. Cone as to the content of combined carbon in his product, the author said that it averaged about 1.60 per cent when the total carbon was 2.70 per cent, leaving only 1.10 per cent carbon present as graphite. In response to a question from F. A. J. FitzGerald, FitzGerald Laboratories, Niagara Falls, N. Y., as to electrode consumption in this process, Mr. Turnbull stated that it averaged 45 to 46 lb. per ton of iron produced. H. E. Randall, the Shawinigan Water & Power Co., Montreal, Canada, said that he knew of one plant that had been started for making cast iron by this process so as to get a quick return on the money.

Corrosion and Copper Bearing Steel

Nearly every meeting of the society is featured by a discussion in some form or another of the corrosion problem. The subject was presented by papers touching on several phases of the question: The corrosion of

steel by the atmosphere, the corrosion of metals by acids and corrosion due to certain conditions in electrolytic pickling or plating.

The familiar topic of copper bearing steel and the corrosion problem was brought out by a paper by O. W. Storey of the C. F. Burgess Laboratories, Madison, Wis., entitled "The Corrosion of Fence Wire." Attracted by the fact that much of the barb fence wire in certain Western districts, made years ago, is still in good condition, while wire now made corrodes or wastes away rapidly, Mr. Storey started an investigation as to the cause. Much to his surprise the author found that, in fences where one strand had corroded and the one alongside it had not, the analysis revealed in the latter the presence of copper. He exhibited specimens. The paper will be reviewed later by THE IRON AGE, but a brief abstract is to the effect that:

It has been definitely established that the durability of old steel fence wire is due to the presence of copper.

Manganese does not increase the corrosion of steel and its absence does not decrease the corrosion.

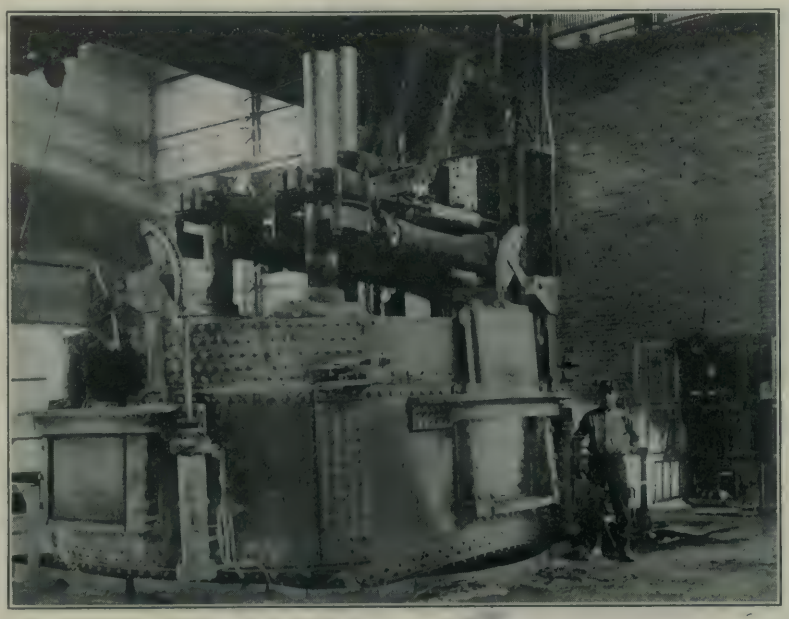
The copper in the early steel and wrought irons came from the copper-bearing ores of the eastern United States and imported ores. The proportion of copper steel made decreased with the increasing importance of the copper free Lake Superior ores.

Steel fence wire containing copper is as durable as wrought iron.

Present day steel fence wire usually does not contain copper, and therefore corrodes rapidly.

Under ordinary atmospheric conditions zinc corrodes more slowly under conditions favoring rapid corrosion of iron, and *vice versa*, iron corrodes more slowly under conditions favoring rapid corrosion of zinc.

The life of fence wire is dependent upon the quality of both the galvanizing and iron or steel base. Since the galvanizing is usually thin, the life of the fence depends principally upon the iron or steel base, which should be highly resistant to corrosion.



The Largest Electric Steel Furnace Operating in the World. It is a 20-ton Heroult furnace from which as high as 27 to 30 tons has been tapped. A party of over 200 electrochemists witnessed the pouring of a heat from this furnace on Saturday at the Duquesne plant of the Carnegie Steel Co.

F. N. Speller, metallurgical engineer, National Tube Co., advised caution in drawing conclusions regarding this complex problem. He recognized the value of copper in steel as a resistor of atmospheric corrosion, but in water pipe a different condition obtains. In the inside of such steel pipe, after two or three years' service, no matter what the copper content, detrimental corrosion always results, but on the outside the copper bearing metal always presented a better appearance than other steels. The outside is subjected to atmospheric corrosion, while on the inside there is a large volume of water.

James Aston, Pittsburgh, claimed that the paper points to the complexity of the whole problem, and advised caution as to jumping to conclusions. He reviewed the fact that we have three so-called anti-corrosion materials: Wrought iron, in which he believed the slag plays an important part; ingot iron, with its purity, and the copper bearing steels. Unfortunately, he said, Mr. Storey does not tell us the value of pure iron in such fence wire, though he does say that wrought iron containing no copper had a measure of protection. One cannot say in his opinion that any one of the three solutions to the corrosion problem is correct.

D. M. Buck, metallurgist, American Sheet & Tin Plate Co., Pittsburgh, said that Mr. Storey does not say that copper is a panacea. The results of the author having been called to his attention, he went to Wisconsin and obtained samples of the old barb wire which he analyzed with the same results. He exhibited an array of these samples. He called attention to the fact that sheet steels all corrode in the first 10 to 12 months, but that the copper-bearing ones in all cases slow up at this point, being covered with an apparently vitreous, dense protective coating, while all others continue to waste away.

Dr. Finck said that he had had samples of copper steel sheets that had stood many corroding atmospheres except those at the sea coast, where the salt-laden atmosphere had been deleterious. Mr. Buck reiterated his old contention that his own observations were to the effect that in a salt brine solution all such sheets corroded, while in the atmosphere of the sea coast the copper-bearing metal stood up.

Prof. Joseph W. Richards, Lehigh University, South Bethlehem, Pa., and secretary of the society, called attention to the fact that in barb wire there existed the possibility of electrolysis between adjoining wires in the twisted strands; that this was especially possible if one wire was harder than another. The question is, would straight wire corrode at the same rate?

Pickling Steel and Its Problems

Problems connected with the pickling of steel were given some attention. The subject was brought up by a paper, "Electrolytic Pickling Process and Its Effect on the Physical Properties of Metals," by J. Coulson, physical chemist, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. It was presented by the author. A brief abstract of the paper is as follows:

To determine the embrittling effect of absorbed hydrogen upon steel pickled in different ways, samples of spring steel wire were pickled chemically by simple dipping in acid, also by electrolytic pickling, using them as cathodes or as anodes. Oscillation tests on the original wires, the same sand-blasted, and the three sets treated as described, showed the chemically cleaned and the cathodically cleaned to be very brittle, while the anodically cleaned had the strength of the original samples. Similar tests were also made with drill-rod steel, hot-rolled Bessemer, and cold-rolled steel, after which mechanical tests were made as to strength, elongation and reduction of area. The chemically and the cathodically cleaned specimens again showed greater brittleness, which was most marked with the high-carbon steels and less marked with the soft steel.

Dr. Carl Hering, consulting electrical engineer, Philadelphia, in opening a brief discussion, said that he regarded the results offered by Mr. Coulson as doing an injustice to cathodic pickling. It might be bad for hard steel, but he deemed it beneficial for other steels and not fair to condemn cathodic pickling because of unfavorable conclusions from using hard steel.

Dr. Joseph W. Richards called the generalizations from the experiments altogether too broad, mentioned the fact that only carbon steels were tested, and recommended that the title be modified accordingly.

Another paper along similar lines was "The Prevention of Brittleness in Electroplated Steel Springs." It was presented in abstract by the author, T. S. Fuller, research laboratory, General Electric Co., Schenec-

tady, N. Y. The paper may be outlined as follows:

The literature of the relations of hydrogen to iron, causing brittleness, is extensively reviewed. In the author's experimental work he tested the breaking strength of seven untreated springs, then tested similar ones electrically copper plated, pickled in sulphuric acid and tinned by dipping in molten tin and then copper plated. The pickling makes them brittle, also copper plating, but tin dipping before copper plating is found to prevent embrittlement entirely.

The facts are all in accord with the assumption that the absorption by the steel of atomic or nascent hydrogen liberated at the cathode is the cause of the embrittlement of steel springs in the plating bath.

This embrittlement may be prevented by first dipping the springs in a bath of molten tin. The tin forms a coating on the steel which is impermeable to atomic hydrogen. Rosin may be used as a flux in the tin dipping. The springs may be sand-blasted, but must not be pickled in acid.

Steel springs may be dipped in molten tin at a temperature of 260 to 300 deg. C. without appreciably changing their mechanical properties.

Comment on the author's results was to the effect that the brittleness described was due to the solution and its character rather than to any other cause, and it was suggested that free cyanide might have been present.

Electric Melting of Brass

Two interesting papers were offered relating to brass and copper. T. F. Baily, president Electric Furnace Co. of America, Cleveland, presented an abstract of his paper, "Resistance Type Furnace for Melting Brass." The author gives more recent results of the commercial operation of his furnace which was described in THE IRON AGE, Feb. 1, 1917. He gives running tests of this furnace melting brass and bronze with mechanical tests of the cartridge brass produced and numerous analyses showing the uniformity of the metal at the beginning and end of the cast. The electrical power required shows favorable comparison, he claims, with melting costs when using crucible or open-flame melting furnaces, the average being 450 kw-hr. per net ton of bearing bronze (495 per metric ton), and 311 kw-hr. per net ton of cartridge brass (342 per metric ton).

H. W. Gillett, U. S. Bureau of Mines, in discussing the paper, claimed that Mr. Baily thinks always in terms of 24-hr. operation and both overestimates and underestimates his results. His averages need further explanation, he thought. Table 1 of the paper does not show that the furnace was kept hot at night. The speaker was glad to see the relation in this table between the percentage of loss by chemical analysis and that by weight. Mr. Baily in explanation stated that for continuous operation the current consumption would be about 400 kw-hr., but on 10-hr. operation, about 550 kw.-hr.

Deoxidation of Copper for Castings

"Copper Castings for Electrical Use," by G. F. Comstock, metallographist, Titanium Alloy Mfg. Co., Niagara Falls, N. Y., was abstracted by Professor Richards. This was the only paper of the 26 on the program not preprinted. In brief, Mr. Comstock recalled the fact that sound copper castings are hard to obtain and that the problem of superior deoxidation was now a subject of experiment at his company's plant. He had found silicon a good deoxidizer if used in the presence of careful melting, and his company had been able to make good sound castings poured in sand. The metal, however, is soft and weak and not easy to harden.

Professor Richards, by way of comment, said that the use of silicon as a deoxidizer of copper was not new and that unless the author had some new way of using it, the paper did not present any additional light on the subject. A member of the society testified that the use of boron, in his experience, makes the conductivity better, the boron being used as a suboxide and also as boron carbide successfully. Testimony was also offered to the effect that two-tenths to three-tenths of 1 per cent of magnesium as a deoxidizer gave good results.

Resistance Furnace for Heating Steel

A resistance furnace for heating steel to forging temperatures was discussed in a paper, "A Resistance Furnace," by Frank Thornton, Jr. Other applications of such a furnace include the heat treating of steel parts; hardening dies and tools, tempering dies and tools; annealing steel, brass, copper and other metals; heating copper, brass and other metals for rolling; melting copper and brass; firing ceramics and firing enameled ware. The paper discusses the heating of furnaces by resistors placed inside the furnace, either on the hearth of the furnace or on a shelf around the walls. The scope of operations suitable to such furnaces is mentioned and the nature of the resistor material, its purity and its electrical characteristics are discussed at length. Experiments were made to determine the suitability of various materials, and best results were obtained with silicon carbide blocks, bricks or rods. Satisfactory running with temperatures up to 1200 deg. C. was obtained.

New Metal for Thermocouples

A paper of interest to those connected with heat-treating problems was "Calorized Iron as an Element for Thermocouples," by O. L. Kowalke, professor of chemical engineering, University of Wisconsin. The author compares the thermo-electromotive force of couples of "calorized" iron-constantan with that of "uncalorized" iron-constantan. A sample of calorized iron wire from the General Electric Co. gave the same thermo-electric potentials as uncalorized iron, up to 1000 deg. C., on repeated calibrations. A sample from the Brown Instrument Co. gave slightly different potentials until after it had been heat treated at 800 deg. C., after which it gave similar results to the other calorized wire. The author concludes that a heavy wire, lightly calorized, gives as constant results as uncalorized iron, and has a much longer life.

Dr. C. G. Finck, in discussing the paper, called attention to the fact that the author presents a cheap thermocouple that is reliable and easily replaced. W. E. Ruder, research department General Electric Co., Schenectady, N. Y., felt indebted to the author for his results.

New Way to Analyze High-Grade Ferrosilicon

Two papers of direct bearing on chemical analytical problems were presented. One was: "A Method for the Commercial Analysis of Ferrosilicon," by Russell E. Lowe, chemist, the FitzGerald Laboratories, Niagara Falls, N. Y. It is recognized that the analysis of high-grade ferrosilicon presents many difficulties and some of these are cleared up by the author. An abstract is as follows:

The method of procedure described involves the decomposition of the alloy by means of nitric and hydrofluoric acids, and the determination of those elements that are generally called for in specifications for the 50 per cent alloy; namely, manganese, sulphur, phosphorus, iron, aluminum and silicon.

In the sulphur and phosphorus determination a method is presented for the necessary removal of the last traces of fluorine without the use of sulphuric acid.

The method, as given, has all of the accuracy of the older fusion methods while at the same time it is more rapid, easier to handle and saves platinum.

Some remarks are appended upon the probable volatilization of phosphorus from samples of ferrosilicon kept nearly 10 years in screw-topped glass jars.

T. D. Yensen, in calling attention to the fact that carbon was not mentioned, asked the author whether it is possible to determine carbon in ferrosilicon without burning the silicon; direct combustion does not get all the carbon. Mr. Lowe replied that the maximum carbon in 50 per cent ferrosilicon was 0.20 per cent and that he had found it impossible to get the carbon by direct ignition. Mixing the alloy with red lead was possible but disagreeable and not very accurate.

"An Improved Electro-Analysis Apparatus" was explained by J. L. Jones, metallurgist Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., the apparatus itself being exhibited and operated. It is a 6- and 10-unit electrically-stirred electrolytic apparatus

for quantitative chemical analyses, particularly in non-ferrous alloys. The electrodes and beakers are fixed and stirring is done by revolving tungsten rods. Each analysis receives its own current, graded by a rheostat from 0.5 to 6 amperes. The volume of non-ferrous work in many large laboratories is now so great that this special type, used by the Westinghouse company, seems to fill the need adequately.

Electric Status of the Norwegian Iron Industry

The Norwegian iron industry was authoritatively reviewed, especially from the electric standpoint, by Haakon Styri, metallurgist Hussey-Binns Steel Co., Charleroi, Pa., in a paper, "The Electric Furnace in the Development of the Norwegian Iron Industry." This development is briefly reviewed, followed by a detailed account of the introduction of electric steel furnaces and electric pig-iron furnaces. The effect of present abnormal war conditions on the expansion and future of the industry is discussed and the commercial relations regarding supply of ore, fuel and steel scrap are elaborated. The development of casting, rolling, and other manufacturing plants is outlined; also the conditions controlling the present investment of capital in these industries. Regret is expressed that the government is favoring non-electric plants, while private capital is more inclined to the development of electric methods. More extended attention will be given to this in a later issue.

The Society and the Naval Consulting Board

The society's share in the work of the Naval Consulting Board was reported upon by two members who have given most of their time the past summer to this important field. Lawrence Addicks, consulting engineer, New York, has been the board's chairman of the committee on special problems in connection with the submarine board. Prof. Joseph W. Richards' duties have been concerned with dealing with all manner of suggestions offered the board from every quarter. It was impossible for obvious reasons to go into details, but it was emphasized that every suggestion and problem, whether apparently of weight or not, was given due consideartion and some of the results arrived at had been of deep significance.

The society's board of directors reported a recommendation that the next meeting be held in the South. It also announced that $2,000 had been appropriated for purchasing Liberty bonds.

A member of the society who has attended all of the 32 meetings since the founding in 1902 said that this one excelled every other in point of entertainment and perfection of management, especially as to plant visitations, which were a feature. Thursday afternoon at least 200 members and guests boarded a special train and were taken to the American Zinc & Chemical Co.'s plant at Langeloth, Pa., where the manufacture of zinc and sulphuric acid was inspected. The research laboratory of the American Sheet & Tin Plate Co. at Pittsburgh and the new laboratory of the Youngstown Sheet & Tube Co. were also visited.

The World's Largest Electric Steel Furnace

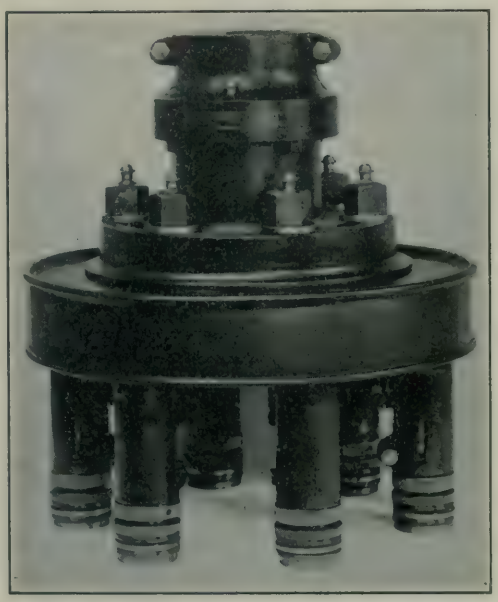
The excursion, which wound up the convention, was on Saturday, when a special train took over 200 to the plants of the Westinghouse Electric & Mfg. Co., the National Tube Co. at McKeesport and the steel department of the Carnegie Steel Co. at Duquesne. Here the largest electric furnace in the United States was seen in operation. A heat of 25 tons was tapped for the benefit of the visitors, while at the same time a 75-ton basic open-hearth was also poured. The electric furnace is of the Heroult type and has a capacity of 20 tons, but has made as high as 25 to 30 tons. It began operating in November, 1916. It requires 175 kw-hr. per ton of steel and operates basic on hot metal. There are three electrodes of 12-in. graphite and the electrode consumption is now from 3 to 4 lb. per ton of steel. The current is 3-phase received at 6600 volts and is transformed to 100 volts at the furnace. Six heats are made per day of 24 hr. and each heat averages about 2½ hr. The steel produced by this furnace is used principally for small gun forgings required by the United States Government, also for ball races, steel balls, etc. The furnace is a tilting one and the ease of its operation was striking.

At the National Tube Co.'s plant, pig iron and Bessemer steel were being made and the visitors were also show the production of all sizes of lap and butt-weld pipe up to 36 in., made in a building covering 32 acres, said to be the largest in the world under one roof.

Six-Spindle Head for Drilling Machines

The Covington Multiple Drill Co., 2449 West McMicken Avenue, Cincinnati, has perfected a multiple-spindle drilling head equipped with six spindles. It may, however, be used with any number of spindles from two to six, the spindle units being readily attached or removed to suit the work in hand. The spindles are also individually adjustable throughout, having a wide range, and when set they are said to be absolutely rigid. The attachments can be made very quickly, as only one conveniently located locking nut is used for each spindle. It was the aim of the manufacturer to produce a machine of minimum weight and maximum strength, and to carry out this idea steel castings are used for all parts subjected to any strains.

This attachment is known as the No. 3 multiple drill head and is especially made for back-geared drilling machines from 22 in. up. Spur gear drive is employed by which, it is pointed out, the flexibility of universal



From Two to Six Holes Can Be Drilled at One Time with a Spur Gear Driven Head for Drilling Machines

joints is obtained without attendant sacrifices to strength and excessive length of the spindle. The spindles are also adjustable vertically to accommodate drills of various lengths. The drive is through a double-ended key inserted in a tang slot of the spindle, which method affords a powerful balanced drive and also makes the attachment a very compact one. The overhang of the auxiliary spindle is only 7 in. below the end of the main one. This allows ample room for handling work of unusual height on the table of the drilling machine. All spindles are provided with ball thrust bearings to take up the end thrust.

Following extensive development and prospecting, the Wharton Steel Co., Wharton, N. J., has uncovered a large vein of fine quality iron ore in the Scrub Oaks property. The vein is about 12 ft. thick and extends for several miles. The company is planning to mine the ore, following the early installation of the necessary equipment. The limestone quarries of the Franklin Lime Co., Hamburg, have been leased by the company, which plans to install new machinery to cost about $50,000 for increased operations.

Alternating Stress Experiments on Steel

Unique British Machine Built Especially for the Purpose—Results of Tests on Very Mild Steel

A PAPER dealing exhaustively with the subject, "Alternating Stress Experiments on Steel," was recently presented before the Institution of Mechanical Engineers (British) by Dr. William Mason of the University of Liverpool. It has been abstracted by the *Engineer*, London, and part of it is reproduced as follows.

The author began with a description of a machine especially built for the purpose. The specimens are held by square ends in chucks which are supported by gimbals. They may be subjected to torsion or bending stresses or both. For the former aluminum levers are attached rigidly to the chucks. One lever is coupled to the mechanism of the machine and receives a slow reciprocating motion tending to rotate the specimen on an axial line. The end of the other lever rests between the ends of two helical springs which resist movement. These springs press against a fixed block of exactly the same width as the head of the lever, and not till the whole initial compression in them has been balanced by the torque does further compression, with movement of the lever end, begin.

Bending is effected by axial extended levers projecting from the chucks; "the bending movement given by them to the specimen is regulated by control springs in a manner similar to that already described for the torque."

In conducting a test the control springs are screwed up by a calibrated amount to give the required torque, and the amplitude of the twisting or bending lever is regulated until the end of the measuring lever, attached to the other end of the specimen, just takes up the initial load on the springs and no more. This adjustment is effected by observation of the line of light between the ends of the springs and the fixed block referred to above. According to the author it is not of importance that the movement should be measured with much accuracy, and at a very slow speed it is allowed to vary slightly in order to avoid the inconvenience of frequent readjustment. The springs, it may be mentioned, have a stiffness of 11 lb. per inch compression, and hence a movement of one-hundredth of an inch more or less is of little consequence.

The effect of the inertia of the measuring lever, made of aluminum, has been carefully estimated for a change of speed from 2 to 200 cycles per minute, and has been found to be only a little over 1 per cent when the torque is 140 in.-lb., and the lift 0.005 in. It is improbable that under any circumstances the error exceeded this amount.

What has been said of the accuracy of measurement of torque applies to the bending tests. The friction in the only joint that mattered, a ball bearing, is so small as to be negligible.

Apparatus for Measurement of Strains

Torsional strains are measured by an arrangement of mirrors fixed to the specimen by bolts passing through the holes in the square ends. The specimen is held horizontally in the machine. A mirror Q_1, whose plane is vertical, is secured to one end of the test-piece, as shown by the illustration; a second vertical mirror Q_2 is carried by an arm T, which is bolted to the other end. Q_1 and Q_2 face each other, and are about 2 cm. apart. Both are parallel to the axis of the test-piece. R is a fixed mirror which is merely used for convenience of keeping the telescope and scale on the same side of the machine. The scale is 155 cm. from Q_1. As the specimen is twisted, the mirrors Q_1 and Q_2 alter their relative inclination; and the range of travel of the point P on the scale is proportional to the total angle of twist during a cycle of stress. A similar arrangement is used for bending deflection.

The material of the tests was provided by the Complex Stress Distribution Committee of Section G of the British Association. It is a dead mild steel of 0.12 per cent carbon. The bars furnished to the author were 15/16 in. square. A direct tension test on a specimen turned to 0.623 in. diameter for a gage length of 4 in. gave a yield point 14.6 tons per sq. in., a maximum stress $= \left(\frac{\text{maximum load}}{\text{area of bar}}\right)$ of 23.5 tons per sq. in., and an elongation of 35.5 per cent in 4 in. The torsion test on a solid bar turned to 0.372 in. diameter gave a yield-point of 9.90 tons per sq. in. shear stress.

The behavior of the material under repetitions of cycles of torsion of equal maximum torque in either direction of twist may be explained as follows: The specimen was given a number of cycles at each of a series of low ranges of stress. Its elasticity was, so far as could be observed by the apparatus for strain measurement, sensibly perfect until the range of stress was $\pm$ 5.50 tons per sq. in. At this stress the width of hysteresis loop and the range of twist showed slight increases; and at $\pm$ 5.62 tons per sq. in. (calculated from the torque by the formula which assumes perfect elasticity) it was evident that an elastic limit for cyclic applications of this stress had been passed. The range of torque was then increased to give $\pm$ 6.25 tons per sq. in. "calculated" (as above) stress; the range of twist now became greater very rapidly. After about 1¾ million cycles at this range of torque the range of twist had appeared to attain a maximum value, and after a total of about 2¼ millions at this range of torque the piece cracked. These cycles at $\pm$ 6.25 tons per sq. in. were imposed at the speed of 200 per minute and without stop or interruption of any kind.

Conclusions

Mild steel will endure a very large number of repetitions of a range stress—considerably greater than the range at which the extra-elastic strain appears—that induces a considerable range of extra-elastic strain. The range of stress (calculated on the assumption of uniformly varying stress) which induces fracture is greater for solid than for hollow test specimens.

The effect of giving rest to a specimen in which an extra-elastic range of strain has developed is to reduce the range of the strain. The physical effect of the rest appears to be similar to that of hardening after strain, and not to be of the nature of recovery of elasticity. The author has not observed in these experiments (with equal + and — stresses) any real adjustment of elastic limits to range of stress.

There appears to be a marked variation, with frequency of repetition of cycle, of the physical state of mild steel subjected to repetition of a higher range of stress than that consistent with unimpaired elasticity, the mobility being greater than with higher frequency.

For the dead mild steel used in this work the range of the induced maximum shear stress at which the elasticity becomes impaired is sensibly the same in both alternating torsion and alternating bending.

The cost of the machine and apparatus used in the experiments has been defrayed by grants from the Royal Society, the Institution of Mechanical Engineers and the University of Liverpool.

Discussion

Several physicists and scientists discussed the paper. As reproduced by *Engineering* they were of the following nature:

R. G. Batson congratulated Dr. Mason on overcoming the many difficulties incidental to the construction of a machine to test material under combined alternating bending and torsion. Dr. Mason had followed, more or less, on the lines upon which Mr. Bairstow,

of the National Physical Laboratory, had worked in his researches in the cyclical variations of stress in iron and steel. The investigation had not afforded a rapid method of determining the limiting range of stresses in a material, but it was very satisfactory to learn that Dr. Mason had found Guest's law to hold good for alternate bending and torsion. In published results obtained at the National Physical Laboratory by the use of a method (suggested by Mr. Bairstow) differing entirely from that employed by Dr. Mason, Dr. Mason's conclusions, particularly in regard to Guest's law, were confirmed.

C. H. Wingfield said it might be of interest to illustrate, by mechanical analogy, the fact that the strain becomes less with rapid alternations. Such an analogy would not, of course, represent all the facts; it represented only certain stresses. He would suppose the plasticity of the specimen under test to be represented by the motion of a plunger in a cataract cylinder. The cataract cylinder is assumed to be full of oil and its two ends are connected by a by-pass pipe provided with a tap. The piston is connected by a rod to a lever mounted on one end of a short shaft which is to be regarded as the specimen under test, the other end of the specimen having mounted on it another lever which projects downward, its lower end engaging with a spring device which can be pulled backward and forward.

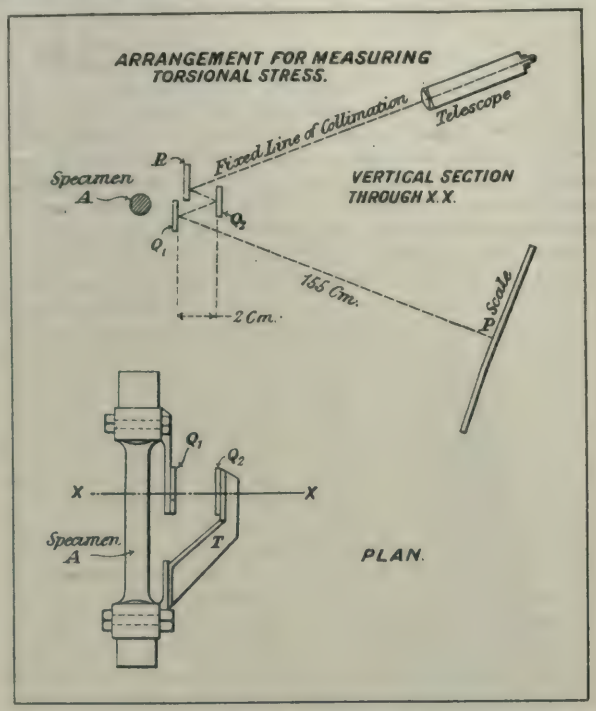
When this latter device is moved slowly, the tap on the cataract cylinder being partially closed so as to oppose resistance to the movement of the piston, the arrangement is representative of the application of a torsional stress on the specimen, and the piston will move a certain distance representing the amount of strain. If the speed of movement of the spring device to and fro be increased there will not be time for so much of the oil to be transferred from one end of the cylinder to the other during each application of stress, and the movement of the piston will therefore be less, thus indicating a less amount of strain. Increasing the speed still further, the angle through which the levers pass would be again diminished, reducing the amount of strain indicated, exactly as the author had found in the case of his experiments.

The mechanical analogy failed, however, in not showing why the range diminished with a constant amount of stress. The well-known reciprocating test machine by Captain Sankey—one which acted by slow motion—showed distinctly that a specimen when twisted backward and forward hardened, as the author had expressed it, and became stiffer and more difficult to twist. That was an everyday experience, as evidenced by the fact that a bit of copper, when twisted backward and forward, would become stiff. In the same way it would move a less distance to give the same compression in the spring.

Nature of the Steel Used

Dr. F. Rogers, of Sheffield, regarded as important the fact that Dr. Mason had dealt with both the plastic and elastic ranges of steel. At the same time, all were fairly convinced that in the elastic range of stress there was also a hysteresis loop, an elastic, or recoverable strain. One thing was clear from Dr. Mason's work and that of others, that as research proceeded the stress at which plastic deformation began to show was lower and lower every year. Methods of discovery had become finer, and he thought everyone would agree that Mr. Mason had made a great effort, in his mechanism, to meet all the refinements which, at the present time, could possibly be foreseen, so as to get his stresses well under control and his means of measuring the strains accurate.

In this connection he would refer to the author's remark that mild steel would endure a very large number of repetitions of a range stress—considerably greater than the range at which the extra-elastic strain appeared—that induced a considerable range of extra-elastic strain. That would be so if the steel were a good one. The steel subjected to experiment was a very mild steel, very low in carbon, lower, in fact, than was nowadays commonly used except for a very few special purposes. The speaker was, incidentally, interested in the steel because it was one of the British Association steels which he had been instrumental in obtaining for his own committee. The result of a tensile test of the material, quoted in the paper also established



Plan and Section of Mirror Attachments for Determining Alternating Stresses.

the fact that the steel must have been of good, tough and mild quality. He would like, finally, to emphasize his opinion that the machine used was the right one for the work.

Reply by the Author

Dr. Mason in replying to the discussion said that Mr. Wingfield's mechanical analogy, while a good illustration, broke down at the point perceived by that gentleman, it could not be carried further, and was only exact for the effect of variation of speed; it did not account for the contraction by strain at constant speed. He had understood Dr. Rogers to say that the range of stress at which the specimen broke was, with the progress of time, getting smaller and smaller, owing to the greater delicacy of the apparatus used and the greater prolongation of the tests. The speaker's personal experience, however, reversed that conclusion. With a thousand million repetitions of stress, less than 5.5 tons per sq. in. in torsion, there would be no change in the steel; it would be the same at the end as at the beginning.

Conservation of German Structural Steel

In the interests of national defense instructions have been issued by the German Minister of Public Works to limit the use of iron and steel to the lowest possible minimum and to substitute other materials in building construction where possible. The circular states that there is no objection to exceeding within certain bounds the limits of the maximum working stress which are imposed by the regulations in force in Germany, so far as they apply exclusively to war constructions designated as such by the Minister of War. The limits may be extended to 1200 kg. per sq. cm. and even 1500 kg. per sq. cm., but they should never exceed 1600 kg. The other official regulations will remain in force, and it is understood that the calculations of stability must be rigorously exact and the pieces of iron and steel will be reduced to the minimum dimensions.

A record was made in connection with the relining of the No. 2 furnace of the Minnesota Steel Co. at Duluth, Minn. The furnace blew out on Sept. 7 and was blown in on Sept. 22, the interval being but 15 days.

FOUNDRY EXHIBIT AT BOSTON

Machinery and Iron, Metal and Melting Equipment Exhibits at the Recent Exposition

Supplementing the detailed analysis of the exhibits of equipment for the foundry industry shown at the foundry and machine exhibition in Boston in the week of Sept. 24, in connection with the annual meetings of the American Foundrymen's Association and the American Institute of Metals, may be appended the following statement of exhibits for which space could not be provided in the issue of Oct. 4. In that issue were covered the exhibits of molding machines, sand blasting apparatus, core ovens and binders, sand handling equipment, conveying equipment and general foundry equipment and supplies. Following is the supplementary account:

Machinery and Tools

The display of machine tools, small tools, vises, saws and special machinery was large, but only a few of the products displayed were absolutely new. One entire hall was filled with machinery, much of it in operation, and in all of the other halls were to be found machine and tool exhibits. With a few exceptions the products shown agreed with the preliminary announcements published in THE IRON AGE, Sept. 20.

The Simonds Mfg. Co., Fitchburg, Mass., had in operation on a Nutter & Barnes machine a new thin metal-cutting saw which had high-speed teeth inserted in a carbon steel body. This saw cuts a kerf no wider than a solid blade saw. E. C. Atkins & Co., Indianapolis, showed a new adjustable hack saw frame with a hard rubber pistol grip handle and the wing nut under the handle out of the way but easily accessible.

The McCroskey Reamer Co., Meadville, Pa., showed two new reamers and a new turret tool holder. Its super adjustable high-speed reamer has as its feature the forward adjustment of the blades so that a considerable length of blade is available for grinding, which can be done without cutting into the body. A smaller reamer than has formerly been available is found in the Norton inserted blade adjustable reamer in which the blades are inserted on a spiral and adjusted forward.

The Rivett Lathe & Grinder Co., Boston, showed a new fully automatic radial grinding machine and the Oliver Machinery Co., Grand Rapids, Mich., a 16-in. tool room engine lathe with taper, relieving and draw-in collet attachments and a follow rest. A new machine in the large exhibit of the Cincinnati Pulley Machinery Co., Cincinnati, was a ⅝-in. drilling machine with a built-in tapping attachment, so designed that the tapping attachment can be thrown out, making it a plain drilling machine. A new design of tool room drill press was also shown with both swinging and revolving tables. A motor-driven bench planer with some unusual safety features to replace hand planing in the pattern shop was shown by J. D. Wallace & Co., Chicago.

In air-power machinery there were several fine exhibits. One that attracted much attention was the compressor of the Sullivan Machinery Co., Chicago, which supplied air to many of the operating exhibits. This machine was an angle compound short belt driven air compressor with a new design of end rolling finger plate valves. This machine had a capacity of 445 cu. ft. of free air against a terminal pressure of 100 lb. at a speed of 250 r.p.m. Another machine furnishing air for pneumatic machines and tools in other exhibits was installed by the Chicago Pneumatic Tool Co., Chicago. This was a 511-ft. compound, short belt-driven compressor of a standard type. Yet another compressor in operation was in the exhibit of the Curtis Pneumatic Machinery Co., St. Louis. The General Electric Co. showed two sizes of cupola blowers, motor-driven.

Other machinery exhibits which attracted special attention were those of the Bilton Machine Tool Co., Bridgeport, Conn.; American Pipe Bending Machine Co., Boston; Hill, Clarke & Co., Boston; Warner & Swasey Co., Cleveland; Beaudry & Co., Boston; Norton Co., Worcester; Dings Magnetic Separator Co., Milwaukee, Wis.; Charles H. Besly & Co., Chicago; Lynd-Farquhar Co., Boston; Gardner Machine Co., Beloit, Wis.; Bridgeport Safety Emery Wheel Co., Bridgeport, Conn.; Forbes & Myers, Worcester, Mass.; Chase Turbine Mfg. Co., Orange, Mass.; Divine Brothers Co., Utica, N. Y., and Athol Machine Co., Athol, Mass., which had a display of vises and machinists' small tools.

Iron, Metal and Melting Equipment Exhibits

As usual, the most attractive exhibits were to be found among the coke, pig iron and non-ferrous metal displays. The Grand Hall was dominated by a most unusual exhibit made by the New England Coal & Coke Co., Boston. This was a replica of Bunker Hill Monument made of foundry coke with four statues at the corners, reproducing the figure of the Puritan which is the company's trademark. The display of Solvay coke made by Pickands, Brown & Co., Chicago, took the form of a giant hub, emphasizing the thought that coke is the hub of the foundry. In the exhibit of Rogers, Brown & Co., Cincinnati, was displayed what is claimed to be the greatest collection of pig iron specimens ever gathered together. Castings had been gathered from all parts of the country and involved molding and pouring problems that made many a foundry superintendent heave a sigh of relief that he had no such difficult pieces to mold. Other attractive booths in the Grand Hall were those of the Thomas Iron Co., Easton, Pa., and the Debevoise-Anderson Co., New York.

Elaborateness marked the several exhibits of non-ferrous metals. The Ajax Metal Co., Philadelphia; the Michigan Smelting & Refining Co., Detroit; White & Brother, Inc., Philadelphia; the Titanium Alloy Mfg. Co., Niagara Falls, N. Y., and S. Birkenstein & Sons, Chicago, had imposing and interesting displays of metals and castings. The General Briquetting Co., New York, and the Eastern Brass & Ingot Co., Waterbury, Conn., demonstrated the progress that has been made in the process of briquetting scrap, turnings and borings. Several crucible displays were made, including an imported crucible made in Japan from Ceylon graphite and foreign clays, shown by General Platers Supply Co., New York.

Cupolas were shown photographically by several makers and there were several exhibits of both crucible and non-crucible types of melting furnaces for non-ferrous metals. A new furnace in the booth of the Monarch Engineering & Mfg. Co., Baltimore, Md., was of 300-lb. capacity, designed to meet the needs of the small consumer. The special feature is a simplified lining.

A new safety feature in connection with cupola practice was exhibited by the Federal Foundry Supply Co., Cleveland. The bottom doors of a cupola are provided with compensating weights so that they can be easily closed. In connection with this method a collapsible cupola bottom bar was shown which, beside the collapsible joint, has a screw extension which makes it unnecessary to shim up the bar. A model of the Ludlum electric furnace, made by the Ludlum Electric Furnace Corporation, New York, with charts of analyses of products and samples of castings made an exhibit that drew favorable attention.

Special Displays

Of exhibits which come under no general classification may be placed the display of the General Fire Extinguisher Co., Providence, R. I., which included a working exhibit of the sprinkler head in operation, a working set of the alarm system employed in connection with the A. D. T. service, and an exhibit of the Rector system of gas heating, including a Hale gas mixer.

The Westinghouse Electric & Mfg. Co., Pittsburgh, showed no products for sale but made a comprehensive display of the many safety features which have been developed in its own plants, freely offering ideas for use of the visiting plant managers.

Structural features for modern foundries were shown by several exhibitors, including the G. Drouve Co., Bridgeport, Conn.; Frank D. Chase, Chicago; David

Lupton's Sons Co., Philadelphia; the Ayer & Lord Tie Co., Chicago, and the Jennison-Wright Co., Toledo.

This long description does not mention many other worthy displays. The only moral that can be drawn is that every live foundryman misses an opportunity to see at first hand the developments of his craft when he misses a foundry convention and its exhibits.

Record Exports of Tin Plates—Production in 1916

The tin plate exports from the United States in the two fiscal years ended June 30, 1917 and 1916, under war conditions, are remarkable, taking into consideration the fact that this product has become a factor in exports only in the last 10 years. The first exports of tin plates were 20,827 lb. in 1898. *Commerce Reports* publishes the following data:

Exports of tin plates, terne plates and taggers' tin reached their highest record in the fiscal year ended June 30, 1917, with a total of 521,861,390 lb., valued at $28,404,433, against 516,257,473 lb., valued at $18,703,773, in 1916, and 105,899,762 lb., valued at $3,643,806 in 1914. While the increase in 1917 over 1916 was only 5,603,917 lb., the increase in value was $9,700,660.

American tin plate is exported to 75 countries in all parts of the world. Canada, our best customer, took 133 2/3 million pounds in 1917; Argentina, 51 1/3 million pounds; Japan, 46½ million pounds; British India, 39 4/5 million pounds; Dutch East Indies and Brazil, 31 1/5 million pounds each; China, 30½ million pounds; Hongkong, 22½ million pounds; United Kingdom, 19½ million pounds; Italy, 18 3/5 million pounds; Straits Settlements, 12¾ million pounds; Uruguay, 11½ million pounds; France, 10 3/5 million pounds; Cuba, 9 million pounds; Mexico, 4 1/3 million pounds, and Russia, 4 1/5 million pounds, with lesser amounts to many other countries. In addition to these large exports to foreign countries, there were shipments to Alaska aggregating 38,828,357 lb., and to Hawaii 17,949,296 lb. There were also shipped to Alaska tin manufactures, chiefly tin can bodies and tops, valued at $3,894,165.

The following table shows the imports and exports of tin plates, terne plates and taggers' tin for a series of fiscal years. It is a remarkable fact that the imports of this commodity reached the highest record in the year in which domestic manufacture commenced.

Fiscal Years	Imports, Lb.	Exports, Lb.
1891	1,036,489,074	.....
1892	422,176,202	.....
1899	108,484,826	205,910
1901	117,880,312	1,367,405
1904	126,909,360	8,107,666
1906	120,819,732	25,967,137
1911	95,319,730	70,199,398
1912	6,613,253	181,899,366
1914	48,877,947	105,890,762
1916	1,796,853	516,257,473
1917	1,370,462	521,861,390

The production of domestic tin plate began in 1891, during the last six months of which there was produced 2,236,743 lb. In 1892, the first full calendar year of the industry, the production reached 42,119,192 lb. and in 1916 it was 2,766,401,000 lb. Of the production in 1916, 2,552,224,000 lb. was tin plates and 214,177,000 lb. terne plates.

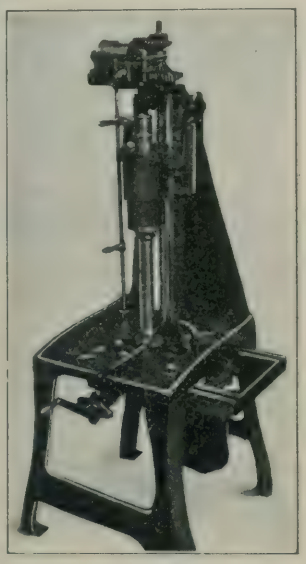
The German Tin-Plate Industry

Efforts are being made to form a syndicate among the German tin-plate manufacturers. The old tin-plate syndicate was dissolved in 1914, but the manufacturers are said to have now come to the conclusion that an organization cannot be dispensed with. It is thought that a new syndicate will be formed, but not until after the war. A large part of the tin plates used in Germany were formerly imported from England, but it is claimed that the German home industry has now grown so much that it will be able to export large quantities when normal conditions are restored.

Automobile Cylinder Grinding Machine

To provide for the grinding of the cylinders of aircraft, automobile and motorboat engines, the Hy-Grade Machine Co., 5606 Curtis Avenue, Cleveland, has built a vertical type of machine. As provision is made for passing the cylinders under the grinding spindle and also for adjusting the spindle to travel around the bore while it is rotating, it is possible to take care of practically all sizes of cylinders.

The machine consists of three principal parts, the vertical frame and table which are cast in one piece, the sliding plate upon which the cylinders are mounted and a set of supporting legs. The ways on the vertical frame and the bottom surface of the table are machined and finished by scraping. The sliding plate on which the cylinder is mounted operates on adjustable ways and can be traversed the full length of the machine. In this way the different cylinders of the engine can be brought under the grinding spindle. The plate measures 16 x 22 in. and is 2½ in. thick and a working space measuring 18 x 22 in. is provided underneath.



Cylinders of Internal Combustion Engines Are Mounted on a Sliding Plate and Successively Brought into Position for Grinding

The spindle is mounted in a movable head and can be adjusted to travel around the bore of the cylinder as it rotates upon its own axis. A belt, that extends back through the ways upon which the movable body travels, drives the spindle. A lead screw operated in both directions by bevel gears at the top of the frame raises or lowers the movable head. A rod with adjustable stops governing the clutch between the two bevel gears at the top regulates the feed, while the rotation of the spindle is controlled by a clutch on a spline shaft driven by spur gears at the top of the frame. The feed for the grinding wheel is operated by a worm with a graduated plate. The spindle, which is 16 in. long, is equipped with a double row ball bearing and an adjustable bronze bearing equipped with a retainer to prevent leakage of oil. The spindle body, which has a travel of 22 in. on the vertical ways, is equipped with adjustable bronze bearings.

The operating levers are concentrated at the front of the machine within easy reach of the operator and counterweights are provided, which are relied upon to relieve the working parts from strain and wear. The machine occupies a floor space of 28 x 32 in. and is 6 ft. in height.

Burwell S. Cutler Made Chief of Foreign Commerce Bureau

The appointment of Burwell S. Cutler, of Buffalo, as chief of the Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington, was confirmed by the Senate Oct 5. Mr. Cutler, who is well known in manufacturing circles in western New York, went into the bureau six months ago at a nominal salary to assist in putting the organization on a thoroughly business basis. He was made first assistant chief, but since the resignation of Dr. E. E. Pratt, has been acting chief.

Mr. Cutler was born in Buffalo and finished his scholastic education at Lake Forest University and Harvard. For 15 years he has been president of an important Buffalo manufacturing concern and has been identified in an official capacity with numerous business houses and civic organizations throughout New York State.

Economical Production of Small Cores*

Scientific Methods in the Core Room —Lowering Costs and Increasing Production and Accuracy of Cores

BY R. E. KENNEDY

ALL factors of manufacturing must be governed by ultimate costs and when applied to the core room may be classified as the workers, the materials and the equipment and its arrangement. Standardization, recognized by manufacturers as an essential feature of their business, brings good results to the core room. The use of unstandardized materials, methods and equipment in the shape of varying core sands, binders, working of core boxes and use of miscellaneous plates, leads to constant trouble and loss of time. The use of special handling equipment, like the lifting truck and its attendant special and standard platforms, has many opportunities to effect economy in the core room.

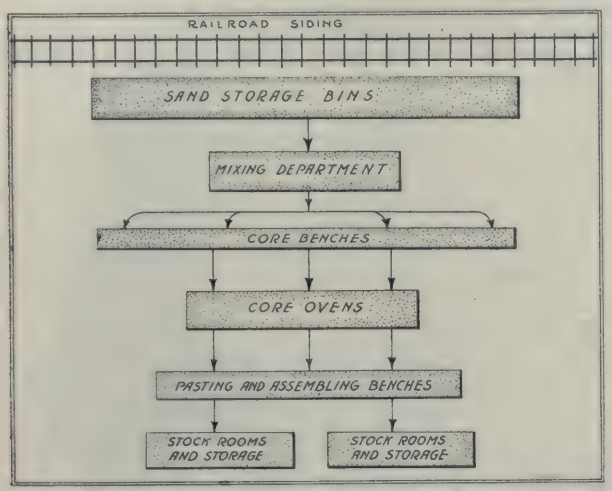


Fig. 1—In the flow of materials in a core department each step should be considered to establish the work in the most efficient manner

Core Room Labor

The problem of labor in the core room is much the same as in other departments of the foundry, as regards the selection and training of workers. The use of women in the core room has proved satisfactory, where conditions of cleanliness, light and ventilation have been given attention. In many cases women have given better results than boys or men, where the work required deftness and quickness. The necessity of providing boys to do the heavy lifting and carrying where women were employed stimulated production, due to the specialization of labor.

Laying Out for Straight-Line Flow

The location of the core room depends on: 1. The size of cores. Large cores demand that the location of the core room be fairly near the point of use of cores in the molds. Small coremaking can be centralized. 2. The number of pounds of cores used per molder has a bearing upon the distance from the core room to the point of molding. 3. Strength of individual cores. Where cores are necessarily rather weak, longer hauling and repeated handling lead to high loss. 4. Methods of handling. Use of adequate transportation equipment over free gangways or overhead conveyors permits of greater hauling distances with less breakage.

Centralization of coremaking can be taken advantage of when the cores are small and the transportation facilities are good. Confining all the coremaking to one place reduces labor and floor space.

As in other lines of manufacturing the core room has the same degree of adaptability to being laid out for the straight-line flow of material through the department from raw material to the finished product. As indicated in Fig. 1, all work should progress through the following steps, in the order named: Sand storage; batch mixer; storage for batches of various mixes; core bench; oven; pasting, blackening and assembling; re-drying, if necessary, and stock storage.

The most logical way to bring the sand there is to have it shoveled direct from the cars into bins near the core room. If not so located and changes cannot be made, it will have to be handled by cars on an industrial track, by horse and wagon, or by wheelbarrow. The core room then should be given its place close to the railroad siding.

Some foundrymen, realizing the necessity for having sand mixes made as standard as possible, have installed equipment for drying the sand. A sand of absolute uniformity in moisture content is necessary to begin with, and when damp sand is used directly in making mixtures, this absolute uniformity is not obtained.

Dry sand occupies less space than wet sand. If

FORM 102
INSTRUCTION CARD
SHOP LABORATORIES
FOUNDRY DEPARTMENT

FLOOR | BENCH | MACHINE | STATION 4

STANDARD FLASK NO. | TOOL KIT NO.
SPECIAL FLASK NO | RAMMER
CORE BOX NO. | CORE PLATE NO | FACING MXT. NO.
SAND MIXTURE NO | TACKLE N°2 Shovel, N°A Wheelbarrow, N°8-21" Fiddle, Quart Measure
WIRE. SIZE | RODS. SIZE
NO. LOOSE PCS | NO. CORES

PART CORE SAND MIXTURE N°3
ARTICLE | PATT. NO.

ITEM	OPERATION ROUTINE	STANDARD TIME
	NOTE. CARD MADE OUT FOR TWO (2) #4 WHEELBARROW LOADS OF CORE SAND MIXTURE. IF A LARGER QUANTITY IS NEEDED USE QUANTITIES OF MATERIALS IN THIS SAME PROPORTION.	
1.	FROM SAND BIN NO. 1 OBTAIN 300 LBS OF SAND. DUMP INTO MIXING BOX.....	.0.05
2.	FROM SAND BIN. NO. 4 OBTAIN 200 LBS OF SAND. DUMP INTO MIXING BOX.....	.0.08
3.	RUN SAND THROUGH RIDDLING MACHINE WITH 1/8" RIDDLE.....	.0.03
4.	ADD THREE (3) QUARTS OF CORE OIL (GRADE #2) AND 2 GALLONS OF WATER....	.0.02
5.	RUN SAND THROUGH MIXING MACHINE.....	.0.06
6.	DUMP FROM MIXING MACHINE AND SHOVEL INTO MIXTURE BIN #3.....	.0.04
	TOTAL STANDARD TIME	0.28

Fig. 2—Written instruction cards may be made out for the men doing the mixing. The sand and binders purchased should run true to a standard quality. Then definite routines can be followed and exact amounts of materials used in making up the core sands, which will insure uniform results in cores, both while green and in the dry state

*From a paper read at the annual meeting of the American Foundrymen's Association, Boston, Sept. 27, 1917.

10 per cent of water is added to clean lake or silica sand the volume increases 40 per cent. This should be taken into consideration when buying and making up core sand mixtures. When adding binder to sand of varying moisture content the strength of the resulting cores will be different and the number of cores obtained from mixing up a wheelbarrow load of dry sand will be greater than the number obtained when starting with a wheelbarrow of damp sand. With dry sand as a basis, binder and water in exact amounts can be added with every assurance that core sands of the same physical qualities will be turned out, day after day.

Mixing Rooms

The mixing room of the average foundry, if there is one, should be located as directly as possible between the sand storage and core room, with easy passageway for trucks. It is essential that standard measuring instruments either in the shape of cups, boxes, buckets, or barrows and riddling and mixing machines be used. The employment of uncertain and varying sized measures leads both to excessive amounts of binders and to the occasional lack of the full amount needed.

Combined with the use of these exact measurements should go instruction cards, containing the necessary information to obtain exact results, even though different men do the mixing. Such a card is shown in Fig. 2.

The number of cores per day from the coremakers is influenced by the character of the binder, for if it tends to stick to the box the maker cannot turn out as many as where a free working material is used. This sticking to the box is due, in many cases, to too great a percentage of binder and the trouble often can be eliminated by reducing the proportion of binder.

Accurate records should be kept of the costs per ton of mixing the different core sands and binder combinations and when these data have been observed for a while the importance of studying for cheaper combinations will be realized. When the costs of these different mixtures are not known an expensive sand often is used where a cheaper one would produce as good results. Weekly summaries of the cost per ton in labor and materials used in the production of these different grades of sand will produce records for comparison and lead to the cutting down of core room costs.

Economical Use of Mixing Machines

Air and electric riddles and small compounding mills prove of value to the core room having even a small output, for the increased quality of the sand mixtures goes far toward cheaper materials and labor costs. By the use of a compounding mill one foundry was able to reduce its costs as shown in the table below, which gives the results of using a compounding mill where it was desired to use some gangway sand in the mixture instead of all new sand.

Comparative Core Sand Mixture Costs When Using Compounding Mill

Cost When Not Using Mill

40 per cent or 800 lb. of new molding sand at $1.20 per ton	$0.48
40 per cent or 800 lb. new sharp sand at $0.60 per ton	0.24
20 per cent or 400 lb. of old core or gangway sand 1 to 40 per cent or 50 lb. compound at $30 per ton	0.75
Total	$1.47

Cost When Using Mill

20 per cent or 400 lb. of new molding sand at $1.20 per ton	0.24
80 per cent or 1600 lb. of old core sand 1 to 80 per cent or 25 lb. of compound at $30 per ton	0.38
Total	$0.62

Having been mixed, the core sand is either taken directly to the core room or shoveled into bins which are temporary storage for the different grades of sand. If such bins are used either they should have sliding or lifting doors at the bottom, where the sand can be shoveled directly from the floor, or the bins should be left open at the front.

Inefficient handling of raw material and product increases the cost of production. Even in small plants much can be done to systematize the delivery of core sand to the benches and do away with the necessity of skilled workers leaving their benches in order to get sand and do mixing. Crowded gangways, littered with core plates, riddles, boards and other trash, go far toward making for inefficient delivery of materials. Rows of benches ranged back to back with sufficient space for a gangway between them will allow the free passage of laborers with their wheelbarrows of sand, rods, etc., to pass without disturbing the coremakers, or the cores setting on stands by the core benches. Benches with a hopper at the back permit of a larger volume of sand being left on the bench at one time, without its being in the way of the worker or without having him disturbed when it is being delivered to his bench.

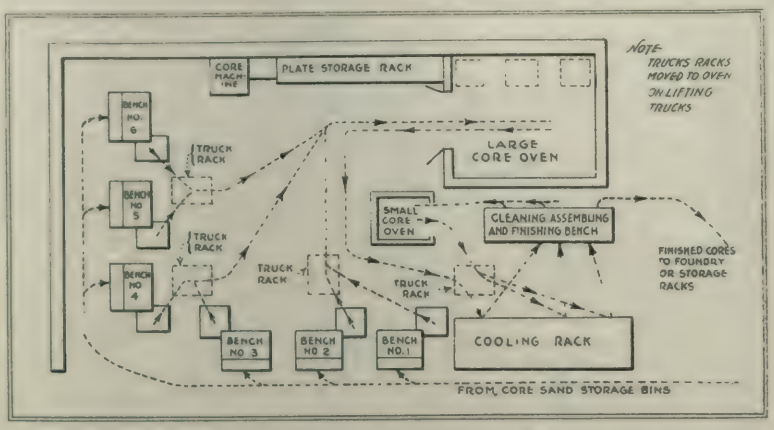


Fig. 4—This plan shows the steps taken to rearrange this core room to give the work a better routing. The crossing and interfering of the work was eliminated by erecting new benches and changing the location of equipment

Figs. 3 and 4 show how the core room at the University of Illinois was rearranged for the better handling of materials and permitting the flow of work to progress in a systematic manner. The coremakers placed their finished plates of cores on racks adapted to use with an elevating truck. This type of truck furnishes the means for the continuous use of large truck ovens. The use of rack trucks on stationary tracks prevents the oven being used while the cores are being loaded into the rack and when they are being removed. The continuous use of the ovens is an important factor where trucks are the means for holding the cores in the oven. Where ovens have to stand

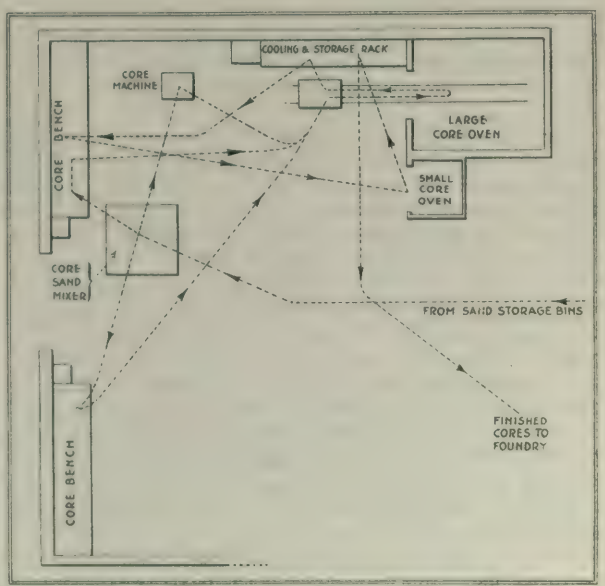


Fig. 3—In this foundry core room the raw and finished product crossed and recrossed several times, delaying the work and causing congestion

idle while their truck racks are being loaded and unloaded, just twice as much oven equipment as is required is being used. When using steel racks in connection with these elevating trucks as many racks as

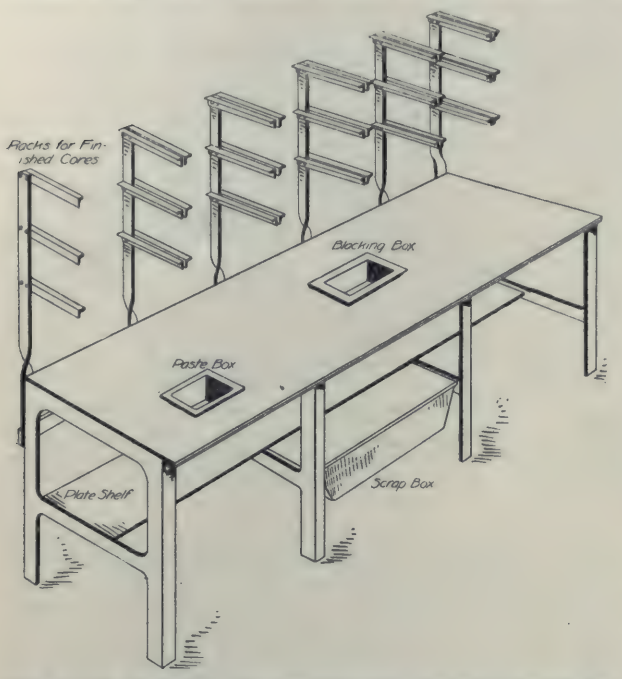


Fig. 5—In designing this pasting and assembly bench for small cores provision was made to enable the worker to have materials and plates located in the most convenient position possible

can be utilized are on hand. Some are placed at the core benches and are being loaded, while another set can be in the oven with baking cores, with a third set with baked cores being unloaded at the assembly benches.

Where these racks can be placed back of the coremaker's bench they will produce best results. In a foundry studied by the writer the time wasted by the coremakers when taking each plate to the oven amounted to more than an average of two minutes per plate. This two minutes loss on each plate could have been reduced to a six-minute loss on 40 plates by using the portable rack.

To insure oven work of the highest degree of uniformity, ovens must be so constructed that their temperature can be maintained at a constant point. They must be well insulated and as free from uncontrolled air as possible. Recording thermometers should be installed, and the thermostat used in connection with the oven flues or dampers will assist in the obtaining of an even degree of heat by providing mechanical means of damper control.

In one large core room it was found that the best results from a continuous oven system for certain cores was obtained when a temperature of 525 deg. Fahr. was maintained. For the ovens used for baking cylinder barrel cores a temperature of 500 deg. Fahr. maintained for two and one-half hours gave the best results. A radiator foundry running about 35 tons of core sand a day found out when using recording thermometer control that 380 deg. Fahr. for the first hour followed by two hours of steady heat, then three hours of slow cooling, gave the best results. The varying of the temperature was obtained by using forced draft.

Finishing and Assembling Cores

Where large numbers of cores are being made the work of smoothing, pasting, blackening and assembling cores can best be divided into separate operations so that special workers each have one or two operations to perform.

If the benches are arranged as in Fig. 5 so that successive operations can be performed by workers sitting next to each other or across the bench from each other, the cores can be passed directly from man to man, eliminating the necessity for storing in trays and carrying or hauling to the next operation. The cores having been finished and assembled, they can best be stored in trays or boxes or on boats, where they can be left until wanted in the foundry and then carried in these same trays direct to the molder's floor, where they are wanted.

Order and Stores Control

The method of core routing and core storage used by the Mueller Mfg. Co., a large manufacturer of brass plumbing goods, uses factory orders, Fig. 6, made out in duplicate, which go to the man in charge of the core-box storage. He gets the desired box from its rack and places it with the order on a rack accessible to the core room foreman. Rush orders and the corresponding boxes are immediately sent to the core room foreman in his office.

Each core has an estimated rate per hour, divided into three classes, *A*, *B* and *C*, according to their intricacy, the most intricate being classed at *A*. The coremakers are rated according to their skill, as *A*, *B* or *C* class, and are paid a corresponding rate per hour, which they get without question, no matter how much they turn out.

If, as shown on the sample card, Fig. 6, the job is scheduled Class *A*, at 35 cores per hour, or 315 for nine hours' work, and the coremaker at the end of the day has produced a total of 350 or 35 above the schedule, she is paid 11 cents extra. This rate of 11 cents is paid for the scheduled number of cores per hour which are turned out in excess of the standard for Class *A*. If the cores are rated in Class *B*, the coremaker is paid 10 cents for each scheduled hour's work in excess of the standard and for cores in Class *C*, 9 cents is paid.

The foreman at the start of work in the morning and afternoon, from his orders, lays out work in advance for the coremakers. The core boxes to be worked are marked with the coremaker's number and sent to a station where a workman gets ready the wires and dryers needed. When the coremaker is ready to start on new work, she obtains her duplicate of the work order, obtains her box and wires, while the dryers are carried to her bench.

PART NO. 39119

DATE STORED	QUANTITY STORED	RACK NO.	SEC NO.	TRAY NO	DELIVERED
6/15	125	C	8	435	✓
6/16	50	H	19	122	✓
6/19	307	K	10	310	
6/20	38	B	4	34	✓

THIS CARD INDICATES THAT 528 CORES ON THIS ORDER HAVE BEEN MADE, SHOWS THE LOCATION OF THE FOUR PLATES AND INDICATES THAT PLATE #310 IS STILL IN THE RACK

OBVERSE

Core Order No. 39119

Dept. 2 Date Wanted 6/18/17

Bin 433 Parts 2 Wire 420

Part No. 56868

Description ELBOW

Catalog No. 30065 Size 1/2"

Wt. of 100 Pcs.

Quantity 500

Instructions

INSTRUCTIONS TO COREMAKER

WRITTEN IN THIS SPACE

Schedule per -35- PER HOUR CLASS A

Coremaker 270 Ck

Counted by 201

Approved by Designed by H. W. Knauss Foreman

6017-10M. 10-2-16

REVERSE

Fig. 6—Exact orders to the core room insure the cores being ready for the molder when the foundry is scheduled to start molding. The back of the duplicate order which is retained by the coremaker is used as a memorandum to keep track of the number of cores he has made, while the back of the original copy is used by the clerk as a final record

As she finishes a plate of cores she enters the number made on the back of her core order. Each plate has placed on it an iron tag with the part number corresponding to that on the work order. The green cores are carried to the ovens by a boy. The ovens are charged by a man who regulates the baking and removes the cores to cooling racks. From the cooling racks they are taken to the benches where girls clean and smooth them up with graphite. The finished cores are next taken to the inspecting and checking rack. At this point the inspector notes on the back of the original order the date, the number in the tray, the rack and section number, when it is to be stored until taken to the foundry, and the tray number. The iron tag which has followed this plate of cores through the different operations is removed, and a paper tag is placed with the cores.

When the entire number of cores have been finished for the order this core-order card is placed in a rack where the laborer who takes the cores to the molders has access to it. This man then knows where to obtain the needed cores, and as he removes them to the molding benches he checks off on his work-order card the number of the plate delivered.

This system provides for having the needed cores on hand when wanted and in a known location. It also provides against dispute between the foundry and core room as to cores made and delivered, supplies the information for the payment of bonus to the workers, and checks losses during the progress of cores from the makers to the foundry.

Each person has his or her specified duty and becomes a specialist in that work. The summary of the flow of work is as follows:

1. Order received at box vault.
2. Order and box delivered to foreman.
3. Day's work scheduled by foreman.
4. Wire and dryer man prepares boxes of wires and dryers.
5. Coremaker has sand brought to bench and receives box and dryers.
6. Green cores taken by laborer to oven.
7. Oven-tender bakes and removes cores to cooling rack.
8. Laborer supplies girls who clean and blacken cores.
9. Finished cores inspected and counted.
10. Finished cores stored in racks of numbered sections.
11. Cores removed to foundry from storage rack by special laborer as they are needed by molder.

Iron Ore Shipments in September

Iron ore shipments from the Lake Superior region in September declined slightly, the total being 9,536,152 tons, a decrease of 64,634 tons compared with September, 1916. The movement to Oct. 1 this year shows a decrease of 2,756,944, or 5.64 per cent. The totals by ports are as follows:

	September, 1916	September, 1917	To Oct. 1, 1916	To Oct. 1, 1917
Escanaba	922,517	1,078,531	5,630,994	5,167,722
Marquette	557,140	509,754	3,026,845	2,408,816
Ashland	1,255,328	1,199,297	6,051,712	5,625,209
Superior	1,945,171	2,174,530	9,760,966	10,376,746
Duluth	3,455,611	3,190,347	16,174,159	15,189,368
Two Harbors ...	1,465,019	1,383,693	8,171,974	7,291,845
	9,600,786	9,536,152	48,816,650	46,059,706
1917 decrease		64,634	.....	2,756,944

Shipments from Duluth amounted to 33.45 per cent, compared with 35.99 per cent of the total in September, 1916. Shipments from Superior were 22.81 per cent of the total last month, compared with 20.26 per cent in September, 1916.

The National Implement and Vehicle Association, according to the announcement from the office of the secretary and general manager, E. W. McCullough, will hold its annual convention at the Congress Hotel, Chicago, Oct. 17, 18 and 19. The registration is already more than 50 per cent ahead of the largest previous attendance. The interest thus shown is considered to indicate "the confidence of the members in the value of co-operation in meeting unusual conditions and solving the many difficult problems of manufacturing and selling which have confronted every one during the past year."

TRANSCONTINENTAL RATES

Purchase of Steel for Shipbuilding Has Bearing on the Case

WASHINGTON, Oct. 9.—A proposed readjustment of the transcontinental freight rates to meet the situation arising from the water competition through the Panama Canal, which was directed by the Interstate Commerce Commission some time ago, will not be put into effect on Oct. 15 as originally planned. This case arose out of a petition of the railroads to file extra low rates to the Pacific coast on iron and steel, chiefly from Eastern points, without making proportionate reductions to intermediate points. The case had many varying trends due to the effect of the war on water transportation. The final decision of the commission was to refuse permission to the roads to make any lower rates to Pacific terminals than to intermediate points. This order was entered June 30 last, and the roads were directed to make the proper changes in their freight rates by Oct. 15.

In the meantime Congress passed a law under which carriers are not permitted to file increases in rates without first obtaining the consent of the commission. The roads have filed their new tariffs under the order of June 30, but it appears that these tariffs will necessarily provide for increases in the rates to Pacific terminals. Although these rates are filed in pursuance of the commission's intentions, there have been, even since, some important developments which make it necessary to give the freight question further consideration. Prominent among these is the purchase of steel on the coast for shipbuilding. The commission has therefore entered an order postponing the effective date of its order of June 30 and refusing to permit the roads to file their proposed tariffs under that order at this time.

In the meantime the commission will take up for consideration the broader question of the procedure under the new amendment to the law. A regulation under this new amendment has been issued by the commission reading as follows:

Until Jan. 1, 1920, no increased rate, fare, charge, or classification shall be filed except after approval thereof has been secured from the commission. Such approval may, in the discretion of the commission, be given without formal hearing, and in such case shall not affect any subsequent proceeding relative to such rate, fare, charge, or classification.

A general hearing on this question will be held before the commission on Oct. 15. Shippers and carriers generally have been invited on that date to present their views. In explanation of the new policy the commission states that the new regulation means that the approval of a proposed increased rate, fare, charge, or classification must be secured before the tariff containing it is filed with the commission by the carrier. Requests for such approval must be made by applicants to the commission.

Cooling Shell Forgings

The apparatus for cooling shell forgings illustrated in THE IRON AGE of Sept. 13 is, it now appears, protected by patents granted to C. P. Sandberg in Great Britain and in the United States and Canada. Authority was given the Canada Cement Company, Ltd., by the Ministry of Munitions under an arrangement by which the Sandberg concern waived royalty or payment in the manufacture of shells for the British Government during the period of the war. As will be recalled, the apparatus provided for the delivery of compressed air through numerous orifices in pipes inside and outside of the hot forging, thus to increase the production, while maintaining satisfactory physical characteristics.

To provide technically trained men in the automobile industry, especially for automobile service stations throughout the country, the Packard Motor Car Co. is opening a technical service training school, open to men who have had any automobile experience. Every man accepted for the school will be paid while being taught.

STEEL MAKING IN JAPAN

Capacity Is Being Rapidly Increased—New Companies Organized

WASHINGTON, Oct. 9.—Official reports have been received here to the effect that Japan is largely increasing her iron and steel output. How far this is due to the export restrictions now being imposed by the United States is not known. The report, however, coming from the American Consul General at Yokohama is very timely. Among other things the Consul General said:

"Projects for two new steel factories in the vicinity of Yokohama are reported by the Japan *Advertiser*. The Asano Steel Works is projected by Soichiro Asano, and the other plant is that of the Japan Steel Pipe Factory. Mr. Asano is the president of the Toyo Kisen Kaisha and the founder of the Asano Shipbuilding Co. His shipyards, established only 10 months ago, are now operating at full capacity. The Mitsubushi Engine & Iron Works, Nagasaki, and the Kawasaki Dockyard Co., Kobe, also have found it imperative to be able to produce their own steel. Ryozo Asano, managing director of the Toyo Kisen Kaisha, and son of Soichiro Asano, has sailed for the United States, where he will investigate the steel industry and make purchases of the latest steel-producing equipment.

"Regarding the new Asano Steel Works, Mr. Kato, managing director and chief engineer of the Asano Shipbuilding Co., is quoted by the *Advertiser* as stating that the independence of the supply of steel has much to do with the independence of the shipbuilding industry of Japan.

"The Japan Steel Pipe Factory, which will soon be established near Yokohama, has purchased mining rights in Nara and Fukushima prefectures with the object of getting ores. The Japan Steel Co. at Muroran, in the Hokkaido, the largest steel company in Japan, is to double its capital of $7,477,500, according to the *Advertiser*.

"The Japan *Chronicle* states that several projects have been launched in that country for establishing iron works. The Tokai Kogyo Kaisha, recently established, has bought an extensive tract of land in a suburb of Wakamatsu, where workshops are being erected.

"Another iron-manufacturing company in course of flotation is the Fuji Seiko Kaisha, with a capital of $2,991,000. The Nippon Kotetsu Kaisha also recently invited subscriptions from the public to its capital of $498,500. There is, besides, the gigantic project of the Kuhara family of Osaka, with a capital of $4,985,000. Mr. Yasukawa, a well-known mine owner of Kyushu, has acquired an iron mine in China, and is arranging to establish a company with a capital of $4,985,000 for the purpose of exploiting it. The Toyo Seitetsu Kaisha has lately increased its capital to $14,955,000, and has bought an extensive site in Kyushu for new workshops, the building of which will be commenced in April next. When these new factories have been completed the company will be able to produce 170,000 tons of pig iron a year."

Contracts for Wharves at Ojibway

The Great Lakes Dredging Co., Ltd., of Canada, Port Arthur, Ont., has been awarded the contract for the construction of wharves, slips and dredging in connection with the steel plant to be erected for the Canadian Steel Corporation, Ojibway, Ont., which has some 2500 acres on the Detroit River. The slips will be 2100 feet long by 250 feet wide. The Canadian Steel Corporation is asking for tenders for 150 houses to be built to accommodate the workmen. All construction work on the plant is to be rushed, as the corporation desires to turn out shipbuilding plates to help the Allied governments.

[The above interesting statement comes from Canadian sources. The Canadian Steel Corporation is a subsidiary of the United States Steel Corporation.—EDITOR.]

Electric Welding Plant Acquired

As a step in the litigation growing out of the patents on the electric welding process, a large number of manufacturers and users of electric welding equipment have purchased the plant of the National Electric Welder Co., Warren, Ohio. The electric spot welding process is controlled by the Thomson Electric Welding Co., Boston, which claims the right to charge a royalty for the use of the process. The Thomson company, it is claimed, also fixes the price which the lessees of spot welding machines must pay. Manufacturers and users of spot welding machines formed an organization to fight the Thomson patents in the courts and recently secured an option on the National plant.

The Thomson company brought suit in the Federal court at Cleveland to enjoin the consummation of the deal to purchase the Warren plant, alleging a conspiracy to destroy its licensing system and invalidate its patent. The complaint alleges that the National Electric Welder Co. was one of the licensees and that the defendants were endeavoring to induce it to violate its contract. The defendants denied this in their answer, but admitted their intention to contest the validity of the patent on the ground that F. P. McBerty, secretary and treasurer of the National Electric Welder Co., invented the electric spot welding process in 1901 and put it into practical operation two years before its discovery by anybody else.

Judge Westenhaver in the Federal court in Cleveland heard the motion for a preliminary injunction and overruled that part of it asking for an injunction against the purchase and sale of the Warren plant, but restrained the National Electric Welder Co. from violating its license agreement and also the other defendants from inducing it to violate the agreement, at least until the merits of the suit are passed on. It is expected that the basic issue as to the validity of the Thomson patent will be decided soon either in Cleveland or in Boston, where suits somewhat similar are pending.

The officers of the new Federal Machine & Welder Co., formed to purchase the National plant, are T. H. Kane, president; Henry C. Milligan, vice-president, and T. M. Seymour, secretary and treasurer.

Revised List of Articles Not to Be Exported

WASHINGTON, Oct. 8.—The necessity for conserving articles useful for war purposes, the supply of which is limited, has induced the Exports Administrative Board to prepare a revised list of commodities of this class, the exportation of which is practically prohibited. Export licenses may be granted, however, for the above articles when destined for actual war purposes, or when they will directly contribute thereto; and in certain unusual cases when such exports will contribute directly to the immediate production of important commodities required by the United States; and also in certain other cases where the articles may be exported in limited quantities without detriment to this country.

The list includes the following:

Boiler tubes (iron and steel), boring mills, vertical, 42-in. and larger, chrome nickel steel.

Ferromanganese, ferrosilicon, ferrovanadium, glycerin, iron and steel plates, including ship, boiler, tank, and other iron and steel plates ⅛ in. thick and heavier and wider than 6 in., whether plain or fabricated, lathes with 30-in. swing and larger.

Oil-well casing, pig iron, planers, metal working, 36-in. wide and larger.

Scrap iron, scrap steel, searchlights and generators (suited for Army and Navy use), spiegeleisen, steel billets, steel blooms, steel ingots, steel sheet bars, steel slabs, tin plate, toluol, tungsten.

Applications may be made at the Bureau of Export Licenses, 1435 K Street, N. W., Washington, D. C., or at its branch offices or agencies at other points.

The Westinghouse Pacific Coast Brake Co., San Francisco, has removed its offices from the Pacific Building to the new Southern Pacific Building on Market Street.

The Two Roll Straighteners at Ends of Cooling Beds



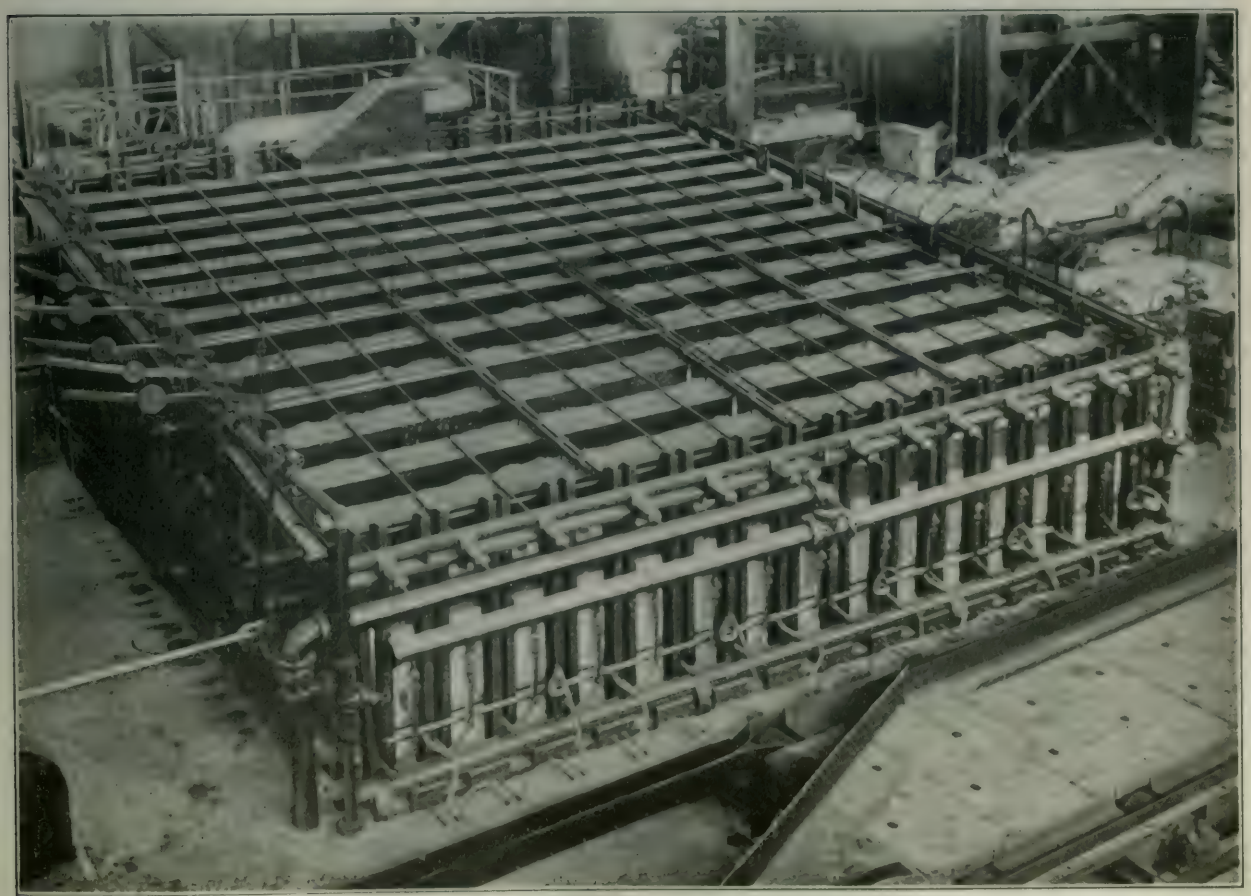
Another New Bar Mill at Youngstown

Youngstown Sheet & Tube Co. Starts Its New 12-in. Mill at Struthers, Ohio—One of Unusually Heavy Type

THE new 12-in. merchant bar mill at the plant of the Youngstown Sheet & Tube Co., Struthers, Ohio, was put in operation on Sept. 4. It was built by the Morgan Construction Co., Worcester, Mass., and is designed to take billets of 1¾ x 1¾-in. to 3 x 3-in. sections in 30-ft. lengths, and reduce them to finishing sections of ½ to 2-in. rounds and squares, 1¾ to 4½-in. flats and angles up to 3 x 3 in., with a capacity under normal conditions of 10,000 tons per month of average sections. Adjoining the 12-in. mill is the 9-in. mill, also built by the Morgan Construction Co., a description of which appeared in THE IRON AGE of April 5, 1917. Both the 9-in. and the 12-in. mills are served from a common billet yard, and use a common warehouse for stock purposes.

The billet yard at the north end of the mill is 90 ft. wide and 594 ft. long. It is served by one 15-ton double-hook crane and two standard gage tracks for unloading material. In its east end is located the roll shop. The warehouse at the south end is 100 ft. wide and 396 ft. long and is served with one 15-ton double hook crane and has a 75-ton capacity platform scale 40 ft. long and four depressed tracks for loading material from stock. The 12-in. mill building is 100 ft. wide x 1150 ft. long. One 15-ton single-hook crane serves the mill, and one 15-ton double-hook crane is used for stock handling. The buildings are of steel construction, and with the exception of the billet yard have the Pond type roof, with swinging windows of steel sash and operating device.

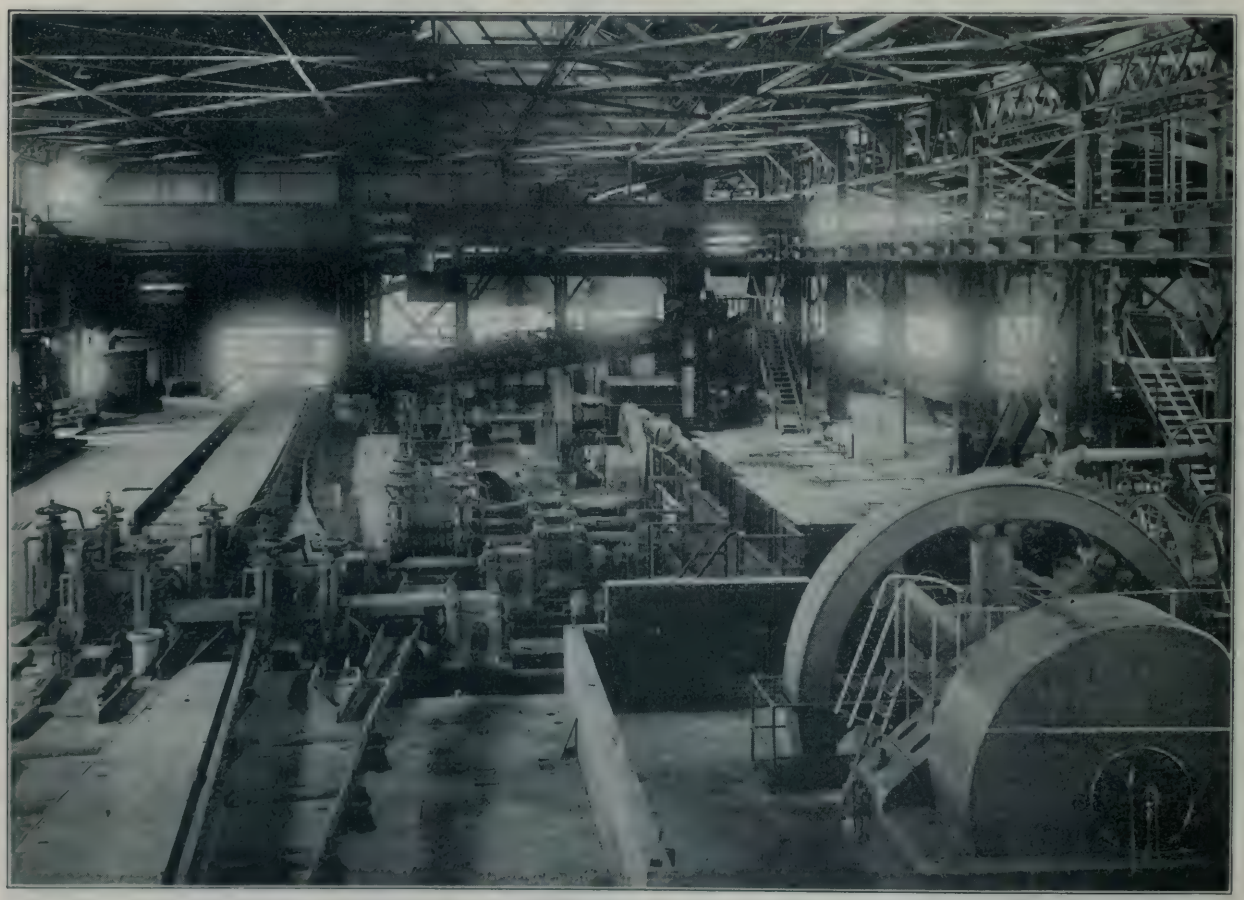
A charging conveyor 82 ft. long carries the billets from the skids in the billet yard to a 30 x 30-ft. Morgan continuous heating furnace, from which they are discharged to the roughing mill by means of a Hawthorne twist push-out. The furnace uses as fuel coke oven gas from the East Youngstown coke plant.



Billets charged in the far end of the continuous heating furnace are discharged by the push-out shown at the left and the first roughing stand may be seen at the right. Coke oven gas is used and the gas boosters are shown.

The roughing mill is a five-stand continuous train of 14-in. rolls, with an electrically driven dividing shear placed midway between the No. 2 and No. 3 stands. The four-stand 12-in. finishing mill is made up of two trains arranged in pairs of two stands each, placed in a staggered position to one side and in front of the roughing mill. These roughing and finishing trains are driven by a Nordberg 44 x 50-in. uniflow engine of the poppet valve type, running from 65 to 100 r.p.m. and developing up to 2100 brake hp. A description of this engine appeared in THE IRON AGE of July 20, 1916.

The cooling bed is 300 ft. long, and is of the double universal type. Located at the end of the bed, and on each side are the roll straighteners of special design, having all driving gears mounted in oil-tight dust-proof housings, and without gears on the ends of the straightener rolls. Beyond the straighteners are located the 300-ft. long front shear tables, bar shears, 75 ft. back shear tables and scales, where the material is sheared to desired lengths and weighed before shipping or stocking. A scrap shear is located near the mill



The roughing and finishing mills driven by a Nordberg uniflow engine. The heating furnace may be seen in the background

end and at the side of the cooling bed, while at the south end of the building in the rear of the back shear table and scales is located a cross roll straightener for straightening rounds.

Electric current for operating the transfer tables, cooling bed, etc., is generated at the rod and wire power house. All control apparatus for operating the motors in this mill is concentrated in two control houses centrally located with respect to the motors. Power from the main generating station is fed into busses within the control houses. Each control panel has its individual connection to the bus. All wiring from the control houses to the motors is carried in fiber ducts, laid in concrete beneath the floor.

Safety in cutlery grinding has been made the subject of an article by Earl B. Morgan, safety engineer, Norton Company, Worcester, Mass., and it has been printed for distribution by that company in a little illustrated pamphlet.

MANGANESE ORES OF VIRGINIA

Character of the Deposits in the Appalachian Mountain and Other Districts

BY MARSHALL HANEY*

MANGANESE ores are widely distributed in the United States, but only a few localities are of importance, and the manganese mining industry, never considerable, had been on the decline for a number of years up to the impetus given by the European war and the greater impetus since our country has gone to war.

Domestic ores are of much lower grade than the imported ores, and generally require washing and sorting in order to make them marketable. The domestic demand for the higher grade ores has been supplied largely from Russia, India, Brazil and Cuba. Manganese deposits are found in the Atlantic States from Vermont to Alabama and among these States Georgia and Virginia have led in production.

Virginia has two distinct districts—the James River area in the Piedmont region and the Appalachian Valley area. The beginning of manganese mining in Virginia and probably in the United States was in 1857, when 100 tons of ore was reported taken from the lands of Joshua Robertson, about five miles from Waynesboro, Augusta County, in the Shenandoah Valley. In 1868 and 1869 about 5000 tons of manganese ore was mined near Warminster, Nelson County, which really marked the beginning of systematic mining of manganese in that State. Virginia has more known deposits of manganese, extending over a large territory and more localities have been worked with a larger manganese production than in any other State in the Union. The ores are usually found embedded in the mantle of residual clays overlying the rocks from which the clays have been removed by the usual process of decay. The ore is distributed through the clays in an irregular manner in the form of pockets or lenticular

*Mining engineer, Geer, Va.

masses, rarely as distinct beds; as veinlets and stringers cutting the clays in all directions; as single nodules or concretionary masses assembled in the clays, and as small decimated grains scattered through the clays.

Both in the Piedmont and Valley regions the ores distributed through the clays conform in a general way to the bedding of the inclosing clays and the ores cut the clays in all directions. The pockets show much variation in size and number, ranging from small nests to bodies yielding many tons of ore. They are rarely composed of solid ore, free from clay, but the ore forms thickly studded nodules in the clays. The proportions of ore and clay vary greatly.

Only the oxides of manganese occur in Virginia and of these pyrolusite and psilomelane greatly predominate. The oxides occur in varying proportions. The ore is usually partly or entirely crystalline, of a dark steel blue color, and of the nodulose type which nearly always displays the complete or partial layers of concentric structure or concretionary masses.



Views Above and Underneath the Double Universal Cooling Beds and the Shears, Bar Pilers, etc.

The rocks in the Piedmont region are schists, gneisses and granites. They are derived in part from the original sedimentary, and in part from igneous masses by metamorphism. Workable deposits of manganese are found in the following counties in Virginia: Albemarle, Amherst, Buckingham, Appomattox, Campbell, Nelson, Pittsylvania and Spottsylvania. Some of the mines in these counties have been worked for many years and have yielded a large quantity of manganese.

The Appalachian Mountain or Valley region includes all the counties lying west of the Blue Ridge on the eastern side of the valley. This region is the chief source of manganese in Virginia as well as in the United States. The principal belt in this region lies along the western base of the Blue Ridge on the eastern side of the valley. This belt has a length of 300 miles in Virginia and workable deposits have been found in the 12 counties bordering on the western base of the Blue Ridge. Along this belt are found the large bodies of iron ore which are associated with the so-called Potsdam or formation No. 1 of Rodgers, and the ores of manganese are associated more or less with those of iron.

Since the European war began many new discoveries have been made in Virginia and have been developed into productive property, and other promising deposits wait for capital to take hold of them.

Appeal to Farmers to Collect Scrap

WASHINGTON, Oct. 9.—Farmers are being urged to participate in the profits derived from scrap. The present situation has been called to the attention of farmers generally and of all others who may be in a position to accumulate scrap by the United States Geological Survey. The Survey claims that even at the recently fixed prices of iron and steel it should be possible for most farmers to reap an overlooked profit through the sale of old iron and steel scattered about their premises; that the saving of such old scrap metal will help to meet the present serious deficiency in the supply of iron and steel; that the use of the old metal will accomplish savings in coke which is now to be had only at unprecedented prices; that the delivery of the old iron and steel at foundries far from iron mines and big steel centers will correspondingly relieve the excessive strain on the mines, some of the furnaces, and the railroad and boat traffic in the coke and iron producing districts.

In the northeastern States scrap metals have long been more or less fully taken care of, mainly by the ubiquitous junk man, and along most railroads and about most industrial plants they are now salvaged systematically. However, in the greater part of the United States little attention is given to saving the old metal scattered about the industrial plants of the farmers, where abandoned binders, plows, mowers, rakes, etc., decorate the fence corners and roadsides, and discarded stoves, pumps, pipe, and small utensils rust about in the barns and sheds.

Life Insurance for Shepard Employees

The board of directors of the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., has requested that the company's next quarterly bonus announcement be deferred until a plan for life insurance for all employees six months in the company's employ can be included. It is expected that the quarterly bonus will be continued on the same basis as for the previous quarter, and that in addition the insurance plan will provide for payment of wages to heirs for a period of one year after the death of an employee. Employees entering the company's service after the inception of the insurance plan will be subject to a medical examination. A reserve of $10,000 was set aside to finance the insurance.

Electric Pig Iron in War Times*

Low Phosphorus Iron from Steel Scrap in Canada—Use of Iron Ore Direct or Ore and Steel Scrap Mixed

BY ROBERT TURNBULL

THE abnormally high prices which are at present being paid for iron and steel products and which have been ruling for the last 18 months have seemingly failed to stimulate or encourage the manufacture of pig iron from ore in the electric furnace. Although from $50 to $80 per ton is now being paid for the different grades of pig iron, no progress has been made in the United States or Canada in the production of electric pig iron from ore, and it may safely be said that outside of Sweden and Norway this method of making iron in the electric furnace is practically *nil*. That pig iron could be made from ore electrically under present conditions, and at the same time yield a handsome profit, there is not the slightest doubt, but there are many difficulties in the way of the prospective manufacturer and one of the most serious is the shortage of power.

In the early part of 1906, when the smelting of pig iron in the electric furnace was undertaken by the Canadian Government, the report issued some time afterward claimed that the results of the experiments had proved that four tons of pig iron could be produced per horse-power year; in other words, this amount of iron could be produced with an expenditure of about 1650 kw. hr., whereas the present Swedish practice, where large furnaces are used, shows that from 2500 to 3000 kw. hr. is required to produce one gross ton of gray iron.

A few years ago the writer made some experiments with a single-phase furnace using about 650 kw., the ore used being hematite, containing from 50 to 52 per cent metallic iron. This furnace was operated for several weeks and the expenditure of energy per gross ton of pig iron produced was 2300 to 2400 kw. hr. It will therefore readily be seen that to produce any considerable quantity of iron in the electric furnace, large amounts of power will be necessary, and this, coupled with the fact that such an enterprise could only be operated under existing conditions, which are liable to change at any moment, has no doubt deterred investors from risking the capital necessary for such an undertaking.

The writer's own experience has not gone to show that any advantage has been gained either by lowering the expenditure of power or decreasing the gross cost of the product by the use of the shaft furnace, such as is used in Sweden, for, unless the gases are utilized, the shaft furnace becomes a complicated, expensive and unnecessary piece of apparatus. A well-designed ordinary electric smelting furnace, with partial roof and automatic charging from overhead hoppers, will produce a cheaper pig than the shaft furnace, and the first cost of plant would be considerably less.

Pig Iron from Scrap Steel

With the war, however, a new industry has been created for the electric furnace, which, owing to its practically low initial cost in plant and low power consumption, bids fair to become very popular. This is the production of pig iron from shell turnings and shell scrap.

As the specifications for steel to be used in the manufacture of shells call for low phosphorus and sulphur, it is possible in the electric furnace to produce a low phosphorus pig iron from such scrap at a figure which, given the present selling price of low phosphorus pig iron, yields a handsome profit, while very little refining is necessary. Any type of steel furnace can be used for this process, and it is not even necessary to have a furnace of the tilting type when little refining has to be done, as by special manipulation of the slag in the furnace a certain amount of phosphorus can be removed and sulphur is always to some extent eliminated by the basic slag employed.

The possibility of this process was first brought to the writer's attention in the fall of 1916, and experiments were immediately undertaken in a small furnace at Orillia, Ontario. These experiments having proved the process to be a feasible one, a new single-phase furnace was built and has been in successful operation since January of the present year. From 6 to 7 tons of low phosphorus pig iron is being produced per 24 hr., the amount of power used on the furnace being about 250 kw.

Furnaces for this work have since been installed at St. Catharines and Collingwood, Ontario, also at Shawinigan Falls, Quebec, and a number of furnaces are now operating in the United States.

At St. Catharines the furnace is of 6-ton capacity, 3-phase, operated by Packard transformers of 1200 kw., but only 700 kw. is being used at the present time, owing to the shortage of power. The daily output is about 20 tons. It is estimated that the production will attain 35 gross tons with the full power of 1200 kw.

Details of the Process

The operation is in many respects similar to the making of steel in the electric furnace, the refining process for the elimination of phosphorus being somewhat different. The charge consists of shell turnings, the necessary carbon base, which may be charcoal, coke or coal, ferrosilicon and lime. Manganese is not added, as care is taken in the process to conserve the manganese already contained in the turnings. The furnace is of the fixed type, with a carbon bottom and silica brick lining. There are two charging doors and one tap hole, similar to open-hearth furnaces. The furnace is controlled by automatic regulators, which eliminate to a great extent manual labor on the furnace, besides giving a much steadier load than is possible by hand control. The product is cast in sand, the pig beds being placed about 30 ft. from the furnace.

In our Orillia plant the iron is cast into iron molds, which make a better looking pig than sand casting. The return in iron as compared with the scrap charged is about 95 per cent, and, as about 5 per cent is added to the iron in the form of carbon and silicon, the total loss is about 10 per cent of scrap charged. The pig produced is very tough and the analysis is fairly uniform, as can be judged by the following table of consecutive heats:

Analyses of Low Phosphorus Pig Iron Made from Scrap in an Electric Furnace in Canada

Heat No.	Silicon, Per Cent	Sulphur, Per Cent	Phosphorus, Per Cent
237	1.45	0.025	0.025
238	1.83	0.029	0.031
239	2.82	0.030	0.033
240	2.11	0.029	0.027
241	1.88	0.025	0.027
242	2.49	0.027	0.027
243	1.21	0.035	0.040
244	2.35	0.030	0.030
245	1.25	0.029	0.031
246	1.55	0.027	0.027
247	1.59	0.028	0.031
248	1.50	0.025	0.029
249	2.02	0.029	0.032
250	1.50	0.032	0.038
251	1.41	0.029	0.033
252	1.50	0.025	0.023
253	2.20	0.025	0.027
254	1.50	0.027	0.039

*A paper, substantially in full, presented at the thirty-second general meeting of the American Electrochemical Society, Pittsburgh, Oct. 4, 1917. The author is electric furnace engineer, Welland, Ontario, Canada.

The carbon is very rarely over 3 per cent; above this point any extra carbon added is very destructive to the lining and roof of the furnace. A roof will last from 150 to 200 heats; the roof conditions are being gradually improved and 300 heats may yet be realized for one roof.

The process is not a new one, as attempts were made several years ago to make pig iron from scrap steel, but the cost was found to be prohibitive.

Using Iron Ore and Scrap

The writer has also made some experiments in operating the pig-iron furnace for ore, before mentioned, by mixing 50 per cent each of scrap and ore in the charge. The result was an increased production from about 6 tons on ore alone to 11 tons with the mixture. The same amount of power was used in both cases.

In passing, it might be said that some of the blast furnaces in the States are now mixing considerable quantities of steel turnings with the ore, in order to increase their output.

Whether the production of pig iron from scrap will be feasible electrically after the war and when normal conditions are again with us is not a settled point. The cost of production is at present high and would be prohibitive under normal conditions. It must be remembered, however, that costs today are possibly 50 percent higher than they were three years ago, and it is the writer's conviction that, provided future experiments find a means of eliminating phosphorus from the iron without removing the slag, the process can be profitably operated in normal times, at least in Canada, where low phosphorus pig iron is always a dollar or two higher than in the United States.

Coolers for the Roof

In conclusion, although a little foreign to this paper, the writer calls the attention of all those interested in steel furnaces to the roof coolers, which are placed around the electrodes in order to keep the bricks at that point as cool as possible. Recent practice at St. Catharines has shown that the life of the roof can be prolonged materially by correct application of these roof coolers, especially the ring of bricks around the electrodes. These coolers should be made to the exact form of the roof, and should rest on the bricks which form the ring around the electrode, and not on any packing between these bricks and the cooler. They should not be flanged, but cast to a special form, so that the cooling water will be at an equal distance from all outside surfaces. The writer will be glad to give any further particulars to those interested.

Embargo Causes Trouble in Canada

TORONTO, ONT., Oct. 8.—Canadian conditions in the steel trade are becoming more and more serious on account of the embargo placed on these products by the Washington Government, and indications point to a difficult situation for consumers to contend with. Market conditions are as a consequence very unsettled and the trade is anxiously awaiting developments. It is expected that the situation will be somewhat relieved, now that the United States Government has fixed prices on steel, iron ore, pig iron and coke. The effort made to have the embargo modified does not appear to have met with much success as the situation is as acute as ever. Existing conditions will benefit Canadian mills to a certain extent, but those consumers who rely on imported steel products will suffer considerable inconvenience. It is stated that shipbuilding and companies engaged in turning out products in connection with the war will not be interfered with, but other industries using iron and steel will be seriously hampered in their manufacturing activities.

The Tricity Steel Co., St. Louis, recently incorporated in Delaware with capital of $1,000,000, has acquired eight acres in the city industrial section for the erection of rolling mill and works to cost about $100,000. The company will specialize in the production of rail joints, tie plates and other railroad supplies.

BILLIONS APPROPRIATED

Congress Likely to Make a Change in Method of Voting Money

WASHINGTON, Oct. 9—Expenditures amounting to nearly $20,000,000,000 is the record left behind by the special session of Congress which came to a close last Saturday. This is a fact which stands out above all else and is ranked in importance only to the new war tax law which will multiply the annual revenues of the Government three times.

The largest appropriations made in any fiscal year of the Government were for the fiscal year which ended June 30 last, when the appropriations totaled $1,625,484,995.53. During the six months of the past session of Congress, appropriations amounting to $17,001,966,814.91, including the $7,000,000,000 to be loaned to our Allies, were authorized. In addition to this amount, Congress authorized contracts to be entered into or obligations to be incurred subject to future appropriations aggregating $2,419,258,393.50, making a total of appropriations and authorizations of $19,421,225,208.41.

Whether or not it was these large appropriations which prompted it or not, the fact does stand out that for once Congress is likely to abandon its obsolete method of handling appropriations. Representative Fitzgerald, of New York, introduced in the House during the closing days a resolution which would combine all authority to report appropriation bills in the hands of one committee. While this resolution is certain to meet with the opposition of the chairmen of the numberless committees heretofore possessing authority over the various appropriation bills, it is sure to win support in other quarters because of the serious business of war expenditures before the Government.

President Wilson has himself come out in favor of the Fitzgerald amendment. In a letter under date of Oct. 4, the President wrote the New York representative endorsing the proposed step which brings the Congress that much nearer the adoption of a budget system of handling governmental appropriations and expenditures.

The session of Congress which just closed is notable for other reasons than the large appropriations made, however. It is notable for the fact that practically all of its deliberations were over war measures.

New Installations of Heroult Furnaces

Licenses for the installation of the following Heroult electric steel furnaces have been issued by the United States Steel Corporation:

The Hess Steel Corporation, Baltimore, Md., will install four 6-ton furnaces for making forging ingots. This is in addition to two furnaces of the same type already operating.

The Watertown Arsenal, Watertown, Mass., will install one 2-ton and two 6-ton furnaces for the manufacture of steel castings and forging ingots.

The Twin City Forge & Foundry Co., Stillwater, Minn., will install one 3-ton furnace for making steel castings and forging ingots.

The American Bridge Co., at its Gary works, Gary, Ind., will install one 6-ton furnace for making steel castings and forging ingots.

The installation of these nine furnaces brings the total operating or contracted for in the United States and Canada to 144.

A new plant for making pig iron by electricity has commenced operations at Porjus Falls, Sweden, according to German papers. It takes its power from the large power station nearby. The first furnace now at work produces 8 tons per day; this will be raised to 20 tons with the installation of a second furnace. A third furnace will produce ferrochrome and other alloys.

Although many of the 25,000 employees of the B. F. Goodrich Rubber Co. of Akron were affected by the selective conscription act, the corporation asked exemptions in only 17 cases, all of which were granted.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

Owned by the United Publishers Corporation, 243 West 39th Street, New York. H. M. Swetland, *Pres.* Chas. G. Phillips, *Vice-Pres.* W. H. Taylor, *Treas.* A. C. Pearson, *Secy.*

BRANCH OFFICES—Chicago: Otis Bldg. Pittsburgh: Park Bldg. Boston: Equitable Bldg. Philadelphia: Real Estate Trust Bldg. Cleveland: Guardian Bldg. Cincinnati: Mercantile Library Bldg. San Francisco: 320 Market Street.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

Contracts and Fixed Prices

The iron and steel trade has accepted with very good grace the condition that prices are to be fixed. The feeling of patriotism is doubtless the dominant one, yet the fact must not be ignored that the system of fixed prices bears promise of advantage to the majority, as well as relief from trying uncertainties. Such complaint as there has been has naturally come largely from those who may be placed at a disadvantage through their having signed contracts to accept material at prices higher than those now fixed or about to be fixed. The only really formidable problem in the whole matter of price fixing is this question of contracts.

The contract problem is not before the trade as a business issue. It is before Washington as a legislative issue. There is nothing in existing law touching upon the question of contract abrogation. There was nothing in the recent agreement between the Government and the producers that affects existing contracts. Nor, finally, is there any disposition in the minds of sellers to consent to the abrogation of any contracts. In the discussion of the price-fixing measure that is to come before Congress upon its assembly in regular session in December there have been some expressions of opinion that contracts should be abrogated when they embody prices much higher than those fixed as selling prices for the future. Chairman Davies of the Federal Trade Commission, which drew the bill replacing the Pomerene bill, has strongly advocated the principle of contract abrogation as a necessary step in making price control really effective, and Dr. Walker, the chief economist of the commission, has testified along somewhat the same line.

The iron and steel trade has no occasion to consider the crossing of any bridge before the bridge is reached, and the matter of contract abrogation is far in the future—three months at the least, even assuming a legislative speed that cannot be expected. Before such a law could become effective a great deal of material will have been delivered. Practices as to contracts, however, are not uniform in all material. The cases of finished steel and pig iron stand in opposite relation in this respect.

The highest prices for steel, involved in the last stages of the steel market's great rise, were for relatively early delivery. Contract buying for regular forward deliveries almost ceased last April, and the further advances that occurred in May and June referred very largely indeed to deliveries promised in from two to five months. Even allowing liberally for delays, there should be hardly any of the highest priced business left on books at the end of this year. A large volume of contract business at much lower prices will survive. It is quite improbable that there will be any large tonnage at such a premium over the fixed prices as would cause hardship to the buyer. In many cases, moreover, contract revision would be merely a repetition of the common practice in the finished steel market when there has been a decline.

In pig iron the case is quite different. As a rule, the higher the price the later the delivery. Only a very small tonnage of the pig iron placed under contract at prices above the fixed level was for early delivery. The lapse of time, instead of clearing away the highest priced iron, merely brings the trade to the time when it is to be offered for acceptance. To cancel all contracts for pig iron at higher than the fixed level, or to reduce them to the fixed level, would evidently be contrary to the conditions considered when the producers agreed to accept a $33 basis. Many of the producers had been losing money on much of the iron they had delivered, through using high priced coke to produce low priced pig iron, and they had on their books, at the time of the agreement, contracts running both below and above the $33 basis. In accepting the basis to govern future transactions they had in mind the fact that the two classes of iron would average. To carry out the spirit of the agreement, if the higher priced contracts were abrogated the lower priced contracts should likewise be abrogated, and no one has dreamed of such a thing being possible.

The idea of leaving the matter of contract abrogation to the judgment of any man or group of men cannot be entertained. The greatest confusion and friction would result from any legislative enactment whereby such contracts as might work a hardship to consumers were abrogated and others were not. No legislation on contracts can be considered for a moment that would not apply to all.

Those connected with the Federal Trade Com-

mission who have suggested the possibility of its being desirable to take action with respect to contracts have laid some stress on the idea that without such control the flow of material might be wholly upon contracts, leaving no material for the open market when the selling price has been fixed. For this there is, perhaps, a remedy already available, in the scope of the Priority Board. It exists already to regulate the flow of material, and to use its power to correct inequalities arising from the contract situation would not necessarily increase the confusion.

The problems presented appear formidable from the viewpoint that what is undertaken is to create, from nothing, a *modus vivendi* for the iron and steel trade. That is not necessarily the viewpoint. The future can be considered from the viewpoint that certain existing evils are to be corrected, or merely lived down by allowing time to elapse, and that certain evils that would have arisen in future, through the continuance of former practices, are to be forestalled. The Government did not wish to have private buyers bidding against it, and it did not wish to have continually, to the end of the war, the possibility that on every sale made to the Government the seller would be in the position of making a sacrifice. From this viewpoint the prospect is not so formidable.

Confusion on Costs

Some of the discussions of costs in the iron and steel industry tend to give an altogether erroneous impression as to the difference in cost between the so-called "integrated" and "non-integrated" producers. It is made to appear, frequently, that the unintegrated operations have a much higher cost and a much smaller profit than the integrated operations. That is not true. There is a difference, but it is small, not large. The misapprehension arises from regarding the integrated concern as one unit, and the unintegrated concerns as a series of units. The fact is that in each case there is a series of units, the series being in one case under a single ownership and in the other case under separate ownerships.

Considering the single operation of manufacturing steel from pig iron, for instance, the integrated company is looked upon as having its pig iron at a very low valuation, because the valuation is the bare cost of manufacture from the ore and coking coal in the ground up through the pig iron, while the unintegrated company is looked upon as having its pig iron at a high valuation, because there have previously been allowed profits on mining ore and coking coal, converting the coal into coke, carrying the ore and converting the raw materials of the blast furnace into pig iron.

If the manufacturing and administrative operations were precisely the same in the two cases, the cost of making a ton of steel plates would be precisely the same, whether by a fully integrated concern or by a line of unintegrated concerns. In either instance the profit could be distributed along the line. In the case of the unintegrated concerns, each would be allowed a profit on the process it conducted. In the case of the integrated concern, a profit would be allowed to each of its departments, each department being exactly co-ordinate with the entire activity of one of the unintegrated concerns.

It might be thought from a practical viewpoint that in allowing profits it would be expedient to allow larger profits to the various unintegrated companies than would be allotted to the corresponding departments of the integrated company, because the latter might be able to make out somehow, through its larger profit in one department absorbing a possible loss in another department. That would be putting a premium on disorganization and could hardly be considered a justifiable expedient in any conceivable circumstances. If, for instance, it were possible to show that if a plate mill with open-hearth furnaces would lose money, or would make altogether too little profit, when buying pig iron at $33 and selling plates at 3.25c., while an integrated company could make an amply large profit when selling plates at 3.25c., it would not follow necessarily that the 3.25c. price on plates was too low. It might be that the $33 price on pig iron was too high.

The difference in cost between the group of departments in the integrated company and the total of costs of the chain of unintegrated companies is small, not large, as is suggested by much of the discussion that has appeared, including some of the testimony recently presented before the Senate Committee on Interstate Commerce on Sept. 21. It is a difference that puts some unintegrated companies out of the competition when prices are extremely low, but it is a difference that counts very little when the industry is even moderately prosperous.

The greatest difference between integrated and unintegrated practice is that the steel mill which must buy pig iron obtains it cold while the integrated companies use molten pig iron direct from their blast furnaces as largely as possible, and thus save the time and expense involved in reheating. In normal times the difference is only in the neighborhood of $1 per ton, though no precise statement can be made, as conditions vary and so many facts must be assumed before a computation of the difference can be undertaken. In times of heavy pressure for steel there is normally room for argument that the use of cold iron cuts down output and thus decreases the earning power of a plant, but this difference cannot be set down in dollars per ton, to arrive at a cost from which the selling price can be computed, because it is a function of the final profit that is to be allowed.

Then there are differences caused by the unintegrated companies having to pay freights on intermediate materials, to a greater extent than is the case with integrated companies, but that is an incident rather than a necessary condition. An integrated company may have more steel-making capacity than blast-furnace capacity at Pittsburgh, and more blast-furnace capacity than steel-making capacity at Youngstown, in which case it will have to pay freight on pig iron from Youngstown to Pittsburgh. If the unintegrated companies chance to be located side by side there is no freight involved.

In administration there are savings to the integrated companies that are important in bad times

but are relatively unimportant in times like the present, when men are thinking in dollars per ton as compared with nickels or dimes in ordinary times.

Thus in the last analysis the real difference between the integrated and the unintegrated production is a small one, due to differences in manufacturing processes and in administration, these being actual physical conditions. The large differences sometimes spoken of are merely on paper. They could be eliminated by a proper presentation of the facts. The capital investment employed in producing a ton of plates, starting from nature, is substantially the same whether the operations are conducted by a fully integrated company or by a chain of unintegrated concerns.

Anti-Trust Suits to Be Pressed

From the beginning of active preparations for war, the impression has been steadily gaining ground that the National Administration has been losing its antagonism to "big business." Representatives of great corporations have been invited to participate in movements designed to strengthen the Government, and their offers of co-operation have been cordially accepted. It is therefore a disagreeable shock to have such an announcement appear as the following, which was sent out from Washington on Monday:

> The war will have no effect upon the Government's prosecution of the five great anti-trust suits now pending in the Supreme Court. Solicitor General Davis said to-day that an agreement had been reached with attorneys for the International Harvester Co. whereby the dissolution suit brought against that company will not be considered by the court until after the arguments in the Steel suit, which will be called in January.
>
> The Coal cases will come up in their regular order and will be reached late in November.
>
> The Supreme Court to-day decided to expedite the Government's anti-trust suit against the United Shoe Machinery Co. and fixed Jan. 7 for rehearing arguments. The suit was dismissed by the lower court, which held the company blameless. The Government appealed.

It would appear that, if the Administration is really developing a more kindly feeling for business interests, the sphere of such a development has not yet expanded enough to take in the Department of Justice.

Conventions and the War

Soon after our entrance into the war a number of engineering and scientific societies advocated, "on account of the war," the cancellation of current conventions. Various reasons were put forward and some usually eventful conventions were abandoned. It is fortunate that others were not, for the value of the deliberations and results of many, if not all, of them was proved.

Week before last at Boston the largest gathering ever held of American foundrymen discussed cast-iron shells, ordnance steel castings, the crucible situation and other topics having to do with pushing the war. In the same week at New York the largest American exhibition of chemical products ever held revealed the wonderful strides that have been made in the manufacture of chemicals, dyes and coke by-products, due almost entirely to the war situation and valuable in its prosecution.

Last week at Pittsburgh a representative gathering of electrochemists enlightened the country by papers and discussions of new war products such as electric pig iron, chlorine, ferroalloys and a symposium on war materials, all essential to war as well as to industry in time of peace. This week at St. Louis there is in session probably the most important meeting ever held on the subject of this country's manganese resources. Under the auspices of the American Institute of Mining Engineers, representatives of the mining and geological industries of the country are giving careful thought to relieving the country's great steel industry from almost entire dependence on foreign sources for its manganese.

Such meetings as these, not to mention the munitions sessions in May of the American Society of Mechanical Engineers and similar ones to come in December, are clearing houses for the exchange of ideas and information of which all need not be kept secret until after the war. England has by such gatherings made striking progress in meeting a serious sudden deficiency in important products—ferroalloys, electrodes and furnaces. Such conventions must here continue, despite the war.

CORRESPONDENCE

Wage Advances

To the Editor: The daily announcements of advances in wages or demands for advances have become a matter of expectation on the part of the public. That is, we expect to see these items in each morning's paper just as we do the financial page. After reading them we shrug our shoulders and view it simply as another result of the war.

As a matter of fact, the period when these advances began to attract notice antedates both this war and the high cost of living agitation. The original desire of the employee arose, not because he wanted to buy something which he could not afford, but because someone told him that his employer was getting all and he was getting nothing. In due time enough of these advances had been obtained in the various trades to increase the cost of each man's necessities. Not being far-sighted enough to anticipate this result, the workman naturally did not deduce the cause from the effect. Simply recognizing the fact that existence was paralleling income, each trade girded up its loins and proceeded to battle for more income to meet the high cost of living, which, in turn, was nothing more or less than the cost of high living; and by this latter is meant the natural desire of mankind to better his mode of living. Thus it has proceeded, perhaps not so like an endless circle, as in the same manner as skirmishers advance.

The war and then our entrance into it were only contributing factors—not causes. The statements which have been industriously circulated concerning enormous war profits and the idea that now our own Government is the ultimate consumer and must pay the fiddler, makes the employee unmindful how high prices go, believing he can keep on forcing up his pay.

Herein lies one very great opportunity for those in charge of propaganda for economy and thrift which has been started. A nation which learns actually to save something out of its income and to resist buying everything simply through the desire of having will slowly but surely waken to the fact that by acquiring both these traits the income will be sufficient. Every advance will then be sought on the basis of merit only.

With the income of all sufficient, the cost of living will not be increased except as affected by other economic causes. Furthermore with this one vexatious question settled, the manufacturer can give his attention and resources to the overcoming of mechanical or natural obstacles and thus reduce cost of production. And while the employee may not be convinced, it is nevertheless a fact that nine out of ten manufacturers are interested in this very thing, reduction of selling prices.

H. D. MURPHY.

Conserving Steel Tools

To the Editor: All substantial structures must have a foundation and a cornerstone. Steel, to-day, is the backbone of most large structures, and the most vital need of the railroad, the munition plant and the ship-yard. It is one material indispensable to the successful prosecution of the war as well as indispensable to the development of the country in times of peace.

Wise steps have been taken to safeguard the supply of steel to the munition industry and the car-building plants, but other less conspicuous industries appear to have been overlooked. One of these in particular—that which deals with the supply of steel tools—is so essential in its nature that even the steel industry itself may be said to depend upon it.

The greatest care should be shown in the use of steel tools. Their abuse at the hands of inexperienced workmen may cause a very acute situation far-reaching in its effect. The time is coming when every steel tool in this country will be urgently needed and when the utmost difficulty will be experienced in replacing such tools as have been worn out.

Let us take as a single illustration of the tool industry, the twist drill, and consider what place it holds in the modern scheme of things. Ninety-four different drill operations are required in the production of the Springfield rifle. That means that before an army of 500,000 men can set foot in France with proper equipment on his back, 188,000,000 holes must be drilled.

Industrial preparedness has taught us that it requires not less than two men sweating at home in the shops for every fighting man at the front. Millions of men must work with tools at home that half that number may fight.

Bear in mind that the common twist drill is only one tool of the many necessary for the production of the finished rifle. Perhaps you now begin to sense the importance of the steel tool with which you sometimes may become a bit careless.

No industrial preparedness or conservation campaign is complete which overlooks the tool industry. Each workman in the country, every manufacturer and consumer of tools should unite in an effort to make the present inadequate supply go as far as possible.

Sacramento, Cal. FRANK J. HULSBRINK,
Southern Pacific Store Department.

Ingot Production of the United States

The American Iron and Steel Institute estimates the ingot production of the country for the year 1917 at 42,260,000 tons, compared with 41,401,917 tons in 1916, which was the record year, and 31,284,212 tons in 1915. The production for the nine months ending with September was 27,935,411 tons by the 29 companies reporting, which made 88.14 per cent of the ingot production in the previous year. Other details of the production by the 29 companies are given in the following table:

	Total First Six Months	July	August	September	Total Nine Months
Open-hearth	13,681,483	2,152,479	2,251,013	2,195,556	20,280,531
Bessemer	5,164,139	777,171	863 873	770.064	7.575 247
Other	55,198	9,465	8,331	6,639	79,632
Total	18,900,820	2,939,115	3,123,217	2,972,259	27,935,411

Enlargement of the locks on the Welland Canal to permit of the construction of bigger ships on the Great Lakes for ocean service is under consideration by Canadian and American Government officials.

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VIEWS ON STEEL PRICES

How Consumers Regard the New Era Shown in Extracts of Letters

As shedding further light on the attitude of consumers of iron and steel toward the prices which were promulgated from Washington on Sept. 24 on iron ore, pig iron, and steel bars, shapes and plates, extracts from some letters which have reached THE IRON AGE will be of interest.

To Buyers of Iron and Steel Articles

To convince its customers that they cannot expect reduced prices because the fixed iron and steel prices represent reductions from the recent levels of prompt delivery purchases, the Charter Oak Stove & Range Co., St. Louis, has issued a circular to its salesmen and customers as follows:

"Our present prices are based on our average cost of iron and steel, which happens to be practically the same as the prices fixed by the Government. We have never adjusted our prices to equal the high market prices that have prevailed. We gave our customers the full benefit of our fortunate purchases by averaging the costs of materials bought by us from time to time before the very high prices which have prevailed for some months were in effect.

"Since the day the Government named the figures we have tried to place orders on that basis, but were unable to do so either for immediate or future delivery.

"Manufacturers of stoves and ranges must make their selling prices based on their average cost of materials and in no case do we believe is any manufacturer's average cost of steel and iron at this time lower than the prices fixed by the Government, in some cases considerably higher. So you can see the manufacturer's cost is not reduced by the action of the Government.

"Another factor is the scarcity of all materials. Supply and demand is a most important factor in regulating prices of all materials, all labor, all finished commodities. Just now the demand is greater than the supply and stoves and ranges are no exception. The quantities on hand were never smaller nor the demand greater.

Price Declines Regarded Unlikely

"If the war continues into and through next year, we do not believe that any manufacturer who uses steel and iron will be able to obtain these materials as he wants them, or in the quantities that he needs, because of the Government's requirements which must be met first. If happily, the war should be brought to a close, a revival of building and other industries would result and use up all the metal that the close of the war would release, so there is no likelihood of an overproduction as far as can be foreseen.

"So the reasonable and logical conclusion is that there is not the remotest possibility of a decline in prices. Dealers who postpone placing orders for their requirements for this fall and winter expecting a reduction in present prices will be disappointed and may cause their customers some inconvenience through not being able to obtain the stoves and ranges they require promptly."

Suggests Prices Take Effect at Future Date

A non-integrated maker of steel products, which holds that it was necessary to buy ahead at high prices to secure deliveries and which suggests that the fixed prices should go into effect at some future date, say April 1, 1918, so that opportunity would be given to work off high-priced stock, has written a letter to the President as follows:

"We are manufacturers of steel products of a finished nature and because of our limited size and means in this age of large corporations, are compelled to buy our raw material, steel billets. You are well informed as to the excessive demands over the past few years for this product, as well as the ever increasing prices. Because of this situation we have found it extremely difficult to keep our mills in operation and, therefore, our management had the forethought, at least so we believed then, to purchase a sufficient quantity to carry us through the remainder of this year, 1917, and well into the first quarter of 1918.

"To this end, last spring we contracted for thousands of tons at the prices then prevailing, which as you well know, were several times the cost of production. Were your administration to bring about drastic reductions in the price of this commodity, it would mean ruination, not only to us but also to other concerns in a similar position, and lack of employment to our employees, of whom at the present time we alone have between 750 and 1000.

"We do not desire to make a selfish or unpatriotic plea. We are willing to do our part and realize the problems before the administration are serious and complicated and that any solution would work certain hardships, but we feel that if the price of steel is controlled and materially reduced and there are no steps taken to protect the consumer who has contracted for his requirements, many substantial, conservative firms like our own will become bankrupt, unsettling the industrial situation and tending to concentrate the power in the large corporations which own their raw material and whose cost of production varies only with the cost of labor and transportation."

Important Measures Postponed

WASHINGTON, Oct. 9—As Congress was about to adjourn, Senator Pomerene called up the exports combination bill and had it made the unfinished business of the Senate. This is the measure which would permit American producers to combine for export trade, or to organize joint foreign sales agencies. The means proposed in the legislation is to limit the application of the Sherman law and the Clayton law to domestic business and not to have it apply to export business.

The bill has already passed the House and when it was made the unfinished business of the Senate, Senator Pomerene explained:

"It is not my expectation or desire to ask for final action. My sole purpose is to have the bill made the unfinished business, so that it may be taken up at the beginning of the next session."

The export combination bill was recommended to Congress by the Federal Trade Commission and has the endorsement of President Wilson. It was passed by the House of the previous Congress only to die in the Senate.

One other measure which was put over until the next winter session of Congress is the Pomerene steel price fixing bill. This measure has already been considered by the Senate Commerce Committee and has been redrafted by a subcommittee. It is the intention of Senator Pomerene to urge the Senate Committee to action and report immediately Congress reconvenes in December.

Preparing to Entertain the Institute

Elaborate preparations are being made for the entertainment of the American Iron and Steel Institute that will hold its fall meeting at Cincinnati Oct. 26 and 27. Headquarters will be at the Hotel Sinton, where the banquet will be given on the evening of the twenty-sixth. The committee will also provide an extensive entertainment program for the ladies who will accompany the delegates.

The entertainment committee consists of the following: James I. Stephenson, Cincinnati Iron & Steel Co.; John E. Woods, Carnegie Steel Co.; B. W. Lamson, Bourne-Fuller Co.; Buckner Wallingford, Walter-Wallingford & Co.; D. B. Meacham, Rogers, Brown & Co.; George M. Verity, American Rolling Mill Co., and Thomas Quinlan, Cincinnati Chamber of Commerce.

The Steel Improvement & Forge Co., Cleveland, has recently installed four new 5 x 10 ft. heat treating furnaces in its Lakeside plant, 5418 Lakeside Avenue.

WAR-EMERGENCY ACT

Foreign Vessels Admitted to Coastwise Trade—Heavy Demands for Ships

WASHINGTON, Oct. 9.—At the urgent request of the Shipping Board, with the indorsement of the Department of Commerce and President Wilson, the Senate adopted without amendment the bill already passed by the House which will admit foreign vessels to our coastwise trade. This is a war-emergency measure. The act provides that the Shipping Board may suspend our navigation laws relating to the coastwise trade during the present war with Germany and for a period of 120 days thereafter.

This is one of the many measures framed to meet the emergencies created by the war with Germany and our participation in that war. Its enactment is intended to supply the needs of our domestic commerce growing out of the diversion of a large part of our coastwise tonnage to the over-seas trade.

The demands of our Army and Navy for transports, colliers, supply and munition ships to meet present and future requirements are so imperative that it is and will continue to be necessary to utilize all of our available ocean tonnage suitable for that purpose with the result that our coastwise trade will suffer great inconvenience and loss unless we utilize all of the available tonnage, whether domestic or foreign, to meet our requirements.

There is no purpose in the legislation to break down our coastwise laws or depart from a policy that has been consistently followed from the foundation of the Government, and all fears expressed to that effect are without foundation.

This legislation was adopted without reference to the soundness or unsoundness of the policy heretofore followed of reserving our coastwise trade for American-built vessels; or whether or not the extension of our coastwise laws to Porto Rico and the Hawaiian Islands is wise or unwise.

This is a war measure and is limited to the period of the war and a reasonable time thereafter, and the powers vested in the Shipping Board are so hedged about and limited that there need be no occasion for fear on the part of the interests that have enjoyed the monopoly of our coastwise trade in the past that they will suffer. They in common with all other patriotic American citizens are called upon to view the problem from the standpoint of public interest and not from the standpoint of private gain.

There can be no ground for fear from the standpoint of our shipbuilding industry. Never in the history of the world has any nation embarked on such a gigantic shipbuilding program. Not only are our existing shipyards crowded to capacity with new work but large sums are being expended both by the Government and private interests in providing new plants for the construction of merchant vessels to replace the losses occasioned by the German submarines, and with the definite purpose of making that method of warfare hopeless as a means of Germany winning the war.

The Shipping Board laid before Congress a complete report of the tonnage under the American flag now engaged in the foreign trade and the tonnage withdrawn from the coastwise trade on the Great Lakes and on our seaboards to meet the requirements mentioned above.

At the end of the fiscal year 1914, and just before the war broke out, we had registered under the American flag and engaged in the foreign trade 1,076,000 gross tons. We had on the Great Lakes 2,882,000 gross tons; and on the high seas and rivers we had 3,969,000 gross tons; in all 7,928,000 gross tons.

At the end of the fiscal year ending June 30, 1917, our shipping registered for the foreign trade has increased from 1,076,000 gross tons on June 30, 1914, to 2,422,000 gross tons; or nearly two and one-half times.

Our shipping on the Great Lakes has dropped from 2,882,000 gross tons to 2,771,000 gross tons; that is, a little over 100,000 gross tons. But it is fair to assume that more than 100,000 gross tons of shipping has been withdrawn from the Great Lakes, because we know that there has been considerable tonnage built on the Great Lakes during that period.

On the seaboards in the coastwise trade our tonnage has fallen from 3,969,000 gross tons to 3,607,000 gross tons; a decline of about 362,000 gross tons, or 10 per cent. These are the figures covering the period up to June 30 of this year.

Prior to that time practically no ships had been taken out of the coastwise trade for military purposes. Since then the withdrawal of shipping from the coastwise trade to carry troops and munitions and supplies of every kind to meet the requirements of our Army and Navy has been very rapid, and it is probable that in a relatively short time 1,000,000 or more tons of shipping must be withdrawn from the coastwise trade to meet the requirements of the military operations of the United States.

The Shipping Board is planning between now and the close of navigation to withdraw from the Great Lakes all the tonnage that can possibly come through the Welland Canal that may be serviceable in the coastwise trade; estimated at over 300,000 gross tons.

The Canadian Government by order-in-council is now permitting American registered boats to engage in the trade between port and port on the Great Lakes, and this arrangement should be reciprocal in the present emergency in the interest of the trade of both countries.

McKinley Memorial Dedicated

YOUNGSTOWN, OHIO, Oct. 8.—Seventy thousand people witnessed the dedication Friday, Oct. 5, at Niles, of the beautiful McKinley Memorial building, erected in honor of William McKinley. The principal speakers were former President William Howard Taft, George B. Cortelyou, Myron T. Herrick, J. Mitchell Chapple, Dr. C. A. Manchester of Canton, at one time McKinley's pastor, and Joseph G. Butler, Jr., president of the McKinley Birthplace Memorial Association. The building and grounds represent an investment of half a million dollars, raised by popular subscription. In addition an endowment fund of $100,000 is being raised for maintenance.

In addition to a 12-foot statue of McKinley, sculptured by J. Massey Rhind of New York, the memorial contains busts and reliefs of men who were prominently associated with McKinley and pioneer iron and steel manufacturers of the Mahoning Valley. In the entrance to the library is a large bust of H. C. Frick, who donated $50,000 to the project. This bust and one of Mr. Taft were donated by Mr. Butler.

Among those recognized in the building are Ohio's war governor, David Tod, who was largely interested in the iron and steel business here in its early days; Andrew Carnegie, P. C. Knox, Theodore Roosevelt, Elihu Root, M. A. Hanna, Henry W. Oliver, Justice Day, John Hay, C. H. Andrews, and James Ward. The last named was the man who built the first rolling mill in Niles 75 years ago.

The memorial project was conceived and carried to consummation largely through the efforts of Mr. Butler, who, although 77 years of age, still is very active in business and public affairs. He is now erecting an art museum in this city at a cost of a quarter of a million dollars to house his own extensive private collection.

The Anniston Steel Products Co., Birmingham, Ala., has been incorporated in Delaware with capital of $3,000,000 to operate a plant for the production of iron, steel and manganese products. Walter M. Hood, M. P. Randall, W. R. Lloyd, C. A. Bingham and P. C. Covington, all of Birmingham, are the incorporators.

The appointment of a supervisor of metal and fibre by the Canadian Government is indicated in an Order-in-Council which also authorizes the Minister of Customs to fix the price of scrap iron and scrap steel, rags, waste and other materials of metal or of animal, vegetable or mineral fiber.

Iron and Steel Markets

TRADE PRACTICE CHANGES

Pig Iron at Same Price for Each Furnace

Recommendations in Price Fixing Program Cover Shell Steel

With the leading iron and steel makers in conference at this writing with the War Industries Board, a further announcement of agreed prices may be expected at any moment. The effort will be to settle on the upward of one hundred items, products and classifications of them, but the American Iron and Steel Institute's committee prior to leaving for Washington late yesterday afternoon had not gotten far beyond a consideration of semi-finished steel products.

What will interest the trade nearly as much as prices is the extent to which there will be a realignment of basing points and other changes in trade practices. The sweeping recommendations proposed in fixing pig iron prices at the same figure for all furnaces are conspicuously epochal. Whether finished steel will be quoted at equal figures for Chicago as well as Pittsburgh is a question; it was not, it appears, discussed at the meetings in Washington out of which came the price promulgation on Sept. 24. The effort will be made to secure a special base price for shell steel, on the ground that it introduces a very different steel mill problem from the rolling of ordinary steel rounds. The place of the jobber in the price fixing program and the status of export sales for commercial use, or under classification C, may bring out definite rulings.

Pig iron manufacturers through their representatives on the American Iron and Steel Institute committee have recommended the adoption of a uniform price at furnace, regardless of location, with differentials of the various grades in harmony with time-honored analyses but with an effort to establish uniformity in nomenclature. While it is proposed to have a uniform base price as a maximum, furnaces will be allowed to name lower prices when they wish to do so.

In addition to recommendations as to base prices and differentials to be submitted to the War Industries Board at Washington, some perplexing problems are also to be submitted. One of these is as to whether buyers of pig iron at about $50 tidewater for export who have not been able to obtain vessels can, without violating the spirit of the agreement, sell at a higher price than the $33 basis. Another question relates to the commissions to be allowed brokers.

The sale of about 9000 tons of Virginia iron takes all that a leading interest will have for this year, and numerous other furnace companies North and South are understood to be in a similar condition. Hence, if the new schedule extends only to Jan. 1 the tonnage of iron to be sold under it will not be large. Some furnaces in Eastern territory have indicated a willingness to sell for the first half of next year on the schedule proposed for the remainder of this year. The making up of contracts for castings has been delayed owing to the uncertainty as to pig iron prices. In the Chicago district, it is estimated that melters are already covered for about 90 per cent of their pig iron requirements for this year.

New buying in steel is still negligible. With the announcements from time to time of fresh and enlarged Government building programs, the trade is coming to accept the attitude of mills in refusing further commitments for the time being, for in addition to the direct Government needs, it is recognized that the effect passes through the ramifications of the industry to the provision of plant extensions and the building of machinery and apparatus. Our pig iron production statistics have shown how difficult it is, with fuel and labor shortage, to increase the basic output, and the records of the American Iron and Steel Institute indicate so far an annual production for this year of 33,000,000 tons of rolled products, or barely 2 per cent more than for 1916.

Thus it is that cancellations of contracts have not occurred; consumers cannot discover other sources of supply. Efforts to secure readjustments of contract prices have not, however, been forsaken. Many of these expire this year, but deliveries will be spread over several months into 1918. Beyond that the orders on mill books are for definite business not subject to cancellation in the ordinary acceptance of the term.

Little interest in lower price demands is shown where the contracts cover manufactured articles already sold and against which the contracts are a protection. But concern is felt over the distance from steel mill products which the pricing program bids fair to cover. The answer of the steel producers is that in times of heavy demand prices do not fall.

One interesting development, which indicates the large part the United States must take in Russian affairs, is the mobilization of several thousand railroad experts and mechanics to supplement the depleted ranks of railroad operatives in that country. As a part of the plan the placing is expected in the next few days of 20,000 more cars for Russia. For the Government's use in France 4250 additional 60-centimeter gage cars have been bought.

The Priority Board has ordered the railroads to provide 100 per cent car supply to the Connellsville regions.

Pittsburgh

PITTSBURGH, Oct. 9.—(*By Wire*)

It is possible that this week announcement will come from the President of Government prices fixed on semi-finished and finished steel products not already covered by the Government prices that came out on Monday, Sept. 24. Large steel manufacturers were in session in New York to-day (Tuesday), and probably also on Wednesday, after which their recommendations as to prices on semi-finished and finished steel products will go to the War Industries Board at Washington and then finally to the President for his approval. Nothing is known as to what prices will be recommended, but it is stated that a suggested price of $55 on soft Bessemer and open hearth 4 x 4-in. billets has been turned down as being too high. It is

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Oct. 10, 1917.	Oct. 3, 1917.	Sept. 12, 1917.	Oct. 11, 1916.
No. 2 X, Philadelphia...	$33.75	$33.75	$52.00	$20.00
No. 2, Valley furnace...	33.00	33.00	52.00	20.00
No. 2 Southern, Cin'ti..	....	....	49.90	17.40
No. 2, Birmingham, Ala..	....	....	47.00	14.50
No. 2, furnace, Chicago*	....	....	55.00	19.00
Basic, del'd eastern Pa..	33.75	....	50.00	20.00
Basic, Valley furnace...	33.00	33.00	48.00	20.00
Bessemer, Pittsburgh....	37.25	37.25	51.95	23.95
Malleable Bess., Ch'go*..	....	....	55.00	19 50
Gray forge, Pittsburgh..	32.75	....	46.95	20.45
L. S. charcoal, Chicago..	....	....	58.00	20.75
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	....	....	$38.00	$33.00
O.-h. rails, heavy, at mill	....	....	40.00	35.00
Bess. billets, Pittsburgh.	55.00	....	65.00	45.00
O.-h. billets, Pittsburgh.	55.00	....	65.00	45.00
O.-h. sheet bars, P'gh...	....	....	75.00	45.00
Forging billets, base, P'gh	....	....	100.00	69.00
O.-h. billets, Phila.....	....	....	85.00	50 00
Wire rods, Pittsburgh...	85.00	....	90.00	55.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	4.25	4.25	4.935	2.659
Iron bars, Pittsburgh....	....	....	4.75	2.60
Iron bars, Chicago.....	....	....	4.50	2.35
Steel bars, Pittsburgh...	....	....	4.00	2.75
Steel bars, New York....	....	....	4.195	2.919
Tank plates, Pittsburgh..	....	....	8.00	4.00
Tank plates, New York..	....	....	8.195	4.169
Beams, etc., Pittsburgh..	....	....	4.00	2.75
Beams, etc., New York..	....	....	4.445	2.869
Steel hoops, Pittsburgh..	....	....	5.75	3.00

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire,	Oct. 10, 1917.	Oct. 3, 1917.	Sept. 12, 1917.	Oct. 11, 1916.
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh	....	....	8.50	3.10
Sheets, galv., No 28, P'gh	....	....	10.00	4.25
Wire nails, Pittsburgh..	....	....	4.00	2.60
Cut nails, Pittsburgh...	....	....	4.65	2.60
Fence wire, base, P'gh..	....	....	3.95	2.55
Barb wire, galv., P'gh...	....	....	4.85	3.45
Old Materials, Per Gross Ton:				
Iron rails, Chicago.....	$36.00	$36.00	$44.50	$20.00
Iron rails, Philadelphia.	*38.00*	43.00	45.00	21.00
Carwheels, Chicago	27.00	27.00	33.50	12.50
Carwheels, Philadelphia.	29.00	29.00	32.00	15.50
Heavy steel scrap, P'gh.	*30.00*	33.00	33.00	18.00
Heavy steel scrap, Phila.	25.00	25.00	30 00	15.50
Heavy steel scrap, Ch'go.	*26.00*	27.00	33.00	16.50
No. 1 cast, Pittsburgh..	*29.00*	30 00	30.00	16.00
No. 1 cast, Philadelphia..	28.00	28.00	32.00	16.00
No. 1 cast, Ch'go (net ton)	21.00	21.00	24.00	13.25
No. 1 RR. wrot. Phila...	*38.00*	43.00	45.00	22.00
No. 1 RR. wrot, Ch'go (net)	*27.00*	30.00	36.00	17.50
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	....	$6.00	$13.00	$4.25
Furnace coke, future....	....	6.00	10.00	3.25
Foundry coke, prompt...	....	....	14.00	3.50
Foundry coke, future....	....	....	12.50	4.00
Metals,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York..	23.50	23.50	25.50	28.50
Electrolytic copper, N. Y.	23.50	23.50	25.50	28.50
Spelter, St. Louis.....	*8.00*	8.12½	8.00	9.50
Spelter, New York.....	*8.25*	8.37½	8.25	9.75
Lead, St. Louis.....	*7.45*	7.82½	9.50	6.85
Lead, New York.....	*7.60*	7.95	9 70	7.00
Tin, New York.....	**61.00**	60.50	61.37½	42.75
Antimony (Asiatic), N. Y.	15.00	15.00	14.50	11.50
Tinplate, 100-lb. box P'gh.	....	....	$12.00	$6.00

further stated that it is the idea of the War Industries Board that the price of billets should not be fixed at above $45, with a differential, of $1 or possibly $2, over this price in favor of sheet bars. While the steel conferences are on in New York, and to be taken up later this week in Washington, new buying in the steel trade has halted, and very little new business is being placed. So far, there has been very little done in the way of selling pig iron at the prices given out two weeks ago by the Government, and this also applies on plates, shapes and bars, the mills being filled up for months ahead on contracts and not actively seeking new business. On some contracts for coke that were on a day-to-day price basis, large shipments have been made to blast furnaces at the $6 price, which is $2 to $3 per ton lower than contracts that were placed a week or two before the Government price of $6 was announced. In regard to foundry coke, it has been determined that the usual differential in favor of this grade shall continue, and this will seem to leave manufacturers of coke free to sell foundry at 75c. to $1 per ton higher than the price of $6 for furnace. This is only tentative, and the actual differential in favor of foundry coke over furnace is yet to be worked out. All prices on iron and steel products remain practically the same as were in force before the Government prices were announced, on such products as were not covered by the Government prices. Consumers are waiting anxiously for announcement of the Government prices on semi-finished and finished steel products, which it is hoped will come out this week. A very decided shortage in the coal supply exists in Pittsburgh and Valley districts, and this is keeping down output of pig iron, semi-finished steel and finished steel to a very great extent. There is also a great shortage in labor, and this is getting more acute as the drafted men are leaving every day for the training camps. Office and mill forces are seriously crippled and the steel business is being carried on under great difficulties.

Pig Iron.—New inquiry for pig iron is light, and sales have been very few. One sale of 1000 tons of Bessemer for delivery over the remainder of the year is reported at $36.30, Valley furnace, subject to revision after Jan. 1, on any unshipped portion of iron, and there has also been a sale of 3000 tons of basic for October shipment at $33, at furnace. It is reported that several sales of low phosphorus iron have been made at $45, and even less, at furnace. It is believed that possibly this week the differentials to apply on the different qualities of pig iron over the $33 price for basic and No. 2 foundry will be given out. We now quote as follows: Basic pig iron, $33; Bessemer, $36.30; gray forge, $32; No. 2 foundry, $33; No. 3 foundry, $32.50, and malleable Bessemer, $33.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being 95c. per ton.

Billets and Sheet Bars.—Announcement is expected from Washington this week of the Government price on billets and sheet bars, and it is stated that the price of billets may be as low as $45, Pittsburgh, with $1 or $2 per ton differential over this price in favor of sheet bars. It is stated that a recommendation made recently to the War Munitions Board that the price of billets be fixed at $55, Pittsburgh, was not favorably received. In the meantime, the local market on soft Bessemer and open hearth billets is steadily declining, and we note a sale of about 1500 tons made last week at $60, and a later sale of 1000 tons at $55, Pittsburgh, for October delivery. Prices on forging billets are also lower. We now quote soft Bessemer and open hearth billets at $55; soft Bessemer and open hearth sheet bars at about $60, but the latter price is tentative, as we have not heard of any sales in this district for some time. Prices on forging billets are nominally $80 to $85 with no recent sales reported.

Ferroalloys.—There is no new buying in ferroalloys and probably there will not be until the announcement expected this week from the Government on price of semi-finished and finished steel products has come out. Whether ferromanganese and Bessemer ferrosilicon

prices will be fixed by the Government is not known at this writing, but it is expected they will be with the other products. In the absence of sales, we quote 80 per cent ferromanganese for prompt shipment at $375 and for delivery in first half of 1918, $350 per gross ton at furnace. These are purely nominal prices, as there is no new buying and will not be until it is definitely known whether the Government will fix prices on these products. We quote nominally 18 to 22 per cent spiegeleisen at $80 to $82.50 per gross ton delivered.

We quote 9 per cent Bessemer ferrosilicon at $89, 10 per cent $90, 11 per cent $95, 12 per cent $100, 13 per cent $105, 14 per cent $115, 15 per cent $125, and 16 per cent $135. We now quote 7 per cent silvery iron at $79 to $84, 8 per cent $80 to $85, 9 per cent $81 to $86, 10 per cent $82 to $87, 11 and 12 per cent $83 to $88. All prices are f.o.b. makers' furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having a uniform freight rate of $2 per gross ton for delivery in the Pittsburgh district.

Steel Rails.—We are not advised of any new buying of either standard sections of light rails, and prices quoted on light rails are purely nominal in the absence of new business. Such prices of light rails and regular prices on standard sections are given on page 907.

Structural Material.—So far as we are advised, there have been no sales of structural shapes by the two local mills on new orders to domestic consumers at the Government price of 3c. per lb., but orders are being placed by the Government and accepted by the mills at that price. Local fabricators say they are filled up for months ahead, and are not actively bidding on new work. The Blaw-Knox Co., of this city, will make very large extensions to its structural steel plant at Hoboken, Pa. Prices to others than the Government are found on page 907.

Plates.—Local mills say they are filled up for months ahead on plates, and have not as yet entered any orders at the Government prices of 3.25c. per lb. for delivery to domestic consumers but are filling large Government orders at that price. Prices which were formerly quoted were 8c. to 9c. for ¼ in. and heavier sheared plates, f.o.b. at mill, Pittsburgh. It is stated that no new business has been done recently by the mills at these prices, since the Government price of 3.25c. came out, and the mills also claim they have not yet sold at the Government price.

Sheets.—It is expected that possibly this week, the Government may announce its prices on sheets, but this will depend largely on the progress made at the meetings of the steel interests in session in New York this week. It is expected that after the meetings in New York have been finished, the steel men will adjourn to Washington to go into conference with Government officials on the new sheet prices. In the meantime, very little new buying is being done, consumers placing orders only for such quantities of sheets as they absolutely need. About the only new buying is coming from the Government, which is placing very heavy orders for blue annealed, black and galvanized sheets, which the mills are filling very promptly and shipping out about as fast as they are rolled, the Government orders having priority. No figures are being given out as to the Government orders for sheets being placed, but they are known to be very heavy, and are on the basis of the tentative price fixed some time ago by the Government and the mills on the basis of 6.25c. for blue annealed; 6.50c. for Bessemer black, and 8.50c. for galvanized, all of No. 28 gage. Prices to the domestic trade are holding fairly firm in the absence of large buying, and are given in detail on page 907.

Tin Plate.—As yet, nothing is known as to the prices of tin plate that will be fixed for 1918 delivery by the Government and the tin plate mills, but it will probably be given out late this month or early in November. The Government has asked that the price of tin plate be not fixed until about Nov. 1, so that it will hardly come out before that time. It is likely, but not definitely known, that the new prices will be fixed in conference between the Food Administration Board and the tin plate manufacturers. Very little tin plate is being sold on new orders. The output of the mills is under contract for all of this year and some of the larger mills have obligations on their books that will take their entire output up to April of next year. On the small orders being placed primes are quoted at $12 to $14 per base box from stock. Prices on terne plates are given on page 907.

Hoops and Bands.—Very few new orders are being placed, the large consumers being covered on contracts made some months ago, and specifications are fairly heavy. We quote steel hoops in small lots at about 5c. to 5.50c. and on steel bands 5c. to 5.25c., extras on the latter as per the steel bar card.

Wire Rods.—Mills report heavy export demand from Canada and Japan and other foreign countries, and sales of soft Bessemer and open hearth rods have been made lately for export at $85 to $90 per ton at mill. One lot of 2000 tons of soft open hearth rods is said to have been bought lately for delivery to Canada at $92 at mill. Domestic demand for rods is quiet, but several of the local makers say their output of rods for the remainder of this year is under contract. A recent sale of 150 tons of high carbon rods was made at $110, maker's mill. Prices on rods to domestic consumers are given on page 907.

Wire Products.—Nothing is known here of a reported embargo on wire products said to have been declared a few days ago by the American Steel & Wire Co. It is a fact that extreme caution is being used by that concern in the distribution of its products, but it is officially denied that any actual embargo has been declared. It is expected by the trade that the Government will fix prices of wire nails and wire somewhere between the price of the American Steel & Wire Co., which is $3.20 for wire nails and $3.25 for bright basic wire, and that of the independent mills which is $4 for wire nails and $4.05 for bright basic wire. Probably wire nails will be put at $3.60 or even $3.75, base, per keg. The new demand for wire and wire nails is very quiet, the trade holding off buying in the belief that prices will be lower before long. Specifications against contracts are only fairly heavy. Prices of the independent mills of nails and wire to domestic consumers, but which now are largely nominal, are given on page 907, prices of American Steel & Wire Co. being $16 per ton lower.

Iron and Steel Bars.—As yet we are not advised of any new business in steel bars at the new price of 2.90c. at mill as recently fixed by the Government. In fact, there has been practically no new buying in either iron or steel bars for some time, nor will there be until the present puzzling condition as to prices has been cleared up. Mills rolling steel bars state they have obligations on their books at the former price that will take their entire output for some months to come. Under the above conditions, we can only quote the prices in effect for some time on iron and steel bars, to domestic consumers, which are printed on page 907. These prices are largely nominal, and probably would not be paid by consumers on new orders.

Shafting.—It is not known as yet whether the Government will fix the price on shafting, but the belief is that it will. The Government has been a very heavy buyer of shafting for various equipment for war purposes, at prices somewhat lower than are ruling to the domestic trade. There is no new buying, but makers report that specifications against contracts are fairly heavy. For the domestic trade, discounts on shafting remain nominally at 10 to 5 per cent off list, prices to the Government being considerably lower.

Railroad Spikes and Track Bolts.—Practically no new orders are being placed, consumers holding off until it is known whether the Government will fix the price on spikes and track bolts with the other steel commodities. It is the belief that prices on both spikes and track bolts will be lower, in sympathy with the other steel products, even should the Government not fix the price. Nominal prices on spikes and track bolts to domestic consumers are given on page 907. Prices on direct and indirect Government orders are somewhat lower.

Nuts and Bolts.—The recent change in discount in bolts, it is said by the manufacturers, is in the nature of a readjustment, the former price on bolts having been out of line with those on nuts. New buying is

reported fairly heavy, and discounts, as given on page 907, are said by the makers to be fairly maintained.

Cold Rolled Strip Steel.—It is expected that the Government may fix the price of cold rolled strip steel and on a somewhat lower basis than is now ruling, and as a result consumers are holding off as much as possible in placing new orders. Specifications against contracts made sometime ago are fairly heavy.

On contracts, mills are quoting 9c. at mill, but on small current orders prices range from 10c. up to 12c. at mill. Terms at 30 days, less 2 per cent off for cash in 10 days when sold in quantities of 300 lb. or more.

Rivets.—There is no new buying in rivets, nor is there likely to be until it is known whether the Government will fix prices on this product, and this information may be forthcoming in the latter part of this week. We repeat nominal prices on rivets of $5.25 for structural and $5.35 for cone-head boiler rivets, per 100 pounds, f.o.b. Pittsburgh. Large quantities of rivets are being furnished to the Government at a lower price.

Wrought Pipe.—While it is expected that the Government will fix prices on wrought iron and steel pipe, it is not believed that these prices will be much, if any, lower than have been quoted by the leading interests for some months. The trade does not expect that the Government will fix higher prices than have been quoted by such interests and it is also recognized that prices on iron and steel pipe of some of the independent mills have been low, when increased cost of labor and steel is considered. Discounts on iron and steel pipe as quoted by the independent mills, prices of the National Tube Co. being considerably lower, are given on page 907.

Boiler Tubes—Should the Government fix prices on boiler tubes, it is expected they will be much lower than those in effect by the leading independent makers for some months. Nominal discounts, which give prices much lower than have been actually ruling for some time, are given on page 907.

Coke.—We cannot learn that any large direct sales or contracts for furnace coke have been made since the Government established its price of $6 per net ton at oven for furnace coke. However, some large consumers who were buying coke at a price fixed from day to day have been getting their coke since Sept. 24 on the basis of $6 per net ton at oven. This price is $2 to $2.50 lower than the prices at which contracts were made, just before the Government fixed the $6 price. It is now learned that the Government will recognize the standard differential in favor of foundry coke over furnace, and the coke operators are to be allowed to charge it. This differential runs from 75c. to $1 per ton, and we therefore quote foundry coke $1 per ton higher than furnace, the price quoted being a tentative one subject to revision after Jan. 1. We quote best grades of furnace coke for prompt shipment and on contracts at $6 per net ton, and best grades of 72 hour foundry at $7 per net ton at oven, but it should be thoroughly understood that the latter is a tentative price. The Connellsville **Courier** gives the output of coke in the Upper and Lower Connellsville regions for the week ending Sept. 29, as 347,408 tons, a decrease over the previous week of 7,694 tons.

Old Material.—Several leading scrap dealers here say they have positive information that the Government is now considering the matter of regulating prices on scrap of all kinds, and it is expected to announce the official prices to be charged by dealers to consumers within a short time. This information is also in possesion of leading consumers of scrap, with the result that they are holding off placing orders, believing that the Government, should it fix prices on scrap, will probably name prices somewhat lower than are ruling now. Only a minimum amount of scrap is being sold by dealers to consumers, not enough to definitely fix prices. Forced sales of scrap already loaded in cars have been made at very low prices. In the meantime, the whole scrap market is weak, and prices on all grades are from $1 to $3 per ton lower. The decline in prices has been mostly in scrap used for open hearth steel purposes, such as heavy melting steel, borings and turnings. On some grades, notably low phosphorus melting stock, prices are holding fairly steady. In the absence of definite sales on which to base quotations, dealers are quoting for delivery in Pittsburgh, and other consuming points that take Pittsburgh freight rates per gross ton as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland, and Pittsburgh, delivered	$30.00 to $31.00
No. 1 foundry cast	29.00 to 30.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md., and Franklin, Pa.	33.00 to 34.00
Hydraulic compressed sheet scrap	24.00 to 25.00
Bundled sheet scrap, sides and ends, f.o.b. consumers' mill, Pittsburgh district	22.00 to 23.00
Bundled sheet stamping scrap	20.00 to 21.00
No. 1 railroad malleable stock	25.00 to 26.00
Railroad grate bars	17.00 to 18.00
Low phosphorus melting stock	40.00 to 42.00
Iron car axles	43.00 to 45.00
Steel car axles	43.00 to 45.00
Locomotive axles, steel	50.00 to 52.00
No. 1 busheling scrap	24.00 to 25.00
Machine-shop turnings	19.00 to 20.00
Cast iron wheels	30.00 to 31.00
Rolled steel wheels	34.00 to 35.00
*Sheet bar crop ends	35.00 to 36.00
Cast iron borings	20.00 to 21.00
No. 1 railroad wrought scrap	32.00 to 33.00
Heavy steel axle turnings	23.00 to 24.00
Heavy breakable cast scrap	24.00 to 25.00

*Shipping point.

Chicago

CHICAGO, Oct. 8.

In the opinion of some of the most important in the steel trade, the situation is more mixed than ever, and certainly the problems seem as many and as complex as they were a week or two weeks ago, yet with the passing of every day a solution of the tangle is nearer. As a rule, consumers are more inclined to wait patiently, which is all they can do—although, were it not for the priority regulations and the limitation of prices on plates, shapes and bars, considerable business would be done. Consumers have expressed a willingness to pay up to 8c. for plates, it not being the price, but the delivery, that counts with them. In these products, however, the mills declare they are sold up for the remainder of the year and longer, and only those with priority certificates, indicating they are serving the Government, are obtaining materials at the new levels of 3.25c. for plates, 3c. for shapes and 2.90c. for bars. A goodly volume of export business is being turned down because the mills cannot ship this year. Sales of specialties, such as axles, tubes, etc., are going forward at a good rate, the purchasers appearing to fear that if they delay they may be placed in the present position of users of plates, shapes and bars. Innumerable questions continue to be asked in every branch of the industry, with the pig-iron trade particularly in doubt as to what it can and cannot do. The opinion is expressed that the wants of those who need pig iron this year may be helped out by a diversion of the surplus which some consumers find they have, in which connection arises the question as to whether this resale iron may be sold at more than $33. At the latter price, no sales are definitely reported, although it is everywhere admitted that the Government price must ultimately prevail. As for the producers, it can only be reiterated they are so completely booked with orders for the next few months that they have no price at all. The silveries, low phosphorus, charcoal, etc., await further price fixing.

Opinion differs as to the working out of the priority arrangement of the Government with regard to deliveries, some statements being of a pessimistic character, while others believe that good will result from the Government knowing the hand of every mill. In a statement issued by a steel mill to its customers appears the following:

We are in receipt of instructions from the Government which will require us to report to it all orders on our books for certain commodities at the close of business Sept. 29, and with notice that similar reports covering all other commodities produced by us will be called for as rapidly as the subjects can be organized and handled.

All orders of every description shall be included in the report. Included under United States Government orders shall be all orders direct from the Government and all orders for material to be furnished sub-contractors on direct Government orders. Based on the information in the hands of the Government officials, priority orders will be issued by the Govern-

ment. * * * Whatever material of every description you have ordered from us that is on direct Government orders placed with you, or is for Government account applicable to orders placed by the Government with others for whom you are producing any articles or parts, should be separated from your ordinary commercial business. Notice should be given us of such order or orders complete and promptly.

That those in classes A and B under the priority regulation will fare well is undoubted; they must, for their work is part of fighting the war. The disturbing question is, what of those in class C, representing the ordinary industries of peace. The question is answered only by other questions, coupled with suppositions. The quotations for cast-iron pipe have been lowered $15 per ton by the leading maker. Price announcements on sheets are expected this week, and, within a few days, official prices on old material. The market for the latter is practically dormant.

Pig Iron.—The trade continues to devote most of its time to conjecture and interrogation. It is quite generally conceded that furnaces will not have much, if any, iron which they can sell at $33 for delivery in the remainder of this year, but it is pretty thoroughly understood that whatever iron may come to hand for disposal will not be sold at over $33. Though it is estimated that melters are at least 90 per cent covered for this year, there is fair inquiry which, sooner or later, must be satisfied. This will be done, presumably, through the distribution of surplus iron which consumers cannot use, and, to some extent, through a revision of deliveries. Already instances are coming to light where consumers are offering their surplus to dealers for placement elsewhere. How much will be offered in this manner is an unknown quantity, while the dealers are puzzled over the matter of price. Most of them assert they would not think of touching iron for which more than $33, furnace, is wanted, though others are speculating as to what license they have in this direction. A report is heard that 300 tons was placed in Chicago at $33, but definite details are lacking. Orders for the Government, direct or indirect, are being filled at the new price, such orders being given priority and operating to postpone deliveries in other directions. It is admitted that the Government cannot be opposed, at the same time declared that no one wants to pursue that course. An experienced iron man expresses the opinion that the situation will be straightened out before long. Incidentally, he declares himself to be one of those who do not believe there will be any pronounced shortage. The silveries, low phosphorus, charcoal and other grades are awaiting the official fixing of their prices. The large producers, both North and South, reiterate they have no prices except for Government business. Appeals made in behalf of old customers have brought no relief. A Rockford, Ill., consumer reported a week ago as having purchased two cars of resale Southern iron at $33, Birmingham, has since denied that he got the iron. The quotations below are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton.

Lake Superior charcoal, Nos. 1 to 4	†$58.00
Lake Superior charcoal, Nos. 5 and 6, Scotch and No. 1 soft or special	†60.50
Northern coke foundry, No. 1	*33.50
Northern coke foundry, No. 2	*33.00
Northern coke foundry, No. 3	*32.50
Northern high-phosphorus foundry	*33 00
Southern coke No. 1 f'dry and 1 soft	†53.00
Southern coke No. 2 f'dry and 2 soft	†52 00
Malleable Bessemer	*33.00
Basic	*33 00
Low-phosphorus	†$85.00 to 90.00
Silvery, 8 per cent	†77.50 to 82.50

*In accordance with the price agreed on, but nominal.
†Not yet changed, but new prices pending.

Ferroalloys.—Eighty per cent ferromanganese is easier, the representative of a large domestic producer quoting $325 for the remainder of this year, or first quarter of next.

Plates.—Material for Government work has been booked at the Government price—3.25c.—one such order being for 2000 tons. Some users of plates have made known their willingness tc pay up to 8c., but they have been unable to get them at any price inasmuch as they did not have Government backing. Some increment to the volume of plates available comes from the embargo on exports, but still the supply falls far short of what is wanted in view of the sold-up condition of the mills, some of which are fully booked into next year. The representative of an Ohio mill which, prior to the price announcement, was placing narrow plates to a limited degree, now must submit all inquiries to the mill. The crux of the present situation is that buyers cannot at this time obtain plates unless the material is directly or indirectly for war work. Jobbers adhere to their price.

For Chicago delivery out of stock jobbers quote 10c.

Shapes.—The mills have all they can handle this year and, except where the Government is involved, business is not being taken at the official price—3c. Only two structural lettings are announced, one of them being obviously for war purposes. The Stupp Bros. Bridge & Iron Co. will supply 712 tons required for 21 storehouses for the Rock Island Arsenal, Rock Island, Ill. Joseph Rothe will supply 224 tons required in the erection of a factory for the Oneida Motor Truck Co., Green Bay, Wis.

For material out of warehouse jobbers continue to quote 5c.

Bars.—Sales of mild steel bars required for Government purposes have been made at 2.90c., Chicago, but as a general thing the bar business has been slow. With bars the mills are in much the same position as with plates and shapes. A leading maker of rail carbon bars asserts he is filled with orders to the second quarter of next year. But little business has been done in hard bars, the nominal quotations for which range from 4.25c. to 4.50c., Chicago. Bar iron has been inactive, the price being unchanged at 4.50c., Chicago. The warehouses have made no changes in their quotations.

We quote warehouse prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c. to 5c.; reinforcing bars, 4.50c. base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Sheets.—There is a wide range of prices for blue annealed and black sheets; in fact, prices may be said to be erratic. Quotations are difficult to procure, but they are covered by the ranges of 8.189c to 8.689c, Chicago, for No. 10 blue annealed, and 8.189c. to 9.189c. for No. 28 black. No. 28 galvanized are about 9.689c., Chicago. A leading producer wants more sheet business. It now has 15 mills running, out of a total of 17. Jobbers have made no changes.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 10c.; No. 28 black, 10c., and No. 28 galvanized, 11.50c.

Wire Products.—The leading maker reports no change. Such business as it takes is on the basis of $3.20, Pittsburgh, for nails. Its customers, in many cases, are admittedly not getting all they want, whether against new orders or specifications against contracts. Entirely new customers are sometimes not accommodated at all. The independent mills continue to quote $4 for nails, and in many instances are serving those whom the larger interest cannot supply. We quote on the basis of $4, Pittsburgh, per 100 lb. for nails to jobbers, as follows:

Plain fence wire, Nos. 6 to 9, base, $4.189; wire nails, $4.189; painted barb wire, $4.339; galvanized barb wire, $5.039; polished staples, $4.339; galvanized staples, $5.039; all Chicago, carload lots.

Rails and Track Supplies.—No inquiries are coming out, and the market is entirely nominal. Rail deliveries are backward, but from some source the railroads must soon have rails if they are to maintain safety and their standards of operation. We quote:

Standard railroad spikes, 4.50c. to 5.25c., base; small spikes, 4.75c. to 5.50c. base; track bolts with square nuts, 5.50c. to 6c., all in carloads, Chicago; tie plates, $70 to $90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base (nominal); open hearth, $40 (nominal); light rails, 25 to 45 lb., $70; 16 to 20 lb., $71; 12 lb., $72; 8 lb., $73; angle bars, 3.25c., base.

Bolts and Nuts.—The market continues a waiting one, many consumers apparently being of the belief they will be able to buy cheaper at a later date. They will, if they wait long enough, but the indications are that they must wait longer than they can well afford, and meanwhile requirements are piling up. The makers

are not getting raw materials any cheaper. For prices and freight rates see finished iron and steel, f.o.b. Pittsburgh, page 907.

Cast-Iron Pipe.—The leading maker has reduced quotations $15 per ton, following the lower quotation for pig iron, the new price allowing about $12 for conversion. The reduction is presumably effected to stimulate business. St. Cloud, Minn., received two bids on 275 tons, but is undecided. Minneapolis, Minn., placed 150 tons with the Hammond-Byrd Iron Co., representing the National Cast Iron Pipe Co. The new quotations follow:

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., $53.50; 6 in. and larger, $50.50, with $1 extra for class A water pipe and gas pipe.

Old Material.—It is predicted in an authoritative direction that Government prices for old material will be announced inside of ten days. Several dealers were in conference at Washington last week. Not much is reported of the deliberations at the capital, but it is said $30 was suggested as a fair price for heavy melting steel. It is expected, however, that a lower price will be fixed.

The railroad lists continue small, not because the roads are unwilling to let scrap go at present prices but because of difficulty in assembling. Lists have been issued by the St. Paul, Rock Island, Pere Marquette, Big Four, Northern Pacific and Illinois Central railroads. The Illinois Central asks buyers to accept scrap in any kind of car which can be found for loading. Except for occasional transactions where a consumer or dealer is in great need, the market is at a standstill. The few sales hardly make the market, and the best quotations that can be given are those supplied by dealers. In last week's market old carwheels should have been quoted at $27 to $28 and stove plate at $17 to $18. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$36.00 to $37.00
Relaying rails	50.00 to 55.00
Old carwheels	27.00 to 28.00
Old steel rails, rerolling	35.00 to 36.00
Old steel rails, less than 3 ft	34.00 to 35.00
Heavy melting steel scrap	26.00 to 27.00
Frogs, switches and guards, cut apart	26.00 to 27.00
Shoveling steel	23.00 to 24.00
Steel axle turnings	19.00 to 20.00

Per Net Ton

Iron angles and splice bars	$34.00 to $35.00
Iron arch bars and transoms	38.00 to 39.00
Steel angle bars	24.00 to 25.00
Iro ncar axles	40.00 to 41.00
Steel car axles	40.00 to 41.00
No. 1 railroad wrought	27.00 to 28.00
No. 2 railroad wrought	25.00 to 26.00
Cut forge	25.00 to 26.00
Pipes and flues	19.00 to 20.00
No. 1 busheling	19.00 to 20.00
No. 2 busheling	13.00 to 14.00
Steel knuckles and couplers	31.00 to 32.00
Steel springs	35.00 to 36.00
No. 1 boilers, cut to sheets and rings	18.00 to 19.00
Boiler punchings	30.00 to 31.00
Locomotive tires, smooth	31.00 to 32.00
Machine-shop turnings	14.50 to 15.50
Cast borings	14.00 to 15.00
No. 1 cast scrap	21.00 to 22.00
Stove plate and light cast scrap	16.00 to 17.00
Grate bars	14.00 to 15.00
Brake shoes	14.00 to 15.00
Railroad malleable	26.00 to 27.00
Agricultural malleable	20.00 to 21.00
Country mixed scrap	16.00 to 17.00

Cleveland

CLEVELAND, Oct. 9.

Iron Ore.—There is more ore on Lake Erie docks than a year ago, the amount on the docks Oct. 1 being 7,727,036 gross tons, as compared with 7,230,024 on the same day a year ago. More than 1,000,000 tons was added to the ore balance on docks during September. The amount placed on docks fell off about 400,000 tons as compared with the same a year ago, but Lake shipments were over 600,000 tons greater in September, 1916, than during the past month. Lake Erie ore docks handled 34,477,097 tons of ore up to Oct. 1 as compared with 38,146,974 tons for the same period in 1916. Shipments from these docks to the interior furnaces to Oct. 1 were 26,776,923 tons as compared with 28,420,289 tons during the same time in 1916. Of the total of 9,536,152 tons shipped from upper Lake docks in September, 7,239,430 tons were received at Lake Erie ports. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, $5.95; old range non-Bessemer, $5.20; Mesaba Bessemer, $5.70; Mesaba non-Bessemer, $5.05.

Pig Iron.—With the price situation as regards differentials not yet cleared up, the market is still almost at a standstill as far as sales are concerned, but there is considerable inquiry for foundry iron, some for the last quarter, but mostly for the first half. A few additional small lot sales of foundry iron are reported at $33 for prompt shipment, and a Cleveland consumer has bought some early shipment malleable iron at $36.30. There is an inquiry from the southern Ohio territory for 5000 to 10,000 tons of basic iron for this year's delivery. Cleveland furnace interests and selling agencies have received reports of the differentials agreed upon by the Pig Iron Committee, but as these must be submitted to the War Industries Board before they are definitely fixed, sellers are refraining from making quotations on grades on which prices have not been established. However, the fixing of differentials will leave the price situation in respect to iron for 1918 delivery unsettled, and that is of fully as much interest to the producers at present as the differentials as very little iron is available for delivery before next year. Consumers appear willing to buy for the first half at the established price, but in view of the fact that the base prices recently agreed upon by the producers and the Government are subject to revision Jan. 1, sellers do not seem inclined to make quotations for delivery next year until there is a more definite understanding than there is at present as to what next year's prices will be. Buyers of castings are seeking to place orders on a basis of $33 pig iron, and this presents a serious problem to foundries that have covered with first half contracts for pig iron at $50 and higher. These foundries, however, have the advantage in that they will doubtless get their iron before their competitors who have not yet covered, but who will place contracts for the lower priced iron. It is understood that many of the furnaces that recently bought the high-priced iron took casting contracts at about the same time based on the pig iron prices then prevailing, these contracts being largely in the automobile field. The Pig Iron Committee has designated 7 per cent silicon iron instead of 8 per cent as the price base for Ohio silveries, the agreed on price of this iron being $43 at furnace with a $3 spread. We quote delivered Cleveland as follows, the prices, except on foundry and basic iron, being those agreed on by the Pig Iron Committee and subject to revision by the War Industries Board:

Bessemer	$37.25
Basic	33.30
Malleable, Valley furnace	33.50
Northern No. 2 foundry	33.30
Gray forge	32.30
Southern No. 2 foundry	37.00
Ohio silvery, 7 per cent silicon	44.62

Coke.—There is some inquiry for foundry coke for early shipment, but producers generally are making no quotations, claiming that they are entirely sold up. There is a possibility that some foundries will suffer from a shortage unless they are able to secure additional coke soon. In the Virginia district, producers are withholding quotations until they learn whether there is to be any differential on Virginia coke. We quote standard Connellsville furnace and foundry coke at $6 per net ton at oven.

Finished Iron and Steel.—The iron and steel trade is still marking time awaiting the announcement of the new prices on semi-finished steel and various products. The Government demands are growing larger and the situation in respect to manufacturers not having Government orders is daily growing worse, as Government requirements are given priority over other orders. It is probable that some manufacturers not engaged directly or indirectly in Government work will suffer seriously before long because of their inability to secure steel. The trade feels that buyers of some products, particularly of plates, at the high prices, are in a more favorable position than those who place orders at the

new Government prices, as the former will be able to get deliveries much sooner than the latter. The fact is becoming more prominent every day that it will be a long time before consumers will be able to get most lines of steel at the new prices. A fair volume of inquiry is coming out largely for bars and plates. Some of these, however, are regarded as market feelers. There is also some inquiry for billets on which mills have not quoted. A Government order for 5000 tons of bars for 3-in. shells for a Cleveland plant, held up some time ago for changes in the specifications, has been released. The Shipping Board has distributed orders for 450 of the new-type of standardized water tube boilers for the Emergency Fleet among 17 boiler manufacturers. These will require 10,000 to 12,000 tons of steel. The Government will furnish the plates and boiler tubes. An increased volume of inquiry for nails and wire has come out since the establishment of bar prices, some buyers trying to place large orders, but the leading interest is adhering to its policy of limiting jobbers to their actual requirements. The delivery situation in these lines is growing worse owing to the fact that mills are not able to keep up their maximum production because of the unsatisfactory operating conditions brought about by the railroad situation and the scarcity of coal, coke and steel. The local plate situation is unchanged, one mill continuing to take orders at 7.50c. for ¼ in. plates and 6.50c. for No. 10 light plates. Sheet buyers are holding off until prices are adjusted, and the only sales reported are small lots for immediate requirements. Mills are making some price concessions to move their stocks. We quote sheets at 7.50c. to 8c. for No. 28 black and No. 10 blue annealed, and 8c. for No. 10 galvanized. Mills continue to quote hard steel bars at 4c., but lower prices are named out of stock. Warehouse prices are 4.50c. to 5c. for steel bars and 5c. to 5.25c. for structural material.

Old Material.—The market is still in a very unsettled condition and there is practically no trading except in small lots between dealers. Both consumers and dealers are holding off waiting for the expected price adjustment. Prices are weak and the tendency is still downward. A number of quotations are largely nominal owing to the fact that no sales have been made on some of these grades since the new prices were announced on iron and steel. There is a wide range in prices quoted, particularly on heavy melting steel. One dealer bought small lots during the week at prices ranging from $26 to $28. Some dealers are asking as high as $30 and a sale at $29 is reported to a dealer for Canton delivery. Borings and turnings are lower, and busheling is very weak. Dealers' prices f.o.b. Cleveland, are as follows:

Per Gross Ton

Steel rails	$27.00 to $28.00
Steel rails, rerolling	40.00 to 41.00
Steel rails, under 3 ft	31.00 to 32.00
Iron rails	35.00 to 36.00
Steel car axles	45.00 to 46.00
Heavy melting steel	27.50 to 28.50
Carwheels	27.00 to 28.00
Relaying rails, 50 lb. and over	50.00 to 60.00
Agricultural malleable	22.00 to 23.00
Railroad malleable	27.00 to 28.00
Steel axle turnings	23.00 to 24.00
Light bundled sheet scrap	22.00 to 23.00

Per Net Ton

Iron car axles	$44.00 to $45.00
Cast borings	16.75 to 17.25
Iron and steel turnings and drillings	16.00 to 16.75
No. 1 busheling	24.00 to 25.00
No. 1 railroad wrought	35.00 to 36.00
No. 1 cast	24.50 to 25.50
Railroad grate bars	20.00 to 20.50
Stove plate	19.50 to 20.00

Bolts, Nuts and Rivets.—There is a good volume of specifications for bolts and nuts, but there is practically no new demand. Buyers are waiting for a price adjustment, but makers declare that lower prices will be impossible for a long time because they will be unable to get 2.90c. steel. The rivet market is also almost at a standstill, although one order for about 700 tons was placed during the week by a locomotive manufacturer. Consumers generally are buying only in very small lots to piece out. Makers continue to quote recent prices, which are 5.25c., Pittsburgh, for structural and 5.35c. for boiler rivets. Bolt and nut discounts are as follows with the usual 5 and 10 per cent discount for round lots:

Common carriage bolts, ⅝ x 6 in., smaller or shorter, rolled thread, 35 off; cut thread, 30 and 5, larger or longer, 20. Machine bolts, with h. p. nuts, ⅝ x 4 in., smaller or shorter, rolled thread, 40; cut thread, 35; larger and longer, 25. Lag bolts, cone point, 40. Square h. p. nuts, blank, $1.90 off list; tapped, $1.70 off list. Hexagon, h. p. nuts, blank, $1.70 off; tapped, $1.50 off. C. p. c. and t. hexagon nuts, all sizes, blank, $1.25 off; tapped, $1 off. Cold pressed semi-finished hexagon nuts, 50 and 5 off.

Cincinnati

CINCINNATI, Oct. 9.—(*By Wire.*)

Pig Iron.—Virginia makers met last week and recommended a price of $33, furnace, for No. 2 foundry, which is now based on the Northern analysis of 1.75 to 2.25 per cent silicon. Iron ranging from 3.25 to 6.25 silicon is advanced $1 for each 0.50 above 3.25. A price of $58, furnace, was recommended on cold blast charcoal iron. Within the past few days a number of small lots of Virginia No. 2 foundry iron have been sold in this territory for this year's shipment. This is the only business of any kind reported. Southern iron, as well as all grades of iron in the Hanging Rock district, are off the market entirely and this includes small lots of resale iron held in these districts. No quotations have been made and the situation is unchanged from last week's report with the exception of a larger number of inquiries out and a few of them for shipment in the last half of next year. Some Ohio silvery iron is also wanted for nearby shipment. The furnaces are withholding quotations and no sales have been booked within the past week. One large foundry, malleable and basic producer in the Hanging Rock district, whose coke supply is improving, reports an increasing production of iron, but a growing scarcity of cars for shipping it has thrown this company further behind on its deliveries. As there is no Southern or Northern iron obtainable at any prices, we are unable to quote any figures except on Virginia iron, as noted.

(*By Mail*)

Finished Material.—Jobbers are somewhat apprehensive about shipments due in the fourth quarter, but so far they have been coming along at a fairly satisfactory rate. There is no effort to place new contracts just now, as it is generally recognized that, even if inclined to accept them, the mills would not be able to make shipments as desired on new business, and at the same time take care of the Government's needs. The warehouse price on steel bars ranges from 4.65c. to 5c. per lb., depending largely on the quantity of the order and the differential in freight rates where outside shipments are concerned. The usual 5c. per 100 lb. is added for twisted bars. Structural shapes are now quoted at 5.15c. to 5.25c. and there is said to be a fairly good business for this time of the year. Plates are unchanged and ¼-in. and heavier remain at 10c. and No. 10 blue annealed sheets at 10c. It is difficult to name any mill figure on black and galvanized sheets, as only nominal quotations are out and no business is being booked at the figures given, which are 8.65c. for No. 28 black and 10.65c. for No. 28 galvanized f.o.b. Cincinnati or Newport, Ky. The jobbers price on nails has about settled at $3.80 per keg and the hardware trade, composing the largest part of the business, is buying very sparingly.

Coke.—All agencies report business at a standstill. No coke is offered for this year's shipment in any of the producing districts. Special attention is being paid to shipments on old contracts, so that there is now considerably less delay in getting the fuel forward than formally. There is a spasmodic inquiry out for foundry coke for future delivery and small odd lots are wanted for prompt movement. It is currently reported that coke producers who have to secure an outside supply of coal are unable to make contracts at the price fixed by the Government, so that it is impossible for them to take on any future coke business that would mean acquiring an additional supply of coal from which to make the fuel wanted. Domestic coke is selling more freely locally, due to the coal shortage.

Old Material.—Prices are still going down, and quotations as given to-day are liable to further reductions before the close of the week. Relaying rails are now quoted at $44 per gross ton, while No. 1 railroad wrought scrap is not firm at $28 per net ton. In fact, reductions have been made on practically every grade of scrap with the exception of No. 1 machinery cast, which appears to be fairly firm at $24 per net ton. The following are dealers' prices, f.o.b. cars, southern Ohio and Cincinnati:

Per Gross Ton	
Bundled sheet scrap	$18.00 to $19.00
Old iron rails	32.50 to 33.00
Relaying rails, 50 lb. and up	44.00 to 44.50
Rerolling steel rails	33.50 to 34.00
Heavy melting steel scrap	25.00 to 25.50
Steel rails for melting	25.00 to 25.50
Old carwheels	25.50 to 26.00

Per Net Ton	
No. 1 railroad wrought	$28.00 to $28.50
Cast borings	12.50 to 13.00
Steel turnings	12.50 to 13.00
Railroad cast	19.00 to 19.50
No. 1 machinery cast	24.00 to 24.50
Burnt scrap	13.00 to 13.50
Iron axles	40.00 to 40.50
Locomotive tires (smooth inside)	33.50 to 34.00
Pipes and flues	16.00 to 16.50
Malleable cast	19.50 to 20.00
Railroad tank and sheet	14.50 to 15.00

Philadelphia

PHILADELPHIA, Oct. 9.

Aside from sales of about 9000 tons of Virginia foundry iron by one company, which exhausts its available supply for this year, there was very little activity in the Philadelphia market during the past week in any commodity. This iron was sold at the prices which have been suggested by the iron producers to the committee of the American Iron and Steel Institute, and which will, in turn, be suggested by that committee to the War Industries Board. The contracts will be revised, if necessary, to meet any changes that might appear in the schedules finally adopted. Inasmuch as the tentative schedules were worked out by both producers and consumers of pig iron, after much discussion, it is considered likely here that the War Industries Board will ratify them. It is estimated here that between 12,000 and 15,000 tons of foundry iron has been sold in the East during the week, 9000 tons of this, as above mentioned, being Virginia iron and the remainder divided between eastern Pennsylvania and Buffalo furnaces. A peculiar situation has developed in the export trade as a result of misunderstanding among iron and steel consumers abroad as to the new prices. It seems to have been generally regarded abroad that the Government had fixed prices for export, aside from the war needs of our Allies, as well as for the domestic trade. This is not true, as the trade here well understands, but export brokers have had an embarrassing time explaining the situation to their clients, some of whom have gone so far as to accuse their agents of trying to extort unreasonable profits.

Pig Iron.—Producers of pig iron are now awaiting ratification by the War Industries Board of the schedule of prices agreed upon as the result of conferences between the committee of the American Iron and Steel Institute and representatives of the furnaces. These suggested prices are printed elsewhere in this issue. About 9000 tons of foundry iron have been sold by a Virginia melter at the new prices, that is $33, furnace, for No. 2 plain, $33.50 for No. 2X foundry and $34.50 for No. 1X foundry. Another company sold two cars of No. 1X foundry at $34.50, furnace. These sales were made with the understanding that the prices would be altered should a schedule different from that agreed upon for recommendation to the Government be finally adopted. A New Jersey company is inquiring for 5000 tons of basic iron for this year and a number of inquiries have been received for the first half of 1918. Sales offices are still at a loss how to handle next-year inquiries. It is reported that members of the War Industries Board, in answer to letters, have expressed their opinion that pig iron contracts for next year must be revised to meet any change that might be made Jan. 1, but melters are of the opinion that contracts made now on the basis of $33, furnace, for delivery next year ought to be permitted to stand in the same way that contracts made before the price fixing now remain in force. Apparently iron consumers would be willing to contract ahead at the present prices. Until this question is settled, they are at sea regarding their future manufacturing plans. We quote the following tentative prices at furnace (freight rate to destination must be added):

Eastern Penna. No. 2 X foundry	$33.50
Eastern Penna. No. 2 plain	33.00
Virginia No. 2 X foundry	33.50
Virginia No. 2 plain	33.00
Basic	33.00

Coke.—Practically no business in coke is being done pending more definite announcement regarding Government regulation. A few cars of foundry coke were sold during the week to cover urgent needs, with the price to be whatever the Government may fix. A report has reached here from Washington that the Fuel Administration has ordered that gondola cars be diverted to the coke ovens to prevent a threatened shortage of coke at blast furnaces.

Ferroalloys.—Ferromanganese is weak and there have been few sales, these ranging from $325 to $350 for the 80 per cent. More talk is heard of pending price fixing, with $300 being mentioned as a possible figure which the Government and the producers may agree upon. Spiegeleisen is also weaker, being quoted at $70 to $75 furnace, with sales negligible.

Rails.—A few inquiries aggregating several thousand tons, mostly for 80-lb. and 85-lb. rails, for export to the Far East, have been going the rounds during the past week.

Sheets.—With new control prices soon to be determined, there is naturally little being done in sheets. Jobbers have bought a few carloads for prompt delivery at prices about as follows: No. 10 blue annealed, 7.50c.; No. 28 black, 7.50c. to 8c.; and No. 28 galvanized, 9.50c. to 10c., Pittsburgh. Some contracts for export to Japan, on which deliveries could not be made within the time specified, have been cancelled. These buyers express a confidence which sellers do not share, that they will be able to place this business later at lower prices. A part of the cancelled orders was for blue annealed sheets sold on the basis of 8.75c., Pittsburgh, for No. 10.

Structural Material.—It has been freely intimated since the announcement of a control price for structural material that, aside from Government work, sales would probably not be made for some time except for the fabricated material, on which price fixing has not been suggested. Interest, therefore, attaches to the effort of the Stone & Webster Engineering Corporation to obtain bids for fabricating work only on 4000 tons of steel required for the new plant of the Philadelphia Electric Co., the Stone & Webster Corporation agrees to furnish the steel. Because it is doing considerable Government construction work, this company may expect to obtain desired deliveries of plain material at the new prices. A large number of fabricators in this district have been asked to bid on fabricating sections for the standardized ships which the Submarine Boat Corporation and the Lackawanna Bridge Co. will build at Newark for the Emergency Fleet Corporation. It is expected that the American International Corporation may also soon ask for bids on similar work. Licenses are now being freely granted for export of ship shapes to Japan, and several shipments have gone forward in the past week. Government orders only are being filled on the basis of 3c., Pittsburgh.

Plates.—Two small mills are commonly reported to have accepted orders for tank plates in the past week or two at 8c., Pittsburgh. Most of the mills decline to quote. Large tonnages are being specified by the Emergency Fleet Corporation, one company having just received an order for 18,000 tons. No business is reported aside from Government orders at the 3.25c. price.

Billets.—Pending the fixing of a control price, no business is being done in billets or other semi-finished steel. It is reported that $55 has been discussed as a base price for billets, but the trade is inclined to believe that the price finally agreed upon will be nearer $50.

Iron and Steel Bars.—A fair business in iron bars continues, with some makers inclined to make conces-

sions on desirable contracts. Leading producers adhere to a price ranging from 4.75c. to 5c., Pittsburgh, but are accepting no business beyond this year. Deliveries in many instances are from two to three months off. There is no business being done in steel bars and the new price of 2.90c., Pittsburgh, is virtually nominal.

Old Material.—Dealers expect that regulation of prices of iron and steel scrap will come as soon as schedules on new material have been finally settled. If prices are fixed too low, a real scarcity may result unless ways are found to prevent small yards from hoarding supplies. Traffic regulations which would give precedence to shipments consigned to companies engaged on work designated in the Government priority schedule as class A and class B are also expected and may make it exceedingly difficult for companies not engaged on war work to get regular supplies. The mills continue to stay out of the market, neither buying nor selling, and in the absence of transactions the prices quoted below in some instances represent the sentiment of dealers and are more or less nominal. The Pennsylvania Railroad Co. received bids last week on a list totaling about 10,000 tons, and the prices offered are reported to have been fairly high considering present conditions, but the purchasers were covering on material which they had sold some weeks ago. The Central Railroad of New Jersey will close bids on Oct. 10 on about 400 tons and the Reading will close bids on the same date for about 2000 tons. There is a good inquiry for low phosphorus heavy melting steel, but no sales are reported. We quote the following prices for deliveries in the Philadelphia district, but these prices do not in every instance represent actual sales:

No. 1 heavy melting steel	$25.00 to $28.00
Steel rails, re-rolling	30.00 to 35.00
Low phosphorus heavy melting	38.00 to 40.00
Old iron rails	38.00 to 40.00
Old carwheels	29.00 to 31.00
No. 1 railroad wrought	38.00 to 40.00
No. 1 forge fire	21.00 to 22.00
Bundled sheets	21.00 to 22.00
No. 2 busheling	15.00 to 16.00
Machine shop turnings (for blast furnace use)	15.00 to 16.00
Machine shop turnings (for rolling mill use)	18.00 to 19.00
Cast borings (for blast furnace use)	15.00 to 16.00
Cast borings (clean)	19.00 to 20.00
No. 1 cast	28.00 to 30.00
Grate bars	19.00 to 20.00
Stove plate	19.00 to 20.00
Railroad malleable	32.50 to 35.00
Wrought iron and soft steel pipes and tubes (new specifications)	28.00 to 30.00

San Francisco

SAN FRANCISCO, Oct. 6.

The strike of ironworkers, though covering large plants at all points about San Francisco, has had only an indirect effect on local rolling mills. The strike, moreover, is considered settled, and the men are expected to return to work within a day or two. The President's announcement of a lower scale of prices in certain iron and steel products, however, has made the situation very uncertain. Local men are unwilling to express themselves until they have had opportunity more fully to consider their position as regards eastern competition and to consider their future policies. At this moment, it is not clear whether plants situated in the East will be willing to fill orders at the new prices, or will be obliged to do so. In the matter of steel bars, it would be a difficult problem for coast rolling mills to pay the old scale of prices for raw material and sell their product according to the maximum price established by the President's proclamation, without incurring losses which might force discontinuance of operations by the weaker concerns. Dealers do not apprehend any immediate revision of prices in this market, dut to the fact that there does not seem to be any provision in the agreement allowing for the cancelling of contracts already in manufacturers' hands.

Bars.—Steel bars are not in such demand as formerly, buyers having been influenced by anticipations of some revision in prices. Jobbers still quote steel bars at a base price of 6.50c., but odd lots are being offered at concessions from quotations. Local mills offer coast sizes at 4c. to 5c., in carload lots.

Structural Materials.—The high prices of structural material have prevented building operations. Nearly all business offering comes from Government sources and is handled by the representatives of Eastern mills which decline to quote except on receipt of specifications. Local fabricators are short on orders, and the prospect of price revision has caused buyers to hold away from the market.

Plates.—The shipyard strike and the embargo on exportations have reduced the pressure on jobbers of tank plates and representatives of Eastern mills. The situation in this market has been complicated by the publication of the new scale of quotations approved by the President, and buyers are awaiting further developments before placing orders.

Sheets.—Stoppage of shipments to the Orient should have placed more stocks at the service of domestic buyers, but stocks in jobbers' hands are very much depleted, and are likely to remain so until it is ascertained how the new scale of steel prices will affect sheets. Asking prices of jobbers have not changed during the last three weeks, but to-day cannot be interpreted rigidly.

Wrought Pipe.—Demand for wrought pipe has been considerably curtailed lately. Nearly all of the orders have come from the oil fields and it is doubtful whether the present demand from that quarter can be sustained unless the Government is more lenient in its views towards the oil producers. Mills have been refusing to quote prices except on definite inquiry.

Cast Iron Pipe.—The market on cast iron pipe here is very inactive. There is very little movement of tonnage with little inquiry from municipalities and corporations. The only municipal order placed lately was one of the small amount of $3,000.

Pig Iron.—An undercurrent of instability in the pig-iron market had prevailed for a week prior to the President's announcement concerning agreed prices. Now, while dealers do not expect much decrease in the prices of pig iron, owing to the fact that most buyers have contracted far ahead, and also on account of the insistent demand, buyers do not feel assured of prices being maintained at or about the present level, and they are not in the market. Some days will elapse before the market settles down and business is resumed. The apparent impossibility of obtaining export licenses prevents the supplying of a strong Oriental demand, and some pig iron destined for Japan has been diverted to the Philippine Islands.

Coke.—Supplies of coke have been easier lately, holders having been induced to place stocks on the market, at prices ranging from $23 to $24, but since the publication of the new price scale arranged by the Government, there are no quotations.

Old Materials.—This market has been softening during the past week and prices have been quoted at $27 to $28 for heavy melting scrap, and $30 for heavy cast iron. Indications are that with the revision of steel and pig iron prices, coupled with the embargo on exports, there will be some very material declines in this market, in the near future.

British Steel Market

Tin-Plate Business Restricted—Ferromanganese Supplies Small—Large Pig-Iron Demand

(*By Cable*)

LONDON, ENGLAND, Oct. 10.

There has been a big demand for Cleveland pig iron and it has been supplied liberally. The stringency in hematite iron is unrelieved. Permit restrictions are hindering business in tin plates. American wire rods are quoted at £28 to £29, c.i.f. The ferromanganese market is firm, but bare of supplies. We quote as follows:

Tin plates, coke, 14 x 20; 112 sheets, 108 lb., f.o.b. Wales, maximum, 30s.
Ferromanganese, £45 nominal.
Ferro-silicon, 50 per cent. c.i.f., £35 upward.
On other products control prices are as quoted in THE IRON AGE of July 19, p. 171.

Birmingham

BIRMINGHAM, ALA., Oct. 9.—(*By Wire*).—Birmingham iron producers report no sales this week and declare the market is in a more or less unsettled condition due to the failure of the Government to settle differentials. The nominal price here to-day on pig iron is $33 No. 2 foundry basis, f.o.b. furnace. Iron producers assert that contracts will require practically the entire make of the district up to Jan. 1.

Buffalo

BUFFALO, Oct. 8.

Pig Iron.—The market still exhibits a waiting attitude pending more definite information relative to price differentials for the various grades of iron, with a good deal of interest manifested by both sellers and buyers as to the conclusions that will be reached by the Government and the War Industries Board respecting such differential scale. Meantime, with nothing definite to govern the naming of prices, producers are not quoting, and are confining themselves to taking care of business on old contracts, being behind on deliveries, as well as being sold up for a long period ahead and having no iron to dispose of. Only a few scattering emergency orders, of small tonnage, have been taken, and in at least two or three instances such emergency orders have been booked with the understanding that prices are to be adjusted to the schedule determined by the Government when announcement of the fixed price is made. Under the circumstances no schedule of prices can be reported.

Old Material.—The meeting of the Advisory Board of the Government, officials of different steel plants and representatives of the National Scrap Iron Association at New York last week to go into the steel scrap situation and determine a base price for the different grades of scrap, has had a restraining effect on business, awaiting the conclusion of the session and the announcement of decisions. The fact that this body was in session caused a temporary break in some grades, but such trading as was done was principally between dealers. As the conference is still on, the recessions in prices may be only temporary, but consumers have stopped buying until definite prices are determined. In the meantime, railroad conditions, shortage of cars, embargoes, etc., have tended to practically suspend shipments, so that taken altogether business of the past week has been of very small volume and practically at a standstill. We quote the following tentative schedule of prices, which shows recessions of $1.00 to $2.00 per ton in nearly all grades, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$30.00 to $31.50
Low phosphorus	41.00 to 42 00
No. 1 railroad wrought	40.00 to 41 00
No. 1 railroad and machinery cast	29.00 to 30.00
Iron axles	45.00
Steel axles	45.00
Carwheels	32.00 to 33.00
Railroad malleable	30.00 to 31.00
Machine shop turnings	17.00 to 18 00
Heavy axle turnings	26.00 to 27.00
Clean cast borings	19.00 to 20.00
Iron rails	40 00 to 41.00
Locomotive grate bars	20.00 to 21.00
Stove plate	20 00 to 21.00
Wrought pipe	26.00 to 27.00
No. 1 busheling scrap	26.00 to 27 00
No. 2 busheling scrap	17.00 to 18.00
Bundled sheet stamping scrap	20.00 to 21.00

Finished Iron and Steel.—It is stated that numerous inquiries have been received asking if it is the intention of producers to adjust prices on existing contracts and orders to meet the Government regulation. In reply to these queries, the mills are taking the position that contracts and orders entered in good faith prior to the Governmental fixing of prices are not subject to revision; and buyers are now evidently coming to the conclusion that products contracted for prior to the Government regulation will have to be taken by them at the old contract prices. Inquiries coming into the market for miscellaneous products are being declined by the mills because of the heavier Government tonnages now being placed and the desire on the part of the mills to clean up existing orders and take care of contracts already booked, and indications point to a considerable scarcity of class "C" steel over the fourth quarter. Sellers require documentary evidence in the matter of class "C" material which purchasers claim is to used for Governmental purposes, as well as for classes "A" and "B". Canadian inquiry has been light for the week, and the tin plate export embargo has shut off business in that line entirely. The Kellogg Structural Steel Co., Buffalo, has received the contract for the structural steel for plant of the Cleveland Worsted Mills at Jamestown, N. Y., about 100 tons.

New York

NEW YORK, Oct. 10.

Pig Iron.—Some perplexing questions are arising in connection with the determination of details of prices to be permitted under Government control. For example, some buyers purchased considerable quantities at about $50 for export and were unable to obtain vessels or permits and the iron has been held for some time in New York and other ports. The question is whether these buyers will be allowed to sell at the price which they paid for the iron or be required to take a heavy loss. The same question applies to melters who have more iron than they need in their yards. Another interesting question is as to whether brokers will be allowed to charge a commission. It is understood that the sentiment of the pig iron producers has crystallized in favor of allowing furnaces throughout the country to name the same maximum price, as for example, $33 as a base price at Birmingham, Virginia, eastern Pennsylvania, Valley and any other producing point. The schedule tentatively agreed upon by pig iron representatives for submission to Washington is as follows: No. 2 pig iron, 1.75 to 2.25 per cent silicon, $33, furnace; No. 2X, 2.25 to 2.75 per cent silicon, $33.50; No. 1X, 2.75 to 3.25 per cent silicon, $34.50; $1 advance for each half of 1 per cent silicon above the percentage in No. 1X. Some iron is being placed on the basis of the Government quotation of $33 for No. 2 foundry, subject to revision in case changes are made in the Washington schedule. Sales include a small tonnage of Alabama iron on a basis of $33, Birmingham, for No. 2, or $37.25, tidewater. For early delivery we quote as follows, tidewater, on those grades on which prices have been fairly established, omitting other grades for the present:

No. 2 X	$33.75
No. 3 plain	32.75

Ferroalloys.—Ferromanganese, domestic 80 per cent, is lower. Sales of carload and small lots for early delivery have been made in the last week at $300 and for delivery next year the same figure has been quoted. The decline of about $50 per ton from the level of a week ago is due, in the opinion of some, to the expected fixing of a price on the alloy by the Government and the desire of some holders to get the best returns possible. Rumors are to the effect that the Government price may be put at $200 but this is unconfirmed. The market generally is devoid of much inquiry. One representative of a British producer has heard that a license to ship 300 tons has been granted. Production in this country in September, according to the blast furnace reports of THE IRON AGE, was 23,973 gross tons which is nearly equal to the record production in August of about 24,500 tons. The spiegeleisen output in September was 18,262 or nearly double that for August. For 20 per cent spiegeleisen as low as $75 furnace is quoted but sales and inquiries are few. A small lot is reported sold at Chicago for this year's delivery at $75, which is about $72 to $73, eastern Pennsylvania furnaces. Ferrosilicon, 50 per cent, is quiet. It is understood that quotations have been advanced from a minimum of $140 to $150 with the range now at $150 to $165 but that these prices have not yet been established by sales, the advance following the large sales made a week or so ago.

Structural Material.—Some good is expected from the local movement mentioned in these pages, growing out of the activities of the Building Material Exchange

and resulting in a committee appointed by the president of Manhattan Borough on the Alleviation of Building Stagnation. Committees are at work on prices and supplies, on labor, on mortgage loans, etc.; and it is said that the atmosphere is being clarified and probably when the steel industry generally gets a new start with the wider acceptance of the fixed prices, activity in building operations may be expected. Assurances have been made freely at the meetings that structural steel at the new prices would be deliverable in New York by Jan. 15. Meanwhile new work is mainly for the Government and for railroads; J. G. White Co. asking for bids on 2000 tons for a nitrate plant and the New York Central for 500 tons of bridge work and the Pennsylvania for 600 tons. The steel for the Tacony Ordnance Corporation, 1750 tons, has been awarded to the Belmont Iron Co. No mill business has been learned of and we therefore cannot quote on mill shipments, but warehouse shapes are still quoted at 5c. to 5.50c., New York.

Steel Plates.—It is believed that some small business is being done on steel plates and in some quarters it is thought that this year shipments may be done at 5c. It is asserted that 600 tons has been bought at 6c. for shipment to the Pacific coast for storage pending licenses to send to the Orient. For the Government railroad in France 4250 cars of 60 centimeter gage have been placed, 1000 box cars each to the American Car & Foundry, the Standard Steel Car and the Pressed Steel Car companies and 800 high side gondolas to the American Car & Foundry Co. and 450 of the same kind to the Magor Car Co. An interesting development is that the 20,000 cars for Russia are probably to be placed very shortly, the assurances being more positive than usual and predicated partly on the plan to send over a large corps of those experienced in railroading comprising superintendents as well as those capable of doing car repair work. Probably several thousand all told are involved. Owing to the difficulty of establishing definitely new transactions, we are unable to quote plates out of mill, but out of store sales have been made as high as 12c., New York.

Iron and Steel Bars.—Cancellation of contracts has so far apparently not been given serious consideration by buyers, but instead they are inclined to believe they had better hold them to insure deliveries which might be exceedingly difficult to get through fresh buying with mills other than those having the existing contracts. It would appear that there are few contracts for 1918 deliveries, these being instead specific commitments, but that many covering 1917 deliveries will carry over for several months into next year. Sellers are making the point that in times of demand it is not reasonable to expect price recessions; such have always heretofore occurred with a diminishing demand, and this argument is held up to convince buyers of the wisdom of holding securely to their own contracts. It is expected that in further price fixing agreements shell steel rounds will be put on a basis different from steel bars. In bar iron a fair amount of business is reported with sustained prices. Although claims are made that some business has been done at 4.50c., Pittsburgh, basis, the conditions are too vague to regard them as fixing the market and we find it necessary not to quote at the moment for mill shipments on steel bars, but we continue to quote mill shipments of iron bars at 4.945c., New York, and from warehouse 5c. to 5.50c. for both iron and steel bars.

Old Material.—The old material market is in a demoralized condition. It is confidently expected that the Government will soon take a hand in fixing prices and some dealers believe that heavy melting steel will be selling at about $20 per ton before long. For the most part, quotations remain unchanged, although some sales of heavy melting steel have been made at $23.50 and the same price has been paid for a limited tonnage of No. 1 machinery cast. Steel mills, when buying at all, are doing so in a very conservative way and foundries are not making any castings except those which have been sold, as they believe that now is not the time to make castings to store for future sale. Rejections are numerous and the car situation is still very unsatisfactory. We quote prices of brokers as follows to New York producers and dealers, per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$23.50 to $25.00
Old steel rails (short lengths) or equivalent heavy steel scrap	23.50 to 25.00
Relaying rails	45.00 to 50.00
Rerolling rails	33.00 to 34.00
Iron and steel car axles	41.00 to 42.00
No. 1 railroad wrought	32.00 to 33.00
Wrought-iron track scrap	27.00 to 28.00
No. 1 yard wrought long	27.00 to 28.00
Light iron	7.00 to 8.00
Cast borings (clean)	16.00 to 17.00
Machine-shop turnings	14.00 to 15.00
Mixed borings and turnings	13.00 to 14.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long)	25.00 to 26.00

For cast-iron scrap, dealers in New York City and Brooklyn are quoting as follows to local foundries per gross ton:

No. 1 machinery cast	$23.50 to $25.00
No. 1 heavy cast (column, building materials, etc.)	21.00 to 22.00
No. 2 cast (radiators, cast boilers, etc.)	21.00 to 22.00
Stove plate	16.00 to 17.00
Locomotive grate bars	16.00 to 17.00
Malleable cast (railroad)	27.00 to 28.00
Old carwheels	27.00 to 28.00

Cast Iron Pipe.—Business is almost at a standstill, as no public lettings of importance have developed and private buying is extremely limited. Nominally prices continue at $65.50 per net ton for 6 and 8-in. and heavier and at $68.50 for 4-in., but a readjustment is expected to come at any time.

St. Louis

ST. LOUIS, Oct. 8.

Old Material.—Scrap continues to be practically without price, as the little buying that is being done among the dealers is of no consequence either as to quantity or as to making a market from which quotations can be determined. The figures given are estimates only of the values and it is very doubtful if any business could be done on them, either from the buying or the selling standpoint. We quote dealers' prices, with the reservation noted, f.o.b. consumers' works, St. Louis industrial district, as follows:

Per Gross Ton

Old iron rails	$36.00 to $37.00
Old steel rails, re-rolling	35.00 to 35.50
Old steel rails, less than 3 feet	29.00 to 30.00
Relaying rails, standard section, subject to inspection	50.00 to 55.00
Old car wheels	24.00 to 25.00
No. 1 railroad heavy melting steel scrap	25.00 to 25.50
Heavy shoveling steel	22.00 to 22.50
Ordinary shoveling steel	19.50 to 20.00
Frogs, switches and guards cut apart	24.50 to 25.00
Ordinary bundled sheet scrap	16.00 to 16.50
Heavy axle and tire turnings	16.50 to 17.00

Per Net Ton

Iron angle bars	$33.50 to $34.00
Steel angle bars	23.50 to 24.00
Iron car axles	39.50 to 40.00
Steel car axles	38.50 to 39.00
Wrought arch bars and transoms	37.50 to 38.00
No. 1 railroad wrought	28.50 to 29.00
No. 2 railroad wrought	26.50 to 27.00
Railroad springs	25.50 to 26.00
Steel couplers and knuckles	27.50 to 28.00
Locomotive tires, 42" and over, smooth inside	29.50 to 30.00
No. 1 dealers' forge	18.00 to 18.50
Cast iron borings	14.00 to 15.00
No. 1 busheling	20.50 to 21.00
No. 1 boilers, cut to sheets and rings	16.50 to 17.00
No. 1 railroad cast scrap	18.50 to 19.00
Stove plate and light cast scrap	16.50 to 17.00
Railroad malleable	25.50 to 26.00
Agricultural malleable	18.50 to 19.00
Pipes and flues	18.50 to 19.00
Heavy railroad sheet and tank scrap	15.50 to 16.00
Railroad grate bars	15.00 to 15.50
Machine shop turnings	14.50 to 15.00
Country mixed scrap	14.50 to 15.00

Pig Iron.—The market has been literally flooded with inquiries for pig iron, some for specific tonnages of moment and others for small lots, apparently for the purpose in the latter case of getting a figure out of the furnace representatives. However, very few sales and those for special lots under analyses differing from the standard grades have been made. Furnace representatives are still in the dark as to what prices they may sell for. A notable feature of the inquiries has been the fact that they came from well outside of the usual St. Louis territory as well as within it; Oklahoma, Nebraska and Kansas melters being included in the list.

Included in the inquiries out and which have the ring of real business about them is one for 20,000 tons of Southern basic, half for first quarter and half for second. Under the conditions existing no quotations can be made in this market and none reported until the details of the Government's price are worked out.

Coke.—The coke situation is much the same as that of pig iron so far as making any transactions are concerned and there are no specially important inquiries in the market with one exception, which calls for 30,000 tons of smelter coke and on which no figures have been made as yet.

Finished Iron and Steel.—In finished products mill representatives have been burdened with calls for future contracts, many of the consumers having, apparently, been of the impression that the fixing of prices also made available a supply of material. Movement out of warehouse continues to increase so far as the supplies will permit, but there is considerable difficulty in meeting the calls for material. We quote for stock out of warehouse as follows: Soft steel bars, 4.55c.; iron bars, 4.50c.; structural material, 5.05c.; tank plates, 10.05c.; No. 10 blue annealed sheets, 10.05c.; No. 28 black sheets, cold rolled one pass, 10.35c.; No. 28 galvanized sheets, black sheet gage, 11.75c.

Jones & Laughlin Co. Strike Settled

The strike which started about three weeks ago at the Eliza blast furnaces of the Jones & Laughlin Steel Co., at Pittsburgh, and later spread to the Soho furnaces, causing these stacks to be banked for a short time, has been settled, the men having returned to work at exactly the same terms offered by the company when the strike started. The trouble was caused by agitators of the American Federation of Labor trying to organize lodges among the men employed at the Eliza and Soho furnaces, but which was unsuccessful. Effective Oct. 1, Jones & Laughlin Steel Co. made a general advance in wages of 10 per cent at all its blast furnaces and steel works in the Pittsburgh district, also at the blast furnaces, steel works, wire mills, tin plate and pipe mills at its Aliquippa works, Aliquippa, Pa.

Experts for Machine Tool Supervision

WASHINGTON, Oct. 9.—Rear Admiral A. V. Zane, of the Priorities Committee, has been placed in general charge of all subjects relating to tools and machine tools. There is but one exception to this. Rear Admiral N. E. Mason of the same committee has charge of all questions arising in connection with tools for the manufacture of ordnance supplies for the Navy.

This delegation of the tool question to these two navy experts is important. Just now the manufacturers who will manufacture supplies for the army and navy are getting in their tools and machine tools to accomplish this work. Also it is imperative that all repairs or replacement of such tools shall be attended to at once, so that there will be no delay. As a consequence, a great number of applications are being received by the Priorities Committee for certificates to command the immediate or prior delivery of such tools to these plants. Such applications are handled by either Admiral Zane or Admiral Mason.

Ford Contract Awarded

The Henry Ford & Son Co., Detroit, has contracted with the George A. Fuller Co. for buildings to be erected on the River Rouge, Detroit. These, together with blast furnaces, coke ovens, docks, etc., will constitute the plant for the manufacture of tractors and steel for Ford automobiles. The estimated total cost of plant is $20,000,000 and approximately $8,000,000 of this is involved in the Fuller company's contract.

The American Bronze Co., Berwyn, Pa., maker of bearing bronzes, has changed its name to the American Bronze Corporation.

IRON AND INDUSTRIAL STOCKS

Downward Trend Continues—Railroads Make a Poor Showing

NEW YORK, Oct. 10.

The downward trend of the stock market last week was decided and was again attributed chiefly to the heavy demands of the Government in financing the war through the sale of Liberty bonds and in the levying of high taxes. The Federal Reserve Board is urging the limitation of maturity of current commercial paper to a period not to exceed four months, instead of six months, as it is thought that this change would improve present conditions. It is believed that the financial machinery of the country is able to meet the strain incident to the war loans, but that all possible assistance should be rendered by the banks and by people in general.

One of the very unfavorable features of the present situation is the poor showing of railroads. The decline in railroad securities is assuming alarming proportions and the reason is found in the great increase in expenses. For example, the New York Central in August increased its gross earnings by the sum of $1,462,457, but the increase in expenses was $2,798,690 and the actual loss in net earnings consequently was $1,337,233. The Pennsylvania Railroad and other companies make equally poor reports.

Among the companies which registered declines last week were the American Locomotive, 1 point; Baldwin Locomotive, 1½; Colorado Fuel & Iron, 1¾; Crucible Steel, ⅛; Republic Iron & Steel, common, 1½; United States Steel, common, 2. Among the very few companies which made gains were Lackawanna Steel, ½ point, and National Enameling & Stamping, ½.

The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com.	22 - 24½	Gt. No. Ore. Cert.	30⅛ - 33½
Allis-Chal., pref.	76¾ - 78	Gulf States Steel.	91 - 97
Am. Can, com.	41½ - 47½	Int. Har. of N. J., com.	108 -109
Am. Can, pref.	100 -101½	Int. Har. of N. J., pref.	112
Am. Car & Fdry., com.	67¼ - 70⅛	Int. Har. Corp., com.	68
Am. Car & Fdry., pref.	107⅞ -110	Int. Har. Corp., pref.	103¼ -105
Am. Loco., com.	56¼ - 61	Lacka. Steel	79 - 81¾
Am. Loco., pref.	99¾ -100¾	Lake Sup. Corp.	15¾ - 16½
Am. Rad., com.	292 -305	Midvale Steel	47⅛ - 51¼
Am. Ship, com.	89½ - 90½	Nat.-Acme	32 - 32¾
Am. Ship, pref.	93 - 94	Nat. En. & Stm., com.	42 - 46
Am. Steel Fdries.	62 - 66⅛	N. Y. Air Brake.	118½ -122
Bald. Loco., com.	57½ - 64⅞	Pressed Steel, com.	59¾
Bald. Loco., pref.	98⅜ - 99	Pressed Steel, pref.	100½
Beth. Steel, com.	86 - 89	Ry. Steel Spring, com.	43 - 45
Beth. Steel, class B	83¼ - 93½	Republic com.	77⅜ - 82½
Beth. Steel, pref.	84 - 91	Republic pref.	99¾ -100⅛
Cambria Steel	145	Sloss, com.	40 - 42
Carbon Steel, com.	72	Superior Steel	40 - 45
Central Fdry., com.	28½ - 29	Superior Steel, 1st pref.	100
Central Fdry., pref.	44	Transue-Williams	41
Charcoal Iron, com.	5¾ - 6	Un. Alloy Steel	41½ - 44
Chic. Pneu. Tool	60	U. S. Pipe, com.	15 - 16⅞
Colo. Fuel	39½ - 43½	U. S. Steel, com.	104⅝ -110½
Cruc. Steel, com.	66¾ - 74½	U. S. Steel, pref.	115¼ -116
Cruc. Steel, pref.	91½ - 95	Westing. Elec.	43½ - 46¼
Deere & Co., pref.	99½ -100		
Gen. Electric	136 -142		

Algoma Steel Meeting

Lake Superior Corporation stockholders at their annual meeting in Cambridge, N. J., Oct. 3, heard from official sources most encouraging reports about the outlook for their property. J. Frater Taylor, president of the Algoma Steel Corporation, the chief subsidiary, told stockholders that the Algoma plant made net earnings for the two months July and August of approximately $1,000,000, subject to interest charges and depreciation. This means that the steel plant is now earning at the rate of more than $5,000,000 for the current fiscal year, comparing with about $4,000,000 earned for the fiscal year ended June 30, 1916.

Mr. Taylor also stated that the plant had been brought up to its maximum capacity of 50,000 tons of steel ingots monthly. This is all open-hearth steel and compares with a pre-war output of less than two-

thirds of that amount, of which one-half was Bessemer.

For the last fiscal year, Mr. Taylor explained, the Algoma Steel Corporation received and released cash amounting to approximately $7,000,000, which was used as follows:

In additions to plant and equipment	$2,000,000
In paying off three-year notes	2,400,000
In paying off mortgages	200,000
For additional working capital on account of increase in accounts receivable	700,000
For additional working capital on account of increased stock of raw materials	1,500,000
Deposited with trustees	500,000

The annual meeting was a prolonged affair, largely because a few stockholders sought to have answered a lengthy list of questions concerning the fiscal affairs of the company. Wilfred H. Cunningham, president of the Lake Superior Corporation, who presided at the meeting, told the inquiring stockholders that the questions submitted would be taken up at the next meeting of the board, and that, if possible, detailed replies would be given to each inquiry. Before this conclusion was reached, however, more than a dozen stockholders got up and aired their grievances against past managements of the corporation.

The retiring directors were re-elected by a vote of 281,871 shares and R. Home Smith, representing the Algoma Central and Hudson Bay Railway Co., was added to the board.

Colorado Fuel Earnings

In the fiscal year ended June 30 last the Colorado Fuel & Iron Co., according to the annual report, earned a balance for its common stock of $3,219,469, which is equivalent to $9.40 a share. Gross receipts from sales were $40,004,886, an increase of 56.1 per cent over the preceding year, while net earnings were $3,887,232, a gain of 89 per cent. Surplus above all operating expenses and fixed charges amounted to $6,218,057, compared with $2,201,170 in the preceding year. Expenditures during the year for improvements and additions to property totaled $2,846,910. The net increase in property account after allowing for book value of plants and equipment abandoned and for other small items was $1,237,909.

J. V. Thompson Assets and Liabilities

The largest schedule of assets and liabilities in the history of the United States Court at Pittsburgh, was filed last week by J. V. Thompson in his voluntary bankruptcy petition. Mr. Thompson was formerly a large coal and coke operator in the Connellsville and Greene county districts, and was also president of the First National Bank of Uniontown, Pa., which closed its doors shortly after his failure. The schedule filed shows liabilities of $39,368,098.11 and assets of $57,474,593.71. The liabilities are: Taxes, $475,000; wages, $1,762; secured claims, $19,870,601.24; unsecured claims, $19,020,734.87. The largest item in the assets is real estate, appraised at $41,204,253.01. Among the greater liabilities are single claims of the Union Trust Co. of Pittsburgh, $1,500,000, and J. R. Nutt of Cleveland, $1,880,000.

Industrial Finances

The State Board of Public Utility Commissioners of New Jersey has approved the merger of the United Shoe Machinery Co., capitalized at $25,000,000, and the United Shoe Machinery Corporation, with a capital of $50,000,000. The name of the merged company will be the United Shoe Machinery Corporation, and it will have a capital of $50,000,000, divided into 2,000,000 shares at $25 a share.

The stockholders of the Lansdale Foundry Co., Lansdale, Pa., have authorized the capital stock to be increased from $25,000 to $100,000. The output of the plant has been doubled, most of it being for the United States Government.

Within the past month the Shenango Furnace Co., Pittsburgh, operating three blast furnaces at Sharpsville, Pa., coal and coke works in Westmoreland County, Pa., and owner of large ore properties, has satisfied a general mortgage for $4,000,000 on all its properties, and also a mortgage of $2,500,000 on its Webb ore mine. The mortgage for $4,000,000 did not become due until 1921, and the mortgage for $2,500,000 until 1930, and both were secured by 5 per cent bonds. The $4,000,000 mortgage was recorded in Westmoreland County, Pa., where the coal and coke properties of the company are located, and was much the largest mortgage of record ever satisfied in full in that county at one time. The Shenango Furnace Co. is absolutely free of all liabilities except its current bills.

On Oct. 1, dividend disbursements by leading steel companies in the Youngstown, Ohio, district totalled considerably over $2,500,000. The largest dividend payers were the Youngstown Sheet & Tube Co., $1,100,000; Brier Hill Steel Co., $702,500; Republic Iron & Steel Co., $437,500, and Trumbull Steel Co., about $275,000. In addition, smaller concerns like the General Fireproofing Co., Republic Rubber Co., and others also paid dividends.

The plant of the Champion Iron Co., Kenton, Ohio, was sold by the receiver a few days ago to Robert L. Miller, Kenton. It is stated that if the sale is confirmed by the court, the plant will be operated along the same lines that it has been in the past.

The Cleveland Tractor Co., Cleveland, has been authorized by its stockholders to increase its capital stock from $600,000 to $6,000,000 of which $600,000 will be issued at once. The proceeds will be used to complete a factory extension now under construction. The company, formerly known as The Cleveland Motor Plow Co., manufactures small farm tractors. It is stated that the new addition will provide a capacity of 8000 tractors next year. The company reports that the demand for tractors is very heavy and a large number of orders are coming from England.

The Detroit Iron & Steel Co., Detroit, has declared an extra dividend of 5 per cent in addition to its regular dividend of 2½ per cent. The dividends will be paid on the $1,500,000 common stock outstanding. The dividends aggregate $112,500 and are the first to be paid on the common stocks since the company increased its capital stock by a 100 per cent stock dividend. There is also $750,000 preferred stock.

The Pittsburgh Steel Co., Union Arcade Building, Pittsburgh, has issued a statement showing that its sales for the year ending June 30, 1917, were $33,066,083.48 an increase of $11,218,047.81 over the year ending June 30, 1916. Net profits for the year ending June 30, 1917 are given as $7,811,444.19, after setting aside $1,507,278.58 as reserve for depreciation and depletion and $1,823,548.16 for estimated war profits tax. In other words, the total earnings of the Pittsburgh Steel Co., for the year ending June 30, 1917, were $11,142,270.93. The total earnings of the company for the year ending June, 1916, were $4,564,067.18.

Dividends

The Midvale Steel & Ordnance Co., quarterly, $1.50 per share, payable Nov. 1.

The Transue & Williams Steel Forging Co., quarterly, $1.25 per share, payable Oct. 20.

The United Alloy Steel Corporation, quarterly, $1 per share, payable Oct. 20.

Mining Engineers Meet

The American Institute of Mining Engineers, Philip N. Moore of St. Louis, president, began its one hundred and fifteenth convention at St. Louis Monday, Oct. 8, with opening addresses, reports of the president and other officers, etc. The convention was arranged to be a moving affair, the delegates in attendance being taken to various mining districts in the vicinity of St. Louis, including the Joplin, Mo., lead and zinc area, the Miami, Okla., lead and zinc district, the Pittsburg, Kans., coal district, and possibly the Illinois coal district. The concluding session is planned for Saturday at Tulsa, Okla. Special study is to be made of all the mineral districts visited.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

(Nominal quotations, showing prices which prevailed when last sales were made. Published as a matter of record.)

Freight rates from Pittsburgh on iron and steel articles, aside from wrought iron and steel pipe in carloads, per 100 lb. New York 19.5c.; Philadelphia 18.5c.; Boston 21.5c.; Buffalo 11.6c.; Cleveland 13.5c.; Cincinnati 18.5c.; Indianapolis 20c.; Chicago 21.5c.; St. Louis 27c.; Kansas City 47c., minimum carload 36,000 lb.; St. Paul 35.5c., minimum carload 36,000 lb.; Denver 79c., minimum carload 36,000 lb.; Omaha 47c., minimum carload 36,000 lb.; New Orleans 30.7c.; Birmingham 46c.; Pacific Coast 75c., minimum carload 80,000 lb. To the Pacific Coast, the rate on steel bars and structural steel is 90c., minimum carload 40,000 lb. and 85c., minimum carload 50,000 lb. On wrought iron and steel pipe, the rate from Pittsburgh to Kansas City is 40c. per 100 lb., minimum carload 46,000 lb.; to Omaha 40c., minimum carload 46,000 lb.; to St. Paul 35.5c., minimum carload 46,000 lb.; Denver 79c., minimum carload 46,000 lb.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in., angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 4c.

Wire Products

(Prices of independent mills)

Wire nails, $4 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire, $4.05 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.95; galvanized wire, $4.65; galvanized barb wire, and fence staples, $4.85; painted barb wire, $4.15; polished fence staples, $4.15; cement-coated nails, $3.90 base, these prices being subject to the usual advances for the smaller trade all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 43 per cent off list for carload lots, 42 per cent off for 1000-rod lots, and 41 per cent off for small lots, f.o.b. Pittsburgh.

Nuts and Bolts

Discounts in effect for large buyers are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days.

Carriage bolts, small, rolled thread, 40 per cent; small cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c., and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent with c. p. nuts, 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq. blank, $1.70 off list, and tapped, $1.50 off; hex., blank, $1.50 off, and tapped, $1.30 off; nuts, c. p. c. and t. sq. blank, $1.25 off; and tapped, $1 off; hex. blank, $1.25 off, and tapped, $1 off. Semi-finished hex. nuts 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Wire Rods

Soft Bessemer and open-hearth rods to domestic consumers at $90 to $95; high-carbon rods made from ordinary open-hearth steel $95 to $100, and special steel rods with carbons running from 0.40 to 0.60, $100 to $110 at mill; above 0.60 carbon, $115 to $120.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $7.00, ⅝ in., 7/16 in. and ½ in., $7.00 base. Boat spikes are occasionally quoted $7 to $8, all per 100 lb., f.o.b. Pittsburgh, but some makers are quoting higher. Track bolts with square nuts, 7c. to 7.50c. to railroads, and 8c to 8.50c., in small lots, for fairly prompt shipment.

Steel Rails

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails, and on carload and smaller lots, 4c. to 4.25c. at mill. Light rails, 25 to 45 lb., $75 to $80; 16 to 20 lb., $80 to $81; 12 and 14 lb., $82 to $83; 8 and 10 lb., $83 to $84; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard Bessemer rails, $38; open hearth, $40, per gross ton, Pittsburgh.

Tin Plate

Effective July 31, prices on all sizes of terne plates were advanced from $2 to $2.50 per package and are now as follows: 8-lb. coating, 200 lb., $16 per package; 8-lb., coating, I. C., $16.30; 12-lb. coating, I. C., $17.50; 15-lb. coating, I. C. $18.25; 20-lb. coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 4c. to 4.50c. for delivery late this year, and 4.50c. to 5c. from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c., railroad test bars, 5.25c. in carload and larger lots f.o.b. mill.

Wrought Pipe

The following discounts on steel are to jobbers for carload lots on the Pittsburgh basing card in effect from May 1, 1917, all full weight, except for LaBelle Iron Works and Wheeling Steel & Iron Co., which quote higher prices, and National Tube Co., which adheres to card of April 1.

Butt Weld

Steel Inches	Steel Black	Steel Galv.	Iron Inches	Iron Black	Iron Galv.
⅛, ¼ and ⅜	42	15½	⅛ and ¼	23	+4
½	46	31½	⅜	24	+3
¾ to 3	49	35½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	42	29½	2	26	12
2½ to 6	45	32½	2½ to 6	8	15
7 to 12	42	28½	7 to 12	25	12
13 and 14	32½	..			
15	30	..			

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	38	20½	⅛, ¼ and ⅜	22	5
½	43	30½	½	27	14
¾ to 1½	47	34½	¾ to 1½	33	18
2 to 3	48	35½			

Lap Weld, extra strong, plain ends

2	40	28½	2	27	14
2½ to 4	43	31½	2½ to 4	29	17
4 to 6	42	30½	4½ to 6	28	16
7 to 8	38	24½	7 to 8	20	8
9 to 12	33	19½	9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

Nominal discounts on less than carload lots, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in.	28	1¾ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3¼ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in.	No quotations
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths. Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net or 2 per cent discount in 10 days:

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer

	Cents per lb.
Nos. 3 to 8	8.00 to 8.50
Nos. 9 and 10	8.25 to 8.50
Nos. 11 and 12	8.50 to 8.75
Nos. 13 and 14	8.75 to 9.00
Nos. 15 and 16	9.00 to 9.25

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	8.30 to 8.80
Nos. 22 and 24	8.35 to 8.85
Nos. 25 and 26	8.40 to 8.90
No. 27	8.45 to 9.00
No. 28	8.50 to 8.95
No. 29	8.55 to 9.05
No. 30	8.65 to 9.15

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11	8.50 to 9.00
Nos. 12 and 14	8.60 to 9.10
Nos. 15 and 16	8.75 to 9.25
Nos. 17 to 21	8.90 to 9.40
Nos. 22 and 24	9.05 to 9.55
Nos. 25 and 26	9.20 to 9.70
No. 27	9.35 to 9.85
No. 28	9.50 to 10.00
No. 29	9.75 to 10.25
No. 30	10.00 to 10.50

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	7.80 to 8.30
Nos. 17 to 21	7.85 to 8.35
Nos. 22 to 24	7.90 to 8.40
Nos. 25 to 27	7.95 to 8.45
No. 28	8.00 to 8.50
No. 29	8.05 to 8.55
No. 30	8.05 to 8.55
Nos. 30½ and 31	8.10 to 8.60

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
Oct.	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
3	23.50	23.50	60.50	7.90	7.75	8.37½	8.12½
4	23.50	23.50	60.75	7.85	7.70	8.37½	8.12½
5	23.50	23.50	60.75	7.80	7.65	8.37½	8.12½
6	23.50	23.50	....	7.80	7.65	8.25	8.00
8	23.50	23.50	61.12½	7.70	7.55	8.25	8.00
9	23.50	23.50	61.00	7.60	7.45	8.25	8.00

NEW YORK, Oct. 10.

All the metals are weak and inactive except tin. The copper market is chaotic and nominal. Tin is fairly active and higher. Lead is dull and weaker. Spelter is again stagnant and nominally lower. Antimony continues unchanged.

New York

Copper.—The copper situation could hardly be more uncertain. Until yesterday all supplies had been practically commandeered by the Government and not only could no copper be sold at the Government price of 23.50c., which we continue to quote as nominal, but even deliveries on contract were forbidden until the needs of the Government and the Allies were known. It is now reported that consumers having contracts can now obtain their supplies as it is found that the combined requirements of the Government and its allies will be 120,000,000 lb. per month for the last quarter. While production in September was only 130,000,000 lb. it is believed that it will reach 200,000,000 lb. per month in the last quarter which will insure 80,000,000 lb. per month for domestic consumers; this is believed by some sufficient. The pooling committee of producers is reported as now in conference with a similar committee of consumers and a comparison of statistical data is expected to bring about a clearing of the situation. The London market is unchanged at £125 for electrolytic and £121 for futures.

Tin.—The feature of the tin market is an appreciable tightening of shipment permits, particularly from England and the Straits Settlements. The names of parties to whom tin is to be shipped are required and this may mean hardship for buyers of spot metal later. The past week has witnessed more buying than in some time. On Oct. 4 at least 300 tons of future shipment changed hands and on Oct. 5 there was again a fair business in futures, amounting probably to 200 tons. Early this week there was a good sized inquiry but sales yesterday and Monday were light and the market has become dull again. The quotation yesterday was 61c., New York. Arrivals to Oct. 9 inclusive have been 1100 tons with 5000 tons reported afloat. The London market yesterday was unchanged from last week's price of £245 10s. per ton.

Lead.—The lead market is dull, stagnant and uninteresting and shows signs of decided weakness. Demand has been as light as possible and buyers are holding off, evidently expecting lower prices fixed possibly by the Government. Sellers, however, are desirous of orders and concessions are being made to such an extent that prices have declined from 7.95c. a week ago to 7.60c., New York, yesterday and 7.45c., St. Louis. A bright spot has been considerable demand from England and Canada which appeared at the end of last week. Sales are reported to have been made of metal for November shipment at 7.50c., New York, with bids for December at 7.37½c. An interesting unconfirmed report is that producers have agreed to furnish the Government its October metal, contracted for at 8c., at a lower price if the quotations of the leading mining paper report an average lower than 8c. for the month. This has had an unsettling influence. Yesterday and Monday further easing has been evident and the market is extremely dull.

Spelter.—The market continues weak. Demand is again at low ebb and quotations have fallen to 8c., St. Louis, or 8.25c., New York, but they are largely nominal. There seems to be absolutely no interest in the market. It is stated that one producer on Monday offered October prime Western at 7.75c., St. Louis, but it is not known whether any sales were made at this price. Later reports state that the offer was withdrawn. For November and December the quotation seems to be about 8.12½c., St. Louis, or 8.37½c., New York.

Antimony.—Demand is of small proportions. Chinese and Japanese grades are obtainable at 15c. per lb., New York, duty paid.

Aluminum.—No. 1 virgin metal, 98 to 99 per cent pure, is quoted at 40c. to 42c. per lb., New York, but there is little demand.

Old Metals.—We are quoting copper nominally on the basis of the Government regulation, but it is impossible for purchasers other than the Government to purchase heavy crucible copper at less than 26½c. to 27c. per pound. We quote dealers' selling prices as follows:

	Cents per lb.
Copper, heavy and crucible (nominal)	23.50
Copper, heavy and wire (nominal)	23.50
Copper, light and bottoms	22.50 to 23.50
Brass, heavy	18.00 to 18.25
Brass, light	14.00 to 14.25
Heavy machine composition	25.00 to 25.50
No. 1 yellow rod brass turnings	17.25
No. 1 red brass or composition turnings	19.00 to 21.00
Lead, heavy	7.50
Lead, tea	6.50
Zinc	6.50

Chicago

OCT. 8.—Small lots of copper for immediate delivery, purchased by consumers who are compelled to buy in a hand-to-mouth manner, command from 28c. to 30c. Generally the metal market is dull. Tin is firm and fairly active. The course of old metals in downward, in keeping with the general trend, despite their being in better demand in place of virgin metal in melting. We quote as follows: Casting, Lake and electrolytic copper, 28c. to 30c.; tin, carloads, 61.50c.; small lots, 63.50c. to 64.50c.; lead, 7.90c. to 8c.; spelter, 8.25c.; sheet zinc, 19c.; antimony, 17c. to 18.50c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 21.50c.; copper clips, 21c.; copper bottoms, 20c.; red brass, 20.50c.; yellow brass, 15c.; lead pipe, 6c.; zinc, 6c.; pewter, No. 1, 35c.; tinfoil, 42c.; block tin, 47c.

St. Louis

OCT. 8.—The non-ferrous metals market has been rather dull during the past week. The quotations to-day at the close on carload lots were: Lead, 7.90c.; spelter, 8c. to 8.50c., according to delivery. On less than carload lots, lead, 8.50c.; spelter, 9.25c.; tin, 66c.; lake copper, held at 29c. without much business; Asiatic antimony, 20c. In the Joplin district there was a slump in prices, the low basis for zinc blende falling to $62.50 per ton, basis of 60 per cent metal, with a range upward to $75 per ton for the top grades. The average for the week in the district for all ore sold was $65, the bulk of the selling being on the lower grades. Calamine was quiet at $35 to $40 per ton, basis of 40 per cent metal, with average for the week for the district $39 per ton. Lead ore continued at $90 per ton, basis of 80 per cent metal, but the market was unsatisfactory and the average for the week for the district $88 per ton. On miscellaneous scrap metals, in which there was a reduction in price during the week, we quote dealers' buying figures as follows: Light brass, 10c.; heavy yellow brass, 13.50c.; heavy red brass and light copper, 18.50c.; heavy copper and copper wire, 20c.; pewter, 25c.; tinfoil, 42c.; zinc, 5c.; tea lead, 6c.; lead, 6.50c.

Japan in 1916 imported from the United States iron as bars, rods, plates, sheets, bands, etc., quantities to the value of $17,566,593. The value of these imports from Great Britain was $9,823,206. Germany is reported as furnishing $204,383 worth.

A book containing the official text of the war tax law together with the income tax law in its amended form has been issued by the National Bank of Commerce in New York.

Book Review

Compressed Air for the Metal Worker. By Charles A. Hirschberg. Pages viii + 321, 5 x 8 in.; illustrations, 294. Published by Clark Book Co., Inc. New York. Price, $3.

In his preface, the author states that experience has impressed upon him "the dearth of practical information in published form relating to the industrial uses of compressed air." As a result of this impression, the author has gotten together in excellent form a comprehensive collection of dates and illustrations which he publishes under the somewhat misleading title of "Compressed Air for the Metal Worker." This title is misleading for the reason that many of the applications of compressed air described cannot be termed, in the strict sense of the word, as pertaining to the metal worker.

The book opens with a chapter on the history of compressed air, describing briefly its discovery and the main steps which have lead to the present applications. Then follows a chapter giving a glossary of compressed air terms, together with excellent illustrations of the various makes and types of compressors in use to-day. This chapter also contains several tables pertaining to the design and performance of compressors, which are arranged in an excellent manner. There are also chapters treating with the details of compressor design, compressor accessories and the methods of installing compressors and their accessories.

Following this is a section comprising three chapters, devoted to portable pneumatic tools, their care and operation and their varied applications. Here, again, the illustrations are excellent and practical tables of value are interspersed. These chapters deal with the subject mentioned in a broad manner, and later in the book the author has introduced chapters treating in detail with the application of portable pneumatic tools such as are used for hoisting, handling and conveying, and the use of compressed air for cleaning.

Before reaching these chapters, there is a section dealing with the use of compressed air in the foundry, and one dealing with the use of compressed air in the machine shop. The section pertaining to the uses of compressed air in the foundry is extremely interesting on account of the comprehensive descriptions and illustrations provided.

The book is concluded with chapters on the use of compressed air for the application of paint, lacquer, etc., and the uses of compressed air for pumping purposes. E. C. R.

A booklet on "Industrial Fatigue In Its Relation to Maximum Output" has been published by Co-partnership Publishers, Ltd., 6 Bloomsbury Square, London, W. C., England. It appears to be a review of the notable experiments that have been going on in Great Britain and of investigations on continental Europe. It touches on the dilution of labor, scientific methods and management, the housing and welfare question, labor turn-over and after-the-war problems. The author, Henry J. Spooner, director of the Polytechnic School of Engineers, London, has obtained a foreword by Sir Robert A. Hadfield as representing a captain of industry and a foreword from J. R. Clynes, a member of Parliament, as representing labor. Sir Robert Hadfield explained that in the early part of the war, his industrial establishment employed some 15,000 and never shut down except on one or two holidays, but it did not pay. Latterly there has been no Sunday work and the result has been an output equally as great as before, a fact which he considers a proof of the inadvisability of employing non-stop and overtime methods. The pamphlet of 59 pages sells for 6d.

War tax calculations on a number of hypothetical cases have been issued in a four-page circular by the National Supply and Machinery Dealers' Association, 505 Arch St., Philadelphia. Five different conditions are covered.

Pittsburgh and Nearby Districts

Officials of the Westinghouse Electric & Mfg. Co., East Pittsburgh, deny the report that the company has received an order for 3500 aeroplane engines, the reported cost having been given as $17,500,000.

The Public Service Commission has granted authority to the Wetzel Natural Gas Co., Charleston, W. Va., to increase gas rates from Oct. 1, 27c. per 1000 cubic feet, with a discount of two cents per 1000 cubic feet if paid on or before the 10th day of the month after bill is rendered. This higher rate is for domestic consumption.

Owing to conditions created by the war, it having called to the services some of the salesmen and engineers of the Blaw-Knox Co. of Pittsburgh, that concern has decided to close its Boston office while the war lasts. All inquiries and all work in the Boston territory will be handled hereafter through its New York office at 165 Broadway. The company states it is not its intention to replace any of the men who are giving their services to the country.

The Pittsburgh Steel Products Co., Pittsburgh, has awarded a contract for the construction of a new tube mill, consisting of two buildings, at Allenport, Pa., to cost $75,000. The structures will be one-story, 236x660 ft., and 178x660 ft., respectively.

Increased Mineral Production

WASHINGTON, Oct. 9.—The total value of the mineral production of the country in 1916 was more than $3,470,000,000, increasing $1,076,200,000, or 45 per cent, over the $2,393,800,000 recorded for 1915, and exceeding the former record year (1913) by more than $1,000,000,000, according to preliminary figures compiled by the United States Geological Survey, Department of the Interior.

Practically all the minerals shared in this increase, gold being the only one of the more important products that showed a decrease in value, though silver and anthracite showed decreases in quantity but increases in value.

The metals established a new record in 1916, exceeding for the first time $1,000,000,000 and approximating a total of $1,622,000,000. Pig iron and copper contributed more than 78 per cent of the total increase of $629,000,000, but large gains were made in zinc, lead, aluminum, ferroalloys, and tungsten ores. As compared with the figures for 1915, the metallic products increased 63 per cent.

Germany's Supply of Copper

Germany is now getting copper from several sources, according to the London *Ironmonger*. The Serbian copper mines are now being intensively exploited by the Germans and Austrians and good copper deposits are also said to have been found in Poland. Work has recently begun in the lead and copper deposits in the district of Kielce and in the neighborhood of Miedziana, Lysa Gora and Olkuss the methodical exploitation of these ores has already been started. The existence of copper in this district has long been known but under Russian rule the deposits were neglected, as the authorities devoted all their attention to the exploitation of the mines in the Ural.

The installation of heating furnaces at the plant of the Sizer Forge Co., Buffalo, has been practically completed. This work, which was designed and installed by the Fuller Engineering Co., Allentown, Pa., will be fired with pulverized coal. Waste heat boilers are also installed in connection with the heating furnaces and are arranged to obtain their suppy of heat from the furnaces, or they can be fired with pulverized coal direct. The pulverized coal plant and equipment for four new open-hearth furnaces which the Fuller Co. is installing at the plant of the American Roller Mill Co., Middletown, Ohio, will be completed shortly.

PERSONAL

Frank Parrish, for many years assistant general purchasing agent of the American Bridge Co., Pittsburgh, and well and favorably known to the trade, has been appointed purchasing agent of the Canadian Steel Corporation, Ltd., effective Oct. 8, and will be located at Ojibway, Ontario.

H. W. Davis, New York sales manager of the American Hoist & Derrick Co., St. Paul, Minn., has been loaned by his company to the American International Corporation, which is building a ship assembling plant for the Emergency Fleet Corporation at Hog Island, Philadelphia. Mr. Davis will have supervision over the work of hoisting and conveying materials.

Robert Pierpont, superintendent Remington Arms Co., Chester, Pa., has joined the Dalton Mfg. Co., New York.

Edgar I. Mills, who has been identified for a number of years with the export branch of the steel industry, has joined the iron and steel department of the Federal Export Corporation. Mr. Mills resigned from the American Steel Export Co. Oct. 1, to assume his new duties.

Edmund Barany, machine designer of the Singer Mfg. Co., Elizabeth, N. J., is now mechanical engineer and assistant to general superintendent of the Cleveland Twist Drill Co., Cleveland.

W. P. Anderson, president Ferro Concrete Construction Co., Cincinnati, has received a commission as captain in the Engineer Officers' Reserve Corps and has been assigned to active duty as student at the Engineers' Training Camp at Belvoir, Va.

L. G. Julihn has been elected president of the Elliott-Fisher Co., Harrisburg, Pa., succeeding George F. Watt, deceased. Mr. Julihn will also act as general manager; he has been connected with the company at Washington in exclusive charge of patents for the past eight years, and in other capacities since 1900.

Paul L. Keiser, Pottstown, Pa., formerly connected with the Eastern Steel Co., has been elected president of the Pottstown Steel Products Co., which is now building a new plant for the manufacture of stacks, tanks and similar products.

John McNeil, Schenectady, N. Y., has been appointed general foreman of the boiler department at the Brooks plant of the American Locomotive Co., Dunkirk, N. Y.

E. Herbert Gilg, doing business under the name of Henry F. Gilg, selling the output of iron sheets for the Wilkes Rolling Mill Co., Sharon, Pa., is going to the front in the Signal Reserve Corps.

Edgar C. Felton, formerly president of the Pennsylvania Steel Co., has accepted an appointment as director of the Department of Civilian Service and Labor, under the Committee of the Public Safety, Philadelphia. In addition to his connection with various railroads and steel companies, Mr. Felton is now on the board of managers of the Girard Trust Co., and director of the Franklin National Bank and the Farmers and Mechanics National Bank.

R. Burdette Dale has resigned as chief engineer of the Erie City Iron Works, Erie, Pa., and has joined the Franklin Mfg. Co., Franklin, Pa., in the planning department.

Marvin W. Lutz has resigned as secretary of the Aultman & Taylor Machinery Co., Mansfield, Ohio, and has been succeeded by Benjamin Hurtxthal, formerly assistant secretary.

Carl Oberstadt, formerly of the Standard Parts Co., Cleveland, has accepted the position of general superintendent of the Cleveland Works, Elyria Iron & Steel Co.

Edward A. Moss, formerly vice president and manager of the sales of the J. E. Moss Iron Works, Wheeling, Va., has severed his connection with that firm and established an engineering and sales office at 2031 Euclid Avenue, Cleveland, for the handling of all kinds of structural steel, metal, iron and bronze products. He had been with the Wheeling firm since its formation and has made a particular study of the service required by the architect, engineer and contractor.

P. H. Withington, president of the Burchard, Roberts, Wales Co., structural engineers, Cleveland, and vice-president of the American Fork & Hoe Co., and E. P. Merrill, engineer, Cleveland, have been selected by the Government's sub-committee on airplanes to engage in work in connection with the development of the airplane back of the firing line in France, and will leave shortly for that country.

Ole K. Olsen, 822 Perdido Street, New Orleans, has been appointed sales agent for the State of Louisiana and the southern portion of Mississippi for the Asbestos Protected Metal Co., Pittsburgh.

R. A. Smart, formerly assistant manager of works of the Westinghouse Electric & Mfg. Co., and later works manager of the American and Canadian plants of the Oliver Chilled Plow Works, is now associated with the Tacony Steel Co., and the Tacony Ordnance Corporation, Tacony, Philadelphia.

R. J. S. Pigott has been made superintendent of the raw-material department, Bridgeport Brass Co., Bridgeport, Conn. He was formerly with the Remington-U. M. C. Co. at Bridgeport and the Sanford Riley Stoker Co.

Donald C. Wright, formerly production manager of the Remington Arms-Union Metallic Cartridge Co., Ilion, N. Y., is now production manager of the Dodge Mfg. Co., Mishawaka, Ind.

Major General George W. Goethals, who resigned recently from the general managership of the Emergency Fleet Corporation, following differences with Chairman Denman of the Shipping Board, was elected president of the Wright-Martin Aircraft Corporation at a meeting of the board of directors last week. Since his departure from Washington, General Goethals has been devoting his time to his engineering firm, Goethals, Jamieson, Houston & Jay. George H. Houston, a partner of General Goethals in this firm, is vice-president of the Wright-Martin Corporation. J. F. Alford retired from the presidency to make way for General Goethals. Marshall J. Dodge of Betron, Griscom & Co., was elected a director and the other directors were reelected.

George M. Smith, chief engineer Walter Rachals & Co., Youngstown, Ohio, has become chief engineer of the Interstate Iron & Steel Co., Chicago.

James H. McKee, superintendent of the forge department of the Pittsburgh Screw & Bolt Co., N. S., Pittsburgh, has been called by the Government to Washington, to give his services in the mechanical department of the gas masks investigation.

G. B. Wickersham, former vice-president and general manager of the Diamond Forging & Manufacturing Co., Pittsburgh, Pa., has assumed charge of the Louisville Steel & Iron Co., Louisville, Ky., as vice-president and general manager. He proposes to put the plant on a continuous operation basis.

John J. Harty has been appointed president of the Canadian Locomotive Co., Kingston, Ont. Mr. Harty was previously vice-president and general manager of the concern. He is also a director of the Dominion Foundries & Steel Co. Mr. Harty is a son of the Hon. William Harty, who was, some years ago, president of the Canadian Locomotive Co., and is still one of its largest shareholders.

Samuel H. Whittaker, Walter-Wallingford & Co., Cincinnati, is convalescing at Grant Hospital, Columbus, Ohio, from a painful street car accident that happened in that city several days ago, in which an artery in his back was severed by flying glass. He is expected to be discharged from the hospital by the end of the present week.

Charles C. Cheyney, manager of the Chicago office and store of the Buffalo Forge Co., has a commission in the Naval Aeronautic Corps and is beach engineer at Pensacola, Fla., in charge of aeroplane engines.

Major L. J. Campbell, one of the vice-presidents of the Youngstown Sheet & Tube Co., Youngstown, Ohio, stationed for some months at Fort Benjamin Harrison,

is awaiting an assignment to a command with the National Army. He, with 16 other officers, has been relieved from duty at his former post at Fort Benjamin Harrison.

D. V. Sawhill, formerly in the sales department of the Pittsburgh offices of the Youngstown Sheet & Tube Co., but for some months in charge of the pipe department of the Cincinnati Iron & Steel Co., Cincinnati, has resigned, and has joined the Pennsylvania Signal Corps.

Edmund Barany, machine designer of the Singer Mfg. Co., Elizabeth, N. J., has assumed the duties of mechanical engineer and assistant to general superintendent of the Cleveland Twist Drill Co., Cleveland.

Coal Jobbers' Sales Regulations

WASHINGTON, Oct. 9.—Regulations intended to prevent jobbers from obtaining undue profits in selling coal have been promulgated by Harry A. Garfield, the Fuel Administrator. Jobbers who at the time of the President's orders fixing the price of coal at the mine had contracted to buy at or below the price therein set may not sell at a price higher than what they pay plus the proper jobbers' commission. All contracts binding at law are to be observed; but coal bought after the President's orders cannot be sold at a price above the one fixed by him, even if delivery was contracted for at an earlier date. In short, jobbers who have made contracts to sell at a high rate cannot now rush into the market, buy at the lower rate established, and sell above the maximum, thus making a greatly increased profit.

The regulations just made prescribe that all jobbers of coal or coke must register with the Federal Trade Commission by Oct. 25, stating the financial interest of all stockholders and partners of jobbing concerns in mines producing coal. Another rule issued by Dr. Garfield concerns methods of accounting by dealers, which the Fuel Administration wishes to reduce to a uniform basis, in order to make comparisons of cost without injustice to any one. Uniform cost-sheets are being prepared for distribution to dealers, who are required to furnish reports monthly, or at any time these are desired by the Fuel Administration at Washington or State fuel administrators.

Coal confiscated by railroads for their own use may be purchased from the owner at the price under which it was consigned when confiscated, if this is not above the figure set by the President. Exception must be made when it has been consigned under a contract that would stand in court, made before the Presidential order, in which case the railroad must pay the higher figure, if it wants the coal.

One of the most difficult problems it is said that the Fuel Administration has had to solve is that of who should pay the cost of hauling coal from "wagon mines," which have no rail connection, to the railroad. Thousands of these mines have started up lately, because of the high price of coal, without which they could not be operated at a profit. Loading cars from wagon mines, after the haul, is slow, which has meant the holding of cars longer than advisable at loading points.

The Fuel Administrator ruled that the product of these mines be shipped in box cars, when it is sent to the general market by rail, thus saving the open cars for the use of mines where the loading can be done most quickly. Where box cars are used by wagon mines a charge of 75 cents per ton, in addition to the President's prices, is permitted, to cover the cost of hauling and loading. The Fuel Administrator also ruled that where these wagon mines make deliveries directly to consumer by wagon or truck, the cost of the haulage may be added to the President's prices.

An assignment of a contract for the sale of coal, when made after the President's order applicable to the price of coal covered by the contract, will be treated as an actual sale of coal. For the present, cannel and smithing coal may be sold at current market prices; but the latter may be used for smithing only.

A. Buch's Sons Co., Elizabethtown, Pa., maker of land rollers and pulverizers, is again operating its foundry after an idleness of three years.

CARWHEEL MAKERS MEET

President Lyndon Reviews the Progress Made in the Past Year

The Association of Manufacturers of Chilled Carwheels held its annual meeting in New York City Oct. 9, at which the following officers were re-elected: President and treasurer, George W. Lyndon; vice-presidents, E. F. Carry and J. A. Kilpatrick; secretary, George F. Griffin; consulting engineer, F. K. Vial; board of directors—J. M. Buick, American Car & Foundry Co.; J. A. Kilpatrick, Albany Carwheel Co.; W. S. Atwood, Canadian Car & Foundry Co.; Charles A. Lindstrom, Central Carwheel Co.; F. K. Vial, Griffin Wheel Co.; E. F. Carry, Haskell & Barker Car Co.; A. G. Wellington, Maryland Carwheel Works; W. C. Arthurs, Mt. Vernon Car Mfg. Co.; J. D. Rhodes, National Carwheel Co.; F. B. Cooley, New York Carwheel Co.; A. J. Miller, Ramapo Foundry & Wheel Works; William F. Cutler, Southern Wheel Co.

From the address of President Lyndon the following extracts are taken:

"The recognition of a standard 850-lb. chilled iron wheel by the Master Car Builders' Association will dispel the illusions of our competitors with respect to the limit of the carrying capacity of chilled iron. It is now a well-established fact that the load that can be carried on a chilled iron wheel is only measured by the ability of the rail to support it. Many 33-in. 950-lb. chilled iron wheels are running under heavy engine tenders of 12,000 gal. capacity and are giving such a good account of themselves that no other type of wheel is considered by the users.

"It has taken a long time to bring this about, and the work we have accomplished this year is the result of persistent effort and close association with all the leading organizations of the country that study the wheel question, and we have also followed up with individual railroads the introduction of new standards. We deal not only with the Master Car Builders' Association, but are in close association with the American Railway Association, American Railway Engineering Association, Interstate Commerce Commission, Bureau of Standards, American Society for Testing Materials, American Foundrymen's Association and the State universities.

"While we have accomplished two-fifths of our program, we should not rest until we have secured the other three-fifths. We must see that the interior of the 625 and 725-lb. wheel receives recognition in the matter of increased plate thicknesses, which can only be obtained by additional weight. We must have a reasonable factor of safety when measured by excessive stresses encountered in service and these heat stresses are now recognized everywhere due to our educational campaign.

"We are not influenced by commercial considerations in asking for heavier wheels. We know the increased weights are necessary. Who knows what the result of the work of the University of Illinois may be? Perhaps the analyses of the stresses within the wheel may suggest a redistribution of the metal, and we may be able to decrease weights, which we will be ready to do with as great an interest as we are now anxious to increase them."

National Association of Purchasing Agents in Session

A convention of the National Association of Purchasing Agents is being held in the William Penn Hotel, Pittsburgh, this week, the first session having opened on Tuesday morning. E. L. McGrew, purchasing agent of the Standard Underground Cable Co., Pittsburgh, president of the National Association, had charge of the sessions. Robert Garland, president of the Chamber of Commerce of Pittsburgh, welcomed the delegates, and the response was made by J. R. Pels of New York, an ex-president of the association. The banquet was held Wednesday evening, Oct. 10, in the William Penn Hotel, Judge J. J. Miller of the Allegheny County Orphans Court acting as toastmaster. Dr. John A. Brashear and James Francis Burke were among the speakers.

MAKERS' CONTROL OF RESALES

Investigating Methods of Manufacturers to Maintain Resale Prices

WASHINGTON, Oct. 8.—Considerable doubt exists in the minds of officials of the Administration as to the legality of attempts by manufacturers to maintain resale prices on their products and for this reason the American Fair Trade League is attempting to persuade Congress to enact the so-called Stevens bill. In the meantime, the question has arisen whether or not trade practices adopted by firms who wish to maintain their resale prices are or are not "unfair trade practices."

The Federal Trade Commission has undertaken to solve this perplexing problem. There have been filed with this commission 27 complaints in all by firms who allege that methods adopted by producers to maintain the prices on their articles are unfair. In view of the large number of similar complaints the commission has decided to combine them all into one general inquiry. Hearings in this proceeding were begun last week at which all the members of the commission were present.

Commissioner Fort presided at these hearings. This was significant in that Commissioner Fort, while the Governor of New Jersey, had more or less experience with attempts to legalize maintained prices. At the opening of the hearings, however, he stated that the Trade Commission was approaching this subject with an open mind. The commission, he said, desires to have the views of all persons interested so that it can arrive at some conclusion as to its jurisdiction before proceeding further.

While the commission had attempted to hear all sides in the proceedings of last week, the witnesses present were predominantly in favor of the maintained-price idea. Therefore, when adjournment was taken after two days of hearings until Oct. 23, it was announced that on this later date opponents to these trade practices will be given an opportunity to present their views.

The first person to appear was Prof. S. McCune Lindsay of Columbia University. Mr. Fort announced that Professor Taussig, chairman of the Tariff Commission, would present his views at a later date. The position maintained by these two economists is identical, Professor Lindsay explained in opening. He condemned the maintained price from the point of view of consumers. He stated that the National Consumers' Association and similar organizations throughout the country have been formed to protect the rights of the consumers as against the dealers or middlemen. Any attempt to fix retail prices, he said, would be opposed to public interests and to the best interests of the consumers. The country wants greater economy and greater efficiency on the part of middlemen. Maintain the retail price, and this will not be had. The professor was asked what should be done to the merchant who offers for sale at less than cost a nationally advertised article of commerce in order to draw trade. He answered that he thought such a man could be prosecuted under the common law, may be, as attempting to monopolize trade. He did not think legislation authorizing the maintenance of retail prices should be adopted merely to check such a practice as that.

Witnesses then following were almost exclusively in favor of the maintained-price principle with the exception of Charles A. Keene, a watch merchant of New York City. William H. Ingersoll, of R. H. Ingersoll & Brother, insisted that a nationally advertised article had an added value and that such an article is much easier for the merchant to dispose of. George L. Record of New Jersey, appearing as attorney for Robert Ingersoll & Brother, reviewed the attempts of the New Jersey Legislature to legalize maintained prices. He pointed out the great growth of the American automobile industry, which he said is due in large measure to the fact that the retail prices of automobiles have been maintained. Among others present were Henry E. Bodman of Detroit, representing the Packard Motor Co.; Alfred Lucking, appearing for the Ford Motor Co., N. A. Peabody, of Cluett, Peabody & Co., Troy, men's collar makers, and K. H. Addington, of the Benjamin Electrical Mfg. Co., Chicago. Mr. Addington recounted instances of cut prices among jobbers handling his company's electrical apparatus. He said it is impossible to maintain an equal competitive standing if the jobber is allowed to cut prices and thereby destroy the stability of the output of a company. He acknowledged that his company could not hope to compete with such a large concern as the General Electric Co. should the latter enter into a big national advertising campaign. The power to remain a competitor is possible under a system of maintained prices by which competition comes through the quality of the output.

Various retail organizations and associations were represented. Edmond A. Whittier, secretary of the American Fair Trade League, declared in a private interview that he was greatly pleased at the outcome of the hearing. He pointed out that more evidence in support of fixed prices had been offered on this occasion than at probably any other.

Russia's Iron and Steel Output

The pig iron and steel output of Russia in 1916, from statistics which are unusually late, was as follows, in net tons, according to U. S. Consul D. B. Macgowan at Moscow:

	1916	1915	1913
Pig iron	4,174,000	4,055,000	5,093,000
Semi-finished steel	4,696,000	4,523,000	5,404,000
Finished iron and steel	3,706,000	3,590,000	4,438,000

As in 1915 and 1914, the records established in 1913 were not attained; in fact production of pig iron in 1916 was less than in 1914 or 1913, and the improvement over 1915 was only 2.9 per cent.

There were 114 blast furnaces in operation in 1916, compared with 120 in 1915. Around Moscow the production has picked up partially, after a sharp diminution in 1915. The southern region produced 75 per cent of the total pig-iron output in 1916, the Ural 21 per cent and the Moscow district 4 per cent. In comparing 1916 and 1915 with the preceding years it is, of course, to be remembered that the Polish production in 1913 totaled 460,000 net tons. There was an increase of 3.8 per cent over 1915 and a falling off of 13.1 per cent from the record of 1913 in the output of semi-finished iron and steel. There has been an increase in the production of merchant bars at the expense of the output of beams, sleepers, rails, roofing and sheet iron and steel. There was a slight increase in the output of rolled wire.

Employees in the metallurgical branches increased from 343,850 in 1915 to 427,502 in 1916. As against the increase of 24.3 per cent in number of workers the growth of production was but 3.3 per cent.

May Buy Canadian Equipment

TORONTO, ONT., Oct. 8.—A highly important development for Canadian munitions plants, which are now contemplating retirement from the shell business, is the presence in Canada of inquiries from American industrial companies for the purchase of their equipment. If this inquiry assumes broad lines, it would be a boon to many companies which own such plants and have seen no other prospect than to scrap them. Many of the big concerns in Canada which have been large producers of shell castings or operated machining equipment have provided for their expenditures in that connection out of earnings, so that to them a sale at this stage of the game would mean clear profits. Several Canadian companies have received offers for their plants from across the border, but the matter is now only in the preliminary stage.

During July the construction of new steamships aggregating 125,000 tons was begun in Italian shipyards, and before the end of the summer a further 125,000 tons will be put in hand, according to the London *Iron and Coal Trades Review*.

OBITUARY



W. LESTER WALKER

W. LESTER WALKER, aged 45 years, and for some years general manager of the Allegheny Steel Co., whose plant is at Brackenridge, Pa., died in the Allegheny General Hospital, N. S., Pittsburgh, on Sunday, Oct. 7, of acute dilation of the heart. Mr. Walker was born in Shelocta, Indiana County, Pa., and when he was a boy, his family removed to Armstrong County, Pa. After finishing the public school course, he was graduated from Elders Ridge Academy. He taught in the Armstrong County schools for five years, and then became assistant principal of Elders Ridge Academy. In 1898 he took a minor position in the sales department of the Hyde Park Iron & Steel Co., at Hyde Park, Pa., manufacturer of sheets. In 1901 he was one of the organizers of the Pittsburgh Shovel Co., whose plant is at Leechburg, Pa., of which he was made a director and also general manager. In 1903 he became secretary and treasurer of the Muskingum Steel Co., at Zanesville, Ohio, sheet manufacturer. In 1909 he accepted a position in the order department of the Allegheny Steel Co., was rapidly promoted, and for five or six years has been general manager of that company. He is survived by his widow, three sons and three daughters.

CRAIG RIDGWAY died at his home, Coatesville, Pa., Sept. 28, aged 88 years. Mr. Ridgway was born July 20, 1829, at Crosswicks near Bordentown, N. J., and went to Coatesville in 1863, when he purchased the William Dripps foundry and machine shop. Although he had no experience as a manufacturer, he was successful from the beginning. The machine shop made a specialty of turbine water wheels and rolling mill machinery. Business was very prosperous during the Civil War and continued throughout later years. In 1877, Mr. Ridgway's oldest son, William H., was taken into the firm. A short time later, the late Andrew Ridgway, who died about three years ago, came into the business and the firm name was changed to Craig Ridgway & Sons Co. In 1890, Ellis B. Ridgway, a third son, entered the company. It made a specialty of the manufacture of steam hydraulic cranes and freight elevators, and the volume of business increased rapidly. As president and treasurer of the company, Mr. Ridgway was its active head for more than half a century and not until three years ago did he retire from active service. He is survived by his wife, who is in her eighty-sixth year, and one daughter, Mrs. Eliza R. Baker, and three sons, William H., Ellis B. and Dr. S. W. Ridgway.

EDMUND STEYTLER, for eight years general sales manager of the Pittsburgh Steel Co., Union Arcade Building, Pittsburgh, died on Monday morning, Oct. 8, at Atlantic City, N. J. Mr. Steytler's health for a long time had been gradually failing, and he was on a long leave of absence from duty trying to recuperate. He had been connected with the Pittsburgh Steel Co. practically since its inception. He is survived by his widow, and two sons, one connected with the Pittsburgh Steel Co., Monessen, Pa., and the other is with the University of Pittsburgh Hospital Unit now doing service in France. He was born in Cape Town, South Africa, and came to the United States with his parents when a boy. He graduated from Washington and Jefferson College and was in the coal business for a short time. Later he went from Pittsburgh to New York and for a time was in the New York offices of the American Steel & Wire Co. He returned to Pittsburgh about 1900 and was employed by the Pittsburgh Steel Co. as a salesman. He was promoted rapidly and some years ago was made general manager of sales. He was member of the Duquesne Club, Country Club, Field Club, and the Pittsburgh Athletic Club.

THEODORE STARRETT, long prominent in steel building construction, died Oct. 9 at his home in Prospect Plains, N. J., after an illness of four weeks following a stroke of apoplexy. He was 52 years old and leaves his widow and two sons. He was born in Kansas and came of a family noted for its big building and contracting operations. His brother, Major W. A. Starrett, is chairman of the committee on building construction of the Council of National Defense, under whose direction army camps and cantonments have been built. Paul Starrett, also a brother, is president of the George A. Fuller Co., and his other brothers, Goldwin and Ralph, are respectively members of the firms of Starrett & Van Vleck, architects, and Starrett & Goss, building contractors. Coming to New York about 20 years ago, Theodore Starrett founded the Thompson-Starrett Co., which rapidly gained a high standing in the erection of steel buildings. He retired from the Company some years ago, devoting himself to the development of his New Jersey estate.

FRANCIS DAYTON CANFIELD, JR., Yonkers, N. Y., died Oct. 9, after a short illness, aged 55 years. At the time of his death he was managing director of the Cuban American Sugar Co.; vice-president of the Fulton Iron Works, St. Louis, and a director of the Canadian Foundry Co. He was born in Boonton, N. J., and leaves his widow, one son and two daughters.

WILLIAM DOUGLAS RICHARDS, Houghton & Richards, Boston, steel merchants, died suddenly, Oct. 3, while on his way to his home in Winchester, Mass. Mr. Richards was born in Columbus, O., Aug. 18, 1948, and went to Boston in 1870.

DR. ALLEN DEVILBISS, president of the DeVilbiss Mfg. Co., Toledo, Ohio, died Oct. 1, aged 76 years.

Tightening the Blockade Against Germany

WASHINGTON, Oct. 9.—England and the United States have been especially effective recently in tightening the commercial blockade of Germany. It was originally the suggestion of the Food Administration that prompted the Export Council to refuse to permit further exports of foodstuffs from the United States to European neutral countries. This order will stand until the end of the current calendar year. After that the neutrals must prove to us beyond any doubt that they are not selling to Germany and thereby contributing to the support of our enemies.

Following upon the heels of our action, England, during the past week, has cut off all of her exports to Holland and the Scandinavian countries. This is extremely significant when it is remembered that not only has it been suspicioned that food supplies have been leaking through Holland to Germany, but it is also reported here without contradiction that Sweden has been selling iron ore to Germany. The Swedish supply of ore is said to be of especial value to the Germans, who are being gradually driven back through the wealthy iron district of northern France.

Not only is it the apparent intent of the Allies to shut the doors of the European neutrals to Germany, but it is the intention to prevent neutrals in other parts of the world shipping goods to Europe which might reach the Germans. The Export Administrative Board has announced its policy in regard to the control of bunker coal to vessels, which is calculated to place an effective check upon such so-called neutral trading.

Too much must not be taken for granted, however, in the announced export policies of England and the United States. A final set policy toward the European neutrals has not been determined upon. If the neutrals will promise to play fair and deal in the open with the Allies, we will undertake to ration them and see that they have an adequate supply of foods and other necessary imports to meet their own needs. If the neutrals do not consider that a fair proposition, they have but one alternative and that is to show their favor for Germany in the open.

The Virginia Iron, Coal & Coke Co. has put its nodulizing plant at Middlesboro, Ky., in operation. It has been under construction for nine months.

SERIOUS LABOR TROUBLES

More Than 10,000 Metal Trades Workers on Strike at Seattle

SEATTLE, Oct. 6.—The strike of the metal trades union in Seattle, which has been threatening for more than seven weeks, has materialized, and more than 10,000 metal trades workers employed in the shipbuilding plants of the city and the smaller contract shops subsidary to the shipbuilding industry are now out. The walkout completely closes down 91 Seattle firms, the list including machine shops, boiler works, brass foundries, iron foundries, blacksmith shops, pattern shops and 16 shipyards. Six of the contract shops signed up with the union, on the wage scale demanded, leaving 5,500 men still at work, including the crew of the big Skinner & Eddy Steel shipbuilding plant. Prior to the metal trades strike, more than 3,500 men were laid off as a result of the lumber strike situation, the sympathetic boycott strike having crippled the big steel shipbuilding plants to that extent. In addition to the three steel shipbuilding plants affected, the strike ties up 13 wooden plants. Practically all of the other concerns affected were engaged in contract work for the shipbuilding plants, and included the Kilbourne-Clark Mfg. Co., Pacific Coast Co., Clyde Casting Co., Fraser Pattern Works, Emery Machine Co., Gray & Barash, Western Engineering Co., Eagle Brass Foundry, and the Commercial Boiler Works, which builds the boilers for the big steel steamships constructed in Seattle. The lumber boycott and metal trades strike leaves work completely suspended on two warships and 12 great steel cargo steamships, besides 16 big wooden steamships on which work was stopped recently due to shortage of lumber. Work still continues on 14 other ships under construction at the Skinner & Eddy Co.'s plant and three wooden ship plants which signed up with the union within the past month. Excepting the warships, the strike brought to an end all work on a grand total of 104,000 tons in steel deadweight cargo capacity.

While at present the metal trades strike overshadows the lumber boycott situation, the latter has developed into a factor that seriously menaces the shipbuilding industry. It is now stated that settlement of the metal trades strike would prove of little avail now, as the lumber boycott in a short time would paralyze the three big steel plants. It is pointed out that the metal trades strike can be settled by the plants granting the new wage scale, but there is no such short and easy road out of the lumber situation.

No effort will be made to operate the big plants in Seattle, and the strike is absolutely peaceful. Forty-three machine shops, 10 blacksmith shops, nine pattern shops, 13 boiler works, 15 iron foundries and eight brass foundries are idle. Both the shipyard owners and the union have agreed that no adjustment can be reached prior to the arrival of the Wage Commission from the United States Shipping Board. Wage increase is the only demand made by the strikers.

The strike in shipyards of Portland which has been in progress for more than two weeks is still unsettled, and the plants are making no concerted effort to re-open. Small crews are working in most of the larger plants, but no definite headway has been made toward adjustment of the situation. During the period of idleness of their plants, the various shipyards are making a number of needed extensions and improvements at their plants, including overhauling of the entire premises and installation of needed machinery. Eleven big shipbuilding plants on the Columbia River, employing more than 7,000 men, have lined up solidly and definitely for open shop principles. Closed shop is the chief demand of the strikers.

Labor troubles have extended to the two big paper mill companies in Oregon City, the Hawley Pulp & Paper Co., and the Crown-Willamette Co., which have definitely refused to sign the agreement presented by the paper mill union for closed shop. It is feared a general walkout will result. About 1,700 employees of the two plants are unionized.

The return of the lumber industry to a normal basis in the near future is confidently predicted by lumbermen of the Northwest. Lumber production has reached 28 per cent of normal, and it is stated that only a very small number of the mills have returned to the eight-hour basis demanded in the lumber strike.

A Unique Engineering Agency

The United States Department of Labor recently created, as a part of its employment service, a division whose function it is to aid the employer in obtaining suitable help, and professional persons in securing suitable employment. This is known as the Teachers and Professional Service Division. While intended to embrace all professions, attention has thus far been confined to the teaching and engineering professions. The services of the division are absolutely free to both employer and employee, all expenses being borne by the United States Government. Its methods are thorough, and no service is rendered the applicant until the division has learned, from persons familiar with the applicant, that he is qualified as to training, experience, and personal qualities for the position he seeks. When an applicant is recommended for a reported vacancy, the employer is given an opportunity to examine the data gathered in the course of this investigation, thus effectually preparing for the final and most important step, the personal interview, and for this ample facilities are provided in the offices of the division where employers may meet with prospects on appointment.

Employers and professional engineers everywhere are invited to avail themselves of the services of this division which, as stated above, are entirely free. Employers in reporting positions are asked to state the nature of the position, its duties, requirements, etc., the probable salary and probable duration of employment. Applicants for registration should indicate in the first letter the nature of the position desired so that the proper blank may be furnished. All communications should be addressed: Teachers and Professional Service Division, U. S. Employment Service, 845 South Wabash Avenue, Chicago.

News of the Labor World

The Lebanon Blast Furnace Co., operating the Meily stack at Lebanon, Pa., has increased the wages of all employees at the local works, effective Oct. 1.

About 1000 machinists employed by the W. & A. Fletcher Co., Hudson Street, Hoboken, N. J., manufacturer of marine engines and boilers, returned to work Oct. 3, after a strike of about 12 weeks, following a general wage advance by the company. The men asked 50 cents a day additional at the inception of the strike.

With only three dissenting voices, the employees of the John Coughlan & Sons shipyards decided to go on strike for higher wages at a meeting held in Vancouver, B. C., Oct. 4. The men have quit work. The decision of the men represents the culmination of several days' negotiations between representatives of the men and the heads of the company. The men demand increases which average about 30 per cent over the present scale of wages. About 700 men are affected.

The Continental Supply Co., whose St. Louis quarters have been in the Third National Bank Building, are to be removed to the Post-Dispatch Building, Twelfth and Olive Streets, where one entire floor and one quarter of another have been leased. The company specializes in pipe and tubing for gas and oil well operations and refinery operations. It operates 29 branches.

The Vulcan Steel Products Co., New York, has opened an office in Havana, under the management of G. O. Simpson. In connection with this office there will be maintained a permanent exhibition of machinery and steel and iron products, in which the company deals.

The Macleod Co., Cincinnati, to take care of expanding business in sand blast equipment and metallurgical furnaces, has enlarged its plant and increased capital to $100,000.

HUGE NAVY PROGRAM

Construction of 787 Vessels Provided For Costing Over $1,500,000,000

The war-construction program of the United States Navy now comprises 787 vessels, including all types from super-dreadnoughts to submarine-chasers. Some of these have been completed in the past few weeks and are now in service. The rest of the program is being pushed to completion. The total cost is estimated at $1,150,400,000. Secretary Daniels announced Oct. 9 that arrangements have been completed for the building of the large number of additional destroyers planned, which will cost about $350,000,000. The Secretary said:

"These destroyers will be built by five companies which have had experience in building this type:—the Fore River Shipbuilding Corporation, Boston; the New York Shipbuilding Corporation, Camden, N. J.; Cramps' Shipyard, Philadelphia; the Newport News Shipbuilding & Drydock Co., Newport News, Va., and the Union Iron Works, San Francisco.

"This is the biggest project we have ever undertaken. Three months ago it looked as if it could not be done. Orders had already been given for all the destroyers the yards could build, and almost as many as the new program calls for are now under construction or contract. To build rapidly the additional destroyers requires a great extension of shipbuilding facilities and the erection of new plants for building engines. The companies were unwilling to invest millions in these additions so the Government must build and will own the new plants and extensions which will be used by the builders.

"We are putting every energy and facility behind this project. Some of the new destroyers are promised for delivery in nine months, all within eighteen months. These vessels will be of the latest and largest improved type, which has just been tried in our service and found to be unsurpassed by any destroyers in the world. The plans are all ready and the adoption of a uniform type will enable us to reduce the number of types of engines and parts and to turn them out in much less time. The principal trouble is in getting forgings and auxiliaries, but the maufacture of these has been arranged for, and we will make every effort to prevent delay in delivery of materials or machinery."

Wages in Navy Yards

WASHINGTON, D. C., Oct. 8.—The presidents of international trade unions held a conference here last week with the joint Army and Navy Board on the adjustment of wages in navy yards and arsenals, of which Assistant Secretary of the Navy Roosevelt is chairman. A tentative agreement was reached in regard to wages by which it is proposed to compensate the workmen for increases in the cost of living.

After the meeting Assistant Secretary Roosevelt said:

"The conference discussed the matter of the existing wage scale at navy yards and the possibility of adjusting the scale on a more uniform basis for all yards and similar trades. It also discussed the advisability of establishing for the duration of the war some method by which the wage scale would not be subject to local fluctuations and fluctuations in different trades, but would be based on some kind of sliding scale dependent on future increase in the cost of living, in case such increase takes place."

The board gave hearing to representatives of the different trades at Norfolk, Philadelphia and Washington Navy Yards.

The Dalton Machine Co., 1911 Park Avenue, New York, builder of bench lathes and special machinery, has changed its name to the Dalton Mfg. Corporation. No changes are contemplated in the management of the company.

PIG IRON SCHEDULE

Prices to Be Recommended to the War Industries Board

The committee of the American Iron and Steel Institute, which has been considering price schedules on pig iron and various steel products, left Tuesday afternoon for Washington and will present to the War Industries Board a report of some of its findings. The schedule for pig iron has been carefully worked out as a result of conferences between the iron producers and the committee. As a basis for the discussion on prices, it was agreed that the prices to be fixed should be f.o.b. cars at any furnace, and not base Valley furnace, as many in the trade have been led to believe was the intention at first. It was quickly decided that to fix a base price for pig iron at Valley furnace would create so much confusion in the various differentials and freight rates that the trade would be hopelessly muddled. The incompleteness of the first agreement at Washington, upon which the President's announcement was based, is shown by the fact that even members of the War Industries Board who were interviewed by pig iron men in Washington last week differed as to what was meant, one holding that the pig iron price was to apply only at Valley furnace and another that it meant any furnace.

In discussing prices for foundry irons, it was decided to grade the irons according to their silicon content. Iron containing from 1.75 to 2.25 per cent in silicon (No. 2 plain) is to take the base price of $33; 2.25 to 2.75 per cent in silicon, $33.50; 2.75 to 3.25 per cent in silicon, $34.50, and for every half unit in silicon above 3.25 per cent there will be an additional dollar per ton. Foundry iron commonly known as No. 3, with silicon content of from 1.25 to 1.75 per cent, is listed at $32.50. All of these prices will apply on foundry irons not over 0.05 per cent in sulphur. On forge iron it was decided to recommend a differential of $1 under the base price, making it $32 for grades with sulphur 0.07 and over and $32.50 for grades containing 1 to 1.75 per cent silicon and sulphur under 0.07. Malleable pig iron is to be 50 cents above the base, or $33.50. On Bessemer iron, it was decided to recommend a differential of 10 per cent above the base, or $36.30, which is the price at which a fair tonnage was recently sold at Valley furnace.

Charcoal irons were tentatively fixed as follows: Warm blast Lake Superior charcoal, $35.50; warm blast Southern charcoal, $10 above base, or $43 on grades 0.40 to 0.60 in phosphorus and silicon 1 to 2 per cent; cold blast charcoal, $25 above base, or $58.

Low phosphorus iron prices are to be based on the grade containing 0.04 per cent phosphorus and sulphur, copper bearing, which was put at $55. Copper free phosphorus iron is to sell, on this basis, at $58. For each reduction in phosphorus of 0.005 below 0.04, there is to be an increase in price of $1.50. For each 1 per cent of silicon in excess of 2 per cent, there is to be an addition of $1.75 per ton.

On silveries and Bessemer ferrosilicon, prices are to be established based on their silicon content, as with the other irons.

In discussing the differentials to be fixed on pig iron high in manganese, it was suggested that when the manganese content is from 1 to 1.50 per cent, an advance of 50 cents per ton be made and that $1 be added for each half per cent of manganese above 1.50 per cent.

Bessemer Sales

PITTSBURGH, Oct. 10.—(*By Wire*)

Sales of about 15,000 tons of Bessemer pig iron have been made at the tentative price of $36.30, Valley furnace, and 10,000 tons of basic at $33, Valley, for shipment as fast as possible.

THE CLOSED OR OPEN SHOP?

Walter Drew, Counsel for National Erectors' Association, Ably Upholds the Open Shop

In an address before a gathering of manufacturers, professional men and general business men at the Hotel Green, Danbury, Conn., Oct. 1, Walter Drew of New York City, counsel for the National Erectors' Association, made a strong argument for the open shop. He based the consideration of the subject at this time on the fact that the present world crisis has brought general recognition of the fundamental importance of industrial questions, on which the fate of nations is now seen to rest. He first pointed out

The Duty of the Employer

"Since industry under the present form of capitalistic control has been in the hands of the employer, he must share responsibility for whatever conditions arise. Upon him, also, rests the chief responsibility of finding a solution. That solution will not come if he acts selfishly. He must seek the common good. He must labor to establish industry upon a sane, wholesome and just foundation, and he must co-operate with those who are working to these ends. He must consider himself, not as merely engaged in business for individual profit, but as a trustee for the beneficial use of the forces of production that he controls.

"This viewpoint of the employer's duty must be the basis of his co-operation with other employers. No association of employers will endure or deserve to endure which is founded upon any other basis. The making of large profits for the employer can no longer be considered the sole test of business success. Industry has not performed its function unless it brings betterment of conditions and increased comforts to the worker as well as the owner and unless its product is made available to the general public at prices as low as possible through efficiency and unrestricted production. This broad view by the employer as a working principle in his own business and in his association with other employers is not altruism but is being found to be a sound, constructive business philosophy."

Logical Result of the Closed Shop

To-day, Mr. Drew said, the foremost labor question in this country is that of the closed shop, or a shop where only union men are employed and where non-union men are excluded. A nation-wide effort to extend the closed shop in our industries, taking advantage of our war-time necessities, is being made. Every community and every industry faces this issue. Mr. Drew then proceeded dispassionately and with a complete avoidance of harsh criticism to discuss the closed-shop problem from the standpoint of the union man, showing by logical steps how finally the immense power of the closed-shop union and its members over industry is exercised without penalty or responsibility in case of mistake, abuse or bad faith. This condition, he said, is unique and is not found in any other department of the business world.

"The weaknesses of the closed shop, its failure as an industrial institution, are due not so much to bad faith, or vicious conduct, or any unworthy motive on the part of the union man, as to his limited and short-sighted viewpoint, his lack of understanding of economic principles and forces, his tendency to seek the apparent and immediate benefit, and his failure to understand and to seek the ultimate good. And in all this he is human, and his counterpart in varying degree is found among all of us.

"If a grocer mismanage his business through ignorance or shortsightedness, he fails and another grocer takes his place. So it is with the business man generally. Each pays the penalty for his lack of ability, and his failure, while it may affect others, still does not amount to a general catastrophe. If all the manufacturers of a given industry, however, should act together on lines that were ill-conceived and fundamentally unsound, then disaster to the whole industry would follow. These same things are ever more true of the worker. If all the workers of an industry, or a community, or a nation share erroneous ideas which form the basis of their philosophy and which they are able to carry out into actual and general practice, the degree of the injury to the industry, the community, or the nation will be measured by the degree and extent of the error. Since productive industry rests upon labor, there will be no alleviating influences; the error will work its full damage and whatever disaster follows will be general."

A Lesson from Great Britain

After discussing the well-known methods practised by closed-shop workers to decrease output, to compel the employment of more men to do a given piece of work and generally to make labor scarce, Mr. Drew gave some chapters of British industrial history, showing how the progressive control of practically all industry in Great Britain by closed-shop unions had reduced that country at the outbreak of the present war to such a state of general inefficiency as to be totally unable to meet the exigencies of the situation. He showed how the problem of increasing industrial efficiency was met and solved by the setting aside of hard and fast union rules and now, he said, "most significant to us in facing our present problems, we find the principles of the open shop agreed to and put into operation as the only way of bringing British industry to a state of efficiency where it can meet the national crisis." He added:

"We find England with hundreds of thousands of women and non-union men working side by side with union men, with old restrictive rules laid aside, or at least modified, with new methods, new machinery and new spirit, performing industrial miracles, although England still faces the serious problems of peace readjustments over which hangs the shadow of the national solidarity of skilled labor. If England found the open shop a national necessity in the time of her greatest crisis, shall we, in our time of need, extend in our industries the system which brought her to the edge of ruin?"

Our Strength Lies in the Open Shop

It may be said, continued Mr. Drew, that we do not have in this country the restriction of output practised in Great Britain. The explanation is simple. The great bulk of our industries are open shop. In a recent official report as to the conditions in our industries, made to the Secretary of War, it was pointed out that practically 90 per cent of the establishments that would be called upon in the work of war preparation were open shops. Our national industrial efficiency, our prosperity, our expanding foreign trade and commerce, the high wages of our workmen, doubling and even trebling those of any other nation—all find their foundation in open-shop industry. He concluded his address with a narration of closed-shop experience in this country and its inevitable handicapping of industry, urging the unions to use their power and influence not to decrease the supply of labor but rather to increase the demand for it.

National Defense Trade Committees Quit

WASHINGTON, Oct. 9.—Director Gifford of the Advisory Commission of the Council of National Defense has announced the intention of the council to discontinue the so-called trade committees, having been persuaded to take this action partly by reason of the apprehension of certain members who are fearful of Section 3 of the food act. Some have already resigned. On the other hand, the council has decided that the need for trade advice hereafter can be obtained equally well from war service committees appointed by each individual trade itself, to sit in Washington and advise with the Government whenever it is necessary. They will be purely representatives of the trade and have no Governmental status. Mr. Gifford thinks it will take at least 60 days within which to make the transition or reorganization.

The Chamber of Commerce of the United States has

been enlisted to assist in prevailing upon the various industries to organize their war service committees to take over the work of the trade committees of the council. In undertaking this work the National Chamber has distributed a bulletin to its membership suggesting the character of service that should be furnished by the members of such committees.

More Tinplate Next Year

Demand for tinplate from all corners of the globe and the consequent high prices prevailing have not only attracted more capital and resulted in the erection of new mills, but have led the existing mills to tin a much greater proportion of their black plate production than is ordinarily the case, according to the Bureau of Foreign and Domestic Commerce, Department of Commerce. Assuming the practice will be followed next year, the following estimates based on figures made public by the Tin Plate Conservation Committee and on returns from the large producers are as follows:

	Base Boxes	No. of Companies Reporting
Estimated hot mill production for 1918	38,700,000	12
Estimated production of coke tinplate for 1918	36,450,000	12
Total shipments for first eight months of 1917	22,843,779	10
Shipments of coke tinplate for food containers, first eight months of 1917:		
(a) Domestic	12,750,350	10
(b) Canada	587,372	8
Shipments of coke tinplate for oil cans for first eight months of 1917:		
(a) Domestic	924,316	8
(b) Export	591,951	8
Shipments of coke tinplate (including silvered tin) for tobacco containers—first eight months of 1917	721,443	5
Shipments of coke tinplate for bottle caps and stoppers—first eight months of 1917	644,522	6
Shipments to jobbers—all tin mill products—for first eight months of 1917	1,030,019	9
Total shipments to foreign countries, first eight months of 1917:		
(a) Canada	1,080,332	8
(b) Other countries	1,448,001	8
Obligations as of September 1, 1917:		
(a) For food containers	7,186,577	11
(b) All other purposes	8,433,183	11

Unless greatly increased shipments are made to the oil, tobacco and bottle cap manufacturers during the last quarter, their consumption this year, it is added, will be approximately one million base boxes each for tobacco and bottle caps and two million boxes for oil. While this is probably as much as was used in the same industries last year, it falls far short of meeting this year's requirements.

Spain's Steel and Ore Output

Spain's output in 1916 of some of the principal metals and minerals as well as steel ingots, etc., is given in the following table, as compared with the 1915 figures in tons:

	1916	1915
Iron and steel ingots, blooms, etc.	820,657	827,149
Iron ore	5,856,861	5,617,839
Iron ore briquets	363,784	132,218
Manganese ore	14,178	14,328
Iron pyrites, common	953,679	730,568
Iron pyrites, cuprous	1,748,742	1,464,350
Briquets	555,975	555,357

These data come from the Consejo de Mineria of Spain, a volume of nearly 500 pages giving metallurgical and mineral statistics of the country.

It is reported from Stockholm that the Grangesberg Co. has informed the railroad authorities that it is compelled to suspend the forwarding of Kiruna iron ore and that, from Aug. 15, no railroad cars will be loaded for the Swedish port of Luleä or the Norwegian port of Narvik. In explanation it is stated that the warehouses for iron ore at Narvik are overflowing and that there is no cargo space available for carrying it away. The construction of new ore warehouses at Narvik has recently been started.

GREAT FLEET OF AIRPLANES

Secretary Baker Tells of Progress Made by the Government

WASHINGTON, Oct. 9.—Further "censored" information regarding the production activities planned to produce the great American fleet of airplanes has been promulgated by Secretary of War Baker. In brief the aviation situation was stated as follows:

Contracts have been let and work is in progress on practically the entire number of airplanes and motors for which provision was made in the $640,000,000 aviation bill passed by Congress in July. This program called for more than 20,000 airplanes.

The types of airplanes now in process of manufacture cover the entire range of training machines, light high-speed fighting machines and powerful battle and bombing planes of the heaviest design. Our contracts call for an ample number of training machines and embrace as well giant battle planes capable of the work of the Caproni, the Handley Page and similar types.

Every measure of insurance has been taken that the American forces in France shall be amply equipped with aircraft. The work of the Aviation Section has been thoroughly systematized. The training of aviators, the building of motors and the construction of wings are proceeding uniformly—each keeping pace with the other and with general war plans.

The comprehensive plan is that, when motors are ready, there shall be ready also the planes necessary; and, when the motors and planes are ready, aviators and machine guns shall be available. Co-ordination has been developed in every branch of the aviation section.

Within a reasonable time, considering the period for preparation, this country will send its first airplane to Europe. This airplane, from the tip of its propellers to the engine, machine gun and camera, will have been made in the United States.

It has been necessary greatly to develop and expand the aircraft industry in this country. This work of increasing the output of existing manufacturing establishments, creating new plants, and providing tool, gage and jig equipment for great quantity production has required time, and the months of the summer have been, and the early fall will be, devoted to this essential groundwork.

United States airplanes are being constructed both in this country and abroad. Approximately one-fourth of the number soon needed will be made abroad.

Provision has been made also for the manufacture of the many accessories necessary to aircraft service at the front. Sources of supply for machine guns, observation apparatus, cameras, scientific instruments of navigation and precision, and many other specialties of the aircraft art have been provided. Both in this country and abroad, this work has been under the direction of skilled men.

The designing of the "Liberty Motor," previously referred to by the Secretary of War as probably the greatest single achievement of the war, has been accorded foreign recognition. Our Allies have already asked for samples of these motors and are investigating the possibilities of quantity production in this country.

The United States to-day is in practical control of many of the materials required for the manufacture of aircraft both for this Government and its Allies. Steps have been taken for the conservation and distribution of such materials and the great resources of this country. Under the direction of the Aircraft Production Board, there is being accomplished an international standardization in the tests of materials and their specifications, so that through a unification of the demands upon this country there may be full use of our resources.

An Order-in-Council has been passed at Ottawa, Can., under the War Measures Act, prohibiting the exportation of steel rails from Canada abroad to countries other than the United Kingdom, British possessions and protectorates.

ORDNANCE PLANTS BUYING

New Companies Need Many Machines

Astounding Volume of Buying Develops from the Continually Expanding War Program of this Government

A great deal of the activity reported from machine-tool markets during the past week centers around the production of guns and shells for the use of the United States Army in France. It is expected that new shell contracts will be given out this week in Washington and a number of companies which have some of this work in prospect are figuring on their additional machine-tool requirements. The Ordnance Department of the army has been extremely busy interesting manufacturers in various parts of the country in the building and equipping of plants for making gun carriages and mounts, firing mechanisms, gun forgings, shells, etc., and its work is bearing fruit. Where no single company can be found to do the work, attempts have been made to interest a group of manufacturers who will combine their energies, resources and experience in promoting the establishment of plants such as the Government requires.

Efforts have been made to interest St. Louis manufacturers to equip a plant for the manufacture of gun carriages. In Chicago a company is being promoted to build tools required for making big guns. Detroit manufacturers, some of them identified with automobile companies, have co-operated to organize a $2,000,000 company, which has obtained a $30,000,000 Government contract for gun mechanisms. Considerable quantities of new equipment will probably be required. An Eastern company will probably receive a contract this week for making gun mechanisms and will require about $500,000 worth of machine tools, most of which have been inquired for.

Among other ordnance and munitions activities are the following: The Standard Ordnance Co., 115 Broadway, New York, is inquiring for equipment for a plant at Hamilton, Ohio, which will be on Government work, the exact nature of which has not been disclosed. Another Ohio manufacturer, it is reported from Cleveland, is in the market for about 145 machine tools, mostly lathes and milling and drilling machines. A large list of machines to be purchased by the American Brake Shoe & Foundry Co., Erie, Pa., to be used on shell work, is expected soon. A company in Detroit is inquiring in the Cleveland market for 10 or 12 screw machines for making fuses for high explosive shells. The Government is inquiring in Cleveland for about 25 turret lathes. The Forest City Machine & Forge Co., Cleveland, has recently received an order for 2,300,000 detonators for 3 and 4-in. shells and is erecting an addition to its plant. The Cleveland Ordnance Co., Cleveland, is expected to place orders soon for machines for forging, rough turning and boring 3 and 4-in. guns.

The Chamber of Commerce of Bucyrus, Ohio, has raised $300,000 for the American Clay Machinery Co. and the Allen Motor Car Co., that city, $200,000 of which will be used for building an addition to the plant of the American Clay Machinery Co., which has a shell contract, and $100,000 for the plant of the Allen Motor Car Co., which is building motor trucks. Both of these companies may need additional equipment.

Dayton, Ohio, manufacturers are preparing to commence work on contracts for shells that will aggregate $20,000,000. The Colt's Patent Firearms Mfg. Co., Hartford, Conn., which has acquired the plant of the New England Westinghouse Co., Meriden, Conn., may need additional machine tools for the latter factory, which will be converted from rifle work to the manufacture of Browning machine guns. The Osgood Bradley Car Co., Worcester, Mass., is inquiring for tools for building gun mounts for the Government. A Pottstown, Pa., manufacturer is in the market for equipment for a complete plant for making 6-in. shells. The Rock Island Arsenal, Rock Island, Ill., continues to buy. The Tucker Supply Co., York, Pa., which has a contract for gun sights, has acquired additional manufacturing space and is in the market for machine-tool equipment.

The J. G. White Engineering Corporation, New York, which recently placed orders on behalf of the United States Army for about 800 machine tools to be shipped to airplane engine factories in France, where 5000 Liberty motors will be made, will be in the market again this week, it is reported, for a list of tools approximating the former list. Other airplane companies continue to buy to round out their requirements. The Nordyke & Marmon Co., Indianapolis, has placed orders within the past week.

Shipbuilding buying also continues very active. The American International Corporation is seeking manufacturers to build winches for the ships it will turn out for the Emergency Fleet Corporation. The Submarine Boat Corporation and the Lackawanna Bridge Co. are doing considerable miscellaneous buying for their plant near Newark. Charles L. Seabury & Co., Morris Heights, New York, will build five mine sweepers for the United States Navy, and are in the market for punching and shearing machinery, bending rolls, air tools, etc. It is expected that the New York Shipbuilding Corporation, Camden, N. J., will come into the market this week for a large number of machines and cranes for an addition to its plant for building torpedo boat destroyers. The Union Iron Works, San Francisco, Cal., which is reported to have obtained a contract for 40 destroyers, may buy additional equipment, though it placed large orders in the New York market a few months ago, which considerably increased its capacity. The Fore River Shipbuilding Corporation, which is buying for an addition to its plant for building destroyers, is reported to be considering locat-

ing some of its factory buildings at a point distant from Quincy, Mass., because of the labor situation. Buffalo has been mentioned as a probable location.

There are many miscellaneous inquiries in the various markets. The Marlin-Rockwell Corporation is buying for its Standard Roller Bearing plant near Philadelphia. The Marconi Wireless Telegraph Co., Roselle Park, N. J., is preparing to increase the size of its plant and is buying new equipment. The International Motor Co., Plainfield, N. J., has bought a few tools for work on a Government motor truck contract. The Electric Machinery Co., Minneapolis, Minn., is building an addition and advises that it will require a 4-motor, 25-ton traveling crane with 60-ft. span, several 16-ft. boring mills, also lathes, milling machines, punch presses, drill presses, etc.

The Penn Seaboard Steel Corporation has closed with Alfred Box & Co., Philadelphia, for three 30-ton traveling cranes for its new steel foundry at Chester, Pa. The Donner Steel Co., Buffalo, has recently bought six cranes. The city of Bergen, Norway, is in the market for 32 cranes. Specifications may be examined at the offices of the Bureau of Foreign and Domestic Commerce.

New York

NEW YORK, Oct. 9.

The J. G. White Engineering Corporation, which a few weeks ago bought about 800 machine tools for the United States Government to be used in the manufacture of 5000 Liberty motors in France, will this week begin the purchase of another lot of about the same size.

It is expected that the New York Shipbuilding Corporation will come into the market this week for a large number of machines and cranes for the expansion of its plant at Camden, N. J., to provide facilities for the building of torpedo boat destroyers for the United States Navy.

The Fore River Shipbuilding Corporation, which is buying for an expansion of its plant at Quincy, Mass., is reported to be seeking another location for some of the manufacturing buildings on account of the scarcity of labor at Quincy. Buffalo has been reported as a probable location for shops to make turbines, boilers and other destroyer equipment.

Charles L. Seabury & Co., Morris Heights, New York, shipbuilders, are in the market for considerable equipment, including punching and shearing machinery, bending rolls, air compressors, air tools, etc. They have received a contract from the Navy Department for the construction of five mine sweepers.

The Marconi Wireless Telegraph Co. of America will greatly increase the size and capacity of its plant at Roselle Park, N. J., and is buying new equipment. The International Motor Co., Plainfield, N. J., which has a Government contract for 1000 motor trucks, has bought a few tools. Other buyers of a few tools are the Goulds Mfg. Co., Seneca Falls, N. Y.; the Taft-Pierce Mfg. Co., Woonsocket, R. I., and the Singer Sewing Machine Co., New York.

Schewan, Tomes & Co., 10 Broadway, New York, are in the market for radial drill, boring lathe, brake lathe and screw machine for export to China.

The city of Bergen, Norway, is in the market for the following cranes: Two 30-ton rotating; 20 1½-ton traveling; 10 2½-ton alternating to 5-ton. Specifications are on file at the office of the Bureau of Foreign and Domestic Commerce, Custom House, New York. The Donner Steel Co., Buffalo, N. Y., has recently bought six cranes.

The Liberty Ordnance Co., New York, has been incorporated with a capital of $15,000 to operate a general foundry and machine shop. T. Pomeroy, F. H. Brownell and R. P. Branley, 2386 Grand Avenue, are the incorporators.

The Peerless Iron Pipe Exchange Co., New York, has been incorporated with a nominal capital of $5,000 to manufacture pipe and cast iron fittings. A. Hausman, J. L. Nova and S. J. Cutler, 787 Bedford Avenue, Brooklyn, are the incorporators.

Albert V. Ellis, Long Island City, L. I., has had plans prepared for the erection of a new one-story pattern shop, about 70 x 70 ft., at Orchard Street and the Boulevard, to cost $10,000.

Peter N. Layton's Sons, Inc., Oyster Bay, has been incorporated with a capital of $12,000 to operate a wheelwright and blacksmith works. W. F., P. N. and P. N. Layton, Jr., Oyster Bay, are the incorporaters.

The Messinger Automatic Sales Corporation, New York, has been incorporated with a capital of $33,750 to manufacture automatic selling machines. H. K. Milliken, A. H. Hadden and E. J. Koehler, 350 Broadway, are the incorporators.

The Restaurant Machinery Co., 51 Liberty Street, New York, has acquired property at 124-126 White Street for extensions.

The Bureau of Yards & Docks, Washington, D. C., will build new machine and structural iron shops for the hydraulic plant at the Brooklyn, N. Y., Navy Yard to cost about $80,000.

The Welding Equipment Co., New York, has been incorporated with a capital of $30,000. J. D. Robinson, J. H. Deyo and G. E. Morris, 63 Nassau Street, are the incorporators.

The Norma Co. of America, 1790 Broadway, New York, manufacturer of ball bearings, has acquired property on the Boulevard, near Marion Street, Long Island City, and contemplates the erection of a new plant.

The Langbein Holding Co., 226 Henry Street, Brooklyn, is building a new three-story factory on Willoughby Street and Flatbush Extension, for the manufacture of surgical instruments.

The Scientific Apparatus Co., 110 West Thirty-fourth Street, New York, with manufacturing plant at 359 Seventh Avenue, has increased its capital from $12,000 to $25,000.

The Continental Battery Co., Brooklyn, has been incorporated with a nominal capital of $5,000 to manufacture batteries. The incorporators are J. R. and A. T. McCafferty and E. Ziegler, 620 West 135th Street.

G. Ernst, Bronx, New York, operating an iron works at 503 East 165th Street, is having plans prepared for the construction of a one-story addition, 26 x 130 ft. Improvements will also be made in the existing plant. The work is estimated to cost about $7,000.

Kahn Brothers, 785 Humboldt Street, Brooklyn, operating a metal working plant, will build a one-story addition, about 145 x 210 ft., to cost $18,000.

The Miller Carbureter Distributors, Inc., New York, has been incorporated in Delaware with a capital of $350,000 to manufacture automobiles and motorcycles. Samuel B. Howard and Arthur W. Britton, 65 Cedar Street, New York, are the incorporators.

The Sterling Brass Bed Co., 999 Metropolitan Avenue, Brooklyn, has been consolidated with the White Metal Bed Co., Brooklyn, under the name of the White Metal Bed Corporation, with capital of $30,000, to manufacture metal beds and cribs. P. Weinberg, J. B. Greenspan and H. Chester, 571 West 175th Street, are the incorporators.

The W. N. Best Smoke Consuming Co., New York, has been incorporated with a capital of $50,000 to manufacture equipment for smoke prevention. E. S. Hammond, A. H. and W. N. Best, 383 Gates Avenue, Brooklyn, are the incorporators.

The Single Service Package Corporation of America, 326 Hudson Street, New York, has had plans prepared for the construction of a new factory on the Saw Mill River Road, Yonkers, N. Y. Alfred R. Turner is president.

The Baldwin Shipbuilding Co., New Baltimore, N. Y., has been incorporated with a capital of $250,000. S. and W. H. Baldwin, and B. Naumberg, 30 Broad Street, New York, are the incorporators

The Morse Chain Co., Ithaca, N. Y., manufacturer of transmission chains, has had plans prepared for the construction of a new four-story addition to its plant on South Tioga Street.

Clemson Brothers, Middletown, N. Y., operating a plant on Cottage Street for the manufacture of hack saws, have been incorporated with a capital of $2,000,000 by R. D. and G. N. Clemson, and W. E. Cross.

The Crucible Steel Co. of America, Syracuse, N. Y., has awarded a contract for the erection of an addition to its plant on West Fayette Street to cost about $60,000. The J. D. Taylor Construction Co., 115 South Salina Street, is the contractor.

The Seaboard Barge Co., Monroe, N. Y., has been incorporated with a capital of $500,000 to build submarines and other vessels. J. A. Anderson, H. R. C. Baird and J. P. Pillow, 420 West 156th Street, New York, are the incorporators.

The T. H. Symington Co., Leighton Avenue, Rochester, N. Y., manufacturer of railway equipment, has had plans

prepared for a one-story addition to be used as a core department.

The Strong Steel Foundry Co., 33 Norris Street, Buffalo, will build a one-story extension, about 20 x 48 ft.

The Perry Motor Boat Co., Buffalo, has been incorporated with a capital of $50,000 to manufacture motor boats. N. Amigone and J. and P. Orlando, Buffalo, are the incorporators.

The Piston Shockless Spring Co., Buffalo, has been incorporated with a capital of $75,000 to manufacture springs. H. E. Spangler and A. M. and W. C. T. Suor, Buffalo, are the incorporators.

The John J. McCloskey Co., Collingswood, N. J., manufacturer of cast-steel looms, etc., is planning for extensions to increase the present capacity.

Thomas A. Edison, Inc., West Orange, N. J., manufacturer of talking machines, etc., is having plans prepared for the erection of a new one-story, reinforced-concrete power plant, about 100 x 100 ft.

The Wood-Seal Co., Montclair, N. J., has been incorporated with a capital of $75,000 to manufacture automobile supplies. W. V. Ash and A. C. Buell, Montclair, are the principal incorporators.

The Metal Shelter Co. of New Jersey, East Orange, has been incorporated with a capital of $100,000 to manufacture machinery. Allan K. Pruden, Louis Brooks and Isaac Josephson are the incorporators.

W. Ames & Co., 417 Communipaw Avenue, Jersey City, N. J., manufacturers of heavy bolts, railroad spikes, etc., will erect a one-story addition to cost about $6,000.

The Machine Tool & Engineering Corporation, Jersey City, N. J., has been incorporated with a capital of $10,000 to manufacture tools and machinery. Fred W. and George W. Rurode, 1 Montgomery Street, and Cornelius S. Edwards, Jersey City, are the incorporators.

The Pennsylvania Railroad, Jersey City, N. J., has filed plans for the construction of a one-story machine shop, one-story blacksmith works, one-story planing mill, two-story office building, and two one-story shops at its Greenville yards to cost about $46,000.

Louis Sacks, Newark, N. J., operating a foundry at 357-91 Hamburg Place, Newark, N. J., will build a two-story addition, about 37 x 46 ft. to cost $9,000.

The Miniature Incandescent Lamp Corporation, Newark, has been incorporated with a capital of $250,000 to manufacture incandescent lamps. C. H. Jarvis, H. A. Black and J. E. Brand are the incorporators.

The Federal Shipbuilding Co., a subsidiary of the United States Steel Corporation, 71 Broadway, New York, has filed notice at Trenton, N. J., of payment of the entire $3,000,000 capitalization of the company in cash. The company has commenced the construction of a shipbuilding plant on the Newark meadows, to specialize in building all-steel vessels. E. H. Gary is president; William J. Filbert is secretary.

J. Wiss & Sons Co., 31 Littleton Avenue, Newark, manufacturer of cutlery, will build a two-story addition to its forge shop, about 22 x 45 ft.

The New Jersey Optical Co., 126 South Street, Newark, will build a new two-story brick plant, 80 x 100 ft., at Runyon Street and Badger Avenue, to cost about $50,000.

The United States Internal Combustion Co., Newark, has been incorporated with a capital of $500,000 to manufacture engines, motors, etc. David and David S. Henney, Montclair, and H. Y. Billings, Mountain Lakes, N. J., are the incorporators.

Oscar Froehlich, Newark, operating a wire works at 51 Bruen Street, has had plans prepared for the erection of a new one-story plant, about 40 x 100 ft., at 676 South Fourteenth Street.

The Hygrade Machinery & Equipment Co., 245 New Jersey Railroad Avenue, Newark, has been incorporated with a capital of $100,000 to manufacture machinery and electrical specialties. Thomas J. Graves, Frederick A. Holt and Harry A. Emertz are the incorporators.

The Deslauriers Air Craft Corporation, 233 Broadway, New York, with plant at Newark, is considering the erection of a new five-story concrete addition, about 100 x 200 ft. It has also had plans prepared for the construction of a one-story assembling works, 90 x 240 ft.

The International Time Recording Co., Endicott, N. Y., J. E. Rogers, manager, has completed plans for a factory, 75 x 260 ft., three stories and basement.

The Groton Electric Power Corporation, Groton, N. Y., has been incorporated with a capital of $20,000 and will construct a power plant. J. B. Carey, O. E. Wasser and I. J. Magee, 622 West 113th Street, New York, are the incorporators.

The General Railway & Signal Co., Rochester, E. E. Jackson, manager, has prepared plans for a power house to be erected at Lincoln Park.

The board of water supply, Olean, N. Y., William Sheehan, chairman, has had plans prepared for a filtration plant with a daily capacity of 2,500,000 gal. and a one-story brick pumping station, estimated to cost $75,000. Bids will be received about Oct. 20.

Construction has commenced on a one-story addition, 32 x 146 ft., to the plant of the Modern Tool Co., Erie, Pa. L. Orr is manager.

W. W. Wotherspoon, superintendent of public works, Albany, N. Y., is receiving sealed proposals for electrical equipment and machinery for operating and lighting the Utica Terminal lock, Utica, N. Y.

The Bridgeford Tool & Machine Co., Winton Road, North, Rochester, N. Y., has had plans prepared for an addition to its plant.

Plans have been prepared for the Bausch & Lomb Optical Co., 1635 St. Paul Street, Rochester, for a five-story factory, 120 x 400 ft., reinforced concrete construction.

The Newark Gear Cutting Machine Co., Newark, of which Henry E. Eberhardt is president, will erect a new four-story building, 40 x 50 ft., which, with the exception of the second floor, will be used as a machine shop. Offices will be located on the second floor. Some new equipment has been bought, but a few additional tools may be required.

The Standard Ordnance Co., 115 Broadway, New York, is in the market for a large quantity of equipment for a factory at Hamilton, Ohio, which will be engaged on Government work.

The Jewell Steel & Malleable Co., 373 Hertel Avenue, Buffalo, N. Y., will build a one-story addition.

The Wire Wheel Corporation of America, 1700 Elmwood Avenue, Buffalo, is having plans prepared for the erection of a new reinforced-concrete plant on Elmwood Avenue. R. N. Reidpath & Son, Builders' Exchange, are the architects.

The Globe Pattern Works, 39 Henry Street, Buffalo, will build a one-story addition, about 32 x 90 ft., on Morris Street, near Hertel Avenue.

The Sebo Co., Inc., Buffalo, has been incorporated with a capital of $40,000 to manufacture machinery and tools. G. Keller, C. Ulrich and A. Sprenger are the incorporators.

The board of education, Buffalo, will receive bids until 12 m., Oct. 11, for tools and supplies for the manual and vocational training departments of the city schools. James Storer is secretary.

The Pierce-Arrow Motor Car Co., Buffalo, will build four extensions, each about 45 x 234 ft., on Elmwood Avenue.

The Buffalo Metal Goods Co., Buffalo, with plant 196 Winchester Avenue, has filed notice of reorganization, with an active capital of $157,500.

The American Car & Foundry Co., 370 Babcock Street, Buffalo, will build an extension to its plant on Metcalfe Street.

The Buffalo Bolt Co., East Avenue and Oliver Street, North Tonawanda, N. Y., manufacturer of bolts, nuts, etc., will build a one-story addition, about 35 x 80 ft.

The Arrow-Grip Mfg. Co., Glens Falls, N. Y., has been incorporated with a capital of $40,000 to manufacture non-skid apparatus. C. C. Kelly, W. H. Dennin and E. G. Mertens, all of Troy, are the incorporators.

The Ransome Concrete Machinery Co., Second Street, Dunellen, N. J., manufacturer of concrete mixing machinery, is planning for the construction of a one-story addition, about 25 x 120 ft., to cost $10,000.

The Coit Machine & Engine Co., 146 Coit Street, Irvington, N. J., is building a new one-story blacksmith works to cost about $4,000.

The Ford Motor Car Co., Detroit, Mich., is taking bids for the erection of a new four-story brick and reinforced-concrete plant, 375 x 760 ft., to be erected on the Newark Meadows, Kearny, N. J.

The Public Service Electric Co., Terminal Building, Newark, N. J., has been granted permission to issue additional capital stock to the amount of $5,000,000 for extensions and improvements in its electric power plants and system. N. A. Carle is chief engineer.

The National Iron Works, 370 Halsey Street, Newark, N. J., has been organized to operate a local plant. Gustave A. Hoffman, 892 Hunterdon Street, heads the company.

The Oxford Truck Mfg. Co., Newark, has been incorporated with a capital of $125,000 to manufacture motor trucks and other vehicles. William W. Schofield and George W. Nuse, Newark; John J. Bush, New York, and Ernest B. Raunser, Brooklyn, are the incorporators.

The H. & L. Novelty Co., 393 Clinton Avenue, Newark,

has been organized to manufacture small hardware and kindred specialties. Richard F. Hackbarth heads the company.

The Newark Steel Post Co., 738 Broad Street, Newark, has been organized to operate a local plant. George T. Prescott is head of the company.

The Lehigh Valley Railroad, Buffalo, will erect a brick boiler house at its shops at South Ogden and Dingens Streets, to cost $26,000, and a brick boiler house, machine shop, blacksmith shop and storehouse at the foot of Tifft Street, to cost $50,400.

The Buffalo Nipple & Machine Co., Buffalo, has completed plans for additions to its factory on Glenwood Avenue.

The city and hospital board of managers, Binghamton, N. Y., has let contracts for a boiler house and heating plant at the City Hospital, to cost $25,000.

The Hornespeed Propelling Co., 302 Main Street, Buffalo, recently incorporated under the laws of Colorado with a capital stock of $1,000,000, has elected James A. Horne, president and general manager; Jacob P. Jacobson, vice-president and M. J. West secretary and treasurer. The company will manufacture airplanes, under the Hornespeed patents, marine propellors and ventilators and fans. Arrangements are being made for the erection of a factory.

New England

BOSTON, Oct. 8.

During the week the flood of inquiries for machine tools reached an unparalleled height. Orders, however, have not been in greater volume than in recent weeks. The distributors of Western machine tools have been figuring day and night to keep up with estimates asked, but actual sales have been slower than usual. There is every indication that as a result of these inquiries there will eventuate orders in a volume that will mean increased output of the machine tool plants if additional material and supplies can be obtained. There is little worriment about supplies as most of these inquiries are for Government work and materials are promptly forthcoming. Labor is a problem and many factories are handicapped by the number of men answering the draft. The strike situation in a few cities is not serious and such outbreaks are sporadic, as a rule, and short-lived.

The Colt's Patent Fire Arms Mfg. Co., Hartford, Conn., has confirmed the report of its purchase of the Meriden, Conn., plant of the New England Westinghouse Co. and has announced that it will build there the Browning light machine rifle. It is understood that the Meriden plant will continue for the next two months to turn out rifles on a Russian contract, by which time the Colt company will have its tools and jigs ready to take up the manufacture of the Browning gun. The Meriden factory now employs 1700 hands.

The Bilton Machine Tool Co., Bridgeport, Conn., has increased its capital stock from $600,000 to $1,000,000.

The Rhode Island Tool Co., Providence, R. I., has awarded a contract for a one-story addition, 32 x 90 ft.

Work has been begun at the Watertown Arsenal, Watertown, Mass., on a foundry, 280 x 300 ft., one story.

The Wizard Foundry Co., North Attleboro, Mass., has begun the construction of a one-story addition, 30 x 100 ft.

The Osgood Bradley Car Co., Worcester, Mass., is inquiring for machine tools for additional equipment to be used in building gun mounts for the Government.

The Eastman Car Co., builder of heated cars, Boston, has been reorganized, control of the company having been secured by Taber D. Bailey and George E. Thompson, Bangor, Me. W. H. Porter, Portland, Me., is also interested in the enterprise. The new officers are George W. Calkins, Boston, president, and George E. Thompson, treasurer. The business will be enlarged.

The Edwin Hills Co., Plainville, Conn., manufacturer of saddlery hardware, will build a three-story addition, 44 x 90 ft., to cost about $20,000.

The M. S. Little Mfg. Co., Allyn Street, Hartford, Conn., manufacturer of plumbing supplies, has awarded a contract for the erection of a one-story addition to its plant on New Park Avenue, 50 x 225 ft., to cost about $30,000.

The Terry Steam Turbine Co., Windsor Street, Hartford, Conn., has commenced the erection of a one-story addition, 100 x 108 ft., to cost about $25,000.

The Millbury Steel & Foundry Co., Millbury, Mass., is building a one-story addition to its foundry, 30 x 120 ft.

W. S. Randall, Portland, Me., and associates, have recently incorporated in Delaware the National Tool & Mfg. Co., with capital of $100,000 to manufacture tools and machinery.

The Howard & Bullough American Machine Works, Pawtucket, R. I., has awarded contracts for a one-story foundry addition, 35 x 68 ft., a three-story addition to a pattern storage building, 76 x 100 ft., and for an additional story to the present pattern storage building.

The United States Government is to build a machine shop, 95 x 250 ft., two stories, at New London, Conn.

The American Steel & Wire Co., Worcester, Mass., has awarded a contract for a one-story building, to contain about 5600 sq. ft., at its South Works.

The Bowers Arms & Munitions Co., Boston, has been incorporated with authorized capital stock of $100,000. Thomas A. Bowers is president and Charles W. Poole, Cranston, R. I., treasurer.

The Winchester Repeating Arms Co., New Haven, Conn., has purchased a tract of land on Division Street for future development of the plant.

The American Steel & Wire Co., Fair Haven, Conn., has begun the erection of a number of small buildings, including a zinc refinery, scale house, sanitary building and four motor houses.

The Luster Products Corporation, Bridgeport, Conn., has been incorporated with authorized capital stock of $25,000 to manufacture hardware and electrical goods. The incorporators are Clarence R. Hall, Grace L. Watt and Mabelle K. Pederson.

The North & Judd Mfg. Co., New Britain, Conn., has issued additional capital stock to the amount of $250,000. Outstanding stock is $1,500,000.

The Gallaudet Aircraft Corporation, East Greenwich, R. I., has completed plans for two buildings, 76 x 151 ft. and 52 x 128 ft., respectively, at its plant on Chepiwanoxet Island.

The Millbury Steel Foundry Co., Millbury, Mass., has awarded a contract for a one-story addition, 50 x 64 ft.

The Connecticut Electric Steel Co., Hartford, Conn., has awarded a contract for a one-story addition, 101 x 195 ft.

The Taunton-New Bedford Copper Co., Taunton, Mass., has awarded a contract for a machine shop, 60 x 100 ft., one story.

The Gem Mfg. Co., Boston, has been incorporated with authorized capital stock of $25,000 to manufacture metal specialties. Frederick W. Dunn is president and Miriam Scoullar, Wakefield, treasurer.

The Marlin-Rockwell Co., New Haven, Conn., has secured permits for the erection of five small additions, including a machine shop and a heating plant.

The Chase Rolling Mill Co., Waterbury, Conn., has received a permit to move two buildings. The site will be used for a new factory building.

The North & Judd Mfg. Co., New Britain, Conn., has plans for a two-story factory building to cost about $40,000.

Butterfield & Co., Derby Line, Vt., have awarded a contract for a three story factory building, 60 x 77 ft.

The Commercial Iron & Metal Co., Fifth Street, Waterbury, Conn., is building a two-story addition, about 44 x 44 ft., to cost $6,000.

Clifford S. Kilbourn, 264 County Street, New Bedford, Mass., has acquired property on East French Avenue and will establish a boat-building and repair works.

Philadelphia

PHILADELPHIA, Oct. 9.

This market is interested in the forthcoming lists of the New York Shipbuilding Corporation, Camden, N. J., for equipment, including many machine tools, plate-working machines, cranes, etc., for expansion of its plant for building torpedo boat destroyers. The American International Corporation continues an active buyer of miscellaneous equipment.

The Marlin-Rockwell Corporation is buying additional equipment for its Standard Roller Bearing plant.

The Penn Seaboard Steel Corporation has closed with Alfred Box & Co., Philadelphia, for three 30-ton traveling cranes for its new steel foundry to be built at Chester, Pa.

The Tucker Supply Co., York, Pa., which has a contract for gun sights for one of the large gun manufacturing companies, has acquired a building formerly used as a shoe factory and will alter and equip it for the gun sight work. The Tucker Supply Co. has also taken over the plant of the Weidman Whor Machine Co., Lancaster, Pa., and will use this plant for the manufacture of supplies for the Navy.

The Tacony Ordnance Co., Philadelphia, has awarded a contract for the erection of its proposed new works to the

F. W. Mark Construction Co., Finance Building, at a cost of $450,000. The plant will be located at Tacony and will consist of a one-story open-hearth building, 105 x 189 ft.; one-story machine shop, 130 x 270 ft.; one-story forge shop, 136 x 210 ft., and heat treating works, 100 x 135 ft.

The Baldwin Locomotive Works, Philadelphia, has awarded a contract for the construction of an addition to its rivet tower works, 44 x 74 ft., at a cost of $60,000. The McClintic-Marshall Co. is the contractor.

The Keystone Needle Works Co., Philadelphia, has been incorporated with a capital of $30,000. Angelo Gambine is the principal incorporator.

The Fort Mifflin Shipbuilding Co., Philadelphia, incorporated with a capital of $10,000,000, has perfected plans for the construction of a shipbuilding plant on the Delaware River, near League Island, Philadelphia. The initial works will consist of shipways for 16 vessels, machine shops, brass and iron foundry, boiler works, blacksmith shop, wood-working plant, etc. An industrial railway will be installed, as well as a series of traveling cranes. Arthur Masters is president; Henry D. Bacon, vice-president, and J. M. Cardeza, treasurer. Leonard E. Harris is consulting engineer.

J. Picucci, 1333 Reed Street, Philadelphia, will build a one-story machine shop, about 20 x 38 ft., at Fifteenth and Reed Streets.

The Philadelphia Supply Mfg. Co., Philadelphia, manufacturer of package handles, etc., has increased its capital from $5,000 to $70,000, and changed its name to the Shuttleworth-Gallen Co.

The Unit Construction Co., Thirty-first and Chestnut Streets, Philadelphia, has awarded a contract for the erection of a new plant at Gray's Avenue and Fifty-eighth Street to consist of a three-story building, 80 x 240 ft., and one-story structure, 60 x 60 ft., to cost about $80,000. Guns for the Government will be manufactured.

The Gara-McGinley Co., Philadelphia, operating a sheet metal works, has recently reorganized and removed its plant from 1631 to 1708-10 Ludlow Street. It will specialize in the manufacture of roofing and kindred products.

Fire Oct. 2 destroyed the three-story plant of the Central Stove Repair & Foundry Co., 2318 Washington Avenue, Philadelphia, manufacturer of stoves and ranges, with loss estimated at $25,000. Thomas McCaffrey heads the company.

The Empire Rubber & Tire Co., North Clinton and Mulberry Streets, Trenton, N. J., has commenced the construction of a one-story addition, about 90 x 320 ft., to cost $40,000.

The McLaughlin Tool Co., Camden, N. J., has been incorporated with a capital of $50,000 to manufacture tools. James Scott, 549 North Second Street; W. J. McLaughlin and William J. Strandwitz, Camden, are the incorporators.

The Strandwitz & Scott Co., Camden, N. J., manufacturer of oil guards, tanks, etc., has completed the erection of a new plant on South Second Street.

The Aluminum Brazing Co., 628-30 Penn Street, Chester, Pa., has had plans prepared for the erection of a new one-story plant, 35 x 60 ft., at Third and Tilghman Streets.

Walter Butz, Norristown, Pa., has acquired property on Kohn Street and will establish a plant for the manufacture of hedge trimmers, cloth cutters, etc.

The Badenhousen Boiler Co., Cornwells, Pa., will build a new one-story plant, 200 x 230 ft., to cost about $50,000.

The Lycoming Foundry & Machine Co., Williamsport, Pa., operating a plant at Oliver and High Streets for the manufacture of gas and gasoline engines, etc., has purchased the plant of the United States Machine Co., Southern Avenue, South Williamsport. The present equipment will be removed from the works and the plant converted into a foundry for increased capacity. The company specializes in the manufacture of automobile motors.

The Belmont Motor Co., Union Trust Building, Harrisburg, Pa., has acquired the plant of the North American Tannery, Lewistown, and will remodel and equip the works for an automobile manufacturing plant. It is said that about 500 hands will be employed for initial operations.

The Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa., has received a Government contract for about 1,000,000 4-in. steel castings for shells and will devote its works in three daily shifts to this production.

The Brown Instrument Co., Philadelphia, has purchased additional property adjoining its factory on which it intends to make extensions from time to time required by the growth of its business. R. P. Brown is president.

The White Motor Car Co., 216 North Broad Street, Philadelphia, will build a one-story service and repair plant at Twentieth Street and Erie Avenue, which will provide about 10,000 sq. ft. of floor space. J. D. Howley is manager.

The Industrial Foundry & Machine Co., Pottstown, Pa., will build a new one-story pattern shop, about 30 x 30 ft.

Baltimore

BALTIMORE, Oct. 8.

The McNamara Brothers Co., Inc., Ranstead's Wharf, Baltimore, manufacturer of tanks and boilers, has awarded a contract to the J. L. Robinson Construction Co. for the construction of an addition to its plant at Bush Street and the Baltimore & Ohio Railroad.

The Baltimore Tube Co., Wicomico and Ostend Streets, Baltimore, Md., will build a one-story machine shop to cost about $20,000. The contract has been awarded the West Construction Co., American Building, Baltimore.

The Kelly-Springfield Tire Co., Akron, Ohio, has approved final plans for the construction of a new plant at Cumberland, Md., to cost about $5,000,000, or about double the amount of investment heretofore considered. The works will consist of a one-story machine shop, 100 x 150 ft.; main building, about 700 x 900 ft.; electric power house, 150 x 150 ft., and other structures. The plant will have a capacity of about 400,000 tons per year. The machinery and equipment will cost about $1,000,000, for which some contracts have been awarded. S. Diescher & Sons, Farmers Bank Building, Pittsburgh, Pa., are consulting engineers.

The Bureau of Yards & Docks, Washington, D. C., is preparing plans for the erection of a one-story machine shop, one-story forge shop, five-story pattern shop and wood-working plant, and one-story brass foundry. F. R. Harris is chief of the Bureau.

The Maryland Brass & Metal Works, Guilford Avenue and Federal Street, Baltimore, is completing the construction of a new brass foundry, about 46 x 90 ft., costing $15,000.

The Crescent Iron Works, Elkton, Md., has been incorporated with a capital of $100,000 to operate an iron foundry. Clement M. Egner is the principal incorporator.

The York River Shipbuilding Corporation, Mutual Building, Richmond, Va., has commenced the construction of a new plant on the Mattapani River, near West Point, Va., to cost about $250,000. The initial works will consist of 10 buildings and an electric power plant.

The A. J. Chesson Agricultural Co., Kinston, N. C., manufacturer of farming equipment, is considering the erection of a new plant to cost about $50,000. A. J. Chesson is president.

The Piedmont Motor Car Co., Lynchburg, Va., is planning for extensions to its plant to include a department for the manufacture of automobile bodies.

The Indian Block Machine Corporation, Bristol, Va., has been incorporated with a capital of $25,000 to manufacture machinery. Richard Burson and George M. Turner, Bristol, are the principal incorporators.

The Colle Muffler & Safety Valve Co., 325 East Oliver Street, Baltimore, will build a two-story addition to its machine shop, 50 x 150 ft.

The Maryland Metal Cross Tie Co., Munsey Building, Baltimore, will purchase a site at Havre de Grace, Md., for the erection of its new one-story plant, 200 x 400 ft., to cost about $100,000.

Chicago

CHICAGO, Oct. 8.

Big things are stirring in this market, all of them having to do with war requirements of which there is hesitancy to talk. Many inquiries from the East are coming to hand, on some of which dealers cannot quote because of territorial reasons, to say nothing of their inability to give the desired deliveries. In several instances machines which have been on order for some time and heretofore intended for private buyers have been commandeered by the Government. A railroad for which a 90-in. boring mill was built did not get the machine for this reason. It is regretted in some quarters that the Government does not, to some extent at least, dispense with its elaborate specifications and send men who know machine tools into the field to place orders in much the same manner as did the foreign Governments at the outset of the war, a plan being followed by the large contractors doing Government work.

One of the large outside inquiries before the trade is for machines needed in the establishment of a repair base in France. A Pottstown, Pa., company has sent inquiries to Chicago for equipment required to set up a complete plant for the manufacture of 6-in. shells. No additional shell orders have been placed in this district. The Rock Island Arsenal continues to buy on an extensive scale, as does the Nordyke & Marmon Co., Indianapolis, Ind., one of its recent orders calling for 15 large turret lathes. It is erecting a large new plate for the manufacutre of Liberty airplane motors.

Skilled labor is becoming an even more serious problem

than it has been heretofore. Good men are sought eagerly, and high wages are offered. That such men must be exempt from military duty is undisputed.

Steps have been taken, but the proposition is as yet entirely in a formative stage and largely dependent on financing, for the organization locally of a company to build tools essential in the making of large guns. There is a tremendous demand for shipyard equipment, some of it coming from Japan, in fact all sorts of large tools are quickly snapped up. Meanwhile the business which dealers are doing where they can make deliveries from stock is of a very satisfactory character.

Bids will be taken Oct. 16 by G. C. Nimmons & Co., architects, 122 South Michigan Avenue, Chicago, on an eight-story reinforced concrete factory, 100 x 100 ft., at Kinzie and Franklin Streets, to cost $125,000, for the Union Special Machine Co., 300 West Kinzie Street.

Plans for the four-story and basement factory, 51 x 112 ft., which is to be built at Twenty-seventh and La Salle Streets for the Ehman Tire & Rubber Co., 142 West Twenty-seventh Street, are being revised. A. C. Ehman is president.

The Peerless Tool Co. has had plans prepared for a one-story factory, 50 x 120 ft., at 2450 West Forty-eighth Street, Chicago. McKeown Brothers, 112 West Adams Street, have the contract.

Miller & Hall, architects, 204 North Karlov Avenue, Chicago, are preparing plans for a one-story factory, 75 x 105, ft., on the West Side, to cost about $15,000. The owner's name is not given.

The Zin-Ho Mfg. Co., manufacturer of portable air compressors, has purchased from the Briggs-Chicago Co. its plant at North Chicago, comprising three acres, with buildings, machinery, etc., at a reported price of $40,000. It is said the purchasing company has Government contracts.

The Illinois Steel Co. is erecting a one-story brick shop at a cost of $10,000.

The Chicago Short Line Railway Co. will erect a one-story brick repair shop, 113 x 150 ft., in South Chicago, to cost $15,000.

A committee of six, all creditors of the Smith Motor Truck Corporation, maker of the Smith Form-a-Truck, has been appointed to take charge of the creditors' interests of the company. It is stated by D. W. Figgis, president, that injudicious buying by the former company has caused an over supply of material, and it had been unable to meet its obligations. The company's assets are reported to be $1,634,786 in excess of the liabilities, which amount approximately to $1,700,000. The committee has worked out a plan for the continuance of operations. The factory is at Clearing, and head offices at Sixteenth Street and Michigan Avenue, Chicago.

The new plant, 80 x 250 ft., which the Buda Co. is building at Harvey, Ill., will be used for the manufacture of gas engines for auto truck tractors.

The Atchinson, Topeka & Santa Fe Railroad, Chicago, has commenced the erection of a one-story addition, 108 x 580 ft., to its car shops at Ottawa, Kan., to cost $45,000. R. A. Rutledge, Topeka, Kan., is chief engineer.

The Octigan Drop Forge Co., Lowe Avenue, Chicago, will build a new one-story machine shop, 50 x 100 ft.

The Electric Machinery Co., Minneapolis, Minn., has begun work on a new factory, considerably larger than its present one, to be built adjoining the present main building. This will make the complete plant more than twice its former size and will so increase the shop facilities that the company will be able to triple its output. The new factory will be completed and in operation before Jan. 1. Among the new equipment to be bought are a 4-motor 25-ton traveling crane, with 60 ft. span; several 16-ft. boring mills and lathes, milling machines, punch presses, drill presses, etc. The company has established a branch office in New York City, with district offices in Boston, Philadelphia and Buffalo. Orders which the company has received for vertical generators, synchronous motors and standard alternators are far larger than the present capacity of the plant will admit, and the new factory will make it possible to give earlier deliveries. Truman H. Hibbard is vice-president and general manager.

The Albert Lea Sprayer Co. is not located in Minneapolis, Minn., recently mentioned in THE IRON AGE, but at Albert Lea, Minn.

The Strite Tractor Co., Minneapolis, Minn., has been incorporated in Delaware with a capital of $5,000,000 to manufacture tractors and farming machinery. G. H. Strite and F. H. Bierman, Minneapolis, are the incorporators.

The Toro Motor Co., University Avenue, Minneapolis, Minn., is taking bids for the construction of a new one-story machine shop, 75 x 190 ft., on Snelling Avenue, to cost about $30,000.

The Sta-Rite Hairpin Co., Findlay, Ill., has been incorporated at Washington, D. C., with a capital of $500,000 to manufacture hairpins and metal specialties. Eugene Bland, Findlay; Isaac B. Craig, Mattoon, Ill., and Norman T. Whitaker, Washington, are the incorporators.

The Kelly-Atkinson Co., Chicago, Ill., has commenced the erection of machine shops to cost about $50,000 at its proposed new shipbuilding plant at Mobile, Ala.

Milwaukee

MILWAUKEE, Oct. 8.

The demand for machine-tools continues at a high rate from scattered sources, and the urgency of needs leaves no hope that manufacturers will be able to make any gains on deliveries before the end of a year or longer. This is particularly true of milling machines, for which the gas engine industry is probably the heaviest purchaser, due to the enormous demands of the war for motive power.

Activity in all manufacturing lines is the greatest ever known and the total capacity of plants is by no means sufficient to absorb all requirements. The prohibitive cost of building materials, and the small supply, together with the acute shortage of skilled and semi-skilled labor, makes it difficult to provide the required enlargements of facilities.

A number of hydroelectric and steam generating power plants throughout Wisconsin are making extensive improvements which have been held off due to heavy costs.

The Cruiser Motor Car Co., Madison, Wis., will award contracts within 10 days for the erection of the first unit of its plant. A two-and-one-half acre site on East Johnston Street and the Milwaukee road tracks has been purchased. A combination touring-camping automobile will be manufactured.

The Pawling & Harnischfeger Co., Milwaukee, maker of electric traveling cranes, is preparing to erect another machine-shop extension, 50 x 160 ft. It is completing work on a 500-kw. power plant addition. O. A. Ruemelin is vice-president and general superintendent.

The Western Rope & Mfg. Co., Tulsa, Okla., which recently purchased the plant of the Schneck Machine Co., 809-811 St. Paul Avenue, and additional acreage, has awarded contracts for the first of a series of shop additions. The new building will be 50 x 110 ft., one-story, of reinforced concrete and brick, and cost about $25,000 with equipment. Gas engines and boilers will be manufactured. James K. Bradley is works manager.

The Badger-Packard Machinery Co., 133-139 West Water Street, Milwaukee, manufacturer of machine-tools, mill and factory equipment, has increased its capital stock from $75,000 to $200,000 to accommodate the growth of its business. L. Kurtz is president and W. L. Romaine is secretary.

The Prest-O-Lite Co., Indianapolis, Ind., has moved its Milwaukee branch from 18-20 Martin Street to 528-532 Milwaukee Street. C. L. Myers is division manager.

The Milwaukee Plate & Stamping Co., Milwaukee, has been incorporated with a capital stock of $25,000 by P. M. Dreher, A. G. Staab and P. M. Hoppe.

The Stowell Co., South Milwaukee, Wis., has awarded the general contract for the erection of an addition to the grinding and annealing room to C. B. Danielson, 2415 Prairie Street, Milwaukee, to cost about $20,000 complete.

The La Pointe Foundry Co., Schleisingerville, Wis., will increase its capacity from 50 to 75 per cent by installing an additional furnace, and has leased a building from the Standard Machinery Co. to provide much-needed floor space.

The Economy Paper Products Co., Milwaukee, has been incorporated with a capital stock of $100,000 and will erect a plant at 315 Wright Street to cost $50,000. The promoters are Arthur F. Tiegs, John T. Arveson, Robert Vochel and John Martin. An architect and engineer have not yet been selected.

The board of education, Bessemer, Mich., has engaged John D. Chubb, architect, 109 North Dearborn Street, Chicago, to prepare plans for a two-story vocational training and graded school building, 170 x 200 ft., costing $125,000. Manual training and domestic science equipment will be required. W. V. Truettner is secretary.

The Atlas Foundry Co., Milwaukee, has been organized with a capital stock of $10,000 and will establish a gray-iron foundry in a plant, 80 x 120 ft., at Thirty-ninth Avenue and Burnham Street, West Milwaukee. George P. Gerlinger, vice-president of the Gerlinger Steel Casting Co., Orvel A. Meyer and Bertha Gerlinger are the incorporators. A 3-ton cupola is being installed and a general line of machinery castings will be manufactured. Mr. Meyer, who comes to Milwaukee from La Salle, Ill., will be manager.

The Kiel Woodenware Co., Kiel, Wis., will erect a one-story extension, 80 x 320 ft., in addition to the enlargement of its steam generating plant, to cost from $65,000 to $75,000.

Plans are being prepared by the Thomas S. Watson Co., consulting engineer, Majestic Building, Milwaukee.

The Hellwig Carburetor Co., Milwaukee, has been incorporated with a capital stock of $30,000 to manufacture gas engine devices and parts. The incorporators are Frank L. McNamara, Harold W. Connell and John F. Hurley, members of a law firm at 800 Pabst Building.

The Rock River Valley Hemp Mills, Waupun, Wis., will erect a power house addition, 30 x 30 ft., for which a 150-hp. boiler will be needed.

The C. H. & E. Mfg. Co., Milwaukee, has awarded the general contract for a two-story shop addition, 50 x 100 ft., at Clinton and Mineral Streets. It manufactures gas engines, concrete mixers, power hoists and other contractors' equipment. F. F. Hase is general manager.

The Electric Specialty Co., New London, Wis., has been incorporated with a capital stock of $100,000 by F. A. Archibald, George T. Dawley and Roman Helman.

The Morton Brake Co. of Wisconsin, Milwaukee, has been incorporated with a capital stock of $25,000 by J. A. Barry, G. W. Miller and I. R. Houtcamp.

The Skidd Mfg. Co., Kenosha, Wis., maker of pasteurizing and dairy machinery, has removed its headquarters from Kenosha to Janesville, Wis. The plant recently was transferred to Janesville.

The board of education, Wausau, Wis., has engaged Swarthout & Spear, architects, Wausau, to prepare plans for a vocational training and graded school to cost in the neighborhood of $200,000. Contracts will be awarded about Jan. 1.

The Waukesha Safety Truck Brake Co., Waukesha, Wis., has perfected its organization and is preparing to establish a factory for the production of a front-wheel braking system for motor trucks. F. H. Halladay, Appleton, is secretary and general superintendent.

The Crank-Shaft Movement Corporation, Green Bay, Wis., has been incorporated with a capital stock of $300,000, to manufacture a special motor, said to be adaptable for use in automobiles, aircraft, boats, etc. Great economy of fuel is claimed for the new engine.

The Spring Bearing Truck Co., Milwaukee, has leased the plant formerly occupied by the Northwestern Bridge & Iron Co., and will shortly commence the manufacture of small gray iron castings. J. George Shaw is president.

Detroit

DETROIT, Oct. 8.

The machine tool market in this district continues to show improvement. With Detroit now filling nearly $300,000,000 in war contracts, manufacturers, especially in metal lines, are working to capacity and are unable to keep up with orders.

A. A. Templeton, president Detroit Seamless Steel Tubes Co.; Alvan Macauley, president Packard Motor Car Co.; Henry W. Hoyt, vice-president Great Lakes Engineering Co.; Roy F. Chapin, president Hudson Motor Car Co.; Harry W. Ford, president Saxon Motor Car Co., and other prominent Detroit men, have organized a company with a capital of $2,000,000 and entered into a contract with the Government for the year ending Oct. 1, 1918, to manufacture a part of the mechanism for large artillery, which calls for about $30,000,000 worth of equipment. Efforts are being made to obtain a building which will provide immediate working space for 3000 men and 10,000 later on. In case present negotiations are not carried through, a new factory will be rushed to completion. It is stated that the contract for succeeding years will exceed the $30,000,000 one placed for this year.

The shortage of coal in this district has forced several plants, including the Michigan Malleable Iron Co., to close. Government action promises no relief for some time. In the meantime manufacturers are borrowing coal from one another in an attempt to keep their industries running. Nearly 1000 cars of coal are needed daily in Detroit to prevent the closing of more plants.

The Buhl Stamping Co., manufacturer of light metallic stampedware, Detroit, is operating its new plant, which represents an investment of $500,000, and is located on the east side of Scotten Avenue, on the Michigan Central Railroad.

The Walcott Lathe Co., Jackson, Mich., has purchased 85,000 sq. ft. of property north of its present plant and will build additional shops, it is expected, in the spring. M. C. Townley and Dean G. Kimball are the principal owners.

Contracts have been awarded for the rebuilding of the foundry of the Morency-Van Buren Co., Sturgis, Mich., which was recently destroyed by fire.

Cleveland

CLEVELAND, Oct. 8.

The demand for machine tools continues active, being almost entirely for Government work. Considerable small lot buying is noted for filling Government orders, as there are but few metal working plants in the Central West not doing work of this kind, either directly or indirectly. Among new inquiries is one from an Ohio manufacturer for 145 standard machine tools, largely lathes and milling and drilling machines in medium sizes. No details are available as to the purposes of this machinery, but it is assumed it is also needed for Government work. A large list of machinery for shell work is expected shortly from the Erie, Pa., plant of the American Brake Shoe & Foundry Co. Another inquiry has come from the Government for about 25 turret lathes, and a company in Detroit is inquiring for 10 or 12 screw machines for making fuse parts of high explosive shells.

The Forest City Machine & Forge Co., Cleveland, is erecting a three-story brick, steel and glass addition. The plant, which is devoted entirely to the making of detonators, has recently received an order from the Government for 2,300,000 detonators for 3 and 4-in. shells.

The Cleveland Ordnance Co., which has been figuring on additional machinery equipment for some time, is expected to place orders shortly for machines for forging, rough turning and boring 3 and 4-in. guns.

The National Lamp Co., Cleveland, a subsidiary of the General Electric Co., will erect a new three-story brick, steel and glass factory, 145 x 267 ft., to be known as the Pitney glass works. Contract has been placed with the Heller Brothers Co., Youngstown.

The Clay Engine Mfg. Co., Cleveland, has been incorporated with a capital stock of $65,000 by J. N. Halls and others.

The Dual Carburetor & Mfg. Co., Cleveland, has been incorporated with a capital stock of $100,000 and contemplates establishing a plant to manufacture carburetors. George F. Hart and others connected with the Guardian Savings & Trust Co., Cleveland, are interested.

The Atlantic Foundry Co., Cleveland, has increased its capital stock from $100,000 to $150,000.

The American Brake Shoe & Foundry Co., Erie, Pa., is enlarging its plant by an extension 210 ft. x 670 ft. to increase its capacity for shell work. A large list of machinery requirements is in preparation and is expected to be sent out shortly. While engaged a few months ago in the manufacture of shells for the Allies, employment was furnished to 6000 men working in three 8-hr. shifts. It is stated that with the enlarged plant about 8000 men will be employed.

In addition to carrying out its other extensive building program in Erie, Pa., previously announced, the General Electric Co. is planning the erection of a large power house.

The American Clay Machinery Co., Bucyrus, Ohio, will erect addition to its plant to cost $200,000, and the Allen Motor Co., Bucyrus, will erect an addition at a cost of $100,000. The Bucyrus Chamber of Commerce has just completed a successful campaign for securing stock subscriptions amounting to $300,000 for these enlargements.

The Bucyrus Steel Co., Bucyrus, has been incorporated with a capital stock of $50,000. It is understood that the American Clay Machinery Co. of that city is back of the new company which contemplates erecting a plant.

It is announced that the Trust Concrete Steel Co. will expend nearly $400,000 for additions to its Detroit, Mich., and Youngstown, Ohio, plants. Two buildings will be erected at Youngstown, one 80 x 400 ft., and the other 65 x 500 ft.

The Canton Rim Co., Canton, Ohio, expects to begin the erection of a plant shortly. W. T. Beardsley is president.

Cincinnati

CINCINNATI, Oct. 8.

Recent changes in the export embargo list include the larger sizes of boring and turning mills, lathes from 30-in. up and planers of stipulated sizes. Local machine tool builders have a number of orders now under way for foreign customers, but do not anticipate any trouble getting permits to ship the machines when finished. The demand for machine tools is more than sufficient to keep all plants busy, so that if the export business were cut off entirely enough domestic orders are booked to keep them running full time. Orders from both Italy and Spain have been coming in freely for lathes, mostly of the smaller sizes, a few shaping machines and a large number of portable electric drilling machines. An order was received last week through a New York exporter for small woodworking machinery to be shipped to Spain, including a number of electrically-driven swing saws.

No changes in machine tool prices are expected on account of the readjustment of the pig-iron figures. The difference in cost will hardly make up for increased manufacturing expenses that have not yet been taken care of.

The Ideal Welding Co., Cincinnati, has leased a building at Eighth Street and Broadway that will give it more space.

The Charles Boldt Paper Mills Co., Cincinnati, has been incorporated with $1,000,000 capital stock by Charles Boldt and others. It recently finished a plant for the manufacture of corrugated paper, and intends to build an addition at an early date.

The American Valve & Meter Co., Cincinnati, will erect an addition to its plant on Spring Grove Avenue, estimated to cost $10,000, to be used mostly for storage purposes.

The American Caster Co., Hamilton, Ohio, has been incorporated with $20,000 capital stock by E. T. Malloy and others. Manufacturing plans have not yet been given out.

It is reported that manufacturers in Dayton, Ohio, are preparing to commence work on contracts for shells that will aggregate $20,000,000, including a large number of shrapnel shells, in which several Dayton manufacturers have had considerable experience.

The Miami Tool & Die Co., Dayton, has been incorporated with $35,000 capital stock by George E. Keller, Milton Stern, and others. Manufacturing plans are not yet available.

The Springfield Millwright Co., Springfield, Ohio, has been incorporated with $15,000 capital stock to do general machine-shop work. It has taken over the shop at 22 South Lowry Avenue, heretofore operated by G. A. Bauer, who is one of the principal incorporators.

The Federal Chemical Co., Columbus, Ohio, is reported to have plans under way for a $250,000 sulphuric acid plant to be operated in connection with its fertilizer plant on Bonham Avenue. The executive offices are at Louisville, Ky.

The Capital Die, Tool & Machine Co., Columbus, has been incorporated with $10,000 capital stock by R. B. Ralston and others.

New machinery is now being installed in the six-story plant of the Sayers & Scovill Co., Cincinnati, recently enlarged and remodeled. A new power plant is included in the list of improvements.

The Northside Tool Co., Dayton, Ohio, has been incorporated with $20,000 capital stock by George Serapin, C. R. Miller and others.

The Wapakoneta Mfg. Co., Wapakoneta, Ohio, has been incorporated with $50,000 capital stock by Frank W. Andrews and others. It will manufacture fire extinguishers.

The Central South

LOUISVILLE, Oct. 8.

Inquiries for boilers and ice-making machinery continue numerous, with orders depending more upon delivery than upon prices. The demand for hoisting equipment and supplies for oil fields is increasing.

The Roy C. Whayne Supply Co., Louisville, is in the market for an 8 to 12-ton, 220 volt, three-phase, 60-cycle electric hoist.

The Southern Engine & Boiler Mfg. Co., Jackson, Tenn., has been incorporated with capital stock of $5,000 by J. T. Murdock, Charles M. Morris, Frank W. Milborn, W. H. Biggs and B. F. Ledagar, practically all of whom are interested in the Southern Engine & Boiler Works, Jackson.

Indianapolis

INDIANAPOLIS, Oct. 8.

The Lincoln Motor Truck Co., Anderson, Ind., has been organized to manufacture motor trucks and will occupy part of the factory buildings of the Spring Steel Fence Co. The directors are Robert J. Walker, Michael G. O'Brien, Anderson, and Ernest Bartsch, Detroit.

The Premier Motor Co., Indianapolis, has obtained a $15,000,000 contract to build motor trucks for the Government. E. W. Steinhart is vice-president and general manager. The company will increase its force to 2500 men.

The National Accessories Co., Indianapolis, has been incorporated with $60,000 capital stock to manufacture mechanical and electrical devices. The directors are Joseph A. Martz, Elmer P. Warren and Will H. Remy.

The Indianapolis Cordage Co., Indianapolis, has been incorporated with $700,000 capital stock to manufacture cordage and agricultural implements. The directors are Albert E. Scheithe, George R. Seeger, Ora D. Stoler, Charles E. Sullivan and Fred A. Doll.

The O. L. Colvin Peerless Mfg. Co., Indianapolis, has been incorporated with $25,000 capital stock to manufacture machinery. The directors are O. L. Colvin, George K. Browning and Thad F. Thompson.

The Sanitary Catch Basin Co., Indianapolis, has been incorporated with $50,000 capital stock. The directors are Allen Boulds, Hyman Stein and John M. Gray.

The Gary Motor Truck Co., Gary, Ind., has doubled its capital stock by issuing $75,000 of preferred.

The General Advertising Plate Co., Terre Haute, Ind., has been incorporated with $50,000 capital stock to manufacture electrotypes and printers' supplies. The directors are Jesse W. Cornelius, A. W. Zinsz and H. W. Moore.

The Standard Ignition Co., Elkhart, Ind., has been incorporated with $200,000 capital stock to manufacture magnetos and other electrical devices. The directors are Andrew H. Beardsley, Martin E. Crow, William H. Foster, John F. O. Stratton and Edward D. Zigler.

The Hiatt Mfg. Co., Winchester, Ind., has been sold to the Imperial Electric Co., Union City, Ind., and the plant will be moved there.

St. Louis

ST. LOUIS, Oct. 8.

The Hope Cotton Compress Co., Hope, Ark., has been incorporated with a capital stock of $100,000 by C. H. Crutchfield, J. P. Brundidge, E. S. Greening and others.

The Kansas City Railways Co., Kansas City, Mo., will equip a sub-power station requiring about $16,000 worth of machinery.

The Kansas City Light & Power Co., Kansas City, are preparing plans for a new power plant at a cost of $3,000,000 to $5,000,000. Two 20,000 kw. generators are included.

J. M. McGowan and H. J. Deboe will build a machine shop to replace the one recently destroyed by fire.

The Ceco System, Clarksdale, Miss., has been incorporated with a capital stock of $100,000 by H. R. Bynum and H. M. Waddell to equip a plant for manufacturing heating systems.

The Interstate Car Co., Mobile, Ala., has purchased the Armour Car Works at Meridian, Miss., and will install equipment to increase the capacity.

The Old Forge Landing Iron & Steel Co., St. Louis, has been incorporated with a capital of $500,000 by R. O. Smith, W. C. Kitchin and J. C. Pratt and will erect a plant.

The Louisiana Consolidated Oil & Refining Co., Shreveport, La., has been incorporated with a capital stock of $1,500,000 by J. C. Ellis and others.

The Marland Pipe Line Co., Ponca City, Okla., has been incorporated with a capital stock of $200,000 by E. W. Marland, J. S. Alcorn and A. L. Bogan and is in the market for pumping equipment.

The Nunn Electric Co., Oklahoma City, Okla., has been incorporated with a capital stock of $125,000 by O. T. Jenkins, Oklahoma City; Galen Crow, Guthrie, Okla., and J. E. Nunn, Amarillo, Tex., to manufacture electric fixtures.

The Marine Paint Co., New Orleans, La., 411 South Peters Street, has increased its capital from $50,000 to $500,000, and will erect a plant to manufacture and grind marine paint.

The K. C. Four Drive Sales Co., Kansas City, has been incorporated with a capital stock of $250,000 by Louis M. Neale, John L. Peak and B. F. Street to manufacture tractors.

Lumberton, Miss., is in the market for crude oil engines, pumps and other power equipment for its waterworks plant. X. A. Kramer, Magnolia, Miss., is the engineer.

The St. Louis Machine Tool Co., South Broadway, St. Louis, has commenced the construction of a three-story machine shop, 40 x 165 ft., to cost about $15,000.

California

SAN FRANCISCO, Oct. 2.

The return of machinists and iron workers to work, after a two weeks' strike, has caused a resumption of activity in practically all the shipyards and machine shops. This return to work is in the nature of a truce, pending negotiations between the conflicting parties, with the Government as mediator. It is generally considered that a permanent agreement ratified between employers and employees will make for an increased business of an extent not possible as long as the industrial situation remains unsolved. Inquiries for railroad equipment are numerous enough to warrant the belief that some railroad construction may soon take place. Orders for marine and stationary pumps and tractors have lately been received in greater number than they can be turned out. Many are for Government requirements, but the majority represent the needs of individual buyers.

The American Machine Works, Oakland, will erect a factory, 50 x 100 ft., at a cost of $30,000.

P. Kirchbaum and S. Grant, Sacramento, will erect a two-story building at Tenth and R Streets and will install machinery for handling and remodeling scrap iron at a total cost of $48,000.

The Dalton Iron Works, Oakland, has been incorporated with a capital of $50,000, by Frank N. and Henry P. Dalton, and Robert P. Kavanagh, to build ships and farm implements.

The Sommarstrom Shipbuilding Co., San Francisco, has been incorporated with a capital of $250,000, by M. F. Sommarstrom, Charles L. Tilden, Henry R. Ridgeway, William H. Fuller and A. F. Lemberger, to build ships.

The Liberty Iron Works, Sacramento, has been incorporated with a capital of $280,000 by O. A. Robertson, H. S. Wanzer, J. M. Henderson, Jr., J. H. Stephens and C. A. Elliott to build aeroplanes.

Bids are being asked by the Board of Public Works, Los Angeles, for one 800-lb. steam hammer for immediate delivery.

A. F. Katzenstein and John Birdwell, Las Cruces, N. M., will erect a machine shop and garage.

The Fulton Shipbuilding Co., Los Angeles, will erect machine shops and marine ways on land acquired on Los Angeles harbor.

S. Yamamoto, San Pedro, will erect a boat-building plant at Fish Harbor at a cost of $5,000.

The New York, San Francisco & HongKong Steamship Co. has bought 10 acres at Redwood City and will, it is understood, erect a shipbuilding plant with a capacity of six ships at one time.

The machine shop of the Standard Oil Co., Taft, which was recently burned, will be rebuilt on a larger scale.

The Pacific Electric Railway Co., Pacific Electric Building, Los Angeles, has awarded contracts for its new car shops at Torrance. It has a site of about 125 acres to allow for expansion. The structures will be of steel and reinforced-concrete and be equipped to handle heavy car work. A temporary building, 75 x 220 ft., will soon be completed and will be used for the immediate construction of 100 freight cars.

The K. O. Wetzel Co., Los Angeles, has been organized to operate an ornamental iron-working plant at 688 South Rio Street. Kurt O. Wetzel, 912 North Soto Street, heads the company.

The Moreland Truck Co., 1701 North Main Street, Los Angeles, is building a one-story foundry, about 60 x 120 ft., at its new plant at Burbank. Electric furnaces will be installed.

The Palau Metals Co., Los Angeles, has been incorporated with a capital of $10,000 to operate a local plant. Charles A. Overmire, William Kennedy and Edward F. Flynn, Los Angeles, are the incorporators.

The County Engineering Department, Los Angeles, will build a new power plant at the county hospital to cost about $30,000. Bids have been received.

The Los Angeles Pump & Supply Co., Los Angeles, has been incorporated with a capital of $15,000. Edward M. Smith, J. W. Harasta and Louis O. Clewett are the incorporators.

The Pacific Northwest

SEATTLE, WASH., Oct. 2.

The Wilson Shipyards, Seattle, has been incorporated with a capital stock of $30,000 by John Wilson, Edgar Ames, T. A. Jones, George Donworth and George W. Albin. It is completing a shipyard on West Waterway to construct and repair wooden ships.

The Treadwell Co., Douglas, Alaska, has awarded contract for an addition, 50 x 150 ft., to its foundry. The new equipment will include an electric furnace.

The Puget Sound Machinery Depot, Seattle, has let contracts for the erection of a new machine shop and warehouse to cost $20,000, exclusive of equipment, which will more than double its present capacity.

P. X. Johnson and associates, Port Angeles, Wash., plan the construction of a factory at an estimated cost of $10,000, to manufacture the Johnson plumb level.

It is reported that negotiations are under way for the consolidation of the Pacific Construction Co. with the Harrison & Lamond Shipbuilding Co., both of Vancouver, B. C., which provide for the construction of a plant to build wooden ships.

S. T. Carlett, of the New Idea Sheet Metal Works, Vancouver, B. C., has taken over the H. A. Slater Sheet Metal Works and combined the two plants. New equipment will be added to manufacture heating and ventilating equipment.

Dan Kelleher, city purchasing agent, Portland, Ore., is advertising for bids for two 1,000,000-gal. multi-stage turbine pumps, 1,000,000-gal. water power pumping machine, and other equipment.

The Grants Pass Iron & Steel Works, owned by Hall & Fitzpatrick, Grants Pass, Ore., operating a foundry and machine shop, contemplate moving to Klamath Falls, Ore., to take care of shipbuilding demands.

The Pacific Car & Foundry Co., Seattle, has been incorporated for $1,000,000 by William Piggot, president, James F. Twohy, vice-president, O. D. Colvin, treasurer, to build and repair cars, engines, etc.

Canada

TORONTO, Oct. 8

Canadian trade continues in satisfactory volume and many industries are deriving considerable business from war orders. The United States Government has placed several contracts in the Dominion. The machine tool market is not very brisk, although the companies having contracts for 6-in. shells are buying a few special tools, but existing equipment will be generally utilized for the new work. New fixtures, however, will be required to suit the size of shells being turned out. A number of machine shops are busy on marine work. The Canadian Car & Foundry Co., Montreal, has purchased some of the new tools for its plant at Fort William, Ont.,

The Wheeler Safety First Life Belt & Fireproofing Co., Ltd., Montreal, has been incorporated with a capital stock of $25,000 by Jonathan A. McLean, Westmount, Que.; Joseph D. Lajeunesse, Gustave Adam and others to manufacture life saving equipment, fire proofing devices, etc.

The Central Iron Works, Ltd., Toronto, has been incorporated with a capital stock of $100,000 by Arthur J. Thomson, 85 Bay Street; William S. Morlock, 107 Roxborough Avenue; Reginald H. Parmeenter and others of Toronto, to manufacture iron, copper, brass, machinery, tools, etc.

The Soo Pole & Tie Co., Ltd., Sault Ste. Marie, Ont., has been incorporated with a capital stock of $500,000 by Harry F. Partridge, Minneapolis, Minn.; Edgar D. Alger, Sault Ste. Marie, Mich.; John L. O'Flynn of Sault Ste. Marie, Ont., and others, to manufacture lumber, timber, wood products, etc.

The Standard Foundry & Supply Co. Ltd., Walkerville, Ont., has been incorporated with a capital stock of $40,000 by Frederick S. Ferguson, Tom P. Charlton, Gordon Ross, all of St. Thomas, Ont., and others, to manufacture iron, steel, brass, machinery, tools, etc.

The London Rolling Mills Co., Ltd., London, Ont., manufacturer of bar iron, steel, bolts, nuts, etc., has received permission to increase its capital stock from $200,000 to $500,000.

The Federal Government has taken over the ship repair equipment of the Lake Shipbuilding Co., Buffalo, N. Y., to be used in Montreal, for the purpose of rejoining Lake vessels that have been cut in two for the trip through the Welland and St. Lawrence canals.

The Canadian Leather Board Co., Chambly Station, Que., is in the market for shafting, pulleys and other equipment for its factory which is being erected at a cost of $250,000.

Boilers, engine, generators, etc., are required by Stewart & Adams for the soap factory which is being erected for Henry K. Wampole & Co., Herriott Street, Perth, Ont. The plant will cost $50,000.

The Canadian General Electric Co., Toronto, will build an addition to its plant at Peterboro, Ont., to cost $40,000. E. G. Paterson is superintendent of the Peterboro plant.

The Romeo Foundry Co., Port Huron, Mich., is having plans prepared for the erection of a foundry at Sarnia, Ont., and will commence construction work this fall. It will manufacture automobile castings, etc., and will cost $200,000.

The Packard Electric Co., St. Catharines, Ont., is in the market for a second-hand power squaring shear to cut No. 10 gage steel up to 24 in.

The Canadian Hanson & Van Winkle Co., Toronto, manufacturer of platers' supplies, etc., will erect two additional stories to its plant at 15 Morrow Avenue, to cost $7,000.

The Coughlan Shipyards, Vancouver, B. C., at which six steel steamers will be constructed, four of which are under construction, will also build the boilers for the vessels and a permit has been taken out for the erection of a boiler shop.

The Weston Water, Power & Light Commission, Weston, Ont., will increase the capacity of the machinery in the substation by changing three of the present 50-kw. transformers for three of 100 kw. development.

THE IRON AGE

New York, October 18, 1917

ESTABLISHED 1855 VOL. 100: No. 16

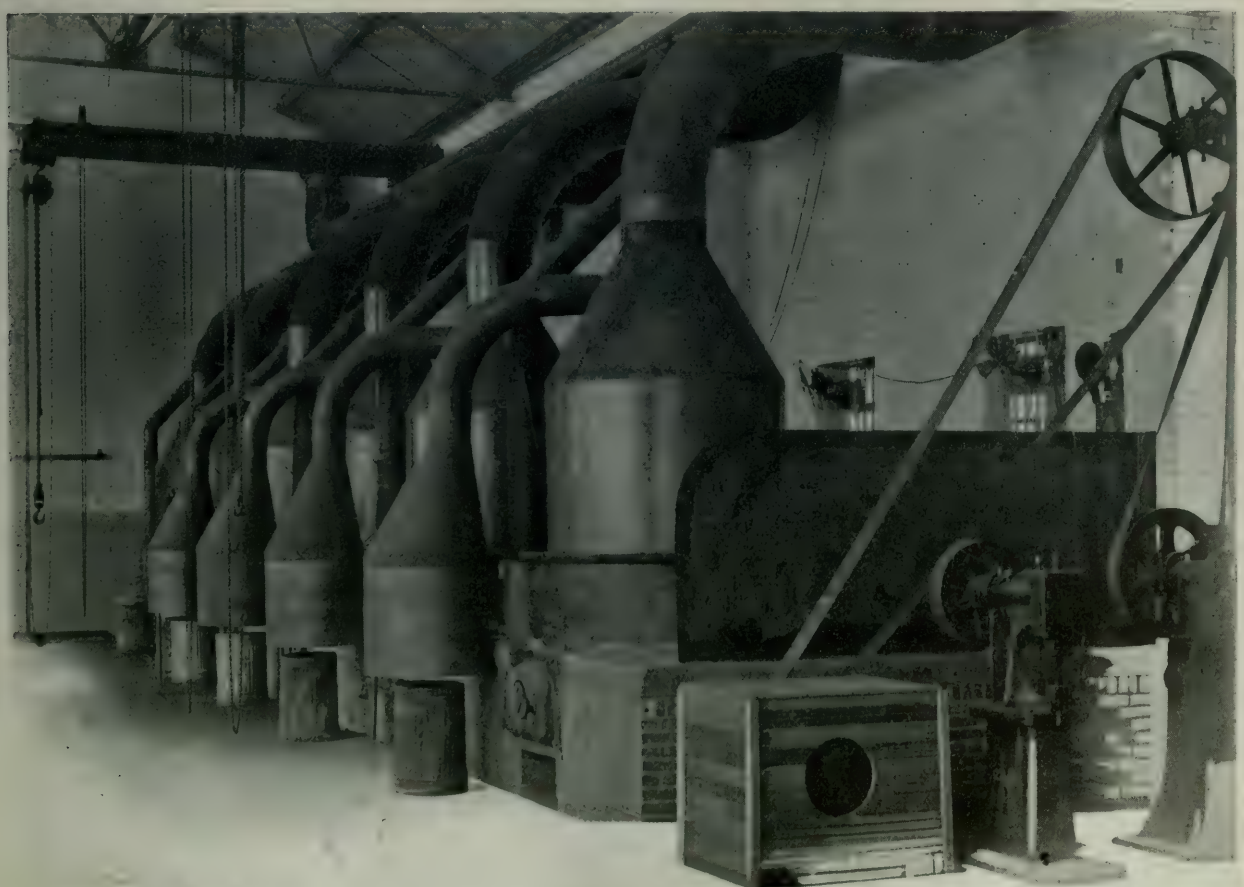
Plant for Large Output of Die Castings

Arrangements to Reduce Production Costs of White Metal Parts in Toledo Works of Doehler Die-Casting Co.

THE demand for white metal castings has grown remarkably fast in the past few years as a result of their increased use in the automobile and other industries that have experienced a marked development, and the growth of the die-casting industry has kept pace with the demand. The increased use of these castings can also doubtless be attributed to some extent to improvements in the die-casting process, including the development of better machines and the making of larger and more complicated die castings than formerly.

Five years ago the Doehler Die-Casting Co., Brooklyn, N. Y., established a branch plant at Toledo, Ohio, the location being near the center of the Central Western automobile field. That plant, which occupied 20,000 sq. ft. of floor space, soon proved inadequate to supply the growing demand of its trade and a new one has been built recently with 80,000 sq. ft. of floor space. This is of the most modern type, designed to meet the special needs of this industry, and provides for economical quantity production by the arrangement of its various departments and the routing of material in the process of manufacture, without the loss of time and labor. Its products include die castings of white metal alloys used for various automobile parts and automobile accessories, such as parts for ignition and lighting systems and magnetos, speedometer parts, gears for oil pumps, windshield nuts, fuse plugs, etc. Outside of the automobile field large quantities of white metal castings are now used in talking and vending machines, and the process is now used to some extent in making munition parts. Another important product of the plant is bronze back babbitt-lined bearings that are largely used in automobiles.

The plant consists of two parallel buildings separated by a wide paved court. The main building is



A Battery of Six Furnaces Each with a Capacity of 1000 Lb. and Using Either Coal or Gas Fuel Is Employed for Melting and Mixing the Metals That Form the Various Alloys Entering into the Production of Die Castings. The output of the furnaces is 8 to 10 lb. ingots ready to go to the melting pots of the die casting machines



Most of the Machines in the Die-Casting Room Are of an Improved Type in Which the Molten Metal Is Forced into the Dies by Air Pressure

420 ft. long and 50 ft. wide. One end of this, 150 ft. in length, is a one-story and basement structure that is occupied by the casting room. The remainder is two stories and basement and is used for various manufacturing departments, inspection and shipping rooms, and for office purposes, the offices occupying the first floor at the front of the building. The second building is 200 ft. long and 50 ft. wide, one story in height, and contains the brass foundry, mixing and metal storage departments. A railroad siding adjoins this building into which raw stock is taken directly from the cars. The buildings are of brick and steel construction. The windows are of factory ribbed glass and steel sash, and the floors are of concrete.

Metal is received in the metal storage room in the form of zinc, tin, copper and lead ingots, and after being weighed on a Toledo automatic scale goes to the stock room. The various alloys are made of a composition to meet specifications. The metals are combined into alloys in a battery of six furnaces, each having a melting capacity of about 1000 lb., and arranged so that they can be gas or coal fired. One furnace has a power-driven mixer or mixing blade that revolves in the pot, being geared to a motor. The metal in the other furnace pots is stirred by hand while melting. The alloy is taken from the furnaces in small ladles and poured into water-cooled, cast-iron molds, where it is cast into ingots weighing from 8 to 10 lb., in which form it goes to the melting pots of the casting machines.

The ingots pass down chutes into sheet-metal shop barrels having a capacity of 700 to 800 lb. each.



In the Cleaning Room a Band Saw Is Employed for Cutting the Gates from the Castings



The Die Makers' Benches Are Located at Right Angles to the Side Walls, Thus Giving Much More Bench Space than a Continuous Bench along the Wall

Each barrel bears a permanent stencil number. Covers are placed on the barrels which are sealed and weighed and tagged, and a receipt is given for each barrel and its contents when the barrels are delivered to the casting department. Here the barrels are distributed to the machines and their contents are used as needed. This care in checking up the metal is due to its high value. To prevent the entrance of burglars the windows in the metal storage department are covered with bars of the type used in prisons.

Ingots are handled in the mixing and storing departments on elevating platform, hand-operated trucks. A monorail track connects the two buildings, and a hand hoist equipped with scales is provided for conveying the barrels containing the alloy ingots from the mixing to the casting department. Separate gas-fired furnaces are used in the mixing department for remelting rejected castings.

Adjoining the melting department is the brass foundry used for making the bronze shells for bearings. This is equipped with eight pit furnaces and three Hawley-Schwartz melting furnaces. Molds are made on three Osborn jar-ramming molding machines. An overhead hand hoist is used for handling the pouring ladle. Gates are cut off the castings with a punch press and then they are cleaned in the Pangborn sand-blast barrel and the two ends are ground. A chemical laboratory is also located in the foundry building.

The casting department is equipped with 35 die-casting machines designed by the company and arranged in three rows extending the length of the room. With the exception of a battery of gravity



The Machining Department in Which the Castings Receive the Finishing Touches

flow machines the casting machines are of the latest improved power plunger type, the metal being forced into the die at a pressure of 1000 lb. per sq. in. by an air cylinder above the machine. Each machine is operated by two men, one of whom handles the valve that controls the air that forces the metal into the die, and the other takes the casting out of the die, the two together changing dies when required.

The casting room is entirely free from piping, all pipes for water, gas, air, and for taking away the products of combustion being carried beneath the floor with connections through openings in the floor under each machine. Products of combustion from the melting pots, which are a part of each machine, are removed by four 8-in. pipes that run the length of the casting department under the floor and terminate above the roof at the end of the building. The ventilating system provides a natural draft, and the casting room is free from smoke and gases at all times.

The castings go from the machines to one end of the casting room, where they are counted and are given a preliminary inspection. Then they are taken to an adjoining cleaning room where the gates and fins are cut off and they are sent to the machining department. The cleaning department is divided into three sections, one for lead, one for zinc, and one for babbitt alloys, so that scrap metal in the form of chips from each cleaning department is kept separate.

Bronze shells used in making bearings go from the brass foundry to the bronze babbitting room on the second floor, where they are lined with babbitt. The shells are first cleaned by being dipped in acid. Then they are dipped into solder pots, after which they are placed in fixtures in special babbitting machines. A nozzle cap is placed over the casting in the fixture and clamped in place, and the babbitt is poured into the mold formed by the shell, a lining of babbitt from 1/16 to 3/32 in. thick being cast on the inner surface of the bronze shell. The molten babbitt melts the coating of solder and causes the adhesion of the two metals. The babbitt, after being poured, is air cooled in the machines. One man operates a battery of four babbitting machines. After babbitting, the gates are cut off on a band saw and the bearings go to the machining room. Here the outside of the bearings is machined on special turret lathes, the work being held in place by pneumatic power, and other machines are provided for boring, face milling and making the oil grooves. After these operations the bearings go to the inspection and shop departments.

The die-making department is one of the largest and most important departments of the plant, owing to the large number of dies required, some of which, particularly those for magneto parts, are very complicated and require weeks to make. Accuracy is maintained within 0.001 in. and an allowance must be made for the shrinkage of the casting. Dies are designed in the engineering department on the first floor, and the drawings are sent to the die room which occupies a large part of the second floor. One section of this room is used for machine work for repairing parts of casting machines, and the other for making dies. Each die maker and his assistant have a bench 8 ft. long and 3 ft. wide, one side of the die room being occupied by these benches, which are placed 7 ft. apart at right angles to the side wall. Each bench is equipped with two drawers, one for the die maker and the other for his assistant. Dies are designed so that as many small parts as possible are cast in one die, and thus in one operation of the die-casting machine. One of the recent products is a washer about ¾ in. in diameter made in large quantities for a munition part. Sixty of these washers are made in one die, the casting coming from the machine with the washers attached to the leader through a thin surrounding web and gates. The washers are cleaned and cut from the attached metal on a punch press with a special fixture that cleans both the inside and outside circumference of the washer, 10 of the washers being cleaned with each operation of the press.

The air compressor equipment occupies a basement room. This includes a Bury two-stage 7½ x 14 x 14-in. compressor, providing 150-lb. pressure for operating the air cylinders of the casting machines, a 14 x 14-in. Bury compressor supplying 60-lb. pressure for blowing dust from the dies between operations, and an American Air Compressor Works' 200-lb. pressure compressor that supplies the air for the machines that make die-cast bearings.

In the basement are also located the steel stockroom, the dieroom and the salvage department for bearings, where bearings rejected by the inspection department are again inspected and those having defects that can be corrected are reclaimed, a white metal inspection room, factory serve-self restaurant, a locker room with steel lockers, lavatories, and a shower bath room with 10 showers.

SHIPBUILDING AT MOBILE

Southern City Suddenly Becomes Important Manufacturing Center

MOBILE, ALA., Oct. 15.—Since the United States Steel Corporation recently purchased a site near Mobile for a great shipbuilding plant the importance of this city as a shipbuilding place has grown rapidly. For years Mobile has had several small plants that built small wooden vessels, principally motor boats, and one large concern, the Alabama Dry Dock & Shipbuilding Co., that has done work in steel ships, mostly repair work, but not until recently did shipbuilding attain a large position.

First recognition came from the navy department, which gave a newly formed concern, the Barret Shipbuilding Co., a contract for four submarine chasers. This contract was sublet to the Henderson Iron Works, which has almost completed the four vessels. This concern moved its plant across the river to Pinto Island, enlarged it and reincorporated under the name of the Henderson Shipbuilding Corporation. It is now actively launched in the shipbuilding business, with a capital of $250,000.

Some time ago representatives of the Kelly-Atkinson Construction Co. of Chicago came to Mobile to see the agent of the Louisville & Nashville Railroad concerning rates on lumber and other materials necessary in the construction of ships. They were contemplating a ship yard at Pascagoula, Miss., 40 miles below Mobile. Upon suggestion they looked over sites in Mobile, were pleased with the old Heironymus Docks property, and entered into a two-years' lease for it. This company holds contracts for building 18 merchant vessels for the government, to be completed in 18 months, at a cost of $10,000,000. It will build six marine ways and will erect machine shops costing $50,000 on the property. The first keel was laid Sept. 15, and the work is rapidly progressing.

Through the Tennessee Coal, Iron & Railroad Co., the Steel Corporation has purchased 11,500 acres eight miles above Mobile, paying $780,000 cash. This land is said to be for a shipbuilding site.

While the plans of the Steel Corporation for the development of its Mobile property have not been made public, it is generally understood that they include plants for the manufacture of nearly everything that goes into the composition of steel ships, except the plates. The plates will be rolled at the steel plant at Fairfield, near Birmingham, for which the Steel Cor-

poration recently appropriated $11,000,000. Twelve marine ways will probably be built and 12 ships fabricated at a time. It is understood that, in addition to these various mills and shops, the Steel Corporation will build a model city near the ship yard. So large a property as has been purchased would not be needed for a ship yard alone.

The Government has spent in the neighborhood of $15,000,000 canalizing the Warrior River up to the Birmingham district, and it offers cheap all-year navigation to the products of that district. It is said that steel plates can be shipped by barge to Mobile for 40 cents a ton, against a rail rate of $2.80 a ton.

Coal Distribution Order Issued

WASHINGTON, Oct. 16.—The first of a series of orders to distribute coal on a priority basis and regulate the movement of coal cars, issued by Fuel Administrator Garfield, provides that the Pennsylvania Railroad, which serves about 7000 mines, shall have its needs properly taken care of. Other railroads will be served through similar orders soon to follow, which will comprise the first series.

All producers of bituminous along the Pennsylvania lines will contribute pro rata to the fuel needed for its operation. The amounts required will, in some instances, interfere with delivery of full consignments called for by their contracts with customers. But the railroads must be kept running. The Fuel Administration suggests that operators withhold coal from persons or corporations needing it least, and that they attend particularly to the supply of other railroads than the Pennsylvania.

It is deemed particularly essential that coal needed by the United States Government be not interfered with. The Fuel Administration may make a special priority order in special cases and intends to care fully for domestic users. Munitions plants and firms manufacturing necessities of life would come into the priority order class. The plan is expected to show immediate results in an increased supply of coal cars and a steady, equitable flow of fuel to the railroads.

The tremendous increase in manufacturing and transportation activity this year has created a demand for soft coal in excess of any in the past, an increase in demand that is difficult to measure in terms of tons but that is certainly more than the 10 per cent by which production has increased. To meet this demand the mines have been producing soft coal at a rate never before equaled. In the second week of July, 1917, the average daily production was more than 1,900,000 tons, the highest point yet attained; in the middle of August, the lowest rate for the summer, 1,638,000 tons, was recorded; and in the last week in September the daily rate was 1,823,000 tons. In the first eight months of 1917, the output of soft coal was 363,500,000 tons, or 37,000,000 tons more than in the first eight months of 1916. In the same period shipments of anthracite increased 16 per cent over those of 1916.

The Filer & Stowell Co., Milwaukee, manufacturer of machinery, engines, etc., has filed suit in the Circuit court at Milwaukee against fifty-two fire insurance companies, to recover sums aggregating $352,373, claimed to be due upon its loss by fire on Dec. 15, 1916. The complainant states that it carried insurance to the amount of $760,000 and that the fire damage amounted to $896,296, and the amount of damages claimed is stated to be the difference between the sum of its policies and the payments thus far made by the companies on the loss.

Electric steel founders and other large consumers of current in Milwaukee and immediate vicinity are confronted by a sharp increase in the cost of current by the action of the Railroad Commission of Wisconsin in granting the Milwaukee Electric Railway & Light Co. and other electric power companies an increase amounting to approximately 22 per cent in charges for current, effective immediately. The increase affects all consumers who use 1000 kw. or more per month.

A War Time Industrial Lift Truck

A form of high lift industrial elevating truck intended for light duty has been placed on the market by the Lewis-Shepard Co., 48 Binford Street, Boston. The maximum capacity of the truck is less than the earlier one, which was illustrated in THE IRON AGE, May 4, 1916, being 2500 lb. as compared with 5500 lb.

The load is lifted vertically by a combination of leverages secured by from four to six short strokes on the handle, and as the ratio is 40 to 1 it is emphasized that women and boys can operate the truck, thus releasing men for other work. A universal joint secures a free lifting and steering handle, which is a feature that permits the load to be elevated with the handle of the truck turned to the side. In this way it is possible to raise or lower a load in narrow aisles or other congested places. The load is lowered to the floor by a release check controlled by a pedal located on the front of the truck. Placing the check in a vertical position, it is pointed out, eliminates the probability of leakage at the piston end or the buckling of the plunger. The necessity of changing leather cup packing is also done away with as all the parts are of metal.



A Lifting Ratio of 40 to 1 Enables Women and Boys to Operate This Truck

This truck is made in six models, three having wheels 6 in. in diameter, while those of the other three trucks are 10 in.

Automatic Oscillating Radial Grinding Machine

For grinding radial thrust bearings, large diameter spherical shapes, external and internal ball races and spherical sockets, the Rivett Lathe & Grinder Co., Boston, has brought out an automatic radial grinding machine. It can also be used for all classes of radial grinding work and has an adjustable cross feed for the workhead and a fixed rate of travel for the oscillating head throughout the latter's stroke in contradistinction to the general design of this class of machinery. It is pointed out that with the variable cross feed, which can be procured through a simple adjusting collar and is automatically decreased as the grinding proceeds, it is possible for the operator when starting work on a bearing race, for example, to remove the metal rapidly and take a fine cut while finishing. Greater uniformity in the work is said to be secured as a result of providing a fixed rate of travel for the oscillating head since the grinding wheel remains in contact with each portion of the finished surface for the same length of time.

Brass Flux to Reduce Silicates

In a paper presented before the American Institute of Metals at its annual meeting in Boston, E. D. Frohman, S. Obermayer Co., Pittsburgh, claimed for the Rillton brass cleaner, a flux made by that company, reduction of silicates of copper as well as oxides in the process of melting brass. He said that in one case a melt in an open-flame furnace contained considerable slag and in this case the addition of 2 to 3 lb. of the flux to the charge enabled the furnaceman to tap 530 lb. of metal, though the original charge of metal was only 500 lb. This he claimed resulted from the reduction of the non-ferrous silicates in the slag.

The Leather Belting Makers' Association

Operation of the Leather Belting Exchange Under Open-Price Competition and the Results Attained

BY LOUIS W. ARNY*

THE Leather Belting Exchange is a trade organization composed of 37 manufacturers of leather belting, and representing 60 to 65 per cent of the leather belting product of the country. The efforts leading to its organization began in September, 1914, and the following months were devoted to a careful study of the conditions of the trade and of the methods which were in use by other trade organizations. For a number of years prior, the conditions in the leather belting trade were very bad. There were 160 concerns in the country competing for the business, many of them getting but a very small share, and most of them very ignorant about their own costs of production or their competitors' selling prices. Of the latter, the only information available was that gathered by salesmen from buyers and, as the buyer is always an interested party, this information was often incorrect and extremely unreliable, but as there was no other source it formed a basis for all the quotations which were made.

The Basis of Operation

The system in use by the Exchange is a composite, embodying the best practice and the best thought and the experience of other trade organizations, adapted to the peculiar conditions of the leather belting business, and, after an experience of nearly two years, has proved satisfactory. It is founded on the principles promulgated by Arthur J. Eddy of Chicago, and explained and elaborated in his book, "The New Competition." The fundamental principle is that of publicity, the supply of accurate information to members regarding sales which have been made. This information is derived from the seller, and not from the buyer, and passes through a routine by which it is audited, classified and tabulated, and then goes to the members. It was believed at the time of organization, in consonance with the Eddy theory, that when a seller had accurate and dependable information regarding the prices at which similar goods actually had been sold, his logical impulse would be to demand for his goods prices on a parity with those at which he knew that other houses had sold, or approximating thereto. This is the same principle which has worked successfully in the grain and stock exchanges. The prices at which belting has been sold are open and above board, and the Exchange is therefore an "open price association." In an organization of this character it is of first importance to secure the confidence of the members in the inviolability of the information which they impart to the Exchange, by establishing safeguards which will satisfy them that their business secrets will not be exposed.

Advantage of Meetings

A very important feature of trade association work is the meetings, the purpose being to bring the members together as frequently, and to get them into as close touch with each other, as possible, so that they may really know each other intimately; and this close personal touch is of the utmost importance. This is difficult in such an organization as the Leather Belting Exchange because the members are located at points so far distant, but an effort has been made to accommodate the meetings as far as possible to the convenience of the members. Annually there is one meeting arranged for a week end at a resort, and the members with the ladies of their families are together three days. Though this meeting is largely social, it is the most important meeting of the year in producing those relations among the members that take the sting out of competition. Men who spend three days with each other golfing, automobiling, walking, etc., and the members of whose families develop friendship for each other look in a different light upon their competitive relations. All these meetings are reported stenographically and every member, whether present or absent, is in close touch with everything that has been said or done. They are held with open doors and any member is privileged to bring a non-member competitor, a buyer or a friend.

The Matter of Price Reporting

In the operation of the Leather Belting Exchange as regards the price at which its members sell their goods there is no compulsion, coercion or restriction, or even influence, implied, expressed, understood or intended, and every member is absolutely free to make any classes or grades of goods that may seem best to please his trade and to sell them to any buyer anywhere at any prices and terms that may seem suitable to him. It must be emphasized that the Exchange does not concern itself in any manner about prices to be made or quoted in the future and it makes no effort to control or influence prices, but concentrates its work on reporting prices which have been made on transactions which are completed, trusting entirely that the price question shall adjust itself through the logical results of the information concerning what has been done.

The only requirement of the Exchange is that, after the sale has been made, a duplicate copy of the invoice shall be forwarded to the office. At the meetings there is no discussion whatever of price, and lately there has been very little private discussion among the members, principally because they have all the data regarding prices, and there is little to be said on the subject, but any information that any member at any time may want about prices or quotations which have been made by member houses can always be had for the asking. When a salesman reports some fabulously low price from a buyer as having been quoted by a competitor the inquiry sometimes is made as to the accuracy of the statement, but usually for the purpose of exposing its falsity. Buyers are not so active in their efforts to break down prices by reporting fictitious quotations as they once were. Further, the price question is looked upon as having been settled in the automatic control exercised by publicity. In view of the high prices of material, prices for the product are not regarded as being satisfactory, but, considering all the factors of the case, they are probably as nearly satisfactory as reasonably can be expected.

Daily Charts to Members

In actual working, every member sends to the secretary every day a carbon copy of every sale of leather belting that he has made that day, this carbon copy being identical with the sales invoice, giving the name and address of the buyer, a description of the goods sold, the quantity, price, discounts, terms and weights, omitting only the name of the seller, but substituting for it a number, by which it is identified. The Exchange then assorts these invoices and calculates from the data thereon the weight per square foot in ounces and the price per pound realized, and all these, excepting only the name and address of the buyer and the name of the seller, are reported on a chart which goes to every member every day. These sales cover the entire country and some little delay in the receipt of the invoices at the office is unavoidable, but this work is now so managed that the charts are just ten days behind the actual sales, so that the members are in possession on the eleventh day of the month of a full report of all the sales which were made on the first day of the month. The only exception is that the Exchange limits its publication on these charts to such items as amount to more than $60, because there is a vast volume of these small sales which are unim-

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portant competitively, and their omission reduces the work of the Exchange and concentrates upon the charts only those items of most interest.

The leather belting product is divided into four grades or qualities, and on these charts each one of these grades is reported separately, and all the items of a similar grade are grouped under one heading. In addition to these reports of sales, the chart each day gives a summary, which supplies the following information:

1. The total sales of that day, including invoices of all amounts.
2. The total sales for the month to that day, inclusive.
3. The total sales to the same date, inclusive, of the previous month.
4. The average price per pound realized in all sales for each of the four grades mentioned.
5. Total average price per pound received for all classes of belting.

The country is divided into geographical districts, each of which embraces a number of States, and the disposition of the goods in these districts is indicated so that, though the members do not know the buyer or his address, they know that certain volumes of goods have gone into New England or the Middle West, and the trend of demand in these various geographical districts may be watched. Incidentally, the routine of the Exchange also supplies an additional audit on these invoices and it discovers many errors, some of them of considerable importance, which might otherwise remain uncorrected.

A Monthly Report to Members

In addition to the charts which go out every day, as described, the entire business for each month is tabulated and summarized in a monthly report, which is issued as soon as possible after the sales of the last day of the month are reported. These reports are made up separately for each individual member and they give the following information:

1. Total business done by all members of the exchange, and as compared with the total business of the previous month and of the corresponding month of the previous year, with the variations expressed in percentage.
2. The total business of the individual member addressed, and as compared with his total business of the previous month, and for the corresponding month of the previous year, with the variations expressed in percentage.
3. His proportion in percentage of the total business done by all the members, with a comparison of his similar proportion for the previous month and the corresponding month of the previous year.
4. The maximum average price obtained by any one member on each of the four grades of belting mentioned.
5. The minimum average price obtained by any one member on each of the four grades of belting mentioned.
6. The average price obtained by all members on each one of the four grades named.
7. The average price obtained by the individual member to whom the report is sent, and as compared with the average price obtained by him during the previous month and during the corresponding month of the previous year, with variations expressed in percentage.
8. The average price obtained by all members for all classes or grades of belting, and as compared with the previous month and the corresponding month of the previous year, with the variations expressed in percentage.

The monthly report also gives the average total sales per working day for the month and the total sales in each one of the nine geographical districts mentioned, and also gives the figures of the previous month and all other months for two years, so that the trend of volume of sales in each one of these districts is apparent.

What Results Have Been Attained

The information of the charts has been of much value in stimulating the sales departments to larger sales at good prices. It is a ready answer to the salesman who always complains that his prices are not right. It is also a check on the factory in the maintenance of goods to standards of weight, as any variation is quickly shown in the price per pound and, as a result, there has been a better standardization of weights, leading to closer uniformity in product. Without any agreement or understanding about prices, the possession of accurate information regarding the prices at which sales have been made by competitors has led to a material reduction in the spread of the variation in prices, and making due allowance for the differences in the merit of the goods offered, and of the different methods and qualities of salesmanship employed, and of other conditions which enter into the problem of price, it fairly can be said that the system has accomplished results that may be considered as being highly satisfactory.

There have been at work, too, other forces besides those of information and possible emulation in the attainment of better prices, for the Exchange has constantly urged upon its members a betterment in the ethics of business. As a result of the higher ideals which it has tried to inculcate, there are to-day a number of houses who are selling their goods at fixed uniform prices for the same grades to the same class of customers everywhere, which has done much to unify prices. Formerly every price was the result of a haggle between the salesman and the buyer, but now, as a general rule, the more important concerns make prices that are beyond the power of the salesman to change or alter, and there are no special prices or considerations to be had. Further, the Exchange has labored toward the production of a more uniform high quality of goods, discouraging in every way any attempt at substitution, or of cheapening of qualities, and this in turn also has had its effect in unifying prices.

Standard Contract Form and Cost Accounting

The Exchange has adopted and put into practice a standard contract form, which is now being used by a large majority of the houses engaged in the business. This form reduces the length of time of the contract, obligates the buyer to take a specified quantity of goods within that time and limits the obligation of the seller to a stated amount, all of which are distinct improvements over the old form of contract agreement previously in force.

Another activity of the Exchange has been the development of a uniform system of cost accounting. This has been a work of much labor, because of the variation in the methods of the various members, but it has been accomplished and the Exchange's accountants are now at work installing this uniform system in the houses of the various members. The acceptance of this system is purely voluntary and there is no intention to make any use of it in any effort to control prices, but it is readily conceivable that when it is in full operation many members will learn that their production costs are quite different in some particulars from what they thought them, and it must have an indirect effect on the prices which, in the future, they may be willing to quote. It also must lead to the exposure of wasteful and inefficient methods and to the discovery and employment of better processes and to a better standardization of product. Members of the Exchange discuss with each other very freely their production problems, and welcome each other to an inspection of their plants, and the establishment of a uniform system of factory accounting will make it possible for them to discuss with each other these problems in terms which readily may be understood.

Scientific Research Undertaken

Another most important work which the Exchange has undertaken has been that of a scientific research into the nature and characteristics of its material, looking toward a betterment in the process of manufacture, and the production of a leather belt of greater efficiency, and possibly at a lower cost, and the development of real data on the subject of belt engineering. There is no satisfactory information on this subject, due to the fact that comparatively little work has been done upon it, and this little has been done by those who were not well informed regarding the nature of the material of which belting is made. It is the purpose of the Exchange to develop a standard belt of the greatest efficiency and economy, and to then formulate and classify the scientific principles under which this standard belt may be most successfully operated. This is a large work, involving much expenditure, but the Exchange has undertaken it with the purpose of placing the business on a higher plane than it has ever occupied.

Investigation of an Acid Open-Hearth Heat*

Uniformity for Shell Steel Demonstrated for British Government—Ingot Mold Large End Up with a Hot Top

BY T. D. MORGANS AND F. ROGERS

THE work described in the present paper was undertaken at the special request of Colonel Stansfeld, C.B., deputy director-general of munitions inspection, with a view to determining the general quality and uniformity of the acid open-hearth steel made at the Blaenavon Co.'s works for the manufacture of high explosive shells.

The plan of the investigation consisted in making the following analyses and tests from pit samples and from the top, middle, and bottom billet from one of the 40-ton acid open-hearth furnaces:

Analyses of pit samples taken immediately before casting each ingot (Table 1).
Analyses of the top, middle, and bottom billet from each ingot (Table 2).
Tensile test from the top, middle, and bottom billet from each ingot (Table 3).
Brinell test from the same (Table 3).
Microscopic examination of the same.

[The results of the tests are plotted in a diagram and a representative selection of photomicrographs are reproduced in the original paper.]

Experimental Heat

The following are the general particulars of the heat investigated:

Composition of the Charge

	Tons	Cwts.	Qrs.
Pig iron	19	1	0
Heavy scrap	21	8	0
Shell steel turnings	3	0	0
Ferromanganese	0	11	3
Ferrosilicon (50 per cent silicon)	0	2	1
Iron ore	2	0	0
Limestone, about	0	14	0
Total	46	17	0

	Hr.	Min.
Commenced charging	12	50 a.m.
Finished charging	6	0 a.m.
Charge melted	10	15 a.m.
Charge boiling	11	0 a.m.
Tapped	2	10 p.m.

Total time taken for charge, 13 hr. 20 min. The ferromanganese and ferrosilicon were put into the bath; none into the ladle.

Analysis of slag taken at the end of the process after the addition of the alloys:

	Per Cent
Silica (SiO_2)	55.67
Alumina (Al_2O_3)	4.11
Oxide of iron (FeO)	17.63
Lime (CaO)	10.04
Manganese oxide (MnO)	13.02
Sulphur and phosphorus (S and P)	Traces
Magnesia (MgO)	0.82

Color of slag, bottle-green.

Size of mold.....18½ in. by 16½ in. (top)
Size of mold.....16½ in. by 14 in. (bottom)
Top of mold brick lined to the depth of 11 in.

Total length of ingot, 5 ft. 6 in. (including head). Ingots teemed in pairs. Approximate weight of ingot, 40 cwt. The time taken to teem the whole cast was 25 min.

Slag was taken for analysis after the addition of the alloy and after teeming metal into ladle. The bath was caught coming down (no pigging back).

Ore not used after carbon in bath reached 0.70 per cent.

Analyses of Pit Samples

These figures will be readily appreciated upon referance to the mean, maximum, minimum and range of variation shown at the foot of Table 1. Practically the irregularities in carbon, phosphorus and silicon are negligible. The variations of sulphur and manganese are more noticeable, but on reference to the table, it will at once be seen that there has been a fairly general fall of sulphur and manganese during the teeming of the ingots, a period of about 20 min. The fall of sulphur (0.009 per cent) is much lower, however, in relation to the fall of manganese (0.11 per cent) than would be the case if the removal of manganese sulphide were the sole action.

These, therefore, give very strong evidence that the fall in manganese is mainly due to the continuance of its deoxidizing action. The drop in sulphur and manganese in the ladle has occasionally been found by other observers.

Top, Middle, and Bottom Billet of each Ingot

The primary feature of the analyses of the top, middle and bottom of each ingot is their regularity. The variation of the sulphur no longer follows a definite fall. This is possibly because the ingot is drawn from a considerable part of the ladle, while naturally the pit sample can only represent a small fraction near to the nozzle at the moment of taking it. The agitation in the ladle during teeming the ingot would possibly be sufficient to mask the tendency evidenced only in the pit samples to removal of MnS.

Table 1—Analyses of Pit Samples

Ingot	Carbon, Per Cent	Phosphorus, Per Cent	Sulphur, Per Cent	Manganese, Per Cent	Silicon, Per Cent
1	0.506	0.043	0.062	0.840	0.172
2	0.512	0.044	0.063	0.875	0.178
3	0.497	0.043	0.060	0.820	0.175
4	0.508	0.043	0.063	0.785	0.169
5	0.491	0.042	0.057	0.830	0.168
6	0.521	0.043	0.060	0.845	0.178
7	0.513	0.039	0.059	0.785	0.180
8	0.500	0.042	0.059	0.790	0.182
9	0.526	0.040	0.061	0.840	0.178
10	0.517	0.041	0.061	0.840	0.179
11	0.509	0.042	0.061	0.790	0.174
12	0.496	0.040	0.056	0.795	0.180
13	0.499	0.040	0.057	0.765	0.174
14	0.526	0.042	0.060	0.810	0.174
15	0.513	0.042	0.057	0.810	0.174
16	0.541	0.042	0.062	0.840	0.174
17	0.526	0.041	0.060	0.805	0.168
18	0.519	0.044	0.060	0.795	0.169
19	0.551	0.044	0.055	0.795	0.176
20	0.507	0.043	0.055	0.805	0.176
21	0.512	0.042	0.054	0.765	0.169
22	0.519	0.044	0.054	0.785	0.171
Maximum	0.551	0.044	0.063	0.875	0.182
Minimum	0.491	0.039	0.054	0.765	0.168
Range	0.060	0.005	0.009	0.110	0.014
Mean	0.514	0.042	0.059	0.810	0.175

Manganese in each case appears definitely to fall. The removal of manganese in the ladle may be taken as distinctly established throughout the present experiments and this is mainly due to the continuance of its deoxidizing action. In the bottom bars silicon also appears to have fallen, but we consider that an explanation founded upon this result might be rather hazardous. The mean results are assembled in the following table:

	Carbon. Per Cent	Phosphorus, Per Cent	Sulphur, Per Cent	Manganese, Per Cent	Silicon. Per Cent
Mean, top bars	0.542	0.045	0.058	0.840	0.177
Mean, middle bars	0.524	0.043	0.055	0.831	0.173
Mean, bottom bars	0.519	0.039	0.051	0.829	0.167
Range of means	0.023	0.006	0.007	0.011	0.010
Mean of means	0.528	0.042	0.055	0.833	0.172
Pit sample means	0.514	0.042	0.057	0.810	0.175

This shows distinctly the usual slightly higher percentages of elements found in the upper ends of ingots.

The comparison between the means of pit samples and of bar samples shows fair consistency in view of the much superior nature of the general sample constituted by the means from the bars, as compared with the mean pit sample.

It should be noted, as a rough generalization upon the whole of the analyses, that the range of variation

*From a paper presented at the annual meeting of the Iron and Steel Institute, London, Sept. 20.

Table 2—Analyses of 4-In. Billets—Finished Top Bars—Billet No. 7

Maximum	0.563	0.048	0.059	0.875	0.182
Minimum	0.525	0.043	0.055	0.785	0.175
Range	0.038	0.005	0.004	0.090	0.007
Mean	0.542	0.045	0.058	0.840	0.177
Finished Middle Bars—Bar No. 4					
Maximum	0.541	0.045	0.058	0.845	0.175
Minimum	0.509	0.039	0.052	0.775	0.171
Range	0.032	0.006	0.006	0.070	0.004
Mean	0.524	0.043	0.055	0.831	0.173
Finished Bottom Bars—Bar No. 1					
Maximum	0.536	0.042	0.054	0.865	0.173
Minimum	0.507	0.037	0.047	0.780	0.160
Range	0.029	0.005	0.007	0.085	0.013
Mean	0.519	0.039	0.051	0.829	0.167

in each element is of the order of one-tenth of the amount of the element present (that is, 5 per cent each way from the mean value), with the exception of silicon in the top and middle bars, which is less than this proportion, and carbon in all the bars, which varies only about 3 per cent up and down from the mean. The authors point out that this degree of variation compares favorably with tests upon single casts which within their experience have been obtained in works practice and is closer than is usually obtained upon successive similar casts.

Table 3—Tensile and Brinell Hardness Tests on 4-In. Billets. Billet Position 1 (Bottom)

	Yield Stress, Tons per Sq. In.	Maximum Stress, Tons per Sq. In.	Elongation, Per Cent	Brinell Test on 3000 Kilos. Hardness Number
Average	23.15	46.82	21.94	208
Maximum	24.4	48.08	23.5	212
Minimum	22.4	46.2	20.5	201
Range	2.0	1.88	3.0	11
Billet Position 4 (Middle).				
Average	23.01	47.12	21.5	210
Maximum	24.2	47.88	24.0	217
Minimum	22.0	46.0	18.5	207
Range	2.2	1.88	5.5	10
Billet Position 7 (Top).				
Average	23.49	47.5	21.7	210
Maximum	24.6	48.6	23.0	217
Minimum	22.4	46.48	20.5	207
Range	2.2	2.12	2.5	10

Average yield stress of whole cast, 23.21 tons per sq. in.
Average maximum of whole cast, 47.15 tons per sq. in.
Average elongation of whole cast, 21.71 per cent.
Average Brinell hardness number, 209.0.

Ingots 3 and 4.—Electric power failed at roughing of Ingot 3, and bottom billet of Ingot 4 too cold to finish. Hence the omission of these tensile and hardness tests.

Tensile, Hardness and Forged Shell Tests

The tensile and hardness tests, in view of their practically featureless uniformity, call for very little comment. It is seen that the tests are well up to standards for this class of steel without further heat treatment after rolling to 4-in. square billets.

It has been possible to add some results of tests taken from the walls of the shell which were forged from this cast, Table 4.

It is seen that these results are well in accordance with the usual specifications for steel of this class; and they show the maintenance of that regularity in quality which was indicated in the more exhaustive tests upon the semi-finished steel already discussed.

Table 4—Tensile Tests on 4.5-in. Shell Forgings

Elastic Limit, Tons Per Sq. In.	Maximum Stress, Tons Per Sq. In.	Elongation, In 2 In. Per Cent
Over 19	48.1	21.6
Over 19	47.6	21.6

The illustration shows a photograph of a section of an ingot from another cast, A20, the particulars of the manufacture of which are practically identical with those of the experimental cast, all the ingots of which were rolled into billets. This ingot was teemed in 2½ min. Its weight was 1 ton 18 cwt. 0 qr. 18 lb.; and the weight of top discard was 4 cwt. 2 qr. 20 lb., which is 12.26 per cent of the total weight of the ingot. The following is the chemical analysis of this ingot:

Carbon Per Cent	Silicon Per Cent	Sulphur Per Cent	Phosphorus Per Cent	Manganese Per Cent
0.44	0.164	0.050	0.045	0.820

The tensile test from the same cast rolled to 4-in. billets was:

Elastic Limit, Tons Per Sq. In	Maximum Stress, Tons Per Sq. In.	Elongation in 2 In. Per Cent
21.9	43.4	22

The pipe was very satisfactorily located in the head and its form indicated no tendency to secondary pipe.

Microstructure of the Steel

Photomicrographs were taken under comparative conditions from 17 of the billets at random. The position of the field photographed was in every case approximately upon the continuation of the axis of the tensile test piece and near one corner of the section of the billet, about ½ in. from each of the two neighboring sides. The magnification was 50 diameters.

The structure consists of a ferrite network, which is partially discontinuous in places, whose meshes are filled with generally lamellar pearlite. Toward the edges of the billet the network size is smaller, and toward the center larger than at the field adopted as standard for the photomicrographs. In many places



Section of An Acid Open-Hearth Steel Ingot Cast at the Plant of the Blaenavon Co. for Making High Explosive Shells. The effect of the hot top and casting large end up is revealed by the extent of the pipe

there are isolated large meshes, or local discontinuities of the network according to the point of view. Throughout the general microscopic examination of all the pieces, no features were encountered which could be classed as defects in a steel of this class.

The variations of structure which were found were such as ordinarily occur in good steel of this class. Such variations, including local differences of network size, were not in any instance of a nature which would prove detrimental to the steel for the purposes for which it was intended.

It is announced in Wheeling, W. Va., that a new company for the manufacture of airplanes will be organized there, of which A. P. Phillips, for a long time associated with the Curtiss plant in Buffalo, will be general manager. A plant will be established, but for the present this will be devoted only to the manufacture of airplane parts.

CASTING BEARINGS

Molding Practice—Segregation in High-Lead Alloys—Sand versus Metal Molds

FOUNDRY problems in the use of both sand and metal molds for casting bearings of nonferrous alloys were discussed by R. R. Clarke, Pennsylvania Lines West, Pittsburgh, in a paper presented at the annual meeting of the American Institute of Metals, Boston, Sept. 26. He explained some methods of avoiding difficulties commonly experienced in molding each of three groups of metals; those containing less than 10 per cent lead, those containing between 10 and 15 per cent lead, and those containing between 15 and 50 per cent lead. An abstract of his paper follows:

Low-lead alloys, if the phosphorus and the ratio of tin to copper are held to safe limits, offer no great difficulty. The 80-10-10 alloy with ½ to 1 per cent phosphorus is easily handled. It works best on second melting, though satisfactory results are obtained by combining and pouring direct. We have found that adding the tin and lead in combination to the copper bath together with vigorous stirring improves the product.

In making the mold, the sand should be of good body and rather dry. Also, it should be tamped until hard, as this causes the metal to freeze rapidly. Facing the molds well with plumbago has the same effect and also makes for a smoother casting. The mold when of sufficient depth should be gated at or near the bottom and the metal should be poured at a low temperature, as hot metal favors lead segregation. Also, the castings should be left in the sand until cooled below the freezing point of lead. A horizontal molding position with the journal core in the drag is preferred, although molding castings such as crown brasses in a vertical position or "on end" is sometimes countenanced. It is a method we have tried and discarded.

Products of medium lead content require the same measures. Phosphorus should be kept to a mere trace, melting and pouring should be done from medium sized rather than large crucibles and stirring should be vigorous and from the bottom up.

Practice with high-lead alloys varies only in a few details from that of low-lead alloys. The inclusion of phosphorus is prohibitive, the use of low-grade material is more markedly detrimental, and the constant building up of scrap with new material is more imperative. Cope shrinkage also is more pronounced and calls for higher and more powerful pressure gates.

Castings of high-lead content should be shaken out cherry-red rather than left in the sand until cold, as this prevents excessive segregation. It is found that the metal casts as well using the direct method as by first pigging and then casting. When working new metal with scrap a good method is to first reduce the copper and then add the scrap, followed by the lead. High-lead alloys should not be subject to air and oil methods, at least not in the type of furnace we operate. Also it appears that the electric furnace is satisfactory. Regardless of practice, absolute exemption from segregation in high-lead alloys has not been our experience.

Metal and Sand Molds Compared

The chill-molding idea applies chiefly to the crown brass variety of work embodying heavy duplicate castings. Locomotive driving-box shells are an example. They run from 50 to 200 lb. and represent almost exclusively our experience in chill-molding bearing metals of copper base. With metals of low or conservative lead content we have not had much success. With higher percentages fairly satisfactory castings are possible, though we do not concede these castings to equal the sand-molded ones. They have a tendency to blow holes, shrinkage, and a most unsightly appearance. This latter condition arises from the lead sweating out and adhering in globules to the walls, these globules being broken off when the casting is removed from the mold. We also believe that the sand-molded castings properly made are as free from metal-included sand as those molded by the chill method.

W. H. Wood 12 years ago developed an iron-chill mold which is still being used in the Altoona brass foundry of the Pennsylvania Railroad Co. and which apparently promotes homogeneousness by preventing too rapid freezing. However, we doubt that it is more economical than the molding machine. Also, the work of using it is not congenial. With five chill molds to work with, I would rather make 20 sand castings than 15 chill ones.

Copper Miners Agree to Arbitrate

WASHINGTON, Oct. 16.—The following telegram has been received from the commission appointed by the President to investigate the labor situation in the mountain region and on the Pacific coast:

"The President's labor commission, sent to the southwest and the mountain region, has concluded the hearing of the side of the striking miners in the Globe Miami copper district of Arizona. The commission was gratified to hear that the State leader of the strikers and President Moyer of the International Union of Mine, Mill and Smelter Workers have unreservedly placed the adjustment of the Arizona labor difficulties into the hands of the commission with an unconditioned agreement to abide by any decision the commission may make for the maintenance of peaceful labor relations in Arizona at least during the period of the war.

"The commission is now hearing the side of the operators and when that side is concluded and the views of other parties interested in the commission's inquiry are submitted the commission will begin the task of formulating a plan of settlement through the co-operation of all interested parties, which it is hoped will satisfy all sides and thus give the nation the copper it needs under just conditions of employment.

"The striking unions concluded the presentation of their case to the commission by making an unqualified offer to go back to work immediately upon the agreement of the operators to submit the dispute to arbitration by the commission, and to continue at work pending the arbitration. The strikers expressly stated that they were eager to do away with any delay which would in the least hold up the normal production of copper for the use of the nation."

The commission is composed of the following: William B. Wilson, Secretary of Labor, Col. J. L. Spangler of Pennsylvania, Verner Z. Reed of Colorado, John H. Walker of Illinois and E. P. Marsh of Washington. Felix Frankfurter of New York is acting as secretary of the commission.

Equipment for Tennessee Company's New Plant

A large order for the complete electrical equipment for the new plant of the Tennessee Coal, Iron & Railroad Co. at Fairfield, Ala., has been placed with the General Electric Co. This includes one type I-88, 4000 hp., 82 r.p.m., 6600 volt, mill type motor with fly wheel for driving the 110 x 36 in. plate mill; one type I-88, 2500 hp., 82 r.p.m., 6600 volt, mill type motor for driving a 28-in. roughing mill; one type I-50, 3000 hp., 155-130 r.p.m., 6600 volt, mill type motor with speed regulating set for driving 24 and 26-in. finishing mills; one motor set consisting of two type MCF-22, 2800 hp., 55 r.p.m., 900 volt, motors forming a 5600 hp. unit, with flywheel set consisting of three MCF-16 2000 kw., 360 r.p.m., generators driven by one type I-20, 4000 hp., 360 r.p.m., 6600 volt induction motor with 100,000-lb. fly wheel, for driving the 44-in. blooming mill. The order also includes all the accessories, switchboard and control equipment.

Atlantic furnace of the Republic Iron & Steel Co. at New Castle, Pa., has resumed blast after being relined and some new equipment added. The capacity of the furnace will now be about 400 tons per day. Hannah furnace of the company at Youngstown, Ohio, will likely be blown out in a short time for relining and general repairs.

TROUBLES RECLAIMING BRASS

Fluxes and Design of Furnace Were Obstacles to Remelting Scrap

Troubles incident to the installation and operation of a reclamation plant to reclaim non-ferrous metal scrap were described by W. H. Parry, National Meter Co., Brooklyn, N. Y., in a paper presented before the American Institute of Metals at its annual meeting in Boston. The ingots obtained from this scrap, he explained, were used in the making of red-brass castings capable of withstanding a pressure of 250 lb. per sq. in. A review of his paper follows:

A coal-fired reverberatory furnace with a capacity of 3000 lb. per charge was chosen after considering various types of furnaces and cupolas. The contract for building this furnace was let to a furnace builder specializing in the type of furnace desired, though a few alterations were made to his design by the company's engineers against his protest.

After a fire had been started in the furnace for the purpose of drying it, the cast-iron buckstays with which the furnace was liberally braced gave way under transverse stress. These gray-iron buckstays were replaced by those made of the garden variety of steel railroad tracks and no further trouble was experienced from them.

The fire box was equipped with 1¼ in. square steel-grate bars. An air space of 1¾ in. was allowed between bars. As soft coal was used this allowed about 75 per cent of the coal to drop down into the ash pit. These were replaced by cast-iron bars designed for an air space of ¾ in.

The most important error was reducing the stack area, making it impossible to do any more than fuse the metal. The return flue passing over the roof had an area of 240 sq. in., while the stack was squeezed to 113 sq. in. This was detrimental to the operation of the furnace, indicating that data bearing on steam boiler practice are not applicable to melting furnaces. A new stack was erected with a 340 sq. in. area and the height increased 10 ft. making the total distance above the flue 40 ft.

From various sources, formulas of fluxes were obtained, but these failed in practice. Technically trained experts with practical experience were consulted and more formulas were prescribed but these also failed. The furnace therefore was shut down until a man capable of operating it was found. He ignored all flux formulas and successfully melted all the metal.

A list of the flux formulas tried out and found inadequate follows:

To every 1000 lb. of metal add 150 lb. of air-slaked lime and 150 lb. of pulverized charcoal. Mix these dry. By the use of this flux all metal was lost.

To every 100 lb. of metal use a flux made as follows: Two parts of plaster of Paris, one part of air-slaked lime and one part of fluorspar. Mix dry and use a quantity not exceeding 10 per cent of the charge. By the use of this flux 80 per cent of the metal was lost.

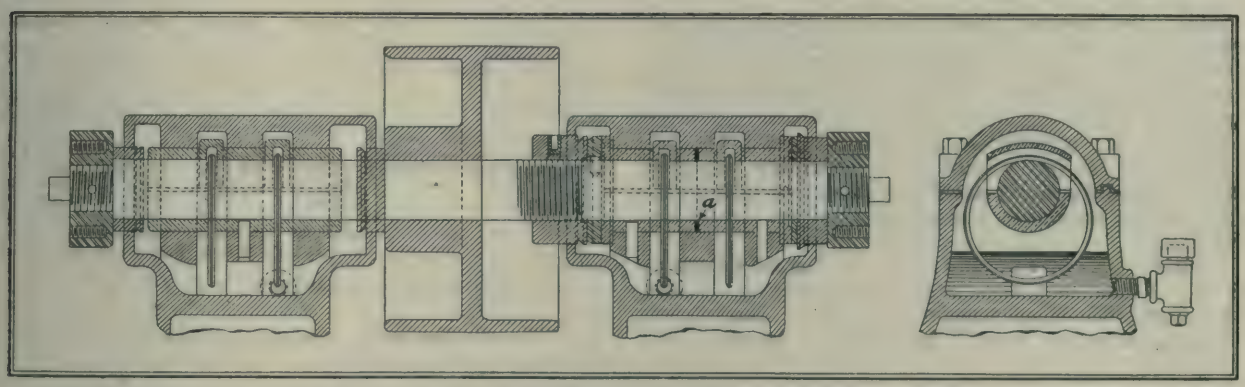
Use three parts of lime, one part of silica sand and one-half part of anthracite coal to every 1500 lb. of metal. As the flux weighed 900 lb. to a 3000 lb. charge it was expected that the melting loss would be very small, but again all metal was lost.

Combine one part of fluorspar, three parts of lime and one-half part of hard coal. This formula proved entirely unsuccessful.

The material melted and on which these fluxes were used was composed of spillings, turnings, slag, which had first been passed through a cinder crushing machine, band-saw dust and grindings. The latter was of a consistency similar to that of No. 2 Albany molding sand, and one-third of it was mixed with the charge.

New Spindle for Disk Grinding Machines

Providing clearance space to take up expansion in the bearing receiving the end thrust and the use of a special arrangement of oil channels in the faces of the thrust bearings characterize a new spindle construction that has been adopted on all single-spindle disk grinding machines built by Charles H. Besly & Co., Beloit, Wis. The clearance space is designed to take up any expansion in the phosphor bronze bearing bushing which receives the end thrust that may be caused by a rise in temperature while the bearing is in service. This has been made necessary by the fact that all of the end play must be taken up in both directions. The oil channels in the faces of the thrust bearings are of a special design which, it is explained, produces a pumping action that is relied upon to force the oil in large quantities between the thrust collars.



Clearance Space *a* to Take Care of Any Expansion of the Phosphor Bronze Bushing Due to Temperature Rise in Service Is Provided in a New Type of Spindle Construction for Disk Grinding Machines

The bearings are a combination automatic ring oiling radial and thrust arrangement with inserted renewable phosphor bronze bushings. The supply of lubricant is placed in the cup shown at the extreme right of the accompanying drawing at intervals of 3 to 12 months, depending upon the character of the service to which the machine is subjected. From this cup the oil passes into the reservoir in the base of the bearing and is lifted by steel oil rings, two for each bearing. The rings operate through channels cut in the bushings, an arrangement which is relied upon to prevent the rings from failing to perform their functions due to displacement. In addition to the ring oiling arrangement for the radial bearings, channels are cut in the faces of the thrust bearings. These are of a special design which is relied upon to set up a pumping action and force oil between the thrust collars.

The bushings employed are of the inserted split type and can be renewed when necessary. The bushing receiving the end thrust is provided with a clearance space *a* which is relied upon to compensate for any expansion that may take place in operation. In this way, it is pointed out, all the end play can be taken up in the spindle without causing the bearing to bind between the hardened and ground tool steel thrust collars. These collars, which take up the end thrust, bear against the flanged ends of the right-hand bearing bushing. An adjusting collar, threaded on the spindle and located under the rim of the spindle pulley, is provided for taking up end play. In this way, it is pointed out, the accuracy of the work that is being turned out is insured.

Exports of Iron and Steel Increase

Reduction Attributed to Embargo Proves Temporary but Movement Is Still Below That of a Year Ago—Heavy Imports of Manganese Ore

THE embargo instituted by the United States Exports Council July 15 for a time cut heavily into the exportations of iron and steel as indicated by the July report of the Bureau of Foreign and Domestic Commerce, but a decided change is shown in the August report. The total of exports of iron and steel in July was only 349,649 tons, while for August it was 522,810 tons. The movement is, however, still below that of a year ago, for in August, 1916, the tonnage of exports amounted to 598,192. Decided gains were made in August in the exports of pig iron, scrap, billets, rails and plates. In the valuation of machinery exported, the total shows a heavy decline as compared with a year ago, but the amount is almost the same as for July of this year.

Imports of Iron and Steel

	August		Eight Months	
	1916, Gross Tons	1917, Gross Tons	1916, Gross Tons	1917, Gross Tons
Ferromanganese	8,525	2,840	48,687	35,473
Ferrosilicon	479	654	4,521	6,887
All other pig iron	5,882	2,296	28,857	12,749
Scrap	7,143	11,213	41,432	161,789
Bar iron	952	402	5,792	1,905
Structural iron and steel	55	1,063	1,067	2,745
Steel billets without alloys	105	5,615	8,135	25,905
All other steel billets	1,411	661	10,418	4,908
Steel rails	7,056	1,174	23,576	5,495
Sheets and plates	122	92	1,217	1,192
Tin and terne plates	105	....	775	124
Wire rods	423	111	2,989	313
Total	32,258	26,121	177,466	259,485

The imports of iron and steel for August amounted to 26,121 tons compared with 32,258 tons in August, 1916, and with 28,859 tons in July, 1917. The imports of manganese ore were 87,650 tons in August, 1917, compared with 76,721 tons in August, 1916. For the eight months the imports of manganese ore were 457,878 tons in 1917, compared with 395,686 tons in 1916.

Exports of Iron and Steel

	August		Eight Months	
	1916, Gross Tons	1917, Gross Tons	1916, Gross Tons	1917, Gross Tons
Pig iron	60,264	.....	283,382	.....
Ferromanganese	.....	*a* 453	.....	*a* 1,082
Ferrosilicon	.....	*a* 1,141	.....	*a* 3,208
All other pig iron	.....	*a* 60,489	.....	*a* 90,161
Scrap	18,149	6,761	121,833	134,784
Bar iron	5,207	2,306	52,245	36,462
Wire rods	11,451	20,577	107,584	99,681
Steel bars	79,338	48,810	524,584	423,201
Billets, ingots and blooms, n.e.s	160,921	189,083	888,565	1,329,708
Bolts and nuts	2,653	2,736	19,351	202,835
Hoops and bands	3,649	4,685	29,590	36,616
Horseshoes	372	1,495	6,206	3,113
Cut nails	278	453	2,795	2,416
Wire nails	14,809	10,552	99,341	64,444
Wood screws	.....	*a* 129	.....	*a* 580
All other nails, including tacks	1,160	874	6,078	13,023
Cast-iron pipes and fittings	6,348	5,775	42,373	47,893
Wrought pipes and fittings	22,454	10,862	93,514	85,575
Radiators and cast-iron house heating boilers	434	188	1,632	4,017
Railroad spikes	1,366	843	18,561	12,808
Steel rails	41,820	24,698	304,773	338,592
Galvanized iron sheets and plates	8,527	7,822	55,123	57,970
All other iron sheets and plates	4,909	5,738	31,436	39,375
Steel plates	26,297	49,802	172,109	355,498
Steel sheets	8,536	11,576	68,110	93,628
Ship and tank plates, punched and shaped	.....	*a* 1,627	.....	*a* 3,044
Structural iron and steel	27,581	19,418	182,533	201,312
Tin and terne plates	18,758	15,962	160,357	116,460
Barb wire	46,843	5,817	299,515	109,915
All other wire	26,068	12,138	188,203	129,058
Total	598,192	522,810	3,714,426	4,036,456

a Not separately enumerated prior to July 1, 1917.

Exports of Machinery

	August		Eight Months	
	1916	1917	1916	1917
Adding machines	$129,067	$153,806	$956,869	$1,492,403
Air-compressing machinery	131,690	56,916	513,555	648,457
Brewers' machinery	43	22,738	11,325	95,096
Cash registers	299,288	32,197	1,171,109	619,090
Parts of	16,176	5,208	103,710	57,135
Concrete mixers	.....	*a* 9,479	.....	*a* 23,844
Cotton gins	21,922	5,402	61,266	64,429
Cream separators	25,499	25,640	346,362	456,093
Elevators and elevator machinery	180,405	82,869	1,128,769	1,400,804
Electric locomotives	5,783	2,253	377,042	322,305
Gas engines, stationary	36,783	20,223	248,729	579,164
Gasoline engines	2,031,934	212,218	11,256,199	2,398,925
Kerosene engines	.....	*a* 198,298	.....	*a* 406,405
Steam engines	1,821,236	2,564,329	7,518,864	17,952,107
All other engines	345,943	112,054	3,454,630	3,047,173
Parts of	1,235,185	.....	6,311,024	*b* 9,287,245
Boilers	.....	*a* 294,890	.....	*a* 506,644
Boiler tubes	.....	*a* 557,839	.....	*a* 1,039,377
All other parts of engines	.....	*a* 1,767,909	.....	*a* 2,634,959
Excavating machinery	.....	*a* 58,369	.....	*a* 85,052
Milling machinery, flour and grist	183,862	39,671	1,698,545	521,354
Laundry machinery, power	41,497	25,967	212,405	294,059
All other	26,804	31,548	146,461	175,268
Lawn mowers	23,412	7,121	170,719	144,747
Metal-working machinery (including metal-working tools)	8,134,473	.....	55,316,874	*b* 44,604,259
Lathes	.....	*a* 1,621,168	.....	*a* 3,181,002
Other machine tools	.....	*a* 785,685	.....	*a* 1,555,120
Sharpening and grinding machines	.....	*a* 406,670	.....	*a* 848,712
All other metal-working machinery	.....	*a* 1,771,683	.....	*a* 3,701,011
Meters, gas and water	66,079	26,270	271,071	323,351
Mining machinery, oil-well	316,911	95,212	1,439,620	891,059
All other	750,076	946,613	4,269,737	7,306,583
Paper mill machinery	108,514	199,259	525,985	1,282,690
Printing presses	207,375	208,833	1,260,043	1,134,272
Pumps and pumping machinery	527,970	463,667	3,523,658	3,977,294
Refrigerating and ice-making machinery	64,177	114,857	483,939	775,482
Road-making machinery	.....	*a* 22,118	.....	*a* 52,169
Sewing machines	391,980	444,460	3,744,281	5,068,193
Shoe machinery	82,524	87,196	666,450	1,011,203
Sugar-mill machinery	1,074,104	702,831	3,028,172	4,536,450
Textile machinery	394,224	283,456	2,389,367	2,181,841
Typesetting machines	54,649	92,394	792,551	778,676
Typewriting machines	1,438,199	527,086	7,337,448	6,706,204
Windmills	83,046	78,123	761,798	715,531
Wood-working machinery, saw mill	46,688	61,178	290,715	411,164
All other	125,569	58,331	608,733	711,894
All other machinery, and parts of	4,104,910	2,912,441	25,663,807	26,971,293
Total	$24,657,597	$18,196,475	$148,061,832	$162,977,581

a Not separately enumerated prior to July 1, 1917.
b Six months ending June 30, 1917.

A DOUBLE ANNIVERSARY

Taylor-Wharton Co. Celebrates Its Founding and the Making of Manganese Steel

VERY few steel companies are able to celebrate their 175th anniversary and still fewer can probably combine with such an event the commemoration of a 25th anniversary, pointing back to a distinct land mark. It was the good fortune of the Taylor-Wharton Iron & Steel Co., High Bridge, N. J., to be able to do both of these unusual things on Saturday, Oct. 13. It was also possible for the company to capitalize the fact that it has furnished iron or steel for every war in which the United States has ever taken part.

Cannon balls of iron and other war necessities were manufactured by the Taylor Iron Co., founded in 1742, for the Revolutionary war. Twenty-five years ago, in 1892, the company started the manufacture of manganese steel castings which has been a very important part of its output ever since. These two facts furnished the basis for the celebration.

The Taylor-Wharton Iron & Steel Co. of to-day had its start in early Colonial times. The High Bridge, N. J., district in early times possessed local ore deposits, abundant timber for charcoal and plenty of water power and these induced the original founders to locate there. They employed Robert Taylor to manage the work for them. Shoes for horses and oxen, wagon iron, nails and crude farming implements and necessities were made in the early days. Later material was furnished for the Revolutionary war and the Civil war. While there have been periods of inactivity in the long lapse of years, due to business depressions, there has been none in the last 50 years. During the entire history of the company, since the management by Robert Taylor, the leadership has continued through five generations in direct line of descent.

Manganese Steel and Recent Expansion

In 1892 came the greatest change in the company's history, unless its recent expansion by the purchase of new companies be recognized. In that year came the introduction of the manufacture of alloy steels or manganese steel, under the direction of William J. Taylor, assisted especially by Dr. Henry M. Howe, Oliver W. Chrystie and Henry D. Hibbard, with the co-operation of Sir Robert Hadfield of Sheffield, England. Lewis H. Taylor was then president. The High Bridge plant, with 256,000 sq. ft. under roof, is now devoted entirely to this industry, turning out many kinds of manganese steel castings for mining, dredging and other work. The output is now over 60 tons of converter steel castings a day from a 3-ton converter. A Heroult electric furnace will soon be operating, supplementing the converter process. Besides the dredging buckets and large and small gears and pinions the company produces a special line of manganese steel chain made up of assembled steel castings.

With the introduction of the manufacture of manganese steel, the company's name was changed to the Taylor Iron & Steel Co. and its manganese steel has since been known by the trade name Tisco. In 1912 the company purchased the plant of William Wharton, Jr., & Co., Inc., Philadelphia, for the purpose of expanding the use of manganese steel in track work. The Wharton company had become the largest customer through an exclusive arrangement which had existed for 18 years. Since then the parent company has further expanded until it controls five main subsidiary plants as follows:

The High Bridge plant, operated directly under the name of Taylor-Wharton Iron & Steel Co., originally the Taylor Iron & Steel Co., is devoted entirely to the manufacture of manganese steel and other special steel castings. This was the first, and for many years the exclusive producer of manganese steel in this country.

The Easton, Pa., plant, operated in the name of the Wm Wharton, Jr., & Co., Inc., is entirely new, consolidating three plants formerly located in Philadelphia. The product is track work, such as frogs, switches, curves and track layout for steam and electric railroads and all kinds of light and heavy iron and steel forgings and castings. A considerable portion of the manganese steel castings made at High Bridge is used in the manufacture of track work at the Easton plant.

Philadelphia Roll & Machine Co. now consists of two parts, the Twenty-third Street plant making rolls and rolling mill machinery, and the Twenty-fifth Street plant, formerly the property occupied by the Wm. Wharton, Jr., & Co., which produces iron and steel castings and machinery of a miscellaneous nature.

Manganese Steel Safe Co., Plainfield, N. J. Preparations are being made for the removal of the machinery and business of this plant to High Bridge.

Tioga Steel & Iron Co., Philadelphia, produces light and heavy miscellaneous hammered and hydraulically pressed forgings. Recently this company has been awarded a contract by the Bureau of Ordnance, United States Navy, covering a heavy tonnage of rough machined and heat treated forgings for 4-in. Navy guns, for which a new plant is being built.

The Historical Pageant

The little town of High Bridge was gaily decorated on Saturday where visitors and guests from nearby towns and steel men from New York, Philadelphia, and other places assembled at the invitation of the company. With the population of the town at least 9000



Colonial Float Drawn by 10 Horses Showing the Part the Taylors Have Taken in the Manufacture of Munitions for Their Country's Various Wars

persons attended the anniversary. Plant visitation formed an important part of the program, various groups being escorted through the works by specially designated guides. The feature of the occasion was a historical pageant or parade which, after passing through the principal streets of the town, was reviewed by Knox Taylor, president of the company, and other officials and guests from a reviewing stand in front of the company's main office.

The parade was an imposing spectacle, made up of many floats representing the local civic industries and fraternal societies as well as the development of the company with special ones from each unit of the company. The Easton plant was represented by many employees and the Philadelphia units were well represented, escorted by a Philadelphia band of 20 pieces which swelled the music from four other bands. Of special interest was an automobile carrying the men who have been in the company's employ for 50 years or more; a Colonial wagon with six horses carrying the 40-year men with other 40-year men in decorated autos, and three automobiles carrying representatives of three generations now employed at the steel plant.

Gold medals were given to employees who have been 50 years with the company, silver medals to those who have been in service 25 to 50 years, and bronze medals to those from 5 to 25 years. A clam bake for 2500 guests was a feature as well as moving pictures and dancing in the evening.

Dr. Henry M. Howe and Henry D. Hibbard, pioneers in the business, were present and were among those scheduled to deliver addresses late in the day, as well as Governor Edge. The celebration was impressive in that it demonstrated the unanimity which pervades the entire organization and which has been so instrumental in its success in the past.

THE MANGANESE PROBLEM

War Minerals Meeting of the Mining Engineers Discusses Its Solution

A HIGH note of patriotism was sounded at the war minerals meeting of the American Institute of Mining Engineers at St. Louis, Oct. 8 to 11. The sessions opened with a patriotic gathering which was international in character. Doctor Ami, official representative of the British Embassy, spoke of Great Britain's appreciation of the entrance of the United States into the war and the efforts which were being made. He likened Great Britain, France and the United States, the three greatest world democracies, to granite made up of quartz, mica and feldspar. The three principal minerals of this most durable of all rocks, he said, typified the three allied nations, quartz standing for rugged England; mica for polished France, and feldspar, useful and complex in composition, suggesting the melting pot of the United States.

Captain De Billy, representing the French Mission and himself a mining engineer, talked on the work of engineers and particularly the mining engineers in the conduct of the war, not only on the firing line but behind the lines. Dr. Feodor Foss of the Russian Industrial Mission told how the mining engineers of Old Russia offered their services to the Government at the outbreak of the war but were refused. He stated that New Russia looked to the United States for assistance in solving her tremendous industrial problems.

F. W. De Wolf, assistant director U. S. Bureau of Mines, in charge of war problems, described in general the machinery of Government that has been designed and built by the co-operative efforts of the existing bureaus with business and professional men. He called attention to the fact that the business of Government had increased four fold since last April and while mistakes were necessarily made at first, order was gradually appearing; certain boards and committees have been found unnecessary and have been eliminated while those whose functions have been clear cut have acquired increased strength.

Work of the War Minerals Committee

The War Minerals Committee consisting of W. Y. Westuvelt, chairman, representing the American Institute of Mining Engineers; David White, representing the U. S. Geological Survey; A. G. White, representing the U. S. Bureau of Mines, and W. O. Hotchkiss of the American Association of State Geologists then outlined the purposes of the committee and the work which it was endeavoring to do. The entire audience showed a grim spirit of quiet determination but was moved to the greatest enthusiasm by the patriotic utterances of the speakers. It was not simply spontaneous enthusiasm because the speakers impressed upon those present the responsibilities upon the mining engineers of the country while members of the War Minerals Committee brought home in a business-like manner the serious shortage of certain minerals essential in making war which results from the extreme lack of ocean shipping.

Shortage of Manganese and Pyrites

At the present time while there is a shortage of domestic manganese ore, there is also a shortage of pyrite, chromite, platinum, mica and other minerals, but the most serious of these is manganese and pyrite.

It was brought out in the meetings that the United States must endeavor properly to solve the problems of producing satisfactory domestic materials to replace those usually imported. In this way more ships will be available for the most effective purpose to which they can now be put.

The Work in Hand

Of greatest importance to the steel industry is the subject of manganese. In the past almost all of this, whether as ore or alloy, has been imported. The domestic industry has lain dormant. The War Minerals Committee has been endeavoring to obtain the detail of local deposits which are in the files of members of the profession. The U. S. Geological Survey has been actively engaged in obtaining accurate field data along these lines. The problem is not only one of the stimulation of production but the solving of problems of utilizing for steel making the various types of material which can be produced in the country. This work is being actively undertaken by the U. S. Bureau of Mines.

The War Minerals Committee urgently called for the time of individual mining engineers to be devoted, as a patriotic service, to the stimulation of production of domestic manganese ores, through a study of the possibility of improving present mining and beneficiation practice. A whole-hearted response was obtained from the mining profession to this request.

It was, however, pointed out that it would also be necessary for the steel industry to co-operate along the lines of investigating the possibility of using our domestic supplies. This will necessarily involve certain adjustments of the practice of using manganese in steel manufacture. It was hoped by the War Minerals Committee that, when the steel industry or consumers of manganese ore realized the seriousness of the situation, they would respond with a like spirit of patriotism and assist in every way possible the solution of the problems of proper utilization.

INVESTIGATING COAST STRIKE

Government Board Opens Inquiry—Shipbuilding Trouble Ends

SEATTLE, Oct. 12.—The metal trades strike, called more than a week ago, continues unsettled. The Federal Labor Adjustment Board has opened its inquiry in Seattle. While it is not believed that the board will render a decision in Seattle, it is considered likely that a temporary working agreement may be brought about that will permit the 9000 metal trades workers to return to work, pending a permanent adjustment. The strike condition is practically unchanged since the walkout, with the exception of several small plants which have signed up with the union. The Skinner & Eddy Shipbuilding Co. is the only steel shipbuilding plant in the city that is operating. Practically all of the boiler plants, engine works and foundries are idle.

The one important improvement in the condition is the calling off of the strike of the wooden shipbuilders, by voting to return to work. This removes the 10-hour lumber issue entirely from the shipyard controversy and leaves the wage adjustment board a free hand in its efforts to bring about a settlement of the steel shipyard strike. The wooden shipyard strike has been in force since Sept. 14, and has been one of the most serious and difficult phases of the situation. About 1500 men will be affected by the new move. It is not expected that the action of the wooden shipbuilders will have any direct effect on the metal trades workers.

The shipbuilding strike in Portland has developed into a deadlock between employees and employers, over the open-shop issue. Portland plants have announced that they will leave adjustment of the matter to the Federal Labor Adjustment Board. Records show that 78 Government vessels are contracted for in Oregon. Some of the larger plants in Portland are working partial crews.

The Couglan Shipyards, the Vulcan Iron Works and the Patterson Engine Works, all of Vancouver, B. C., are tied up by striking boilermakers and metal trades workers. Higher wages constitute the main part of their demands.

It is stated that an easier tone is felt in lumber and that sawmill production continues three-fourths of normal. The car shortage has again become a serious factor in western Oregon. West Coast lumbermen have been asked to furnish the Government with 10,000,000 ft. of fir airplane stock, 9,000,000 ft. to be clean and without a knot. It is stated that the spruce output is insufficient to meet the demands of the air-

plane manufacturers. West coast lumbermen are now engaged in turning out 25,000,000 ft. of fir stock for the Italian Government. Approximately 5,000,000 ft. of spruce is being shipped to the Government monthly from Washington mills.

New Sheet Plant Starts

The Mansfield Sheet & Tin Plate Co., Mansfield, Ohio, has started operating its new six-mill plant, work on which was started November, 1916. The new plant will employ approximately 1300 men and will have an output of approximately 7000 tons per month. Two parallel buildings with standard lean-tos, measurements over all being 530 ft. by 225 ft., have been erected on an 18-acre tract of land. This work was done by the Massillon Bridge & Structural Co., Massillon, Ohio. One building contains the six hot mills, the four roughing mills, and the bar department. The other contains the cold-roll and finishing departments.

The hot-mill housings weigh 17 tons, and the mills are 30 in. in diameter, with 24-in. necks. The hot mills are driven by one 1500-hp. motor, furnished by the Westinghouse Electric & Mfg. Co., East Pittsburgh, and are gear driven. The driving gear was furnished by the Mesta Machine Co., Pittsburgh. The weight of the gears and flywheels is approximately 370,000 lb. The hot and cold-mill equipment, together with one roll lathe and four 156-in. shears, was furnished by the Hyde Park Foundry & Machine Co., Hyde Park, Pa. All mills are equipped with Baird water-cooled standing plates, which consist of hollow square plates, through which cold water runs. A cold-air system also has been installed on each mill. Fresh air is taken from the outside and kept circulating in the interior of the mill.

The plant is equipped with Allis continuous pair furnaces. The bars are charged from the rear of the furnaces and pushed to the front by hydraulic pressure. These furnaces were installed by the George J. Hagan Co., Pittsburgh. The sheet furnaces are of the standard two-door type, and for the present will be gas fired. Two motor-driven crocodile shears have been installed for cutting sheet bars. These were furnished by the Youngstown Foundry & Machine Co., Youngstown, Ohio. Three cranes, two of 25 tons and one of 30 tons, were furnished by the Alliance Machine Co., Alliance, Ohio, two being used in the finishing department and one in the hot-mill department.

The finishing department is equipped with eight cold mills, driven by one 500-hp. Westinghouse motor and Falk gears. The drive was designed by the Falk Co., Milwaukee, Wis. Five standard construction double annealing furnaces, capable of taking ten charges a day, were erected, and are hand fired for the present. The pickling department has two four-arm Mesta heavy-type picklers, this being the only department where steam is used. A 300-boiler hp. Stirling boiler equipped with Combustion Engineering Corporation stokers also has been installed.

Government Building Ships at Balboa

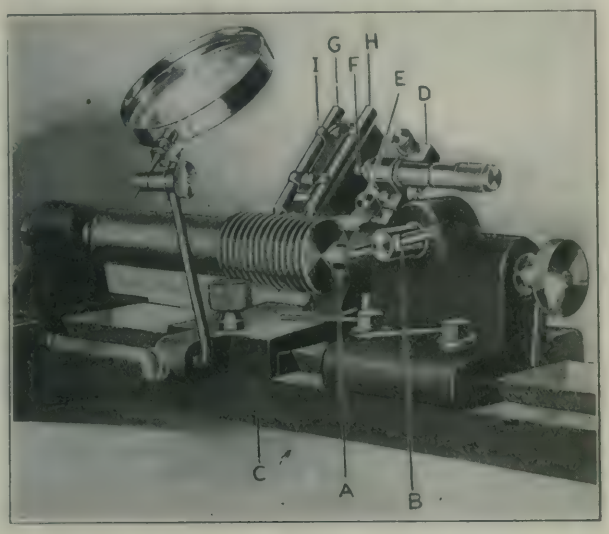
A coast guard cutter for the United States Coast Guard Service is being constructed at the Balboa shops, Panama. The hull dimensions will be: Length over all, 120 ft. 3 in.; beam, molded, 24 ft.; depth at side, 13 ft. 6 in. The power will be provided by two oil-burning water-tube marine boilers having a heating surface of 2200 sq. ft. The main engine will be vertical, inverted cylinder, direct acting, triple expansion type, dimensions 13 x 21 x 34 x 26 in. It is believed that the Government plant at Balboa can compete, at this time, with private plants in the United States on small hulls of this nature.

The Champion Engineering Co., Kenton, Ohio, has been organized to operate the plant of the Champion Iron Co., which was recently sold by the receiver. The new officers are: W. E. Norton, president; R. A. Valls, vice-president and general manager, and R. L. Miller, secretary and treasurer. The company will manufacture the line of electric traveling cranes made by its predecessor.

Testing Machine for Thread Gage Leads

A device which depends upon the principle of seeing light between two curved surfaces for its operation has been developed by the H. E. Harris Engineering Co., Bridgeport, Conn., for testing the lead and angle of thread gages. The device was first manufactured for use in the Bureau of Standards but has since been developed as a commercial proposition on account of the necessity which has arisen for the production of accurately threaded screws, taps and tap holes in connection with the manufacture of munitions. The work of testing is done by two angle test pieces which engage with the threads that are to be tested and a micrometer for indicating the deviation from the proper dimension.

The machine consists of a heavy cast bed to which the stationary head at the left carrying a fixed center is permanently fastened and a sliding tailstock at the right which can be fastened in position on the bed by two clamping screws. This tailstock carries a spring center *A* which can be withdrawn by the knob at the extreme right of the illustration or clamped in place by the screw *B*. The measuring devices are carried on the slide *C*, which is fitted to the bed and may be fastened in position by a thumb screw. This slide supports a second one of the compound type, the lower



The Accuracy of the Lead of Thread Gages Is Determined by Two Angle Test Pieces and a Micrometer Which Measures the Deviation from a Standard Distance

member of which *D* is adjustable toward and away from the line of centers, means for clamping it in the proper position for different diameters of thread gages being provided by the clamp screws *E*. The lower member supports a micrometer head operating against a hardened stud *F* in the upper member of the compound slide, which is provided with lateral movement parallel to the line of centers. The amount of this movement is measured by the micrometer head or by the use of distance gages between the point of the micrometer clamped stationary and the stud on the upper member.

Two angle test pieces, *G* and *H*, are mounted in the upper member of the slide. These are held by the spring clip *I*, which enables them to be adjusted toward or away from the gage or thread that is being measured by finger pressure. The center distances between the V's and the angle test pieces are exactly 1 in. apart, thus providing a basis for checking the error in the lead of gages which are made according to English measurement and are over 1 in. in length.

The gage to be tested is put between the centers by placing one center of the gage upon the fixed center at the left, bringing up the tailstock and clamping it in place and permitting the spring center *A* to go into the opposite center of the gage, after which the spring center is clamped in position. After the gage has been mounted in the machine it is turned on the centers until the thread permits the test point *H* to move into it and cut off light on both sides of the

cone point. After this point has been brought into engagement, the point *G* is then brought down. To measure the amount that the lead on the thread gage is long or short, the micrometer is set at zero and the point *H* is drawn back from the thread. This permits the point *G* to be moved in either direction.

The micrometer is then turned to move this test point until it is opposite the thread, when it is moved down to shut out the light. The distance that this point has to be moved indicates the amount by which the lead of the gage is long or short in 1 in.

Bailey Electric Furnace Installations

The Electric Furnace Co. of America, Alliance, Ohio, is installing at the plant of the Morris & Bailey Steel Co., Wilson, Pa., a continuous car type of electric annealing furnace for the bright annealing of strip steel and sheets. It will have a capacity of 150 tons per day.

Among other installations of electric furnaces that are being made by this company are: A continuous furnace for the reduction of tungsten ore for the Crucible Steel Co., Pittsburgh; a heat-treating furnace for gears for the Pierce-Arrow Motor Car Co.; two billet-heating furnaces for steel forgings for the American Car & Foundry Co., Berwick, Pa.; an automatic heat-treating furnace for automobile crank shafts and other forgings for the Ingalls & Shephard Forging Co., Harvey, Ill.; a brass-melting furnace with a daily capacity of eight tons for the Bridgeport Brass Co., Bridgeport, Conn.; a similar furnace for the Hayes Mfg. Co., Erie, Pa.; an automatic heat-treating furnace for treating airplane parts for the Erie Specialty Co., Erie, Pa., and a large melting furnace for aluminum alloys with a daily capacity of 24 tons for the Aluminum Co. of America, at Massena, N. Y. Furnaces have been erected by this company and recently placed in operation for annealing locomotive axles in the plant of the Valley Steel Co., St. Louis, Mo., and a furnace for melting brass slabs for cartridges with a daily capacity of eight tons in the plant of the Baltimore Copper Rolling & Smelting Co.

The Suwanee Iron Co., Grand Rivers, Ky., recently organized with a capital of $100,000, is planning for the early operation of its local iron furnaces, following remodeling and improvements. It is expected to blow in one furnace before the close of the month and the other by the first of the year.

Movable Platform for Spring Assembling

The Detroit Steel Products Co., Detroit, recently installed a movable assembling and inspection platform in its spring factory. Aside from cutting the number of men employed for this work almost in two, from 45 to 25, the company states that errors in assembling are minimized, the production is speeded up and the assembling of the spring leaves and their inspection before incorporation in the completed spring simplified. This platform is another of the special mechanisms developed by the company.

The platform, which has a daily capacity of approximately 40 tons of springs, enables the various operations entering into the assembling and inspection of springs for motor cars and trucks to be handled easily. There are in all 12 steps in the process of assembling and inspecting a spring. These are facing the long plate, reaming the eye, grinding the spring ends, polishing the back and plates of the springs, riveting the clips, lubricating and assembling the leaves, inspecting for fit and to see that the spring leaves are all turned in the proper direction, the bulldozer and capacity tests, the placing and riveting of the clip bolts, and the final inspection. A brief description of the two tests and the apparatus employed in making them appeared in THE IRON AGE, May 17, 1917.



Some of the First Operations in the Assembling of Motor Car and Truck Springs Being Performed on a Movable Platform Which Requires but 25 Men to Do the Work formerly Handled by 45 Employees

The first three stages are brought out in the illustration. At the right the first operation, that of grinding the sides of the curved loop at the ends to make it square and smooth, or, as it is termed, facing the long plate, is being performed. The reaming of the eye is next shown, this calling for an accuracy of 0.001 in. and perfect alignment with the backs. At the extreme right the ends of the springs are being ground.

Probably the first instance on record of the use of oxy-acetylene welding and cutting apparatus for the purpose of robbing a bank was the burglary of the State Bank at Waldo, Sheboygan County, Wis., on the night of Oct. 10. The vault door was removed by cutting out the time-locks, but the robbers were not successful in opening the burglar-proof safe within the vault by the same process. An attempt to blow open the safe with nitro-glycerine also failed. The loot consisted of $1,200 in postage stamps and $75 in pennies, taken from the vault.

GENERAL ADVANCE SOUGHT

Railroads Plan to Present Claims to Interstate Commerce Commission

WASHINGTON, Oct. 16.—Reports have been received here indicating that the American railways are planning to petition the Interstate Commerce Commission for permission to file a general advance in freight rates. It is stated that the advance in rates is necessary in view of the diminishing investment return now received by railway securities. Authorities insist that it is absolutely necessary to increase the investment return, otherwise persons will not desire to invest their money in railroads. On the other hand, it is significant that the petition for an advance is being discussed immediately after three new commissioners have taken their seats.

Members appointed to the Interstate Commerce Commission by President Wilson have been looked upon as favorable to the cause of the railroads. President Wilson appointed Commissioners Hall and Daniels. A new amendment has been enacted by Congress increasing the membership of the commission from seven to nine members. President Wilson thereupon appointed two new members and a third to fill the unexpired term of the late Judson C. Clements. President Wilson, therefore, has appointed five out of the nine members of the commission.

Upon the day following the first report that the railroads contemplate making their application for a general advance in freight rates, the commission gave notice of the recreation of a Board to handle all such petitions under the revision of the law. Heretofore the railroads could file advances in rates and the commission had authority to suspend such advances and investigate their reasonableness. Now the railroads are required to obtain the consent of the commission before they file their new tariffs.

The Administration is rather generously inclined toward the railroads. It is believed furthermore that the public is far more willing to give a sympathetic hearing to the cause of the roads than ever before because it is realized that the transportation systems of the country are taxed to their uttermost and that the increase in railway facilities should be encouraged in every way possible. The reports of the roads themselves of the increased work done as a result of the war bear out the necessity for extra equipment. The experience of nearly every shipper tends to prove the same thing.

According to a report just issued by the Railroads War Board, the freight statistics for July, the latest month for which official figures are available, show that the railroads successfully handled 20.2 per cent more freight that month than for the same period last year. The figures that tell the story of this accomplishment have just been compiled from railroads having 220,054 miles of track, or approximately 85 per cent of the entire trackage of the United States.

In July last year, these railroads gave service equivalent to carrying 27,809,430,998 tons of freight one mile, while this year they carried 33,434,368,526 tons one mile, an increase of exactly 20.2 per cent. This great increase in service was rendered with an almost negligible increase in the amount of equipment used. The number of freight locomotives in July last year, for instance, was 29,888, while this year the number was 30,277, an increase of only 1.3 per cent. Last year in July there were 2,204,902 freight cars in service, while this year the number was 2,256,621, an increase of 2.3 per cent.

One of the most encouraging marks of progress and one for which the railroad employees are entitled to credit is the great reduction in the number of freight cars and locomotives in the shop or awaiting repairs. Last year in July, there were 144,478 freight cars under or awaiting repairs, while this year only 135,831 were in that condition, a decrease of 6 per cent. Freight locomotives in repair or awaiting repair in July last year amounted to 4,460. In July this year only 4,122 needed shop attention, a reduction of 7.6 per cent.

Last year, the July statistics showed that railroad locomotives ran an everage of 64.4 miles per day. In July this year, they made 68.8 miles. Freight cars made an average of 26.4 miles in July last year. This year they made 28.3 miles, an increase of 7.2 per cent.

German Imports and Trade After the War

Conditions and regulations to govern imports into Germany after the war or during the transition period are being discussed as follows in Germany, according to the London *Ironmonger:*

The Central Association of the German wholesale trade is publishing a series of pamphlets dealing with the conditions that are expected to prevail in various branches of industry during the so-called period of transition that, it is assumed, will follow the declaration of peace. The first of the series is written by Herr Lustig, general manager, German Iron & Steel Trading Co. (Deutscher Eisenhandel). Mr. Lustig believes that it is the intention of the German Government to establish monopolies for the importation of certain staple articles and to place the importation of raw materials in the hands of special organizations. He is not altogether in favor of such measures and while admitting that it would be injurious to abolish too rapidly the numerous organizations for the control of trade that have been set up during the war, he thinks that their mode of working should be changed and that they should use the merchant class, which has now been almost entirely squeezed out, as intermediaries.

If all imports are to be monopolized, either by the government or by central organizations, each representing a different industry, enormous sums of money will have to be sent abroad to pay for the goods bought. But if wholesale and export traders are used as intermediaries in buying, their old business relations in foreign markets, resumed after the war, will be available to establish credit and will make it possible to get better terms and to distribute the payments so as to make them less oppressive.

It will be necessary to push as much as possible the exportation of goods of high intrinsic value, such as potash and coal tar products, and thus to establish credits in foreign countries. All this will be made easier if all purchases abroad are made not by the Government or the manufacturers direct but by committees consisting of representatives of the manufacturers, the merchants and ship-owners. Private trade should be left unfettered, on condition that all goods sent to Germany shall be consigned to one or another of these committees.

The author thinks that the government should have a certain control over the selling prices of imported goods, as he is afraid that otherwise speculation may raise those prices to inordinately high levels, and he advocates that the government shall fix the maximum prices which the buying organizations will be allowed to pay for goods bought for Germany. He would also set up a central organization whose business it would be to see that the imports were restricted to urgent necessities and that they were fairly divided so that no industry or no one state of the Empire could get an advantage over the other.

Japan Wants Blast Furnaces

Japan is now seeking to buy blast furnaces. It is likely before long that the sale of perhaps five will be effected. This will naturally require the dismantling of the furnaces and transporting them for erection in Japan. The exporting of blast furnaces has in fact become a new feature in the iron and steel industry. It was reported in THE IRON AGE of Aug. 30 that the furnace at Battelle, Ala., is now in process of demolition to be shipped to India and this exporting follows the earlier movement of moving blast furnaces from poorly located places to spots where immediate use may be made of them.

New Dutch Steel Plant

LONDON, ENG., Oct. 16 (*By Cable*).—A Netherland blast furnace steel and rolling works has been formed in Holland, capital 25 million gulden, the Dutch Government participating. The rolling mill output will be 150,000 tons, chiefly shipbuilding material.

The Shenango Furnace Co., Pittsburgh, has subscribed for $1,250,000 of bonds. Employees of the Farrell and Sharon, Pa., works of the Carnegie Steel Co. have subscribed for over $300,000 of new Liberty bonds.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

Owned by the United Publishers Corporation, 243 West 39th Street, New York. H. M. Swetland, *Pres.* Chas. G. Phillips, *Vice-Pres.* W. H. Taylor, *Treas.* A. C. Pearson, *Secy.*

BRANCH OFFICES—Chicago: Otis Bldg. Pittsburgh: Park Bldg. Boston: Equitable Bldg. Philadelphia: Real Estate Trust Bldg. Cleveland: Guardian Bldg. Cincinnati: Mercantile Library Bldg. San Francisco: 320 Market Street.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

The Fixed Steel Prices

From the beginning of the talk of steel price control it has been hoped that the complexity of the relations of the various products would not prove incapable of fairly satisfactory adjustment. The belief was strong in those of widest trade experience that a harmonious or well balanced price structure could be produced without serious difficulty, if merely the scale should be established. That scale was fixed by the agreement between the Administration and the large producers announced Sept. 24, setting pig iron at $33, Valley, for basic and foundry, and steel bars, shapes and plates at 2.90c., 3c. and 3.25c. respectively. The additional prices announced late last week are in harmony with these basis prices.

While it required somewhat protracted discussion to reach an agreement upon the prices announced in this second batch, and while the fixing of prices on certain commodities had to be deferred, these phases of the procedure are not inconsistent with the assumption that as a mathematical, an accounting or a technical problem the task of relating prices is not discouragingly difficult. The slow progress made arose from the fact that there are diverse interests to be harmonized. All manufacturers must be brought into accord, the finished product of the one being the raw material of the other. Even the War Industries Board is not disinterested, for it must assume a tactical position to make sure, when basis prices are fixed, that other prices are not placed disproportionately high.

Whether demand and supply should control the general level of prices is a question upon which much can be said. The strongest argument for price fixing is that competition as a price maker has lately been merely a phrase, for the competition that has been defended as a principle of sound trade has been competition between sellers, whereas the competition of late has been between buyers —an altogether different thing.

That the law of supply and demand, or of competition, has in recent months produced anything like reasonable relations between prices of different commodities in the iron and steel industry cannot, of course, be maintained for an instant. It is of interest to observe the incongruities produced, by comparing the relations in the price structure now being built up, quite a consistent one, with the relations that have existed at times in the past.

Now there are prices of $33, Valley, for basic iron and $47.50, Valley or Pittsburgh, for 4 x 4-in. steel billets. In the first stage of their rapid ascent billets were quoted in THE IRON AGE at $45 in the issue of Aug. 17, 1916, while at the same time pig iron was quoted at $18. The billet quotation then jumped to $50, when pig iron was quoted at $20, so that we have the equivalent of $47.50 billets and $20 pig iron, made by the market, instead of $33 pig iron. In the other direction we have it that when billets rose to $50 grooved steel skelp was quoted at only 2.50c., whereas now the relation of $47.50 billets and 2.90c. skelp seems much more reasonable. Then there was a time, late in the spring of 1916, when prices ranged from low to high for the following commodities: No. 28 gage black sheets, merchant steel bars, No. 10 gage blue-annealed sheets, plates. Mills now would not regard it as consistent for blue-annealed sheets to be placed below the 3.25c. plate price, or for No. 28 gage black sheets to be set still lower, and below the 2.90c. bar price. A sad mess would have been made, in other words, if the Government, in seeking for a reasonable price schedule, had suggested that the iron and steel industry select its date in the past, the prices upon which date should be accepted as the market prices in the future. As an example of the incongruities above referred to, the date of $32 pig iron (the market jumped from that to $35) was the date of $65 sheet bars and 5c. black sheets, and the sheet manufacturers would certainly object either to the sheet bar price or the sheet price, probably to both.

The structure of fixed prices now being developed makes a favorable comparison even with the normal markets before the war boom. The prices are graduated from raw material to finished product. In periods both of low prices and of high prices the open market prices have not shown a spread equal to manufacturing cost between billets and slabs on the one hand and merchant bars and plates on the other. Roughly speaking, when prices were low and when they were high a net ton of the finished product has been quoted at little if any above a gross ton of the raw material. If

the detached finishing mill made a profit at all it was by holding a low-priced contract for its raw material and selling its finished product on a spot market—rather a precarious performance at best.

Price Control Enforceable

The question has arisen whether the agreements made between the Government and various groups of producers, on the "one price for all" basis, will be kept by all producers. The natural assumption is that when an agreement is entered into in good faith it will be kept. In the case of the agreement on steel prices it is generally inferred that while a minority, which is relatively small, was not directly represented at the Washington conferences, those constituting such a minority will also feel duty bound to act accordingly.

Assumption or inference, however, is not sufficient in a matter of such importance. Everyone wants to know positively whether the agreement is going to be the rule throughout the trade with respect to all the producers and with respect to all the sales they may make. While doubt seems to have arisen in the minds of some buyers, it would appear that such doubt does not rest upon evidence that would really bear upon the general question, whether or not the agreement will be kept in its entirety. There have been, for instance, numerous refusals of producers to sell at the set prices. It must not be understood, however, that the agreement was that the producers would sell. The spirit of the agreement was that sales when made would not be at above the set prices, and furthermore that producers would strive to maintain output.

The great majority of buyers have shown a disposition to accept the agreement on its face and to feel that the question of price has been eliminated, while there necessarily remains the equally important question of deliveries. There is no occasion for the mills to sell or the buyers to buy material that cannot be delivered, but it would be much more satisfactory to both producers and buyers to know that the Government has means that it can bring into play to compel adherence to the agreement. Producers would not feel comfortable at the prospect that non-adherents would be rewarded for failing to support a Government measure. If 90 per cent of the producers adhered to the agreement, and the remaining 10 per cent sold to the highest bidder, the premium bid would be much greater than if all producers sought to sell at a premium. Nor would consumers feel comfortable if the measure of their success in staying in business by securing deliveries of steel were their willingness to tempt producers to violate the agreement.

The fact is that, while the Government has no direct way of enforcing a general agreement as to prices, it has power to punish a certain number of violators. It has ample authority to commandeer any plant or part of plant needed to furnish it material for prosecuting the war. It has made no threat, and has had no occasion to make any threat, with respect to its intention thus to deal with any steel manufacturer disposed to be a slacker, but its power remains. Any plant suitable for the display of such power can be selected. Merely for the purpose of increasing the production of war material the natural selection would be of a plant not already so engaged, but capable of being thus employed. Plant facilities entirely unsuited to making war material would be excluded, but there is no prospect of there being any question as to the price of the product of such plant facilities.

The Government's absolute authority lies in the priority regulations. All matters relating to sequence in producing and shipping material have been placed in charge of the Priority Board, which assumes authority both over the machinery of production and over the machinery of transportation. From the practical viewpoint the question of its power is not whether the Priority Board has full legal authority, but whether anyone is going to take the Board into court. The second question suggested is easier to answer than the first.

The first function of the Priority Board is to see that the United States Government receives its war material as soon as it needs it. Its second activity is in connection with material destined for the Government's Allies. Its third activity is in connection with material destined for others. No one can question the full propriety and legality of the Government's war steel being given precedence over everything else. Once the manufacture and shipment of a single ton of steel is delayed by preference being given to a Government order, however, the normal course of trade is interfered with, and it is no great step for the Government next to determine what steel shall thereby be delayed in manufacture and shipment. It is well known that the Priority Board has assumed this attitude and contemplates the regulation of all classes of shipments as far as may be necessary. Should a case arise of a manufacturer selling at a price higher than the maximum that has been set, there is little doubt that the Board would forbid the filling of such an order until after taking care of all other orders.

Undivided Loyalty Demanded

For many years it has been the well-established custom of the Government to discourage its employees from becoming members of labor unions, and it is rather surprising that the recent organization of a National union, which it is hoped by the organizers will include all Federal employees, has not attracted more attention. It was announced at the convention which was held in Washington that there are now sixty local unions of Government workers in the United States, and it is planned to organize 600,000 civil employees of the Government. Perhaps the most remarkable feature of this new movement is that it is made at a time when it has been agreed by representatives of employers and employees, including Secretary Wilson of the Department of Labor, that neither labor nor capital should make any effort to change the status of the working conditions as long as the war continues. In other words, the open shops should remain open and the closed shops should continue closed and other fundamental working conditions should not be changed. This understanding has

been generally adhered to, but the movement to unionize Federal employees is a direct departure from the policy recently adopted.

The reason for not encouraging or even permitting Federal employees to become members of unions is entirely sound, as it is based on the fact that Government service demands absolutely unqualified loyalty, and it is well known that when any question arises between employer and employee, the union man believes that his loyalty is due first to his union. It has been clearly recognized that such a condition in the post office and other branches of the Government would be intolerable.

On account of some real service which Mr. Gompers has rendered in the present war period and owing to some other reasons not so sound, he has had a very important influence with the Administration. He has been particularly active in the organization of the new union, and undoubtedly will have a large following, but it is hoped that the patriotism and common sense of Government employees will prevent them from rushing into this new organization and that they will be true to the time-honored position of the Government which demands unswerving loyalty from its employees.

British Steel for Shells

The British investigation of an acid open-hearth heat for making high explosive shells, reviewed in this issue, presents some interesting facts. It demonstrates the high degree of uniformity obtainable from the practice of casting the ingot large end up with a hot top. Not only is the percentage of discard largely reduced, but defects from segregation and pipe are at a minimum. It would be interesting to know to what extent this is the practice in England. Without doubt some such procedure is desirable to meet the rigid specifications. It is admitted that in the United States early in the war some steelmakers had great difficulty in satisfying foreign inspectors with steel cast in ingots with the small end up with no hot top or even with one. To what extent this American practice has been altered to meet new war conditions is not generally known, but in some cases decided changes are believed to have been necessary. It is certain, however, that the British method referred to is superior.

It is also interesting to note that in the heat under discussion additions of manganese and silicon were made in the bath and not in the ladle, and also that no ore was added after the percentage of carbon reached 0.70 per cent. Both of these points are vitally important in the production of the best steel, but their value is not always recognized or lived up to in tonnage production.

The manganese content of the slag for the heat reported is illustrative not only of the loss of manganese, but also of the importance of the slag as a by-product. It is hoped that steel making will some day reach the stage where so large a loss can be eliminated. It is claimed that this has been done in the electric furnace. It is also not at all impossible that a way may yet be worked out for reclaiming the manganese, silicon and iron content in acid slags in the shape of a silico-manganese alloy. Important work on this is now being done in this country.

MANY ORDERS PLACED

Active Buying of Machinery in the Pittsburgh District

PITTSBURGH, Oct. 15.—Conditions in the local machinery trade have not been so active at any time since the war started as they are at present. Local builders of heavy machinery equipment are being deluged with Government orders, and local sales agents for New England, Cincinnati and other places where shops for building machinery are located, are receiving enormously heavy inquiries for machine tools, nearly all for Government work. Very heavy orders have been placed lately, and others are being figured on and will be given out shortly. Local companies are going into the manufacture of war munitions on a large scale, and their needs of general machine-shop equipment are very heavy. The Westinghouse Air Brake Co. has taken a Government contract for 2500 Rohn aeroplane motors, and has lately bought a very large quantity of lathes, planers, milling machines, shapers and other equipment. It will still be a buyer of considerable machine-shop equipment, and will have other inquiries out in the market in a short time. The Westinghouse Electric & Mfg. Co. has taken a large Government order for hand grenades, and has been a very heavy buyer of machine tools, placed with New England, Cincinnati and other manufacturers. The company will make these hand grenades at its shops in this city and will need a large quantity of additional tools. The Pittsburgh Steel Products Co., which is building a new seamless tube mill at Allenport, across the river from Monessen, Pa., is also buying heavily of machine tools, and will continue a heavy buyer for some months to come. The Carnegie Steel Co. is buying heavily of miscellaneous machine tools. Nearly all the orders being placed are for Government work for quick shipment. A local company which recently took a large Government order for machine-shop tools for 90 days' delivery, has been advised by the Government that it wants these tools shipped in 30 days. The fact that the Government wants its material quickly, and that its orders are taking preference over all other orders, is making it hard for companies that want machine tools for domestic work to get deliveries. Local conditions among machine-tool builders are getting worse, as men are responding to the draft, and it is impossible for them to get out a maximum output of tools. Prices are showing some advance, and the scarcity of steel and labor is being severely felt.

The Edgewater Steel Co., whose plant is at Oakmont, Pa., has taken a large Government order for 9.5-in. guns, and also for 155 mm. guns. This company is having built one 6000-ton high-speed steam hydraulic forging press, and one 3000-ton press, both by the United Engineering & Foundry Co., Pittsburgh. These presses will be delivered shortly, and will be used by the Edgewater Steel Co. in making forged steel car wheels and Government munitions. In addition, the Edgewater Steel Co. has just placed a contract with the United Engineering & Foundry Co. for another 2000-ton steam hydraulic high-speed forging press, and also a contract with the Morgan Engineering Co., Alliance, Ohio, for a 1000-ton press of the same type. The Edgewater Steel Co. sent out under date of Oct. 10 an inquiry for a long list of boring lathes, turning lathes, planers and other miscellaneous tools for which it expects to close this week.

This list is as follows:

Two boring bar lathes 26-in. x 32-ft. centers, with two steady rests, and with one carriage, carrying front and rear tool posts.

Two cutting off lathes, 36-in. x 26-ft. centers, with two carriages each carrying front and rear tool posts, the carriages to feed toward each other, as well as toward the headstock.

Two heavy duty drill presses with adjustable tables, with a capacity for drilling 4-in. holes. These to be used with the hollow drills for taking out test pieces

Two tool grinders.
Two test bar grinders.
One 26-in. heavy duty shaper.
Two cold saws with 60-in. diameter saws.
Two cold saws with 48-in. diameter saws.
One 24-in. heavy duty slotter.
One centering machine for 24-in. diameter.
Two test bar lathes 20 in. x 8 ft.

Boring Lathes for 9.5-in. Guns

Two 36-in. to bore 24-ft. long for tubes.
Four 48-in. to bore 12-ft. long for jackets.
Two 36-in. to bore 10-ft. long for hoop.

Boring Lathes for 155-Mm. Guns

Two 36-in. to bore 24-ft. long for tubes
Two 36-in. to bore 12-ft. long for hoop A.
Two 36-in. to bore 12-ft. long for hoop B.
Three 48-in. to bore 12-ft. long for jacket.
All boring lathes to have one carriage in addition to boring bar feed, with two steady rests on the 24-ft., the shorter ones to have one steady rest.

Turning Lathes for 9.5-In. Guns

Two 42-in. x 24-ft. centers for tubes
Two 36-in. x 10-ft. centers for hoops.
Four 48-in. x 12-ft. centers for jacket.

Turning Lathes for 155-Mm. Guns

Two 36-in. x 24-ft. centers for tubes.
Three 48-in. x 12-ft. centers for jacket.
All 24-ft. turning lathes are to have two taper attachments and the shorter ones each to have one taper attachment, except when some method of turning taper by the former is provided.

Planers

Three 36 x 36 x 12 ft.
Two 48 x 48 x 12 ft.
Four 48 x 48 x 16 ft.

All to have two heads on cross rail and one side head.

The Steel Industry in Australia

The demand for rails has been so great, states the British Trade Commissioner of Australia, that since the inception of the Broken Hill Proprietary steel works at Newcastle, N. S. W., the company has been unable to roll plates and sheets. Large quantities of rails have been turned out for the Commonwealth Government Railway and channel sections are at present being rolled to the order of the government. The Commissioner has been informed that the company can roll 4-ft. plates, but not 5-ft. plates, the size most suitable for shipbuilding. When it is in a position to roll plates and sheets a large market for its products will be opened up in Australia, and it will then be possible to establish galvanizing and tin-plate industries there. A firm has already purchased land near the steel works with a view to the erection of a galvanizing plant. Other prospective developments in connection with the steel works include wire drawing and the manufacture of wire nails. The present installation of coke plants consists of 66 Solvay ovens and a considerable increase is proposed.

Large Decrease in Steel Corporation Orders

The monthly statement of the United States Steel Corporation of unfilled orders on its books on Sept. 30 shows a total of 9,833,477 tons or a decrease of 573,572 tons from the previous month, when the total was 10,407,049 tons. This is the first time the unfilled orders have fallen below 10,000,000 tons since September, 1916, when they were 9,522,584 tons. The following table gives the unfilled tonnage of the United States Steel Corporation at the close of each month since January, 1914:

	1917	1916	1915	1914
January	11,474,054	7,922,767	4 248,571	4,613.680
February	11,576,697	8,568,966	4,345,371	5 026.440
March	11,711,644	9,331 001	4,255,749	4,653,825
April	12,183,083	9,829,551	4,162 244	4,277,068
May	11,886,591	9,937,798	4,264,598	3.998,160
June	11,383 287	9.640,458	4 678.196	4,932.857
July	10,844,164	9,593 592	4,928,540	4,158,589
August	10,407,049	9,660,357	4,908 445	4,213,331
September	9,833,477	9,522,584	5,317.618	2,787,667
October		10,015,260	6,165 452	3,461,097
November		11.058,542	7,189,489	3,324,592
December		11,547,286	7,806,220	3,836,643

The National Steel Products Co., Ensley, Ala., has taken bids for the construction of a new plant at Bessemer for the manufacture of steel castings for railway appliances. The initial works will be about 40 x 150 ft., with capacity of 15 tons daily. A 3-ton open-hearth furnace will be installed. J. V. Calvin is secretary.

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Agreed Prices on Semi-finished Lines

White House Announces New Schedule on Billets, Blooms, Sheet Bars, Wire Rods and Shell Bars, Judge Gary Expresses Satisfaction

WASHINGTON, Oct. 16.—Following the two-day conference with the representative steel producers last week, the War Industries Board, with the approval of President Wilson, promulgated fixed prices on blooms, billets, slabs, sheet bars, wire rods and shell steel bars. Those participating in the conference included the board, and the iron and steel committees of the American Iron and Steel Institute. Another conference will be held the latter part of the current week to review proposed fixed prices on other finished articles. It was reported that a schedule of these prices had been drafted but will not be promulgated until those interested have had an opportunity to express their opinions.

While the prices promulgated last week represented considerable cuts in the prevailing market prices, it was said they are generally satisfactory to the trade. These prices are in harmony with the fixed prices on the basic articles which were promulgated by President Wilson on Sept. 24, last. Among those articles upon which prices will be determined are wire, pipe, rails, nails, hoops, bands, cotton ties, tin plate, rivets and spikes. Until these prices are announced, however, the trade itself will continue to apply its own prices as well as its own differentials.

The further prices fixed last week were formally announced by the White House through the Committee on Public Information.

Officials of the War Industries Board who have charge of the steel price question hope to announce further prices the latter part of the current week or the first of the next. A conference of such steel men as are directly interested in these other articles will be arranged to-morrow, according to information given the representative of THE IRON AGE. The steel men who conferred with the War Industries Board last week included the following:

General Committee, Elbert H. Gary, chairman; James A. Farrell, vice-chairman; James A. Burden, E. A. S. Clarke, Alva C. Dinkey, Willis L. King, Charles M. Schwab, John A. Topping.

Members of the subcommittees who were present included the following: Sheet Steel, W. S. Horner, Charles O. Hadley, Walter C. Carroll; Scrap Iron and Steel, Eli Joseph, Samuel Deutsch, Vernon Phillips, Joseph Michaels.

The chairmen of all the subcommittees were in attendance. These included, in addition: Ferroalloys, Mr. Farrell; Pig Tin, John Hughes; Pig Iron, Ore and Lake Transportation, H. G. Dalton; Tubular Products, James A. Campbell; Cold-rolled and Drawn Steel, F. N.

PRESIDENT APPROVES STEEL PRICE AGREEMENT BETWEEN WAR INDUSTRIES BOARD AND MILLS

The following is the official statement issued by the War Industries Board of the Council of National Defense:

The President has approved an agreement between the War Industries Board and the steel men, fixing the following maximum prices, which become effective immediately, and are subject to revision Jan. 1, 1918, viz.:

Commodity	Price Agreed Upon	Base
Blooms and billets 4 by 4 in. and larger	[1]$47.50	Pittsburgh and Youngstown.
Billets under 4 by 4 in.	[1]51.00	Do.
Slabs	[1]50.00	Do.
Sheet bars	[1]51.00	Do.
Wire rods	[1]57.00	Pittsburgh.
Shell bars:		
3 in. to 5 in.	[2]3.25	Do.
Over 5 in. to 8 in.	[2]3.50	Do.
Over 8 in. to 10 in.	[2]3.75	Do.
Over 10 in.	[2]4.00	Do.
Skelp:		
Grooved	[2]2.90	Do.
Universal	[2]3.15	Do.
Sheared	[2]3.25	Do.

[1] Gross tons. [2] Per 100 lb.

The prices enumerated have been fixed by the President on the assurance of those representing the steel industry that these prices equitably adjust the relations of the steel interests to each other, and will assist them in fulfilling their obligations to give the country 100 per cent of production at not to exceed the prices heretofore announced.

Measures will be taken by the War Industries Board for placing orders and supervising the output of the steel mills in such manner as to facilitate and expedite the requirements for war purposes of the Government and those nations associated with us, and to supply the needs of the public according to their public importance and in the best interest of all, as far as practicable.

A spirit of co-operation was manifested by the steel men, and no doubt is entertained that every effort will be made to bring the production as nearly as possible up to the extraordinary demands resulting from the war.

Beegle; Wire Products, Frank Baackes; Wire Rope, Karl G. Roebling; Malleable Castings, Frank J. Lanahan.

Judge Gary Satisfied

E. H. Gary, chairman of the United States Steel Corporation, said after returning to New York, that the steel industry generally will be benefited by the attitude and action of the War Industries Board and the President in fixing prices for steel products.

"On the whole, it may be said," asserted Mr. Gary, "the negotiations with the War Industries Board and the results were satisfactory to the steel producers, although the prices named are lower than had been expected.

"The disposition of the members of the board carefully to inquire into the facts relating to costs, capacity, facilities and profits has been so fair and frank that the manufacturers without exception will be influenced to respond to the requests of the board for production equal to full capacity. And the prices determined upon will, with some adjustments between manufacturers as to deliveries, yield profits sufficient to bring them within the President's original proclamation.

"The prices of commodities not already considered by the board will be fixed by arriving at a parity.

"The steel industry generally will be benefited by the attitude and action of the War Industries Board and the President. The profits of some of the manufacturers will be somewhat decreased. However, conditions will be more normal and they will be healthy."

LIBERTY BOND BUYING

Subscriptions of Employees Not as Numerous as for First Offering

Many manufacturers are again responding and subscribing for Liberty Loan bonds, but the movement to interest employees does not seem to be as general and fear is expressed that the number of workingmen represented in subscriptions will be much smaller than it was at the time the first issue was subscribed for. There is, however, a feeling that interest will soon be quickened, especially by the observance of Oct. 24 as Liberty Bond Day, and that the bonds will be oversubscribed.

Among New York subscriptions were: Lackawanna Steel Co., $1,000,000; International Nickel Co., $1,000,000; Worthington Pump Machinery Corporation, $500,000; The American Steel Export Co., $100,000; American Locomotive Co., $2,000,000.

Zalmon G. Simmons, founder and president The Simmons Co., Kenosha, Wis., manufacturer of steel beds and springs, has made a subscription to $250,000 of Liberty bonds. The subscription was made at Madison, Wis., on Oct. 3, when W. G. McAdoo, secretary of the treasury, delivered an address to the people of Wisconsin.

The Republic Iron & Steel Co. will be a heavy subscriber to the new Liberty Loan bonds and has placed $800,000 of its subscription through Youngstown, Ohio, banks and $1,000,000 with Cleveland banks. Just what the total amount of the subscription of the Republic company to the Liberty Loan bonds will be has not been determined, but will depend largely on further developments in regard to excess-profit taxation. The company subscribed $5,000,000 to the first Liberty Loan bonds, and its subscription to the second will likely be the same.

Among the subscribers to the second Liberty Loan made in Cleveland were the following: Pickands, Mather & Co., $1,000,000; Corrigan, McKinney & Co., $1,000,000; Aluminum Castings Co., $50,000; McMyler Interstate Co., $250,000; National Acme Co., $100,000.

Employees of plants in and near Chester, Pa., are doing their part to help the country by subscribing to the Liberty Loan. Big meetings were recently held at the plants of the Penn-Seaboard Steel Co. and the Baldwin Locomotive Works resulting in large subscriptions being made by the workers.

Ferdinand Schlesinger, head of the Northwestern Iron Co., Milwaukee; Newport Mining Co., and various other large mining, furnace and chemical interests, thus far is the largest individual subscriber in Milwaukee to the second Liberty Loan, having purchased bonds amounting to $500,000 for his personal account. Other large subscribers thus far are: Allis-Chalmers Mfg. Co., $300,000; Harley-Davidson Motor Co., $200,000; Cutler-Hammer Mfg. Co., $200,000; Pressed Steel Tank Co., $100,000; Shadbolt & Boyd Iron Co., $25,000; Milwaukee Steel Foundry Co., $10,000; Heil Co., $10,000; Mechanical Appliance Co., $25,000; Vilter Mfg. Co., $35,000; Federal Malleable Co., $25,000; Richardson-Phenix Co., $50,000; Wisconsin Motor Mfg. Co., $10,000. The Aluminum Goods Mfg. Co., Manitowoc, Wis., has made a subscription of $150,000.

Tuesday was a day of large subscriptions in New York, including American Can Co., $1,000,000, Midvale Steel & Ordnance Co., $1,500,000, and Phelps-Dodge Corporation, $1,000,000.

The McKeesport Tin Plate Co., McKeesport, Pa., has subscribed $1,500,000 for the second Liberty Loan bonds, and the Aluminum Co. of America, Oliver Building, Pittsburgh, has subscribed the same amount.

Manufacturers in the Pittsburgh district are subscribing very liberally for the second Liberty Loan bonds. The latest subscriptions reported are as follows: Pittsburgh Coal Co., $2,500,000; Henry W. Oliver estate, $500,000; Oliver Iron & Steel Co., $1,000,000; Oliver & Snyder Steel Co., $500,000; W. Harry Brown, $500,000; Gulf Oil Corporation, $1,500,000; Harbison-Walker Refractories Co., $2,000,000; Firth-Sterling Steel Co., $500,000, and Ohio Fuel & Supply Co., George W. Crawford interests, $320,000.

The Pittsburgh Steel Co., Union Arcade Building, Pittsburgh, has subscribed for $1,000,000 of Liberty Loan Bonds.

Mahoning Valley Responds

YOUNGSTOWN, Oct. 15.—At a meeting of the directors of the Brier Hill Steel Co. held here this afternoon, it was voted unanimously that the company take $2,000,000 in Liberty bonds. Employees of the Youngstown Sheet & Tube Co., in a campaign promoted by the company officials, have taken a large block of the Liberty bonds. Every steel concern in the Mahoning Valley is lending its assistance to the Liberty bond sale.

New Pittsburgh Subscriptions

PITTSBURGH, Oct. 17 (*By Wire*).—The Lockhart Iron & Steel Co., Pittsburgh, has subscribed $300,000 for Liberty Loan bonds; the Jones & Laughlin Steel Co., $2,000,000; Crucible Steel Co. of America, $1,500,000, and American Window Glass Co., $350,000.

Ford Makes Large Subscription.

DETROIT, Oct. 16.—Detroit's Liberty Loan drive received powerful impetus to-day when it was announced that Henry Ford had contributed $5,000,000, and that the Ford Motor Co. had made a similar contribution. Ford's subscription was accompanied by a statement declaring that the United States, in making war on Germany, did the "best thing that ever happened for the world."

The announcement of Ford's subscription and his statement was made at the noon meeting of the Liberty Loan committee. Detroit has now subscribed more than $25,000,000 to the second loan.

The Chicago Shipbuilding Co. launched the first boat in the United States to be built under the direction of the Emergency Fleet Corporation Oct. 13. Frank L. La Marshe, general superintendent of the yards at 101st Street and Calumet River, South Chicago, had charge of the ceremonies. The boat is 261 ft. over all, has a 43½-ft. beam, a depth of 20 ft. and a capacity of 3000 tons. It was named the War Hound. Two other boats are being constructed in the same yards, and men are working day and night to finish them.

Iron and Steel Markets

FURTHER PRICE FIXING

Import of Semi-Finished Steel Settlements

Wire Price This Week—Little Business Except in Iron at New Prices

That Government price fixing is all of the herculean task that the trade prophesied is borne out by the fewness of the items covered in the two agreements so far made. As indicated in THE IRON AGE last week only semi-finished steel was included in the announcement of Oct. 11. Just when additional maximum figures will be settled on is not clear, but it is likely, now that ratios have been established for conversion differences between raw materials and semi-finished products and between the latter and finished forms, that further Government prices will be arrived at without requiring general sessions in Washington between the War Industries Board and the producers.

Whatever the basis of the adverse criticism already developing, the underlying object in the price fixing seems clear—to secure a condition which will bring out 100 per cent production. A surprising low billet price, $47.50, out of line somewhat, other differences in prices being considered, makes for a wide spread between the steel for, and the steel as finished product. Clearly less concern is thus shown for the billet producer, with his relatively less margin between pig iron and scrap and the billet. On the score of accelerating mill operations may be accepted $47.50 billets on the one hand and $58 and $60 for bars and beams on the other and $50 for slabs against $65 for plates.

The fact that plates are put at $5 and $7 per ton higher than bars and beams is also perhaps a recognition of the special cases of recent additional mill capacity entailing high capital charges, with similar incentive to encourage slab production at $2.50 per ton more than billets.

On high Government authority it is intimated that the industry is to adjust itself to the new base prices, particularly in the matter of adopting usual trade practices without specific announcements in this regard. It is not clear as yet, however, that producers are expected to take any initiative in revising prices of major commodities not yet covered. Approximations as to what they may be, discounting special conditions, may be ascertained by comparing the new prices with the average of those for the years 1911 to 1914, inclusive, the four-year period before the war demand developed. The producers have used quotations of THE IRON AGE for this interval as the basis of their figures in deliberating with the War Industries Board.

Before the end of the week, the base for wire will probably be fixed. A figure a little above the mean between the quotation of the largest maker and the higher one of the others would harmonize with the rest of the new prices. The spectacle of raising the price acceptable to the one vanishes when it is recalled that it has long been made on much deferred deliveries.

Old material as well as sheets and tubular goods are also shortly to be settled. As yet steel rails have been given little attention. Chicago as a basing point bids fair to stay. The contention is that largest buyers in the Middle West have commonly been billed without including the Pittsburgh-Chicago freight rate. Tin plate, which involves the cost of the imported covering material, will probably be considered, as desired by producers, by the Food Administration Board.

Outside of Government orders, business has been light. Sales of steel have been made at both the fixed prices and higher, the latter, like 1000 tons of billets at $50, for immediate delivery, representing largely the closing of options made before the price announcements. The signs are that before long sales will be sufficiently numerous to establish a public market at the agreed figures.

Following a drop of $15 in cast-iron pipe in Chicago last week comes one of $9 in the East. Ferromanganese has also been reduced. Some drop in warehouse plate prices is also noted. Against these is the likelihood of advanced freight rates.

Government purchases include fully 30,000 kegs of nails and 8000 tons of steel pipe; and 30,700 cars which the United States is to put into Russia, are about closed. Upward of 100,000 tons of structural steel will shortly be bid on for ships.

The pig iron market has been characterized by a more general and more cheerful acceptance of the agreed prices than has prevailed in the finished and semi-finished markets. Considerable selling has been made on the basis of $33, furnace, for iron analyzing 1.75 to 2.25 per cent silicon. The recommendations as to details of schedules submitted to Washington have not yet been acted on. Sales of basic have included 20,000 tons in the Philadelphia district. There is no difficulty in placing iron offered for sale, and several makers have withdrawn from the market. Some buyers who bought iron at high prices are asking to have their contracts readjusted, but this has not generally been done.

Pittsburgh

PITTSBURGH, Oct. 16—(*By Wire*).

The additional prices on steel announced by the Government last week—$47.50 on billets, $51 on sheet bars and small billets, and prices on shell steel, skelp and other materials—have helped to clear the situation to some extent, but the trade is still anxiously waiting for the Government prices on close to 100 other items of finished steel that have not yet come out. Included in these are sheets, iron and steel pipe and boiler tubes, light and standard section rails and other important products. The trade is holding off placing orders until these prices are announced, and new buying is almost at a standstill. There have been very few new sales of pig iron, and other materials at prices fixed by the Government on Sept. 24. In the item of plates, there

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Oct. 17, 1917.	Oct. 10, 1917.	Sept. 19, 1917.	Oct. 18, 1916.
No. 2 X, Philadelphia...	$34.25	$34.25	$50.00	$20.50
No. 2, Valley furnace...	33.00	33.00	50.00	20.00
No. 2 Southern, Cin'ti...	35.90	....	49 90	18.40
No. 2, Birmingham, Ala.	33.00	....	47.00	15.50
No. 2, furnace, Chicago**	33.00	....	54.00	19 00
Basic, del'd, eastern Pa.	33.75	33.75	48.00	20.00
Basic, Valley furnace...	33.00	33.00	42.00	20.00
Bessemer, Pittsburgh...	37.25	37.25	50.95	23.95
Malleable Bess., Ch'go**.	....	....	55.00	19.50
Gray forge, Pittsburgh..	32.75	32.75	46.95	20.45
L. S. charcoal, Chicago..	....	....	58.00	20.25
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	....	....	$38.00	$33.00
O.-h. rails, heavy, at mill	....	....	40.00	35.00
Bess. billets, Pittsburgh.	*47.50	55.00	65.00	45.00
O.-h. billets, Pittsburgh.	*47.50	55.00	65.00	45.00
O.-h. sheet bars, P'gh...	*51.00	....	75.00	45.00
Forging billets, base, P'gh	....	....	100.00	69 00
O.-h. billets, Phila.....	....	....	75 00	50.00
Wire rods, Pittsburgh...	*57.00	85.00	90.00	55.00
Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia.	4.25	4.25	4.935	2.659
Iron bars, Pittsburgh....	...	...	4.75	2.75
Iron bars, Chicago.....	4.50	...	4.50	2.35
Steel bars, Pittsburgh...	†*2.90	...	4.00	2 75
Steel bars, New York....	...	...	4.195	2.919
Tank plates, Pittsburgh..	†*3.25	...	8 00	4.00
Tank plates, New York..	...	...	8.195	4.169
Beams, etc., Pittsburgh..	†*3.00	...	4.00	2.75
Beams, etc., New York..	†*3.195	...	4.445	2.869
Skelp, grooved steel, P'gh	*2.90	...	...	2.50
Skelp, sheared steel, P'gh	*3.25	...	...	2.60
Steel hoops, Pittsburgh..	...	...	5.75	3.00

*Agreed prices. †As yet only a few sales made.
**The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Oct. 17, 1917. Cents.	Oct. 10, 1917. Cents.	Sept. 19, 1917. Cents.	Oct. 18, 1916. Cents.
Sheets, black, No. 28, P'gh	...	...	8.50	3.30
Sheets, galv., No. 28, P'gh	...	...	9.50	4.40
Wire nails, Pittsburgh..	...	...	4.00	2.70
Cut nails, Pittsburgh...	...	...	4.65	2.60
Fence wire, base, P'gh..	...	...	3.95	2.65
Barb wire, galv., P'gh...	...	...	4.85	3.55
Old Materials, Per Gross Ton:				
Iron rails, Chicago.....	$36.00	$36.00	$44.50	$20.00
Iron rails, Philadelphia.	38.00	38.00	43.00	21.00
Carwheels, Chicago.....	*26.00*	27.00	32.50	13.00
Carwheels, Philadelphia..	29.00	29.00	32.00	15.50
Heavy steel scrap, P'gh..	*27.00*	30.00	33.00	18.50
Heavy steel scrap, Phila.	25.00	25.00	30.00	16.00
Heavy steel scrap, Ch'go.	*25.00*	26.00	31.00	16.75
No. 1 cast, Pittsburgh...	*27.00*	29.00	30.00	16.00
No. 1 cast, Philadelphia.	28.00	28.00	30.00	16.00
No. 1 cast, Ch'go (net ton)	*20.00*	21.00	24.00	13.50
No. 1 RR. wrot, Phila...	*35.00*	38.00	43.00	22.00
No. 1 RR. wrot, Ch'go (net)	**29.50**	27.00	34.00	17.75
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	†*$6.00	....	$12.50	$5.00
Furnace coke, future....	†* 6.00	....	8.50	3.50
Foundry coke, prompt...	....	....	13.50	3.75
Foundry coke, future....	....	....	12.00	4.00
Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.	23.50	23.50	26.25	28.50
Electrolytic copper, N. Y.	23.50	23.50	26.25	28.50
Spelter, St. Louis.....	8.00	8.00	8.12½	9.50
Spelter, New York.....	8.25	8.25	8.37½	9.62½
Lead, St. Louis.....	*6.87½*	7.45	7.87½	6.85
Lead, New York.....	*7.00*	7.60	8.00	7.00
Tin, New York.....	61.00	61.00	61.75	40.75
Antimony (Asiatic), N. Y.	15.00	15.00	15.00	13.00
Tin plate, 100-lb. box, P'gh.	....	....	$12.00	$5.75

have been only two sales reported amounting to about 3500 tons at the 3.25c. price, and there were some unusual conditions attached to these sales, the mills making them having had the plates in stock and anxious to move them. That buyers would take hold at the Government prices to be announced very shortly is almost certain, but the trouble may be to find producers of material willing to sell at the Government prices, as they can very readily and truthfully make the claim that their output is sold up for three to six months, and they do not care to sell at the new figure until they are in need of new orders. The makers of iron and steel pipe and boiler tubes have assured the Government that whatever prices are fixed on tubular products will be satisfactory to them and they have given assurance to the Government of their intention to get out a maximum output and also to continue to furnish to the Government its needs of pipe as promptly as it can be turned out. There have been serious declines in prices of scrap, also in ferromanganese, and it is believed that by the end of the year, or before, the whole iron and steel market will have settled down to the prices fixed by the Government, and business will be carried on at these prices. The greatest troubles that now face the iron and steel interests are the shortage in cars and labor, and especially in coal. It is admitted that the price of $2, at mine, on coal was too low, and production has shown a very heavy falling off. Mills are unable to get coal as fast as needed and have been compelled to shut down departments for days at a time until fuel would arrive. The army draft is making serious inroads on mill organizations, and the substitution of female labor in work formerly done by males is steadily increasing.

Pig Iron.—New inquiry for pig iron continues light, the only active buyer of Bessemer and basic recently being a local steel company, which has bought 30,000 to 40,000 tons of these grades for as prompt delivery as the furnaces can make. The sales of both Bessemer and basic were made at the $33 price for basic and $36.30 price for Bessemer, f.o.b. Valley furnace. The Sharon Steel Hoop Co. has also disposed of 5000 tons more of basic iron for prompt delivery at $33 at Mary furnace, Lowellville, Ohio, and the Cambria Steel Co., which had some surplus Bessemer iron, has sold 5000 tons to a local dealer at $36.30, Johnstown, which makes the price slightly higher, f.o.b. Pittsburgh, than if the iron was bought at Valley furnace. This iron has been re-sold to a steel company for prompt shipment. We also note a further sale of 4000 tons of basic for October delivery at $33, Valley furnace. There have been small sales of No. 2 foundry iron at the fixed price of $33, Valley furnace, and several of the larger makers of this grade have advised customers they will take care of their needs at the fixed price of $33 at furnace. There has been a sale of about 2000 tons of malleable Bessemer iron for delivery at Cleveland at $33.50 at Valley furnace. A sale of 500 tons of low phosphorus pig iron is reported to have been on the basis of very close to $40, Valley furnace. This is the lowest price touched on low phosphorus iron for many months. It is believed there will be considerable movement in pig iron in the near future, as the feeling is prices are going to rule firm and that they will not be any lower during the near future at least.

We quote as follows: Basic pig iron, $33; Bessemer, $36.30; gray forge, $32; No. 2 foundry, $33; No. 3 foundry, $32.50, and malleable Bessemer, $33.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being 95c. per ton.

Billets and Sheet Bars.—The Government price announced last week of $47.50 on soft Bessemer and open-hearth 4-in. billets, $51 on small billets and $51 on sheet bars was a surprise to the trade in more ways than one. In the first place, the trade did not look for as low a price on billets as $47.50 per gross ton, nor did it expect a differential in price of sheet bars and small billets over 4 x 4 in. billets of $3.50 per gross ton. For years the usual spread between billets and

sheet bars has not been over $1 per ton, and between 4 x 4 in. billets and small billets not over $2 per ton. The fact is there have been times recently when sheet bars and billets sold at the same prices, and small billets about $1 per ton higher than ordinary billets. So far we have not heard of any bales of sheet bars and billets at the new prices, the lowest actual sale made having been noted in this report last week, which was 1000 tons of soft open-hearth billets for prompt delivery at $55, Pittsburgh. A rate of 1000 tons of 4x4 in. open hearth billets was made at $50 on an old option.

Ferroalloys.—The local market is bare of new inquiry, and there has been a decided drop in prices of 80 per cent ferromanganese, both for prompt and future delivery. We now quote 80 per cent domestic ferromanganese for any delivery at $300 per gross ton, delivered to buyer's mill. No sales have been reported in this market for several weeks. We quote 18 to 22 per cent spiegeleisen at $70 to $75 and 50 per cent ferrosilicon in carload lots at $150 to $160, delivered, lower prices being made on larger lots.

We quote 9 per cent Bessemer ferrosilicon at $89, 10 per cent $90, 11 per cent $95, 12 per cent $100, 13 per cent $105, 14 per cent $115, 15 per cent $125, and 16 per cent $135. We now quote 7 per cent silvery iron at $79 to $84, 8 per cent $80 to $85, 9 per cent $81 to $86, 10 per cent $82 to $87, 11 and 12 per cent $83 to $88. All prices are f.o.b. makers' furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having a uniform freight rate of $2 per gross ton for delivery in the Pittsburgh district.

Structural Material.—Aside from Government work, very little new business is being placed in this district. The American Bridge Co. has taken 600 tons for a bridge at Washington, and the Submarine Boat Corporation is asking bids on 69,000 tons of fabricated steel needed for the construction of 50 merchant vessels for the Government recently ordered from that corporation. Local fabricators say they are not bidding actively on new work, as they are filled up for months. Prices for domestic consumption are given on page 959.

Plates.—Late last week the Government tentatively placed contracts for 30,000 4-wheel cars of small capacity for Russia, the order having been divided among the steel car companies, but later the order was cancelled, and it is now understood the Government is figuring on placing 30,000 8-wheel standard gage box cars for Russia, and this order is expected to come out at any time. Domestic railroads are not buying any new equipment. No orders for steel cars have been placed for some time, and there are no new inquiries in the market. Recently a local steel car company bought from two different mills about 3500 tons of sheared plates at 3.25c. at mill, the price fixed by the Government on Sept. 24. However, there were some unusual conditions attached to these two sales, and they cannot be taken as evidence that the plate mills are freely quoting sheared plates at 3.25c. at mill. In fact, these are the only two sales that we have yet heard of at this price. Quotations continue nominally at 8c., mill.

Steel Rails.—It is stated that no new orders are being placed for either standard rails or light rails and will not be until the Government fixes rail prices. Whether the Government will lower the price of standard sections is a question. It is regarded by the mills and railroads as a very conservative price, and may be allowed to remain undisturbed.

Sheets.—The price of $51, f.o.b. Pittsburgh, fixed by the Government on sheet bars indicates strongly that Government prices on sheets, which are expected to come out at any time, will be somewhat lower than the Government has been paying for sheets for some months, which are based on 6.25c. for blue annealed, 6.50c. for Bessemer black, and 8.50c. for galvanized, all of 28 gage. Nearly all the new buying in sheets for a month or more has been done by the Government. The new demand from domestic consumers is dull, but specifications against contracts have been fairly active. It is known that stocks of sheets are low, and as soon as the Government announces prices an active buying movement may result. In the past two weeks the Government has placed very heavy orders for Bessemer black and galvanized sheets at prices noted above, and a large quantity of galvanized sheets has been bought for export for France, where war activities are in progress. Sheet mills are well sold up over the remainder of this year, but some mills are able to take orders, if they can be obtained, for fairly prompt shipments. Prices to the domestic trade on the small amount of new business being placed are holding fairly firm and are given in detail on page 959.

Tin Plate.—No announcement of the Government prices on tin plate will be made until Nov. 1, or later. In the meantime, the trade is dull, the mills not seeking new orders, and in fact have been asked not to take any obligations until the new price is fixed. The price of tin plate for last half of 1917 was $7.50 per base box for Bessemer, and $7.75 for open-hearth stock, but the price to be fixed by the manufacturers and the Government is expected to be somewhat lower. Some of the larger tin-plate mills will not be able to clean up contracts on their books until the end of the first quarter of next year. On small orders being placed for shipment from stock, primes bring all the way from $10 up to $15 per base box. Prices on terne plates, for which the demand is very dull, are given on page 959.

Hoops and Bands.—Practically no new orders are being placed, and these only for small lots for prompt shipment. Large consumers are covered over remainder of this year and into first quarter of next year. We quote steel bands in small lots at about 5c. to 5.50c., and steel hoops at 5c. to 5.50c., f.o.b. Pittsburgh. It is expected the Government prices on hoops and bands will come out this week, and will be considerably lower than the above.

Wire Rods.—The domestic demand for wire rods is dull owing to the falling off in new business in wire products, but the export demand is still heavy, and some large sales of soft rods and high carbon rods have been made for export to Canada and France, also to South America and other neutral countries. We note a domestic sale of 500 or 600 tons of soft open-hearth rods at $83, and a sale of 550 tons of high carbon rods at $93, f.o.b. mills. The price on rods fixed by the Government, $57, has not been named in any sales in this district. Former prices are given on page 959.

Wire Products.—The Government has placed some heavy orders for wire nails since Oct. 10, amounting to about 30,000 kegs or more, one local mill taking 6000 kegs and another 3500 kegs. Some of these nails are for export to France for Government work, and the price was $3.20 f.o.b. Pittsburgh. The domestic demand for wire and wire nails is dull, and specifications against contracts are only fair. The trade is looking for a lower price than $4 on wire nails and $4.05 on bright basic wire, and is holding off placing orders until the Government price comes out. Some in the trade believe the Government will fix a price on wire nails higher than $3.20, which has been the price of the American Steel & Wire Co. for some months, and others in the trade believe it will be lower. Price of the independent mills on wire and wire nails to domestic consumers, and at which very little business has been actually placed, are given on page 959. Prices of the American Steel & Wire Co. are $16 per ton lower.

Iron and Steel Bars.—Inquiries among the steel-bar mills indicate that no new orders have been taken thus far at the 2.90c. price fixed by the Government, the mills stating, when offered new business at this figure, that they are sold up on steel bars for some months and have no bars to offer. There has been very little new buying in iron and steel bars for several months, the trade being covered on contracts over the remainder of this year, and some of the large implement makers are covered into 1918. We continue to quote prices in effect on iron and steel bars for some time, as no new sales are reported at the Government price. The prices quoted on page 959 are purely nominal, and would not likely be paid by consumers on new orders.

Shafting.—It is expected the Government price on

shafting will be given out this week, but nothing is known as to whether it will be lower than the price that has been in effect for some time. Some of the shafting makers are covering their large trade for some months ahead without fixing any price, and when the Government announces the prices, they will apply on these contracts. Two of the largest automobile builders have recently contracted for their supply of shafting through the first half of 1918. New buying is dull, consumers holding off, expecting a lower market. To the domestic trade, discounts on shafting remain nominally at 10 to 5 per cent off list, prices on Government purchases being lower.

Railroad Spikes and Track Bolts.—There is a fair amount of new inquiry for railroad spikes, the Erie Railroad having an inquiry out for 1000 kegs and other roads for smaller quantities. The Government is expected to announce prices on spikes and track bolts this week, and they will likely be lower than the present market. Several large contracts for standard size spikes have lately been placed at 5c. and other smaller contracts at 5.50c. at mill. Nominal prices on railroad spikes and track bolts are given on page 959. Prices on Government orders, direct and indirect, are considerably lower.

Nuts and Bolts.—The new demand is reported fairly active, but the Government prices to be given out this week may be somewhat lower than the present market. Specifications are reported fairly active, and the Government has been a very heavy buyer of nuts and bolts for some time. Discounts are said to be firm, and are given on page 959.

Cold Rolled Strip Steel.—A meeting of cold rolled strip steel makers is being held today (Tuesday) in Chicago in connection with a meeting of the implement makers. The Government is expected to make announcement of prices on cold rolled strip steel this week, and they are likely to be lower than the figures quoted by makers for some time. The new demand is quiet, buyers expecting a lower market, but specifications against contracts are said to be fairly active.

On contracts, mills are quoting 9c. at mill, but on small current orders prices range from 10c. up to 12c. at mill. Terms at 30 days, less 2 per cent off for cash in 10 days when sold in quantities of 300 lb. or more.

Rivets.—There is very little new buying of rivets, consumers holding off until the Government announces its prices, which will likely be this week. Nominal prices on rivets are $5.25 for structural and $5.35 for cone head boiler rivets, per hundred lb., f.o.b. Pittsburgh. The prices to be fixed by the Government are expected to the considerably lower.

Wrought Pipe.—In the past two weeks, the Government has placed orders with the different mills through the sub-committee on tubular products for about 8,000 tons of steel pipe, 6 in. and smaller in size and most of it for shipment to France, for taking water to the various war buildings being erected by our Government in that country. The new demand for both iron and steel pipe is dull, buyers holding off until the Government announces its prices on both iron and steel pipe, which may possibly come out before this report reaches its readers. While nothing definite is known as to the prices the Government will fix on pipe, it is possible they will be in line with the discounts issued by some of the independent mills on May 1, last. The opinion is they may be slightly lower than the prices these discounts figure out. Mills are sold up on both iron and steel pipe over the remainder of this year and the National Tube Co. and other mills have heavy pipe obligations on their books over the first half of 1918. Discounts on iron and steel pipe as quoted by most of the independent mills from May 1, prices of the National Tube Co. being lower, were given on page 959.

Boiler Tubes.—Word is expected at any minute from the Government as to what prices it has fixed on boiler tubes and it is believed they will be very much lower than the prices in effect by most of the mills for many months past. Deliveries of both iron and steel tubes have been very hard to obtain for a long time, with the result that a mill that could make fairly prompt delivery could get very heavy premiums in prices. As soon as the Government fixes prices, these premiums will disappear. Nominal discounts, which represent prices much below those that have actually ruled for some months, are given on page 959.

Coke.—As yet no open sales of furnace or foundry coke for prompt or future delivery have been reported this week at the prices fixed by the Government, $6 on furnace coke, the usual differential on foundry to be allowed. It is said that different subterfuges are being tried by some operators to obtain a higher price than $6 on furnace coke, and that prosecutions may follow if these practices are continued. One scheme tried has been to form a mythical stock company and to every purchaser of furnace coke allow him to have one share of stock at $2.50, the other $6 to apply on his purchase of furnace coke. This report is gossip in the trade, and is given for what it is worth. Some of the coke operators are shipping, steadily, furnace coke at $6 per net ton at oven on open contracts made some time ago, and have not decreased the supply furnished, but on the contrary, in several cases it has been increased. The prices of $6 on furnace coke and $7 on foundry are still in force, subject to revision after Jan. 1. The $1 differential in favor of foundry coke over furnace is purely tentative, and was adopted solely to allow coke operators and consumers of foundry coke to have a price on which to figure business, and is subject to revision after Jan. 1. The *Connellsville Courier* gives the output of coke in the upper and lower Connellsville regions for the week ending Oct. 6 as 352,471 tons, an increase over the previous week of 5,063 tons.

Old Material.—Local conditions in the scrap trade are the same as noted in this report for several weeks. Consumers and dealers are waiting for word from Washington as to what the Government intends to do in the matter of regulating prices on scrap, and in the meantime consumers are not buying a pound of material, believing if the Government does fix prices on scrap, they will be much lower than what dealers regard as the market now. The only material selling is in cases where dealers have contracts for delivery of scrap prior to Nov. 1, and they are buying some heavy melting steel to ship on these contracts, if they can get cars, and are paying a little above market prices to get it. Consumers have been offered heavy steel scrap at $28, or lower, delivered, and have turned it down. The railroads still require a permit from the shipper before a car of scrap can be moved, and also a promise from the consumer, that he will take the scrap in and unload the car promptly. This often means a delay of a week or more before a loaded car can be moved, and makes it very hard for dealers to get scrap delivered to consumers. Not enough scrap material has been sold in this market for a month or more to definitely fix prices. The prices given below, are purely nominal, but some scrap loaded on cars that had to be moved, has been sacrificed, and sold at lower prices.

Dealers quote for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$27.00 to $28.00
No. 1 foundry cast	27.00 to 28.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland Md., and Franklin, Pa.	31.00 to 32.00
Hydraulic compressed sheet scrap	22.00 to 23.00
Bundled sheet scrap, sides and ends, f.o.b. consumers mill, Pittsburgh district	21.00 to 22.00
Bundled sheet stamping scrap	19.00 to 20.00
No. 1 railroad malleable stock	23.00 to 24.00
Railroad grate bars	16.00 to 17.00
Low phosphorus melting stock	38.00 to 40.00
Iron car axles	41.00 to 42.00
Steel car axles	41.00 to 42.00
Locomotive axles, steel	48.00 to 50.00
No. 1 busheling scrap	22.00 to 23.00
Machine-shop turnings	18.00 to 18.50
Cast-iron wheels	28.00 to 30.00
Rolled steel wheels	33.00 to 34.00
*Sheet bar crop ends	33.00 to 34.00
Cast-iron borings	19.00 to 19.50
No. 1 railroad wrought scrap	30.00 to 31.00
Heavy steel axle turnings	22.00 to 23.00
Heavy breakable cast scrap	22.00 to 23.00

*Shipping point.

Cleveland

CLEVELAND, Oct. 16.

Iron Ore.—Boats are being diverted from the ore trade to the grain trade, the latter being given the first call for wild tonnage. On this account, there will probably be some falling off in October shipments. Boats are getting good dispatch and the supply of vessels seems adequate to meet the present demand for vessels for carrying ore, grain and coal. No ore sales are reported. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, $5.95; old range non-Bessemer, $5.20; Mesaba Bessemer, $5.70; Mesaba non-Bessemer, $5.05.

Pig Iron.—The market is fairly active after being at a stand-still for several weeks while buyers and sellers were waiting for the price regulation and fixing of differentials. The demand is largely for foundry grades in lots of 200 tons and under for this year's delivery, although there is some buying for the first half and a few sales of malleable iron are reported, including a 300-ton lot for this year's delivery. Sellers are taking orders for iron for such deliveries as they are able to fill at the Government price, $33 for No. 2 foundry and $33.50 for malleable. Sales for this year's delivery are being made subject to price revision should the Government change the differentials named by the Pig Iron Committee on the various grades. Orders for the first half are being booked at this year's prices without readjustment clauses in the contracts, sellers believing that should there be any price revision Jan. 1, it will be downward rather than upward. Producers are still receiving requests for readjustments of high-priced contracts. Shipping orders continue heavy. However, it will be some time before deliveries will be made on the iron sold at the maximum prices, most of the shipments at present being of iron bought at below the Government price. The Westinghouse Electric & Mfg. Co. has changed its specifications in the inquiry for iron wanted for its Cleveland plant for Government work, and now is asking for 1000 to 2500 tons of standard Bessemer iron instead of malleable iron. Southern pig iron producers are not making quotations, and it is still uncertain what their attitude will be on prices. It will be necessary for them to reduce the Government price of $33 $3 or $4 a ton to meet the competition of Northern iron in the Northern Ohio territory. No quotations are being made on low phosphorus iron, as sellers have no information as to what price this iron will command under the Government regulation. We quote delivered Cleveland, as follows:

Bessemer	$37.25
Basic	33.30
Northern No. 2 foundry	33.30
Southern No. 2 foundry, nominal	37.00
Gray forge	32.30
Ohio silvery, 7 per cent silicon	44.62

Coke.—There is a great deal of inquiry for foundry coke for prompt shipment, and some inquiry for contracts, but as producers are loaded up with high-priced contracts, local sellers are unable to secure prices from producers and cannot quote on the inquiries. However, it is reported that a very few small lots of foundry coke have been picked up at $6 per net ton at oven. Foundries are likely to suffer before long unless they are able to secure a supply of coke.

Finished Iron and Steel.—The volume of inquiry for finished products has increased, but this is largely for steel for Government work and consequently has not resulted from the fixing of prices. This demand is for various lines of finished steel for cranes, motor trucks, army wagons and other equipment. A large amount of business in axles and other truck parts is being distributed among manufacturing plants. An order for 600 tons of tire steel for army wagons has been placed and another order for several hundred tons is pending. Another order placed is for 750 tons of chrome vanadium spring steel. There are new inquiries from railroads for 4750 tons of steel for bridge work on which the Government price has been quoted, but no promise was made as to delivery except the rather indefinite one that delivery could probably be made late in 1918 subject to Government requirements. Manufacturers are finding it more difficult every day to secure steel wanted for other than Government work. A builder of heavy machinery is inquiring for 1200 tons of bars, plates and shapes for delivery in June and October, 1918. Before the announcement of prices on semi-finished steel last week, several sheet bar sales were made to Ohio mills at $80 for prompt shipment, consumers being willing to pay the high price rather than to wait for the lower Government price and the uncertainty of delivery. The local plate market is unchanged, one mill continuing to book orders at 7.50c. While the prices fixed by the Government for semi-finished steel seem generally to give satisfaction, some objection is being made to the $50 price fixed for slabs, it being claimed that the steel makers who are allowed $17 for converting $33 pig iron into slabs have an advantage over the plate mills that must sell their product at $65 a ton, being allowed only $15 a ton for conversion. Sheet prices have eased off and the demand has improved. Some mills are glad to fill up with orders at higher than the expected Government prices and some consumers are willing to place orders at the prevailing prices and secure deliveries rather than to wait for the lower Government prices and the possibility of delayed deliveries. Sheets are being offered at 7c., Pittsburgh, for No. 28 black and 8.50c. for galvanized, although sales are reported at as high at 8.50c. for black sheets. Galvanized sheets have been sold as low as 6c. by a consumer having a surplus stock. It is expected that the Government price on black sheets will be from 5.50c. to 6c. The demand for hard steel bars for reinforcing purposes is light and prices are not firm, the usual quotations being from 3.75c. to 4c. Warehouse prices are 4.50c. to 5c. for steel bars and 5c. to 5.25c. for structural material.

Old Material.—The scrap market is almost at a standstill. Consumers are unwilling to buy until prices are fixed by the Government, and the only trade is in small lots between dealers to cover old orders. The market is weak, prices still showing a downward tendency. There have not been enough transactions in most grades to establish prices, and quotations are still largely nominal. Some of the dealers are asking $30 for heavy melting steel scrap but the market on this grade appears to be $2 to $3 a ton below that price. Busheling has declined about $2 a ton and dealers are now offering only $22 for this grade. Shipments to mills are very slow owing to delays in securing releases of car from the railroads. Dealers quote, f.o.b. Cleveland, as follows:

Per Gross Ton

Steel rails	$26.00 to $27.00
Steel rails, rerolling	36.00 to 37.00
Steel rails, under 3 ft.	30.00 to 31.00
Iron rails	35.00 to 36.00
Steel car axles	45.00 to 46.00
Heavy melting steel	27.00 to 28.00
Carwheels	26.50 to 27.50
Relaying rails, 50 lb. and over	50.00 to 60.00
Agricultural malleable	22.00 to 23.00
Railroad malleable	27.00 to 28.00
Steel axle turnings	23.00 to 24.00
Light bundled sheet scrap	22.00 to 23.00

Per Net Ton

Iron car axles	$44.00 to $45.00
Cast borings	16.75 to 17.25
Iron and steel turnings and drillings	16.00 to 16.75
No. 1 busheling	22.00 to 23.00
No. 1 railroad wrought	34.00 to 35.00
No. 1 cast	23.00 to 23.50
Railroad grate bars	19.00 to 19.50
Stove plate	19.00 to 19.50

Bolts, Nuts and Rivets.—New inquiry for bolts, nuts and rivets is light. Consumers are withholding orders for a possible price reduction. While there are reports of price shading by jobbers, bolt and nut makers appear to be holding to recent prices, but if buyers can wait long enough they will probably be able to buy at lower prices. However, makers are not disposed to make concessions until they catch up somewhat on orders. Rivet prices are still apparently firm. We quote rivets at 5.25c., Pittsburgh, for structural and 5.35c. for boiler rivets. Bolt and nut discounts are as follows, round lot buyers being allowed 5 to 10 per cent discount from these prices:

Common carriage bolts, ¾ x 6 in., smaller or shorter, rolled thread, 35 off; cut thread, 30 and 5, larger or longer.

20. Machine bolts, with h. p. nuts, ⅝ x 4 in., smaller or shorter, rolled thread, 40; cut thread, 35; larger and longer, 25. Lag bolts, cone point, 40. Square h. p. nuts, blank, $1.90 off list; tapped, $1.70 off list. Hexagon, h. p. nuts, blank, $1.70 off; tapped, $1.50 off. C. p. c. and t. hexagon nuts, all sizes, blank, $1.25 off; tapped, $1 off. Cold pressed semi-finished hexagon nuts, 50 and 5 off.

Cincinnati

CINCINNATI, Oct. 16—(*By Wire*).

Pig Iron.—A new southern Ohio furnace, built to produce basic for the owner's exclusive use, in its initial operation turned out over 2000 tons of iron that ran high enough in silicon to be used for foundry purposes. The bulk of this iron has been sold at a reported price of $33, furnace. A few small lots of foundry iron from Ironton have also been disposed of at the same figure, all for this year's shipment. Southern producers have been slow in getting into line, but some furnace and resale No. 2 foundry is now on the market at $33, Birmingham basis, with prices subject to revision to conform to the Government's schedule. Very little of this iron has been sold in this territory and the furnace offers came out only this week. It is hardly probable that there is enough iron in the South for this year's shipment, not under contract, that will prove any disturbing factor as far as contracts are concerned. A number of inquiries have been received lately for first half iron, but furnace operators are generally disposed to let that delivery take care of itself. So far, no contracts have come to light on the proposed basis of billing the iron at the Government's price at the time of shipment. It is rumored that Southern producers will recommend the adoption of the new Virginia furnace schedule of 1.75 to 2.25 per cent silicon for No. 2 foundry iron. Only a fair tonnage of Virginia foundry was sold in this territory at $33, furnace, and sellers now state that there is very little No. 2 foundry in that district to be had for this year's movement. All selling agencies are receiving urgent requests from consumers to hurry forward iron due them on contracts. A quiet inquiry is out from a consumer in this territory for a medium sized tonnage of basic for this year's shipment. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, nominal prices, as follows:

Southern coke, No. 2 f'dry and 2 soft	$33.00
Southern Ohio coke, No. 2	33.00
Basic, Northern	33.00

(*By Mail*)

Finished Material.—Jobbers report more inquiries, both from city and suburban customers. Orders are also more numerous but not so large as usual. Standard galvanized steel pipe is hard to obtain; a medium-sized order from a neighboring city had to be split among three houses to obtain prompt shipment. Cold rolled shafting is in good demand and so far the jobbers have been able to make prompt deliveries on nearly all orders received. It is quoted from stock at 15 per cent plus list. Prices on steel bars are somewhat irregular and as low as 4.65c. could be done on good specifications, although as high as 5c. on small shipments is quoted. Twisted steel bars take the usual advance of 5c. per 100 lb. Structural shapes are unchanged at 5.15c. to 5.25c. and plates ¼-in. and heavier are held at 10c. A better call for No. 10 blue annealed sheets is reported and they are firm at 10c. from stock. The nominal mill quotation on No. 28 black sheets is 8.65c., Cincinnati or Newport, Ky., and on No. 28 galvanized 10.65c. All kinds of wire goods are slow and from $3.80 to $3.90 per keg base is quoted by jobbers on wire nails.

Coke.—New orders are as scarce as they have been in all districts for the past three weeks. Some business is being taken in Connellsville coke, but the number of cars obtained is said to be small and represents fill-in lots of foundry coke badly needed by consumers. Oven operators in the Wise County, Pocahontas and New River districts are practically unable to take more business this year and are unwilling to book orders for shipment next year.

Old Material.—The uncertain conditions surrounding the market make it difficult for the dealers to establish stable prices. The market is still declining, but not so rapidly as a week ago. A reduction of 50c. per ton has been made on nearly all grades, but a firm offer for a desirable tonnage would be accepted below the regular market quotations.

The following are dealers' prices, f.o.b. cars, southern Ohio and Cincinnati.

Per Gross Ton

Bundled sheet scrap	$17.50 to $18.00
Old iron rails	32.00 to 32.50
Relaying rails, 50 lb. and up	44.00 to 44.50
Rerolling steel rails	33.00 to 33.50
Heavy melting steel scrap	24.50 to 25.00
Steel rails for melting	24.50 to 25.00
Old carwheels	25.00 to 25.50

Per Net Ton

No. 1 railroad wrought	$27.50 to $28.00
Cast borings	12.50 to 13.00
Steel turnings	12.50 to 13.00
Railroad cast	18.50 to 19.00
No. 1 machinery cast	23.50 to 24.00
Burnt scrap	13.00 to 13.50
Iron axles	40.00 to 40.50
Locomotive tires (smooth inside)	33.50 to 34.00
Pipes and flues	15.50 to 16.00
Malleable cast	19.00 to 19.50
Railroad tank and sheet	14.00 to 14.50

Birmingham

BIRMINGHAM, Oct. 15.

Pig Iron.—The pig iron market in the Birmingham district is in a more or less unsettled state as regards prices, but iron makers assert that they are being pushed to meet contract requirements and they do not expect any trouble in price adjustments when the Government prices are made final. The Government price of $33, No. 2 foundry basis, is being quoted very little here, iron producers declaring that they have nothing to offer above the make necessary to meet contractual requirements. Local producers yet are awaiting official confirmation of the prices fixed by the Government. The only information they have received has come through the press, and they declare they will not begin to make prices other than on the $33, No. 2 foundry basis, until they have received more definite information regarding this price. Producers state that they believe there will be differentials for various furnace makes, and they desire to obtain definite information along this line before proceeding to change prices in future contracts. No news has been made public of any iron buyers making attempts to obtain release from contracts made before the Government prices became effective, and it is presumed that producers have not had to meet a situation of this sort.

Old Materials.—Prices on old material have shown no change. The effect of the Government's price fixing on pig iron is reflected in this market, and it is indicated that there will be drops in prices here. No revision has been made since last week, however. Dealers report further increase in stock on hand. Quotations are as follows:

Old steel axles	$32.00 to $33.00
Old steel rails	24.00 to 25.00
No. 1 wrought	26.00 to 27.00
Heavy melting steel	20.50 to 21.50
No. 1 machinery	23.50 to 24.50
Car wheels	23.00 to 24.00
Tramcar wheels	20.00 to 21.00
Stove plate	18.00 to 19.00
Shop turnings	11.00 to 12.00

Coal.—Coal operators are bending every effort toward speeding up production and assert that they are meeting with fair success. They believe that if they can continue to increase the production for the remainder of the month and set a standard which can be maintained there is no danger of a coal shortage.

San Francisco

SAN FRANCISCO, Oct. 13.

The distance of this market from Eastern sources of supply adds more indefiniteness to a situation already complicated since the publication of the Government scale of maximum prices for steel products. Local mills await further declarations of Government price regulation with the expectation that differentials allowing for freight and extra cost of production may be established for Coast mills. With no advices of price changes from Eastern mills,

there is no change in this market; jobbers booking orders at former ruling prices. Few orders are being booked by representatives of Eastern mills, several of whom have left for the East to consult with their houses on the situation. There is a feeling of insecurity in the trade, generally, and it is apprehended that as soon as lower priced material arrives in this market, dealers here will have to follow the Eastern lead and scale down prices. Some large buyers are holding away from the market, being undecided whether to close at present figures or to await expected lower prices.

Bars.—No orders are being booked by local mills at the Government maximum price, the mills being already overbooked and delivery uncertain. Coast sizes from local mills continue at the base prices of 4c. to 5.25c. in carload lots, f.o.b. San Francisco, but jobbers' prices exceed these, their quotations being offered at a base price of 6.50c. Demand for steel bars has fallen off during the past week owing to the unsettled condition of the steel market, and local mills are working only on existing contracts.

Structural Materials.—There is considerably more inquiry for structural shapes, although it is chiefly of a tentative nature. Engineers and architects, expecting recessions in prices, are preparing plans and estimates for clients desirous of building as soon as the Government price goes into effect. Aside from this, there is little stir in this market and few orders are being offered local fabricators. In spite, however, of a weakened demand, there has been no deviation from a base price of 7.75c., f.o.b. San Francisco, although sales exceeding this figure are announced by representatives of Eastern mills as having taken place, compelled by unusual conditions of supply and demand.

Plates.—Since the return of the machinists and ironworkers to the shipyards, after the walk-out, the demand for tankplates has improved. No new quotations are indicated by Eastern mills, and jobbers offer only at former prices. Buyers are in somewhat of a quandary. While there seems a probability of a readjustment of prices, in accordance with the Government scale, yet it is not unlikely that the embargo on shipments to Japan may be lifted, which would make uncertain deliveries.

Sheets.—Shipyards are placing some large orders for sheets, intended for additions to present buildings, or as temporary structures at new shipyards. Small orders are infrequent and bookings, as a whole, are not in such volume as formerly. Jobbers make no concessions in prices, while quotations are hard to obtain from representatives of Eastern mills. Stocks in jobbers' hands are low, and at this juncture jobbers do not feel inclined to replenish, preferring to await events.

Wrought Pipe.—Activity in the wrought pipe market has not assumed large proportions lately. Orders from the oil fields are still arriving, but not in such volume as during previous weeks. Black oil pipe, 4 in., is quoted at $96.25 per 100 ft., f.o.b. San Francisco, with Eastern deliveries rather uncertain. The lull in building has stopped individual buying, most of the bookings coming from corporations.

Cast Iron Pipe.—There is very little tonnage offering and the market on cast iron pipe is extremely quiet. No contracts of size are offering and the usual small orders from corporations are lacking. Buyers seem diffident about entering the market and future operations depend on the adjustment of conditions in the iron and steel market. Present quotations are, for water pipe, 6 in. or larger, $73, f.o.b. San Francisco, and gas pipe, Class A, $77, f.o.b. San Francisco.

Pig Iron.—Most buyers free from existing long time contracts are holding back until the price situation clears. There are no quotations yet at any figures approaching the Government maximum price. Jobbers and Eastern representatives quote nothing less than $65 a ton for No. 2, f.o.b. San Francisco. There is a feeling among some of the local mills that long term contracts for pig iron, made with Eastern corporations, may be subject to revisions by the Government, or interpretation by the courts. Reports from the furnaces recently installed in the Northwest state that they will soon be able to supply customers with pig iron.

Coke.—There is more activity in the coke market here than has been displayed for some time. Spot stocks, in bulk, have sold lately as high as $35 a ton and $40 sacked, f.o.b. San Francisco. Eastern deliveries are somewhat easier and futures are quoted at $23 to $24 a ton, f.o.b. San Francisco.

Old Materials.—Stocks of old material are accumulating; 400 tons has arrived in the last two weeks, which, added to stocks already on hand, places the supply somewhat in excess of local requirements. Holders express confidence in a maintenance of present prices, but unless export licenses can be obtained for shipment to Japan, a drop in values seems inevitable. Selling prices during the past week have been, for heavy melting steel scrap, $26; cast iron heavy material, $32 to $34; light cast iron stove plate, $22, f.o.b. San Francisco. Country scrap is not much in request, the tendency of buyers being toward the better grades.

Buffalo

BUFFALO, Oct. 15

Pig Iron.—One furnace interest of the district reports that several sales of No. 2X foundry iron have been made during the week at $33, furnace, in lots of 400 to 600 tons. This producer had until very recently been running one of its furnaces on ferrosilicon, but changed to foundry iron within the last week, and some of this product is now being disposed of at the above-mentioned price. Most of the furnaces of the district, however, report very little iron to sell, having practically no product uncontracted for for delivery over the remainder of the year, and are not making efforts to sell for 1918 deliveries at present. A good many users are asking if furnaces have iron to sell at Government prices, and producers state they are perfectly willing to sell such product as they have uncontracted for, for delivery at such time as they have it to dispose of, at the tentative prices that have been promulgated by the Government, subject to any changes due to governmental revision.

The price scale would, therefore, be approximately as follows, f.o.b. furnace, Buffalo:

No. 1 foundry	$34.50
No. 2 X	33.50
No. 3 foundry	32.50
Gray forge	32.00
Malleable	33.50
Basic	33.00
Lake Superior charcoal, f.o.b. Buffalo	39.75

Finished Iron and Steel.—The mills and sales agencies of the district as a rule report they have practically nothing to sell, having sufficient orders on books to carry them over the remainder of the year, and are not yet entertaining the taking on of orders or contracts for the period after Jan. 1, although if quotations were made, they would be at prices prescribed by the Government. In the Canadian market, interest has been centered on the fixing of prices by the United States Government in conference with the steel makers, and similar action by the Dominion Government is looked for in price fixing and control of materials. Users of steel plates and of tin plate are greatly exercised over the embargo on these products, as it is unlikely that class C consumers will be able to get requirements filled; but so far no modification or remedy has been suggested. The John W. Cowper Co., Buffalo, has received the contract for the construction of a power house and refinery for Hydofats, Inc., Niagara Falls, an auxilliary of the Kellogg Products Co., taking 100 tons of structural steel.

Old Material.—The market is again marking time, awaiting announcement of price that the Government will fix for the different lines of scrap materials. The conference of the American Board of Scrap Dealers scheduled for Oct. 25, at the Fort Pitt Hotel, Pittsburgh, is expected to have an important bearing on the fixing of the price scale, and the general impression is that the price to be fixed by the Government will be $30 for heavy melting steel. It is reported

that one large consumer in this district has offered $28.00 within the past few days, but was unable to close purchases of any material tonnages at this figure. A good many large orders placed within the last month for heavy melting steel at $35.00 to $38.00 that call for delivery extending to Jan. 1, are being hurried forward as rapidly as possible by sellers, and dealers generally are putting all endeavors into the completion of old contracts rather than manifesting much interest in new business. Another embargo on Monessen, Pa., one of the largest consuming points, coupled with the fact that practically all outside shipping points require special permits, and the serious handicap of the scarcity of labor tend to retard and restrict shipments to a minimum. We quote dealers' asking prices as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$30.00 to $31.50
Low phosphorus	41.00 to 42.00
No. 1 railroad wrought	40.00 to 41.00
No. 1 railroad and machinery cast	29.00 to 30.00
Iron axles	45.00
Steel axles	45.00
Carwheels	30.00 to 31.00
Railroad malleable	29.00 to 30.00
Machine shop turnings	17.00 to 18.00
Heavy axle turnings	26.00 to 27.00
Clean cast borings	19.00 to 20.00
Iron rails	40.00 to 41.00
Locomotive grate bars	20.00 to 21.00
Stove plate	20.00 to 21.00
Wrought pipe	26.00 to 27.00
No. 1 busheling scrap	25.00 to 26.00
No. 2 busheling scrap	17.00 to 18.00
Bundled sheet stamping scrap	19.00 to 20.00

BRITISH STEEL MARKET

Talk of Reorganization of Business Methods—All Plants Busy

LONDON, ENG., Oct. 16 (*By Cable*).

Pig iron, Cleveland, is quieter but firm. Hematite is strong, with urgent home demand. Tinplates are firm. Steel allotments have increased. Current mill output is now about 37 per cent of normal. Semi-finished is idle and unchanged. Ferromanganese is firm. Orders are pending for a large quantity for shipment in first half of 1918. North Atlantic ports sellers are asking $350 and upward, c.i.f.

(*By Mail*)

Productive capacity in the British iron and steel industry continues fully engaged, and no efforts are spared to satisfy as far as circumstances permit the heavier calls made upon steel producers for munitions and shipbuilding material. There is, on the whole, no great change in the general situation, which is as satisfactory as could be expected, all things considered.

Greater firmness prevails in pig iron, with evidence of an enlarged demand on all sides, especially for steel-making descriptions, the position of which seems more acute, and this has necessitated a considerable number of furnaces being put on basic iron lately in the Midlands. The output of East Coast hematite is also being increased, the demand growing to such an extent as to force a restriction of the allocations to consumers. The July allocations to Italy have only just been made, and have been cut down considerably, although it is hoped that the deficit will be recouped when the applications for the next two months are dealt with. The Italian demand is greater than ever. The price to Allies remains at 141s., subject to an allowance for ore freight over the official basis. Requirements in Cleveland foundry iron are met with ease, but, with the increasing demand, stocks are hardly likely to accumulate much over the end of the year.

Semi-finished Very Tight

There is not the least sign of any alleviation of the tightness in semi-finished steel, the home output being almost entirely appropriated for Government work, but official quotations are retained as before at £10 7s. 6d. for Welsh bars and billets delivered. Shell discard billets are also being utilized for war work. There is really nothing fresh regarding American material, business being negligible in the absence of offers, though small lots of wire rods are occasionally obtainable at about £28 to £29 c.i.f. Liverpool.

Intense stringency is everywhere in evidence in finished iron and steel, and new business is restricted. The whole position is absolutely dominated by war and marine requirements.

Reorganization Discussed

The reorganization of the British steel trade is now engaging the attention of the Committee of the Iron and Steel Institute, whose report says that "It is clear to the committee that the one outstanding feature which has been revealed by their work, so far as it has gone, has been the eliciting of the almost unanimous opinion that if the steel industry in this country is to maintain its position, it must be by some great broadening of our commercial organizations that would lead to economies far and away outweighing any other element in the situation, and long ago realized and adopted by our foreign competitors. The view is held in trade circles that the industry can hardly hold its own in open competition with other steel-producing countries unless the contemplated scheme includes a central selling board under whose control orders would be allocated to the works in proportion to their capacity."

Plates and Sheets

There is virtually no change in the plate and sheet markets, which are entirely under Government control, the chief difficulty barring the way to an extension of production from the present reduced level, in the case of tinplates and galvanized sheets, being the lack of steel. Only few orders are now being booked in black sheets on the basis of the official price fixed recently of £17 1s. 0d. for close annealed No. 24 gage sheets net f.o.t. at makers' works, and it is understood that some works are now taking orders for Allied countries on the same basis, although there is some grumbling that the official basis is too low.

There is not much stirring in tinplates, but the mills have very little to sell for near months, some makers having their output already earmarked into March next. There is no special feature, the tone being firm on the official maximum basis price of 30s. per base box net at mills, although this figure is shaded to the extent of 1s. for suitable specifications in light plates. Merchant business is almost at a standstill, while export orders for Allied countries continue to be passed on direct to the works through Government channels.

Business in ferromanganese hangs fire, makers being still out of the market. There is a steady demand for Continental ports, the price asked being £80 f.o.b. for loose, while the quotation for North American Atlantic ports for far forward shipment is $375 c.i.f. America is still inquiring.

Chicago

CHICAGO, Oct. 15.

More satisfying information, from the viewpoint of the consumer, at least, is at hand regarding the prices of foundry iron, mild and hard steel bars, and warehouse prices on plates and sheets. Pig iron has been sold, though not in large quantities, on the basis of $33, furnace, with the understanding that the price is subject to revision should such action be justified by Government announcement more definitely placing the status of iron prices. An Eastern producer has sold in this market both mild and hard steel bars on the basis of 2.90c., Pittsburgh, the agricultural implement trade taking a limited quantity of hard bars. Less of the mild steel was disposed of, the deliveries in both cases being prompt. A large jobber to-day announced a reduction from 10c. to 7c. in the price of plates out of warehouse, while the declines in sheets varied from ½c. to 1c. The mill prices on sheets, while uncertain, are admittedly lower, with the market soft. It is generally asserted that plates and shapes are unobtainable, except for Government purposes, at the recently fixed prices of 3.25c. and 3c., although it is intimated that Eastern mills which have avoided contracts are quietly looking around for plate business. Large Western producers have no bars to offer, any more than they have

plates and shapes. At the same time, inquiry is plentiful.

The prices, fixed by agreement, on blooms and billets, slabs, sheet bars, wire rods and skelp, will not have much effect, except as they influence the general price situation, on most of the mills in this territory. Those which produce the products named can use practically all they make. It is predicted that there will be no eagerness to sell sheet bars at $51 a gross ton, likewise with 4 x 4 in. and larger billets at $47.50 per gross ton. The prices for shell steel are regarded as pretty low, in view of the extent to which the cost of production has increased, and it is declared, with regard to all the prices, that the cost of doing business has caused much of the profit that might be in them to disappear.

Pig Iron.—Sales have been made in the past week, for delivery this year, and in the first quarter and first half of next, on the basis of $33, furnace, with the understanding in all cases that the price is subject to revision, if considered proper after further Government announcement is made. It is understood, however, that whatever sales are made will not be affected by any changes in official figures which may be made at the end of this year. The trade is still awaiting official notification as to basing points, also information as to differentials, but it is not assumed that any furnace will accept less than $33 for No. 2. Further evidence of the bending of the iron market toward the $33 level is that dealers are receiving offerings, both from furnaces and consumers, the latter having surplus stocks, which name $33, furnace, as an acceptable price. In a small way, there is considerable inquiry, and one of the large interests is quoting where the specified deliveries are beyond next February, at which time it will have a new furnace in blast and consequently more iron to sell. So far as this year is concerned, the interest in question is sold up, therefore not quoting except where Government requirements are to be filled, but admits that $33 would be its quotation if it could take any non-Government business. Another interest reports sales aggregating 1250 tons, at the official price of $33, mostly, however, for delivery in other territories, although some sales were made in the Chicago district on the same basis, with a clause providing for revision of price. In one case, no price at all was arranged, tentatively or otherwise, and it is to be determined by future events. Both low phosphorus and charcoal iron are under inquiry, and prices of a tentative sort have been named, the quotations being based on the recommendations made to the War Industries Board as stated in THE IRON AGE of Oct. 11, page 915, final action on which is awaited. A company which manufactures aeroplane motors is in the market for 800 tons for delivery in the last and first quarters. The quotations below are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton.

Northern coke foundry, No. 1	*33.50
Northern coke foundry, No. 2	*33.00
Northern coke foundry, No. 3	*32.50
Northern high-phosphorus foundry	*33 00
Southern coke No. 1 f'dry and 1 soft	†53.00
Southern coke No. 2 f'dry and 2 soft	†52.00
Malleable Bessemer	*33.00
Basic	*33.00
Low-phosphorus	†$85.00 to 90 00
Silvery, 8 per cent	†77.50 to 82.50

*In accordance with the price agreed on. Sales made with revision clause.

†Not yet changed, but new prices pending. Figures shown entirely nominal.

Ferroalloys.—No change in 80 per cent ferromanganese is reported, $325 being quoted for the remainder of this year or first quarter of next.

Plates.—The Government continues to place orders for plates required for tank work, and for ships to be built for the Emergency Ship Corporation, although the quantities placed with one large local independent mill are not notable as to size. To private buyers quotations are not being made by local producers, the mills insisting they cannot take any business not connected with Government work, but it is reported that one or two Eastern makers are beginning to become somewhat anxious for orders inasmuch as they have avoided the making of contracts and largely confined their bookings to prompt deliveries at the high prices which have prevailed. In a general way, the domestic consumer of plates and shapes is in a worse way than he was before the official prices of 3.25c. and 3c. were named. Chicago jobbing warehouses to-day dropped their price on plates from 10c. to 7c.

For Chicago delivery out of stock jobbers quote 7c.

Shapes.—Except for Government business, it does not appear that 3c., Pittsburgh, has been done. All of the producers and their representatives say they have none to offer for delivery this year, while circumstances make them unwilling to sell into the future. The requirements of the Emergency Fleet Corporation continue to be cared for. No structural lettings were announced this week. Jobbers announce no change in their price.

For material out of warehouse the quotation is 5c.

Bars.—An Eastern producer which had a limited quantity of mild and hard steel bars to dispose of for prompt delivery placed them quickly at 2.90c., Pittsburgh, and could have sold a much larger tonnage had it been available. The rail carbon bars were taken by the agricultural implement trade. The mild steel bars did not involve a large tonnage. Other makers of rail carbon bars report no sales for the reason that they are booked to capacity. They say they have had no reason to change their previously quoted price of 4.25c. to 4.50c., Chicago. A little business has been done in iron bars at 4.50c., Chicago. Warehouse prices are unchanged.

We quote warehouse prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c.; reinforcing bars, 4.50c. base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Sheets.—With an announcement regulating the prices of sheets unquestionably near, not much business has been done and the market has shown pronounced weakness. It is difficult to name exact prices, but a leading maker puts the minimum of No. 28 black and No. 10 blue annealed at about 6.50c., Pittsburgh, or 6.689c., Chicago. The makers profess not to know at what figure No. 28 galvanized should be quoted, and 9.689c., Chicago, is repeated as a nominal quotation. Another meeting to consider the sheet situation is to be held in Pittsburgh to-morrow. Jobbers have dropped their quotations ½c. on blue annealed, ¾c. on black and 1c. on galvanized.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 9.50c.; No. 28 black, 9.25c.; and No. 28 galvanized, 10.50c.

Wire Products.—The leading interest continues to follow its course of recent weeks, taking business on the basis of $3.20 for nails, but not looking for new customers. The independent makers continue to quote on the basis of $4. In connection with the newly fixed price of $57, Pittsburgh, per gross ton for wire rods, a local maker states that it was recently offered $80, and that inasmuch as it can use all it produces, it does not expect to offer any to the public at the new price. We quote wire products on the basis of $4 for nails per 100 lb. to jobbers, as follows:

Plain fence wire, Nos. 6 to 9, base, $4.189; wire nails, $4.189; painted barb wire, $4.339; galvanized barb wire, $5.039; polished staples, $4.339; galvanized staples, $5.039; all Chicago carload lots.

Rails and Track Supplies.—So far as can be learned, the market in these products is dormant. We quote nominal prices as follows:

Standard railroad spikes, 4.50c. to 5.25c., base; small spikes, 4.75c. to 5.50c. base; track bolts with square nuts, 5.50c. to 6c., all in carloads, Chicago; tie plates, $70 to $90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base (nominal); open hearth $40 (nominal); light rails, 25 to 45 lb., $70; 16 to 20 lb., $71; 12 lb., $72; 8 lb., $73; angle bars, 3.25c., base.

Bolts and Nuts.—With producers the situation is but little changed, consumers awaiting governmental action that will be to their advantage. For prices and freight rates see finished iron and steel, f.o.b. Pittsburgh, page 959.

Store prices are as follows: Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to ⅞ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to ⅞ x 6 in., 40-2½; larger sizes, 30-5; hot pressed nuts, square, $2, and hexagon $2 off per 100 lb.; lag screws, 50 per cent off.

Cast-Iron Pipe.—Contractors are expected to let 300 tons at Berwyn, Ill., to-morrow, and 850 tons at Gross Point, Ill., Oct. 17. Makers' quotations are unchanged at the reduced prices announced a week or more ago. They are looking for orders to be filled this year.

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., $53.50; 6 in. and larger, $50.50, with $1 extra for class A water pipe and gas pipe.

Old Material.—The market is quiet and to a large extent devoid of feature, except that there is evidence of influences which tend to steady prices. Business in several items has been done, notably turnings, railroad wrought, busheling and pipes and flues and short lengths of old rails. Incidental to the confusion and uncertainty which followed the first announcement of official prices for a few products, the quotation for old steel rails, less than three feet, given in THE IRON AGE of Oct. 4 was too low. Later information justifies $35 to $36, instead of $29 to $30 which was printed. Fair sized lists have been issued by the Big Four and Union Pacific and smaller ones by the Monon Route, C. & E. I. and Soo lines. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Old iron rails	$36.00 to $37.00
Relaying rails	50 00 to 55.00
Old carwheels	26.00 to 27.00
Old steel rails, rerolling	34.00 to 35 00
Old steel rails, less than 3 ft	33.00 to 34.00
Heavy melting steel scrap	25 00 to 26.00
Frogs, switches and guards, cut apart	25 00 to 26 00
Shoveling steel	22.50 to 23.00
Steel axle turnings	19.00 to 20.00

Per Net Ton	
Iron angles and splice bars	$34.00 to $35.00
Iron arch bars and transoms	36 00 to 37.00
Steel angle bars	24 00 to 25.00
Iron car axles	40 00 to 41.00
Steel car axles	40 00 to 41 00
No. 1 railroad wrought	29.50 to 30.00
No. 2 railroad wrought	26.50 to 27 50
Cut forge	25 00 to 26 00
Pipes and flues	18.00 to 19.00
No. 1 busheling	20 00 to 21 00
No. 2 busheling	14.00 to 15.00
Steel knuckles and couplers	29 00 to 30 00
Steel springs	35.00 to 36.00
No. 1 boilers, cut to sheets and rings	17.00 to 18.00
Boiler punchings	30 00 to 31.00
Locomotive tires, smooth	31 00 to 32 00
Machine-shop turnings	15 00 to 15 50
Cast borings	14.00 to 15 00
No. 1 cast scrap	20.00 to 21.00
Stove plate and light cast scrap	15 50 to 16.50
Grate bars	14 00 to 15.00
Brake shoes	14.00 to 15 00
Railroad malleable	25 00 to 26 00
Agricultural malleable	20 00 to 21 00
Country mixed scrap	15.50 to 16.00

Philadelphia

PHILADELPHIA, Oct. 16.

Announcement of agreed prices on billets, slabs, wire rods, sheet bars, shell bars and skelp by the President has caused scarcely a ripple in this market, and no business in these products is reported. However, the inactivity which has prevailed in plates, shapes and steel bars since prices were fixed has been broken to a slight extent by mills which have accepted orders for delivery over the remainder of this year and first quarter of next year from favored customers, such, for example, as the railroads. In the aggregate, several thousand tons in the three products named have been accepted without Government priority certificates at the fixed price. Despite the fact that most of the mills do not need and are not encouraging business for this year, the feeling is becoming more general that comparatively soon there will be tonnage offered for delivery next year. Exporters are not finding it difficult to locate mills willing to accept orders for fairly prompt delivery at 6c. to 8c. for tank plates, 4.50c. for steel bars, and about the same price for shapes. Such sales, of course, are for other than war purposes. There are reports that material bought for export at these prices has been resold in this country, but they lack confirmation. A leading pig-iron seller has opened its books for any delivery, though admitting its inability to take much tonnage for this year. Several sales of basic iron, aggregating 20,000 tons, have been made during the week at $33, furnace, of which several thousand tons are for delivery in 1918. Gray forge has been sold at $32, furnace, Bessemer at $36.30, furnace, and several grades of foundry iron at the differentials recommended to the War Industries Board, subject to revision if necessary. The committee considering price fixing on iron and steel scrap is reported to have discussed $25 and $27.30 per ton as a price for heavy melting steel.

Pig Iron.—Although there has been no announcement from Washington regarding the differentials to be established on grades of pig iron other than $33, base, for foundry (1.75 to 2.25 per cent silicon) and basic, a leading seller of eastern Pennsylvania iron this week announced it had opened its books for orders for any delivery, which means largely next year, as there is very little iron available for delivery this year. This seller has taken a number of orders for foundry grades based on the tentative prices of $33, furnace, for iron 1.75 to 2.25 per cent silicon, $33.50 for 2.25 to 2.75 per cent silicon, and $34.50 for 2.75 to 3.25 per cent silicon. These orders will be revised to meet any changes the War Industries Board may make in the schedule recommended by the pig-iron producers. It is contended here that makers may safely take contracts for next year's delivery at the new prices, and that such contracts cannot be altered in the event of a Government price revision on or about Jan. 1. A contract is declared to be as inviolable under these conditions as were existing contracts when the new prices were announced on Sept. 24. A factor that may deter some sellers from accepting much tonnage for next year is their inability to foresee what the coke situation will be. Scarcity of coke is already a serious problem, and at least one furnace in eastern Pennsylvania will go out of blast this week for lack of a sufficient supply. Furnace operators are calling on the Fuel Administration at Washington for coal and coke to avert complete shutdowns. Under the gradings of foundry iron, based on silicon content, as recommended by makers, there will be an effort to establish some uniformity of trade designations throughout the country. In the East, 2X iron has in the past been sold in competition with No. 2 foundry from Southern furnaces, though the latter was lower in silicon content. The term No. 2 plain may now be dropped, and called No. 2 foundry, its silicon content being 1.75 to 2.25 per cent, while 2X iron, as sold in the East, will be understood to mean iron containing 2.25 to 2.75 per cent silicon. Pig-iron sellers seem to be well satisfied with the new method of quoting prices only at furnace. Under present conditions there is not likely to be any attempt to equalize freight charges from different points. As an instance of the new condition, a Virginia furnace has sold 5000 tons of foundry iron, containing 3.25 to 3.75 per cent silicon, at $35.50, furnace, of which 1800 tons going to New England took a $3.25 per ton freight rate above the furnace price. A sale of 400 tons of foundry grades and 200 tons of Bessemer has been made for export to the Italian Government at the agreed price. Other lots sold include 1000 tons of gray forge at $32, 200 tons of Bessemer at $36.30, and a few hundred tons of foundry iron, 2.75 to 3 25 per cent silicon, at $34.50. The Norfolk & Western Railroad has had an embargo on pig-iron shipments in effect for 10 days, and it may last two weeks more, preventing Virginia furnaces on that road from making deliveries. No exception is made by the railroad except for Government navy yards or arsenals.

We quote the following tentative prices at furnace (freight rate to destination must be added):

Eastern Penna. No. 2 X	*$33.50
Eastern Penna. No. 2 foundry	33.00
Virginia No. 2 X	*33.50
Virginia No. 2 foundry	33 00
Basic	33 00
Gray forge	*32 00
Bessemer	*36.30

*Subject to revision.

Coke.—Sales of coke have come to a dead stop and selling agents who would like to help out regular cus-

tomers with a few cars have been unable to do so. Blast furnaces are facing a serious shortage.

Ferroalloys.—Fear of price regulation has greatly weakened the market for ferromanganese, and though there have been no known sales in this market in the past week, it is reported that makers would sell at $300 or less. Spiegeleisen is also weaker, $70 to $72, furnace being quoted, with a possibility that $68 could be done.

Rails.—The American International Shipbuilding Corporation is in the market for 6700 tons of 85-lb. rails and 160 tons of 60-lb. rails for its ship plant at Hog Island, near Philadelphia. The Submarine Boat Corporation has recently closed for a fair tonnage for its new ship plant near Newark.

Sheets.—The Government has given out a number of good sized orders for sheets on behalf of the Italian Government, agreeing to furnish the sheet bars. The price is to be as fixed by the War Industries Board. Small sales have been made here for prompt delivery at about 7c. to 8c., Pittsburgh, for No. 10 blue annealed and No. 28 black and 9c. to 9.75c. for No. 28 galvanized.

Structural Material.—The Stone & Webster Engineering Corporation, Boston, has asked fabricators in this district to bid on 10 more buildings, each requiring about 450 tons of steel, to be erected in France for the United States Government. The Government will require about 1000 tons for a radio station on the Atlantic Coast. Some business has been placed at the agreed price by favored customers.

Plates.—It is reported that orders for export have been accepted at 6c. to 8c. for tank plates. In some instances, it is rumored such plates have been resold for domestic use. A few good domestic customers have succeeded in getting orders for this year and first quarter of next year accepted at the new price of 3.25c., Pittsburgh, but the average buyer would find it difficult to place business. The opinion prevails in some quarters that before long some plate tonnage for next year delivery will be offered.

Iron and Steel Bars.—Several fairly large tonnages of bar iron have been taken at 4.25c., Pittsburgh. Very little is being done in steel bars, though a few thousand tons for export have been sold at 4.50c. Several mills are filled up with orders for shell steel for England. We quote 2.90c., Pittsburgh, base, for steel bars.

Billets, Slabs, etc.—No business has been placed here for billets, slabs, sheet bars, wire rods or skelp at the new prices announced by President Wilson.

Old Material.—Regulation of shipments of old material by a permit system, as recently inaugurated by the Pennsylvania Railroad, will probably be extended soon to a large number of other railroads in the East, and may eventually become nation-wide. The New York, New Haven & Hartford Railroad now requires that application be made to its offices at New Haven, Conn., for permits to move scrap material over its lines. Heretofore it has been possible to obtain permits from the Pennsylvania Railroad for shipments originating on other roads. Dealers in iron and steel scrap in this market look for tighter restrictions on shipments to come during the winter months, and they are advising mills to make their purchases now. Apparently mills are not heeding this advice, as very little business is coming out, consumers evidently preferring to await the outcome of reported price fixing. Price fixing on scrap presents some problems not encountered with pig iron and manufactured steel products. Washington will be warned not to fix prices too low, as was at first done in England, with the result that the movement of scrap from the small dealers to the large yards was almost completely checked. Nothing official has been heard from Washington regarding the discussions on scrap price fixing, but rumors in the trade mention two prices, $25 and $27.30 per ton, as having been considered tentatively for heavy melting steel. It is said that all of the more important old materials will be put under price regulation, though dealers maintain that such regulation is not needed, and that a proper differential between the new prices of pig iron and scrap material now exists. The question of brokerage commissions must be decided in connection with a price fixing program. C. A. Barnes, 509 Widener Building, Philadelphia, secretary of the American Board of Scrap Dealers, has called a meeting of that organization for Thursday, Oct. 25, 1 p.m., at the Hotel Fort Pitt, Pittsburgh, to consider price fixing and formulate recommendations to be presented to the Government. Sales of heavy melting steel have been made during the week at $26. Two mills are offering $25 per ton. There has been a good demand for No. 1 forge fire and bundled sheets, with a marking up in price of about $1 per ton. No. 1 railroad wrought has declined about $3 per ton. We quote the following price for delivery in the Philadelphia district:

No. 1 heavy melting steel	$25.00 to $28.00
Steel rails, re-rolling	30.00 to 35.00
Low phosphorus heavy melting	38.00 to 40.00
Old iron rails	38.00 to 40.00
Old carwheels	29.00 to 31.00
No. 1 railroad wrought	35.00 to 40.00
No. 1 forge fire	22.00 to 23.00
Bundled sheets	22.00 to 23.00
No. 2 busheling	15.00 to 16.00
Machine shop turnings (for blast furnace use)	15.00 to 16.00
Machine shop turnings (for rolling mill use)	18.00 to 20.00
Cast borings (for blast furnace use)	15.00 to 16.00
Cast borings (clean)	19.00 to 20.00
No. 1 cast	28.00 to 30.00
Grate bars	19.00 to 20.00
Stove plate	19.00 to 20.00
Railroad malleable	32.50 to 35.00
Wrought iron and soft steel pipes and tubes (new specifications)	28.00 to 30.00

St. Louis

ST. LOUIS, Oct. 15.

Old Material.—The market remains unsettled. Nothing is being done on which to base quotations and in consequence figures given below are only estimates of value. Because of the difficulty in getting cars, prices are, perhaps, a little stronger, due to needs of local consumers who can be served quickly. Some offerings are appearing from day to day from the railroads, which, however, are declining to guarantee any special type of car for shipping such material as may be taken. The only list of importance out is one of 1500 tons from the Missouri, Kansas & Texas. We quote dealers' prices, with the reservation above given, f.o.b. consumers' works, St. Louis industrial district, as follows:

Per Gross Ton

Old iron rails	$36.00 to $37.00
Old steel rails, re-rolling	35.00 to 35.50
Old steel rails, less than 3 ft.	29.00 to 30.00
Relaying rails, standard section, subject to inspection	50.00 to 55.00
Old car wheels	24.00 to 25.00
No. 1 railroad heavy melting steel scrap	25.00 to 25.50
Heavy shoveling steel	22.00 to 22.50
Ordinary shoveling steel	19.50 to 20.00
Frogs, switches and guards cut apart	24.50 to 25.00
Ordinary bundled sheet scrap	16.00 to 16.50
Heavy axle and tire turnings	16.50 to 17.00

Per Net Ton

Iron angle bars	$33.50 to $34.00
Steel angle bars	23.50 to 24.00
Iron car axles	39.50 to 40.00
Steel car axles	38.50 to 39.00
Wrought arch bars and transoms	37.50 to 38.00
No. 1 railroad wrought	28.50 to 29.00
No. 2 railroad wrought	26.50 to 27.00
Railroad springs	25.50 to 26.00
Steel couplers and knuckles	27.50 to 28.00
Locomotive tires, 42 in. and over, smooth inside	29.50 to 30.00
No. 1 dealers' forge	18.00 to 18.50
Cast iron borings	14.00 to 15.00
No. 1 busheling	20.50 to 21.00
No. 1 boilers, cut to sheets and rings	16.50 to 17.00
No. 1 railroad cast scrap	18.50 to 19.00
Stove plate and light cast scrap	16.50 to 17.00
Railroad malleable	25.50 to 26.00
Agricultural malleable	18.50 to 19.00
Pipes and flues	18.50 to 19.00
Heavy railroad sheet and tank scrap	15.50 to 16.00
Railroad grate bars	15.00 to 15.50
Machine shop turnings	14.50 to 15.00
Country mixed scrap	14.50 to 15.00

Pig Iron.—The flood of small inquiries continues. The demand is for last quarter and first quarter and comes from points which have never sought material from St. Louis, many concerns scarcely known to the local trade appearing. The inquiry reported last week for 20,000 tons of basic is still unfilled, the replies from the furnaces being unanimous that no quotations could be made nor would contracts be entered into that would be subject to the establishment of market differentials by the Government. Some few sales were made of small lots of Ohio and Virginia iron on the basis of $33, Pittsburgh, for 1.75 per cent to 2.25 per

cent silicon with an increase of 50c. per half unit for silicon in excess of that of base grade. Representatives here are being crowded for the delivery of pig iron under contract. Melters generally are approaching a need of iron, and the settlement of the price situation will be of material benefit in many ways.

Coke.—The coke situation is much the same as that of pig iron and no contracts are being made.

Finished Iron and Steel.—Deliveries are becoming more extended each day, while mill representatives are postponing the consideration of contracts. Bars are being specified heavily, but delivery is set for the third quarter of 1918. One new inquiry in the market is for 1000 tons of piling for use in Kansas City territory. Stock in warehouse has been marked down during the week and is now quoted as follows: Soft steel bars, 4.55c.; iron bars, 4.50c.; structural material, 5.05c.; tank plates, 7.05c.; No. 10 blue annealed sheets, 9.55c.; No. 28 black sheets, cold rolled one pass, 9.25c.; No. 28 galvanized sheets, black sheet gage, 10.50c.

New York

NEW YORK, Oct. 17.

Pig Iron.—Pig iron sellers have been disposing of fair tonnages, the quotations being on a basis of $33, furnace, for iron analyzing 1.75 to 2.25 per cent silicon and with the stipulation that the differentials to be established by agreement of the Government and manufacturers will be adhered to. Whenever furnaces have gone into the market, they have found buyers quick to place orders, and all the furnaces which have been selling could probably have sold more, but they have been very conservative, and several, notably in Virginia, have retired from the market for the present. Indications are that while melters are pretty well covered for the remainder of the year, there will be no surplus of iron, and the present condition may be described as strong. The recommendations as to differentials and other matters submitted to Washington last week have not yet been acted upon. For early delivery we quote as follows, tidewater, on those grades on which prices have been fairly established, omitting other grades for the present:

No. 1 X	$34.75
No. 2 X	33.75
No. 3 plain	32.75

Ferroalloys.—Domestic ferromanganese is lower again. The drop of $50 per ton, recorded last week, has been followed by a decline since then of $25 per ton. Carload and small lots for delivery this year have sold at $275, which is also being quoted for delivery next year. Sales have also been made at $290. Inquiry is not large and the market is generally quiet. Receipts in September are indicated as having been larger than for any month since May inclusive, exceeding 3000 tons, which compares with an average of 2220 tons per month for May to August inclusive. Prospects for a maintenance of this rate are not bright, reports indicating that licenses for shipment from England are diminishing at an unsatisfactory rate. The large manganese ore imports, referred to elsewhere, are encouraging. Spiegeleisen, 20 per cent, has sold as low as $75, furnace, in the past, and with some unconfirmed reports that $72 has been done. Demand is not large. Ferrosilicon, 50 per cent, is quiet with sales of small lots for this year's delivery having been made at $190 to $200. For next year $150 to $165 is being asked, with some sales recorded at the lower figure.

Structural Material.—The fact that the fixed prices have as yet had no influence on new contracting is indicated in the report of the Bridge Builders and Structural Society to the effect that about 52,000 tons measures the volume of business done throughout the country in September, compared with 68,500 tons the month preceding and 75,000 tons in July. Good bookings are, however, expected shortly growing out of the shipbuilding work, but with steel about the only item entering into building construction on which lower than recent prices may be expected, general building activity seems still to be of the future. No business at 3c. for the general buyer is yet to be noted, but one mill is willing to quote on this basis for limited tonnages, with deliveries in about three months. No new projects apparently have been awarded and to the recently published lists of fabricated structures under consideration may be mentioned 600 tons for a power house and machine shop for the Government at New London; 500 tons for the American Smelting & Refining Co., Utah, and 150 tons for the Chesapeake & Ohio, Huntington division. We quote mill shipment of limited amounts in three months at 3.195c., New York, and out of store, 5c. to 5.50c., New York.

Plates.—It appears that all of 30,000 cars will be bought for the Russian railroads, with the contracts substantially awarded at this writing, and business will soon be consummated on 10,000 cars for French railroads. A case is learned of a round tonnage of plates being offered at 3.25c., Pittsburgh, but of narrow sizes. Against this are rumors of a plan to get a mill to roll a large tonnage of ingots into plates to be sold for prompt delivery at a premium, with small likelihood, however, that a mill can be found to consider the proposition. It is also stated that a small plate mill has shut down, owing to inability to make a profit at the established price, but it is not expected that in the Government plan to secure 100 per cent production idleness will long be allowed, if indeed there is not some other reason than profit consideration for the reported action. Surprise is expressed at the success of one buyer to secure licenses on plates to be shipped to the Pacific coast to go in storage against release for export; the railroad is to refund the difference between domestic and export freight rates when the plates leave the country. While the fixed price for plates is 3.25c., fresh business to the public at this figure has not been learned of and the quotation is thus nominal. Out of store we quote plates at 8c. and higher, with some reduction in quantities by the jobber before sales are effected.

Iron and Steel Bars.—No notable change in the situation appears to have occurred. The fixed price of 2.90c. is as yet nominal so far as information concerning sales to the public are concerned, but bar iron business is still done at 4.75c., Pittsburgh, or 4.94c., New York, with warehouse business at 5c. to 5.50c. for iron and steel bars in reduced quantities.

Old Material.—The scrap market continues to drag and steel scrap particularly is weak with a tendency downward. There is some demand for car wheels, but very little interest is being shown in other kinds of steel scrap. Machinery cast has shown some improvement and No. 1 has been sold at higher prices. Railroad conditions do not improve, and complaints are numerous that there is no satisfaction in transacting business on account of the difficulty in obtaining cars. In some cases, dealers report that scrap which has been purchased has been held for several weeks awaiting cars. We quote prices of brokers as follows to New York producers and dealers per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$23.50 to $24.00
Old steel rails (short lengths) or equivalent heavy steel scrap	23.50 to 24.00
Relaying rails	45.00 to 50.00
Rerolling rails	33.00 to 34.00
Iron and steel car axles	41.00 to 42.00
No. 1 railroad wrought	32.00 to 33.00
Wrought-iron track scrap	27.00 to 28.00
No. 1 yard wrought long	27.00 to 28.00
Light iron	7.00 to 8.00
Cast borings (clean)	16.00 to 17.00
Machine-shop turnings	14.00 to 15.00
Mixed borings and turnings	13.00 to 14.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long)	25.00 to 26.00

For cast-iron scrap, dealers in New York City and Brooklyn are quoting as follows to local foundries per gross ton:

No. 1 machinery cast	$24.50 to $26.00
No. 1 heavy cast (column, building materials, etc.)	21.00 to 22.00
No. 2 cast (radiators, cast boilers, etc.)	21.00 to 22.00
Stove plate	16.00 to 17.00
Locomotive grate bars	16.00 to 17.00
Malleable cast (railroad)	27.00 to 28.00
Old carwheels	27.00 to 28.00

Cast-Iron Pipe.—In sympathy with the lower prices

of pig iron, the quotations on cast-iron pipe have been reduced $9 per ton and $56.50 is now quoted on 6-in. and heavier and $59.50 on 4-in. Still lower prices are made to the Government. No business of importance is pending either for private demand or municipalities.

BETHLEHEM SHIPBUILDING CO.

New Organization to Increase Efficiency of Operations

The organization of the Bethlehem Shipbuilding Co., Bethlehem, Pa., will bring together into one large merger the several shipbuilding interests controlled by the Bethlehem Steel Corporation. The component parts of the new organization are the Fore River Shipbuilding Corporation, Quincy, Mass.; Harlan & Hollingsworth Corporation, Wilmington, Del.; Samuel L. Moore & Sons Corporation, Elizabeth, N. J.; the Union Iron Works Co. and the Union Iron Works Dry Docks Co., San Francisco; and the shipyard now operated by the Bethlehem Corporation at Sparrows Point, Md.

E. G. Grace, head of the Bethlehem Steel Corporation, is to be president of the new corporation, which will be formed under the laws of Delaware. The executive head of the Bethlehem Shipbuilding Company will be Joseph W. Powell, president of the Fore River Shipbuilding Corporation, who becomes vice-president of the new company. Mr. Powell, who is barely 40 years old, and looks like a man of 30, has had a rapid rise in the ranks of the Bethlehem Steel Co. He has a notable Spanish War record, for while he was a cadet on the battleship New York he was in charge of the steam launch which followed Hobson on the Merrimac right up to the mouth of San Diego Harbor, on the night when the Merrimac was sunk to block the egress of the Spanish fleet. Hobson's book, "The Sinking of the Merrimac," tells of the important role that Powell played in the affair. He resigned from the Navy in 1906 to take up naval construction at the Cramp shipbuilding yard in Philadelphia. While there he attracted the attention of Charles M. Schwab. In the few years that he has been in charge of the Fore River plant he has become the most notable figure in the American shipbuilding industry. Mr. Powell has won a reputation as a hard worker, and it has been his custom to punch the time clock at seven o'clock in the morning, like any of the men in his employ. No small part of his success has been due to his popularity with the thousands of men who worked under him.

H. S. Snyder, vice-president of Bethlehem Steel Co., will be vice-president in charge of finances of both the shipbuilding company and the steel corporation as well.

Several of Mr. Powell's lieutenants who have helped to establish the success of the Fore River organization, will go to Bethlehem as his aids. Among these will be Vice-President and General Manager H. Gerrish Smith; Vice-President Harry Brown; Treasurer E. B. Hill, and Joseph Larkin of the service department.

S. W. Wakeman the present general superintendent of the Fore River plant, succeeds Mr. Powell with the title of manager. Mr. Wakeman was born in Bridgeport, Conn., and worked his way through Cornell, finding employment in shops in and near Bridgeport during his vacations. He specialized in marine work. He rowed in the Cornell varsity crew, 1897-8, and first met Mr. Powell when the latter was a member of an Annapolis crew that competed with Cornell. Mr. Wakeman's first connection, after leaving college, was with the Newport News Ship Building & Dry Dock Co. For 14 years he was with the New York Ship Building Co., becoming assistant to the general manager. The first of this year he became general superintendent at Fore River.

Joseph P. Kennedy, president Columbia Trust Company, Boston, has resigned his position to become assistant manager of the Fore River plant.

The formation of the new company was brought about after a consultation with the Navy Department for the purpose of expediting the construction of ships. The formal announcement in part says "The demands of the Government on the facilities of the shipbuilding plants will make it essential that all duplications of engineering and similar overhead work shall be avoided so far as is possible and the proposed consolidation is expected, through the resulting standardization and the centralization of management, to increase the production of the yards affected—a result of vital importance in this time of insistent demand for expedition in the building of ships. There will be no radical departure at this time from the present operating methods at these plants, except that the sales, purchases, accounting, collections and payments for all shipbuilding operations will hereafter be made or done at or from Bethlehem."

American Iron and Steel Institute at Cincinnati

The following is a tentative list of papers to be read at the thirteenth general meeting of the American Iron and Steel Institute, to be held at Cincinnati, Oct. 26:

President's Address. Elbert H. Gary, chairman, United States Steel Corporation, New York.

Cincinnati and Its Industries. Daniel B. Meacham, partner, Rogers, Brown & Co., Cincinnati.

Recent Installations of Large Electric Motors in Rolling Mills. S. S. Wales, electrical engineer, Carnegie Steel Co., Pittsburgh.

Iron and Steel Scrap. W. Vernon Phillips, F. R. Phillips & Sons Co., Philadelphia.

The History of Iron and Steel Manufacture in Ohio. Joseph G. Butler, Jr., vice-president, Brier Hill Steel Co., Youngstown, Ohio.

Malleable Iron and Its Uses. Henry F. Pope, president, National Malleable Castings Co., Cleveland.

A Paper on a Commercial Subject. Eugene P. Thomas, president, United States Steel Products Co., New York.

Discussion of each paper under the five-minute rule will be welcomed.

Entertainment, provided by the Cincinnati Committee and the Chamber of Commerce, will take up all of the second day, Oct. 27. The morning will be devoted to an automobile tour of the city, ending with a luncheon at the Grandin Road Country Club. The afternoon will be divided between three diversions—golf, the races at Latonia, and inspection of the art gallery of Charles P. Taft.

Railroad Equipment Demand

A demand for railroad equipment beyond general estimates was hinted at by William C. Redfield, Secretary of Commerce, in an address which he made before a conference of editors of the business press at New York on Oct. 16. Speaking of the stipulations of the trading with the enemy act, he told how on top of the demands for merchant and navy shipbuilding is to be reckoned a railroad demand which will perhaps result in our making up in construction abroad what we have not been doing in the United States. Following the contracting for the 1200 miles of railroad in France for the United States Government, complete in road bed, rolling stock and buildings, the statement seems already substantiated by reports that fully 30,000 cars are to be supplied by the Government to Russia, to be operated by railroad men selected from this country, and 10,000 cars are about to be supplied to French railroads.

The Defiance Screw Machine Products Co., Defiance, Ohio, specialist in large screw machine work, is building a two-story addition to its plant, the steel to be furnished by the Toledo Bridge & Iron Co., Toledo, Ohio. The company states it has on hand all the equipment needed for the additions, and will not be in the market for any machinery. The enlargement of this plant is made necessary by the steady growth of its business.

The Iroquois Iron Co., South Chicago, expects that its new furnace, No. 5, now building, will go into blast about Feb. 15, 1918. The company is considering inquiry for delivery after next February, in view of the expected increase in production.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

(Nominal quotations, showing prices which prevailed when last sales were made. Published as a matter of record.)

Freight rates from Pittsburgh on iron and steel articles, aside from wrought iron and steel pipe in carloads, per 100 lb. New York 19.5c.; Philadelphia 18.5c.; Boston 21.5c.; Buffalo 11.6c.; Cleveland 13.5c.; Cincinnati 18.5c.; Indianapolis 20c.; Chicago 21.5c.; St. Louis 27c.; Kansas City 47c., minimum carload 36,000 lb.; St. Paul 35.5c., minimum carload 36,000 lb.; Denver 79c., minimum carload 36,000 lb.; Omaha 47c., minimum carload 36,000 lb.; New Orleans 30.7c.; Birmingham 46c.; Pacific Coast 75c., minimum carload 80,000 lb. To the Pacific Coast, the rate on steel bars and structural steel is 90c., minimum carload 40,000 lb. and 85c., minimum carload 50,000 lb. On wrought iron and steel pipe, the rate from Pittsburgh to Kansas City is 40c. per 100 lb., minimum carload 46,000 lb.; to Omaha 40c., minimum carload 46,000 lb.; to St. Paul 35.5c., minimum carload 46,000 lb.; Denver 79c., minimum carload 46,000 lb.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in., angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 4c.

Wire Products

(Prices of independent mills)

Wire nails, $4 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire, $4.05 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.95; galvanized wire, $4.65; galvanized barb wire, and fence staples, $4.85; painted barb wire, $4.15; polished fence staples, $4.15; cement-coated nails, $3.90 base these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 43 per cent off list for carload lots, 42 per cent off for 1000-rod lots, and 41 per cent off for small lots, f.o.b. Pittsburgh.

Nuts and Bolts

Discounts in effect for large buyers are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days.

Carriage bolts, small, rolled thread, 40 per cent; small cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent with c. p. nuts 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq. blank, $1.70 off list, and tapped, $1.50 off; hex. blank, $1.50 off, and tapped, $1.30 off; nuts, c. p. c. and t. sq. blank, $1.25 off; and tapped, $1 off; hex. blank, $1.25 off, and tapped, $1 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Wire Rods

Soft Bessemer and open-hearth rods to domestic consumers at $83 to $85; high-carbon rods made from ordinary open-hearth steel, $95 to $100, and special steel rods with carbons running from 0.40 to 0.60, $100 to $110 at mill; above 0.60 carbon, $115 to $120.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $5 to $5.50; ¾ in., 7/16 in. and ½ in., $7.00 base. Boat spikes are occasionally quoted $7 to $8, all per 100 lb., f.o.b. Pittsburgh, but some makers are quoting higher. Track bolts with square nuts, 7c. to 7.50c. to railroads, and 8c. to 8.50c. in small lots for fairly prompt shipment.

Steel Rails

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails and on carload and smaller lots, 4c. to 4.25c. at mill. Light rails, 25 to 45 lb., $75 to $80; 16 to 20 lb., $80 to $81; 12 and 14 lb., $82 to $83; 8 and 10 lb., $83 to $84; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard Bessemer rails, $38; open hearth, $40 per gross ton, Pittsburgh.

Tin Plate

Effective July 31, prices on all sizes of terne plates were advanced from $2 to $2.50 per package and are now as follows: 8-lb. coating, 200 lb., $16 per package; 8-lb. coating, I. C., $16 30; 12-lb. coating, I. C., $17.50; 15-lb. coating, I. C., $18.25; 20-lb. coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C. $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 4c. to 4.50c. for delivery late this year, and 4.50c. to 5c. from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c., railroad test bars, 5.25c. in carload and larger lots f.o.b. mill.

Wrought Pipe

The following discounts on steel are to jobbers for carload lots on the Pittsburgh basing card in effect from May 1, 1917, all full weight, except for LaBelle Iron Works and Wheeling Steel & Iron Co., which quote higher prices, and National Tube Co., which adheres to card of April 1.

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	42	15½	⅛ and ¼	23	+4
½	46	31½	⅜	24	+3
¾ to 3	49	35½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	42	29½	2	26	12
2½ to 6	45	32½	2½ to 6	8	15
7 to 12	42	28½	7 to 12	25	12
13 and 14	32½	..			
15	30	..			

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	38	20½	⅛, ¼ and ⅜	22	5
½	43	30½	½	27	14
¾ to 1½	47	34½	¾ to 1½	33	18
2 to 3	48	35½			

Lap Weld, extra strong, plain ends

2	40	28½	2	27	14
2½ to 4	43	31½	2½ to 4	29	17
4 to 6	42	30½	4½ to 6	28	16
7 to 8	38	24½	7 to 8	20	8
9 to 12	33	19½	9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

Nominal discounts on less than carload lots, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in.	28	1¾ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3¼ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in.	No quotations
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths. Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net or 2 per cent discount in 10 days:

[Open-hearth stock, $5 per ton above these prices.]

	Cents per lb.
Blue Annealed—Bessemer	
Nos. 3 to 8	8.00 to 8.50
Nos. 9 and 10	8.25 to 8.50
Nos. 11 and 12	8.50 to 8.75
Nos. 13 and 14	8.75 to 9.00
Nos. 15 and 16	9.00 to 9.25
Box Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21	8.30 to 8.80
Nos. 22 and 24	8.35 to 8.85
Nos. 25 and 26	8.40 to 8.90
No. 27	8.45 to 9.00
No. 28	8.50 to 8.95
No. 29	8.55 to 9.05
No. 30	8.65 to 9.15
Galvanized Black Sheet Gage—Bessemer	
Nos. 10 and 11	8.50 to 9.00
Nos. 12 and 14	8.60 to 9.10
Nos. 15 and 16	8.75 to 9.25
Nos. 17 to 21	8 90 to 9.40
Nos. 22 and 24	9 05 to 9.55
Nos. 25 and 26	9.20 to 9.70
No. 27	9 35 to 9.85
No. 28	9.50 to 10.00
No. 29	9 75 to 10 25
No. 30	10.00 to 10.50
Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16	7.80 to 8.30
Nos. 17 to 21	7.85 to 8.35
Nos. 22 and 24	7 90 to 8.40
Nos. 25 and 27	7 95 to 8.45
No. 28	8 00 to 8.50
No. 29	8 05 to 8.55
No. 30	8.05 to 8.55
Nos. 30½ and 31	8.10 to 8.60

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin.	Lead		Spelter	
		Electro-	New	New	St.	New	St.
Oct.	Lake	lytic	York	York	Louis	York	Louis
10	23.50	23.50	60.62½	7.50	7.37½	8.25	8.00
11	23.50	23.50	60.62½	7.00	7.37½	8.25	8.00
13	23.50	23.50	....	7.00	6.87½	8.25	8.00
15	23.50	23.50	61.00	7.00	6.87½	8.25	8.00
16	23.50	23.50	61.00	7.00	6.87½	8.25	8.00

NEW YORK, Oct. 17.

Inactivity characterizes practically all metals. On Friday, Oct. 12, there was no market, due to a holiday. Copper is nominal at the Government price. Tin is moderately active and steady. Lead is inactive and lower. Spelter is dead and unchanged. Antimony is lifeless with no change.

New York

Copper.—The copper problem is still unsolved. Definite information as to the exact status is hard to obtain. Various reports are circulating but they are contradictory. It is certain that committees representing producers and consumers are meeting frequently in an endeavor to solve the problem of the equitable distribution of copper after the Government and its allies' needs are provided for. It is stated that consumers are now receiving metal on old contracts, especially for October delivery, but that no copper is being sold at the new price of 23.50c., which we continue to quote as nominal. The amount available for the general market will not be known until the committees finish their work. Small lots are going to needy consumers at around 28c. The London market is unchanged.

Tin.—There have been fair sales of tin for future shipment from the East in the past week, but otherwise the market has been without interest. On Monday, Oct. 15, probably 300 tons of January and February shipment from the Straits changed hands, as well as a little nearby metal. For two lots of 50 tons each of futures, 57.62½c. was paid on that day. Previous to this, except on Saturday, Oct. 13, when there was good inquiry for futures, the market was extremely dull. Yesterday, Oct. 16, it was difficult to interest buyers and there were only moderate sales of January-February shipment from the East. In the entire week there has been practically no business in spot tin which is now almost in a specialty class, due to permit difficulties. The quotation yesterday was 61c., New York. Arrivals up to Oct. 15 inclusive, have been 1540 tons, with the quantity afloat 4520 tons. The London market has advanced £2 per ton in the week to £247 10s. for spot Straits.

Lead.—The startling reduction of 1c. per pound late last Thursday by the leading producer, bringing the price to 7c. New York, has been the feature. It came as a surprise because of its extent, not more than ½c. per pound having been looked for. The cause had been the offering by independents of round lots for any position to the end of the year at concessions under the former price of 8c. New York, but buyers did not appear. The entire situation is bearish, and the future is hard to judge, with the added rumor of a threatened Government price fixing of lead under 6c., New York. Four months ago lead was selling at 12c., New York. It is stated that already there have been offerings below the new price, but in general the market is unsettled and quiet.

Spelter.—The market is now confronted with price fixing by the Government as an added burden. Announcement is made that this will be done as soon as the Federal Trade Commission's investigation of costs is completed. This is likely to take some time, and the prospect for a settled market in the near future is not bright, if the report is true. While the market is exceedingly dull, with demand very small, it is fairly firm at 8c., St. Louis, or 8.25c., New York, for early delivery with ⅛c. to ¼c. higher asked for November and December. This is partly due to the nearness of present prices to cost of production. A factor by no means bullish is the mid-year report of the U. S. Geological Survey, which shows that smelting capacity had been increased up to June 30.

Antimony.—There is very little demand, and Chinese and Japanese grades are quoted at 15c. per pound, New York, duty paid.

Aluminum.—The market is lower and inactive. No. 1 virgin metal, 98 to 99 per cent pure, is quoted at 38c. to 40c. per pound, New York.

Old Metals.—We are quoting nominally on the basis of the Government arrangement with the producers, but purchasers other than the Government are obliged to pay from 26c. to 27c. per lb. for heavy crucible copper.

Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible (nominal)	23.50
Copper, heavy and wire (nominal)	23.50
Copper light and bottoms	22.50 to 23.00
Brass, heavy	18.00 to 18.25
Brass, light	14.00 to 14.25
Heavy machine composition	25.00 to 25.25
No. 1 yellow rod brass turnings	17.25
No. 1 red brass or composition turnings	19.00 to 21.00
Lead, heavy	7.50
Lead, tea	6.50
Zinc	6.50

Chicago

OCT. 15.—Some consumers who have contracted for copper are worrying over the manner in which deliveries lag, but so far melters have found enough metal with which to continue operations, and it is hoped and believed that the Government will release enough to prevent any shut-downs. Quotations cover a wide range, 30c. having been paid in some transactions. An instance is mentioned where an Eastern dealer asked 32.50c. for Lake copper. Tin is strong, and has been moving in a satisfactory way. Lead and spelter are dull, though the latter has a better tone. The old metal market continues quiet. We quote as follows: Casting, Lake and electrolytic copper, 28c. to 30c.; tin, carloads, 61.50c.; small lots, 63.50c. to 64.50c.; lead, 6.95c.; spelter, 8.25c.; sheet zinc, 19c.; antimony, 17c. to 18.50c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 21.50c.; copper clips, 21c.; copper bottoms, 20c.; red brass, 20.50c.; yellow brass, 15c.; lead pipe, 5.50c.; zinc, 6c.; pewter, No. 1, 35c.; tinfoil, 42c.; block tin, 47c.

St. Louis

OCT. 15.—The market has been quiet and in some respects slightly weaker. The close to-day on carload lots was: Lead, 7.25c. to 7.50c.; spelter, 8c. to 8.25c. In less than carload lots the prices were: Lead, 8c.; spelter, 9.25c.; tin, 66c.; copper, no market; Asiatic antimony, 18c. In the Joplin district zinc blende was weaker, the price for 60 per cent metal ranging from $50 to $70 per ton, with most of the sales between $55 and $65, and the average for the week for the district $65. Some few lots brought as high as $75 for special quality. Calamine ranged from $35 to $40, basis of 40 per cent metal, with the average for the week $38. Lead ore was weaker, 80 per cent metal selling at $87.50, with the average for the week $87. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 10c.; heavy yellow brass, 14c.; heavy red brass and light copper, 18.50c.; heavy copper and copper wire, 20c.; pewter, 25c.; tinfoil, 42c.; tea lead, 5c.; zinc, 6c.; lead, 6c.

License Policy Announced

WASHINGTON, Oct. 16.—On Oct. 10, notice was given that Collectors of Customs would no longer license by use of the shipper's Export Declaration shipments containing an amount of any one commodity less than $100 in value, provided such shipments contained articles on the "Conservation List."

The War Trade Board has announced further that Collectors of Customs will no longer license by use of the shipper's Export Declaration shipments of arms or munitions of war when destined to Mexico, even if the value be less than $100.

IRON AND INDUSTRIAL STOCKS

Industrial Stocks Still Declining—Some of the Causes Given

NEW YORK, Oct. 16.

Last week was another period of decided declines and with hardly an exception railroad and industrial stocks lost ground. The causes usually given for this continued liquidation are high money rates, usually attributed to the destruction of war and to the heavy demand, decreased earnings, selling on account of fear that peace may bring lower earnings to some properties, expected reduction of dividends on account of increased taxes, selling to invest in Liberty bonds, uncertainty as to the Government prices, embargoes and other matters, labor shortage and uncertainty as to the future condition of the labor market, and short selling. The selling for investment in Liberty bonds is undoubtedly an important factor. The *Wall Street Journal* says:

"The decline in the shares of the Bethlehem Steel Corporation has been almost as sensational as the advance which started shortly after the European war. The old common stock of Bethlehem Steel sold as high as $700 a share in the latter part of 1916. The closing price Wednesday for the new "B" stock was $76.50 a share, the equivalent of $206 a share for the old stock, thus representing a decline of $494 a share, or $54,104,000 from the high record. Bethlehem Steel has not wasted any money, and has added millions of dollars to its value in construction and surplus. In the three years to end Dec. 31, 1917, it will show a surplus for the new common stock of something like $150 a share, or $90,000,000. All this money has been spent either for construction, or has been added to surplus and working capital. That Bethlehem's expenditures for depreciation have been ample, is evident from the fact that last year its charges for repairs and depreciation amounted to nearly $27,000,000, equal to $45 a share on the 600,000 shares of common stock.

Among the steel and industrial companies which recorded losses last week were the following: Allis-Chalmers Mfg. preferred, 2¼ points; American Can common, 3⅛; American Car & Foundry common, 4; American Locomotive common, 5½; Baldwin Locomotive common, 6¾; Bethlehem Steel, 8; Bethlehem Steel, class B, 9⅝; Colorado Fuel, 3¼; Crucible Steel common, 3⅛; General Electric, 3⅛; Lackawanna Steel, 3½; Midvale Steel, 3¾; Republic Iron & Steel common, 2¾; United States Steel common, 4⅜; United States Steel preferred, 2.

The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com..	18½ - 20½	Int. Har. Corp., com.	64 - 66
Allis-Chal., pref..	74 - 76	Int. Har. Corp., pref.	103
Am. Can, com...	37½ - 42½	Lacka. Steel ...	75 - 80
Am. Can, pref...	95½ - 98⅞	Lake Sup. Corp..	11 - 15½
Am. Car & Fdry., com.	62¾ - 67¾	Midvale Steel...	42¾ - 47½
Am. Car & Fdry., pref.	108	Nat.-Acme	30 - 32
Am. Loco., com..	52 - 55¾	Nat. En. & Stm., com.	39 - 42½
Am. Loco., pref..	99 -100	Nat. En. & Stm., pref.	94
Am. Rad., com...	292 -305	N. Y. Air Brake.	112 -118
Am. Ship, com...	90 - 91	Nova Scotia Steel	78¼ - 86
Am. Steel Fdries.	57½ - 62	Pitts. Steel, pref.....	97
Bald. Loco., com.	49¾ - 57	Pressed Stl., com.	53 - 58⅞
Bald. Loco., pref.	96 - 97½	Pressed Stl., pref.	98¼ - 99¼
Beth. Steel, com.	70½ - 82½	Ry. Steel Spring, com	37½ - 43⅛
Beth. Steel, class B	69⅛ - 83¾	Ry. Steel Spring, pref.	96¼
Beth. Steel, pref.	90 - 93	Republic, com. ..	71 - 78
Case (J. I.), pref.	80 - 80½	Republic, pref...	98⅝ - 99⅞
Central Fdry., com.	27 - 29⅝	Sloss, com.	37¾ - 40⅛
Chic. Pneu. Tool	57 - 57½	Superior Steel...	33¼ - 40
Colo. Fuel	34¾ - 40	Transue-Williams	38¾ - 40½
Cruc. Steel, com.	62 - 67⅝	Un. Alloy Steel..	39⅞ - 40⅞
Cruc. Steel, pref.	90 - 93	U. S. Pipe, com..	13½ - 14
Gen. Electric ...	134½ - 139	U. S. Steel, com..	99⅛ - 106
Gt. No. Ore. Cert.	26¼ - 30⅝	U. S. Steel, pref..	111⅞ - 115½
Gulf States Steel	88 - 90⅝	Va. I. C. & Coke.	55 - 56¼
Gulf S. Steel, 1st pref.	102	Warwick	9
Int. Har. of N. J., com.	104½ - 107½	Westing. Elec....	40 - 43⅝
Int. Har. of N. J., pref.	110		

Lackawanna Earnings

The report of the Lackawanna Steel Co. for the nine months of the present year show earnings of $21,104,516, equivalent to $52.12 per share on the common stock, compared with $24.11 per share on the common stock in the corresponding period of 1916. The increase in earnings was $9,760,696. In the third quarter of 1917 the net earnings amounted to $7,021,871, an increase of $2,976,678 compared with the same period in 1916. Excess profit taxes imposed by the recent act of Congress have not been deducted. The unfilled orders at the end of the third quarter were 791,962 tons, an increase of 46,268 tons compared with the same date in 1916.

Industrial Finances

The annual meeting of stockholders of the Westinghouse Air Brake Co. of Pittsburgh will be held at Wilmerding, Pa., where its works are located, on Thursday, Oct. 18. The annual report of the company for fiscal year ended July 31 has been sent out. The net profit shown for the year, after the usual charges and after setting up adequate reserves to cover estimated tax requirements and other contingent liabilities, is $6,388,462.66, as compared with $9,396,103.48 in 1916 and $1,575,838.50 for 1915. The increase of total assets from $36,836,976.62 last year to $44,076,559.69 this year, is due in large part to increased investment account through the acquisition of Union Switch & Signal Co. stock.

The Burt Electric Co., Erie, Pa., has called a special meeting of its stockholders to be held Dec. 8 to vote on a proposed increase in the capital stock. The company has a large amount of Government work on order for electrical equipment and plans to increase its plant facilities.

A special meeting of the stockholders of the New Britain Machine Co., New Britain, Conn., has been called for Wednesday, Oct. 24, to take action on the recommendation of the board of directors to increase the capital stock of the company from $1,000,000 to $1,500,000. The income from the new issue of stock will be used for the enlargement of the plant and improvements in equipment.

Dividends

The Central Foundry Co., quarterly, 1¼ per cent on the preferred, payable Nov. 15.

The Cleveland Cliffs Iron Co., quarterly, 2½ per cent, payable Oct. 25.

The Colorado Fuel & Iron Co., quarterly, ¾ per cent on the common and 2 per cent on the preferred, payable Oct. 25.

The Wheeling Mold & Foundry Co., quarterly, 4 per cent on the common, payable Nov. 1, and 2 per cent on the preferred, payable Oct. 1.

British Control of Lead Supplies

Possession of all pig lead, virgin re-melted, old scrap and residues in the United Kingdom, except such lead as may be in the hands of a manufacturer in his own works, was taken over by the Ministry of Munitions on Sept. 1. The lead so taken will be paid for on delivery at the following maximum prices: Virgin pig, £29 per ton c. i. f., £30 ex store; sheet lead, £39 10s., delivered United Kingdom, less 2½ per cent monthly account; lead pipe, £40 per ton delivered United Kingdom, less 2½ per cent monthly account. Red lead and litharge, £42 per ton, less 2½ per cent monthly account in 5 cwt. casks.

A 13-acre tract near Fort Independence Point on Narragansett Bay, owned by the City of Providence, R. I., has been commandeered by President Wilson as a site for the boiler plant of the Fore River Shipbuilding Corporation, at which are to be constructed the boilers for the destroyers to be built by the Fore River company at its new Quincy, Mass., yard.

WORKMEN BADLY NEEDED

Labor Shortage Seriously Interferes with Government Operations

WASHINGTON, Oct. 16.—Labor is just now the most harassing problem facing the Government. Chairman Hurley of the Shipping Board stated that the labor shortage is the only important obstacle in the way of the enormous merchant shipbuilding program upon which the Government has launched. The delivery of supplies, and this applies to the steel producers of the United States, contains no elements for criticism. On the other hand, there is a serious shortage of labor, and Mr. Hurley is now endeavoring to find some remedy for it.

The Council of National Defense has taken the problem up from the point of view of housing. With the consent of the President a commission has been appointed to investigate the conditions prevailing in manufacturing centers. This commission will make some definite recommendations regarding the construction of shelter for the vast army of laborers who are necessary to the successful prosecution of the enormous industrial production which must be carried out to win the war.

Chairman Hurley, in company with Admiral Capps, general manager of the Emergency Fleet Corporation, is now engaged upon a series of tours of inspection of the various snipbuilding yards in the East. Their first trip was made to Sparrows Point, where the Bethlehem company is building ships. Mr. Hurley stated that the Sparrows Point plant is running at but 50 per cent capacity because it is impossible to obtain workmen. Similar conditions prevail at the plants of the New York Shipbuilding Co. and Cramps.

Some Pay Very High Wages

It is feared that too liberal a view was held toward such new yards as have sprung up during the past year in the United States. These new yards took contracts for construction at prices unknown before. In some instances, it is said, the new yards have taken on contracts for ships at as much as $200 a ton, whereas the older plants are still engaged upon work which will pay them but $80 or $90 per ton. The new yards have been enabled, by reason of the more favorable contracts, to pay higher wages. The result has been a gradual withdrawal of labor from the older established plants to the new yards.

The Shipping Board is now faced with the problem of either restricting the shipbuilding output of the country or increasing the supply of labor in the shipyards. There is a limit to the increase of labor because in the building of ships the skilled workman is an important factor. It is believed, nevertheless, that a good many unskilled workmen can be taken on and trained. Skilled workmen in other lines of industry might be induced into the yards and there trained into shipbuilding after a brief period.

Making a Survey

The Department of Labor announces that through the United States Public Service Reserve it is making a bird's-eye survey, from the information at hand in Washington, of the requirements for additional men likely to be needed in the near future by various branches of the Government and concerns holding important war contracts. The officers of the Reserve in charge of the work expect to keep the information secured up to date so that at all times an intelligent estimate can be made of what requirements are in sight.

At present there is no department or place where any comprehensive information is at hand as to what men are going to be needed in various civilian activities directly connected with the war. A man seeking to find an opportunity for service can only wander from office to office trying to pick up information as to where he can be of use. When this work is done the Reserve not only will have at hand a large list of members who have indicated their willingness to respond to a Government call, but it will also be able to divert those who wish to undertake immediate service to the proper source of such employment.

The securing of this data is an essential preliminary to any intelligent effort to deal with the scarcity of skilled labor, which it is expected will shortly become acute here as it has in other countries engaged in the war.

British Will Make Tour

Four members of the British Ministry of Munitions leave Washington this week on an extended tour through several Middle Western and Eastern States for the purpose of placing at the disposal of American industrial leaders, both employers and employees, Great Britain's experience in promoting the production of munitions, particularly from the standpoint of the distribution and effective employment of labor. The commission goes at the invitation and under the auspices of the Council of National Defense and the several State councils.

Although the members of the party will make some public addresses, it is expected that their information will usually be disseminated through a series of small informal conferences. Their first stop will be at Pittsburgh, and among the other cities to be visited are Indianapolis, St. Louis, Chicago, Detroit, Cleveland, Buffalo, New York and Boston.

Westinghouse Electric & Mfg. Co. Advances Wages

Another increase in wages for shop employees aggregating nearly $2,000,000 a year has just been announced by the Westinghouse Electric & Mfg. Co. Effective Oct. 16, all employees observing shop hours, except munition workers, will receive an additional bonus of 10 per cent if they are on a salary or time-rate basis, and of 7 per cent if they are on a piece, premium or task basis. The 20,000 shop employees of the Westinghouse company form one of the most highly skilled organizations in the country. It is also one of the best paid bodies as well. Increases granted since the outbreak of the European war amount to about 60 per cent of the former average compensation.

News of the Labor World

Union molders employed in Louisville, Ky., plants have formulated demands for increased wages and there are assertions made by union officials that a strike will be called unless the increases are forthcoming. A nine-hour day, a minimum wage of $4, time and a half for overtime and double time on Sundays are asked for. The scale is now from $3.25 to $3.75 for a 10-hr. day, although leading employers state that wages are ranging often up to $4.50 a day. The plants of the American Elevator & Machinery Co., Vogt Bros. Mfg. Co., the Henry Vogt Machine Co., the W. E. Caldwell Co. and Balke & Co. would be affected immediately, while other concerns would likely be involved in case of a strike. About 200 molders are concerned.

Twenty-five employees of the Nordyke & Marmon Co., Indianapolis, have been exempted by the army appeal board, by request of the company. They are expert workmen on aeroplane motors. The company has lost 400 men by draft and volunteer enlistment.

The A. Buch's Sons Foundry Co., Elizabethtown, Pa., has announced a wage increase of 10 per cent, effective immediately.

A few employees at the light plate and boiler shops of the Pennsylvania Shipbuilding Co., Gloucester City, N. J., declared a strike on Oct. 6, with demand for 10 per cent increase in wages.

The Eastern Malleable Steel Co. and the Pullman Co., Wilmington, Del., are now employing women for light work in their local machine repair shops and foundry. The women wear overalls and jumpers.

Increases in wages, which ultimately will amount to $8,000,000 a year, were announced Oct. 16 by the Curtiss Aeroplane & Motor Corporation, Buffalo. A 5 per cent advance, applicable to all employees, becomes effective at once. A premium system has been adopted which will make it possible for skilled workmen to add as high as 30 per cent to their wages. In addition to

these advances by the company President William A. Morgan will distribute as premiums $150,000 in Liberty Bonds. The company is about to occupy a new plant, covering 30 acres, which has been built in 68 days.

Over 100 iron molders and helpers are on strike at the Vulcan Iron Works, New Britain, Conn. The molders demand $4 for nine hours work and time and one-half for overtime; also a bonus of 30 cents on each dollar earned in wages. The laborers ask for 35 cents an hour with the overtime and bonus provisos asked by the molders.

Machinists and general floor helpers of the Standard Machine Co., Auburn, R. I., went on strike Oct. 9, after demands for an advance of 15 per cent in wages and time and one-half for overtime had been refused. The men are not organized.

The scarcity of skilled and unskilled labor is seriously crippling industries in the Shenango Valley, Pennsylvania. Unskilled labor is at a premium, and in some cases is being paid as high as $4 per day. Thousands of men have left shops, factories and steel mills to join the National Army, and owing to the scarcity of men their places are being filled by women and girls as far as possible. The American Sheet & Tin Plate Co. has tin plate mills at New Castle, Sharon and Farrell, and owing to its inability to get men, is employing women and girls in tin plate labor where it is practicable to do so. Some women are employed at the roughing mills on work heretofore done by men and are earning from $3 to $4.50 per day. Labor conditions in the Shenango Valley are likely to get worse as the army draft goes on, and output of products by the manufacturing plants in that district will then show a further considerable falling off. The work done by the women and girls employed in the factories to replace men is said to be highly satisfactory, and it is probable that after the war is over a good deal of labor formerly performed by men will continue to be done by women and girls.

Co-operation of Waste Material Dealers Needed

The Metals Division of the National Association of Waste Materials Dealers, in convention at the Hotel Astor, New York, listened to an address on Tuesday by Eugene Meyer, Jr., assistant to Bernard M. Baruch, head of the Raw Materials Division of the War Industries Board. Mr. Meyer said he had been delegated to take charge of the work of conserving supplies of copper, zinc, lead, antimony and other non-ferrous metals for the Government.

"Your capacity for usefulness to the Government at this time is considerable," Mr. Meyer said. "Just now, the situation as to copper is most urgent and pressing. Not only do we want to establish an interest between our board and your industry, but it is desired that you name a committee to co-operate with the board, which shall speak for the important industry you represent. We don't know when a situation may develop when your knowledge of metals may be helpful to the Government.

"You as an industry should organize to carry out the spirit of the copper agreement, and any other agreements that may be proposed by the War Industries Board. The suggestion I make is that you pledge support and stand by these orders and agreements, and act in accordance with all regulations promulgated. It is the intention of the Government, through the board, to accord fair and dispassionate treatment to all interests, and all that we ask is that you do the fair and helpful thing in order to assist the Government and its allies to win the war."

British Plant to Be Extended

A cable dispatch from London says that the Effio Vale Steel, Iron & Coal Co. will spend between $15,000,000 and $20,000,000 within the next two years extending the plant, including enlargement of the blast-furnace capacity and coke-oven departments, besides additions to the steel works. A subsidiary plant in connection with the blast furnaces, constructed at a cost of about $1,250,000, will enable the company to recover potash in considerable quantities.

Pittsburgh and Nearby Districts

The Blaw-Knox Co., Pittsburgh, with plants at Hoboken and Wheatland, Pa., builder of steel forms for concrete construction, also structural steel work and transmission towers, has lately bought more ground adjoining its plant at Hoboken and will install a modern water gas welding plant. The company states that its two plants are operating to utmost capacity, its contracts being entirely Government work on direct and indirect orders.

The Heppenstall Forge & Knife Co., Forty-seventh and Hatfield Streets, Pittsburgh, Pa., manufacturer of iron and steel forgings, has commenced the construction of a new one-story machine shop, 140 x 350 ft., and furnace, on Forty-sixth Street, to cost about $100,000.

The Pittsburgh Screw & Bolt Co., Preble Avenue, Pittsburgh, Pa., is building a two-story addition about 35 x 44 ft.

Installations of Booth-Hall Electric Furnaces

New installations of Booth-Hall electric furnaces are announced as follows:

The West Michigan Steel Foundry Co., Muskegon, Mich., will install a 3-ton furnace for making steel castings from cold scrap. It will be operated by power furnished by the Consumers Power Co.

The Duriron Castings Co., Dayton, Ohio, will install a ¾-ton furnace for producing castings of Duriron. Power will be furnished by the Dayton Power & Light Co.

Another furnace of this type of 1½-ton capacity will be put in operation late in November by a company whose name cannot be divulged until the furnace is started.

These three furnaces are in addition to a 3-ton furnace already announced which will be put in operation early in November by the Midland Electric Steel Co., Terre Haute, Ind., bringing the total of this type to four in the United States.

The Booth-Hall Co., 565 West Washington Boulevard, Chicago, have recently issued a 4-page leaflet giving drawings of their furnace and complete information regarding its operation, whether for single, two or three-phase current. Furnaces of 8 and 10-ton capacity are built three phase; those of 1½-ton capacity for the straight melting down of scrap are built single phase, except where the power conditions are such that a single-phase load is not acceptable, in which case the two-phase furnace is recommended. Furnaces of 2½ to 6-ton capacity are built two phase. The claim is made that all parts of the Booth-Hall furnaces are constructed as simply and strongly as possible and that any repairs can be effected with unusual ease.

Agree Not to Sell to Enemy

WASHINGTON, Oct. 16.—The War Trade Board, created by the Executive order signed by the President on Oct. 12, 1917, has drawn up an agreement, to be signed by exporters when shipping to their own branches in foreign countries. The exporters agree that none of the articles contained in any of the shipments for the licensing of which applications are pending, will be directly or indirectly re-exported, or sold, transferred or delivered, either in their present or any other form, contrary to the agreement herein contained. The signers agree not to sell or deliver, directly or indirectly, or trade, or engage in the doing of any business with enemies or enemy allies, as herein defined, or for or on account of, or on behalf of, any such enemy or enemy allies during the continuance of the present war.

The regular monthly meeting of the Pittsburgh section of the Association of Iron and Steel Electrical Engineers will be held in the Hotel Chatham, Pittsburgh, on Saturday, Oct. 20. Ward Harrison will present a paper entitled "Some Recent Advances in Industrial Lighting Equipment." Mr. Harrison's paper will discuss particularly those aspects of effectiveness which are dependent upon the skillful utilization of light to produce the best illumination. As the demand for production increases, so do requirements for good lighting become greater. Practically every electrical superintendent has installed new lighting systems in the last year or two.

Effect of Pickling on the Strength of Steel*

Chemical or Electrolytic Treatment as Cathode Weakens the Metal—Treated as the Anode Physical Properties Are Unimpaired

BY JOHN COULSON

BRITTLENESS of steel springs resulting from acid pickling and electroplating is a well-known phenomenon. Tempered springs which are pickled even for a few seconds in an acid bath snap when subjected to strain. Such springs, however, can be electrolytically pickled without destroying their resiliency. This paper cites an electrolytic process for removing oxides from the surface of iron, steel and other metals without impairing their physical properties.

It is known that metals absorb gases and that the amount absorbed depends upon the nature of the gas, the condition and character of the metal and the surrounding medium. These absorbed gases appear to play an important role in the behavior of iron, steel and certain alloys. Electrolytic iron is extremely brittle due principally to occluded hydrogen, and there appears no doubt that the brittleness of steel springs after pickling is due to the absorption of hydrogen during the ordinary pickling process. This effect is still more pronounced if the springs are made the cathode in an acidulated electrolyte.

Numerous experiments were carried out to determine the behavior of steel springs, drill rod, tempered steel, Bessemer and cold-rolled steel rods after undergoing different pickling treatments. The pickling bath consisted of a 27 per cent solution of H_2SO_4 kept at 60 deg. C. Test specimens of each of the above materials were treated consecutively; one-third of each set was pickled by the ordinary chemical process, one-third electrolytically as anode, and one-third as cathode. The lead tank containing the pickling bath served for the second electrode in the electrolytic processes.

Tests in Steel Springs

The springs dealt with were 3/32 in. (2.4 mm.) diameter tempered steel wire wound closely in the form of a helix ¾ in. (19 mm.) diameter. Twenty of these springs constituted a set for the testing machine. The machine was adjusted to exert a maximum tension of about 16 lb. (7.3 kg.) on each spring, and then dropped to zero again. The number of oscillations of the machine and the life of each spring were automatically recorded.

Table 1—Life Test on Steel Springs Variously Treated

No.	Treatment	Load, Lb.	Life, (No. of Oscillations)
1	Original state	16.0	11,090,000
2		15.8	191,426
3		15.8	Not broken
4		15.8	13,173,000
5	Sand-blasted	16.1	10,017,000
6		15.6	13,715,000
7		15.8	8,373,210
8		16.0	11,495,000
9	Pickled 40 sec. chemically	16.0	Broke during preliminary test
10		15.4	
11		16.0	
12		15.6	
13	Pickled 40 sec. as cathode	15.8	45,000
14		15.8	Broke during preliminary test
15		15.9	
16		15.3	
17	Pickled 40 sec. as anode	16.0	14,220,000
18		16.0	1,714,000
19		15.8	12,387,000
20		15.8	11,725,000

Table 1 gives the history of one of the many sets of springs tested. Each set of springs was divided into groups of four, each group was constituted of springs of like treatment. The first group tabulated received no treatment further than tempering, which was common to all. The second group was sand-blasted; the third group was pickled 40 sec. chemically; the fourth group was pickled 40 sec. electrolytically as cathode, and the fifth group was pickled 40 sec. as anode. All the springs pickled chemically and as cathode electrolytically broke during the preliminary test, which consisted of a continuous strain for 12 hr. The crystalline structure of the breaks resembled that of glass-hard steel. No difference appeared to exist in the properties of the other groups of springs. All withstood, on the average, about ten million oscillations before breaking.

Bending tests were carried out on bars 1 by ¼ in. (2.5 x 0.6 cm.) cold rolled steel. Test pieces which had been pickled chemically and electrolytically as cathode showed fatigue and cracks much sooner than untreated test pieces or pieces which had been pickled electrolytically as anode. The records for the last two cases were very similar. The Brinell test for hardness indicated an increase of about 5 per cent for specimens pickled as cathode, while no material change was noticeable for any of the others.

Table 2—Tests on Pickled Wire and Rods

Material	Diameter mm.	Diameter In.	Pickling	Unit Stress Kg. per sq. mm.	Unit Stress Lb. per sq. in.	Reduction of Area, per cent	Elongation in 2 In. (5 cm.), per cent
Spring steel wire	2.0	0.0785	None	178	254,000	51	..
	2.0	0.0785	Chemical	173	247,000	3	..
	2.0	0.0785	Cathode	173	247,000	3	..
	* 2.0	0.0785	Anode	176	252,000	51	..
	5.2	0.205	None	160	228,000	47	..
	5.2	0.205	Cathode	157	224,000	3	2
	5.2	0.205	Anode	155	221,000	49	10
Drill rod	6.3	0.25	None	118	169,000	22	5
	6.3	0.25	Cathode	113	162,000	7	2.5
	6.3	0.25	Anode	114	163,000	25	6.6
Hot rolled Bessemer.	5.9	0.236	Cathode	48	69,000	22	29
	5.9	0.236	Anode	47	68,000	63	35
Cold rolled steel	6.3	0.25	None	74	106,000	50	..
	6.3	0.25	Chemical	70	100,000	40	..
	6.3	0.25	Cathode	72	103,000	35	..
	6.3	0.25	Anode	71	102,000	50	..

Tests on the tensile strength, elongation and reduction were determined for a number of rods of different materials, some of which had been pickled chemically, others electrolytically. Table 2 gives the results of a few of these tests. Each number tabulated is the average value for three rods similarly treated, and as a rule the values for a given set of rods all agreed fairly well.

The table shows that all the materials pickled either chemically or electrolytically as cathode show deleterious effects. The properties of the high carbon steel undergo the greatest modification. The majority of specimens of this material tested showed no elongation or reduction whatever when pickled electrolytically as cathode. Anode pickling, it appears, does not impair the physical properties of any of the materials here dealt with.

The fracture of rods pickled chemically and as anode were perfectly cup shaped. The rod pickled as cathode, on the other hand, showed a very short break without any appreciable reduction in area. The same bar also showed an irregular break with a dark center encircled by a bright band. This band was well defined, and indicated clearly the depth the hydrogen penetrated the metal during the process of pickling.

The rate at which the hydrogen penetrates the metal increases with the current density. In the case of or-

*From a paper presented at the thirty-second general meeting of the American Electrochemical Society at Pittsburgh, Oct. 5, 1917. The author is physical chemist, Westinghouse Research Laboratory, East Pittsburgh, Pa.

dinary chemical pickling, absorption takes place more slowly. It is very probable that the hydrogen absorbed by the metal, where it loses its identity as nascent hydrogen, forms an alloy, thus modifying the physical properties of the steel. The bright band of the last test referred to indicates that the rupture took place along the crystal faces and not through the crystals. The light was reflected from the crystal faces and is, therefore, more intense than the reflection from the ruptured crystals of the central area.

Restoration by Annealing

Test specimens, made brittle by pickling either chemically or electrolytically as cathode, were restored to the original condition by annealing. This restoration was effected considerably by repickling the test pieces electrolytically as anode. A number of test pieces of spring steel 0.205 in. (5.2 mm.) diameter were pickled two minutes electrolytically as cathode; half of these broke with no elongation and no reduction. The other half was repickled two minutes electrolytically as anode, and then tested. These had an average value for elongation and reduction of 5.5 per cent and 25 per cent respectively. Non-pickled material showed 8 per cent elongation and 40 per cent reduction. It is probable that prolonged re-pickling electrolytically as anode would restore completely the physical properties of the metal.

A Summation

Hydrogen is absorbed rapidly by iron and steel when pickled either chemically or electrolytically as cathode, in acid solutions, thus causing brittleness, diminution of the tensile strength, elongation and reduction of area.

Iron and steel may be cleaned effectively and quickly by pickling electrolytically as anode, without impairing their strength, resiliency or other physical properties.

Federal Export Buys a Railroad

The New Mexico Central Railroad has been purchased by the Federal Export Corporation, 115 Broadway, New York. This property lies in a section of New Mexico that has recently been opened to oil developments. The line has a length of 120 miles extending south and southeast from the city of Santa Fe, where it joins the main line of the Atchison, Topeka & Santa Fe Railroad to Willard, where it crosses the southern branch of the Santa Fe road and thence to Torrance, where it connects with the El Paso & Southwestern. The Federal Export Corporation has in project the electrification of the road or its re-equipment with internal combustion locomotives. Its engineers are at present examining the property with the object of ascertaining the most available means of placing the road on a more productive basis.

Takes Merchant Ships

WASHINGTON, Oct. 16.—Beginning Monday, Oct. 15, the United States Shipping Board, through a chartering committee sitting in New York, took over all American merchant vessels of 2500 tons deadweight. The vessels will be chartered at a rate fixed by the board, but they will be turned back to their owners to operate under such direction as the Shipping Board chooses to impose. Thus the United States formally takes almost absolute jurisdiction of all the merchant fleet flying the American flag.

The Standard Statistics Co., New York, began recently the publication of the Standard Daily Trade Service. The design of this service is to place upon the desk of the busy executive, in compact form, a complete digest, analysis and index of all available basic business and financial information. This matter is arranged alphabetically in the eight-page daily bulletins so that a few minutes each morning will enable the executive to find what he needs to know in the mass of information, particularly in regard to foreign trade, now reaching his desk. The sources of information are given so that with the least possible loss of time the subscriber to this service is able to find the particular things he wishes to see in his trade publications.

American Manufacturers' Export Association

The American Manufacturers' Export Association held its eighth annual convention at the Biltmore Hotel, New York, Oct. 10. It commended the public stand of President Wilson against economic leagues among nations after the war; asked for a more liberal policy of the National Government toward export trade development, declared that exporters wanted no special advantage from victory of the United States in the war, and it favored an international conference to promote uniform laws and regulations governing international carriers. For example, it passed a resolution to the effect that

"The export manufacturers of the United States seek in international trade only such gains as this country is economically entitled to, and have neither desire nor design to profit by conditions created by the European conflict. The export manufacturers of the United States do not favor the principle of retaliation at the close of the war on account of the obstacles which may be found in the way of the expansion of our trade during the war."

James A. Farrell, president United States Steel Corporation, and W. W. Nichols, assistant to chairman, Allis-Chalmers Mfg. Co., New York, were elected directors for three years, and E. C. Lufkin, president Texas Co., a director for two years. George E. Smith, president Royal Typewriter Co., was elected president, and E. V. Douglass was re-elected secretary.

Further Drop in Fabricated Work

The records of the Bridge Builders and Structural Society, as collected by its secretary, George E. Gifford, 50 Church Street, New York, show that 29 per cent of the entire capacity of the bridge and structural shops of the country was put under contract in September. This corresponds to about 52,000 tons and is the average at which work was taken in the seven months immediately following the outbreak of the war in August, 1914. At no other period since 1911 has the volume of business been so low.

So far this year about 832,000 tons of bridge and building work have been closed against 1,070,000 for the same period of 1916. For business to reach a total for this year equal to the totals of either 1913 or 1914, contracting over the remaining three months would have to exceed 45 per cent. The total amount of business done in each of the years 1915 and 1916 was about 1,500,000 tons.

Record Manganese Ore Imports in August

Manganese ore imports in August were the largest for any month this year and exceed any month in 1916. They were 87,650 gross tons, the next largest months having been 81,269 tons in May this year and 81,942 tons in July, 1916. The August imports bring the total for the year to Sept. 1, 1917, to 457,878 tons, corresponding with 391,589 to Sept. 1, 1916. The average imports so far this year have been 57,234 tons per month contrasting with 48,027 tons per month in all of 1916, then a record.

The annual report of the Industrial Commission of Wisconsin for the fiscal year ended June 30, shows that the total sum of benefits paid by employers of Wisconsin under the requirements of the workmen's compensation act was $1,576,329, compared with $1,216,189 for the previous year. The number of cases settled last year was 17,157, against 12,848 in the preceding period. The total compensation paid to injured workmen last year was $1,184,271, an average of $69 per case; for medical aid to injured workmen, $391,958, or $23 per case.

Regular monthly meetings of the Pittsburgh section of the Association of Iron & Steel Electrical Engineers will be resumed with a meeting at the Hotel Chatham, 423 Penn Avenue, Pittsburgh, Pa., Saturday, Oct. 20. Some recent advances in industrial lighting equipment will be discussed by Ward Harrison, illuminating engineer, National Lamp Works, Cleveland.

Creditable Service from Electric Mills

Two Motor-Driven Reversing Blooming Mills Which from an Operating Viewpoint Have Justified Their Installation—Minor Alterations Which Improved Service

DATA pertaining to electrically driven reversing blooming mills which are of interest from an operating viewpoint were given by Ralph D. Nye, electrical engineer, United Alloy Steel Corporation, Canton, Ohio, in a paper presented before the Association of Iron and Steel Electrical Engineers at its convention this week in Philadelphia. These data apply to two typical installations of electrical blooming mills and, he explains, show what results have been secured. Following is a review of his paper.

Installation Number One

The installations are designated as No. 1 mill and No. 2 mill. No. 1 mill is a 34-in. blooming mill, that is, the pinions are 34 in. in diameter. The installation was designed to roll a maximum capacity of 50 tons of ingots per hour, size 18 x 20 in., and weighing about 5500 lb., to finished billets averaging 4 x 4 in., and using 21 to 23 passes. The estimated power consumption with the mill rolling at an average rate of 40 tons of ingots per hour to 4 x 4-in. billets was 26 kw.-hr. per ton of ingot rolled. The maximum torque capacity of the reversing motor is 670,000 lb.-ft. Its full-field speed is 47 r.p.m., and its maximum speed with weakened field about 100 r.p.m. The rated capacity of the induction motor is 1500 hp., and it operates on three phase, 2200 volts and 60 cycle alternating current. Its full-load speed is 350 r.p.m. The generator capacity is 1960 kw., continuous rating.

Characteristics of Service

This equipment was installed in the spring of 1915 and rolled its first steel during June of that year. The first ingots put into the mill were rolled down to a finished size four by four. The mill has practically been in continuous operation since that time, and the total delay due to trouble with the electrical drive since the mill was started does not exceed 10 hr. Some alterations were found advisable in the arrangement of control switches and on the reversing motor since installation. The number of accelerating switches was reduced and some changes were made in relays to increase rate of acceleration and speed up operation. On the motor it was found that the commutating pole coils were apt to work loose due to the heavy pulls on them at times of motor reversal, and additional fastenings were added to these coils. Also the interpoles were readjusted to prevent any movement under these stresses. The motor commutator was not under cut at first and it was found advisable to do this to improve commutation. After under cutting, a type of brush designed for under-cut commutators was installed, so that the high current peaks are handled successfully without blackening the commutator.

The motor requires forced ventilation, and it is necessary to arrange for a good supply of clean, cool air. This air is taken from outside the building through a duct about 40 ft. above the mill floor, and is not washed. No trouble from dirt collecting in the motor has been experienced. Of course, it is necessary to blow out the machine with compressed air and clean it about once a month. Twenty thousand cubic feet of air per minute, at 1½ oz. pressure per sq. in. is required to cool the motor, two fans of this capacity being provided, both of which are operated in hot weather.

All bearings on the equipment are provided with oil-ring lubrication. The two main bearings carrying the flywheel are operated water cooled. These bearings and also the reversing motor bearings are arranged for forced oil feed but the equipment is being run without this. The forced feed is considered an extra safeguard against bearing trouble. Neither water cooling nor forced feed has been found necessary on the main motor bearings. It was at first thought that on account of the relatively low speed and frequent reversal of this motor the rings would not deliver enough oil, but experience shows that they do the work satisfactorily. Each motor bearing is equipped with four rings.

As an indication of the severe service that is put on this type of equipment, it may be said that at two different times the motor has twisted off a cast steel connecting spindle used to couple the motor to the pinion housings. This spindle is about 19 in. in diameter. The main motor bearing next to the pinion housing is provided with a thrust collar designed to take up any thrust due to diagonal breaking of this spindle, and in neither of the cases was any damage done to the motor.

Economic Results Obtained

As to the rolling capacity of the mill, and the cost of operating the electric equipment, the following table shows the total tonnage of ignots rolled and the actual kilowatt-hour consumption per ton for several typical months of rolling. This includes all necessary power, such as exciter and motor driven fan requirements, in addition to the main power supply.

Operating Data No. 1 Mill

Month	Monthly Tonnage	Kw.-hr. per Ton
1	21,100	17.7
2	19,400	18.4
3	21,200	18.6
4	18,800	20.6
5	22,100	18.5
6	20,000	24.6
7	21,800	19.5
Average	20,600	19.7

The above tonnage is made up almost entirely of ingots 20 in. by 22 in. about 70 in. long. Fifty per cent. of these were rolled down to 4x4 in. billets using 19 to 21 passes. The balance were rolled to a size averaging 6x8 in., using 17 to 19 passes. Approximately 90 per cent. of this steel may be classed as high carbon. During the sixth month where a consumption of 24.6 kilowatt-hour per ton is shown a number of new operators were breaking in on the mill, and this is thought to account for the increase of about 25 per cent. above the average in power consumption. No exact costs of attendance of repairs is available but this item is relatively small and would not exceed 15 per cent. of the power cost. The equipment is installed in a main substation where an attendant is required on the switchboard and as he also looks after the mill drive only a part of this attendance cost can be charged to the cost of rolling. The only repairs so far have consisted of brushes and switch contact renewals, the cost of which is relatively small.

Installation Number Two

No. 2 mill is a reversing bloomer having 35-in. diameter pinions. This mill is of heavier construction all the way through than the one above, being about as heavy as the average 40-in. bloomer. The rolls are 32-in. diameter and 90 in. long. This mill was expected to roll a maximum capacity of 75 to 90 tons of ingots, size of ingot 20 by 21 inches, weighing 7000 lb. each per hr., to finished billets averaging 4 x 4 in. and using 19 to 21 passes. The power consumption with the mill rolling at an average rate of 75 tons per hr. to four by four billets was estimated at 28 kilowatt-hour per ton. The reversing motor has two armatures, mounted on common shaft, each with a maximum torque capacity of 600,000 lb.-ft. This gives the motor a total maximum rating of 1,200,000 lb.-ft. The full field speed is 40 r.p.m. and the maximum speed with weakened field 120 to 130 r.p.m. Field windings consist of variable and

constant potential excited circuits. The capacity of the induction motor is 2500 hp. and it uses three phase 2200 volts, 60 cycle current. Its full load speed is 350 r.p.m. Two generators each rated at 1450 kw. continuous capacity are used.

Characteristics of Service.

This equipment was erected during the fall of 1916 and started to roll steel in December. No trouble with the drive was experienced in starting rolling, the usual adjustments of relays and resistance necessary to make the equipment perform in the best manner being all that were necessary. The control equipment is operating as originally installed. The only mechanical adjustments necessary were to scrape in two of the bearings on the flywheel set. Since starting, only one delay, and that about half an hour has occurred. This happened during the time the floor was being put down in the sub-station, dust causing the brushes to stick in holders in one of the generators. It was found advisable to undercut the motor commutators and this has been done, giving considerable improvement in commutation. This motor requires about 35,000 cu. ft. of cooling air per min. Two fans of this capacity are installed, one is held in reserve as a spare except in very hot weather, when both are operated together. The air supply is taken from outside the sub-station building and is not washed. No trouble from dust collecting in the motor has been experienced except that it is necessary to blow it out about once a month. Rolling conditions are such that additional cooling to be secured from washed air is not necessary.

All the bearings of this equipment are arranged with oil-ring lubrication. Cooling water is used on the two flywheel bearings. It was found advisable to put forced oil feed on all the five bearings of the motor generator set in addition to the oil-ring lubrication. The motor bearings did not require it for regular operation but it was provided as an emergency measure.

Economic Results Obtained.

The following table shows the monthly tonnage rolled since this mill was started, and the total kilowatt-hour consumption per ton of ingot.

Operating Data No. 2 Mill.

Month	Monthly Tonnage	Kw.-hr. per Ton
1	15,000	33.5
2	14,800	32
3	19,000	30.5
4	21,000	28.5
5	25,000	27
6	22,000	26.7
Average	19,500	29.7

The above tonnage consists of ingots 19 and 21 in., weighing 6000 lb. each. Seventy per cent of these were rolled to 4 x 4 in. billets using 23 to 25 passes. The balance were rolled to a size averaging about 6 by 6 in. and using 19 to 21 passes. Sixty per cent of this steel may be passed as high carbon. The gradual reduction in power consumption per ton from month to month is no doubt due more to expert handling of the mill and also the increased rate of rolling. The electrical equipment is installed in a sub-station having the switchboards, rotaries and transformers and the attendance consists of one operator on each turn with a helper or clean-up man on day turn. The attendance costs chargeable to the blooming mill are not more than 1 per cent per ton of ingot it rolled. No repairs except a few brushes and switch contacts have as yet been required.

Comparison of Installations

Without going into the electrical conditions existing in these equipments it is safe to say that the operating results secured have justified their installation. Considered from the standpoint of reliability they seem to have delivered the goods. Considered from the standpoint of cost, since the cost of power is between six and seven mills per kilowatt-hour, it appears that both mills are rolling steel at a total operating cost of less than 20c. per ton. This is probably a lower cost than the average steam-driven mill. In the plant with the No. 2 equipment an engine-driven reversing mill is being operated, rolling a steel schedule which should not require as much power per ton as the one on the electrically operated blooming mill, yet the operating cost per ton on the steam mill is at least double that of the electric.

The averages of the above tables show the No. 2 equipment is using 29.7 kilowatt-hour per ton and the No. 1 equipment 19.7 kilowatt-hour which is 10.0 kilowatt-hour more for the No. 2 mill. The six-month run on the No. 2 drive includes several months breaking in and some low tonnages so that a fairer basis of comparison would probably be to take the average of the last three months. This average shows a total tonnage of 22,500 and power consumption of 27.4 kilowatt-hour per ton of ingots. This amounts to about 10 per cent higher tonnage and 7.7 kilowatt-hour per ton, or almost 40 per cent more power than the No. 1 mill drive required.

This higher power consumption by the No. 2 equipment may be accounted for in several ways. The No. 2 mill is larger and of course heavier, having been designed to take care of large ingots and heavy drafts. The drive was laid out to roll 50 per cent more steel than the No. 1 drive. The No. 1 mill is rolling about up to its rated average capacity of 40 tons per hr., and the No. 2 mill is rolling under rated capacity. Also the No. 2 equipment is rolling a higher percentage of four by four, that is 70 per cent against 50 per cent on the No. 1. The No. 2 mill is making lighter drafts and more passes per ingot. Also it may be noted that the estimated power consumption, made before the mills started to roll was 26 kilowatt-hour and 28 kilowatt-hour per ton of ingot rolled, to four by four, on the No. 1 and No. 2 mills respectively.

It is apparent that the No. 1 mill is meeting expectations in the matter of power consumption. The No. 2 equipment at present rate of rolling is probably not down to estimated consumption of 28 kilowatt-hour per ton of four by four. No doubt it would meet this estimate if the steel were drafted heavier and 75 tons per hr. rolled. The No. 2 equipment is adapted to heavier drafts and fewer passes, and the comparison shows the advantage in having the electric drive fitted to the work to be done in the mill.

First Liberty Motor Delivered in Record Time

WAUKESHA, WIS., Oct. 15.—The Waukesha Motor Co., Waukesha, Wis., earned the distinction of being the first contractor for manufacturing the new Liberty motor for the Government, to submit its finished product to the Government. In exactly 11 days and seven hours after receiving the detailed specifications the Waukesha company completed the first motor and packed it for express shipment to Washington for official tests. This is believed to be a world's record and has resulted in a flood of congratulatory telegrams from officials and manufacturers in all parts of the country. The work was in charge of J. B. Fisher, chief engineer, and was executed under the direction of A. W. Dietzel, factory superintendent, the materials being provided under the direction of James Remington, purchasing agent. Harry L. Horning, vice-president and general manager of the Waukesha company, is chairman of the engineering committee in charge of the design of the new motor.

In an address urging the economic use of fuels, Van H. Manning, director of the Bureau of Mines, before a meeting of State officials called to assist in fuel administration, described the problem in part as follows: About 15,000,000 people shovel the 20 per cent of coal used for domestic purposes. About 250,000 firemen shovel the 60 per cent used by power plants and railroads. The householder should be made to realize that when he throws a shovelful of anthracite coal into his furnace its value is equivalent to ½ lb. of sugar or 1 pint of milk. He needs to give attention to the matter of weather strips, double windows, pipe coverings and the like. The industrial fireman, to bring about the larger economy, must be regarded as a skilled worker and be properly instructed and given proper labor-saving devices.

PERSONAL



C. W. Johnson, who was elected vice-president of the American Institute of Metals at its recent meeting at Boston, is general superintendent of the East Pittsburgh works of the Westinghouse Electric & Mfg. Co. On graduation from Ohio State University, he began his career as draftsman with the Steel Motor Co., Johnstown, Pa. He joined the Bullock Electric Co., Cincinnati, in 1897, successively holding the position of chief draftsman, engineer and production manager. From 1904 to 1907 he was superintendent of the combined Allis-Chalmers and Bullock plants at Montreal, Canada. In the latter year he entered the employ of the Westinghouse Electric & Mfg. Co. as chief inspector. In 1909 he was promoted to the position of assistant manager of works, and in 1912 he was made general superintendent of works.

W. B. Sullivan, who was formerly Eastern representative of the Rich Tool Co., with offices at Philadelphia, has been appointed manager of sales, with headquarters at the general offices in the Railway Exchange, Chicago.

James H. Hood, Belmont, Mass., has arrived in France to assume the position of director general of construction for the Stone & Webster Corporation, Boston. He will be in charge of the building of a great ordnance depot for the United States Government. It is understood that the contract calls for the erection of 28 storehouses and 10 shop buildings, each 250 ft. wide and 500 ft. long, and for the building of a 10,000-hp. power station.

H. E. Dodge, Dodge Brothers, Detroit, has turned over to the Government for war service a second steam yacht.

Dr. Ira N. Hollis, president of the American Society of Mechanical Engineers, and also of the Worcester Polytechnic Institute, will be the guest of the joint engineering societies of San Francisco at a dinner on Oct. 25.

R. E. Prussing is now in charge of the Detroit agency of the Whiting Foundry Equipment Co., Harvey, Ill. He has been in the employ of the company for 10 years, in the engineering, estimating and sales departments.

J. S. Shorey, General Electric Co., delivered an address before the Engineers' Club of Trenton, N. J., Oct. 11, on centrifugal blowing engines. H. L. Gantt, consulting management engineer, New York, is to address the club on Oct. 22 on the economic position of the engineer.

S. Rea Morria, formerly connected with the National Tube Co., Pittsburgh, has been elected secretary-treasurer of the Pottstown Steel Products Co., Pottstown, Pa., now building a new plant.

Charles M. Dill, Philadelphia, local representative of the Witherow Steel Co., has resigned to join the United States Army.

In the United States service, army or navy, are 50 employees of Joseph T. Ryerson & Son, Chicago, the number including the volunteers and those drafted. Two vice-presidents of the corporation are doing their full share, Donald M. Ryerson being an ensign at Annapolis, and Edward L. Ryerson, Jr., being a first lieutenant in the Signal Corps and now connected with the Aircraft Production Board, Washington.

J. E. Maloney, formerly sales manager of the pressed-steel department of the Hydraulic Pressed Steel Co., Cleveland, has been made general sales manager of that company, filling a vacancy caused by the recent death of O. P. Stehn. C. W. Vilas, formerly assistant factory manager, has been made sales manager of the pressed-steel department.

Thompson Lothrop, an inspection engineer of the United Alloy Steel Corporation, Canton, Ohio, has entered the Government service as first lieutenant, and has been assigned to the truck division of the War Department.

H. F. Brandes, for the past four years works manager of the Putnam Machine Co., Fitchburg, Mass., who directed the erection and equipment of the new plant of the company, has resigned, and returned to Bridgeport, Conn., for the present, to give attention to his interests in the Springfield Mfg. Co. His son, who formerly managed this plant, has been drafted.

Charles O. Rowe has been appointed representative in the Philadelphia district of the Hess Steel Corporation, Baltimore. For the past six years he was in the sales department of the Union Drawn Steel Co.

E. J. Renshaw has been appointed general manager of the Nicetown Plate Washer Co., Juniata and Clarissa Streets, Philadelphia.

Don R. Marsh, production manager with the Buffalo Forge Co., has given up his work to assume similar duties at Washington in the production of ammunition. He will receive a captain's commission.

H. F. Bardwell has been appointed New York district manager for the Vanadium-Alloys Steel Co., with offices at 30 Church Street, New York.

C. F. Goodrich, assistant manager of the Buffalo Forge Co.'s Boston office, has left for active duty as first lieutenant in the Ordnance Department, and is stationed at the Watervliet Arsenal.

A. W. Hubbard, assistant to the president of the Andrews Steel Co. and Newport Rolling Mills for the past 26 years, has been elected president and general manager of the Charleston Alloy Steel Co., Belle, W. Va. P. D. Mackey has been appointed general superintendent to succeed Charles A. Swan, resigned.

E. R. Stettinius, a member of the firm of J. P. Morgan & Co., who had charge of all buying for the Allies, has been assigned a new task by the War Department. He will place and supervise all contracts for trench tools and other materials needed by the department.

L. N. Hall, for 17 years city salesman in Philadelphia for the Carnegie Steel Co., will become connected with the Pennsylvania Steel Export Co., Widener Building, Philadelphia, on Nov. 1.

Frank H. Brooks has resigned from the presidency of E. & T. Fairbanks & Co., scale manufacturers, St. Johnsbury, Vt., effective soon, and will be succeeded by P. C. Brooks, vice-president and manager of the Canadian-Fairbanks-Morse Co., Ltd., Toronto Ont.

Maj. L. J. Campbell, a vice-president of the Youngstown Sheet and Tube Co., Youngstown, Ohio, has been assigned to the command of a battalion of heavy artillery at Camp Sherman, at Chillicothe, Ohio.

OBITUARY

CORNELIUS G. VAN ALEN was stricken with paralysis on his seventy-first birthday, Sept. 25, and died in a short time. He was one of the prominent citizens of Northumberland, Pa., senior member of the firm of Van Alen & Co., and president of the Keystone Forging Co.

PAUL WESTPHAL, treasurer of the Wisconsin File Co., Milwaukee, Wis., died Oct. 11, after a long illness. He was 35 years of age.

Damages amounting to $100,000 were caused at the Farrell, Pa., plant of the American Sheet & Tinplate Co., Sunday night, when the copperas plant, manufacturing a by-product, was destroyed by fire. A crossed electric wire is blamed for starting the blaze.

OFFICIALS ARE CRITICISED

Judge Talks Very Plainly in Decision in Labor Case

In an opinion handed down in United States District Court Oct. 9 at Cincinnati by United States District Judge Sater, the Niles-Bement-Pond Co., New York, owner of a majority of the stock of the Niles Tool Works Co., Hamilton, Ohio, is granted a temporary injunction directed against officers and members of Iron Molders' Union Locals Nos. 68 and 283, enjoining them from illegal interference with the plant or work of the Niles Tool Works Co. and molders employed by it to take the place of striking unionists.

In his opinion Judge Sater criticizes the conduct of city and county authorities in connection with disturbances growing out of the strike of molders in Hamilton, and suggests, if there is no law in Ohio providing for the ousting of officials for failure to perform duties imposed upon them by statute, such laws should be enacted. He criticized also officials of the unions and the Strike Committee for failure to prevent demonstrations against the employees and property of the Niles Tool Works.

Rights Are Defined

Outlining the rights of the respective parties, Court says in part:

"Labor has the right to strike. The strike sometimes is the only weapon laborers may wield to obtain their just deserts. The molders were at liberty to contend for the employment of union labor only at the tool company's plant, but the company has the right to run an open shop, without discrimination both union and non-union labor. The union men were not required to work for the company, but they had no right to say no one else should take their places.

"The right to form and join a union exists. The right to prevent another man from working, if he does not belong to the union, does not exist.

"This still is a free country. In the eyes of the law the rights of a union man are no higher or sacred than those of the non-union man. The rule of equality prevails. Whenever labor or capital resorts to discrimination, oppressive conduct or words or deeds of violence it discredits itself and weakens itself and invites the accompanying defeat which usually follows."

After reviewing the alleged acts of violence on the part of strikers and sympathizers and testimony given at the hearing of this case, touching upon the part taken by the city and county officials, Judge Sater wrote:

"A mob or an unlawful assemblage is a cowardly thing. If, in its formulative period or even in its somewhat advanced stage, it be fearlessly taken in hand by courageous ministerial officers who have regard for their own efficiency and respect for the sanctity of their oaths of office, it almost always quickly melts away.

Officials Assume Responsibility

"Sheriffs and mayors and their subordinates are selected for and accept their positions to direct and do promptly just that kind of work, when occasion requires. There may be here and there a lawless, obstreperous person who will resist officers who thus perform their sworn duty, but these officers are authorized to meet resistance with force and with as much force as is necessary to subdue him and preserve the peace.

"Where the officers of the law are derelict of duty, as they were touching the matters here under consideration, many ordinarily well-disposed but sympathetic persons may follow vicious and evil-disposed leaders into subverting the law, endangering not merely the property but the liberty, limbs and life of others and rendering the preservation of order difficult and dangerous.

"It is always a grave reflection on peace officers when, on account of their dereliction of duty, citizens of their community are forced to appeal to the courts to maintain the supremacy of the law and to give the protection such officers are bound by oath to afford. The ministerial arm can act more quickly and is no less powerful than that of the courts, and should be prudently, impartially and, if need be, vigorously employed.

"If the Ohio statutes do not sufficiently provide for the speedy and sure removal of such derelicts from office, amendments ought quickly to be made that such may be done."

NEW WAR TRADE BOARD

President Provides for Enforcing Trading with Enemy Act

WASHINGTON, Oct. 16.—The President, on Oct. 6, approved the trading with the enemy act, and by an executive order, signed Oct. 12, 1917, has established the administrative machinery to carry out its provisions. This act has conferred on the President war powers of the widest extent. It has added to the power to embargo all exports, which was conferred upon the President by the espionage act, the power to prohibit all imports into the United States except under such licenses as may be granted. It has conferred on the President the power to prohibit or regulate all transfers of credits, money, currency, bullion and securities between the United States and all foreign countries. It imposes severe criminal penalties on all persons who trade or communicate directly or indirectly with an "enemy," or "ally of enemy," or with any person acting on their behalf or for their benefit. It creates a definition of an "enemy" and "ally of enemy," with which it is highly important that every citizen of the United States should promptly familiarize himself for his own protection and for the loyal support of the Government in its efforts to wage the war to a successful termination. The act further provides for the use in the United States of enemy-held patents which may be of assistance to us in carrying on the war. It provides for taking over and administering the property in the United States of "enemies" and "allies of enemies." It confers upon the President complete power to censor all communications of every sort passing between this country and any foreign country. It provides certain regulations with regard to the foreign-language press in the United States. These are merely the broad outlines of the act, but it will readily be seen that the act confers power to deal effectively with the abnormal conditions of trade created by the war and the exigencies of the public safety. Certain of the powers conferred by the act the President has directed to be exercised through the State Department, the Treasury Department, the Attorney General, the Post Office Department, the Commerce Department, and the Federal Trade Commission. As to many of the powers conferred upon the President by Congress in this act, no single existing department is interested, and the President has provided for their joint administration by a War Trade Board composed of representatives of the departments which are most vitally concerned.

Members of the Board

The new War Trade Board so established is composed of Vance C. McCormick, chairman, as representative of the Secretary of State, a representative of the Secretary of the Treasurer to be appointed, Dr. Alonzo E. Taylor as representative of the Secretary of Agriculture, Thomas D. Jones as representative of the Secretary of Commerce, Beaver White as representative of the Food Administrator, Frank C. Munson as representative of the United States Shipping Board. Thomas L. Chadbourne, Jr., is counselor to the board. The functions and organization of this board are as follows:

The War Trade Board, under the President's direction, succeeds to all the functions which have been exercised by the Exports Administrative Board, which goes

out of existence. The proclamations of the President forbidding the export of various articles without a license are continued in full force and effect, but licenses will hereafter be granted by the War Trade Board instead of by the Exports Administrative Board, and all applications for such licenses, and all correspondence with regard to them, should be addressed to the Bureau of Exports of the War Trade Board. Its headquarters will for the present continue to be 1435 K Street, N. W., Washington.

Important Definitions

The definition of an "enemy" or "ally of enemy" requires careful consideration. In the first place, any person, no matter of what nationality, who resides within the territory of the German Empire or the territory of any of its allies, or that occupied by their military forces, is expressly made an "enemy" or "ally of enemy" by the act. Even citizens of the United States who have elected to remain within such territory are "enemies" or "allies of the enemy" within the provisions of the act. Further, any person not residing in the United States, of whatever nationality, and wherever he resides, who is doing business within such territory, is placed within the definition of "enemy" or "ally of enemy." So also is any corporation created by Germany or its allies. So also is any corporation created by any other nation than the United States and doing business within such territory. Further, for the purposes of this act, the government of any nation with which the United States is at war, or the ally of any such nation, and every subdivision of such government and every officer, official agent, or agency of such government, is an "enemy" or "ally of enemy," and the act makes no restriction as to where such officer, official agent or agency may be located.

It is important for the public to have clearly in mind that not only is it unlawful to trade with an "enemy" or "ally of enemy" without license, but it is equally unlawful to trade with any person whom there is reasonable cause to believe is acting for or on account of or for the benefit of an "enemy" or "ally of enemy," and it makes no difference what the nationality or what the residence of such person may be. On the other hand, in dealing with subjects of Germany who are resident in the United States, it is important to remember that while other provisions of the law make it possible to intern them, the mere fact of their nationality does not make them "enemies" within the meaning of this act and so prevent persons in this country from having ordinary commercial relations with them.

License to Trade with the Enemy

The Trading with the Enemy Act, however, while imposing such stringent provisions gives power to the President to grant licenses to trade with the enemy. The exercise of this power has been delegated by the President to the War Trade Board. Applications for license to trade with an "enemy" or "ally of enemy," or a person acting on behalf of or for the benefit of an "enemy" or "ally of enemy," should be sent to the War Trade Board.

In addition to the War Trade Board the President has created a War Trade Council, composed of the Secretary of State, the Secretary of the Treasury, the Secretary of Agriculture, the Secretary of Commerce, the Food Administrator, and the chairman of the United States Shipping Board. This War Trade Council will take the place of the Exports Council, and will act in an advisory capacity in such matters as may be referred to it by the President or the War Trade Board.

The act contains various provisions as to the applications for patents by citizens of the United States in enemy and ally or enemy countries during the war, and for the use in the United States by citizens of the United States of enemy-held patents during the war, and also for the suspension of information as to certain patent applications made in the United States, secrecy as to which is necessary for military reasons. The Federal Trade Commission is empowered by the President to deal with all these matters, receiving applications and granting licenses with regard to them.

Coal Production Increased

WASHINGTON, Oct. 16.—Coal production in this country this year will exceed that of last year by 10 per cent. The embargo against sending coal to Canada has been lifted and an arrangement made by which the Dominion is to be supplied on a pro rata basis, substantially as though it were a State of the Union. The American Northwest will be properly supplied.

These facts were developed at conferences held late last week by Federal Fuel Administrator Harry A. Garfield. Not only will this year's coal production exceed that of last year by 10 per cent, but it will exceed that of two years ago by 23½ per cent.

"The question of shortage for this year," said Dr. Garfield, "will depend then upon whether the American demand has increased by more than the 10 per cent increase in production. If our industrial development, from the war and other causes, has grown beyond that, then we must go short. We have no figures at hand to tell what that development has been."

Prof. Smith stated that the Survey figures include all bituminous coal, whether used in making coke or not, and that the figures for anthracite are approximately the same. Last year the bituminous tonnage mined was in excess of 502,000,000 tons. It is expected this year to reach 552,000,000 tons. Anthracite should show the same increase, substantially. America, according to Prof. Smith, is now nearly a month ahead of last year's production at this time.

Tata Iron & Steel Co. Preparing to Expand

YOUNGSTOWN, Oct. 15.—Serene labor conditions in Asia, where strikes and lockouts are unknown, and wages, due to the economical living of the natives in a warm country, at a minimum, will insure the rapid growth of the Tata Iron & Steel Co., located at Sakchi, India, stated G. H. Lee, an American representative of the corporation, while in Youngstown last Saturday looking after furnace equipment contracts at the plant of the W. B. Pollock Co.

Mr. Lee stated that native female labor, employed quite extensively in the Far East, is procurable at from four to six cents a day; unskilled male labor is paid approximately 10 and 12 cents a day, while skilled laborers are available at 50 cents a day. All that is required is great patience in dealing with the native labor, stated Mr. Lee. Maximum wages are paid experts from Great Britain and the United States whose principal duties are instructing the natives in steel making.

The Tata Iron & Steel Co. works built originally from plans prepared by Julian Kennedy of Pittsburgh, is planning to expand. Two blast furnaces, a plate mill and 150 by-product coke ovens have been contracted for. A third blast furnace will be erected later. Because of the admirable labor conditions promised for the India corporation, it is the opinion of Mr. Lee that the company will have no difficulty making money in normal times, or when there is a depression in other countries. In this thought the stockholders are encouraged by the cheap available native labor.

L. S. Phillips and James McClure, former Youngstown men who have been two years at the works of the Tata Iron & Steel Co., are expected back in the United States next February as their contracts expire some time in January, 1918.

Ferromanganese Imports Still Low in August

Ferromanganese imports in August were only 2840 gross tons which is next to the best month in the last four up to September but considerably below the previous war average and far less than the pre-war imports. In May, this year, when the sudden decrease started they were 2187 tons; in June, 3817 tons; in July, 2037 tons, and in August, 2840, making the average for these four months only 2220 tons per month. This contrasts with an average of 6190 tons per month for the first four months of this year and with 7577 tons per month in all of 1916. The pre-war average for five years, 1910 to 1914, was 100,793 tons per month.

Machinery Markets and News of the Works

COMMANDEERING BEGUN

Government Now Takes Freely Whatever Tools It Needs

Active Buying Continues for Ordnance Plants, Shipbuilding, Airplane Engine Work and Other War Necessities

The Government has tabulated complete records of machine tools on order in all of the leading factories of the country and is now exercising freely its right to commandeer through the granting of priority certificates, these certificates giving precedence to those engaged on important war work. It is said that efforts are being made in Washington to make up a schedule of all of the machinery requirements of the War and Navy departments for the next year in order to systematize the placing of priority orders.

The Fore River Shipbuilding Corporation, Quincy, Mass., which will build torpedo boat destroyers in a new plant being erected by the Government, will commandeer the tools it needs and its first efforts were directed this week toward getting equipment for a plate and angle shop, which will be located at Squantum, Mass. Buying will be done subsequently for the turbine machine shop at Buffalo, N. Y., and the boiler shop at Providence, R. I. The Aberthaw Construction Co., Boston, has begun work on the buildings and will purchase the necessary cranes, which, it is now reported, will number 70 or 80. About $3,000,000 or more will be spent in equipping the three plants.

Buying for ordnance plants continues to feature the machine-tool markets. The Edgewater Steel Co., Pittsburgh, has issued a list of 58 large tools it will require for machining 9.5-in. and 155-mm. guns. A number of cranes will also be required. The Watertown Arsenal is about to buy and the Watervliet Arsenal will be in the market heavily in a week or two. The Symington-Anderson Co., Rochester, N. Y., which has a gun-machining contract, is buying additional tools. The Himoff Machine Co., Astoria, L. I., has a large contract for gun mounts, and is inquiring for machine-tool equipment. The American Gas Accumulator Co., Elizabeth, N. J., has a mine contract for which it is buying tools. The Blake & Knowles plant of the Worthington Pump & Machinery Corporation, East Cambridge, Mass., has bought about $400,000 worth of new equipment for making pumps for the Navy.

The Companie Generale de Construction de Locomotives, H. Kampmann, 30 East Forty-second Street, New York, representative, is buying for a locomotive shop in France.

The Westinghouse Air Brake Co. will make airplane engines at its plant at Wilmerding, Pa., and is buying new equipment. The plant had been equipped for shell and fuse work when word was received from Washington to change to airplane engines. The Lincoln Motor Co., Detroit, has placed additional orders. The Ford Motor Co., Detroit, is buying. The Simplex Automobile Co., New Brunswick, N. J., is expected to issue a new list this week.

Buying in the New York market has been done by the Goulds Mfg. Co., Seneca Falls, N. Y., the Empire Cream Separator Co., Bloomfield, N. J., and a Japanese shipbuilder, whose purchases of second-hand machinery aggregated $75,000. The Monroe Calculating Machine Co., Orange, N. Y., is expected to buy soon.

The New York Central is inquiring for two tools and the Erie Railroad for one.

The American International Shipbuilding Corporation may provide for a larger fabricating shop at its Hog Island shipyard than was at first intended. This corporation continues an active buyer. It has just closed for a large number of locomotive cranes. The Submarine Boat Corporation and the Lackawanna Bridge Co., which are erecting a ship plant near Newark, are inquiring for five cranes. The New York Shipbuilding Corporation, Camden, N. J., and the William Cramp & Sons Ship & Engine Building Co., Philadelphia, are expected to buy for torpedo boat destroyer work. The Merchant Shipbuilding Corporation, Bristol, Pa., and the Chester Shipbuilding Co., Chester, Pa., are closing for a large number of new machines.

The Kemper Construction Co., Philadelphia, has a contract to furnish small parts for merchant ships and inquired last week for about 25 second-hand tools. It will also need a number of new engine lathes soon. The De Laval Steam Turbine Co., Trenton, N. J., is expected to buy equipment soon for work on turbines.

The Bartlett & Hayward Co., Baltimore, Md., is reported to have issued a list of large tools wanted for gun work. The Camden Forge Co., Camden, N. J., may buy gun-boring and turning machines. The North American Motors Co., Pottstown, Pa., has received bids on about 40 tools to be used on a 6-in. shell contract.

The Pennsylvania Railroad Co. continues to buy tools for a locomotive shop in France, having just closed for five bolt-cutting machines.

The Navy Department wants machines for the machine shops on several new battleships now building.

The Hess-Bright Mfg. Co., Philadelphia, will increase its capacity 25 per cent and will need new equipment.

The American Car & Foundry Co., Detroit, has closed for about 40 lathes and other machinery for a war contract.

An inquiry for 145 tools, reported from Cleveland last week, was issued by the Recording & Computing Co., Dayton, Ohio, and orders are now being closed. A leading Detroit automobile manufacturer has bought about 30 screw machines from a Cleveland maker. The Cleveland Tractor Co., which is enlarging its plant, has bought 15 turret lathes. An English order for 25 screw machines went to a Cleveland company. The Dayton-Wright Airplane Co., Dayton, Ohio, has placed additional orders.

General demand in Chicago is good. Planing machines are greatly needed. There is an inquiry also for large boring mills for gun mount construction. Large lathes with long beds for turning large old-style ordnance are also much sought. Sales at auction of used machinery in Chicago resulted in higher prices being paid than the machines cost when new.

The Tacony Ordnance Corporation, Tacony, Pa., has placed an order with the Chesapeake Iron Works, Baltimore, Md., for 13 electric traveling cranes, and the Morgan Engineering Co., Alliance, Ohio, received an order for a 60-ton ladle crane. The Badenhouser Co., Cornwells, Pa., has bought four 5-ton cranes. The Pennsylvania Railroad Co. is inquiring for jib cranes. Anderson, Meyer & Co., New York, are inquiring for two cranes for export to China. The General Electric Co. is in the market for several small cranes.

New York

NEW YORK, Oct. 16.

The Edgewater Steel Co., Pittsburgh, has sent to New York a list of large tools required for work on a Government gun contract. This company will machine some of the 9.5 in. forgings, which will be turned out at the new plant of the Tacony Ordnance Corporation, Tacony, Pa. It will also handle 155-mm. guns. Its list calls for two boring bar lathes, two cutting-off lathes, two heavy duty drill presses, two tool grinders, two test bar grinders, one heavy duty shaper, four cold saws, one heavy duty slotter, one centering machine, two test bar lathes, eight boring lathes for 9.5-in. guns, nine boring lathes for 155-mm. guns, eight turning lathes for 9.5-in. guns, five turning lathes for 155-mm. guns and nine planers. It is understood that a number of cranes will also be required for the gun work. The Edgewater Steel Co. is affiliated with the Kennedy-Stroh Corporation, Pittsburgh.

A number of machine-tool and machinery men were summoned to Boston on Monday by the Fore River Shipbuilding Corporation, which, it was said, would close orders this week for its plate and angle shop for torpedo boat destroyer construction. This shop will be located at Squantum, Mass. The boiler shop will be located at Providence, R. I., and the machine shop for turbines at Buffalo, N. Y. Buying for the two latter shops will be done soon. It is now reported that the contract of the Fore River Shipbuilding Corporation calls for the construction of 50 destroyers within 16 months. Work has already been begun on the buildings, which will be erected by the Aberthaw Construction Co., 8 Beacon Street, Boston. This company will also purchase the cranes for the buildings, of which possibly 70 or 80 will be required. The Fore River concern has been granted class A priority certificates by the Government and will commandeer the equipment it needs. It is said that the equipment of the plants will cost upward of $3,000,000.

Buying continues active for ordnance and munitions plants. The Watertown Arsenal, Watertown, Mass., has sent out a large list and the Watervliet Arsenal, Watervliet, N. Y., is expected to buy heavily within a week or two. Among the requirements of the Watertown Arsenal are boring mills, milling machines and gun-turning lathes. The Symington-Anderson Co., Rochester, N. Y., which has a gun-machining contract, is buying. The Himoff Machine Co., Astoria, L. I., has obtained a large Government contract for gun mounts and will require a considerable number of new machine tools. The American Gas Accumulator Co., Elizabeth, N. J., has obtained a mine contract and is buying new equipment.

Purchases of the Blake & Knowles plant of the Worthington Pump & Machinery Corporation at East Cambridge, Mass., will aggregate about $400,000. This factory has a large contract for pumps for the Navy Department.

The Companie Generale de Construction de Locomotives, represented by H. Kampmann, 30 East Forty-second Street, New York, is buying a complete equipment for a locomotive shop to be built in France. Early deliveries are not being insisted upon, six months to a year being requested in most instances.

Buying for the airplane engine industry continues. The Westinghouse Air Brake Co. will build 30 engines a day at its plant at Wilmerding, Pa., and is buying the necessary equipment. The plant was fully equipped for shell and fuse work, when an order was received from Washington to change to airplane engine construction. The Lincoln Motor Co., Detroit, has placed additional orders in the past week for its airplane engine plant. The Ford Motor Co., Detroit, has placed an order for a large number of grinding machines and is reported to be considering the purchase of other equipment. The International Motor Co., Plainfield, N. J., has bought additional tools in the past week. Nothing has yet developed from the inquiries of the General Vehicle Co., Long Island City, N. Y., or the Simplex Automobile Co., New Brunswick, N. J. The latter company is said to be trying to let sub-contracts for airplane engine parts and is expected to issue a new list of machine-tool requirements this week.

The Monroe Calculating Machine Co., Orange, N. J., which is building a new plant, has not yet purchased equipment for it, and is expected to come into the market soon for a number of new tools. The Goulds Mfg. Co., Seneca Falls, N. Y., continues to buy. The Empire Cream Separator Co., Bloomfield, N. J., is buying a number of tools.

Except for purchases by the Pennsylvania Railroad Co. for its Altoona shops some weeks ago, there has been so little railroad buying of late that an inquiry from the New York Central for two tools and from the Erie Railroad for one attracted more attention than they would perhaps otherwise have received.

A Japanese shipbuilder, through a representative in New York, has bought second-hand machinery aggregating $75,000 from several different companies. In most instances licenses were easily obtained, but the Government declined to grant a license for the exportation of a vertical boring drill.

The Chevrolet Motor Co. will move its engineering department and its purchasing office from Detroit to New York.

The Submarine Boat Corporation and the Lackawanna Bridge Co. are in the market for four 5-ton cranes, 58 ft 2 in. span, and one 15-ton crane, 36 ft. 8 in. span, for the ship assembling plant they are erecting near Newark, N. J. Anderson, Meyer & Co., New York, are in the market for two cranes for export to China. The General Electric Co. wants three 3-ton cranes for the Schenectady works and one wall crane and one 3-ton traveling crane for its Pittsfield works. The J. G. White Engineering Corporation and the American Smelting & Refining Co., New York, are in the market for one hand-power crane each.

The Endicott Forging & Mfg. Co., Inc., Endicott, N. Y., has placed orders for two new 2800-lb. Chambersburg hammers and two Toledo presses.

The E. W. Bliss Co., Adams and Plymouth streets, Brooklyn, N. Y., has had plans prepared for the erection of a one-story brick addition to its works at Fifty-third Street near First Avenue, to cost about $10,000.

The Automatic Trolley Lock Co., New York, has been incorporated with a capital of $100,000 to manufacture special trolley locks and allied specialties. L. F. Roggenstein, H. D. Junge and J. M. Ruhl, 2426 University Avenue, Bronx, are the incorporators.

The Gotham Can Co., 60-68 Eagle Street, Brooklyn, manufacturer of tinware, has increased its capital from $150,000 to $500,000.

The Decorated Metal Mfg. Co., 196 Degraw Street, Brooklyn, manufacturer of tin boxes and metal specialties, is planning for the erection of a four-story addition.

The Amalgamated Oil-Gas Corporation, New York, has been incorporated with a capital of $600,000 to manufacture gas-making machinery, coke ovens, engines, etc. A. E. Moore, 37 Wall Street, New York; A. F. McCabe, 19 Tompkins Place, and S. C. T. Dodd, 1918 Avenue H, Brooklyn, are the incorporators.

M. Kohner & Co., Brooklyn, have been incorporated with a capital of $20,000 to manufacture motors, engines, etc. J. B. Stern and M. Kohner, 571 Forty-seventh Street, Brooklyn, are the principal incorporators.

The Drawn Metal Products Corporation, New York, has been incorporated with a capital of $250,000 to manufacture metal goods. H. Osswald, C. A. Mezger and T. F. Crean, 359 Parkside Avenue, Brooklyn, are the incorporators.

The Ruggles Orientator Corporation of New York, New York, has been incorporated with a capital of $100,000 to manufacture machinery and apparatus for the instruction of student aviators. A. C. Streitwolf, J. H. Leddy and W. G. Ruggles, 168 West Seventy-third Street, New York, are the incorporators.

The H. & N. Mfg. Co., New York, has been incorporated with a capital of $325,000 to manufacture airplanes, motors, etc. The incorporators are J. B. Mooney, W. G. Decker and J. B. Mackie, 15 Wall Street, New York.

The Municipal Auto-Garage & Machine Corporation, Brooklyn, operating a plant at 26 Court Street, has increased its capital from $10,000 to $100,000.

The Speed Key Mfg. Co., Floral Park, L. I., has been incorporated with a capital of $25,000 to manufacture typewriter speed keys. G. H. Locke, P. C. Locke and H. E. Frost, 382 St. Johns Place, Brooklyn, are the incorporators.

The New York Edison Co., 130 East Fifteenth Street, New York, will make extensions in its four-story power plant on First Avenue, to cost about $7,000.

The Landau Machine & Drill Press Co., New York, has been incorporated with a capital of $10,000 to manufacture multiple chuck drill presses. J. J. F. Mulcahey and J. N. Landau, 115 Broadway, are the incorporators.

The Latshaw Steel & Metal Products Corporation, New York, has been incorporated with a capital of $100,000 to manufacture iron, steel and metal products. J. Taylor and V. and H. L. Latshaw, 220 Broadway, are the incorporators.

The Campbell Motor Car Co., New York, has been incorporated in Delaware with capital of $3,000,000 to manufacture automobiles. L. H. Gunther, Joseph F. Curtin and Samuel B. Howard, New York, are the incorporators.

The North American Refining Co., New York, has been incorporated with a capital of $10,000 to manufacture metal goods. J. Schulhofer and A. Isaacs, 150 East Fiftieth Street, are the incorporators.

The Braden Mfg. Co., New York, has been incorporated with a capital of $20,000 to manufacture dies and tools.

The incorporators are D. A. Young and R. W. Braden, 135 West Third Street.

The International Dymalkon Process Corporation, New York, has been incorporated with a capital of $500,000 to operate a general foundry and machine works. J. A. Poulin, E. O. Anderson and P. A. Stilwell, 38 Fort Washington Avenue, are the incorporators.

The Standard Self-Starter Co., New York, has been incorporated with a capital of $10,000 to manufacture automobile self-starting devices. B. L. Darrow, J. L. Brulatour and J. J. Blemly, 441 West Thirty-fourth Street, are the incorporators.

E. Rothschild, Inc., New York has been incorporated with a capital of $10,000 to manufacture electric clocks. A. L. Stock and E. and H. J. Rothschild, 277 West Fourth Street, are the incorporators.

The Motor Starter Corporation, New York, has been incorporated with a capital of $2,000,000 to manufacture motor starting devices. S. W. Labrot, R. Delafield and S. McRoberts, 55 Wall Street, are the incorporators.

The Simmons Machine Co., 986 Broadway, Albany, N. Y., is having plans prepared for the erection of a one-story addition to cost about $12,000.

The American General Electric Corporation of China, Schenectady, N. Y., has increased its capital from $250,000 to $500,000.

The Tottenville Shipyard Co., Monroe, N. Y., has been incorporated with a capital of $100,000 to operate a shipbuilding plant with department for the manufacture of airplanes. J. A. Anderson, R. C. Baird and J. P. Pillow, 420 West 156th Street, New York, are the incorporators.

The Ross Vulcanizing & Battery Co., East First Street, Elmira, N. Y., will build a two-story addition to its plant, about 60 x 80 ft.

The Rome Electrical Co., Henry and Jay streets, Rome, N. Y., manufacturer of insulated wire, etc., has increased its capital from $40,000 to $300,000.

The Jamestown Iron & Metal Co., 201 Harrison Street, Jamestown, N. Y., has been incorporated with a capital of $10,000 to manufacture iron and metal products. M. M., E. and A. L. Minsker, Jamestown, are the incorporators.

The New Idea Double Tire Co., 261 West Onon Street, Syracuse, N. Y., manufacturer of automobile tires, has increased its capital from $5,000 to $75,000.

The Atterbury Motor Car Co., Elmwood and Hertel avenues, Buffalo, manufacturer of automobiles, is planning for the erection of an addition to its plant.

The Rome Iron Mills, Inc., Rome, N. Y. has been reorganized with a capital stock of $2,000,000. The business will be carried on with an active capital of $500,000.

The Standard Aero Corporation, North Avenue, Plainfield, N. J., manufacturer of airplanes, is rushing improvements at the plant of the former John Stephenson Car Works, Elizabeth, recently acquired, and expects to occupy the plant before the end of the month. The initial output will average about 60 machines weekly.

The Banknote Press Co., Plainfield, N. J., has been incorporated with a capital of $25,000 to manufacture printing machinery. George W. V. Moy, 125 East Front Street; Morris C. Van Arsdale and Harry W. Marshall, Plainfield, are the incorporators.

The J. D. B. Rubber Co., Arlington, N. J., has been incorporated with a capital of $50,000 to manufacture rubber products. Alfred G. Berg, James H. Robertson and Benjamin A. Dare, all of New York, are the incorporators.

The Union Terminal Cold Storage Co., Twelfth and Henderson streets, Jersey City, N. J., is planning for the erection of a new cold storage plant, about 100 x 100 ft., on Thirteenth Street.

The Arthur Daniels Co., Jersey City, has been incorporated with a capital of $10,000 to manufacture tools and machinery. Samuel Elfenbein, 38 Sherman Place, Jersey City, and Arthur Daniels, Bayside, L. I., are the principal incorporators.

The Barlow Foundry Co., 551 New Jersey Railroad Avenue, Newark, specializing in the production of gray iron castings, will build a new one-story brick and steel foundry, about 59 x 100 ft., on Hunter Street to cost $20,000.

The Standard Machine Brush Co., Newark, has been incorporated with a capital of $20,000 to manufacture brushes, etc. George H. Van Emburg, 462 Broad Street, and J. D. Gladwin, are the incorporators.

John Regner & Co., Newark, have been organized to operate a machine shop at 391-3 New York Avenue. John Regner heads the company.

The Universal Talking Toys Co., Newark, has been incorporated with a capital of $60,000 to manufacture mechanical toys. Sylvester H. Williams and Frank S. Ely, Newark, and Richard S. Arthur, New York, are the incorporators.

The Art Metal Works, 7-15 Mulberry Street, Newark, manufacturer of metal specialties, has purchased a tract of land adjoining its plant and contemplates the construction of a series of buildings, providing an additional floor area of over 30,000 sq. ft. Louis V. Aronson is president.

The Specialty Machine Co., 9 Clinton Street, Newark, has been organized to manufacture automatic vending machines. Mortimer and Samuel Klein head the company.

The Little Janitor Clock Co., 16 Stuyvesant Avenue, Newark, has been organized to manufacture furnace clocks. William H. Weesel, 8 Richmond Street, and David H. Tillery, Newark, head the company.

The Kendall Foundry Co., Buffalo, brass founder, has acquired the property of the American Bronze Co., at Arthur Street and the Erie Railroad and commenced operations in the plant.

The Michigan Limestone & Chemical Co., Buffalo, has purchased a site on the Buffalo River at Katherine Street and the Erie Railroad on which it will erect a group of buildings for a crushing, grinding and chemical plant, including a machinery repair shop.

The Thomas-Morse Aeroplane Co., Ithaca, W. T. Thomas, president, has plans in preparation for a factory addition.

The Curtiss Aeroplane Corporation, Buffalo, is constructing a testing room at its Austin Street plant to cost $10,000; also a steel test house to cost $28,000 at its Elmwood Avenue plant, and a power-house.

The New York Central Railroad Co. is building a power plant to cost $30,000 at Curtiss and Clarke streets, Buffalo.

The Wire Wheel Co. of America, Buffalo, H. F. Krause, manager, has plans in preparation for the construction of a new plant at Elmwood Avenue and the New York Central Railroad to manufacture wire wheels.

New England

BOSTON, Oct. 15

The Liberty Ordnance Co., Bridgeport, Conn., has been incorporated with authorized capital stock of $4,000,000 to manufacture ordnance and munitions. The incorporators are Kenneth W. McNeil, Archibald McNeil, Jr., and Arthur L. Ruland.

The Fore River Shipbuilding Corporation has selected Providence, R. I., as a site for a boiler factory which will cost $500,000 and employ about 800 men. The steel for the building is being assembled and it is the intention of the company to rush the structure as much as possible. The last big building of this kind constructed by the company was completed in 39 days and like expedition is expected in the completion of the Providence plant. The boiler house will be auxiliary to the big shipbuilding plant to be built on the Squantum Aviation Field, Quincy, Mass., where 46 torpedo boat destroyers will be constructed, and also to a $2,500,000 turbine plant at Buffalo which will employ about 3500 men. It is the intention to have the Quincy plant completed by Jan. 15. The entire contract for the destroyers, the main plant, turbine and boiler plants calls for the expenditure of $69,000,000.

The Stillman White Foundry Co., Providence, R. I., has awarded a contract for an addition, 26 x 40 ft., two stories.

The World Electric Machinery Co., Boston, has been incorporated with authorized capital stock of $25,000. Max Freedman is president and Charles M. Waugh, Cambridge, treasurer.

The Burgess Co., Marblehead, Mass., has awarded a contract for a machine shop, 48 x 55 ft., two stories, and for a boiler house.

The Arkin Fastener Co., Boston, has been incorporated with authorized capital stock of $10,000. Louis Arkin is president and Lelia B. Clapp, Winthrop, treasurer.

The Lake Torpedo Boat Co., Bridgeport, has awarded a contract for a motor generator building, 20 x 36 ft., one story.

The Thomaston Business Men's Association, Thomaston, Conn., is to erect a factory to house a machine building company, controlled by Carl Holden and John Johnson of Waterbury. The name of the company is to be selected later, and plans for the building are being made.

The Forem Co., Providence, R. I., has been incorporated, with capital stock of $15,000, to manufacture machinery and tools. The incorporators are Maurice W. Clarke, Joseph A. Barrett and Harry M. Friedman.

The New England Structural Co., Everett, Mass., has

awarded contracts for a tool shed, 40 x 60 ft., one story, and an office building, 12 x 70 ft., two stories.

The National Sales Machine Co., Boston, has been incorporated with authorized capital stock of $1,500,000. The directors are Jose B. de Mass, president; Mary E. Hurley, 293 Concord Avenue, Belmont, treasurer; and William J. Denholm.

The G. S. Machine Tool Co., Pittsburg, Mass., has been incorporated with capital stock of $25,000. William H. Savage is president and Robert D. Gould, treasurer.

Hunter & Havens, South Avenue, Bridgeport, manufacturers of wrought iron and steel products, have commenced the erection of a one-story addition, about 27 x 32 ft.

The Heppenstall Forge Co., Howard Avenue, Bridgeport, manufacturer of drop forgings, has commenced the construction of a one-story addition, about 60 x 360 ft.

Baer Brothers, Canal Street, Stamford, Conn., manufacturers of castings, etc., will build a new one and two story foundry, about 240 x 300 ft., on Fairfield Avenue.

The Waterbury Mfg. Co., Waterbury, Conn., manufacturer of brass goods, has commenced the construction of a six-story addition to cost about $100,000.

The H. & H. Foundry Co., Stamford, Conn., manufacturer of iron castings, is building a one-story addition to its plant.

The American Machine Co., Pleasant View Street, Pawtucket, R. I., is building a one-story foundry extension, about 35 x 70 ft.

Philadelphia

PHILADELPHIA, Oct. 15.

Slow pay by manufacturers is causing complaint among the dealers. Tools which are sold on 30 days' time are frequently not paid for in several months, and in not a few instances dealers, much against their will, have been forced to accept notes on past-due obligations. The most solvent companies are declared to be the worst offenders.

Dealers also complain of discrimination against them in the Government purchasing departments in Washington as the result of an order issued some weeks ago which is said to have been particularly aimed at irresponsible brokers who were seeking Government business to make commissions from manufacturers. The order referred to directed that buying be done only from producers and established machine-tool dealers resent the fact that some Government purchasing agents have construed this to apply to them also. In many instances factories have been obliged to conduct selling negotiations at Washington and later adjust profits with their Philadelphia agents, in whose territory Washington is located. Letters of protest have been sent to the Federal authorities and it is said have brought some promise of rectifying the alleged discrimination against the recognized dealers.

The American International Shipbuilding Corporation continues an active buyer for its Hog Island shipyard. It is reported that plans for fabricating steel sections for the ships to be built for the Emergency Fleet Corporation have not been carried out as successfully as was expected, and as a consequence a very much larger percentage of the fabricating will be done on the ground than was at first intended. If this proves true the corporation must buy considerable equipment for punching, shearing, bending and drilling operations on plates and shapes. A large order has been placed for locomotive cranes.

The New York Shipbuilding Corporation, Camden, N. J., and the William Cramp & Sons Ship & Engine Building Co., Philadelphia, which will expand their plants to build torpedo boat destroyers, are expected to come into the market shortly for a good deal of miscellaneous equipment. As an indication of the scope of the new work, it is stated that although the Cramp shipyard is now employing more than 6000 men, it will take on many additional to complete in record-breaking time the destroyers it has contracted to build.

The Merchant Shipbuilding Corporation, Bristol, Pa., and the Chester Shipbuilding Co., Chester, Pa., have closed for a large number of new machines, including about 30 for plate-working operations. The Pennsylvania Shipbuilding Co., Philadelphia, is expected to buy more equipment soon.

To supply small parts of various kinds for the new merchant fleet now building, the Kemper Construction Co., 905 Market Street, Philadelphia, which has been chiefly engaged in structural bridge construction, will equip a plant in this city. A factory building with 10,000 sq. ft. of floor space has been leased and work will be begun in 60 days on an initial Government contract aggregating $500,000. The company is negotiating for a much larger order. Its machine-tool requirements include 14 engine lathes, eight drill presses, one heavy-duty drill press, four sensitive drills, four external grinders, and later additional engine lathes will be purchased. Orders for most of this equipment were given this week.

The De Laval Steam Turbine Co., Trenton, N. J., is expecting a Government order for turbines for destroyers, upon receipt of which it is expected to buy a number of new tools.

The Camden Forge Co., Camden, N. J., is building a new forge shop, 100 x 500 ft., one story, which will be completed Jan 1, doubling the capacity of the plant for marine shafting and locomotive work. The company has also been making gun forgings for the Japanese Government, and it is reported may undertake similar work for France, in which event the rough machining will also be done, and for which gun boring and turning lathes and similar heavy tools will be required. Six electric traveling cranes have been bought recently for the new shop, one 50-ton, one 15-ton, and two 10-ton bridge cranes and two 35-ton one-legged gantry type.

It is reported here that the Simplex Automobile Co. has received a Government contract for airplane engines and will this week issue a new list of machine tools to be bought, this list superseding one issued several weeks ago totaling about 100 tools.

The Bartlett & Hayward Co., Baltimore, Md., has issued a large list of tools to be used on gun-finishing work. The Poole Engineering & Machine Co., Baltimore, which has bought heavily in the past few weeks, will occupy a new building Dec. 15 with its gun-machining department.

The North American Motors Co., Pottstown, Pa., has received bids on machine tools needed for a 6-in. shell contract. Among the tools to be bought are 15 engine lathes, 10 turret lathes, 10 cutting-off machines and four grinders.

The Hess-Bright Mfg. Co., Philadelphia, will increase its capacity 25 per cent and is reported to be ready to buy a large number of tools.

The United States Navy is obtaining bids on tools for the machine shops on several battleships now building at various yards. The Frankford Arsenal, Philadelphia, will need considerable equipment for its new fuse plant.

The Pennsylvania Railroad Co.'s purchasing department is still buying machines for shipment to France, there to be used in the United States Government locomotive shop. Several bolt-cutting machines were purchased last week.

The Keystone Watch Case Co., Philadelphia, has discontinued the manufacture of fuses at its Ridgefield, N. J., factory, and has issued a printed list of several hundred second-hand tools which it is offering for sale.

The Tacony Ordnance Corporation, Tacony, Pa., has placed an order for 13 cranes, aggregating about $125,000, with the Chesapeake Iron Works, Baltimore, Md., and with the Morgan Engineering Co., Alliance, Ohio, an order for one 60-ton ladle crane for its new gun-forging plant. The Badenhouser Co., Cornwells, Pa., manufacturer of water tube boilers, has closed with Alfred Box & Co., Philadelphia, for four 5-ton cranes, each 47 ft. 6 in. span. The Pennsylvania Railroad Co., Broad Street Station, Philadelphia, is inquiring for jib cranes for an ash pit at Mt. Carbon, Pa.

The Tioga Iron & Steel Co., Fifty-second Street and Gray's Avenue, Philadelphia, manufacturer of iron and steel forgings, has acquired a tract of land on Fifty-first Street, adjoining its present works, for the construction of additions.

S. L. Allen & Co., Denkla Building, Philadelphia, manufacturers of agricultural implements and machinery, are taking bids for the erection of an addition to their plant at Fifth Street and Glenwood Avenue.

S. H. Davies, Philadelphia, has had plans prepared for the erection of a one-story, brick automobile repair shop, 40 x 70 ft., at Tenth and Tioga streets, to cost about $6,000.

The Main Belting Co., 1241 Carpenter Street, Philadelphia, manufacturer of belting, is having plans prepared for the erection of a three-story brick and steel addition.

The Turbo Motors Co., Trenton, N. J., has been incorporated with a capital of $100,000 to manufacture motors. W. Holt Apgar, 36 East State Street, Trenton; William McElroth, East Radford, Va.; and L. S. Randolph, Blacksburg, Va., are the incorporators.

The New York Shipbuilding Co., Camden, N. J., has filed plans for the construction of a one-story addition on Broadway, near Morgan Street.

Joseph Gaskill, receiver for the Camden Iron Works, Camden, has announced that he will continue the operation of the plant, following a failure to receive bids for the property late in September. It specializes in the production of cast iron pipe, hydraulic presses, etc., and will operate at full capacity. The company has assets estimated at over $1,356,000.

The Jacob Wilson Estate, Easton, Pa., manufacturer of iron and steel castings, has commenced the erection of a new one-story foundry, about 60 x 100 ft., at Holly and Lehigh avenues, to cost $35,000.

The Supreme Jack & Hoist Co., Williamsport, Pa., has been incorporated in Delaware with a capital of $100,000 to manufacture hoists, tools and machinery. Henry J. Schmick, William J. Rouse and Alvin P. Huber, Williamsport, are the incorporators.

The Titan Metal Co., Bellefonte, Pa., is building a one-story addition to its plant, 60 x 200 ft., to cost about $35,000.

The Bearings Company of America, Harrisburg and College avenues, Lancaster, Pa., has completed plans for the erection of a one-story addition, 36 x 120 ft., and will soon call for bids.

The Lanzius Aircraft Co., 149 Broadway, New York, a Delaware corporation capitalized at $5,000,000, has secured land at Middletown, near Harrisburg, Pa., and plans the erection of a plant for the manufacture of airplanes, to be known as the Lanzius Improved Variable-Speed Airplane. The proposed works are estimated to cost $250,000 and will have an initial capacity of 50 machines per month. The company is also contemplating the erection of other plants in different sections of the country. E. W. Bloomingdale is chairman of the board of directors.

The Pennsylvania Shipbuilding Corporation, Gloucester City, N. J., has increased its capital from $1,000,000 to $2,500,000. It is operating a local shipbuilding works and plans for an increase in capacity.

The Husted Hall Mould Works, Bridgeton, N. J., operating a plant at 38 Atlantic Street for the manufacture of machine molds, has been incorporated in Delaware, with capital of $100,000, to manufacture dies, tools, machine molds and kindred products. Monroe G. Husted, John T. and Maurice R. Hall, Bridgeton, are the incorporators.

The American Brass Products Co., Pottstown, Pa., has acquired the plant of the International Forge Co., which it will continue to operate. Holland M. Merrick is president.

The Johnstown Traction Co., Johnstown, Pa., has commenced the erection of a new one-story car repair plant, 54 x 180 ft., to cost about $10,000. George N. Smith is chief engineer.

The Wridgway Co., Scranton, Pa., manufacturer of pistons for airplane motors, is planning for the establishment of a new factory at Hazleton.

Baltimore

BALTIMORE, Oct. 15.

The American Propeller & Mfg. Co., 233-249 East Hamburg Street, Baltimore, which will build an addition to its plant, will increase its capital stock from $150,000 to $500,000.

The Pusey & Jones Co., Wilmington, Del., is contemplating the construction of a new foundry to cost about $75,000.

The Payne Valve Corporation, Roanoke, Va., has taken over a building 60 x 100 ft. and will install machinery to manufacture automobile tire valves. S. G. Greene is the manager.

The Kendrick Aeroplane Co., Alexandria, Va., has been organized with Blaine Elkins, Washington, D. C., president.

The Newport News Shipbuilding & Drydock Co., Newport News, Va., is contemplating additional improvements.

The Maryland Utilities Co., Crisfield, Md., has been incorporated with $100,000 to generate electric power. The incorporators are Albert Emanuel, Louis A. Petitt, Jr., and L. Paul Ewell.

The Southern Aircraft Co., Washington, D. C., has been incorporated in Delaware with capital of $500,000 to manufacture airplanes. C. N. Riker, F. S. Swindell and W. J. Dow, Washington, are the incorporators.

The Electric Hose & Rubber Co., Twenty-first and Dure streets, Wilmington, Del., will make improvements and alterations in its plant to cost about $20,000. C. D. Garretson is general manager.

The E. J. Codd Co., 600 South Caroline Street, Baltimore, will build a new one-story machine shop, about 60 x 74 ft., at Aliceanna and Spring streets.

Chicago

CHICAGO, Oct. 15.

An increased number of inquiries are coming from the East, many from dealers, and some business has resulted. This is taken to indicate the shortage of tools on the seaboard, and by some is believed to presage a heavier demand in this section. Sellers have no reason to complain, although in the past week buying by private companies has been somewhat lighter. Priority regulations continue to take machines here and there which originally were intended for delivery to non-war industries.

Planing machines are in such great demand that manufacturers have been looking around in the endeavor to locate shops which might undertake to build them on contract. Most of the machines wanted are large. One reason for the demand is that new field pieces for the army, made up to 6 in. in bore, are not round. Certain features of the recoil mechanism require that the gun be irregular in shape, with the result that the outside cannot be turned, but must be planed.

The building of large gun mounts, such as are used on submarine chasers, requires the use of large boring mills, and of these there is a scarcity also. A mount for a 4-in. gun requires a 72-in. mill.

Large lathes with long beds for turning large old-style ordnance are much sought. Heavy-duty milling machines are active, the others slow. Priority regulations are working smoothly, and dealers assert with considerable satisfaction that a way has been found for them to deal directly with the arsenals, instead of having transactions go through Washington. Instances are cited where one arsenal has placed orders by telegraph, the formalities coming later.

Trouble has been experienced in getting licenses to export to Russia, distrust being apparent as to the ultimate destination of certain tools wanted in that country. One result has been to cause the machines to be disposed of at home. Eighteen milling machines came on the market in that way.

The Simmons Machine Co., New York and Albany, N. Y., has inquired in this market for 100 18-in. x 8 ft. engine lathes. Lately there has been a superfluity of lathes with swing up to 20 in.

The equipment in the plant of the Drexel Motor Car Corporation, Chicago, including a large number of tools which have been in use less than a year, will be sold Oct. 24. The equipment of the Make A Motor Truck Co., Inc., Chicago, was sold at auction Oct. 12, the prices paid for some tools exceeding those paid when the machines were new. The business of the latter company consisted of converting Ford cars.

S. N. Crowen, architect, 30 North La Salle Street, Chicago, is taking bids on a one-story brick and stone factory, 163 x 234 ft., to be erected at Southport and Diversey avenues for the Nelson Mfg. Co., which will contain a machine shop and enameling and case-hardening departments.

Contracts have been let by S. N. Crowen, architect, for a one and two-story mill construction factory, 60 x 213 ft. at 5730-5736 West Twelfth Street, Chicago, for O. C. Huffman, president United States Can Co., Cincinnati. This will be the first unit of a large factory.

Bids have been taken by Leitelt Brothers, Inc., 7731 South Chicago Avenue, Chicago, for a one-story factory addition, 46 x 77 ft., to cost $6,000.

The Acme Steel Goods Co., 2716 Farrell Street, Chicago, will build a four-story factory, 100 x 105 ft., to cost $60,000.

The Goodman Mfg. Co., 4832 South Halsted Street, Chicago, will build a one-story addition, 36 x 124, at a cost of $10,000.

The Lasker Iron Works, 1849 West Thirty-third Street, Chicago, has secured a permit for a shop addition, 30 x 40 ft., which will cost $5,000.

The International Harvester Co. has purchased approximately 12 acres in the Notre Dame addition to South Chicago to provide for future needs.

The first unit of the Great Western Smelting & Refining Co., which recently purchased 25 acres at Whiting, will consist of a foundry, 100 x 100 ft., to cost about $60,000. The ultimate expenditure will be several hundred thousand dollars.

The American Machine & Tool Co., Chicago, has been incorporated with a capital stock of $25,000 by Carl D. Swanson, Joseph Richer and Ernest E. Eklund.

The Bradford Sales Co., Peoria, Ill., has been incorporated with a capital stock of $25,000 by J. S., C. F. and H. S. Bradford to manufacture automobile parts.

The Weaver Mfg. Co., 2171 South Ninth Street, Springfield, Ill., will erect a one-story addition to its factory which will contain 2000 sq. ft. and cost about $12,000. New machinery will be purchased. The company manufactures automobile repair machinery.

The Illinois Central Railroad will build a roundhouse to cost $60,000 at Matoon, Ill., and a similar building at Kankakee.

G. W. Cushman, Champaign, Ill., has received bids for an addition to his machine shop, 60 x 150 ft.

The forging and boring departments of the Hart-Parr Co., Charles City, Iowa, were destroyed by fire Oct. 10. The company has both British and United States war orders, largely ship work.

The Blackhawk Airplane Co., Davenport, Iowa, has been

incorporated in Delaware with capital of $100,000 by D. R. and J. R. Lane and C. V. Dart.

The S. & S. Steam Superheater Co., Chicago, has been incorporated in Delaware with capital of $100,000 to manufacture superheaters and boilers. John C. Smith and Philip Sulton, Chicago, are the incorporators.

Milwaukee

MILWAUKEE, Oct. 15.

Orders for machine tools continue to be placed in the local market at a rate which shows no slackening in demand. Requirements of milling machines are so broad that makers are working night and day and still are unable to catch up on deliveries. While the supply of both skilled and unskilled labor is inadequate, not much complaint is heard. Many men employed in shops devoting only part capacity to Government work are seeking positions in industries which are entirely occupied with such contracts, due to the desire for security under the conscription act and also to obtain increased wages.

Dealers in light tools report a steady demand from garages and small machine shops which are being erected or established in large numbers.

The G. W. Jones Lumber Co., Appleton, Wis., has plans for a new planing mill, with a 150-hp. Corliss steam generating plant, to be erected in connection with its sawmill at Wabeno, Wis., at an estimated cost of $40,000.

The Menasha Paper Co., Menasha, Wis., will build a two-story paper mill, 42 x 200 ft., at Ladysmith, Wis., at a cost of $75,000.

The Record Needle & Mfg. Co., Milwaukee, has been incorporated with a capital stock of $75,000 by interests affiliated with the Badger Talking Machine Co., 135 Second Street, to manufacture needles and other talking-machine accessories. Details will be announced later. George F. Ruez is president.

The Jenkins Machine Co., Sheboygan, Wis., manufacturer of saw and planing mill and general wood-working machinery and equipment, has purchased the plant and business of the Pribnow Swage & Tool Works, Mellen, Wis., and will consolidate the plant in Sheboygan. The Pribnow company's line of sawmill specialties will be continued on a much enlarged scale.

The Rhinelander Refrigerator Co., Rhinelander, Wis., manufacturer of ice-boxes and refrigerating plants, has increased its capital stock from $50,000 to $100,000 to accommodate the growth of its business.

The Jorgenson Mfg. Co., Waupaca, Wis., incorporated with a capital stock of $70,000, has taken a lease, with the option of purchase, of the factory and water power of the Waupaca Felting Mills, and is buying machinery and equipment for the manufacture of gas engine primers, carburetors and other automobile accessories. The officers are: President, J. P. Jorgenson; vice-president, Julius Jorgenson; secretary-treasurer, C. A. Jorgenson.

The Hamilton Mfg. Co., Two Rivers, Wis., which recently purchased the Chester, Pa., steel furniture plant of the Keystone Type Foundry Co., Philadelphia, announces that reports that it will consolidate the plant with the main works at Two Rivers are incorrect. It has a long-term lease of the Chester plant.

The Electrical Construction Co., Racine, Wis., has been incorporated with a capital stock of $18,000 by Charles F. Brietzke, William B. Pierce, and others.

The Crank Shaft Valve Movement Corporation, Green Bay, Wis., incorporated with $300,000 capital, has perfected its organization and elected the following officers: President, Jules Gerard; vice-president, Sylvester Duquaine; secretary, William Cook; treasurer, A. L. Cannard; general manager, W. V. Leppla, Escanaba, Mich. Plans for establishing a small plant and an experimental shop are now being completed. A gearless internal combustion engine will be manufactured.

The Ajax Frog & Switch Co., Blue Island, Ill., expects to start operations in its new plant at Superior, Wis., by Nov. 1. The main building is 120 x 200 ft., divided into a forge shop, 50 x 80 ft.; boiler room, 35 x 35 ft.; office, 25 x 40 ft.; machine-shop, 25 x 45 ft. It will manufacture intricate railroad specialties.

The Laursen Automatic Pump Co., Menomonie, Wis., at a special meeting of stockholders, authorized the directors to proceed with the production of an improved type of pump, recently perfected.

The Wisconsin Duplex Auto Co., Clintonville, Wis., incorporated several months ago with a capital stock of $500,000, expects soon to make a definite decision concerning the establishment of its proposed new plant. The company has been doing experimental work in connection with the Andrews Motor Mfg. Co., 834 Muskego Avenue, Milwaukee, for several months and may take over that plant. It will manufacture passenger and commercial cars with a duplex transmission system. William A. Besserdich is president and general manager.

The Terra Aluminum Co., Waukesha, Wis., will build a new one-story addition to its plant at Mishawaka, Ind., about 70 x 90 ft. The company is planning for the removal of its plant to the new location.

Detroit

DETROIT, Oct. 15.

The machine tool market in this section continues to improve and more sales were made the past week than for several months. The American Car & Foundry Co. placed an order for 40 Wickes lathes and considerable other machinery, believed to be for a large war order recently received. Numerous other orders and inquiries have made the market unusually strong.

Deliveries remain about the same, although lathes are easier to obtain. Milling machines and certain kinds of drilling machines are very difficult to secure.

Labor is well employed at high wages and no trouble is anticipated.

It is reported that the Ross Automobile Co., Detroit, contemplates removing to an Eastern city. H. D. Mackaye is general manager.

N. D. Rutherford, Findlay, Ohio, manufacturer of the Dairy Maid milking machine, will locate his factory in Saginaw, Mich.

The Allegheny Forging Co., a Pennsylvania company which recently bought the Emergency Drop Forge plant, Lansing, Mich., will expend nearly $50,000 in overhauling and re-equipping the building. Work is now being pushed. John Bell, formerly with the Seager Co., is temporarily in charge of the plant.

The Lewis Mfg. Co., Bay City, Mich., has started the erection of an addition to its plant on Twenty-third Street.

The Barnes Foundry & Mfg. Co., Detroit, announces that the first unit of its new plant will shortly be constructed. It recently purchased 31 acres, of which the first unit will occupy about one-third of the property and will represent an investment of $350,000. Gray iron castings for cylinders, pistons and airplane motor cylinders will be manufactured. Claire L. Barnes is president; George W. Smith, vice-president, and Charles E. Pelton, secretary and treasurer.

The Haskall Mfg. Co., Ludington, Mich., has decided to make an additional investment of $1,000,000 in new buildings and machinery for construction of veneer parts for airplanes. Government contracts have been secured and the company plans to employ 3000 men as soon as facilities are available.

The Karo Karburetor Co., Alma, Mich., will triple the size of its plant to take care of a contract received by the Western Carburetor Co. for its entire output up to 200 carburetors per day.

Negotiations are under way for the location in St. Clair, Mich., of the Harrow Tractor Co. A building 60 x 100 ft. will be erected. At present only assembling will be done.

Permits have been granted to the Chevrolet Motor Co., Flint, Mich., for a factory to cost $100,000 and additions to cost $30,000.

The McCord Mfg. Co., East Grand Boulevard, Detroit, manufacturer of railroad specialties, is building a new one-story machine shop, about 40 x 80 ft.

Cleveland

CLEVELAND, Oct. 15.

The demand for machinery continues heavy, largely for munition, airplane and motor truck work. The inquiry noted in this section last week for 145 machines is from the Recording & Computing Co., Dayton, which is now placing orders, having purchased 37 screw machines and other equipment. A leading Detroit automobile manufacturer placed an order in Cleveland the past week for 50 screw machines. The Cleveland Tractor Co., which is enlarging its plant, placed orders for 15 turret lathes. A British order for 25 screw machines was given to a Cleveland maker. Orders for additional equipment were placed in this market by the Dayton Wright Airplane Co., Dayton. No large new inquiries came out the past week, but machinery houses report a good demand for small lots of tools. Efforts are being made in Washington to make up a schedule of all the machinery requirements of the War and Navy departments for the next 12 months, to systematize the purchase of equip-

ment and to assure the placing of priority orders for which the earliest delivery is required.

G. F. Mitchell & Son, Cleveland, makers of sheet metal products, have acquired a six-acre site on the Nickel Plate Railroad and London Road, on which they contemplate the erection of a new plant, having outgrown their present quarters on Cedar Avenue. Six 50-ft. one-story units each 300 ft. in length, with saw tooth roof will be built.

The Ohio Blower Co., Cleveland, has commenced the erection of its new branch plant at Orville, Ohio, which includes a foundry, 100 x 100 ft., and a machine shop, 60 x 200 ft., to be used for the manufacture of its steel specialties.

The Economy Machine Co. is the name of a new Cleveland company that is building a plant on East Fifty-fifth Street near the Taylor-Boggis Foundry Co. to do jobbing machine work. David Kraus is manager.

The Lake Erie Dry Dock & Engineering Co., Sandusky, Ohio, has been formed with a capital stock of $1,600,000 to take over the plant of the Lake Erie Dry Dock & Mill Co. and probably other plants of that city. Charles Bright and others are interested in the new company, which, it is stated, will engage in shipbuilding work.

The Universal Machine Co., Bowling Green, Ohio, is erecting two buildings, each 55 x 85 ft., which when completed will add 40 per cent to the present floor space.

The Niles Forge & Mfg. Co., Niles, Ohio, has increased its capital stock from $30,000 to $80,000. It is stated that manufacturing facilities will be increased.

The Aristos Co., Warren, Ohio, has been incorporated with a capital stock of $50,000 by Fred T. Petrel, Paul A. Homer, and others, to manufacture vapor plugs for automobiles.

Specifications will be issued shortly for machine shop, foundry, forging, sheet metal, wood-working and electrical equipment for the manual training department of the Lakewood, Ohio, schools, amounting to $100,000. R. L. Short, director of high schools, Lakewood, can be addressed. Delivery is wanted by August, 1918.

The Fairmont Tool & Forge Co., Cleveland, recently incorporated with a capital stock of $100,000, will establish a plant at 105th Street and Quincy Avenue to manufacture airplane parts and tools. J. Wentworth Smith is president; Charles W. Yarham, general manager, and B. G. Gilmore, sales manager.

The American Tool & Mfg. Co., Urbana, Ohio, is about to move into its new plant, 60 x 120 ft., with office building adjoining. P. J. Schneider is manager and H. P. Creighton superintendent and treasurer.

The Williams Foundry & Machine Co., Akron, Ohio, recently reorganized, has increased its capital to $2,500,000.

The Semi-Steel Foundry Co., Barberton, Ohio, has commenced the construction of a new brick and steel foundry and machine shop to cost about $100,000

Cincinnati

CINCINNATI, Oct. 15.

Machine tool dealers are receiving a number of inquiries from small manufacturing companies, which is considered an encouraging sign for future domestic business. For some time there has been a very scant inquiry for machine tools from this source. Machine tool builders are figuring on a large number of machines needed by munition makers, shipbuilders, and the Government. The general rule now is to issue a list of specifications for machines that the manufacturer can furnish and not send a complete list covering everything required.

There is no let-up in inquiries for export and purchases are quietly made that rarely come to light. Orders have lately been received for machine tools for Japan, while Spanish and Italian purchases depend upon the ability of manufacturers to make deliveries. On account of the present conditions in the machine tool trade, it is expected that the coming convention of the National Machine Tool Builders' Association, to be held in New York this month, will be attended by a large number of machine tool builders from the Central West.

The Peters-Bossert Co., Cincinnati, has been incorporated with $75,000 capital stock by J. W. Heintzmann, J. Sagmeister, William E. Hess, M. W. Ostemdorf and A. Mannion. It operates a jobbing machine shop at Front and Culvert Streets, the capacity of which will be increased to manufacture special machine tool parts.

The National Oxygen Co., Cincinnati, has removed its plant from 3240 Spring Grove Avenue to 4600 Spring Grove Avenue, Winton Place. A. J. Chinn is president.

The Cincinnati Grinder Co., Cincinnati, advises that it expects to occupy its new plant on Colerain Avenue before Nov. 15.

The Wadsworth Watch Case Co., Dayton, Ky., has been incorporated with $150,000 capital stock by H. A. Wadsworth, and others. It is reported that the company intends enlarging its plant at an early date.

The Independent Pipe Co., Springfield, Ohio, is equipping a plant for the manufacture of sewer pipe to be constructed of reinforced concrete.

The Oliver Superior Glass Co., Westerville, Ohio, has been incorporated with $100,000 capital stock to erect a plant for the manufacture of automobile lenses and other specialties T. C. Tussey is secretary.

The Automatic Circuit Breaker Co., 153 North High Street, Columbus, Ohio, is remodeling a two-story building at Sixth Street and Wesley Avenue in which will be installed equipment to manufacture an electrical specialty.

The National Electric & Construction Co., Mansfield, Ohio, has been incorporated with $10,000 capital stock by Frank Mattox, and others.

The Automatic Electric Devices Co. and the Simplex Controller Co., Cincinnati, have been incorporated with $10,000 and $5,000 capital stock by Clarence E. Ogden, and others, to manufacture electric specialties. The companies will fit up a joint plant and later will need two 14 or 16-in. lathes, a drill press and other machines. The executive offices are at 515 Mercantile Library Building.

Indianapolis

INDIANAPOLIS, Oct. 15.

The H. Clauss Cutlery Co., Tipton, Ind., has been incorporated with $100,000 capital stock to manufacture machinery, tools and equipment. The directors are B. H. Adler, Lee F. Griffith, Henrie Clauss, G. D. Krebs and H. R. Adler

The American Appliance Co., Indianapolis, has increased its capital stock from $40,000 to $150,000.

The Arc-Flame Mfg. Co., recently organized at Jeffersonville, Ind., will manufacture the Dorsey hydro-carbon fuel-burning apparatus, a burner for coal oil.

The Standard Electric Co., Indianapolis, recently organized with $500,000 capital stock, will build a plant at Noblesville, Ind. The directors are E. C. Applegate, administrative head of the Founders Syndicate, who is president and treasurer; D. H. Duncan, formerly connected with the National Motor Co., vice-president and factory manager, and Henry Bartlett, expert electrician with the Merchants Heat & Light Co.

The T. C. Ross Mfg. Co., Indianapolis, has been incorporated with $25,000 capital stock to manufacture car fenders and machinery. The directors are T. C. and C. L. Ross and James Wilson.

The Central Plating & Mfg. Co., Indianapolis, has increased its capital stock from $10,000 to $30,000.

The A. T. S. D. Mfg. Co., Michigan City, Ind., has been incorporated with $10,000 capital stock to manufacture machinery. The directors are Claude N. Allen, J. C. Lyons and George E. Malone.

The Crowley Building Block & Mold Co., Kokomo, Ind., has been incorporated with $15,000 to manufacture building blocks. The directors are James F. and Claude S. Crowley and James H. Warwick.

The Kant Freeze Radiator Cover Co., Anderson, Ind., has been incorporated with $20,000 capital stock to manufacture automobile radiator equipment. The directors are Allen C. Shimmer, William J. Norton and Charles T. Norton.

The Corbin Folding Chair Attachment Co., South Bend, Ind., has been incorporated with $25,000 capital stock to manufacture furniture. The directors are J. A. Hull, Frank J. Cosgrove and F. A. Hull.

The Central South

LOUISVILLE, Oct. 15

Some slackening in demand is reported by manufacturers and distributers of machinery, attributed to a disposition to await developments. Wood-working equipment is showing considerable activity. Coal and coke are difficult to obtain and efforts to accumulate reserve supplies have not been very successful. Labor continues scarce and in some cases demands for advances have been made.

The Henry Vogt Machine Co., Louisville, is building a new boiler house and will replace existing boilers with two of 500 hp.

The Embry Box Co., Louisville, which recently purchased a factory for $50,000, will be in the market for wood-working and box-making machines. The new plant will be equipped for individual motor drive.

The Wakefield Harrow Co., Lewisburg, Tenn., has been

incorporated with capital stock of $10,000 by J. W. Wakefield, C. C. Houston, P. B. Houston, Jr., J. P. Fitzpatrick and E. E. Murray, to manufacture farm implements.

St. Louis

ST. LOUIS, Oct. 15.

The Hope Cotton Compress Co., Hope, Ark., organized with capital of $100,000, has purchased the plant of the St. Louis Compress Co., and will add considerable equipment. J. P. Brundidge is president.

Wapanucka, Okla., will add about $6,000 worth of equipment to its electric station.

The Pelican Well Tool & Supply Co., Shreveport, La., will install forge shop and steam hammer equipment.

The Duplex Oil & Refining Co., Cushing, Okla., Herman F. Grim, and others interested, will equip a plant requiring an investment of about $500,000.

The Burlington Oil & Refining Co., Oklahoma City, Okla., has been incorporated with a capital stock of $1,000,000 by H. W. Ferguson of Oklahoma City, Okla.; W. D. King and R. R. Sims of Frederick, Okla., and will establish a plant.

The Humphreys Pipe Line Co., Tulsa, Okla., has been incorporated with a capital of $500,000 by John B. Means, and others, and will install oil pumping stations, etc.

The department of public property, Thomas L. Willis, engineer, New Orleans, La., will equip a garbage reduction and grease recovery plant to cost $1,250,000 to $2,000,000.

The Fortier Electric Mfg. Co., Tulsa, Okla., U. D. Fortier, manager, and W. N. Sill, president, is in the market for equipment for the establishment of a plant to manufacture time switches, electric washing machines and other devices.

The International Shipbuilding Co., Pascagoula, Miss., has purchased land for additions and is in the market for equipment.

Joplin, Mo., has voted $100,000 for waterworks plant equipment. J. J. McAfee is city engineer.

The plants of the William Carter Lumber Co. and the Baldwin Mill Works, Laurel, Miss., have been burned with a loss of about $125,000. They will be rebuilt.

The Vicksburg, Shreveport & Pacific Railroad, Vicksburg, Miss., is planning for the erection of new shop buildings at Monroe, La., to include a one-story machine shop, 100 x 120 ft., and seven-stall roundhouse. An overhead electric crane, locomotive hoist and other equipment will be installed.

The Coal Oil Manifold Co., St. Louis, has been incorporated with a capital of $10,000 to manufacture kerosene engines, manifolds, etc. R. W. Morrison, W. S. McCall and Edward H. Gorse, St. Louis, are the incorporatros.

The Coast Ship Co., Biloxi, Miss., recently incorporated with a capital of $100 000, has acquired a site on Back Bay for its proposed shipbuilding plant, which will be devoted to the construction of vessels of 2000 tons capacity and give employment to about 500. D. J. Gay is president.

Texas

AUSTIN, Oct. 13.

Dealers report an improvement in the demand for machinery and machine tools. An unusual number of manufacturing plants being built and are in prospect which will require the installation of heavy machinery. Mexico is expected to be an active purchaser this fall.

The Davis Mfg. Co., Deming, N. M., has been incorporated and will build a plant to manufacture a machine for cutting wild vegetation.

The Humble Oil Co., Houston, has purchased the refinery of the Dixie Oil Co., San Antonio, for $550,000 and will install additional machinery and enlarge the plant.

Snowflake & Taylor, Snowflake, Ariz., are having plans prepared for a hydroelectric plant to cost about $50,000.

Smith & Townes, architects, Amarillo, are preparing plans and specifications for the proposed manufacturing plant to be built at Texico at a cost of about $10,000,000. It is stated that construction will be started as soon as the plans are finished.

The Houston & Brazos Valley Railroad will install new machinery, including a large crude oil engine, in its shops at Velasco.

The Gulf, Colorado & Santa Fe Railroad has appropriated $26,969 for the purchase of shop machinery and other improvements at Galveston.

The Wier Lumber Co., Wiergate, will install considerable machinery in the new lumber mill which it is constructing.

The Atchison, Topeka & Santa Fe Railroad plans to install additional machinery and enlarge its shops at Clovis, N. M., which, with other contemplated improvements, will cost about $100,000.

C. A. Robertson, Texico, is promoting the organization of a company with a capital stock of $10,000,000 to erect a plant at that place for the manufacture of automobiles and farm tractors.

Waco will construct a sewage disposal plant at a cost of about $182,000. P. Trevino, San Antonio, is engineer.

The Houston Compress Co., Houston, has been incorporated with a capital stock of $300,000. M. D. Anderson is a stockholder.

California

LOS ANGELES, Oct. 9.

The Santa Fe Railroad, Los Angeles, is said to be planning for the erection of additions to its shops at Clovis, N. M., at an estimated cost of about $50,000.

In addition to power plants, the Southern California Edison Co., 120 East Fourth Street, Los Angeles, will build two new electric generating stations at Huntington Lake. The proposed power plants are estimated to cost about $2,000,000, including development work in connection with the projects.

In connection with its new shipbuilding works at San Diego, the United States Steel Shipbuilding Co., Los Angeles, will establish a department to build airplanes. Benjamin F. Graham heads the company.

The DeLion Tire & Rubber Co., Los Angeles, has been incorporated with a capital of $50,000 by J. W. Luther, A. L. Bartlett and J. E. Geyer.

The Sierra & San Francisco Power Co., Oakdale, is planning for the construction of an addition to its electric power plant at Stanislaus to double the present capacity and estimated to cost about $1,000,000. H. F. Jackson is general manager.

The C. H. Sharp Mfg. Co., Los Angeles, manufacturer of heating furnaces and systems, has removed its office from 1312 East Twelfth Street to 210 West Eleventh Street.

The Pacific Northwest

PORTLAND, ORE., Oct. 9.

Demand from lumber mills and small machine and automobile repair shops shows some increase, but the shipbuilding industry is held up to some extent by the labor situation. The lack of definite information from the East as to the effect on machinery of Government prices of steel products and the unwillingness of machinery houses in this section to make lower prices without this information is believed to have held up considerable new business.

Portland is in the market for four pumps, two with a daily capacity of 1,000,000 gal., and two with a daily capacity of 500,000 gal., together with motors and other electrical equipment.

The Standard Machine Works, Stanwood, Wash., has been sold to Gilbertson & Bergerson by M. H. and F. Olney.

The Oregon Shipbuilding Co., Portland, has dissolved and consolidated with the Motorship Construction Co.

The National Steel Construction Co., Seattle, will add to its wooden shipbuilding plant equipment to manufacture steel vessels at a cost of about $75,000. The enlargements will include a two-story boiler house, 60 x 250 ft.; storage shed, 60 x 200 ft., and a blacksmith shop.

The Whalen Pulp & Paper Co., Vancouver, B. C., will equip shipbuilding yards at Quatsino, on Vancouver Island, for building wooden ships for its own use.

The Sound Paper Co., Seattle, is considering sites at Everett and on Lake Washington, on which it will build a paper mill with daily capacity of 400 tons to cost $6,000,000. A hydroelectric plant will be constructed at a cost of $3,000,000.

A. A. Haskin, Hoquiam, Wash., and associates have formed the U. S. Aerospeed Co. and plan the establishment of a plant to manufacture airplanes.

The Olympic Steel Works, Seattle, has recently completed the installation of machinery at its plant on the Canal Waterway, which will have a daily capacity of 4000 lb. of steel castings.

The Huffschmidt-Dugan Iron Works, Bend, Ore., plans the construction of an addition to its foundry to cost $5,000. New equipment will be purhased.

The Doran Brothers Machine Co., Seattle, contemplates increasing the capacity of its plant more than 30 per cent. at a cost of $15,000. Its facilities were recently doubled by the construction of a new foundry.

The Seattle Can Co., Seattle, has leased a block at Ninth

Avenue South and Nevada Street on which it will make additions to its plant.

Canada

TORONTO, Oct. 15.

The shipbuilding plant on the Niagara River, near Bridgeburg, Ont., which has been closed for several years, will soon be put in operation by the Canadian Allis-Chalmers Co., King and Simcoe streets, Toronto, the holding company of the Canada Foundry Co., Toronto, which has owned the plant for the past 10 years. Steel ships of the size to pass through the Welland Canal will be constructed. A force of men will be put to work at once in order to get the yards ready for ship construction at an early date. The plant was constructed in 1903 by the now defunct Canadian Shipbuilding Co. and comprises about 200 acres. Some additional shipbuilding machinery will be purchased.

The Arnprior Cabinet Co., Ltd., Arnprior, Ont., has been incorporated with a capital stock of $100,000 by Daniel O'Connell, Robert J. Simpson, Bertrand T. McAvoy, Agnes Beverly, 17 Westminster Avenue, and others, to manufacture office furniture, cabinets, fittings, etc.

The International Rubber Goods, Ltd., Toronto, has been incorporated with a capital stock of $40,000 by James F. Lee, 15 Kendal Avenue; Donald F. Johnston, Albert E. Ashman, and others, to manufacture automobiles, machinery, engines, tractors, rubber goods, etc.

The York Electric Co., Ltd., Toronto, has been incorporated with a capital stock of $40,000 by Dyce W. Saunders, 71 Bay Street; Stanley S. Mills, Paul Home, and others, to carry on the business of electrical engineers and to manufacture electrical and mechanical machinery and equipment, etc.

The R. Bell Engine & Thresher Co., Seaforth, Ont., is in the market for a 30 to 50-hp. electric motor, 25-cycle, three-phase, 220 volts, 750 r.p.m.

The Crescent Concrete Co., Toronto, has been awarded contract for an addition to the machine shop of the Willys-Overland Co., Weston Road, Toronto, to cost $8,000.

The City Council, Hamilton, will purchase additional steam pumping equipment at a cost of $159,000. Charles G. Booker is chairman.

St. Thomas, Ont., will build a sewage disposal plant to cost $7,500. Construction will be commenced at an early date.

The St. Lawrence Welding Co., Montreal, has opened its new brass foundry at 39 Olier Street. The plant is equipped with the latest requirements and the production of castings has been started. Robert Stark will have charge of the brass foundry under the direction of A. M. Barry.

The Schaake Machinery Co., Vancouver, B. C., will start work at once on the erection of a frame machine shop to cost $8,000. Gardiner & Mercer, Birke Building, Vancouver, are the architects.

The Winnipeg Ceiling & Roofing Co., Winnipeg, will build a mill and brick construction factory to cost $10,000.

NEW TRADE PUBLICATIONS

Electric Hoists.—Link-Belt Co., Thirty-ninth Street and Stewart Avenue, Chicago. Book No. 246. Points out the advantages of the company's electric hoists which include simple construction, ready accessibility of parts and reliability and safety of operation. A list showing the great variety of work for which the hoists are being used is presented. The construction of the alternating and direct current types of hoist is gone into at some length, the text being supplemented by a number of illustrations. The various types of each that can be supplied are next shown and described and several dimension tables and diagrams are employed to supplement the descriptive matter. A number of illustrations of the various types of hoists in use are included.

Universal Grinding Machine.—Simmons Machine Co., Inc., Albany, N. Y. Circular. Shows a universal tool and cutter grinding machine of heavy construction for use in the modern tool room. A brief description of the construction of the machine and a condensed table of specifications supplement the illustration.

Titanium Aluminum Bronze.—Titanium Bronze Co., Inc., Niagara Falls, N. Y. Two booklets. The first relates to a bronze containing both titanium and aluminum which is claimed to possess the strength and toughness of manganese bronze and the wearing qualities of phosphor bronze, combined with acid resisting properties. A list of the parts for which it can be used is presented as well as a number of photomicrographs of the different kinds of bronzes. The composition of the two grades that can be supplied is given and test results are included. The other pamphlet relates to the facilities possessed by the company for the production of die castings from this metal. Approximate composition and physical properties of the alloy are given, and the text is supplemented by a number of illustrations of parts produced in this way.

Oil Burners.—Hauck Mfg. Co., 140 Livingston Street, Brooklyn, N. Y. Bulletin No. 19A. Relates to the use of the oil burner as a source of heat supply in connection with machine and repair shop operations. Brief descriptions of the various types of burner that can be supplied are presented and a number of illustrations of the burners in use with brief descriptions of the work they were called upon to do are included.

Grinding Wheels.—American Emery Wheel Works. Providence, R. I. Reference card. Gives considerable useful information as to the speeds that are recommended for grinding wheels and the various grades and grains for handling different classes of work. The card consists of a celluloid holder and a slide upon which the various information is contained and may be read through slits in the casing.

Molding Machines.—Berkshire Mfg. Co., Cleveland. Collection of loose leaf circulars. Describe molding machines of the automatic and air-operated squeezer types. In addition to the description of the construction of the machines, the work for which they are adapted is mentioned, and instructions for their operation given. A number of illustrations of the different machines supplement the text description.

Iron and Wire Work.—J. E. Bolles Iron & Wire Works, 288 Milwaukee Avenue East, Detroit. Circular. Presents a brief description of the plant which has just been completed and the facilities possessed for turning out plain and ornamental iron, wire, brass and bronze work. The text is supplemented by a number of illustrations of various parts of the shop and specimens of the work produced in it.

Portable Elevator.—New York Revolving Portable Elevator Co., 344 Garfield Avenue, Jersey City, N. J. Bulletin No. 43. Covers some of the uses to which the Revolvator can be put aside from the primary purpose of piling goods in storerooms and warehouses. These include the installation of overhead electric motors, an application which was illustrated in THE IRON AGE, April 26, 1917; for overhead drilling; for loading goods on trucks and freight cars, as well as piling inside of the latter, and for all forms of heavy lifting. The text matter is necessarily brief, the pictures being relied upon almost entirely to tell the story.

Power Presses.—Toledo Machine & Tool Co., Toledo, Ohio. Catalog No. 11 and pocket reference book. The first shows an extensive line of presses and other machinery, dies, and special tools. It is divided into 17 sections, each dealing with some particular class of machine. In general a brief description of the construction of the line of machines covered by each section is presented on the first page or two followed by illustrations and short descriptions of the different machines. A sectional index which will facilitate the finding of any particular machine is included, as well as a comprehensive telegraph code and tables of useful information. The reference book is intended to slip in the vest pocket and gives in much briefer form the information contained in the large catalog.

Safety Devices for Power Presses.—Zeh & Hahnemann Co., Newark, N. J. Circular. Mentions a series of safety devices which are designed to cover almost any condition encountered in the operation of power presses. Illustrations of the different attachments which include gate and sensitive finger guards, a safety operating device and a treadle operated gate guard and clutch lock, are presented and brief descriptions of the devices and the work for which they are adapted are included.

Rock and Ore Crusher.—C. G. Buchanan Co., Inc., 90 West Street, New York. Bulletin No. 10. Illustrates and describes an all steel rock and ore crusher of the jaw type. The crusher is built in five standard sizes and is intended for quarry work in connection with large power shovels for preliminary crushing. The descriptive matter is illustrated by a number of views of the crusher, showing the details of construction and the various arrangements of drive that can be supplied.

Air Compressors.—Nagle Corliss Engine Works, Erie, Pa. Bulletin No. 29. Points out the advantages of using the company's short belt-driven air compressor. Among the points upon which emphasis is laid are a low initial cost, freedom from vibration and a small amount of floor space. Several views of the compressors are presented, together with dimension tables and diagrams.

Pressed Steel Bench Legs.—New Britain Machine Co.,

New Britain, Conn. Bulletin No. 1200-A. Contains illustrations and a brief description of a line of all steel bench legs for use in shops of all kinds. The various methods of planking the different types of legs are shown and the advantages of the steel leg construction as compared with an all wood bench or one employing cast legs are pointed out.

Gear Shaping Machine.—Fellows Gear Shaper Co., Springfield, Vt. Circular. Treats of the proper method of mounting and setting the cutter in the company's gear shaping machine. The circular is intended to be given to the operator and was prepared to furnish explicit and accurate instructions as to the correct method of operating the machine.

Rock and Diamond Core Drills.—Sullivan Machinery Company, 122 South Michigan Avenue, Chicago. Catalog No. 69 and Bulletins Nos. 70-D and 70-E. The catalog describes a line of diamond core drills for prospecting mines and mineral lands and for making test borings. The construction of the various drills is gone into in some detail, the text being supplemented by illustrations of the drills in use and their various parts. The process of drilling by this method is described and instructions for setting the diamond bits are included. The first bulletin pertains to a rock drill in which the piston and its rod and the steel bit reciprocate as one. The general features of this line of drills are briefly touched upon followed by descriptions somewhat in detail of the different styles that can be supplied and their accessories. Condensed specification tables and a number of views of the drills in use are included. The second bulletin relates to heavy rock drills for submarine work. Descriptions supplemented by numerous engravings of the different drills are presented and a number of views showing them in use are included.

Threading Tool.—Rivett Lathe & Grinder Co., Boston. Pamphlet. Refers to a threading tool for use in lathes to cut any of the standard screw threads. A brief description of the tool is given and the advantages of the improved model that is now being manufactured are emphasized. These include a positive position of the cutter while working, an increased range of adjustment and ease of making changes. A number of engravings of the tool and the different cutters that can be supplied are presented.

Adjustable Speed Motor.—Reliance Electric & Engineering Co., Cleveland. Bulletin No. 1014. Illustrates and describes a line of adjustable speed motors of the armature shifting design for use on direct current circuits. After a brief description of the principle of operation the forms of speed control are shown, together with the starting and reversing equipment employed. A number of illustrations of the motors in use for various kinds of service and a partial list of users are presented.

Swivel Pipe Joints.—Universal Valve Co., Burlington, Wis. Catalog. Relates to the Kno-Pak swivel joint for use in pipe lines conveying steam, air, gas or ammonia. The various types of joints, all of which are seated and held tightly against a ring of babbitt metal by the tension of a cast-iron spring, are illustrated and briefly described. A number of views of the joints in use are presented and a number of suggestions for their installation are included.

Pressed Steel Parts.—Geuder, Paeschke & Frey Co., Milwaukee, Wis. Calendar measuring 9 x 9¾ in. Is designed as a desk convenience for those who desire to refer ahead frequently. The calendar contains the dates for 1918 and 1919 and is printed on heavy cardboard so that it can be hung up or placed in a desk drawer without likelihood of becoming damaged. Under each month the number of working days are shown and in the spaces for each day are given the number of days which have elapsed since the first of the year.

Plunger Pumps.—Worthington Pump & Machinery Corporation, 115 Broadway, New York. Bulletin W-400-25. Pertains to a line of outside packed plunger pattern pumps for general service. A sectional view of the water end of one of the pumps is presented, supplemented by a brief general description of the construction. The various pumps comprising the line are illustrated and described, a pair of facing pages being given to each style. The illustrations of the pumps are given on one page with a brief description and table of sizes and capacities on the facing one.

Rotary Shearing Machines. Quickwork Co., St. Marys, Ohio. Circular. Calls attention to a rotary shearing machine for the production of various sizes and shapes from plate and sheet metal. Among the advantages claimed for the machine are an increased output and savings in labor, material and floor space. A brief description of the construction and operation of the machine is given, the text being supplemented by a condensed table of specifications and illustrations of parts that have been produced.

Conveying Machinery.—Link-Belt Co., Thirty-ninth Street and Stewart Avenue, Chicago. Two bulletins. The first, No. 340, is devoted to an installation of conveying machinery for sand and gravel which was made at the Raritan Ridge Clay Co., Metuchen, N. J. A brief description of the equipment, supplemented by engravings of portions of it, is given. The other bulletin, No. 343, illustrates the construction and operation of the Watson bridge tramways and tower systems. Among the advantages claimed for this type of equipment are larger capacity with the same size of bucket, lower first cost and the elimination of the whipping around of the ropes. In both bulletins mention is made of the complete line of equipment which the company is prepared to supply for elevating and conveying material of all kinds, transmitting power, etc.

Electrical Supplies. Western Electric Co., 195 Broadway, New York. 1918 Year Book. Size, 6½ x 9½ in.; pages 1160. Lists some 50,000 different electrical supplies of all kinds. The various lines are illustrated and where necessary brief text descriptions are employed to supplement the illustrations. In practically every case tables of sizes are included.

Automatic Sealing Machine.—Johnson Automatic Sealer Co., Battle Creek, Mich. Pamphlet. Calls attention to an automatic sealing machine for handling from 20,000 to 35,000 packages per day. Mention is also made of a line of package conveying machinery and automatic scales which are also built.

Colored Lacquers.—Moller & Schumann Co., Marcy and Flushing avenues, Brooklyn, N. Y. Bulletin No. 2. Refers to a line of colored lacquers or transparent color varnishes for use on manufactures of tin, polished nickel, aluminum, zinc, etc. The lacquers can be used for either air drying or baking and can be applied by brushing, dipping, spraying or by a coating machine. Reproductions of the six standard shades are given and mention is made of the various other enamel and japan products of the company.

Carbonfree Metals.—Goldschmidt Thermit Co., 120 Broadway, New York. Pamphlet No. 20. Presents illustrations, brief descriptions and instructions for the use of a line of carbonfree metals. The various other metals and alloys that can be supplied by the company are also mentioned.

Oil Cups.—Gits Bros. Mfg. Co., 553 West Monroe Street, Chicago. Pamphlet. Describes and illustrates a line of self-closing spring lid oil cups that are made in several different styles. The cups are intended for all classes of lubricating work and in the pamphlet a separate page is devoted to each type. An illustration and brief description of the cup is given with a table of the different sizes that can be supplied underneath.

Pattern Makers' Machinery.—Oliver Machinery Co., Grand Rapids, Mich. Two bulletins. The first illustrates a universal saw bench and the various attachments that can be supplied for use with it. The description is brief but comprehensive and consists of a series of short paragraphs with sidehead titles in contrasting type. The other bulletin pertains to a wood turning face lathe having a swing of 88 in. over the floor. A condensed table of specifications supplements the descriptive matter and a number of illustrations of other pattern makers' lathes that can be supplied are included.

Scoop Conveyor.—Portable Machinery Co., Inc., 25 Park Place, Passaic, N. J. Circular. Illustrates a scoop conveyor for loading and unloading, storing and reclaiming coal, coke, ore, stone, sand, manufactured products and sacks and packages. A concise description of the conveyor, which is of the portable belt type, is presented, together with views and diagrams of installations.

Electroplating and Polishing Supplies.—Hanson & Van Winkle Co., 269 Oliver Street, Newark, N. J. Catalog No. 21. Size 6 x 9 in.; pages, 276. This is the company's latest catalog illustrating and describing a line of electroplating and polishing supplies which includes chemicals, polishing lathes, grinding machinery, dynamos and lacquers. The catalog is arranged so that the dynamos and their accessories are first presented followed by the apparatus employed in connection with the plating operation. After this come the chemicals, cleaning compounds, polishing and buffing lathes and wheels, etc. Tables giving the various sizes of the different pieces of equipment are included.

Cork Insulating Brick.—Armstrong Cork & Insulation Co., Pittsburgh. Folder. Mentions the use which may be made of the Nonpareil insulating brick in boiler settings. A brief description of the bricks, which are composed of a mixture of diatomaceous earth and finely ground cork, is given, and the results of a number of tests that have been made on the bricks as a heat insulating material in boiler settings are included.

Punching and Shearing Machines.—Cleveland Punch & Shear Works Co., Cleveland. Calendar. Is of the same general type as those previously issued by the company, the dates for the working days of each week, commencing Oct. 1, 1917, and extending to March 30, 1918, being given on a separate leaf. Illustrations of various types of punching and shearing machines and the dies, punches and other tools used in connection with them are presented on the front of the leaf with a specification sheet and order blank on the back.

THE IRON AGE

New York, October 25, 1917

ESTABLISHED 1855 VOL. 100 : No. 17

To Prepare Soldier Cripples for Industry

Outline of Government Plans to Reinstate the Maimed of War on a Self-Sustaining Basis

PROGRESS in the matter of caring for crippled soldiers, to prepare them for taking a definite place in the work of the world after the war, is being made under the auspices of the United States Army. Early this year scientists and sociologists who had seen much of the results of the war contended that the subject could not be given consideration too soon. Yet it seemed that nothing was being done, so all-absorbing have been the large immediate questions of other phases of war planning. The economic and industrial, as well as the human, problems of rebuilding cripples are admittedly important. With any long participation by our representatives on the fighting fronts these problems will be big, for with the great strides made by modern surgery in saving lives proportionately large are the numbers of those with missing limbs and blinded eyes.

The fear has been that the unfortunates would perhaps be left to make hit-and-miss selections of an occupation. It was thought that they would be taken in hand by self-directed, if albeit kindly disposed, volunteer instructors and turned into producers of articles of low commercial value. Handiwork for which only an artificial demand could be created, and this from charitable impulses, would not long be regarded as any able-bodied man's work; the cripple desires to be put on a fully self-supporting plane. The net result, otherwise, is a lowering of morale and a tendency toward wilful dependency. Though fortunately there are, as yet, no war subjects for surgical and sociological study, it has been urged that the salvaging of our war cripples demands a careful canvassing of all that should be done, which will take long to establish, and the securing of instructors to be educated before they are ready to direct their pupils.

Announcement of Governmental consideration of the problem was made some weeks ago by Major Gen. W. C. Gorgas, surgeon general, U. S. A. The idea that responsibility of the Government ended with the return of the soldier to private life, with his wounds healed, and such pension as he might be given, no longer holds, he said, but instead "It is the duty of the Government to equip and reeducate the wounded man, after healing his wounds, and to return him to civil life ready to be as useful to himself and his country as possible."



A Mechanical Arm and Hand Is One of the Devices Developed by Dr. Jules Amar, a French Investigator

He told how the idea was to be carried out. Reconstruction hospitals are to be located in large centers of population, such as Boston, New York, Philadelphia, Baltimore, Washington, Buffalo, Cincinnati, Chicago, St. Paul, Seattle, San Francisco, Los Angeles, Denver, Kansas City, St. Louis, Memphis, Richmond, Atlanta and New Orleans.

These hospitals are not to be the last step in the return of the wounded soldiers to civil life. When the soldiers are able to take up industrial training further provision will be ready.

"Additional education will be given to those fitted for it, and men may in some cases be returned to more valuable work than that from

which they were called to war. Workshops will be provided at the hospitals, but arrangements will also be made with outside industries whereby more elaborate methods of training may be carried on. An employment bureau will be established to place men so trained in different parts of the United States."

The subject was also given special attention at a meeting this week in Chicago of the Clinical Congress of Surgeons. It was brought out that every effort will be made to do the best "repair" work possible on men whose early return to the trenches is out of the question. Expert opticians and optometrists will do all that they can for men partly blind, for instance. Expert psychologists will devote their time to studying the state of mind and point of view of soldiers who have paid their price and to whom things look black. "Their morale will be built up, they will receive new interests, and every opportunity to realize that life is worth the living, the more so that their duty has been well done."

Some conspicuous work on what is known as the reeducation of the maimed has been done by Dr. Jules Amar, director of the Laboratoire des Recherches sur le travail professionnel of the Conservatoire des Arts et Metiers, Paris. At a meeting held on Dec. 23, 1916, he read a paper profusely illustrated with examples of the apparatus he has employed to ascertain the physical strength of disabled members and to increase their usefulness by exercising under special conditions. He showed various artificial attachments for arm and leg, either to ameliorate a paralyzed condition or to substitute for a missing part, such as a forearm, hand or leg. The accompanying illustrations show two cases of mechanical arms with substantially universal joints.

Other illustrations of the numerous applications of mechanical devices originating with Dr. Amar have been shown in general magazines. In a general way they represent an adaptation of the individual to existing conditions and existing industrial apparatus, while a school of investigators in this country, of which Frank B. Gilbreth, industrial engineer, Providence, R. I., is a leader, emphasizes the desirability of modifying possible equipment or devices to suit the limited capabilities of the injured person. A monograph on this subject was presented under the joint authorship of Mr. Gilbreth and Dr. Lillian M. Gilbreth before the Economical Psychology Association early this year. Later these same authors discussed the subject before the national conference of the Western Efficiency Society in Chicago in May, and from this the following items may be taken as summing up the necessity of specially careful working out of the general salvaging program:

A universal lack of realization of the great difference existing among the cripples, and of the need of placing each man in that work not only that he was best fitted to do, but that he would most enjoy doing, and that would arouse and hold his interest most successfully and permanently.

A lack of realization of the many more opportunities available for cripples than had been realized.

A lack of realization of the necessity of supplying the proper and fitting reeducation for the productive output at the earliest possible moment, in order to bridge over the period of discouragement and despondency and to help the cripple to fit back into the economic world and its work.

A failure to impress upon the cripple from the earliest possible moment his likeness to other people and to other workers, rather than his differences, and therefore, as a result, a failure to provide for that social element in the work that is necessary if his permanent happiness is to result.

A failure to educate the general community as to what their attitude toward the cripple should be.

In a paper presented before the tenth Sagamore Sociological Conference in June the same authors discussed some of their experiments with micromotion films and other apparatus which they use, and dwelt on the advantage of experimenting with unmaimed subjects, as these possess to an exaggerated degree the awkwardness which characterizes the recent cripple. They urge every one to try to discover opportunities for the cripple. They consist, they say, of:

1. Of adapting cripples to jobs already existing, or so adapting such jobs to cripples, that cripples may become competitors with the whole worker. 2. Of finding occupations that do not exist, but which should exist for public prosperity, and assigning these to crippled workers. 3. Of reserving certain jobs for cripples and putting them in these jobs on a non-competitive basis so far as uncrippled workers are concerned.



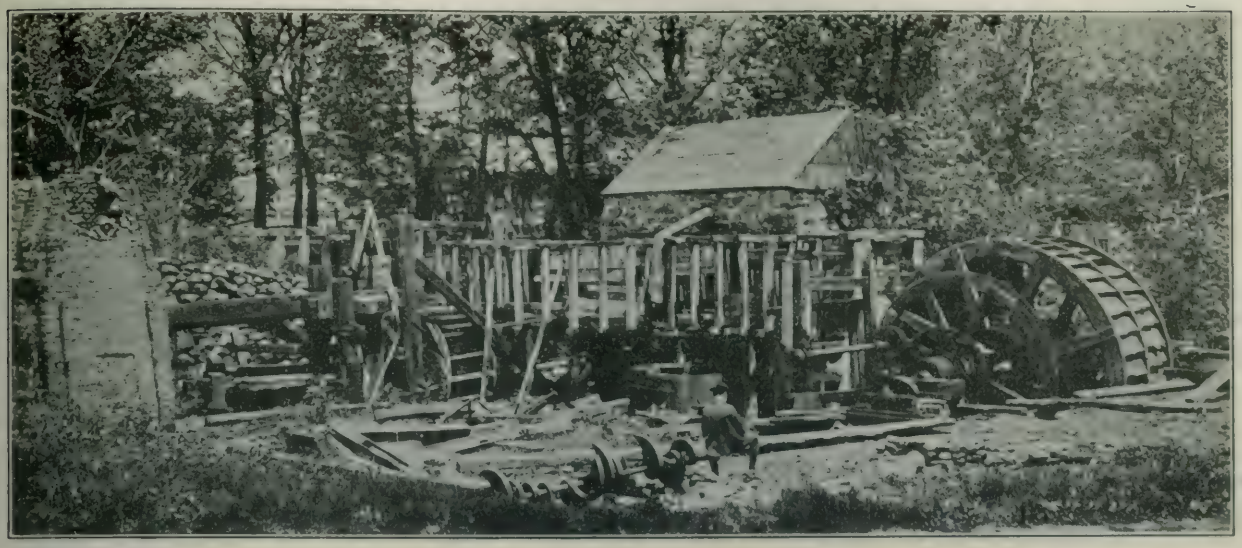
Another of Dr. Amar's Substitutes for Hand and Arm

Will Build Wooden Ships

TORONTO, ONT., Oct. 22.—Thomas Mulvey Kirkwood, Toronto, has been granted favors by the city of Three Rivers, Que., for the construction of wooden ships. Mr. Kirkwood has organized the Three Rivers Shipyard Co., Ltd., whose bonds are financed by Le Credit Canadien, Ltd., Montreal, Que., and guaranteed by the city of Three Rivers. The cost of each vessel will be $450,000. The shipyard will be located on the western side of the Three Rivers harbor, and will cover an area of some five acres. The plant will consist of one 2-story machine and pattern shop, 75 x 175 ft., concrete foundation and wooden frames; two 250-ft. slips on pile foundations, the bottom being clay and sand.

A large deposit of pyrites of iron, for the manufacture of sulphuric acid, has been offered to the Government without charge by the owners, through H. Ward Hicks, Ste. Genevieve, Mo. The deposit is located in and adjoining Ste. Genevieve County.

As early as 1750 the Ryerson family was interested in iron manufacture in New Jersey, where are the remains of old Ryerson forge



A 75TH ANNIVERSARY

Joseph T. Ryerson & Son to Commemorate Establishing of Business in 1842

THE corporation of Joseph T. Ryerson & Son will commemorate, Nov. 1, the seventy-fifth anniversary of its establishment in Chicago. The growth and development of the corporation form a part of the story of the rise of Chicago and the great West and are closely associated with the expansion of the steel industry. In connection with the anniversary, the unusual facts can be pointed out that for 200 years the Ryerson family has been connected with iron and that one branch of the family has carried on this record from father to son for five generations, covering the period since 1750.

Early in the eighteenth century interest was manifested in iron deposits on a tract of 6000 acres in northern New Jersey which were bought by George Ryerson and associates, and from 1750 to 1770 certain crude processes of iron manufacturing were inaugurated, the family, it is stated, subsequently pushing the development of these interests to the extent of making pig iron as early as 1760.

Thomas Ryerson, in 1790, started in business as a wholesale dealer in finished iron and steel products of imported and domestic manufacture, in Philadelphia. His son, Joseph T. Ryerson, located in Chicago and established the present firm of Joseph T. Ryerson & Son, in 1842. His son, Edward L. Ryerson, continued the business, which since 1888 has been a corporation, of which he was president until 1911, and is now chairman of the board of directors. His sons, Joseph T. Ryerson, Donald M. Ryerson and Edward L. Ryerson, Jr., have entered the firm during the past fifteen years and are now vice-presidents.

Chicago Then a City of 6000

In his journey to Chicago, in 1842, Joseph T. Ryerson started from Philadelphia by railroad to Columbia, Pa., and then proceeded as follows: Stage coach over the mountains to Pittsburgh; stage to Cleveland; boat to Detroit; rail to Jackson, Mich.; stage to St. Joseph, Mich., and boat to Chicago. He arrived Nov. 1, after an eight days' journey, and found Chicago a city of 6000 people, with half a dozen brick buildings and the remainder rude frame structures.

After bartering with the agent, who wanted $300 a year, Mr. Ryerson finally, for $200, secured possession of a two-story brick building just west of the southwest corner of Clark and Water streets. Soon he received a stock of $20,000 worth of iron and began business as the accredited agent of Wood, Edwards & McKnight, Pittsburgh iron masters.

The first venture having proved successful, and more space being needed, Mr. Ryerson, in the spring of 1843, rented a larger brick store at 90 Lake Street, just opposite the old Tremont House, a famous Chicago landmark on the corner of Dearborn and Lake streets.

In 1844 he secured land at 74 Lake Street and built a two-story building and stocked it, on his own account, retaining also the stock of heavy iron for his Pittsburgh firm. Several years elapsed and Lake Street developed into a dry goods shopping center, so Mr. Ryerson, in 1852, bought an 80-ft. dock lot at 218-224 South Water Street. Though his friends regarded him as going far out in the prairie, the new location proved ideal, as he could receive all consignments of iron arriving by lake at his own docks.

Rebuilds After Great Fire

His business weathered the panic of 1857 and continued to increase with the growth of the Middle West. On Oct. 9, 1871, the great Chicago fire reduced his building to ashes. The South Water Street warehouse was rebuilt and stock replenished by March 15, 1872. From this time on his business grew rapidly. He purchased a lot at 18-22 Milwaukee Avenue and erected a three-story office and warehouse building, but did not live to see a transfer of the business to the new building, his death occurring March 9, 1885. At the death of Mr. Ryerson, his son, Edward L. Ryerson, who had been admitted to partnership in 1879, succeeded to sole care of the interests of the firm. In this period of the firm's history the business was incorporated under the old name of Joseph T. Ryerson & Son, with Edward L. Ryerson, president; Herman B. Butler, vice-president and treasurer, and Clyde M. Carr, secretary.

The last twenty-five years are a series of expansions, ending in the present plant at Sixteenth and Rockwell streets, Chicago, and also in the erection of branch plants at Jersey City and St. Louis. This year, on the seventy-fifth anniversary of the firm, the fourth unit is being opened at Detroit.

When Edward L. Ryerson retired as president, in 1911, and was elected chairman of the board of directors, Mr. Carr succeeded him as president. Joseph T. Ryerson is vice-president and treasurer; Donald M. Ryerson and Edward L. Ryerson, Jr., are vice-presidents; George G. Moody is second vice-president, and E. L. Hartig is secretary and assistant treasurer.

The Chicago plant has switching tracks to Chicago's 23 trunk line railroads and 36 freight cars may be loaded under cover at one time. The plant is divided into two main divisions, including one warehouse, 500 x 500 ft., housing the heavy material, such as billets, plates and structural material; the other division including a five-story office building and a warehouse 500 x 500 ft., in which are stored bars, shafting, sheets, tubes, rivets, bolts, nuts, boiler specialties, machinery, etc. A complete heated warehouse floor is reserved for sheets and cold rolled strip steel. There is a department especially designed for the storing, cutting and shipping of each steel product.

Competitive Education Between Nations

Other Countries More Alert Than the United States in Their Educational Processes—Americans Should Appreciate the Wealth of Mental Resources Here Dormant and Unused

BY PAUL KREUZPOINTNER*

EDUCATION as a whole, education as an instrumentality to advance their ethical, civic and economic standards in competition with the standards of others, has become as much a matter of rivalry between nations as are the products of factories or commercial methods a matter of such rivalry. This statement may be somewhat of a shock to many who consider education as a spiritual product of a nation's mental activity, and therefore unrelated to the forces which influence and shape the material side of its professional, commercial, industrial and civic life.

Economic necessities and climatic conditions determine the nature, extent and intensity of human activities to sustain life and national existence. And since these human activities will fail in their purpose unless they are properly directed and organized by the well-developed mental capacities and natural spiritual endowments of the people, the educational processes of a country are adapted to the economic needs of that country. And to the extent that these economic needs become more pressing, and to the degree that the educational processes of a people in home, school and public life succeed in shaping and adapting their mental capacities in conforming to these economic needs, to such an extent and degree the material welfare, the moral life and intellectual standard of a people will be maintained successfully and satisfactorily.

Development of Educational Competition

As long as a country is self-sustaining, possessing enough land and raw materials to support its own population without being obliged to depend upon the resources or consuming needs of other nations, the educational processes of such a country can afford to follow the natural, easy-going inclinations of the people and disregard the educational activities of other nations. But there is no country in the world so wealthy in resources that, with increasing population, it will not be compelled to conserve those resources by the application of highly scientific, technical and mechanical processes, which in turn compel the improvement and perfection of its educational methods. This means intensified economic strain on the people. But other nations labor under the same economic strain, and in order to relieve it and to support their growing population nations are encroaching upon each other. That country, therefore, which has at its command the best educational processes to utilize the mental power of its people for this offensive and defensive struggle will be better enabled to relieve their economic strain.

Hence arises the competition, in recent decades, of the educational system in different countries when competing with each other in the products of their industries. These products are the results of mental capacity and physical energy, the quality and efficiency of which depend upon the high or low standard and serviceability of the educational processes applied to develop that capacity and to stimulate that energy; and to the degree of severity of the economic strain prevailing in a given country, to that degree its educational methods will be found to be perfected, effective and efficient. As a corollary, to the degree that the economic strain in different countries increases, to that degree these countries will study, copy, adopt the principles, or, in other words, try to compete with the educational processes of the countries farthest advanced along that line of human activity.

The fact that European countries and Japan are keener and more alert in studying and perceiving the advantages of the educational systems and practices of competing countries than we in the United States have been until recently is not due to any greater degree of intelligence or mental capacity, but to their being subject to an ever-increasing economic pressure—to provide food, shelter and clothing for their steadily growing population. Hunger is the whip which drives those nations not only to study the industrial and commercial progress and methods of competing countries, but no less so to study the educational methods which promoted their superiority, if there be superiority.

Studying Methods of Other Countries

Since the middle eighties, when other countries began to perceive the rapid strides the United States was making industrially, foreign engineers and educational experts have been visiting us in large numbers to study our advantages and disadvantages. We reciprocated in such studies, but with characteristic self-sufficience began rather late to interest ourselves in what other industrial nations were doing and how they lived. As far as study of their educational systems is concerned, the results have often been superficial and misleading, because lacking insight into the historic development and environmental influences which shaped the life of other nations.

From 1886 to 1912, when he was retired from the service of the Pennsylvania Railroad, the writer had the pleasure of meeting on their investigating tours 354 engineers and governmental officers from 17 different countries, the majority of whom were interested in our educational machinery, its working and results. During the World's Columbian Exposition of 1893 he was assigned by the railroad company as a guide to 72 engineers from 12 different countries. A number of these visitors were frank enough to express their conviction that, with our inefficient and inadequate provisions for the education of our working people, they were not much afraid of our competition, notwithstanding our superior industrial organization and mechanical ingenuity.

For many years Germany, more than any other country, has followed the development of our industrial training and technical education, adopting our manual training system for its elementary schools. In 1902 our secondary education was the subject of a study by an expert. The educational exhibit of the United States at the St. Louis Exposition in 1904 was carefully studied by a German expert who also made visits to our schools, and in his published report the belief was expressed that it would take this country many years to perfect its industrial educational system in conformity with its industrial needs if, in fact, it ever should succeed in doing so.

A German expert, who, before the present war, studied our progress in industrial and technical education, remarked to the writer that the American people do not know and do not appreciate the wealth of mental resources lying dormant and unused in our youth. From the standpoint of our industrial and educational needs, we do practically nothing to develop that wealth of mental resources, and, moreover, we do little to strengthen the weak points in our educational system, as there are weak points in every educational system of every country.

How Famous Foreign Schools Are Visited

As a sample of the intensity with which all nations follow this development of competitive industrial and technical education, a study of the list of visitors at

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the continuation schools of Munich, Germany, is highly illuminating. The Munich continuation school system is now considered the best and most effective anywhere, following its reorganization by Dr. G. Kerschensteiner, and since 1908 has been visited annually by hundreds of educators and industrial experts. In 1911 and 1912, there were 610 individual visitors, of whom 383 were from countries outside of Germany. These 383 were from 24 different countries, among them being 73 from the United States. In addition, in those years there were 79 delegations and official commissions counting from 3 to 60 members each, from 11 different countries. Taking an average of 10 members in each delegation and commission, there was a total of 1400 visitors at the Munich schools in two years to learn what they could about the methods pursued. Who will say that education has not become an intensely competitive factor in the life of all countries if 25 nations, including Germany, find it desirable and necessary to study these schools?

France is introducing continuation schools, and there is a bill before the British Parliament now which provides for a reorganization of the British educational system, with compulsory continuation schools up to 18 years of age for all industrially employed, going, in the case of girls, even a step farther than the Munich schools.

The foregoing is a brief presentation of the present aspect of competitive industrial and technical education. While we have made very commendable and praiseworthy strides during the past five years in the organization of public, industrial and continuation schools, shop and apprentice schools and evening schools, and the Smith-Hughes law will help much, yet in comparison with what is needed we have merely made a good beginning.

If Munich considers it worth while to invest $31 per boy and $18 per girl, including building account, in its continuation schools, while Wisconsin spends $11 and Pennsylvania $5 per pupil in their continuation schools then our competitive industrial education is evidently far from what it should be. Taking the list of visitors at the Munich industrial continuation schools as a guide, let us not forget that the United States is only one out of at least twenty-two nations seriously involved in the struggle of competitive national education.

Will Need Machinery After the War

WASHINGTON, Oct. 23.—The attention of engineers, contractors and others interested in public improvements has been called to a report on the needs of Scotland for American machinery after the war is over by the Department of Commerce. This matter was the subject of a report by Consul Rufus Fleming, who is stationed at Edinburgh. Mr. Fleming said:

Notwithstanding taxation will rest heavily upon every community in consequence of war expenditures, soon after the return of peace large projects must be undertaken in this part of Scotland.

Streets and highways have been badly worn by increased traffic and repairs have been deferred; harbor construction and improvements, for which full arrangements were made several years ago, are in abeyance owing to financial and labor problems; and tramway extensions, important housing schemes, sewerage works, industrial plants, land clearing and drainage enterprises, and the development of mines and quarries are among the other works, public and private, which must receive attention when conditions will permit.

American manufacturers and exporters of machines for engineers and contractors in the various lines indicated could probably cover this market in the most satisfactory way from general agencies in English commercial and industrial centers to which the engineering and building concerns throughout the country are in the habit of sending orders for heavy machines of all kinds.

The Modern Tool Co., Erie, Pa., manufacturer of threading tools and grinders, is adding a third story to its plant, 48 x 150 ft., and will move its offices into it, providing for additional plant space. New machinery has been bought, and is expected to be working early in November. Production is to be increased from 40 to 45 per cent. Lyle W. Orr is general manager.

STEADY LOAD WITH WASTE GAS

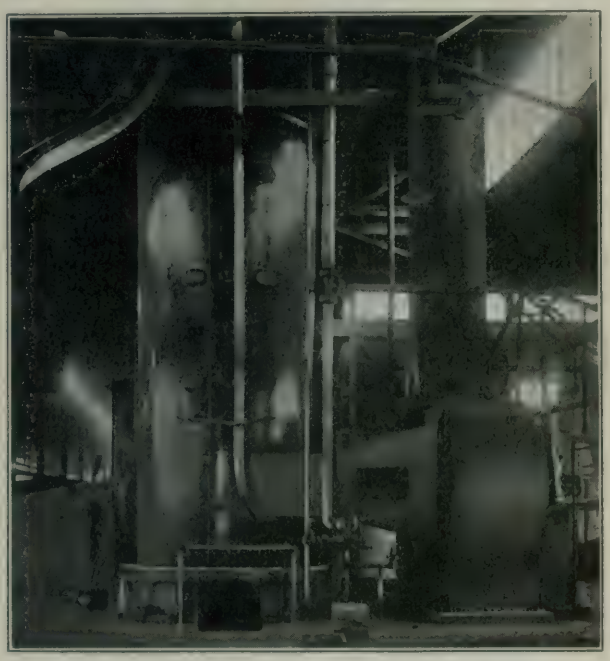
Coal Fire Supplements Waste Heat—Boilers Applied to Two 20-Ton Melting Furnaces

IN a paper presented before the American Foundrymen's Association at its recent convention in Boston, C. D. Townsend, Danville Malleable Iron Co., Danville, Ill., gave the following description of waste heat boilers as applied to two malleable melting furnaces:

After investigation of various kinds of boilers, including horizontal, marine and others, the Danville Malleable Iron Co. selected an upright water-tube boiler as best suited for the utilization of waste heat from melting furnaces. That the floor space required was comparatively small was an important factor in determining the choice. A 250-hp. boiler was estimated to be of sufficient size, considering the grate area of the furnace; but because of what might be called a superheated gas after it has passed over a bath of molten metal, and because of its velocity, greater capacity was deemed advisable and a 400-hp. boiler was finally selected.

Auxiliary Fire-Box

To get constant results from the boiler, and also maintain constant steam pressure, it was thought best to have two furnaces and an auxiliary fire-box connected with the boiler. By running the furnaces one



Draft Induced by a Fan Connected to the Stack of the Waste-Heat Boiler is Found to Improve Regulation

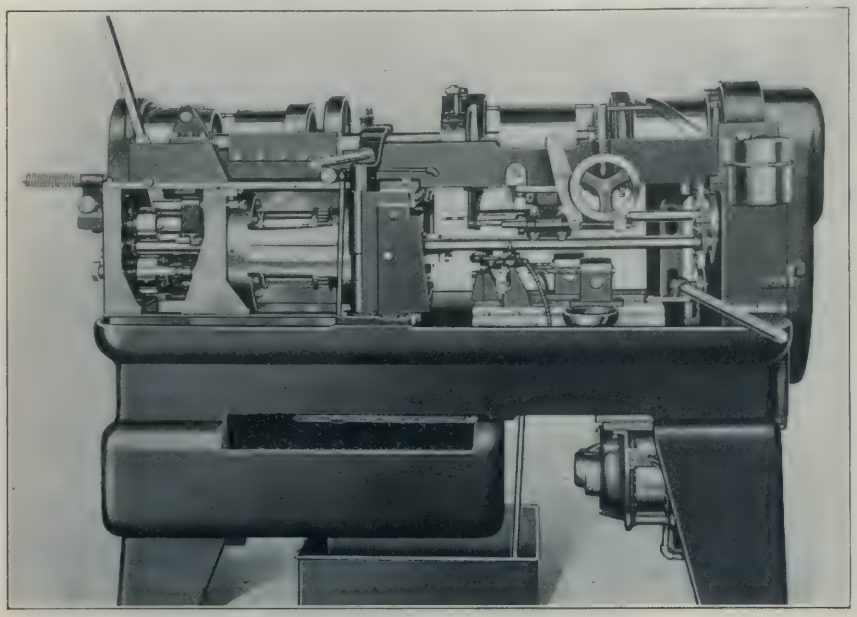
at a time, a full head of steam can be kept on the boiler, except for intervals during the time of charging the furnaces, and for a short period while the cold stock is being thoroughly heated. This takes care of all firing for at least nine hours of the day. During the balance of the day the boiler can be kept under pressure by a small fire in the auxiliary fire-box. One furnace is operated while the other is being repaired.

Induced Draft Regulation

Temperature control in the furnace and the efficiency of the boiler can be aided by the addition of an induced-draft fan in the base of the stack. By operating this fan with variable speed the furnace draft can be regulated and the fan tends to hasten the time of melting. The temperature in the base of this stack is approximately 800 deg. Fahr., and the temperature at the back bridge-wall of the furnace is about 2500 deg. Fahr. This equipment evaporates approximately 246,000 lb. of water per day, using in the auxiliary fire-box from one to three tons of coal.

The boiler should be set as close as possible to the

back bridge-wall of each furnace to utilize all the waste gas possible. This can be accomplished by setting the furnaces parallel to each other or at right angles to the boiler. To take care of the large amount of gases that pass through the boiler during the period of melting, the boiler should be set eccentric with the casing, leaving the greatest area on the front or steaming side of the boiler so that the extremely hot gases have a chance to rush up the front and become effective near the top. If the boiler tubes are set close to the casing, the intense gases and impinging flames will do most of their work on the tubes near the bottom of the boiler.



Placing the Cams at the Top of the Machine Avoids Clogging Due to Falling Chips

The water supply for a waste-heat boiler should be absolutely assured. Two independent sources of supply should be provided and all piping and valves should be extra heavy and erected with care. Expense should not be considered too largely in making the water and steam connections.

The most desirable service of a waste-heat boiler can be obtained by using it in conjunction with a battery of hand-fired boilers, the steam pressure to be equalized and balanced by their use. In this way the waste-heat boiler serves as an auxiliary or a fluctuating source of steam supply to a boiler plant.

Care of Boiler

A waste-heat boiler requires constant attention. The water supply must be positive and intelligently supplied. The boiler should be washed down and the tubes inspected for defects at least every three weeks, and the flues should be turbined, if necessary, not less than every six weeks. Treated water should be used to minimize the collection of boiler scale. Soot should be blown off the tubes at least three times a day.

A 400-hp. boiler connected with a 20-ton furnace operating at capacity will produce steam at full capacity or a little in excess after the iron has been reduced to a semi-fluid state or for eight or nine hours per day. There is no noticeable effect on the furnace operation and, in fact, the furnaces are operated without regard to the boiler connection. The fuel ratios do not change; neither do the furnace firing operations.

"Utility Letters of Credit in the Export Trade—A Plea for Standard Forms" is the title of a new pamphlet issued by the American Steel Export Company of New York. The author, J. P. Beal, who is secretary and assistant treasurer of this company, makes valuable recommendations to the American banker and exporter.

The Philadelphia office of the Brown & Sharpe Mfg. Co. will be removed on Nov. 1 from the Bourse Building to 1103-1105 Liberty Building, Broad and Chestnut streets.

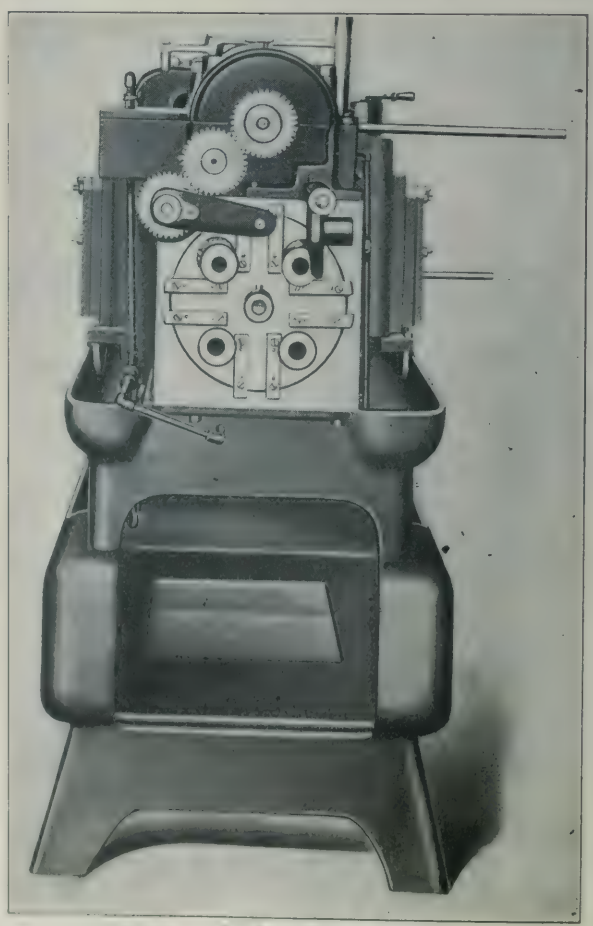
NEW FOUR-SPINDLE AUTOMATIC

Screw Machine Embodying a Number of Notable Changes in Design

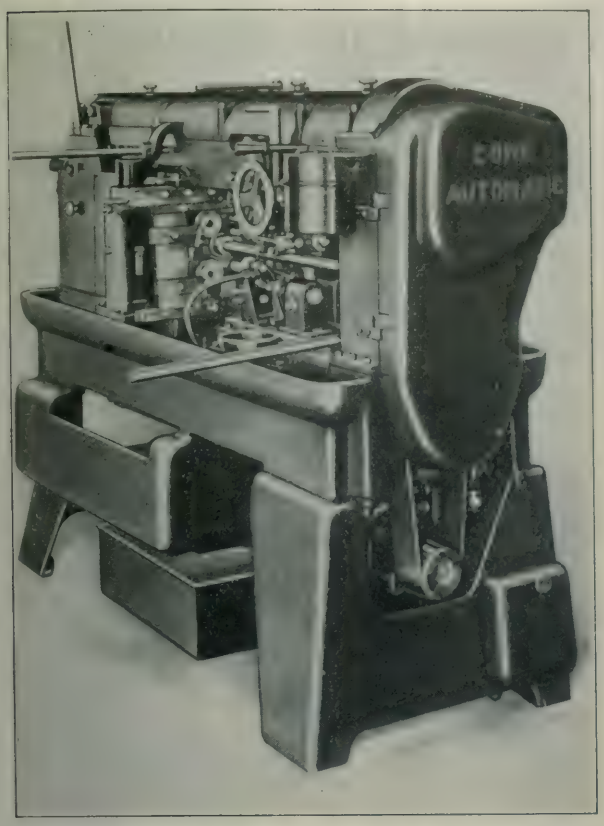
THE Cone Automatic Machine Co., Windsor, Vt., has placed on the market a four-spindle automatic screw machine of new design. The cam is located at the top of the machine, the starting and finishing of the work is done at the front of the machine in full sight of the operator, a single belt drive is employed and a convenient means of disposing of the chips is provided for. Care has been taken to protect the moving parts, and where the guards are not an integral part of the machine they are made light so that replacement will not necessitate such exertion on the part of the operator as to leave them to be neglected and out of use for periods at a time.

The machine is mounted on legs, an arrangement which provides space for putting the driving motor underneath one end of the bed as well as furnishing space for a receptacle for the chips. The chip-retaining pan, it is pointed out, may be cleaned without interfering with the operation of the machine and at the same time the operator can push the chips along toward the end of the machine, should he desire.

The arrangement of the four hollow spindles through which the stock passes is clearly brought out in one of the accompanying illustrations. The work is started in the spindle at the lower left corner and passes around in a counter-



The First and Last Operations Are in Full View, the Work Starting in the Lower Left Spindle and Progressing in a Counterclockwise Direction

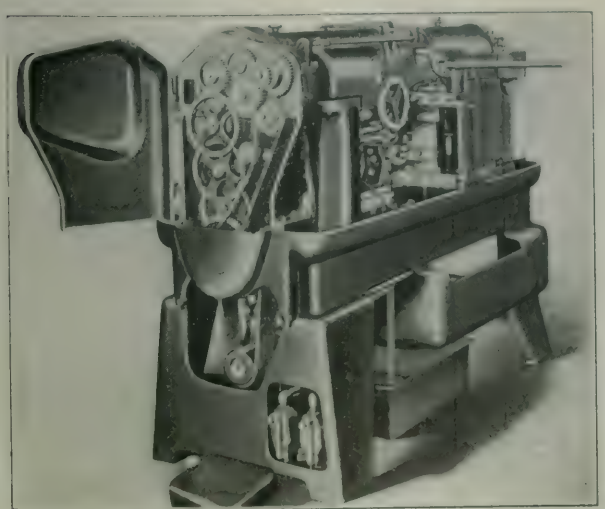


After the Work Is Cut Off in the Upper Spindle, the Completed Piece Drops through the Opening at the Right of the Bed into a Tote Box or Other Receptacle

clockwise direction to the spindle in the upper left corner, where the finished piece is severed from the stock and drops into the metal cup at the right of the bed. This cup delivers to a tote box or other receptacle for receiving the finished parts. The relation of the first and last operation spindles and the metal cup for receiving the finished work are clearly shown.

The spindles are indexed by a cam mechanism which is located at the top of the machine, with no likelihood of the cams becoming clogged by chips. The cams are protected by removable covers of sheet metal which are light enough to facilitate removal and replacement and at the same time stiff to withstand hard usage.

An electric motor operating at a speed of 1800 r.p.m. is employed to drive the machine through a single belt As will be noted, the motor is mounted underneath the bed and the other transmissions are of the gear and chain and sprocket type.



Only One Belt Is Employed in Driving the Machine, the Remaining Transmissions Being of the Gear and Chain and Sprocket Types

Central Steel Co. Additions

The Central Steel Co., Massillon, Ohio, is making a number of additions to its plant and is planning further enlargements for next year. These will include the building of an electric steel plant equipped with two 15-ton electric furnaces. A 22-in. bar mill, which is expected to be placed in operation about Jan. 1, is being installed and a steel foundry and other extensions have just been completed. In addition, two 75-ton open hearth furnaces were recently placed in operation, making nine furnaces in all, the others being of 50-ton capacity.

The new 24-in. bar mill, which consists of two stands of rolls, will be located at the side of the sheet bar mill in the continuous sheet bar mill building. Ordinarily, the steel will go directly from the blooming mill to the sheet bar and billet mill for producing small billets up to 6 x 6 in., but small billets and bars may be rerolled on this mill, and two reheating furnaces are being installed in connection with it. A 40 x 60 ft. hot bed and a saw built by the company and a 6 x 6 in. McIntosh shear have been installed in connection with this mill. As the billet and sheet bar mill and finishing mill will not be used at the same time, the power equipment now used for the former will also be used to drive the new bar mill.

The steel foundry was placed in operation a few days ago. This occupies a new building, 50 x 150 ft., served by a 15-ton Morgan crane and equipped with a 1-ton electric furnace built by the company that is used for experimental work. A track leads from the foundry building to the open-hearth building and the molds will be taken to the open-hearth plant for pouring, the molten metal being supplied by open-hearth furnaces. Steel castings will be made up to two tons. The product of the plant is almost exclusively alloy steel.

New plant extensions just completed include a stripper building, 60 x 120 ft., equipped with a 200-ton Morgan stripping crane, a pickling plant occupying a 40 x 250 ft. building and a billet shed 88 x 250 ft. A new 15-ton Morgan crane has been installed in the stock house and a new two-story storeroom, 40 x 100 ft., and a new four-story office building, 50 x 100 ft., are now being erected.

Pittsburgh Foundrymen's Association

The monthly meeting of the Pittsburgh Foundrymen's Association was held in the Fort Pitt Hotel on Monday evening, Oct. 15, in that city, and was preceded by a dinner. L. A. Way, president, was in the chair, and W. W. Sanderson of the Carborundum Co. acted as secretary, owing to the illness of F. H. Zimmers, the secretary. N. Kelly & Son Foundry Co., and the Bronze Age Metal Co., were elected new members. The speaker was Major C. M. Wesson of the ordnance department, U. S. A., who is officer in general charge of manufacture at the Watertown arsenal. Major Wesson spoke on the making of steel castings for ordnance work and discussed the unusual physical requirements demanded in castings to be used in artillery gun mounts and other ordnance.

The Wisconsin Gun Co., Milwaukee, organized by five leading metal-working interests of Milwaukee to manufacture 3-in. field pieces for the Government, celebrated the speedy completion of its new shop at Thirty-fifth Avenue and Orchard Street on Saturday, Oct. 20, by holding flag-raising exercises. The shop is 130 x 300 ft., and was completed in just 51 days by the Worden-Allen Co., Milwaukee, general contractor, or 39 days ahead of the date specified in the contract. By Jan. 1 the company hopes to be able to turn out three pieces of ordnance a day.

Reports from Detroit state that work on the Ford blast furnaces west of that city is progressing rapidly. A small army of men is at work excavating and building, and construction will be continued during the winter.

Cast-Iron Shells in Permanent Molds*

Some of the Essentials as to Composition and Design of Mold—French Practice and Specifications

BY EDGAR A. CUSTER

THERE is nothing new in the use of cast-iron projectiles—before the age of steel they were the sole means of battering down defenses and attacking at long range. Some of the reasons why the use of cast-iron shells was abandoned are that the metal has never had a very good reputation for uniformity and freedom from sponginess and gas holes; its tensile strength is low and it lacks toughness. Any of the defects commonly found in cast iron will seriously affect the trajectory and direction of a shell and render it comparatively useless. A forged steel projectile meets all objections and has the call.

The objection to steel projectiles is that they are comparatively ineffective against earthworks or trenches when the caliber is 5 in. or less. The amount of contained explosive is small and a great proportion of the explosive effect is used in bursting the walls of the shell. In larger sizes this objection is less apparent. The explosive effect increases with the added charge in a greater ratio than the strength of the added amount of metal in the projectile. The present war has taught us that steel, concrete and brickwork offer but little resistance to modern siege guns and they have been abandoned for earthworks manned with an ample force.

A few years ago some experiments were made on the lower Chesapeake to determine the effect of cast-iron shells on the superstructure of a condemned war vessel. One shell that penetrated the structure and burst in a wardroom was particularly observed. The room was about 20 x 60 ft. and one side was lined with lockers. Every locker was torn to pieces and the paint on the walls and ceiling in the line of the explosive force was cut off as with a sand blast. It was the unanimous opinion that the explosion would have killed every man who happened to be in the room at that time. A few tentative experiments were made after this and a permanent mold was constructed, but the project was allowed to drop and no effort was made to thoroughly investigate the subject.

The first intimation that cast-iron shells were being used in the present war was an article in the London *Engineer* which described a number of fragments of cast iron that were undoubtedly portions of an exploded shell. It was noted that some of the pieces were slightly chilled on one side and the *Engineer* surmised that cast-iron cores were being used. As the peculiarly destructive effect of these shells was observed not only in the open but also against earthworks, the idea that the Germans were using cast-iron shells on account of the scarcity of steel was abandoned. As a matter of fact, as early as May, 1913, German and Italian munition makers were discussing this phase of projectile work and were seeking all the information that was available. In August, 1913, it was reported to the writer that shells had been made that were satisfactory in that they had the proper degree of fragmentation and were strong enough to resist the effect of the propelling charge. Moreover, these shells were made in iron molds with iron cores.

Essentials of Cast-Iron Shells

It is essential for the work that the degrees of fragmentation of shells be calculated to a nicety. Too great fragmentation will make the shell ineffective. A steel shell weighing 13½ lb., when charged with one pound of TNT, will burst into approximately 1050 pieces if there is complete detonation. The largest pieces average 0.3 to 0.4 lb. in weight and many of these are splinters due to the fibrous nature of the metal. The fragments recoverable have a wide variation in weight, as shown by the fact that while the average weight of the large fragments is almost half a pound, the average weight of all the fragments is about 0.01 lb. It follows that a very large per cent of the fragments would do no harm. A cast-iron shell under the same conditions would burst into nearly 1500 pieces with the fragments comparatively uniform in size and weight.

When it comes to making a projectile of cast iron that is to be used against an enemy, a number of difficulties are met. It must be very strong, easily machined, absolutely solid and free from spongy spots and blowholes, and above all, every shell must have exactly the same degree of toughness. To meet these requirements, the foundry must be run on a strictly scientific basis. There can be no guess work. When shells are cast in sand, the elements of carbon, silicon and manganese must be held to very definite limits, and these limits vary with the thickness of the shell walls, which can only be determined by trial. The point aimed at is the correct degree of fragmentation and all foundry methods must aim at this. Dry-sand molds, open and porous; perfect cores and trap or swirling gates must be used. The methods of melting and care of iron and fuel must be carried out whether the shells are made in sand or in a permanent mold.

Foundry Iron in Permanent Molds

Ordinary foundry iron, when properly cast in a permanent mold and when removed at the proper time, has, in the resultant casting, the same degree of hardness irrespective of any variation in the chemical constituents, so long as the same size, weight and shape of casting is made. The time the casting remains in the mold is the determining factor of the degree of hardness. A casting weighing about 60 lb. remains in the mold four or five seconds, while a casting of the same general contour weighing 500 lb. will require from 25 to 60 seconds before it is safe to lift it out.

To illustrate this point, data on a casting weighing 1100 lb. are presented. Fig. 1 shows the general outline of a mold that was used to make a shell bushing. A trap gate was used and the casting had a very heavy base and comparatively thin upper walls. In fact, about 65 per cent of the total weight was concentrated in the lower third of the casting. This large mass of metal increased the time interval in that it was necessary to set the walls deeper than in a casting of smaller bulk. There were no risers and the only means provided for the escape of air from the matrix were a few shallow channels cut into the mold at the top of the casting. A large cast-iron core operated by a hydraulic cylinder formed the interior cavity. The mold was opened and closed by a similar cylinder. Into this mold irons of the following analyses, all of which were melted in an ordinary cupola, were poured:

	Mixture No. 1	Mixture No. 2	Mixture No. 3	Mixture No. 4
	Per Cent			
Manganese	1.50	0.50	0.80	1.50
Sulphur	0.03	0.05	0.06	0.03
Silicon	1.05	1.75	2.25	1.05
Phosphorus	0.05	0.06	0.06	0.05
Steel scrap	...	...	...	16.00

From 10 to 12 castings were poured from each of these irons and when the castings were broken not one showed the least sign of sponginess or gas holes. The mold was poured full and the first part to freeze was the entrance gate so that there was no possibility of

*From a paper presented at the thirty-second general meeting of the American Foundrymen's Association, Boston, Sept. 24 to 28.

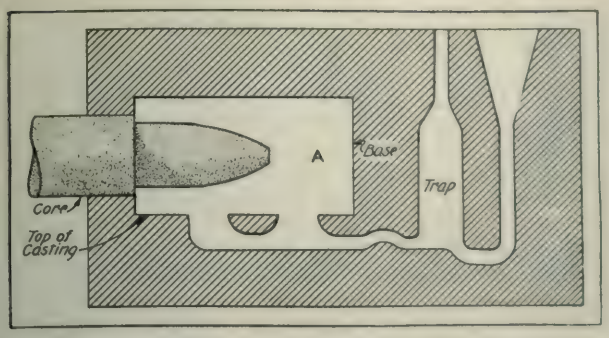


Fig. 1—Two-Part Cast-Iron Mold or Shell Bushing With 15-In. of Metal Surrounding the Gates, Runners and Casting

feeding. Only enough iron was poured to fill the cavity.

The time of setting was measured by the time the core remained in the casting before it was safe to draw it. No. 1 iron required 1 min. and 20 sec. before the core was drawn. When the core was allowed to remain in the casting 1 min. and 30 sec., it was gripped by the iron and had to be cooled to room temperature before removal was possible. No. 2 iron required 1 min., and No. 3, 30 sec. In No. 4 a new condition was set up when 16 per cent of scrap steel was melted with the charge in the cupola. In this case it was 2 min. and 20 sec. before the core could be withdrawn. The results show that in a casting of this size the low silicon iron cools much slower than one of higher silicon content. The effect of the long time in the mold was to make the casting very hard and heat treatment was given to bring it to machinability. The temperature of the core had no effect on the time of setting. The tenth casting was given the same time as the first, although the core was heated to a temperature of over 400 deg. Fahr.

Mold for a 60-lb. Shell

A mold was made for a shell that, when finished, weighed 60 lb. The mold was made in three parts, as shown in Fig. 2, and was equipped with a cast-iron core. The portion of the shell forward of the bourlette band is cast in the solid part of the mold and no provision is made for venting. The parting of the movable portions of the mold runs in a straight line through the center of the shell and extends 3 in. beyond the base. It then turns at an angle of 45 deg. and runs straight the remaining distance to the outside of the mold. The pouring cup is placed about 5 in. from the outer end of the parting and the main sprue runs down to an easy curve to the bottom of the trap. The entrance to the trap is ¾ in. in diameter, while the main sprue is 1½ in. in diameter. The trap gate is 5 x 4 in. with heavy filleted corners and open at the top. The sides are given ⅛ in. draft, so that the moving parts of the mold will open readily. The bottom of the trap is set low enough to allow a slight hump to be placed in the runner between the trap and the matrix. This hump serves to catch any air or dirt that may be carried with the first rush of the metal. The center line of the runner is 3 in. below the bottom of the matrix and two gates are cut—one between the revolving band and the base and the other between the band and the bourlette. The gates are 1/16 in. wide and have a small fillet where they enter the matrix. The mechanism for drawing the core is attached to the part *A* and moves with it. Channels are cut in *A* and *B* in the proper position to receive the copper band.

The operation of casting is as follows: The copper band is placed in the channels, the mold closed and then poured as fast as the runner will take the metal, keeping the pouring cup full until the end. In four seconds the core is withdrawn, the mold opened and the casting removed. The copper band will be firmly cast into place.

It was found that a mixture corresponding to No. 4 in the experiment previously mentioned, with the exception that the manganese was under 0.08 per cent, gave the casting the toughness necessary for the proper degree of fragmentation, but the long exposure in the mold made the casting too hard. A scleroscope reading of 65 to 70 was the invariable result irrespective of any difference in the mixtures.

It was evident that some form of heat treatment was necessary to bring the casting to a workable condition. It had been determined that a mark of 45 would give the proper degree of fragmentation. A number of trials were made before it was found that a "flash" heat of 865 deg. Cent. would restore the casting to a good workable condition and bring the scleroscope to just about the correct figure. It was further found that the castings should be allowed to cool before being subjected to the treatment so that a number of shells could be treated at the same time, starting at the same basis of temperature.

In a permanent mold, it is impossible to get a casting free from gas or air holes without the use of trap gates. There is no trouble in filling the mold when semi-steel is used. The metal does not need to be poured especially fast. Nevertheless, unless a substantial trap gate is provided, small holes will collect against the bottom of the core and the top of the casting. The most careful pouring will not change this condition. There is a point when semi-steel can be poured in a permanent mold without these holes forming and without trap gates, and that point is when the metal has cooled until it is almost viscid. The difficulty of successfully hitting this point is so great as to make this method beyond the range of commercial success.

Time a Vital Factor

The selection of different irons for different sizes of shells, made in permanent molds, is not necessary. To explain this, the influence of silicon and manganese is exerted only when the molten metal is cooling in the mold and the total effect of this influence is measured by the time the molten metal takes to become solid. In a sand cast projectile weighing 65 lb., the time is five minutes; in a permanent mold casting the time is five seconds.

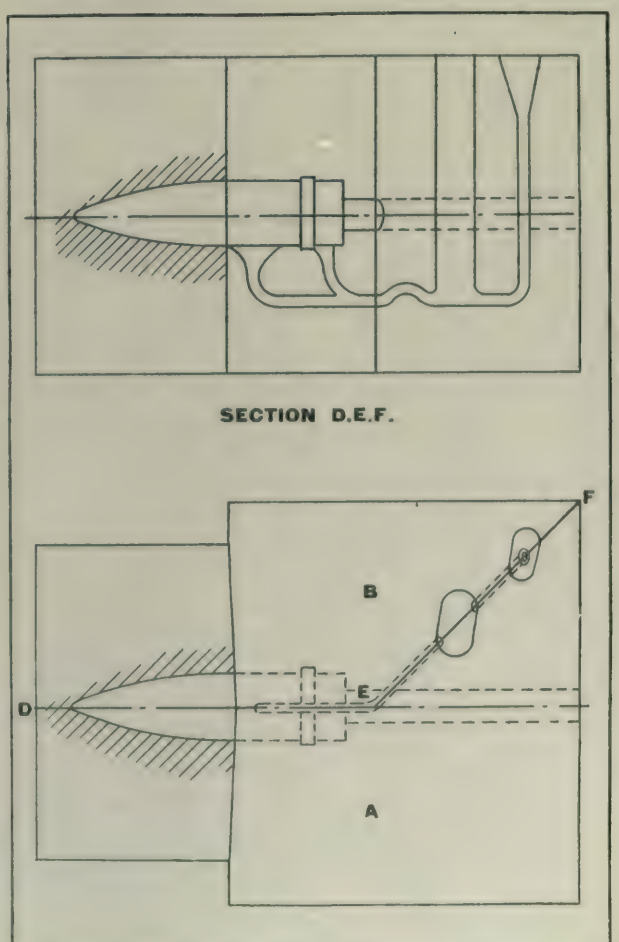


Fig. 2—Sketch of a Three-Part Permanent Mold for a 60-Lb. Shell

When cast-iron shells are used in the open, the fragmentation must be exact, but when used against earthworks, only the explosive force counts. Since it is impossible to set aside shells for each duty, it is obvious that the degree of fragmentation must govern the process. This is easier to accomplish with a permanent mold than by any other known process. As has been said, the question of hardness does not depend upon the variations of the pig iron so long as ordinary foundry iron is used. The same statement is true of the so-called semi-steel so long as the same percentage of steel scrap is melted with the iron. The term "ordinary foundry iron" is used to denote pig iron ranging from 1.75 to 2.75 per cent silicon, below 0.80 per cent manganese and with sulphur below 0.08 per cent. Phosphorus has no appreciable effect up to 1 per cent. A casting that would analyze 3 per cent total carbon, 1 to 1.20 per cent silicon, 0.60 per cent manganese, 0.05 per cent sulphur and 16 per cent steel scrap would be an ideal composition for a 60-lb. shell. All shells, whether cast-iron or steel, must be subjected to a definite heat treatment and, in the case of cast-iron, the degree of heat and time of exposure to get the proper scleroscope test can be determined only by experiment.

As to the design of the mold, the main point to be considered is that plenty of metal should surround not only the matrix but also the sprues and runners. In a casting such as a 5-in. shell there should be at least 10 in. of metal outside of every portion of the mold that comes in contact with the molten metal. The purpose of this is twofold, to provide a sufficient heat storage capacity so that the molten metal will be robbed of its heat in the shortest possible time and to make the mold strong enough to resist the tremendous expansive power of the cooling metal. The matrix and the core should be made to the exact size of the casting before finishing.

Make no allowance for shrinkage. Why there is no apparent shrinkage when these castings are made in a permanent mold is a moot subject. It may be that, since the interior of the casting is molten when it is taken from the mold and the outside contraction has not started at the time of removal, the expansive force of the cooling interior metal will neutralize the contracting force of the cooling exterior. It is a very interesting point, but it is true that when the casting is so thick that the interior is molten at the time of removal, shrinkage may be safely ignored.

The mold should also be so equipped as to be easily and quickly opened and closed. The movable portions should run on grooved wheels fitting V-shaped tracks. The purpose of this is to prevent small particles of iron interfering with the adjustment of the moving parts. Casting is apt to be a sloppy proceeding and there are always small particles of iron splashing around. Mount the molds so that there is plenty of space underneath to collect any molten metal that may carelessly escape. Before closing the mold, run a flat scraper over the face to remove any small particles that may adhere. If these general rules are followed out, two 60-lb. shells can be cast every minute and all will be of the same weight, size and texture.

The position of the copper revolving band is an important consideration. In some steel shells this band is placed within a very short distance of the base, but in a cast-iron shell plenty of metal must back up the band. Even with the strength that steel gives, portions of the base are sometimes torn off by the tremendous force set up when the band enters the rifling at a very high velocity. The effect of this rupture is to disturb the trajectory and direction to such an extent as to render the shell not only useless but dangerous.

French Specifications for Iron Shells

The French Government has issued specifications for shells cast in sand that are here given in part. They call for the analysis of shells of 122 to 155 mm. caliber. The chemical analysis is given at the top of next column.

	Per Cent
Graphitic carbon	0.70
Combined carbon	2.40
Silicon	1.35
Manganese	0.70

The amount of total carbon and silicon must not exceed 4.7 per cent. If this limit is exceeded, the iron will lack toughness. At least 2 per cent of the total carbon must be combined to produce proper fragmentation. The percentage of dust increases as the combined carbon decreases.

Although the sum of total carbon plus silicon is set at 4.7 per cent, it is preferable to keep these limits to 4.4 per cent with a minimum percentage of silicon. The percentage of silicon varies according to the type of molding. In the 122-caliber the best results were obtained by using a minimum of 1.20 per cent silicon for dry sand and 1.35 per cent for green sand. The percentage of silicon varies in inverse ratio to the thickness of the walls and the caliber; the thicker the wall, and higher the caliber, the lower the silicon. Manganese decreases with the thickness of the walls and caliber and increases with the sulphur.

The sulphur should never exceed 0.08 per cent and should be lower whenever possible. The percentage of phosphorus is set at 0.15 per cent or under. The charge should be as follows:

	Per Cent
Pig iron	40
Scrap	40
Steel	20

The term scrap is used to denote scrap melted, pigged and charged according to analysis.

These specifications correspond closely to the iron previously mentioned as being ideal for use in permanent molds. The striking point is that the silicon decreases when a dry-sand mold is used, and this point is emphasized by the use of a still lower silicon in a permanent mold. The percentage of combined carbon will always be high when a permanent mold is used. Once the proper mixture has been determined, that mixture is used irrespective of the thickness of walls or caliber of shell.

All the foundries of France engaged in this work have been mobilized on a common basis and are using precisely the same methods of selection, analysis and general foundry procedure. This has not been done without enormous losses and vexatious delays. There have been many cases where the loss of the total heat has been reported and a loss of 40 per cent was not uncommon in the first stages. Team work, scientific methods and keeping everlastingly at it have brought results. To-day the output has reached staggering proportions—over 1,000,000 rounds per day are being made.

It is very hard to say that it is doubtful if there is a foundry in the United States that could qualify at once for this work without material changes in procedure. Primarily, it is not a commercial proposition and if this Government decides to use cast-iron shells, the work must be undertaken with the foreknowledge that trouble is ahead. The necessity will be paramount of not only putting forth prodigious efforts but also of sinking individuality for the common good. A full and free interchange of ideas and data is indispensable. There is no doubt of the ultimate outcome.

Floor Type Tapping and Drilling Machine

W. H. Simmons & Co., 208 Lawrence Street, Cincinnati, is now building a floor type automatic drilling and tapping machine in addition to the bench type which was illustrated in THE IRON AGE, June 21, 1917. The general appearance of the machine is the same as the earlier one, except that a pipe section column is used in place of the former rectangular one. The machine has a clutch and reversing mechanism which can be set to run the tap to any desired depth and then reverse and stop the spindle automatically. This clutch is of the jaw type, and a sensitive drive for light tapping or tapping soft metal is secured by adjusting the belt through the movement of the lower pulleys, which are mounted on an eccentric shaft. The machine will drill or tap to the center of a 12-in. circle and is provided with four attachments for tapping 16, 18, 20 and 24 threads per in.

Nitre Cake for Pickling Brass

Nitre cake, as a substitute for sulphuric acid in pickling brass, is finding extensive use in Great Britain according to a paper by H. W. Brownsdon before the Birmingham section of the Society of Chemical Industry. The quantity so used in that country now runs into several hundred tons per week. Difficulty in obtaining raw material, coupled with the increased demand for sulphuric acid for other purposes, has resulted in an extended application of nitre cake solutions in place of dilute sulphuric acid for pickling annealed brass.

Nitre cake is essentially crude acid sodium sulphate, and while the latter in the pure anhydrous state contains theoretically 40.8 per cent of sulphuric acid, the free acid found in nitre cake may vary from 5 to 30 per cent. For pickling, the nitre cake solution should show 3 to 5 per cent sulphuric acid on titration; there is no advantage to be gained in using solutions of higher acid concentration.

While nitre cake is a variable product, annealed brass from a pickling point of view may be even more so. Given clean work, nitre cake solutions replace dilute sulphuric acid quite efficiently, but with dirty work the difference is much more marked, and nitre cake solutions, even under the most favorable conditions, may fail to pickle the work satisfactorily. It is little consolation for the manufacturer to know that his troubles lie in his annealing furnaces. Much may be done to overcome troubles as follows:

The nitre cake solution should be as hot as possible.

Its acid content should be tested frequently and maintained at 3 to 5 per cent by the addition of nitre cake.

The hot annealed products may be quenched in water whereby much scale is mechanically loosened prior to pickling.

The hot annealed work may be placed direct into the nitre cake solution, and the pickle can thus be maintained at a high temperature without auxiliary steam heating.

Oxidizing agents such as ferric salts, bichromates or persulphates may be added to the pickle, but in many cases the price is prohibitive.

Electrochemical aid might be sought by using a low voltage current, making the lead lining of the vat the cathode and the work to be pickled the anode.

Movement of the work in the pickle, or the agitation of the pickle during pickling, or both.

The difficulties met with in the successful use of nitre cake solution can only be overcome in a satisfactory manner by paying close attention to the conditions governing the annealing so as to obtain the annealed brass as clean as possible, and by using the nitre cake solution under conditions which will most strongly stimulate its pickling activity.

Swedish Iron-Ore and Steel Output in 1916

Iron-ore exports from Sweden in 1916 were less than in 1915, or 5,339,000 metric tons, as compared with 5,994,000 tons. The 1913 exports were 6,440,000 tons. The pig-iron output fell off slightly in 1916, having been 737,300 tons, or 30,300 tons less than in 1915. It was, however, about 93,000 tons more than the yearly average for the last 10 years of 643,700 tons. The Bessemer steel production decreased last year 15,000 tons but the open-hearth output increased 25,000 tons. Iron and steel imports in 1916 were 28,000 tons greater than those for 1915, when they were 230,000 and 17,000 tons more than the yearly average for the last 5 years.

New Electric Steel Foundry in Ohio

The Fairbanks Steam Shovel Co., Marion, Ohio, is building a new steel foundry, 62 x 300 ft., one story, equipped with a 1½-ton Snyder electric furnace for making steel castings, forging billets and ingots. It is expected to be in operation by Jan. 1.

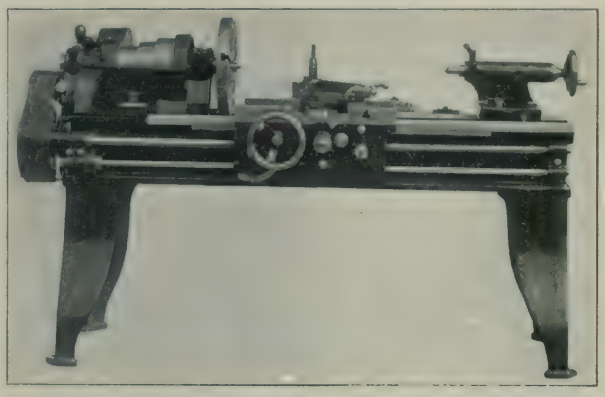
The Philadelphia section of the Association of Iron and Steel Electrical Engineers will hold a meeting on Saturday evening, Nov. 3, at the Majestic Hotel, Broad Street and Girard Avenue. No general paper has been announced.

A 14-in. Lathe with Special Feed

The American Machine Tool Engineering Works, Chicago, has placed on the market a 14-in. back-geared lathe. Among the points about its construction that are especially emphasized are the use of a feed change lever on the apron, an extra long tailstock spindle and a lever for shifting the double back gears that is placed within easy reach of the operator. The lathe is designed for both toolroom and manufacturing work and is supplied with a large number of change gears, thus providing for a wide range of thread cutting of both English and metric pitches.

The headstock of the lathe is of the bowl type and has a 0.60 per cent carbon crucible steel spindle. The spindle is bored to hold a bushing with a No. 3 Morse taper, and the bearings, which are of bronze, are finished by scraping to fit the spindles. The lathe has a swing of 14⅝ in. over the ways and a 6-ft. machine will mount work 36 in. long between centers. A three-step cone pulley ranging in diameter from 5½ to 8 in. drives the spindle, the power being transmitted from the countershaft by a 2½-in. belt. The spindle has 18 speed changes ranging from 30 to 655 r.p.m. The lever for shifting the back gears is located at the end of the headstock, where it is within easy reach of the operator.

The carriage has a bearing 23 in. long on the V's and the bridge is 7¼ in. wide. The feed rod is driven from the headstock by a train of gears through an overload friction, thus eliminating the feed belt and at the same time providing a safety device in case of accident. The feed change lever is located in the apron, and by moving this lever to any one of four positions it is possible to vary the cross and longitudinal feeds. This arrangement, it is explained, is in addition to the feed reverse levers usually found in lathe aprons. A safety device is also provided in the apron to prevent the half nuts from engaging with the lead screw when either of the feeds is engaged or vice versa. The tailstock spindle is 1¾ in. in diameter and has a travel of 8 in. A metric lead screw and change gears for cutting threads from 1 to 7 mm. may be supplied if desired.



Four Changes in the Cross and Longitudinal Feeds of a New 14-In. Back Geared Lathe Are Secured by Moving a Lever on the Apron

The Page Woven Wire Fence Co., Adrian, Mich., and Monessen, Pa., which has been doing business under that name for 30 years, has announced a change in its corporate title, effective Oct. 22, to the Page Steel & Wire Co. The announcement says that the change in name involves no change in attitude toward any of the old lines of production, but has been decided upon because of expansion of the company's business in such a way that the old name has been outgrown and is a misfit. The parent business of the company was wire fencing, but it has developed other products, among them wire rods, rope wire and spring wire, and it also has made arrangements with the American Rolling Mill Co., Middletown, Ohio, and the Copper Clad Steel Co., Pittsburgh, for the exclusive sale of iron and steel wire manufactured by these companies. The Page Steel & Wire Co. announces also the opening of an office in the Union Arcade, Pittsburgh, in charge of E. C. Sattley, general manager.

Steel Plant Electrical Safety Provisions

In a paper presented at the eleventh annual convention of the Association of Iron and Steel Electrical Engineers, Philadelphia, Sept. 10, Walter Greenwood, safety engineer Carnegie Steel Co., Ohio Works, Youngstown, Ohio, discussed automatic engine stops, switches and cranes from the viewpoint of safety.

Automatic Engine Stops

Automatic engine stops of some kind, he said, were found installed on nearly every engine the turbine or flywheel of which burst in the last 10 years and, if possible to do so, he believes they should be so constructed that with ordinary attention they will not fail to operate when required, regardless of the inconvenience they may cause by operating unexpectedly by reason of their own imperfections or by failure of their operating agency. In each of five cases of burst turbines which have come to his attention, the turbine was equipped with an automatic controlling device which failed to prevent the explosion.

He gave as a reason for favoring an electrically operated unbalanced stop valve, installed along with such other automatic devices as may be required, that an electrically operated valve may be operated from numerous points remote from the engine if desired. Where electrical stops are used an independent generating outfit connected to a wet battery should be installed in a plant of any considerable size. This would insure against failure of current, but to further insure against such failure a switch should be supplied to automatically cut in current from one of the most reliable circuits of the generating station in case the independent generators failed or stopped. He recommended that an emergency valve never be placed with the stem on the underside and that on all engines the oil be fed in ahead of it. Valves on turbines, he said, can be given sufficient lubrication to prevent corrosion or accumulation of matter around the stem, and the lubricant should be injected directly on the valve stem in a quantity so small that it can have no noticeable effect on other parts of the turbine.

There exists, he believes, a hazard from blast-furnace blowing engines over-speeding and that this can be reduced by installing unbalanced valves kept open by a magnet, but not automatically closed from overspeeding. These could be operated by breaking the circuit from various remote points. The process of stopping an engine by closing the throttle, he believes too slow, even though an attendant is near at the critical time. A valve such as he has in mind would check the speed of the engine without stopping it entirely.

Switches

Regarding switches, he recommended that the operating engineer be satisfied only with a switch that possesses all requirements for economic operation, and he believes that such operation is possible from a good safety switch. The interlocking feature to positively prohibit closing a circuit before closing the switch encasement, he believes, is of less importance than the matter of seeing a switch in operation while inspecting it. He recommended further that switches be constructed for quick break and for a quick closing; that they be inclosed by waterproof encasements of noncombustible material; that their throw be made from the outside of the encasements by levers or rods so that the circuits can be closed or opened without opening the casings; that except for a few exceptional purposes, they be fused on the side that is dead when the circuits are broken, and that provisions be made for locking them open with a considerable number of locks.

The claim that low voltage will not injure a person unless his heart is not in normal condition, he says, seems to have been contradicted in one particular case brought to his attention in which two men were electrocuted by contact with the same wire, carrying low-voltage current, in the same place and at the same time.

Stops on Crane Runways

A suggested safety provision for use on crane runways, which he said has been very popular with safety men, is a track stop fastened to the rail, but he believes that safety can be provided for in the arrangement of the wire installation so that a simple appliance can be set at any point on the track to break the current and apply the brakes to the crane. Between the two methods, stopping the crane by an obstruction that adds a new hazard and stopping by manipulating the current, the latter he held should have the preference.

Improving Correspondence Discussed

Recognition of the importance of better business correspondence found expression in a convention arranged by the Norton Co., Worcester, Mass., and held in the assembly hall of its administration building, Oct. 15 and 16. About 160 delegates from 35 cities attended the sessions.

Among the speakers on the program were: Charles R. Wiers, Larkin Co., Buffalo; E. H. Fish, H. N. Rasely and E. J. Chaffin, Norton Co., Worcester; John F. Tinsley, Crompton & Knowles Loom Works, Worcester; L. A. McQueen, B. F. Goodrich Rubber Co., Akron, Ohio; E. P. Cramer, Goodyear Tire & Rubber Co., Akron; John J. Morgan, John J. Morgan Advertising Co., Boston; Prof. Paul G. Cherrington, Harvard University School of Business Administration; Nelson C. Durand, vice-president Thomas A. Edison, Inc.; and Prof. George B. Hotchkiss, New York University School of Commerce, Accounts and Finance.

Among the many manufacturing companies represented were the following from the metal-working industries: Simonds Mfg. Co., Fitchburg, Mass.; New Jersey Zinc Co., New York City; Stanley Works, New Britain, Conn.; Art Metal Construction Co., Jamestown, N. Y.; Kawneer Mfg. Co., Niles, Mich.; Taft-Pierce Mfg. Co., Woonsocket, R. I.; Bilton Machine Tool Co., Bridgeport, Conn.; Warner & Swasey Co., Cleveland; Chase Rolling Mill Co., Waterbury, Conn.; Locomobile Co. of America, Bridgeport, Conn.; Columbia Steel & Shafting Co., Pittsburgh.

There was such keen interest in the discussions that a committee of five members was appointed to plan for another convention next year at Akron.

The First Heine Boiler Still Fit for Service

The first Heine type boiler ever built was installed in 1881 in one of the armories of the Missouri National Guard at St. Louis. A few months ago the building was destroyed by fire and the boiler was subsequently removed by the Heine Safety Boiler Co. It has 24 tubes about 10 ft. long with a heating surface of approximately 250 sq. ft. The boiler was inspected by one of the boiler insurance companies and as a result a certificate that the boiler could carry a pressure of 80 lb. as compared with its original pressure of 100 lb. was issued. The tubes were pitted and will have to be replaced and the blow-off flange must be renewed. With these exceptions, however, the boiler is in good condition. One of the interesting features is the use of vertical baffling, which has been superseded by the horizontal type in both the land and marine boilers built by the Heine company.

Purchasing Agents Close Meeting

At the closing session of the National Association of Purchasing Agents, held at the William Penn Hotel, Pittsburgh, last week, E. L. McGrew, purchasing agent of the Standard Underground Cable Co., was re-elected president, and L. F. Boffey of New York City was re-elected secretary. Other officers elected were: N. O. Acby, first vice president, Columbus, Ohio; Charles P. Kingston, second vice president, Detroit; William B. Golder, third vice president, Philadelphia; and W. T. Hall, treasurer, New York. After final adjournment, the delegates made a trip of inspection to the plants of the Westinghouse Electric & Mfg. Co., East Pittsburgh. Detroit was chosen for the convention next year.

The district offices of the Concrete Steel Co., formerly located in Youngstown, have been removed to Cleveland. D. S. Bright is district sales manager, and M. H. Stevens has been made manager of the plant at Youngstown.

NEW MILITARY TRUCK TESTED

Remarkable Record Made in Manufacturing Standard Military Truck

WASHINGTON, Oct. 23.—An order for 10,000 standard military trucks has been placed by the War Department. The contract will be scattered throughout the automobile industry of the United States, about 60 plants participating in the making of the different parts. The first test sample of the standard truck was completed at Lima, Ohio, and a second at Rochester, N. Y. They completed their test runs to Washington, D. C., last week. The designing and building of these trucks is considered another war-time achievement by those in charge of this phase of the quartermaster's work.

The designs were started last August with the assistance of the Society of Automotive Engineers. The standard truck only will be supplied to the American army after Jan. 1 next. This means that only 7500 different parts will be carried in stock for repairs by the quartermaster. Because of the varying types of trucks now used by the Allies on the front, a stock of about 2,000,000 different parts is carried in France.

So successful has been the work of standardizing the three-ton truck that the War Department is intending to have the three-quarter ton and the one-and-a-half-ton truck standardized for the use of the army. The two trucks put through their tests this week were both of the class B truck design for a three-ton load, but with capacity for five tons. The assembling of these trucks as well as the designing of them sets a high mark in American production, the first truck having been assembled two days ahead of schedule.

The two trucks that have been assembled have exceeded the expectations of not only Brig. Gen. Chauncey B. Baker of the Quartermaster's Department, who has directed the work, but also of the two score of engineers and hundreds of draftsmen who worked on the design in Washington. Early tests of the engine showed 58 horsepower at 1350 revolutions per minute, and the engine torque curve is better than anticipated. It is felt that the United States heavy-duty war truck will go far to revolutionize army truck work so far as operation and maintenance are concerned, and that the truck will play a large part in affecting truck design in commercial circles.

The speed with which the different makers attacked their respective tasks and completed them is shown by the following:

The Continental Motor Mfg. Co., which was one of the several engine producers participating in the program, received blueprints on Sept. 9, and had an engine running 19 days and 18 hours thereafter, while the Waukesha Motor Co. had its first engine running in eleven days and seven and one-half hours from the time the blueprints reached its factory. These companies did not have to make all the patterns for castings for the dies for forgings, some of these having been made previously, but they had to do most of the machining and other operations on the parts. In developing the engine four or five makers co-operated by distributing the different parts, one making several parts not only for itself but for the other engine makers. In this way time was saved. The Continental company made the cylinders, gearcase cover, and many small parts such as pumps, bushings, etc. The Waukesha company manufactured the cylinder heads, the crankcase, intake and exhaust mainfolds, roller push-rods, etc. The Wisconsin company made the lower part of the crankcase.

The remarkable patriotic response of manufacturers of raw and finished products made possible the completion of the units in record time. As an illustration, the Park Drop Forge Co. worked continuously in three shifts and succeeded in sinking the dies for the crankshaft in seven days, an operation which is rarely completed in peace times in less than three weeks. The Werra Aluminum Castings Co. produced the pattern for the main crankcase and the first casting in five days, this usually taking from three to four weeks on much smaller jobs. The Continental pattern shop completed the pattern for the cylinder pairs in slightly over five days, an accomplishment which can be appreciated only by those who have manufactured engines.

In summarizing the co-operative talent embodied in the engine, it might be said that the crankcase is Continental, the cylinders Waukesha, the oiling system a combination of Wisconsin and Buda, the pistons Hercules, and the timing-gear system a combination of Buda, Wisconsin, and Continental. The governor is a combination of Kelly-Springfield and Waukesha. The camshaft is a composite design. The engine has been designed with the thought of using the heavier fuel, the combustion chamber and other parts having been designed to meet these requirements.

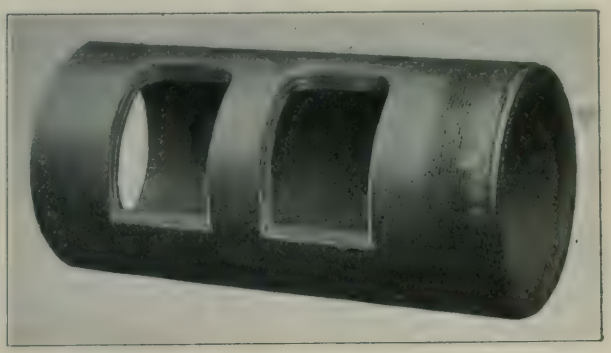
What has been said of the engine can be said of the transmission, the axles, and other parts. Three or four of the leading axle makers have worked together on the axle design. So with the transmission.

So well have all the engineers co-operated that the schedule set for the completion of the different truck units, as well as of the completed truck, has been lived up to and generally improved upon. The first engines built in different factories were to have been delivered on Sept. 30 and they were delivered on that date. The completed chassis was to have been ready Oct. 10 and was ready on Oct. 7.

The Automotive Products Section of the War Industries Board is composed of H. L. Horning, chairman; Brig. Gen. Chauncey M. Baker, officer in charge of army transportation; Coker F. Clarkson, secretary and general manager of the Society of Automotive Engineers; C. W. Stiger, president, Motor and Accessory Manufacturers' Association; Henry R. Sutphen, president, Motor Boat Association; Frank Russell, president, Aircraft Manufacturers' Association, and T. W. Henderson, president, Motorcycle Manufacturers' Association.

An Example of Three-in-One Piping

An interesting example of what wrought pipe will withstand is shown in the accompanying illustration. It appears that in an Ohio gas field a string of 1440 ft.



Three Sections of Well Casing, in Falling 200 Ft., Were Telescoped Without Breaking the Weld

of 8¼ 24-lb. steel casing was let go and the string, weighing something over 34,000 lb., dropped 200 ft. to a bottom of limestone. The three sections on the bottom were telescoped, one inside and the other outside. No failure in the weld could be noted and the three lengths were thus telescoped without a crack. The exterior appeared like merely a straight length of casing. The piece was machined to show the three separate sections as telescoped. The exhibit was obtained from the National Tube Co., Pittsburgh.

Regarding a tungsten deposit at Hatches Creek in the Northern Territory of Australia, the report of the Director of Mines of Australia states that the reefs are numerous, well defined and with considerable persistence in size along the line of outcrop. With the introduction of capital and better transport facilities the field is destined to become an important producer in the future. The British Trade Commissioner in New Zealand reports that an important find of scheelite has been made in the Barewood district. A Dunedin syndicate has secured an option and opened up the reef.

Failure of Boiler Plates in Service*

Investigation Shows Fatigue of the Material to Be the Cause of Cracks in Riveted Joints

BY E. B. WOLFF

THIS research was undertaken with the view of finding the causes of the cracking of boiler plates over the riveted seams. The boilers were of the single-ended ordinary marine type with three flues. The shell plates and the rivets were generally approximately 32 mm. thick, made some from basic and some from acid open-hearth soft steel with an ultimate tensile strength of 42-48 kg. per sq. mm. and an elongation of 23 to 20 per cent in 10 in. The phosphorus and sulphur contents had to be under 0.05 per cent. Most of the boilers with the cracked plates belonged to steamship companies, the boats of which made voyages with a great many stops, so that the fires were frequently extinguished and relighted. Most of them being oil-fired, this could be done very easily. The plates of coal-fired boilers, however, cracked in the same manner. Boilers made of the same material for other companies, the boats of which had only long non-stop runs, did not fail.

The researches were started after one of the boilers had exploded. An investigation showed that the explosion had been caused by the shell plate of the boiler having burst open in the middle of the double butt strap joint at the side. Through the large opening the contents of the boiler had been ejected, destroying the hull of the ship and causing much damage.

After the rupture the shell plate, at the place where it had failed, had a thickness varying from 33 mm., the original dimension, in the middle, to 27.5 and 28 mm. at the sides. As the plates had an equal thickness in all other parts, the only possible explanation of this difference was that the plate had failed by the forming of a crack in the middle of the length of the boiler, this crack having gradually developed to such an extent that the sound part at the sides could not withstand the boiler pressure and failed suddenly, showing a reduction of area only in that sound part. As at the time the direct cause of this disaster could not be ascertained, it was decided to take out of service all boilers made of the same material and at the same time as the burst boiler. It was found that a large part of the shell plate, under the butt strap cover plate, had cracked. The crack could only be detected by taking off the cover plate. From Fig. 1 it can be seen that if the boiler had been kept in service much longer a similar disaster would have followed.

In the years following other boilers, made with every precaution and good workmanship, and of the best material obtainable, also cracked, but not always in the same seam; sometimes the lap joint, joining shell plate and front plate, failed; in other cases both joints developed cracks in some parts.

Description of the Cracks

All the cracks found are, in the beginning, defects of microscopical dimensions. It would occur that a boiler, the side seam of which had failed, would be sent back to the boiler-shop to be fitted with a new shell plate. After detaching the front plates, nothing abnormal would be seen, and it would be decided to make use of the old front plates and fit new shell plates to them. The shell plates were bent with great care to the radius of the front plates and bored in position. When the first rivet, joining the front and shell plates, was put in, cracks appeared in some of the old rivet-holes of the front plate. By a renewed examination of the other rivet-holes, after cleaning the metal by scraping it carefully and later etching it, minute cracks were detected. The etching of the front plate, in the manner presently to be described, disclosed a great many miniature cracks.

The cracks were found in the butt joints as well as in the lap joints, but in all cases they started either from the inside of the holes, in two places, where the highest tensile stress occurred, or at the surfaces of the plates where they were pressed on the surfaces of other plates. Fig. 2 gives a view of the peculiar form of these cracks. Where they are found in the rivet-holes of the plates, they occur generally on two sides of the holes; in the case of the pipe-holes of the tubular boiler they spread from the top of the hole inward. When they occur on the surface of the plate, it is generally around the rivet-holes.

The cracks start as miniature surface cracks of microscopical dimensions. Every little crack has been formed by itself, without the slightest reference to its neighbors. A polished and etched section through these cracks shows that the crystallites in the immediate neighborhood have not been deformed. The structure of the material has in most of the cases been found quite normal, no free cementite being present. Afterward the cracks grow in length and depth, and unite in longer ones, forming a peculiar stepped line.

All evidence points to a peculiar form of destruction of the surface layers of otherwise very plastic metal. As the cracks always started at the surface of the metals and in the holes over the entire thickness of the plate, phosphorus or sulphur segregations, if these had occurred, could have had no influence. No segregations of importance were, however, found in most of the cracked plates. At first it was thought that the deformation of the material in the rivet-holes made by the boring of these holes might have had a great influence. As it was not possible to produce similar cracks in holes that were bored with a blunt drill, and as pieces cut out of such a hole and bent open, till the deformed surface broke, showed sufficient deformation before breaking, it was concluded that if the deformation had been one of the causes, it could only have been a secondary one. As hand-riveted joints cracked in exactly the same manner as joints where the rivets had been pressed in by the hydraulic riveting machine, the pressure of this machine on the plate also cannot be the cause of the cracking.

Fatigue As a Cause

The only phenomenon known, where cracks of the kind described have been observed in plastic material, is that known as fatigue. The researches of Ewing and Humfrey have disclosed the mechanism of the formation of these very local hair-cracks in plastic metal. A case of the formation of similar cracks in a large shaft, where overloading in service could be proved, showed the same kind of cracks after etching with diluted sulphuric acid. Fig. 3 shows that the

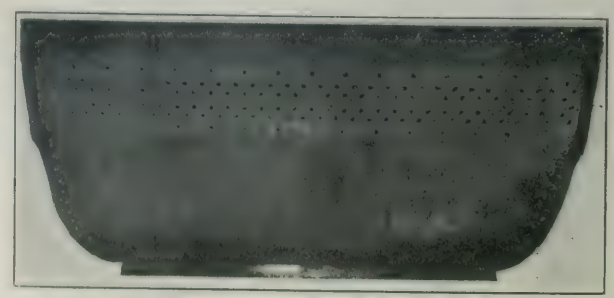


Fig. 1—Cracks in a Boiler Revealed After the Cover Plate Was Removed

*From a paper presented at the annual meeting of the Iron and Steel Institute, London, Sept. 26

crystallites in the immediate neighborhood of the crack were not deformed. This was also the case with the boiler-plate cracks.

It may be observed, in the first place, that the ships with boilers that have cracked made relatively short voyages along the coast, and that in the beginning no care was taken to avoid changes in the steam pressure. When later care was taken to maintain the steam at a regular pressure, the cracking diminished. The first boilers were oil-fired, and were made of basic open-hearth material; afterward boilers both oil and coal-fired made of first-quality Scotch acid steel cracked in the same manner. Notwithstanding the severe conditions of the service, the number of the alternations is, however, only few, when compared with that required to produce ordinary fatigue breaks. Only when it can be proved that at the places where the cracks are found, abnormally high stresses can occur, may we accept fatigue as the cause of these cracks.

From the theory of Kirsch and Leon, and the tests by Preuss, the tension at the edges of a hole in a bar loaded in the direction of its axis may amount to three times the average tension calculated for that bar. If the holes of a riveted joint can behave as in ordinary bars, we have an explanation for the fact that the tensions at the edges of the holes can reach a very high value. The average tensional stress in the cracked plates was approximately 11 kg. per sq. mm. When this value is trebled, we reach such a high stress in these places that very few alternations will suffice to cause a crack.

With a view of proving that the friction between

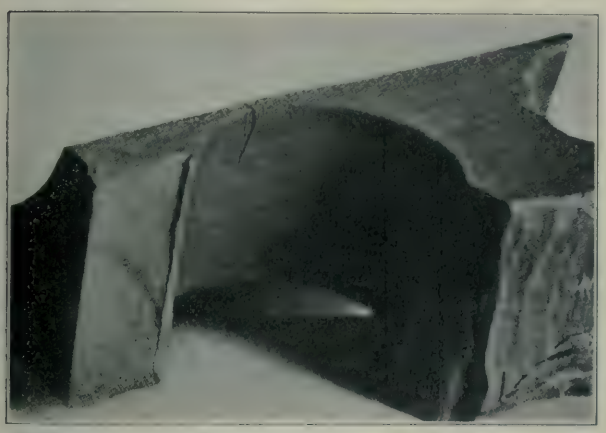


Fig. 2—Cracks in the Waterdrum of a Tubular Boiler of the Yarrow Marine Type. The distance of the holes for the pipes to the edge of the thicker part of the shell had been made too small; after some years of service cracks appeared at the outer surface. After taking the tubes out and etching the holes, miniature cracks did appear even in holes that had seemed faultless

the plates will not be sufficient to counteract the deformation of the sides of the holes, and in order to learn the values of the local stretch in different places of the surfaces of the plates that are pressed against each other, the author has made use of a special type of extensometer, designed by Mr. Okhuizen.

[The original paper gives details of the design of this extensometer and of the tests.]

Conclusions

The investigation proved that peculiar kinds of cracks occur in riveted joints of all kinds of boilers in service. These cracks are in most cases invisible in the beginning and can then only be observed after etching the plates. They are found either on the inner surfaces of the rivet-holes or on the surfaces of the plates where these are pressed together. They are found in lap joints as well as in butt-strap joints, in shell and front plates as well as in firebox plates. The real stresses in different place of the riveted joints have been measured by a special extensometer (Okhuizen), and it has been proved that the supposition that these cracks have been caused by fatigue of the material is probably right. The real stresses that occur in boilers can be even much higher than those in a test-piece.

P. D. Merica, in *Metallurgical and Chemical Engineering*, May, 1917, has published the results of an investigation on the embrittling action of sodium hydroxide on mild steel and its possible relation to seam failures of boiler plate. The conclusion drawn is that the influence of alkali on steel can be detected principally by means of the alternate bending test, the number of alternations being some 20 per cent lower for the metal treated by the alkali than the values for the untreated metal. A recovery of the material occurs after a week's time of treatment at the temperature of 180 deg. C.

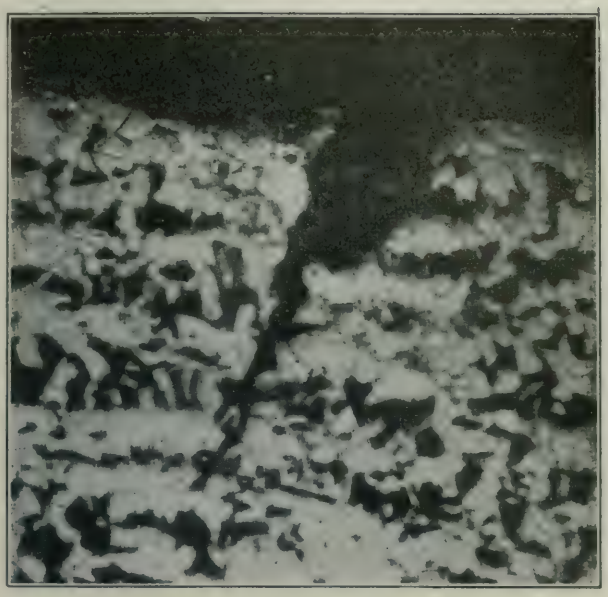


Fig. 3—One of the Cracks in a Shaft. The crystallites have not been deformed. Magnification is a slight reduction from 80 diameters

The same kind of cracks mentioned in the present paper were found by Mr. Merica in different kinds of boilers. The cracks described by me have occurred not only in the water-space but also in the steam space of boilers. Being extremely local, in most cases no leakage was observed and no boiler scale was found between the plates. Since the boilers crack after having been in service for one or more years, recovery of the material from the effect of the alkali, mentioned by the author, should have taken place long before the cracks started.

Commenting on Dr. Wolff's paper, the London *Times* says: It is a fortunate circumstance that in spite of the large number of marine boilers in service, roughly estimated by J. T. Milton, engineer surveyor of Lloyd's Register, at 50,000, and although these are of all ages, the case described in the paper is practically the only instance on record of a marine boiler bursting with disastrous effect while in service. Mr. Milton himself knows of no other case, and C. B. Stromeyer, another authority, who was formerly an official of Lloyd's Register, was able to confirm the statement. A point raised in the discussion referred to the fact that the plates of the boiler which exploded were probably of basic steel, whereas acid steel has been almost invariably employed for boiler plates, at least until recent years; and it was hinted that failures which have occurred in shell plating may be the result of using steel made by the basic process. The probable cause assigned for the failure of the boiler plate which was the subject of discussion was the fact that in Continental practice boiler plates are annealed, and that by reason of the custom of annealing them in batches those in the middle of a batch so treated are subject to uneven heating, which leads to the development of defects that may cause failure in service. This view is to a certain extent confirmed by the fact that the trouble experienced with boiler plates is invariably round the edges, which are the part of the plate which would tend to be overheated by the annealing methods adopted; but it is the fact that plates which have not been subjected to annealing have failed in the same way.

WAR PROBLEMS DISCUSSED

Agricultural Implement Manufacturers' Convention—Co-operating with the Government

Many problems which the war has interjected in their business were considered by the manufacturers composing the National Implement and Vehicle Association at the twenty-fourth annual convention held in Chicago, Oct. 17 to 19. Especial emphasis was laid on the steps which had been taken to secure priority in the delivery of raw material to the agricultural implement industry, the action taken resulting in that industry being the first to arrive at a practical arrangement for close co-operation with the Government. Early in the situation, the executive committee of the association appointed a War Emergency Committee consisting of C. S. Brantingham, chairman; G. N. Peek, George A. Ranney, W. H. Stackhouse and H. M. Wallis. Further developments are described in the report of the committee as follows:

Method of Obtaining Priority

To obtain priority for this industry, the Government and your executive committee have appointed the members of your war emergency committee as a special committee, to be known as the Farm Implements Committee, this in compliance with the War Industries Board's request to deal with the Government Priority Committee on all questions of priority affecting the members of this association, as well as non-members in this industry.

This special farm implements committee has prepared blanks which have been approved by the Priority Committee. Copies of these blanks will be sent to the membership. These blanks call for certain information required by the War Industries Board, which must be furnished before priority certificates will be issued by the War Industries Board. Each case must be presented separately and passed on separately by the Priority Committee. The Priority Committee has requested that one person be designated as Washington representative, with whom it may deal as cases arise. It is, therefore, highly important that the membership cordially co-operate with this farm implements committee and thereby permit it to be of the greatest possible help to the industry, as well as to the individual members seeking priority for their orders.

The retiring president, Joseph Dain, Deere & Co., Moline, Ill., referring to priority and the farm implements committee, in his address, said:

Let me request not only the members of our association, but all of the manufacturers of implements throughout the country, to readily and heartily respond to all requests for information which may come from this committee or any priority committee that may have Government sanction. The information so furnished will be absolutely essential for the protection of the industry in its supply of raw materials, and absolutely necessary to the Government if it makes a limited supply of materials cover the greatest possible field. The association is going to great expense in handling these priority matters, and is entitled to the heartiest co-operation upon the part of all manufacturers in our line.

Discussion of Vital Topics

Thursday, the second day of the convention, was termed war emergency day, the topics being those vital to the present situation. C. S. Brantingham, reporting for the War Emergency Committee, said that no industry as a whole could be placed in priority class A or B, and that the Priority Board at Washington could only recognize a committee which represented the entire industry. Only specific orders are classified. Therefore, if the association were to help a non-member, it is necessary that the latter's inquiries should flow through the Farm Implements Committee. He stated that the suppliers of material are doing their best for the industry, but that they are co-operating with the Government and conforming with the Government's priority provisions. The Farm Implements Committee is purely advisory in its relations with the Priority Board, but it was reassuring that members of the board had personally, though not officially, stated that they regarded the implement industry as an essential to the conduct of the war.

George A. Ranney, International Harvester Co., Chicago, discussing the effect of the war on material deliveries and prices, gave the opinion that when present materials contracts expire, or by Jan. 1, the effect of the Government's action on prices will be felt; meanwhile buyers must be patient. He endeavored to give the convention a sense of the huge amount of money which the Government has appropriated—some $21,000,000,000—and emphasized the fact that it will largely be spent in promoting industrial activity and in procuring raw materials, one result of which will be that some industries will have to go without all the material they desire. He urged conservatism in exercising priority privileges, and said that for a manufacturer to ask for 1000 tons when he actually needed but 500 tons would tend to discredit the association and the industry it represents. He also said that the tremendous movement of materials and men by rail promised to create a great congestion in freight.

George N. Peek, Deere & Co., Moline, spoke on cost standardization and labor. He said that while it was understood that material prices would be revised Jan. 1, not one knew whether they would be revised up or down, and that no one cared to speculate. The determination of accurate costs was pronounced most necessary, said Mr. Peek, for the reason that the Government has the power to do about as it pleases with the agricultural implement industry. It remains to be seen whether the Government will exercise that power, but if it does, the industry must be in a position to give accurate costs. He said, also, that the manufacture of unnecessary machines, some of which could be described as whims, should be eliminated. He expressed the opinion that it was largely the continual turnover of labor in manufacturing plants that makes high labor costs, and that not enough attention is paid to seeing that every new man makes good, not only for his employer, but for himself; in other words, that he gets the wages he should get, in which event he would be more likely to remain satisfied.

Makes Plea for the Railroads

W. H. Stackhouse, French & Hecht, Springfield, Ohio, made a plea for the railroads in discussing transportation. He believed they should be accorded substantial increases in freight rates, and said that the depreciation of railroad equipment is a problem which must be met directly and without evasion. Recent methods of augmenting the service of the railroads, the speaker said, showed the wisdom of pooling arrangements and the hypocrisy of law, inasmuch as the railroads are now pooling with the connivance of the Federal Government. He also urged Federal incorporation and regulation of railroad securities, not with a view of depriving the individual States of their right to tax railroad property and impose police regulations, but to enable the roads to escape from a multiplicity of masters and an excessive number of laws. He said the most marked result of the present regulation will be the nationalization, to a large extent, of the railroads of the country.

Officers Elected for 1918

At the closing session of the convention, officers for 1918 were elected as follows: President, C. S. Brantingham, Emerson-Brantingham Co., Rockford, Ill.; chairman executive committee, G. A. Ranney, International Harvester Co., Chicago, Ill. Members executive committee: H. M. Wallis, J. I. Case Plow Works, Racine, Wis.; Wm. Black, B. F. Avery & Sons, Louisville, Ky.; F. G. Allen, Moline Plow Co., Moline, Ill.; R. V. Board, Kentucky Wagon Co., Louisville, Ky.; Willard Z. Carr, American Seeding Machine Co., Richmond, Ind.

Vice-presidents: Danforth Geer, W. A. Wood M. & R. M. Co., Hoosick Falls, N. Y.; J. D. Oliver, Oliver Chilled Plow Works, South Bend, Ind.; A. M. Ford, Geneva Metal Wheel Co., Geneva, Ohio; S. S. Davis, Rock Island Plow Co., Rock Island, Ill.; H. F. Yergey, Columbia Wagon Co., Columbia, Pa.; W. W. Miller, Miller Wagon Co., Edina, Mo.; Geo. A. Yule, Baine Wagon Co., Kenosha, Wis.; H. C. Hargrave, Des Moines Silo & Mfg. Co., Des Moines, Iowa; W. B. Moyer, Moyer Mfg. Co., Montevideo, Minn.; W. J. Irons, Cushman Motor Works, Lincoln, Neb.; Chas. G. Rowley, Aspinwall Mfg. Co., Jackson, Mich.; S. C. Harlan, Florence Wagon Co., Florence, Ala.

Japanese Will Aid Chinese Enterprise

Announcement of a co-operative project between Chinese and Japanese capital to develop China's largest iron and steel enterprises has been made by Keiichiro Yasukawa, says *The Far Eastern Review*. He states that a company has been formed with $5,000,000 capital, one-half of which is subscribed by Chinese and the other half by himself, the Chinese parties interested being in control of the Hanyehping Works. The new company has entered into a contract with the Hanyehping company to furnish a large fixed amount of pig iron which will be transported to Japan, where the new company will put up large steel works at Kurosaki, a small town on Hakata Bay, in Kyushu. Mr. Yasukawa is one of the biggest figures in Japan's mining industry. Of late he has extended the scope of his enterprises, embracing many other lines, including banking. At his own expense he has established a technical college at Tobata, Fukuoka prefecture. He is also a member of parliament. Originally his plan was to manufacture steel in China and export it to Japan. The duty on steel, however, is $5 a ton, while on pig iron it is but $0.70 a ton. For this reason it was decided to manufacture in Japan.

In the first week of October, 1916, a provisional contract was signed between the Hanyehping shareholders and Mr. Yasukawa. On the basis of this provisional agreement, a new company was planned under the name of the Kyushu Steel Works, a joint enterprise with a capital of $5,000,000, equally divided between Chinese and Japanese. The promoters planned to start work at once on the new plant, but delay was due to protracted negotiations with the Imperial Japanese Government Steel Works over the proportional share of pig iron to be delivered. The amount of pig iron which it is planned to produce is between 450,000 and 500,000 tons. The Kyushu Steel Works will obtain, with the consent of the Government Works, a supply of 60,000 tons per year.

Discussion of Papers at Institute Meeting in Cincinnati

Patriotism is to be the keynote of the meeting of the American Iron and Steel Institute to be held in Cincinnati on Friday of this week. The paper by S. S. Wales, electrical engineer Carnegie Steel Co., on "Recent Installations of Large Electric Motors in Rolling Mills," will be discussed by Wilfred Sykes, Westinghouse Electric & Mfg. Co., Pittsburgh, and David B. Rushmore, General Electric Co., Schenectady, N. Y. The paper by Henry F. Pope, president National Malleable Castings Co., Cleveland, on "Malleable Iron and Its Uses," will be discussed by F. E. Nulsen, Missouri Malleable Iron Co., East St. Louis, Ill.; Prof. Enrique Touceda, Rensselaer Polytechnic Institute, Troy, N. Y.; Frank Lanahan, Fort Pitt Malleable Iron Co., Pittsburgh, and J. S. Haswell, Dayton Malleable Iron Co., Dayton, Ohio. The paper by Eugene P. Thomas, president United States Steel Products Co., New York, will be on "Export Trade as Affected by the War." It will not be discussed nor will the paper by Joseph G. Butler, Jr., Youngstown, on "Fifty Years of Iron and Steel." Chairman John A. Topping of the Republic Iron & Steel Co. will discuss the paper by W. Vernon Phillips, Philadelphia, on "Iron and Steel Scrap."

At the banquet to be held Friday evening at the Hotel Sinton, there will be numerous short speeches and other interesting features.

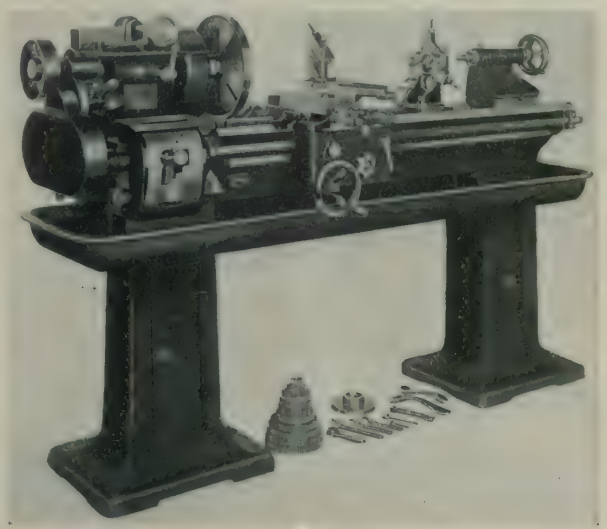
It is announced that employees of the Bellaire blast furnaces and steel works of the Carnegie Steel Co., at Bellaire, Ohio, will be furnished with coal this winter at 8c. per bushel. It is said that local dealers are now asking 16c. per bushel.

Several northern Ohio cities have received communications from the National Machinery & Supply Co., Hamilton, Ont., which is seeking a location for a new plant. A building with 75,000 sq. ft. of floor space is desired.

A New 13-in. Geared Lathe for Toolrooms

A 13-in. lathe which can be used either for precision work in the toolroom or for manufacturing where accurate work is required has been brought out by the Master Machine Tool Co., 110 West Fortieth Street, New York. The headstock spindle has a wide range of speeds, from 28 to 418 r.p.m., in six steps, and is driven by a positive clutch. These changes are secured by a lever and handwheel conveniently situated on the headstock.

The bed has two wide V and two flat bearing surfaces reinforced by cross braces which are relied upon to reduce the amount of vibration. The lead screw, which is splined, is located directly under the guides, this arrangement being relied upon to provide a steady motion for the carriage. The spindle, which has a hole 1 1/16 in. in diameter throughout its entire length and is arranged for draw-in attachments and collets, is driven by a positive clutch. The bearings are of phosphor bronze and the large end of the spindle has a thread and shoulder for chucks and faceplates. Quickly adjustable collars are provided for taking up wear and a ball thrust bearing is provided to reduce the amount of end thrust.



A Positive Clutch Drives the Headstock Spindle in a New 13-In. Toolroom Lathe at Speeds ranging from 28 to 418 r.p.m.

The apron is of the standard double plate type and the rear one is detachable, to facilitate the removal of all parts for repair or inspection. The lead screw is splined for driving the worm which operates both the automatic longitudinal and cross feeds through a friction clutch. A safety lever is relied upon to prevent the engagement of the split nut with the lead screw while either feed is in use. The thread on the screw is employed only when screw threads are being cut, thus prolonging the life of the screw. A four-change feedbox is provided to house the steel gears. It is possible to secure any feed practically instantaneously from the roughing to the finishing cut. Threads ranging from 1¼ to 80 per in. can be cut by manipulating the gears in the feedbox, the proper position of the controlling levers being indicated on the gear plates.

The tailstock has a spindle 1⅜ in. in diameter and is provided with a side attachment for turning tapers. A special nut on the outer end of the tailstock holds the tailstock screw in place, and by unscrewing the nut it is possible to remove the entire screw easily.

The regular driving arrangement is from a reversing countershaft through a single pulley, but if desired a motor-driven tool with an adjustable chain drive and positive reversing mechanism in the headstock can be provided, or a special type of electrical reversing mechanism can be supplied which eliminates the controller generally employed.

The blast furnace of the Oriskany Ore & Iron Corporation, Lynchburg, Va., has been making ferromanganese since Oct. 6. John S. Kennedy has been general manager of the company since last June.

A RISING ALABAMA CITY

Advantages of Sheffield as a Producing and Shipping Point Becoming Recognized

THE decision of the Government's board of experts to locate the experimental nitrate plant at Sheffield, Ala., within a dozen miles of the Mussel Shoals, on the Tennessee River, together with the rehabilitation of the Cole furnaces by the newly organized Sheffield Iron Corporation, gives to this Southern city rather more than a local interest. It is already something of an iron center, through the operations of the Sloss-Sheffield Steel & Iron Co., and its facilities for water transportation in connection with that industry, as noted in THE IRON AGE, Aug. 16, 1917, should lend to this location an added importance.

Sheffield is a town of about 5000 population and was started at about the same time that witnessed the booming of Birmingham. It lies between the two older towns of Tuscumbia, on the west, which is about two miles away, and Florence, on the east, across the Tennessee River, and about five or six miles removed. This close proximity to the two older towns would seem to circumscribe Sheffield in certain minor matters, but it calls for no very great stretch of the imagination to picture all three of them grown together at no distant day, which was more than likely the dream of its founders. As a matter of fact, a residence in Sheffield gives to its people many of the advantages of the neighboring communities, all of which are connected with a satisfactory trolley service.

The nitrate plant will use between 500 and 600 acres of land, all of which has been provided, and it is current gossip that some of the machinery is now on the way, while within another week it is said that the building operations will be started.

Transportation Advantages

It is difficult to account for the very much greater growth of Birmingham than that which came to Sheffield, except upon the ground that Birmingham had a larger number of railroads and that her iron manufacturers had not so far to go for their ore and coal. Railroads will go, however, to where the business is; and when one reflects that Pittsburgh makes iron from Lake ores, and Chicago makes its iron with coke from Pennsylvania and West Virginia, the conclusion must be that Sheffield is not severely handicapped for her stock, going to Russelville, about 20 miles, for ore, and to Jasper, about 80 miles, for coal.

There is one thing about water transportation that cannot have penetrated the minds of many of the large shippers, and that is that a steamboat capable of handling a dozen barges of iron or coal can be launched and equipped for less than the present price of a first-class locomotive.

Within a few months a prominent manufacturer of pig iron in the Birmingham district, employing some 30 locomotives between its mines and furnaces, wanted an engine of certain specifications and wrote to a number of makers for their prices. The lowest price that the purchasing agent was able to get was so high, he said, that he dictated a letter to the effect that no engine on earth could be worth such money, and he would never pay such a price, but before the letter was mailed he received a wire withdrawing the quotation. Naturally, the cost of building boats has also advanced in recent years, but timber can still be had in certain sections at reasonable prices, and a small steamboat can be made to handle a number of very large barges.

Perhaps the best comment upon Sheffield as a center for large manufacturing plants was recently made by the president of one of its large enterprises, who, on a visit from New York, remarked that the place was steadily growing in his estimation; that the more he considered it the better it seemed. The climate, the natural resources, the negro labor and the shipping facilities all conspire to effect a low cost of production, and with a navigable river the whole year the markets of the world are at Sheffield's gates. E. M.

STEEL PLANT SAFETY

Accident Statistics—Other Industries—Youngstown Sheet & Tube Co.

IN a paper presented before the National Safety Council at its annual meeting in New York, Sept. 14, D. R. Kennedy, assistant to the president, Youngstown Sheet & Tube Co., Youngstown, Ohio, gave accident statistics which, he said, were compiled from data presented by 23 concerns employing over one-half million men and representing, besides the steel industry, other large industries which have shown exceptional growth under the conditions brought about by the war and, therefore, in his estimation exemplify the worst phase of the safety situation. A review of his paper follows.

It is almost the universal experience that accidents started to increase early in 1914, reached their peak in 1916, and receded rather sharply in the first half of 1917, in spite of the fact that the employment roll of the industries involved is still mounting in the same or more pronounced proportion. However, not until some time in 1916 did organization for increased production become efficiently developed. While new men were arriving literally by train loads, and were more or less unfamiliar with the new type of employment, safety departments were lost in the maze of new construction and it was not surprising that the accident rate mounted rapidly and steadily. That the new man problem had much to do with the situation is shown in Vol. 4, No. 2, of the Bulletin of the Pennsylvania Department of Labor, by a chart of the Cambria Steel Co., showing that the liability to injury of the new man of less than 30 days' employment was six to one as against a man of 30 or more days' experience.

The table following shows the accident frequency rates per 100 employees for seven large iron and steel plants: the Commonwealth Steel Co., the American Rolling Mill Co., the American Steel Foundries, the Republic Iron & Steel Co., the Inland Steel Co., a subsidiary plant of the United States Steel Corporation, and the Youngstown Sheet & Tube Co.

Frequency Rates of Iron and Steel Plants

Total Number Employed	Year	Total Injured	Rate per 100
24,802	1914	7,445	30.0
26,740	1915	8,157	34.2
37,049	1916	12,951	34.9
45,945	1917	13,104	28.5

Comparable data were also furnished by the Ford Motor Co., the Eastman Kodak Co., the Raritan Copper Works, the Winchester Repeating Arms Co., the Goodyear Tire & Rubber Co., the Republic Rubber Co., the Omaha Gas Co., the Scovill Mfg. Co., the International Harvester Co., and Fairbanks, Morse & Co., as follows:

Frequency Rates of Other Than Steel Plants

Total Number Employed	Year	Total Injured	Rate per 100
58,240	1914	13,124	22.5
71,005	1915	20,789	29.2
95,902	1916	31,635	32.9
136,999	1917	29,315	21.3

The tables show that in both groups there was an increase in the accident frequency rate in 1915, and that it reached its peak in 1916. In 1917 the rate decreased. The reports received show that this tendency has been the common experience of nearly every plant. One or two plants reported a drop in 1916. None of the 23 companies shows an increase in 1917.

Statistics of the Youngstown Sheet & Tube Co.

The accident experience of the Youngstown Sheet & Tube Co. the last four years has been similar to that of the other seven iron and steel plants studied. The following table shows the rate of off-time accidents per 100 employees since 1913, and also the average number of days off for each off-time accident.

Off-Time Accidents Youngstown Sheet & Tube Co.

	1913	1914	1915	1916	1917
Rate of accidents per 100 employees	28.9	33.1	30.2	37.6	28.8
Average number of days lost	12.8	13.4	12.3	14.9	13.3

The original statistics which furnished the basis for these rates follow. They show the importance of the new man problem. The increase in the number employed has been: 1914 to 1915, 852; 1915 to 1916, 1500, and 1916 to 1917, 2500 men.

Original Statistics Youngstown Sheet & Tube Co.

	1913	1914	1915	1916	1917
Number employed	7,963	5,648	6,500	8,000	10,500
Off-time accidents	2,302	1,690	1,804	2,669	2,732
Days lost	29,432	22,715	22,300	39,256	36,472

Rates of accidents per 100 men employed for the first six months of 1916 and 1917 give additional emphasis to my point, that accidents have decreased in 1917. These rates include all accidents and not merely off-time injuries. They are, Mr. Kennedy believes, a true representation of conditions in the iron and steel industry, and also quite accurately represent the experience of the other manufacturing establishments furnishing data for this study.

Total Accidents per 100 Employees, by Months, of Youngstown Sheet & Tube Co.

Year	Jan.	Feb.	Mar.	Apr.	May	June
1915	17.9	21.0	22.8	25.3	23.7	24.1
1916	28.0	23.6	25.7	27.7	24.0	21.3
1917	17.0	15.5	18.3	17.3	19.5	18.2

Average Time Lost Per Accident

The following table shows the actual number of off-time accidents by years, also the number of working days lost on account of accidents, and the average yearly number of employees as furnished by the following seven plants; the Commonwealth Steel Co., the American Steel Foundries, the Youngstown Sheet & Tube Co., a subsidiary of the United States Steel Corporation, Fairbanks, Morse & Co., the Corn Products Refining Co., and the Republic Rubber Co.

Off-Time Accidents of Various Plants

	1914	1915	1916	1917
Total off-time accidents	9,309	10,325	16,734	17,622
Total days lost	59,881	55,956	122,401	116,069
Total employed	20,497	21,095	28,605	37,368

The foregoing figures further support the facts already presented, showing the tendency in industrial accident rates since 1914. All evidence thus far has shown that the peak was reached in 1916. Whether accident rates will continue to fall off as they have done in 1917 is hard to state, and as these charts have been prepared to show existing facts nothing by way of prophecy has been attempted.

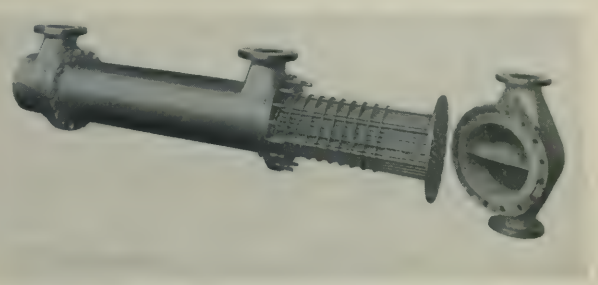
Data concerning the severity of work accidents during the period under study were obtained from a subsidiary of the United States Steel Corporation, the American Steel Foundries, Fairbanks, Morse & Co. the Corn Products Refining Co., the Youngstown Sheet & Tube Co., the Republic Rubber Co., and the Commonwealth Steel Co. The total number of working days lost in any year was divided by the total number of off-time accidents of that year. This gave the average length of time lost for one off-time accident for each of the four years as follows: 1914, 6.4 days; 1915, 5.4 days; 1916, 7.3 days, and 1917, 6.5. These figures show that the severity of accidents in 1917 has decreased, when compared to that of 1916.

About 12,000 tons of manganese ore has been shipped from Panama to the United States since the opening of the Mandinga mines by an American syndicate early in 1916, says U. S. Consul Julius D. Dreher of Colon. It is not expected, he reports, that any considerable quantity of ore will be mined in the future. The statistics in his report show manganese ore exports in 1917 to have been 9935 tons, valued at $328,684, with none exported in 1915.

Quenching and Lubricating Oil Cooler

For cooling the oil used in connection with quenching tanks the Griscom-Russell Co., 90 West Street, New York, has developed a special form of cooling apparatus. The features of the design of the cooler include the use of a number of tubes which form a compact bundle and a special form of helical baffle. Another application of the apparatus is for reducing the temperature of oil that has been employed for the lubrication of turbine bearings, reduction gears, etc.

The oil from the quenching tanks circulates continuously around the bundle of tubes through which the cooling water flows. In this way, it is pointed out, the temperature of the oil is constantly maintained at the desired point. The tubes are of seamless drawn copper and are expanded into the tube sheets at either end of the cooler. In this way the entire tube bundle can be removed as shown, thus facilitating inspection and cleaning. Other points upon which special emphasis are laid in connection with this construction are



The Oil Employed in Connection with Quenching Tanks Circulates Continuously around the Nest of Tubes through Which Water Flows and Is thus Kept at a Constant Temperature

a high rate of heat transfer, thus giving a compact unit that occupies but a small amount of floor space, and the elimination of internal joints and the removal of any likelihood of water leaking into the oil.

In operation the oil passes through the shell and a special helical baffle brings it into intimate contact with the cooling surface. It is emphasized that this type of baffle which gives the cooler the name of Multi-whirl insures a long, smooth path of flow for the oil with a small drop in the pressure.

The iron-mining interests of South Russia have approached the Ministry of Commerce and Industry with a memorial setting forth that, owing to the lessened activity of the metallurgical industries, they have been accumulating an unsalable surplus of iron ores, according to U. S. Consul David B. MacGowan of Moscow. It is estimated that on July 14 they had available ores sufficient for nearly six months of normal operation. The Krivoi-Rog mines are producing upward of 90,000 net tons a month more than the furnaces require. If the mines continue through the year at their present rate of production, the ore reserves will have attained almost 2,400,000 tons. Naturally the iron-mining interests are feeling the burden of obligatory production at a high rate, with so much of their capital invested in surplus ores. This investment, at the present rate of progress, will have amounted by the end of the year to upward of 15,000,000 rubles. (At the time this report was written, July, 1917, the ruble was quoted at 21c. to 22c.) The cost of production increased from 1.755 rubles per net ton in March, 1914, to 2.79 rubles in April, 1917. Upon the introduction of the wage scales that the mine owners have agreed to, the cost of production will amount to 4.59 rubles per ton, and if all the demands of the operatives should be granted they would amount to 7.56 rubles.

Hannah blast furnace of the Republic Iron & Steel Co., at Youngstown, was blown out last week for relining and repairs. W. B. Pollock & Co., of Youngstown, will do the work. The furnace has a daily capacity of about 350 tons.



How Goshen Furnace Was Remodeled

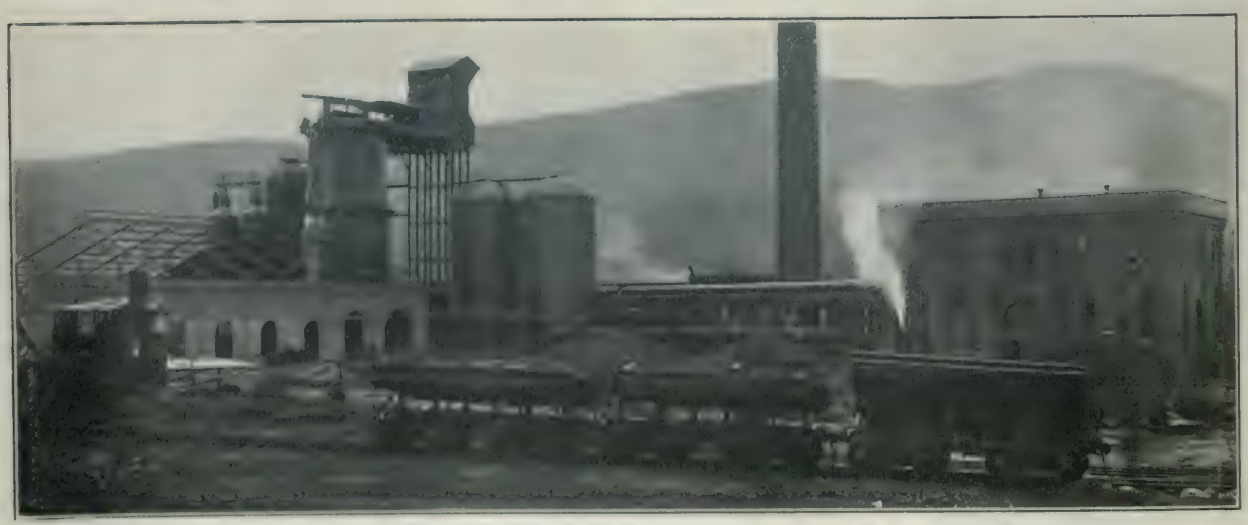
Undertaking Included Attention to Housing and Sanitation — Accomplished in Four Months by Unique Expedients—To Make Ferromanganese

AFTER extensive repairs, replacements and additions, made under trying conditions, the Goshen furnace of the Southeastern Iron Co., Goshen, Va., was blown in Oct. 8. Its production of iron is about 250 tons per day, but it will shortly go on ferromanganese, its capacity for the latter being about 75 tons per day. The furnace was acquired last May from the Goshen Furnace Co. by the Southeastern Iron Corporation, Tower Building, Chicago. It was originally known as the Victoria furnace, having been erected in 1882, and its last campaign, after rebuilding in 1902, terminated in December, 1910, when it was blown out.

The work of rebuilding, now practically completed, was handled by Freyn & Co., engineers, Peoples Gas Building, Chicago, who started work as general contractors in full charge about June 4. The furnace was ready for operation Oct. 5. Considering the difficulties encountered in securing adequate labor and prompt delivery of material and the housing and sanitation problems which were overcome, it is probable that the work accomplished in four months establishes a record for such performances. In the past seven years the majority of the former employees of the plant drifted away, and before labor could be induced to return it was necessary to do considerable repair work on the 80 dwelling houses owned by the company. In fact, the work was essential to afford accommodations for the new organization. The houses were redecorated and refurnished, as well as repaired, and one which was suitable for the purpose was fitted up as a club house for the employees. Provisions are being made for a moving picture theater, reading rooms, hospital, etc. To provide pure water 16 wells were drilled on the property and extensive provisions carried out for the sanitation of the dwellings and the plant itself. Old sewers were repaired and new ones added. As a precaution against typhoid all of the employees were inoculated. The local health officer said there was abundant justification for these measures.

Details of Repairs to Furnace

The construction work on the furnace plant proper included relining the existing stack in hearth



Goshen Furnace, Oct 14

and bosh. The dimensions of the furnace follow: Hearth diameter, 11 ft. 6 in.; bosh diameter, 18 ft. 6 in.; stock line, 13 ft., and height of furnace, 75 ft. The steel work required considerable patching, especially on the furnace shell and the bosh jacket, while the downcomer elbow was entirely replaced. The hearth and the bosh cooling arrangement was completely remodeled and provision made for cooling the stack by water sprays in view of the furnace being intended for the production of ferromanganese. Extensive repairs were made to the blast furnace top, the hoist engine and double vertical elevator. It is the intention, later on, to install a modern closed top and skip incline.

The cast house was rebuilt, and a Brassert gas washing unit was added to clean the stove gas, and later on the boiler gas. The unit was constructed by Hibben & Co., Chicago. The bell and hopper extension was protected by the Ives method of heat insulation. The four hot blast stoves were in good condition, although requiring some patchwork and repairs of the brick work. Three of the stoves have linings with 4½-in. checkers, and the total heating surface is sufficient to secure heats of 1500 deg. Fahr.

Old Locomotive Supplied Steam

The old tubular boilers were dismantled and replaced by six 400-hp. Babcock & Wilcox boilers, arranged for gas and coal firing. The early need for steam for construction purposes was met by utilizing an old and defective locomotive, the running days of which were over, but which still could produce steam. It was placed on a side track and supplied power for various purposes, including the operation of a turbo-generator by means of which the plant was lighted at night, thereby facilitating 24-hr. operations in the last few weeks of the undertaking. Previous to the arrival of the generator work was carried on by the light of torches. Another expedient was to fasten to a tree a Westinghouse air compressor of the locomotive type, the steam for which came from the old locomotive.

The old underground flues leading to stoves and boilers were partly rebuilt and partly abandoned. A new overhead gas main for the boiler gas was erected, making use of the sections of the old tubular boilers. A considerable part of the stove and furnace fittings, such as hot-blast valves, gas burners, hopper extension, mud gun, etc., were supplied. A reinforced concrete cinder pit with derrick, hoist and bucket were installed for granulating the cinder.

A new 50-ft. Fairbanks-Morse type F railroad track scale is now being installed. The steam piping of the plant was redesigned and renewed, the sub-contract for both steam and water piping being held by the Pittsburgh Piping & Equipment Co., Pittsburgh. The blowing engines were overhauled and fitted with new valves, and the capacity of the pumping equipment was increased by the installation of two new high-speed engine-driven centrifugal pumps of 3000 gal. per min. capacity each, thus providing for the additional water requirements of the plant. In addition to the turbo-generator for supplying light and power, air compressors were added to the equipment, and a locomotive crane, steam shovel, steam hammer and forge-shop and machine-shop tools were purchased. Two old locomotives were repaired and partly rebuilt.

Rebuilt Trestles and Bins

New facilities for loading and shipping were provided. Perhaps the most difficult portion of the work consisted in practically relaying all the tracks on the property, and in completely rebuilding the ore and coke trestles, as well as the pockets for raw materials. The latter began to arrive about the middle of July. The stock house was remodeled to facilitate handling and charging operations.

The majority of the men used in the construction force were natives, both whites and negroes being employed, but it was necessary to obtain workmen in the North to expedite the work. The construction organization increased from a few men early in June until the maximum of 330 men was reached in the latter part of September. Freyn & Co., the general contractors, had expected to have the furnace ready for blast by Oct. 15, but they succeeded in completing their task ten days earlier, despite labor conditions and the difficulty experienced in obtaining materials. They attribute not a little of their success to the co-operation which came from the Chesapeake & Ohio Railroad, as well as from the various sub-contractors and suppliers of material.

Buffalo Selected as Site for Steam Turbine Plant for Government

The United States Government has purchased a site of 20 acres at Buffalo upon which will be built an extensive plant for the manufacture of steam turbines for the fleet of destroyers to be constructed for the Navy Department. The plant will be operated by the officers of the Fore River Shipbuilding Corporation of Quincy, Mass., now a part of the Bethlehem Shipbuilding Corporation. Ground has already been broken for the initial main building, which is to be 700 ft. in length by 300 ft. in width, of concrete, steel and glass construction. The Aberthaw Construction Co. of Boston has contract for erection of the building; Monk & Johnson, Boston, being the construction engineers. The plant is to be ready for installing machinery Jan. 15. The cost of the equipment, it is stated, will be about $1,000,000. At the outset, 2000 skilled machinists will be employed, and the plant will be operated day and night to meet the demands that will be made upon it. Niagara Falls electric power will be used. The location is at Vulcan Street and the Niagara Falls Division of the New York Central Railroad, adjoining the large plant of J. H. Williams & Co., makers of drop forgings.

Takes Over Projectile Plant

The Liberty Ordnance Co., New York, a newly organized corporation, capitalized at $4,500,000, of which Kenneth W. McNeil of A. McNeil & Sons Co., coal merchant, 1 Broadway, New York, is president, has purchased the plant of the Bridgeport Projectile Co., Bridgeport, Conn. The company has received a Government contract for 12,000,000 shells and 300 naval guns. The plant of the Bridgeport Projectile Co. is one of the finest of the newly built munition factories in this country. It was erected at the beginning of the war by German capitalists to provide war supplies for Germany. Upon its completion in April, 1915, it began work on a $5,000,000 contract received from the German Government for shrapnel cases. Through Carl Heynan, the Kaiser's representative, $2,000,000 was advanced to the company. Heynan severed his connection with the company when Count von Bernstorff was sent back to Germany. Present offices of the Bridgeport Projectile Co. are at 52 Vanderbilt Avenue, New York.

Milwaukee manufacturers who have had under consideration for some time past the specifications for gun carriages for the 3-in. field pieces to be produced by the Wisconsin Gun Co., Milwaukee, have been obliged to abandon the attempt to undertake the carriage production because of the crowded condition of all metal-working shops and the heavy demands entailed by the ordnance project.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

Owned by the United Publishers Corporation, 243 West 39th Street, New York. H. M. Swetland, *Pres.* Chas. G. Phillips, *Vice-Pres.* W. H. Taylor, *Treas.* A. C. Pearson, *Secy.*

BRANCH OFFICES—Chicago: Otis Bldg. Pittsburgh: Park Bldg. Boston: Equitable Bldg. Philadelphia: Real Estate Trust Bldg. Cleveland: Guardian Bldg. Cincinnati: Mercantile Library Bldg. San Francisco: 320 Market Street.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

Definitions for Materials

Price fixing is going to improve the terminology of the iron and steel trade. There has always been room for criticism that the industry did not define its materials closely, but no one except the lexicographers seemed to care. It did not matter a great deal whether a given piece of steel be called a bloom, a billet or a slab, and, indeed, the question what is steel has been the cause of unending discussion. The market has settled these questions by attaching specifications or size limits to the material, whereupon the generic term to be applied became of minor consequence. The market would develop a price for the specification that would be mutually satisfactory to buyer and seller.

Now the price fixing reverses the order. In an open market the size or specification determined the price. First came the specification, then the price. Now the price is fixed first and the specifications that are to be included under that price must be drawn up. Prices have been fixed, for instance, at $47.50 for billets 4 x 4 in. and larger, $51 for smaller billets, $50 for slabs and $51 for sheet bars. This settles the matter for billets, provided they are square, but when the billet is not square when is it larger than 4 in. square and when is it smaller? When is a bloom a billet and when is it a slab? The process of manufacture does not define, for, even if it be admitted that all slabbing mills produce slabs, all slabs are not produced in slabbing mills. All blooms may perhaps be produced in a blooming mill but all blooming-mill product is not blooms. Some slabs are produced in a blooming mill.

The railroads have done something to improve the terminology of the steel industry. They have made the definitions of some of the materials more exact, but they have produced some confusion as well, and in some cases there has been one terminology for buying and selling material and another terminology for shipping it.

The gathering of production statistics has not helped to define the intermediate rolled materials, because the statistics of such materials are not gathered. In the gathering of statistics there has been no occasion to define a billet or a slab, for example, because the production statistics do not take cognizance of such materials. If the billet is to be subjected to further rolling it is left alone and the material is caught in the final hot rolled form. Statistics of the production of forging billets are gathered, but the distinction is commercial only, not physical. If the billet is to be forged it is a forging billet, no matter how soft, and if it is to be rolled it is not considered, no matter how hard.

Even in the finished rolled products the nomenclature employed in production statistics is necessarily more referable to origin than to either characteristics or use. The plate mills produce material thinner than quarter-inch, and that is called plates, while the jobbing mills produce material that is thicker than 13 gage, which is called sheets. Consumers require certain descriptions of this material which is sometimes bought from a plate mill and sometimes from a jobbing mill, depending upon market conditions. The market makes the price and the price determines where the order will go. Now the price is to be set first and for a given specification the price should be the same, no matter what the name of the mill may be that rolls it.

With fixed prices for pig iron the analysis must likewise be fixed. There is to be a price for No. 2 foundry iron. It is fortunate that grading by fracture has largely disappeared, for no set of definitions for fractures could possibly escape producing friction. When grading foundry iron by analysis the trade has had little controversy, for if a question arises it is merely necessary to prescribe the analysis in the sales contract. In a period of years the silicon conforming to No. 2 foundry iron in the Central West has varied upon occasion according to market conditions. In a strong market the silicon has more commonly been 1.75 to 2.25 per cent, but in a weak market it has often been defined at 2 to 2.50 per cent. Even at that, silicon has not always been the sole determining element, for low sulphur has sometimes been used to excuse a low silicon content in support of a claim that the iron is No. 2, anyhow.

All that is clear is that now that prices are to be fixed a great many definitions will have to be written. There will be many controversies, no doubt, but the opportunity is a magnificent one for the trade to improve its terminology. The spirit should not be that of merely "getting over" this

trying period but should be that of writing definitions that will remain for the future and be recognized indefinitely as standard. There is a chance to establish a nomenclature for the trade that will make the transaction of business easier after the war.

Allocation and Dilution of Labor

With the problem of the control of prices of raw materials and of the distribution of supplies and machinery now virtually solved by the Government, one of the disturbing factors in industry is fast being removed. Most manufacturers believe that they will soon know definitely just how the distribution of raw materials is to affect them.

But the greater problem—labor—is unsolved. This is the chief source of anxiety to-day. With the ever-increasing demand for workers in munitions plants, shipyards, and airplane and motor truck factories, a serious dislocation of labor is certain unless the Government finds a way to control this vital element in industry. Equally serious will be the further dislocation of wage rates and the continuance and perhaps expansion of this era of extravagant pay.

There is no war cloud of blacker portent than the persistent demand of labor for more pay. Strikes and threats of strikes prevail over the land. City bids against city and factory against factory for workmen, and not alone are those industries remote from the war program the sufferers—the manufacturer who is engaged in Government work finds himself with a shifting and unstable crew. In some cities there is a distressing shortage of labor; in others it is no uncommon sight to see files of men lined up before an employment office. A surplus of skilled labor is nowhere discovered, but unskilled labor is still fairly abundant in some cities. And most large cities have all too big a quota of men idle from choice.

It is hard to see how this difficulty is to be adjusted without legislation authorizing the organization of a body similar to the British Ministry of Munitions with its labor supply department. This means conscription of workers, a thing abhorrent to the American mind, but there is a growing belief that only through direct Government control of labor can the exigencies of the industrial portion of our war program be met. If Sir Stephenson Kent and his fellow delegates from the Ministry of Munitions of Great Britain can convince our manufacturers and the leaders of our workmen that in this direction lies the path that American industry must travel to most efficiently support our troops in the field and to shorten the duration of the war, then will the action of the Council of National Defense in bringing them to this country to address our citizens be more than justified. There are many difficulties and prejudices to be overcome, but it is unthinkable that the patriotism of employer and employee will fail to respond to any plan that gives reasonable assurance of larger production with equitable wages for workers, no unendurable hardships and no exploitation of labor.

New plants starting on Government work must secure the necessary complement of skilled employees, either by bidding for them with higher wages or by Government dilution of labor. The process of overbidding other employers promises to entail an aftermath of wage adjustment on the coming of peace that will create such labor unrest and industrial strife as America never has seen. Labor dilution—the transfer of skilled workers from the factory with a high percentage to the factory with a low percentage—appears the most logical solution of this problem. The allocation of skilled workmen to the plants whose products are most promptly needed on the fighting line needs little defense. It may be a matter of regret to break into a well-organized working force engaged in making the products of peace, but our real task now is to win the war. To this purpose every energy is being bent, and there must be sacrifices of individual profit and comfort in order that the future security and peace of the nation be assured —and that at the earliest possible moment.

Priority in Machine Tools

From the standpoint of efficiency in manufacturing guns, ammunition, airplane engines, turbines, ships and many other much-needed equipment for the war, nothing is of more importance than the tardy but none the less welcome effort of the Government authorities to straighten out the tangle in deliveries of machine-tools and kindred machinery which the priority orders of various departments at Washington have brought about.

Manufacturers of machine-tools have become almost exhausted by the effort of keeping their delivery records in proper order. One schedule of deliveries has been made up only to be torn asunder a few days later by another priority order. Even the recent decision of the Government to divide the priority orders into different classes, according to their relative importance in carrying on the war, was of little effect. Picture a manufacturer of machine tools whose plant is already filled up for many months ahead with nothing but Government work, all on priority orders, and then imagine his dismay when told that he must make certain deliveries within three or four weeks. His answer obviously must be that to shove in the new work ahead of the machines already on order simply means postponing deliveries on some of these latter machines, but this the various Government departments concerned will not listen to, and it ends up with the machine-tool builder being asked to do the impossible. To the credit of many of them it may be said that in the matter of deliveries they have achieved the near-impossible, and it is not going too far to say that no doubt many of them, spurred on by the urgent necessities of the Government, have excelled their own expectations. And this, too, despite the withdrawal of labor by the draft and the attractions of higher wages paid in munitions shops.

The Government has realized that something must be done to assist the machine-tool builders out of their dilemma. Hence a new department has been created by the War Industries Board, with G. E. Merryweather, a Cleveland machine-tool man-

ufacturer, who has been called into Government service, its head. Mr. Merryweather has already begun a movement to place all priority orders on a basis that will enable machinery builders to know where they stand. About fifteen of the foremost machine-tool engineers of the country have been summoned to Washington to assist in unraveling the tangle which priority orders have created, and it is confidently predicted that before their labors are ended the situation will have been so greatly improved that deliveries of machinery may proceed with few further hitches. The Government will map out its own needs as far ahead as possible and assist the machine-tool builders in arranging their delivery schedules in a way that will contribute most effectively to the war program.

Needs of the Ordnance Department

The Ordnance Department at Washington has called the attention of THE IRON AGE to the urgent necessity of co-operation on the part of metal-working trades in the work of bringing to full strength the necessary quota of men for the enlisted ordnance corps of the National Army. Skilled men in a great many different lines of trade are urgently needed at this time. In order to carry on effective fighting, men in the front line must have the skillful co-operation of specialists behind, and it is important that each man does the work for which he is best fitted, thus saving the Government a long period of instruction and also clearly increasing his own chances for advancement in rank. The ordnance corps has well been called "The Army Behind the Army."

We take pleasure in calling attention to the present condition of affairs. While, of course, there is a decided shortage of labor in iron-working trades, it is possible to spare a man here and there, and a considerable number should be available. Many are not absolutely indispensable and would be willing to sacrifice a part of their salaries to serve their country. The full details as to methods of enlisting can be obtained from the Chief of Ordnance, Enlisted Personnel Division, Washington, D. C.

CORRESPONDENCE

British Exports of Commercial Steel

To the Editor: Referring to your issue of Aug. 30, 1917, page 502, you state that "Great Britain is making highly profitable export shipments of commercial steel." You made a similar remark in a previous issue and I beg to inform you that this statement is incorrect.

Under the Defense of the Realm Act not a single ounce of steel may be used for commercial purposes in Great Britain. Steel is only allowed to be manufactured, rolled or drawn, for orders which bear a ministry of munitions, admiralty, war office or other government order number, or for the preservation of food crops. In addition to this the export of commercial steel is *entirely* prohibited, but we are, of course, exporting a very small quantity of war steel to our allies.

You are doing us an injustice in making the above statement, and I think it would only be fair that you give publicity to this communication.

W. STUART MULLER.

Manchester, England, Sept. 20.

WILL TRADE VESSELS

America Will Help France and Obtain Boats to Haul Manganese Ore

WASHINGTON, Oct. 23.—Steps have been taken by the United States Shipping Board to supply the French Government immediately with steam tonnage sufficient to take care of its emergency needs. The board will turn over 20 new ships built in American yards to the French, one of which of 6000 tons deadweight was completed and delivered this week. In addition, the Shipping Board will charter to the French 200,000 tons of American steamships in exchange for 400,000 tons of French sailing vessels. This latter trade will supply ships to engage in commerce with Latin America.

Now that the urgent needs of the French Government have been partially met by the United States, the Shipping Board intends next to take up the petitions of the Italian Government for cargo ships. France's needs were far more urgent than the needs of any of the other nations allied with us. The French have been urging thir claims upon us through various channels and it was with considerable relief that they received the promises of the Shipping Board last week.

The 20 new ships, which will be turned over to France, represent from 70,000 to 80,000 tons deadweight. They were built on the Great Lakes in American yards; some at Toledo, others at Detroit, and others at Chicago. Five of these vessels were built under original contracts for France, and a number of them were built under contract for the Cunard Line.

One ship has been delivered from the Lakes. Ten more will come through within the next week, and the whole 20 will be delivered, according to information in possession of the Shipping Board, within the next 30 days. In view of the closing of the Lakes by the winter season it is necessary that all new tonnage built in lake yards shall be delivered in the Fall.

The trade of American steamers for French sailing vessels resulted from entirely separate negotiations. Sailing vessels have proved useless in the submarine zone. The British lost most of theirs. The French had a similar experience but were successful in dispatching about 400,000 tons of her steel sailing vessels to this side of the Atlantic. These vessels are now in South American waters. Aside from the profit of operation they are of no use to the French Government now because it would be a certain loss to send them back through the submarine zone. For this reason the French have agreed to charter these vessels to the Shipping Board, and in return the Shipping Board will charter to the French 200,000 tons of American steam shipping. This tonnage will undoubtedly be withdrawn from the Latin-American trade and turned over to the French for the Atlantic service. We will take the French sailing vessels under charter with their French crews and operate them in this same trade.

According to the plans of the Shipping Board, the French sailing vessels will be used to bring manganese ore from Brazil and nitrate from Chile. They will also be used to bring chrome ore from the French colony of New Caledonia.

Brazil's First Steel Output

RIO DE JANEIRO, BRAZIL, Oct. 22.—(*By Cable.*) The first commercial steel ever produced in Brazil was made on Oct. 19 in a plant using a Whiting converter. More complete details will be furnished later.

William H. Wilkoff, president of the Youngstown Car Co., Youngstown, Ohio, announced last Saturday that his corporation has just secured an order from the Government for the construction of 500 dumping cars to be used in army engineering work both in this country and abroad. The order is to be completed within 60 days. The Youngstown Car Co. makes a specialty of turning out dinkey cars for construction companies.

RAILROADS GET NEW HEARING

Eastern Lines Will Be Heard Nov. 5 on Claims for Higher Rates

The Eastern railroad companies have been accorded more favorable treatment by the Interstate Commerce Commission than they expected. Having petitioned for the opportunity to present anew their claims for higher rates, the railroad companies were advised Oct. 22 that the commission will go even further and will reopen the entire 15 per cent rate case. In addition, the commission shows its appreciation of the conditions under which the railroads are struggling by saying that if further financial relief is needed by the carriers such relief should be applied promptly. The commission instead of agreeing to the suggestion of the railroads that 60 days should be allowed them to prepare a new case has ordered the old case reopened and hearings begun on Nov. 5.

In their application, made Oct. 17, representatives of the Eastern roads suggested at an informal conference that they should have permission to present evidence as to why the increases denied them last June should now be granted. They had intended merely to ask for increases on commodity rates, particularly grain and live stock. It would not surprise many if by Jan. 1, should the carriers make good their claims, the whole matter may be settled, whereas it was not expected that hearings would be begun much before then. The response of the commission is quite generally accepted as foreshadowing a recognition of their advancing costs and the difficulties they are meeting. It is regarded as well within the realm of possibility that the commission may now give the railroads the full 15 per cent asked for. It is also regarded as probable that the Southern and Western carriers, particularly the latter, already showing reductions in net earnings, will join in the request for an adv:.nce.

An advance in freight rates is of course not likely to be warmly welcomed by shippers. The cost of doing business will thus be further enhanced and they cannot unload every item of this kind on the ultimate consumer. But the serious plight of the railroads is so well established and their necessities are so urgent that the shippers would show a proper spirit if they were to refrain from bitterly attacking the application for higher rates.

Needed for the Army

The Quartermaster Enlisted Reserve Corps, with recruiting headquarters at 357 Broadway, New York, has received a new authorization to enlist men to follow their civilian trades in the Army, for duty in this country and abroad.

The men particularly needed at this time include Electricians, Tinsmiths, Iron Workers, Mechanics and Blacksmiths. Enlistment is open to citizens of the United States, or to those men who have declared their intentions of becoming citizens. They must be between the ages of 18 and 45 years and have no one depending on them for support.

Added to Conservation List

WASHINGTON, Oct. 23.—A long list has been added to the so-called "conservation list" by the War Trade Board. This is a list of articles which will not be allowed to be exported except for war purposes inasmuch as the United States is in need of the materials or articles and must conserve its own supply. The list includes chrome steel and a number of similar materials.

The Norton Co., Worcester, Mass., abrasive and grinding wheel manufacturer, which has made large extensions to its plant during the past three years and has built a notable industrial village, has bought 205 acres adjoining its present tract to provide for future plant expansion and more workmen's homes. The company has no plans for immediate new construction.

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STANDARDIZED SHIP STEEL

Practice Recommended by Steel Makers to Secure Maximum Output

To secure maximum output of structural steel for cargo ships, American steel makers, after some months of investigation and collaboration with others concerned, have drawn up a statement of standard practice recommended by them for use in designing. It has been adopted by the Emergency Fleet Corporation. It aims at a use of standard structural sections rather than so-called ship shapes; it reduces the number of sizes of sections and the number of different thicknesses of plates; it is calculated to eliminate special features of ship structural design which are regarded as of doubtful value measured in terms of the demand for utmost rapidity of construction. It has, in short, for a primary object the establishment of standardized design so that mill facilities for one ship will suffice for another with the closest possible approach to the intensified duplication system of manufacturing peculiar to industrial practices generally in this country. The standard practice is of course apart from the talked-of plan of making standard ships, a matter which rests with the shipbuilders themselves and in fact already put into practice by some of them. In the light that the standard practice mentioned recognizes the quality requirements of the British, French and American Governments, it marks a big step forward in the making of an international ship steel specification. Further it may be remarked that even standard order forms, all of one style of arrangement and size, are provided for, to insure proper routine in mill operations, thus to supply material to shipyards in proper rotation, and to minimize the overlooking from time to time of single items, as is occasionally done when all sorts and conditions of purchasing order blanks are allowed.

A small pamphlet printing of the standard practice has been issued by the Carnegie Steel Co. The recommendations, as there explained, include the following:

That shipbuilding practice conform to uses established as standard in the fabrication of shapes and plates for bridges, buildings and cars, and that useless and minute variations be absolutely eliminated.

That to relieve the present mill congestion the use of tees and deck beams be eliminated to the greatest extent possible.

That structural channels or angles be used for ship channels or bulb angles; provided, however, that ship channels and bulb angles may be rolled if required by shipbuilders' schedules.

That thicknesses of plates be specified in multiples of 1/16 in. (1/32 in. where necessary).

That sketch plates be ordered in multiple and cut to size at the shipyard, rolling mills to furnish to sketch only straight double or single taper plates.

That within universal plate mill limits, plates be furnished sheared or universal at mills' option. Where sheared plates are absolutely necessary, orders should be marked "sheared only."

Plates, shapes and bars 3 ft. long and shorter should be ordered in multiple lengths. To assist mills, orders should specify lengths into which multiples are to be cut so as to permit, at mills' option, application of short length pieces.

Plates narrower than 18 in. (preferably 24 in.) and lighter than ¼ in. should be ordered in multiple widths, to be recut to widths at the shipyards, and to assist mills orders should specify widths into which multiples are to be cut so as to permit, at mills' option, application of narrow width plates.

That extreme sizes of plates, as shown in makers' published lists, both as to widths and lengths, should be avoided, as the rolling of such extreme sizes reduces the output of the mills.

That the steel be manufactured in accordance with American Bureau of Shipping requirements, Lloyd's Register of Shipping or Bureau Veritas as may be called for by shipbuilders' schedules, these classification societies accepting standard specifications for structural steel for ships of the American Society for Testing Materials.

The recommendations list the standard size of angles and thicknesses of plates.

McDonald Mill Started

YOUNGSTOWN, Oct. 23.—Pressing an electric button, Thomas McDonald, consulting manager of the Carnegie Steel Co. in the Youngstown district, last Friday afternoon started in motion the machinery of a bar mill at the new McDonald plant, located just west of this city. A group of United States Steel Corporation officials from Pittsburgh, headed by Homer G. Williams, president of the Carnegie Steel Co., witnessed the operation. W. J. Wigham, assistant to the president, and a dozen other officials came from Pittsburgh in a special car. Others present included James H. Grose, district superintendent, who will be in general charge of the new plant; W. U. Dennison, superintendent of the McDonald mills; A. W. Griffith, superintendent of bar mills in the district, and members of their staffs.

On the initial run a small heat was rolled, the machinery performing without a hitch. Only the cooling bed is uncompleted. Nine mills are now being constructed, three bar and six hoop mills, and they will have an annual capacity of 500,000 tons. The machine shop, a brick building, was the first to be completed. The furnace building, where the steel will be heated that is brought from the Ohio Works for rolling, is also virtually finished. The new plant will be operated entirely by electricity. Current will be transmitted from the Ohio Works by means of high tension wires strung on large columns, resting on concrete bases. All the latest electrical devices are being installed, much of the material being furnished by the Westinghouse Electric & Mfg. Co.

There has been much activity for more than a year at McDonald, the work of building the new plant that will eventually represent approximately $12,000,000 being pushed along rapidly. In connecton with the mill the Carnegie Steel Co. has appropriated $2,000,000 for the construction of dwellings in the new steel town of McDonald, close by the plant.

It is the plan of the management to get two bar mills in operation by Nov. 15. Before leaving McDonald Friday, Homer G. Williams, president of the Carnegie Steel Co., expressed himself as entirely satisfied and pleased with the showing made at McDonald since the construction work commenced.

Takes Over Wisconsin Mine

MILWAUKEE, WIS., Oct. 22.—The Republic Iron & Steel Co., Youngstown, O., has taken over the Northern Chief iron mine at Plummer Mine, a few miles southwest of Hurley, Wis., and leased acreage within a radius of two miles of the property, and will re-open the mine at once. The Plummer mine has been idle for several years, having been abandoned by its former owners, as being unprofitable. The shaft now is down 1300 ft., but will be deepened much further because of the presence of a high quality of ore. It is stated that present conditions make it advisable to go to considerable expense in developing the Northern Chief property, which formerly was one of the best producers on the Gogebic range. Francis J. Webb, Duluth, Minn., general manager of the Republic properties on the Mesaba range, will have charge also of the new property.

Corrigan, McKinney & Co., Cleveland, Oct. 22, blew in their No. 2 River furnace which has been out of blast for relining. The four stacks are now running, one that had been banked for some time because of the coal shortage having been started up again last week.

A. H. Cox & Co., dealers in machinery and electrical equipment and engineers and contractors for electrical and mechanical power plants, Seattle, Wash., have moved into the building adjoining their present quarters at 309 First Avenue South.

RAILROAD OWNERSHIP

Public Railroad Regulators Discuss Government Ownership of Lines

WASHINGTON, Oct. 23.—The National Association of Railway Commissioners, in its annual session here last week, took steps to create a special committee to give exclusive study to Government ownership of railroads. The association is composed of all the Federal and State officials who have been delegated authority to regulate railroads and public utilities. A report on public ownership of American railroads was read to the association by Edwin O. Edgerton of California, which was also signed by John Guiher of Iowa, and Shelby Taylor of Louisiana.

"Irrespective of whether he is an advocate or an opponent of the theory that the interests of the people are best served by public ownership of utilities," said Mr. Edgerton, "the student must recognize the fact that public ownership, whether national, state, district, or municipal, is gradually replacing both regulated and unregulated private ownership. In countries at war, that is, in countries where the state insists on a maximum of effort, the march in the direction of complete public control appears to be more rapid than in countries leading a normal existence. But the direction is clear in both cases." He gave a resume of railroad control throughout the world from which the following extracts are taken:

Of the total mileage of the world for 1913 (690,165 miles), private companies owned 464,421 miles, or 67 per cent, and governments owned 225,744 miles, or 33 per cent. In 1912 the private companies owned 68 per cent. The government railways gained one per cent by increasing their mileage by 9644 miles, while the mileage of private companies increased only 5487 miles.

It will be noted that, in respect of length of lines, outside of North and South America, government ownership greatly predominates, but that the privately-owned mileage in the United States, 256,823, greatly exceeds the mileage of all the government-owned roads in the world. It is somewhat surprising, however, to find that the greatest increase in government mileage is in North and South America, due to the absorption of private lines in Mexico and Argentina. Even outside of the United States, however, private ownership is greatly predominant in America.

In the majority of the countries of the world, also, prior to the war, private ownership of railroads continued to prevail. Of 75 nations and colonies for which statistics are given, 42 had more private than government mileage, while 33 have more government mileage. While in 26 countries the entire mileage was privately owned, in only 7 are all the railroads owned by the state. These were Serbia, Bulgaria, Natal and four German colonies in Africa. In Europe state ownership predominates in only 10 out of 21 countries.

Mr. Edgerton cited the fact that the recommendation has been made in Canada to combine all the Canadian roads in one government corporation and continued:

There are very few thinking men left in the country who will insist that regulation in its present form can adequately deal with our railroad problem. The inadequacy of Federal regulation in the matter of securities control is a yearly recurring topic in the reports of the Interstate Commerce Commission, as in the reports of this association; Federal incorporation for interstate roads is quite uniformly recognized as necessary, and the railroads themselves have come to this conclusion.

That there is conflict and duplication between Federal and State commissions cannot be denied. That regulation is often made ineffective by the conflict and onerous by the duplication is clear. Whether or not the period of railroad regulation is merely a necessary step in the evolution of the public utility from private to public control and ownership, the fact is that our railroads today have gone beyond regulation in some of their very essentials. Here, too, the war has revealed the weak spots and pointed out the remedies that during peace, it would have taken us a long time to find.

After describing the trend of control in the United States since we became a belligerent, citing the work of the Railway War Board which has co-ordinated all the railroad facilities of the United States, he said: "A complete national railroad system means, inevitably, control, pooling and elimination of wasteful and unrealizes more than ever that its railroads are the arteries of its economic life and that their ultimate direction cannot be left in the hands of private owners, however high a caliber these owners may represent as men and citizens." He concluded:

In the United States a national transportation policy embracing an intelligent plan of railroad construction, efficient nation-wide operation, the elements of financing, of rate making, of traffic development, of thoughtful adjustment of water and rail transportation, and of other equally fundamental policies, has heretofore been an impossibility. We have come to uniform accounting, but beyond that it seems we have been unable to go. The times have forced a change and the new national railroad policy is rapidly assuming its first shape without Government direction and with almost no Government co-operation.

The direction of this policy is also quite distinctly defined: It is toward the elimination of what little remaining competition there was between carriers; toward centralization; toward uniform standards of construction and operation; and, most important of all, toward higher rates. In spite of the great savings already effected by the greater efficiency of the new system, and in spite of the much greater savings still possible, higher rates appear inevitable unless the Government becomes the directing force and, from national considerations, takes its controlling part in the shaping of this new national railroad policy.

The National Association of Railway Commissioners, in our opinion, has no more important duty to perform at this time than to give its best thoughts to these new developments. We have, therefore, concluded that it should continue the study of these questions through the instrumentality of a permanent committee, and it has seemed to us that at this time our committee can render a service to the association by an attempt to give an outline of the scope of the permanent committee's duties and by a recommendation indicating along what lines further investigation should be made.

This report, however, was not made unanimous to the National Association. Carl D. Jackson of Wisconsin insisted that it was too early to come to any conclusion regarding the advisability of public ownership. He said: "It may be questioned as to whether the experience of foreign countries operating utilities for war purposes and under forced conditions will develop the test or standard for operating under normal and peaceful conditions. Unquestionably many of the lessons as to economic and efficient operation through broader control, pooling and elimination of wasteful and unnecessary competition, will not be lost upon a return of peace, and I believe that the country and Congress will see the advisability of framing laws calculated to bring about economical and efficient co-operation in place of laws aimed at developing wasteful competition."

Conserving British Blast-Furnace Dust

Conservation of blast-furnace dust has been introduced in England, evidently with a view to recovering its potash content. The Minister of Munitions has issued an order providing that no person shall buy, sell, deal in or dispose of any blast-furnace dust, except under, and in accordance with the terms of a license issued on behalf of the Minister of Munitions by the Controller of Potash Production, and that no person shall treat any such dust so as to extract any component part thereof, except in accordance with the terms of the license.

For the purpose of this order, blast-furnace dust shall mean dust deposited or otherwise derived from the gases of any furnace used for treating ores for the production of iron or any of its alloys.

Spain's Iron and Manganese Ore Exports in 1917

Spain's exports of iron ore and manganese ore have shown considerable increase in the first half of 1917 as compared with the same period in 1916. To July 1, 1917, the exports of iron ore were 2,588,710 metric tons as compared with 2,386,439 tons to July 1, 1916. The manganese ore exports to July 1, this year, have been 8527 tons against 2310 tons to July 1, 1916. There has been a falling off in exports of iron pyrites of over 500,000 tons, the total to July 1, 1917, having been 1,014,636 tons.

Iron and Steel Markets

PRICE FIXING IN DOUBT

Delays Point to Leaving Details to Trade

Some of the New Prices Established—Sentiment Sought on Abrogating Contracts

Further price-fixing announcements from Washington seem unlikely. Though an agreement was reached between the War Industries Board and the producers, in New York, on Oct. 16, no new prices have been named. Thus it appears that the modification in Government policy noted last week has taken shape, and the industry is expected literally to adjust prices on even major commodities. Already the leading wire maker has approached the mean between the two general wire levels which have long obtained, quoting $3.50 on nails, or 30c. nearer the $4 basis of other mills. It will not be surprising if the presidential address of Judge Gary before the American Iron and Steel Institute, in Cincinnati, on Friday, sheds some light.

The War Industries Board has had as a primary object the securing of maximum production of ships and shells, and the magnitude of the task and the size of the organization it is building may well militate against too rapidly instituting sweeping edicts over materials of less importance for the work of the war. How thoroughly it will be possible, without authoritative announcement or the exactions of priority orders, to secure immediately the "one-price-for-all" policy is an unanswered question.

On top of this is the canvassing now going on among consumers by the Federal Trade Commission to ascertain opinions as to abrogation of contracts. Concern is shown among students of trade over the apparent effort to secure a contract nullification or adjustment feature in the proposed Pomerene price-fixing bill, with all that it might mean in unstabilizing business remote from basic material production.

When all is summed up, the general consumer is still in the dark. With the increasing drafts of labor, the minimum immigration, the overloaded transportation and terminal facilities, the fuel scarcity, not to mention the checks likely in winter, production of iron and steel for this year, even considering increased capacity of plants, can hardly exceed that of last year. One authoritative estimate is that next year's total output will not be over 85 per cent of last year's.

If price fixing is regarded as revolving about finished steel, as the immediate need of war, and if the agreed prices represent, as is understood to be the case, substantially the mill billing prices of September, then the higher average billing at the end of the year is a pointing finger. Much that is said of possible price revision on Jan. 1, however, refers to pig iron as the general basing product, and this, it is suggested, should in the opinion of the Government be lowered. What will likely happen to steel prices is thus a matter of conjecture.

Transactions have established wire rods at $57 per ton, furnace coke at $6, and steel bars and shapes at the agreed prices. In bars and structural material, sales have been made for deliveries extending into 1918; a lot of 10,000 tons of bars for the rest of this year and the first quarter of 1918 has been closed at 2.90c. in the Chicago territory, and the Pittsburgh basing is retained.

Buying of pig iron has continued as rapidly as furnaces have been willing to take orders and demand has been far in excess of the tonnage which the makers felt they should book. This is illustrated in the case of charcoal pig iron; a Michigan company sold about 4000 tons on the basis of $35.50 for grades 1 to 4 and $38 for Scotch and low silicon irons and could have disposed of a much larger tonnage. There has been some hesitancy on the part of both buyers and sellers because the Government attitude has not yet been made known on the recommendations relating to differentials, but it is now understood that all minor matters are to be left to the trade to be worked out.

Some coke producers continue to show a disposition to evade selling at the fixed price of $6 for both foundry and furnace coke. Blast furnace operators, unable to obtain coke, are making complaint at Washington. Production is almost up to normal in the Connellsville region and furnace men assert there is ample to meet demands for spot delivery as well as to fill contracts.

As to unannounced prices it may be stated the agreed plan provided that steel scrap, like pig iron, should be set at the one maximum price for all scrap consuming centers. For tubular goods, the level of the May 1 card is taken, and for tin plate prices slightly higher than those in effect in the last half of 1917. The matter of rail prices is left to the railroads and the rail makers.

The navy's distribution of structural material for destroyers covers 65,000 tons of plates and 20,000 tons of shapes and before long about three times this amount of steel will be required for Government shipbuilding. An important development in establishing a standardization of structural steel for ships has been realized. Mills will be able to secure tonnage production and fabricators with little building work will be well engaged in the country's supreme war effort.

Pittsburgh

PITTSBURGH, Oct. 23 (*By Wire*).

Another remarkably quiet week in the steel trade has gone by and the trade is still awaiting further announcement from Washington of Government prices on the other iron and steel articles, which up to this writing have not been given out. It was fully expected that last week the Government would announce prices on such important items as steel sheets, wire products, iron and steel pipe and other lighter forms of finished steel, but the expected announcement has not yet been forthcoming. In the meantime the whole trade is in a waiting attitude and very little new business is being placed by domestic consumers. Most of the new orders being taken by the mills is either direct or indirect Government orders. On these orders for materials on

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Oct. 24, 1917.	Oct. 17, 1917.	Sept. 26, 1917.	Oct. 25, 1916.
No. 2 X, Philadelphia...	$34.25	$34.25	....	$21.00
No. 2, Valley furnace...	33.00	33.00	$33.00	21.00
No. 2 Southern, Cin'ti...	35.90	35.90	....	18.90
No. 2, Birmingham, Ala.	33.00	33.00	....	16.00
No. 2, furnace, Chicago**	33.00	33.00	....	22.00
Basic, del'd, eastern Pa..	33.75	33.75	45.00	21.50
Basic, Valley furnace....	33.00	33.00	33.00	20.00
Bessemer, Pittsburgh ...	37.25	37.25	37.25	24.95
Malleable Bess., Ch'go**.	33.00	....	....	21.50
Gray forge, Pittsburgh..	32.75	32.75	....	20.95
L. S. charcoal, Chicago..	35.50	....	....	20.25

Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	....	....	$38.00	$33.00
O.-h. rails, heavy, at mill	....	....	40.00	35.00
Bess. billets, Pittsburgh.	*$47.50	*$47.50	60.00	50.00
O.-h. billets, Pittsburgh..	*47.50	*47.50	60.00	50.00
O-h. sheet bars, P'gh....	*51.00	*51.00	70.00	50.00
Forging billets, base, P'gh	....	....	90.00	73.00
O.-h. billets, Phila.....	....	....	70.00	50.00
Wire rods, Pittsburgh....	57.00	*57.00	85.00	55.00

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	4.25	4.25	4.935	2.659
Iron bars, Pittsburgh....	...	...	4.75	2.75
Iron bars, Chicago.....	4.50	4.50	4.50	2.35
Steel bars, Pittsburgh...	2.90	†*2.90	4.00	2.75
Steel bars, New York...	3.095	...	4.195	2.919
Tank plates, Pittsburgh..	†*3.25	†*3.25	8.00	4.00
Tank plates, New York.	...	...	8.195	4.169
Beams, etc., Pittsburgh..	3.00	†*3.00	4.00	2.75
Beams, etc., New York..	3.195	†*3.195	4.445	2.869
Skelp, grooved steel, P'gh	*2.90	*2.90	...	2.50
Skelp, sheared steel, P'gh	*3.25	*3.25	...	2.60
Steel hoops, Pittsburgh...	...	...	5.75	3.00

*Agreed prices. †As yet only a few sales made.
**The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Oct. 24, 1917. Cents.	Oct. 17, 1917. Cents.	Sept. 26, 1917. Cents.	Oct. 25, 1916. Cents.
Sheets, black, No. 28, P'gh	...	...	8.50	3.40
Sheets, galv., No. 28, P'gh	...	...	9.50	4.75
Wire nails, Pittsburgh...	...	...	4.00	2.70
Cut nails, Pittsburgh....	...	...	4.65	2.70
Fence wire, base, P'gh..	...	...	3.95	2.65
Barb wire, galv., P'gh..	...	...	4.85	3.55

Old Materials, Per Gross Ton:				
Iron rails, Chicago.....	$36.00	$36.00	$40.00	$22.00
Iron rails, Philadelphia..	38.00	38.00	43.00	21.00
Carwheels, Chicago	26.00	26.00	30.00	14.50
Carwheels, Philadelphia.	29.00	29.00	32.00	16.00
Heavy steel scrap, P'gh.	27.00	27.00	33.00	19.00
Heavy steel scrap, Phila.	25.00	25.00	30.00	16.00
Heavy steel scrap, Ch'go.	**26.00**	25.00	30.00	17.75
No. 1 cast, Pittsburgh..	27.00	27.00	30.00	16.00
No. 1 cast, Philadelphia.	28.00	28.00	30.00	16.00
No. 1 cast, Ch'go (net ton).	20.00	20.00	18.00	14.75
No. 1 RR. wrot. Phila...	35.00	35.00	43.00	22.50
No. 1 RR. wrot, Ch'go (net)	*28.50*	29.50	34.00	18.00

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	$6.00	†*$6.00	$6.00	$7.00
Furnace coke, future....	6.00	†*6.00	6.00	3.75
Foundry coke, prompt...	†*6.00	...	...	5.00
Foundry coke, future....	†*6.00	...	...	4.50

Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.	23.50	23.50	23.50	28.50
Electrolytic copper, N. Y.	23.50	23.50	23.50	28.50
Spelter, St Louis.....	8.00	8.00	8.25	10.00
Spelter, New York.....	8.25	8.25	8.50	10.25
Lead, St. Louis.....	*6.12½*	6.87½	7.82½	6.92½
Lead, New York.....	*6.25*	7.00	7.95	7.00
Tin, New York.....	**61.62½**	61.00	62.00	41.25
Antimony (Asiatic), N. Y.	*14.75*	15.00	15.00	13.00
Tin plate, 100-lb. box, P'gh.	....	....	$12.00	$5.75

which the Government has announced prices, these prices apply, but so far there have been very few sales by the mills of plates, shapes and bars, also of steel billets and sheet bars at the Government prices. There have been fairly heavy sales of pig iron at the Government prices of $33 at Valley furnace for basic and No. 2 foundry and $36.30 for Bessemer. The steel mills, when offered orders at Government prices for delivery in this quarter, simply say that they are filled up into next year and have no material to offer on new business. In a few cases there have been sales of plates, steel bars and possibly shapes at Government prices, but these were made only to regular customers and to help out on contracts taken some time ago, and for which they did not have enough material to complete the contracts. It should be borne in mind that all Government prices fixed thus far apply only for the present quarter ending Dec. 31 and are subject to revision on Jan. 1 or after. With the mills loaded up with business for some months, it is going to be very hard for consumers to find any mills that have any material to spare for the present quarter, and new business up to the end of this year is certain to be very light. The coal situation is still bad, particularly in the Youngstown, Ohio, district, and is interfering with the output to some extent. The supply of cars in the past week has been bad, getting as low in the Connellsville coke regions as 30 per cent. The scarcity of labor is being more keenly felt right along, but as soon as cold weather comes will likely improve. There are thousands of men who do not want to work outdoors in cold weather, and as soon as it comes they hunt inside jobs where they can keep warm. Several of the tin plate mills report the supply of labor better in the past week or two than for some time.

Pig Iron.—The local market is quiet, and there is very little new inquiry. Most of the buying of Bessemer and basic iron in this district, since the Government announced prices on pig iron on Sept. 24, has been done by a local steel company, whose blast furnaces were banked recently for a short time, requiring that this concern take in a good deal of outside iron. It is estimated that this interest has bought close to 60,000 tons of Bessemer and basic iron at the full official prices of $33 for basic and $36.30 for Bessemer at Valley furnace. The Westinghouse Air Brake Co. recently sent out an inquiry for about 7000 tons of iron and has closed for about 3000 tons of No. 2 foundry and 1000 tons of malleable Bessemer on the basis of $33 for the foundry iron and $33.50 for the malleable Bessemer at Valley furnace. The Westinghouse Electric & Mfg. Co. has also closed for about 2500 tons of malleable Bessemer iron for delivery to its Cleveland foundries to be used in making castings for the Government. A Southern Ohio open hearth steel plant has an inquiry out for 5000 to 10,000 tons of basic iron which has not yet been closed. There has been moderate buying of No. 2 foundry iron at the official price of $33 Valley furnace. Bessemer and basic pig iron are reported scarce, and there is ready sale for all that can be picked up for prompt shipment.

We quote as follows: Basic pig iron, $33; Bessemer, $36.30; gray forge, $32; No. 2 foundry, $33; No. 3 foundry, $32.50, and malleable Bessemer, $33.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being 95c. per ton.

Billets and Sheet Bars.—So far as we can learn, there have been no sales of soft open hearth or Bessemer billets at $47.50 or of sheet bars at $51, Pittsburgh, these being the prices announced by the Government on Oct. 11. The steel mills have regular customers for billets and sheet bars at much higher prices who take their regular output, and as the Government prices on billets and sheet bars apply only for the present quarter, being subject to revision on Jan. 1 or after, there is not much probability of any heavy sales of billets or sheet bars at these prices. The differential of $3.50 per ton in prices between billets and sheet bars has not yet been satisfactorily explained, but probably was made so large for the reason that a few months ago there was a spread of $10 or more in favor of sheet

bars over billets, but this was an unnatural spread and was brought about by unusual conditions existing at the time. No price has yet been named on forging billets, and the only thing to do is to omit quotations.

Ferroalloys.—Announcement is looked for at any time of Government prices on ferroalloys, and in the meantime there is practically no new buying, consumers holding off, waiting until the official prices are given out. We quote 80 per cent domestic ferromanganese for any delivery at $300 per gross ton, delivered to buyer's mill, and on a firm offer, this might be shaded. We quote 18 to 22 per cent spiegeleisen or about $70 and 50 per cent ferrosilicon in carload lots at $140 to $150, delivered, lower prices being made on 100 ton lots and over.

We quote 9 per cent Bessemer ferrosilicon at $89, 10 per cent $90, 11 per cent $95, 12 per cent $100, 13 per cent $105, 14 per cent $115, 15 per cent $125, and 16 per cent $135. We now quote 7 per cent silvery iron at $79 to $84, 8 per cent $80 to $85, 9 per cent $81 to $86, 10 per cent, $82 to $87, 11 and 12 per cent $83 to $88. All prices are f.o.b. makers' furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having a uniform freight rate of $2 per gross ton for delivery in the Pittsburgh district.

Structural Material.—No important domestic jobs have been given out in this district for some time, but the American Bridge Company, McClintic-Marshall Co., and other local fabricators are booking heavy Government orders for fabricated steel work, details of which are being withheld. The Blaw-Knox Co. is executing some large contracts for fabricated steel for shipment to France. The American Bridge Co. has taken about 500 tons of bridge work for the Pennsylvania Railroad, and independent fabricators about 200 tons. We do not hear of any new sales of structural steel shapes at the Government price of 3c., as local structural mills are filled up on contracts for some months ahead, and have no material to sell on new orders for delivery in present quarter. Nominal prices in effect before the Government prices were announced are given on page 1021.

Plates.—As yet the expected order from the Government for 30,000 standard gage 8-wheel box cars has not been placed, but may come out at any time. None of the domestic railroads is placing new orders for steel cars, and the steel car companies report that deliveries of plates on orders for cars taken sometime ago, but not completed, are still very bad. There have been further small sales of sheared plates by some of the independent mills at the Government price of 3.25c. at mill, but in cases of such sales they were plates intended for other shipments, or else there were some other unusual conditions attached to sales. We quote sheared plates, ¼ in. and heavier, at 3.25c. at mill.

Steel Rails.—Nothing is being done in the way of placing orders for either standard sections or light section rails, and probably will not be until the Government announces prices on rails, which may come out at any time. Nominal prices on steel rails, both heavy and light sections, are given on page 1021.

Sheets.—As far as new buying is concerned, the sheet market is about at a standstill. The consumers of sheets figure that with sheet bars at $51, prices of sheets will be fixed by the Government very much lower than the present market, and they are naturally holding off placing orders as long as they possibly can. It is said that some sheet mills have signified their willingness to cover their most important trade for first quarter or first half of next year, the price to be left open, and to be whatever prices the Government may fix. It is said that some business has already been booked on this basis, but only to favored large customers. Nominal prices in effect on sheets, but which are probably higher than the actual market are given on page 1021.

Tin Plate.—As a result of several conferences held recently, the tin plate manufacturers have put up to the War Industries Board their proposed price of tin plate for 1918 delivery. This price has not been given out nor will it be by request of the War Industries Board, but it is understood the figure suggested by the manufacturers has been fair to them, and to consumers, and is slightly higher than the prices of tin plate in effect for last half of 1917, which were $7.50 per base box for tin plate made from Bessemer stock, and $7.75 for open hearth stock. The manufacturers are not favorable to selling their output for a year ahead owing to the uncertainty as to prices and delivery of pig tin and sheet bars, but may agree to sell for nine months or up to Oct. 1 next year. It has been carefully figured out that the world's shortage in supply of tin plate for 1918 will run from 12,000,000 to 15,000,000 boxes. It has also been determined that the entire output of tin plate in this country next year will be needed for the canning of food supplies, and that manufacturers of other products, such as tobacco, candy and other goods that have been using tin plate to pack those products, will have to use some other material. No business in tin plate has been booked by any of the mills for 1918 delivery, but several mills state that already inquiries from their trade for reservations on their books, the price to be whatever is fixed by the Government, are more than double their capacity. Prices on stock items of tin plate for prompt shipment are lower, and we quote small lots at $9 to $11 per base box at mill.

Hoops and Bands.—Possibly the Government prices to apply on hoops and bands may come out this week. In the meantime, little is developing in the way of new orders, most consumers being covered by contracts, and specifications are fairly heavy. It is believed that if the Government fixed prices on hoops and bands they will be somewhat lower than those in effect for some time. We quote hoops and bands in small lots at 4.50c. to 5c. and steel hoops at 5c., f.o.b. Pittsburgh.

Wire Rods.—The Government price on wire rods at $57, Pittsburgh, which is $9.50 above the price of soft billets, is regarded by manufacturers as very conservative, and was fully as high as expected. In fact, it is said that some large consumers of rods, notably chain makers, have been receiving a good part of their supply at about this figure or less. A local mill has made a sale of 100 tons of soft wire rods at the new price of $57, and we therefore quote soft Bessemer and open-hearth rods at $57, Pittsburgh. No differentials were fixed on high carbon rods over soft rods, but these may be given out this week.

Wire Products.—The Government is still a fairly heavy buyer of wire nails, its orders being divided among the different mills, based on their capacity, but about one-half of the total purchases of wire nails made so far by the Government have been filled by the American Steel & Wire Co., and the other half was divided among the independent mills. Domestic buying of wire and wire nails is dull, the trade waiting for the Government prices, which are expected to be lower than those of the independent mills, which are based on $4 for wire nails and $4.05 for bright basic wire. As stated before, it is believed the Government price on wire and wire nails will be somewhere between the prices of the American Steel & Wire Co., which are $3.20 for wire nails and $3.25 for bright basic wire, and those of the independent mills, which are $4 for nails and $4.05 for bright basic wire. Prices of the independent mills on wire and wire nails to domestic consumers, but at which very little new business has been done, are given on page 1021. Prices of the American Steel & Wire Co. are $16 per ton lower.

Iron and Steel Bars.—The price of 2.90c. on steel bars fixed by the Government is really only for the present quarter, being subject for revision Jan. 1. Local mills have their output of steel bars sold for some months ahead, and are not quoting the new prices for any bars to sell for this quarter delivery. It is said there have been a few small sales of steel bars by some of the smaller mills at 2.90c., but these were only small lots for prompt shipment. The new demand for iron bars is reported fairly active and prices are ruling firm. The Government has not yet indicated a price on iron bars, and former prices are still being quoted and sales made at these prices. Nominal prices in effect on both iron and steel bars are given on page 1021.

Shafting.—As yet the Government price on shafting has not been announced, but is fully expected this week. Several of the larger makers of shafting are covering their large trade through the first half of next year, prices being left open and to be fixed after

the Government announcement of prices comes out. New orders are light, being only for small lots to fill urgent need. Discounts on shafting to domestic consumers remain at 10 and 5 per cent off list. Prices on Government orders are somewhat lower. The Government has been a very heavy buyer of shafting for some months.

Railroad Spikes and Track Bolts.—New inquiry is dull for both spikes and bolts, the consuming trade holding off placing orders in view of the expected lower Government prices that may come out this week. A few contracts for standard-size spikes have lately been placed at 5c. and small lots as high as 5.50c. at mill. Nominal prices on railroad spikes and track bolts are given on page 1021. Prices on Government orders, both direct and indirect, are considerably lower.

Nuts and Bolts.—The new demand is quiet, the trade holding off for the expected Government prices, but specifications against contract are fairly active. It is said discounts which have been in effect for some time are firmly held on domestic orders, and these are given on page 1021. Prices on Government orders, which are quite heavy, are lower.

Cold Rolled Strip Steel.—There is very little buying in cold rolled strip steel, the trade holding off placing new orders in the belief that the Government will name prices somewhat lower than are now ruling in the open market. Specifications against contracts are said to be coming in at a fair rate.

On contracts, mills are quoting 9c. at mill, but on small current orders prices range from 10c. up to 12c. at mill. Terms at 30 days, less 2 per cent off for cash in 10 days when sold in quantities of 300 lb. or more.

Rivets.—Makers report there is practically no new demand, buyers holding off placing orders until Government prices come out. Very heavy orders for rivets are being placed by ship builders on Government work, which the makers are turning out and shipping as promptly as they can. Nominal prices are $5.25 per 100 lb. for structural rivets, and $5.35 for Conehead boiler rivets, f.o.b. Pittsburgh. Government prices are expected to be considerably lower.

Wrought Pipe.—The Government has not yet made any announcement of prices on iron and steel pipe, but these are expected to come out at any time. While nothing official has been given out, it is believed the new prices on both iron and steel pipe to be announced by the Government will be based largely on the card of the independent mills, issued on May 1, and which is given in detail on page 1021. The National Tube Co. has not issued a new card on steel pipe since April 1, and its prices have been $10 to $12 per ton lower than those of most of the independents.

Boiler Tubes.—The Government prices on iron and steel boiler tubes are looked for at any time, and will no doubt be considerably lower than prices that have ruled for some months. Mills rolling iron and steel tubes are filled for a long time ahead, and will have very little material to spare for delivery this quarter, so that they will not be affected particularly by the prices the Government may name.

Coke.—On the authority of R. A. Rainey, chairman of the Coke Committee of the Council of National Defense, we can state that no differential in price of foundry coke over furnace coke has been established by the Government, and that the $6 per net ton price at oven applies on both furnace and foundry coke. We have quoted in this report for several weeks a tentative price of $7 per net ton on foundry coke, but were careful to state that this was not an official price and should not have been so regarded. It is claimed that four or five of the small coke operators are still trying in various ways to evade the Government price of $6 per ton at oven, and are also getting from $8 to $9 on contracts made prior to Sept. 24 when the Government announced prices on coke. The car supply in the coke regions was bad last week, running on one or two days as low as 30 per cent of normal. One prominent coke interest states that on one day last week it did not receive a single car. We now quote standard grades of furnace and foundry coke for prompt shipment or on contracts at $6 per net ton at oven. The *Connellsville Courier* gives the output of coal and coke in the upper and lower Connellsville region for the week ending Oct. 13 as 339,002 tons, a decrease compared with the previous week of 13,449 tons.

Old Material.—Conditions in the local scrap market are absolutely without change from those noted in our report last week. On Thursday, Oct. 25, a meeting of the American Board of Scrap Dealers is to be held in this city to talk over the present situation in scrap, with special reference as to what may be done by the Government at Washington in the fixing of prices on the leading grades. Announcement of Government prices may come this week, as it is understood they were practically agreed upon at conferences held between leading scrap dealers and Government officials at Washington. The scrap committee of the American Iron and Steel Institute is said to have recommended $30 as the price for select heavy steel melting scrap, basing this on the proposition that a ton of heavy steel scrap is worth nearly as much as a ton of basic pig iron for open hearth steel-making purposes. However, it is not believed the Government will fix the price as high as $30, and some in the trade think it may be as low as $25. Consumers are holding off from buying, believing that Government prices will probably be lower than those nominally in effect now. No material is being sold by dealers to consumers, and prices are largely nominal. Dealers quote for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$27.00 to $28.00
No. 1 foundry cast	27.00 to 28.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md., and Franklin, Pa.	31.00 to 32.00
Hydraulic compressed sheet scrap	22.00 to 23.00
Bundled sheet scrap, sides and ends, f.o.b. consumer's mill, Pittsburgh district	21.00 to 22.00
Bundled sheet stamping scrap	19.00 to 20.00
No. 1 railroad malleable stock	23.00 to 24.00
Railroad grate bars	16.00 to 17.00
Low phosphorus melting stock	38.00 to 40.00
Iron car axles	41.00 to 42.00
Steel car axles	41.00 to 42.00
Locomotive axles, steel	48.00 to 50.00
No. 1 busheling scrap	22.00 to 23.00
Machine-shop turnings	18.00 to 18.50
Cast-iron wheels	28.00 to 30.00
Rolled steel wheels	33.00 to 34.00
*Sheet bar crop ends	33.00 to 34.00
Cast-iron borings	19.00 to 19.50
No. 1 railroad wrought scrap	30.00 to 31.00
Heavy steel axle turnings	22.00 to 23.00
Heavy breakable cast scrap	22.00 to 23.00

*Shipping point.

Chicago

CHICAGO, Oct. 22.

The prices of pig iron are fast conforming to the level established by agreement between producers and the War Industries Board. Foundry No. 2 and basic have been sold in limited quantity at $33, furnace, without revision clauses or other reservation; while 4000 tons of Lake Superior charcoal have been sold at prices figured from the official base. The trade is anxiously awaiting definite announcement fixing base points, this apparently being the reason why certain producers are remaining out of the market, although with others it is simply because they have no iron to sell. Only in a limited way can the market for steel bars be said to be 2.90c., while no tangible evidence can be found of the possibility of procuring plates at 3.25c., despite the fact that certain mills which have avoided long term contracts are said to be approaching the time when they will actually need business. Local makers are not quoting on plates, shapes and bars, although to the best of their ability they will care for Government requirements at the official prices. The largest independent is selling no billets, sheet bars or slabs. Inquiries for many cars have come to the front. They are being figured on, but where the steel will be obtained is a question. A definite announcement on sheet prices is expected Oct. 25. The sheet market has been upset; little has been done and quotations are soft. Consumers of bolts and nuts, like sheet consumers, are waiting, likewise the melters of scrap.

Pig Iron.—An announcement from the Government officially designating price basing points for pig iron

would do much toward easing the minds of the trade. It also would make them easier to have definite information as to the official acceptance of proposed differentials. Meanwhile no inconsiderable amount of business has been done on the prices presented by a committee of the American Iron and Steel Institute to the War Industries Board. The prices referred to, which appeared in THE IRON AGE of Oct. 11, carried with them the suggestion that they should be f.o.b. cars, and furnace, and it is on this basis that many sales have been made in the past week. Some sellers, who a week ago were inserting a revision clause in their contracts covering sales made on the $33 basis, are no longer doing this, principally because of strenuous objection from purchasers. There can no longer be any question about $33 being the operative price of No. 2 foundry, at least one prominent seller freely admitting that he is taking business at $33, furnace; in limited quantity, of course, for he has not a great quantity to sell. Basic has been purchased for delivery in this territory at $33 furnace, also with no revision clause. A maker of charcoal iron has sold about 4000 tons at the price fixed by the recommended differential for this grade, or $35.50 for grades 1 to 4 inclusive, and $38 for Scotch and low silicon irons, both f.o.b., furnace. As the freight rate to Chicago is usually figured at $2, it would make these grades $37.50 and $40, Chicago, respectively. The inquiry for charcoal iron is far in excess of the tonnage available. Discussion of the question of basing points brings out several opinions, one being that the Government may be figuring on helping the freight situation by having each furnace serve its contiguous territory. On the other hand, it is pointed out that a great deal of Southern iron comes North, especially when price conditions are favorable, and that it would be unfair to make Birmingham a base, at $33, if the furnaces had to stand the $4 freight to Chicago. Again, it is argued that a Northern purchaser could buy his iron at $33, Birmingham, and himself pay the freight of $4, making his total outlay $37 per ton, but the question is asked, would he do it, if he could buy local iron at $33, furnace, plus a small freight rate? Southern furnaces are not quoting in this market, but more resale iron has changed hands at the agreed prices. The leading Northern producer has no iron to sell until after next February, though both would take care of a Government contractor armed with a Class A priority certificate. The quotations below are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton.

Lake Superior charcoal, Nos. 1 to 4	†*$37.50
Lake Superior charcoal, Nos. 5 and 6, Scotch and No. 1 soft or special	†*40.00
Northern coke foundry, No. 1	*$33.50
Northern coke foundry, No. 2	†*33.00
Northern coke foundry, No. 3	*32.50
Northern high-phosphorus foundry	*33.00
Southern coke No. 1 f'dry and 1 soft	**53.00
Southern coke No. 2 f'dry and 2 soft	**52.00
Malleable Bessemer	*33.00
Basic	†*33.00
Low-phosphorus (copper free)	*58.00
Silvery, 7 per cent	*43.00

*Agreed prices. Sales not reported, except as indicated.
†Sales made at these prices
**Resale southern iron

Ferroalloys. — Eighty per cent ferromanganese is now quoted at $300 for the remainder of this year and $275 for first half of next

Plates.—Rumor is persistent that tank plates are being offered at 3.25c., the Government price, but evidence thereof is not at hand. The offerings are reported to be made by mills which avoided long term contracts so far as they were able and consequently are now in a position to take on business involving prompt deliveries. The leading interest has none to offer, neither has the leading independent, for this year, at least. The Government demand for plates seems insatiable, and it promises to grow heavier. The jobbers continue to quote their new price announced last week.

For material out of warehouse the quotation is 7c.

Bars.—A few additional sales of small lots of hard steel bars have been made at 2.90c., although the sizes are limited and the quantity available about exhausted. The makers of mild steel bars say they have none to offer, but will have some at a comparatively early date. Makers of bar iron are still quoting 4.50c. Chicago, and assert they can well afford to do so in view of their commitments. The same is true of most makers of hard steel bars who give their nominal price as 4c. to 4.25c., Chicago.

We quote warehouse prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c.; reinforcing bars, 4.50c. base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Structural Material.—The leading mills in the Chicago territory are not selling at 3c.—the official price—or at any price, unless it is for Government needs. The leading independent has enough orders to occupy its capacity for three or four months, meanwhile is not quoting. It is rumored, nevertheless, that some business has been done on the 3c. basis. No structural lettings have been made known, but there is a heavy inquiry for railroad cars. The Union Pacific is inquiring for 1000 hoppers, 1000 gondolas, 1000 box, 200 tank and 500 flat cars, 50 cabooses and 1000 logging trucks. The Western Pacific asks bids on 1000 box cars; the Illinois Central, on 1000 gondolas; the Central of Georgia, 500 box cars; the Seaboard Air Line, 500 flat cars, and the Grand Trunk on 100 refrigerator cars. In addition, the car builders are figuring on a new inquiry for 1000 cars for the United States railroad in France. In the latter country the Standard Steel Car Co. is equipping two large plants for the assembling and repair of cars, men for the purpose being drawn from various car shops in this country. Some are already on the other side and in training.

For material out of warehouse the quotation is unchanged at 5c.

Sheets.—A definite Government announcement fixing an official price for sheets is expected to appear Oct. 25. Its appearance has been delayed, and the market, in consequence, has been in a chaotic state, but nevertheless a little business has been done. The representative of an Ohio maker is submitting all inquiry to his mill and offhand does not quote. Another maker advances as the mill price for No. 28 black and No. 10 blue annealed sheets, 6c. to 7c., Pittsburgh, or 6.189c. to 7.189c., Chicago. He puts the value of No. 28 galvanized sheets at 7.50c. to 8.50c., Pittsburgh, or 7.689c. to 8.689c., Chicago. Inquiry is plentiful, but indefinite, the consumers also having their eyes on Washington. Jobbers continue to quote their slightly reduced prices of a week ago.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 9.50c.; No. 28 black, 9.25c.; and No. 28 galvanized, 10.50c.

Bolts and Nuts.—Bolt and nut interests are to hold a meeting in Pittsburgh on Wednesday of this week. A great deal of business is pending, which should be set in motion at an early date. For prices and freight rates see finished iron and steel, f.o.b. Pittsburgh, page 1021.

Store prices are as follows: Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to ⅜ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to ⅜ x 6 in., 40-2½; larger sizes, 30-5; hot pressed nuts, square, $2, and hexagon $2 off per 100 lb.; lag screws, 50 per cent off.

Cast Iron Pipe.—Berwyn, Ill., awarded 300 tons to a contractor. On 850 tons wanted by Gross Point, Ill., only one bid was submitted and as it exceeded the engineer's estimate, it was rejected. Dickinson, N. D., awarded 175 tons to a contractor. Quotations, recently fixed on the $33 pig iron basis, are unchanged.

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., $53.50; 6 in. and larger, $50.50, with $1 extra for class A water pipe and gas pipe.

Old Material.—The market continues very quiet, although there has been a little business in heavy melting steel, busheling, and turnings. Dealers are puzzled over the outcome of the inactivity of the mills. It is asked how they will fare if they wait until the usual interruptions imposed by winter on traffic. The answer

to the inactivity probably lies in expectancy that Washington will fix prices. Meanwhile scrap is none too plentiful. Repeated conferences between the War Industries Board and a committee of old material men have been held, the only public results of which so far have been rumors, which have placed the price to be fixed for heavy melting steel all the way from $25 to $30. Small lists have been issued by the Rock Island, C. B. & Q. and Soo Lines. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$36.00 to $37.00
Relaying rails	50.00 to 55.00
Old carwheels	26.00 to 27.00
Old steel rails, rerolling	34.00 to 35.00
Old steel rails, less than 3 ft.	32.50 to 33.00
Heavy melting steel scrap	26.00 to 27.00
Frogs, switches and guards, cut apart	26.00 to 27.00
Shoveling steel	23.50 to 24.00
Steel axle turnings	18.00 to 19.00

Per Net Ton

Iron angles and splice bars	$33.00 to $34.00
Iron arch bars and transoms	35.00 to 36.00
Steel angle bars	23.00 to 24.00
Iron car axles	40.00 to 41.00
Steel car axles	40.00 to 41.00
No. 1 railroad wrought	28.50 to 29.00
No. 2 railroad wrought	26.00 to 27.00
Cut forge	26.00 to 27.00
Pipes and flues	17.50 to 18.50
No. 1 busheling	19.50 to 20.50
No. 2 busheling	13.50 to 14.50
Steel knuckles and couplers	29.00 to 30.00
Steel springs	35.00 to 36.00
No. 1 boilers, cut to sheets and rings	17.00 to 18.00
Boiler punchings	30.00 to 31.00
Locomotive tires, smooth	31.00 to 32.00
Machine-shop turnings	15.00 to 15.50
Cast borings	14.25 to 15.25
No. 1 cast scrap	20.00 to 21.00
Stove plate and light cast scrap	15.50 to 16.50
Grate bars	14.50 to 15.50
Brake shoes	15.00 to 16.00
Railroad malleable	24.00 to 25.00
Agricultural malleable	20.00 to 21.00
Country mixed scrap	15.50 to 16.00

Wire Products.—In the face of the price fixed for wire rods—$57 a gross ton, (Pittsburgh)—an advance by the leading interest from its $3.20 base is looked for. Meanwhile the independents continue to quote on the basis of $4 for nails, We quote on the latter basis, to jobbers, per 100 lb. as follows:

Plain fence wire, Nos. 6 to 9, base, $4.189; wire nails, $4.189; painted barb wire, $4.339; galvanized barb wire, $5.039; polished staples, $4.339; galvanized staples, $5.039; all Chicago carload lots.

Rails and Track Supplies.—No railroad business is reported. We quote as follows, many of the prices being nominal, pending adjustment following the fixing of various semi-finished steel prices.

Standard railroad spikes, 4.50c. to 5.25c., base; small spikes, 4.75c. to 5.50c., base; track bolts with square nuts, 5.50c. to 6c., all in carloads, Chicago; tie plates, $70 to $90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base (nominal); open hearth, $40 (nominal); light rails, 25 to 45 lb., $70; 16 to 20 lb., $71; 12 lb., $72; 8 lb., $73; angle bars, 3.25c., base.

Cleveland

CLEVELAND, Oct. 23.

Considerable falling off in the iron-ore movement is expected this month. Weather conditions have been generally unsatisfactory. This week boats were held in port at the head of the Lakes by a severe snow storm, while there has been some freezing of ore which has delayed loading. Another cause of the decline in shipments is that boats are still being diverted from the ore to the grain trade, in which many of them will be engaged for the remainder of the season. In some cases these boats have been released voluntarily by the ore shippers. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, $5.95; old range non-Bessemer, $5.20; Mesaba Bessemer, $5.70; Mesaba non-Bessemer, $5.05.

Pig Iron.—Considerable activity prevails in foundry iron, and some sales of malleable iron are also being made. Buying is in lots up to 1000 tons, mostly for the first half, although there is still some demand for iron for this year's delivery. All sales are being made at Government prices. Consumers feel that there is little possibility that the Government prices will be shaded and see no reason for deferring purchases longer, and with the growth of confidence a buying movement has sprung up. Steel-making iron is quiet, although one sale of 7500 tons of basic iron is reported by a Cleveland agency to an Ohio consumer for this year's delivery. Some 8 per cent Ohio silvery iron is being offered at $46, the Government price, for delivery during December and the first half. Alabama furnaces are not quoting in this territory, but some Tennessee iron is being offered on the basis of $33, Birmingham. Many Southern producers are far behind on deliveries and others are well sold up. Those still having iron to dispose of apparently expect to be able to sell it for shipment to the St. Louis district and nearby consuming points, and so far show no disposition to go below the $33 price to meet the competition of the Northern furnaces in Ohio territory. Complying with requests that they recommend prices on low phosphorus pig iron, makers of this grade have named $58 as a price for standard low phosphorus and $55 for copper bearing low phosphorus iron, the Government has taken no action as yet on these prices. A Valley maker has sold some standard low phosphorus iron at $60 for first half delivery and an Eastern producer is reported to have made a $55 quotation to a Pittsburgh consumer for copper bearing low phosphorus iron. We quote, delivered Cleveland, as follows:

Bessemer	$37.25
Basic	33.30
Northern No. 2 foundry	33.30
Southern No. 2 foundry, nominal	37.00
Gray forge	32.30
Ohio silvery, 7 per cent silicon	44.62
Standard low phos., Valley furnace	58.00

Coke.—Many foundries are short of coke, and it is claimed that some will be forced to shut down unless they are able to secure a supply soon. Selling agents, however, are unable to find any producer who will supply coke, all claiming that they are sold up. A Cleveland interest succeeded in purchasing during the week about fifteen carloads of Connellsville furnace coke for prompt shipment at $6 per net ton at oven.

Finished Iron and Steel.—The plate market is somewhat easier. A Cleveland mill that has been booking orders at 7.50c. since the establishment of the Government price has reduced its quotation to 7c., and an Eastern mill is offering a limited tonnage of universal plates for early delivery at the Government price, at mill, instead of using Pittsburgh as the base point. Another Cleveland mill is staying out of the market until it catches up on orders, but announces that when it makes sales it will not quote higher than the Government price. Government licenses for plates for shipment to Canada and to South America are now being freely secured, but makers are not having much success in securing licenses for shipments to Japan and other countries. A Government order for 8600 tons of ⅛-in. plates has been distributed among several mills. A Cleveland mill has received word from Washington that the Federal Trade Commission will hear arguments in favor of the cancellation of contracts made before the fixing of Government prices. This particularly interests mills under contract for semi-finished steel at high prices. There is considerable inquiry for forging steel bars for airplane work, and an Ohio manufacturer is inquiring for 1000 tons of forging billets per month for the first half of next year. Mills are asking $90 for forging billets on which the Government price has not yet been fixed. There is considerable inquiry for sheet bar contracts but some mills have none to offer. In structural lines the Pennsylvania Railroad has taken bids for 2000 tons of material for bridge work in Ohio. There is little demand for sheets except from consumers who need them for early delivery, others holding off until the Government prices are fixed. Sheet prices continue to ease off, and quotations generally range from 6c. to 7c. for No. 28 black and No. 10 blue annealed and from 7c. to 8c. for galvanized. However, one seller is quoting sheets at 5c. for black, 5.25c. for blue annealed and 7c. for galvanized, and is offering to readjust contracts at an advance of $10 per ton over Government prices when these prices are fixed. Hard

steel bars are still quoted by makers at 3.75c. to 4c. Warehouse prices are unchanged at 4.50c. to 5c. for steel bars and 5c. to 5.25c. for structural material.

Bolts, Nuts and Rivets.—A number of shipbuilding companies building boats for the Government are in the market for rivets, aggregating several thousand tons. Makers are quoting the regular prices on these inquiries and are stipulating that in case the Government regulates the price they will readjust their contracts on that basis. New demand for bolts and nuts is light, consumers apparently waiting for Government action before placing orders but no information is available as to when the Government prices will be named. Some price shading is reported on round lot inquiries. We quote 5.25c., Pittsburgh, for structural and 5.35c. for boiler rivets. Bolt and nut discounts are as follows, round lot buyers being allowed 5 to 10 per cent discount from these prices:

Common carriage bolts, ¾ x 6 in., smaller or shorter, rolled thread, 35 off; cut thread, 30 and 5, larger or longer, 20. Machine bolts, with h. p. nuts, ⅝ x 4 in., smaller or shorter, rolled thread, 40; cut thread, 35; larger and longer, 25. Lag bolts, cone point, 40. Square h. p. nuts, blank, $1.90 off list; tapped, $1.70 off list. Hexagon, h. p. nuts, blank, $1.70 off; tapped, $1.50 off. C. p. c. and t. hexagon nuts, all sizes, blank, $1.25 off; tapped, $1 off. Cold pressed semi-finished hexagon nuts, 50 and 5 off.

Old Material.—The market is practically at a standstill. Consumers and dealers are awaiting the expected Government regulation of prices and little trading is looked for until this happens, or it is made known that there will be no regulation of scrap prices. There has been no further sagging in prices and quotations are unchanged. However, many of these are merely nominal because of the absence of sales. Material is not being forced on the market and in some cases dealers have to pay prices higher than usual quotations to secure what they need. For example, heavy steel scrap for prompt shipment brought $29.50 and a sale of cast iron was made at $25. Dealers quote, f.o.b. Cleveland, as follows:

Per Gross Ton

Steel rails	$26.00 to $27.00
Steel rails, rerolling	36.00 to 37.00
Steel rails, under 3 ft.	30.00 to 31.00
Iron rails	35.00 to 36.00
Steel car axles	45.00 to 46.00
Heavy melting steel	27.00 to 28.00
Carwheels	26.50 to 27.50
Relaying rails, 50 lb. and over	50.00 to 60.00
Agricultural malleable	22.00 to 23.00
Railroad malleable	27.00 to 28.00
Steel axle turnings	23.00 to 24.00
Light bundled sheet scrap	22.00 to 23.00

Per Net Ton

Iron car axles	$44.00 to $45.00
Cast borings	16.75 to 17.25
Iron and steel turnings and drillings	16.00 to 16.75
No. 1 busheling	22.00 to 23.00
No. 1 railroad wrought	34.00 to 35.00
No. 1 cast	23.00 to 23.50
Railroad grate bars	19.00 to 19.50
Stove plate	19.00 to 19.50

Cincinnati

CINCINNATI, Oct. 23. (*By Wire.*)

Pig Iron.—Only small sales of foundry iron have been made in this vicinity during the past week and all of this new business was booked at $33 furnace for No. 2. Southern producers are more willing to sell at this figure, although it is a rare occurrence for more than 50 or 100 tons to be ordered for last quarter. Offers are now out on first half No. 2 foundry iron on the $33 Birmingham basis, but very little iron has been sold from that territory for the delivery named. Practically all contracts for first half shipment stipulate that they are subject to the Government's revision of prices on Jan. 1. The lower grades of iron are hard to dispose of, as the furnaces do not know what prices to make on them, but on such quotations as they are issuing they are adhering to the old schedule of 50 cents a ton differential between grades. Some Northern Bessemer has lately been sold by southern Ohio furnaces at $36.30 furnace, which represents the tacit agreement on Bessemer of 10 per cent above No. 2 foundry. No basic is to be had for this year's shipment in the Hanging Rock district, but producers state that $33 would be the price quoted in case they should be able to take on any business. The inquiry for foundry iron for first half shipment is increasing and a number of fair-sized deals are under consideration by different firms. The Virginia foundry iron supply has not yet been entirely exhausted, but selling agencies report only odd lots are available for this year's movement. There is still a wide difference of opinion between producers of Ohio silvery irons and no quotations can be named just now. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, nominal prices, as follows:

Southern coke, No. 2 f'dry and 2 soft	$33.00
Southern Ohio coke, No. 2	33.00
Basic, Northern	33.00

(*By Mail*)

Finished Material.—The warehouse price on plates, ¼-in. and heavier, has been reduced to 7c. This reduction has brought out only a small amount of business, but there is an improved call for steel bars, that are now quoted at 4.65c., although certain sizes are held at 5c. Reinforcing concrete rods are quoted at 4.70c. Structural shapes are in a little better demand and 5.15c. is now the quotation named by the jobbers. The store price on No. 10 blue annealed sheets has been reduced from 10c. to 9½c. Nearby mills are now quoting No. 28 black sheets at 7.65c. and No. 28 galvanized at 9.15c., f.o.b. Cincinnati or Newport, Ky., and sales are being made at these prices. Jobbers are not disposed to reduce wire nails below $3.90 per keg base, although there has lately been some desirable business taken at a lower rate.

Coke.—The general opinion is that producers are more willing to take on new business at the Government's price of $6 at oven. A few small foundry contracts have been made on this basis, subject to the revised Government schedule that will probably go into effect Jan. 1. Coke producers have been slower than pig-iron makers in adjusting themselves to the situation, but to a large extent they have been handicapped by natural conditions that have held up the production. So far only a few Connellsville producers have taken on any new business.

Old Material.—The past week has been very dull with dealers who are not disposed to buy scrap at any price, while consumers are indifferent as to accepting dealers' offers. Although there has been no radical change in previous quotations, the market is still very weak and shows no signs of an early recovery. The following are dealers' prices, f.o.b. cars, southern Ohio and Cincinnati.

Per Gross Ton

Bundled sheet scrap	$17.50 to $18.00
Old iron rails	32.00 to 32.50
Relaying rails, 50 lb. and up	44.00 to 44.50
Rerolling steel rails	33.00 to 33.50
Heavy melting steel scrap	24.50 to 25.00
Steel rails for melting	24.50 to 25.00
Old carwheels	25.00 to 25.50

Per Net Ton

No. 1 railroad wrought	$27.50 to $28.00
Cast borings	12.00 to 12.50
Steel turnings	12.00 to 12.50
Railroad cast	18.50 to 19.00
No. 1 machinery cast	23.00 to 23.50
Burnt scrap	13.00 to 13.50
Iron axles	40.00 to 40.50
Locomotive tires (smooth inside)	33.50 to 34.00
Pipes and flues	15.50 to 16.00
Malleable cast	19.00 to 19.50
Railroad tank and sheet	14.00 to 14.50

Philadelphia

PHILADELPHIA, Oct. 23.

The shortcomings of the Government's price control program are becoming increasingly apparent. Quite contrary to expectations that the situation would "work itself out," it is now more confused. Even official departments in Washington, the Navy, for example, does not recognize that prices have been officially fixed and its orders are placed with prices left open. A number of the large mills did not sign the so-called "gentlemen's price agreement" and accept the new prices only as a matter of policy. The unsettled condition in which the price program has been left accounts partly for the frequency with which new business is being turned down. Many of the steel mills do not know yet "where they are at" and efforts to obtain light in Washington generally reveal that officials expect steel producers to work out their own solution of various vexatious prob-

lems. One of these has been: Are mills entitled to a premium for service, such as cutting material to special sizes, and for prompt delivery out of stock? Some have interpreted the Government price control plan as giving them the right to charge extras. One mill is adding about 5c. per lb. for small lots of plates and shapes sold from stock. Another makes a charge of about $10 per ton to cover service, viz., prompt delivery. A fair tonnage of steel bars was sold by an eastern Pennsylvania mill from warehouse last week at 6c. A small mill which rolls plates from slabs has declined to accept Government orders for plates at 3.25c. and continues to accept commercial orders at 7c. to 8c. for tank quality. Even the coke makers, whose product is covered by the Lever bill, in some instances, decline to recognize that the price has been definitely fixed for coke. They say the President has made no proclamation as he did on coal and that the price of $6 at ovens, fixed at the meeting in Washington, is not an official price and not binding. The official announcement was made in the same way on coke as for prices on various steel products. A coke company has refused to deliver coke at $6 to a blast furnace in this district, which has a contract based on current price quotations, and complaint has been made to the War Industries Board and the Fuel Administrator. The Federal Trade Commission is conducting an inquiry by mail to ascertain from iron and steel producers their costs for raw material and average selling prices for their products this year. The commission also asks for views on the abrogation of all existing contracts, as suggested by Senator Pomerene, author of the bill to fix prices by law. Business, except for Government account, is almost at a standstill in this market.

Pig Iron.—The slight flurry in pig iron noted a week ago was short-lived and the past week the market has lapsed into a state of dullness. A few thousand tons of iron were sold for delivery this year and 1000 tons of foundry grades for the first half of 1918, but all of the iron for this year was in small lots and to regular customers. There are many inquiries for next year, but furnaces have become alarmed by the coke situation and several selling agents have received word from makers to make no forward commitments until further notice. One of the Warwick furnaces has been banked because of coke shortage, and other furnaces are so close to the point of exhausting their supply that they are greatly worried. Many eastern Pennsylvania furnaces are curtailing production because of coke shortage. The Norfolk & Western Railroad has lifted its embargo on pig iron shipments, but cars are not plentiful and Virginia furnaces are much behind on deliveries. Consumers in New England not engaged on Government work are declared to be suffering because of the embargo on shipments of pig iron over several Eastern roads. We quote the following tentative prices at furnace (freight rate to destination must be added):

Eastern Penna. No. 2 X	*$33.50
Eastern Penna. No. 2 foundry	33.00
Virginia No. 2 X	*33.50
Virginia No. 2 foundry	33.00
Basic	33.00
Gray forge	*32.00
Bessemer	*36.30

*Subject to revision.

Coke.—Shortage of coke is becoming very embarrassing to eastern Pennsylvania blast furnaces. The coke makers, it appears, are shipping almost 100 per cent of their production on contracts made at prices ranging from $8 to $10, and there is nothing left for the one who tries to buy at the $6 price. A furnace near here which received ample supplies of coke when prices were at higher levels cannot now obtain deliveries at $6, the official price, though its contract calls for specified quantities each month at the current quotation. The coke maker refuses to recognize the $6 price. Complaint has been made to the War Industries Board and the Fuel Administrator by the coke consumer, but without result thus far. It is learned that a coke producer has offered to ship coke to this district at $8.50 per ton at oven, but buyers have not dared to accept the offer, though they would gladly pay the price, so urgent is their need. The coke maker justifies his offer on the ground that the price of coke has not been officially fixed under the Lever bill by proclamation of the President, but that the $6 price was decided upon at the meeting of iron and steel producers with the War Industries Board in Washington and that the coke makers are not legally or morally bound by it. Meanwhile no coke is being sold in this market.

Ferroalloys.—The market for ferromanganese is weak, with very little demand. A few cars have been sold at $275 and $285 for the 80 per cent.

Sheets.—An eastern Pennsylvania mill has accepted small orders for blue annealed sheets from old customers at the price to be fixed by the War Industries Board. A little business is being done at prices approximating 7c. to 8c., Pittsburgh, for No. 10 blue annealed and No. 28 black and 9c. to 9.50c. for No. 28 galvanized. There is keen competition among sellers, however, and on a desirable order possibly below 7c. could be done. A sale of 250 tons of blue annealed sheets on the basis of 8c., Pittsburgh, is reported.

Plates and Shapes.—A small mill in this district rolling plates from slabs has declined to accept proffered Government business at 3.25c. on the ground that it is not a maker of steel. It is continuing to sell its output of plates at 7c. to 8c., Pittsburgh, for tank quality. The Lukens Steel Co. was forced to shut down its open-hearth furnace for two days last week because of a temporary gas coal famine. All plate mills report curtailed production because of shortage of fuel. Makers of plates and shapes met last Saturday in Washington, at the request of Secretary of the Navy Daniels, to confer on steel requirements for the new torpedo boat destroyer-building program. Ten mills divided the steel to be used in 150 destroyers soon to be built. About 75,000 tons of plates and sheets will be required, divided as follows: High tensile plates, 25,000 tons; 17,000 tons medium plates; 5000 tons of boiler steel and 18,000 tons of sheets. About 130 tons of shapes will be required for each destroyer, a total of 19,500 tons. Orders for rivets for the 150 ships were awarded at the same time. Large orders for the merchant ships being built by the Emergency Fleet Corporation are expected soon. One company received a specification for 8000 tons of plates last week. The tonnages of shapes and plates soon to be placed by the Emergency Fleet Corporation for its merchant fleet will fill many mills to capacity for several months and will leave practically nothing for ordinary commercial purposes. The American International Shipbuilding Corporation has asked nearly every fabricator in the East for bids on all the work it can take from Nov. 1, 1917, to May 1, 1918. These orders will be placed promptly and the shapes and plates material will be required almost immediately. Mills have received orders for plain material from the New England Structural Co. and the Boston Bridge Works, which have contracts for fabricating 5000 tons for additions to the plant of Fore River Shipbuilding Corporation for destroyer construction. The New York Shipbuilding Corporation, Camden, N. J., will require 3000 to 4000 tons also for additions for destroyer work. The Philadelphia Electric Co. will build its new plant of reinforced concrete because of inability to obtain nearby deliveries of steel. The Stone & Webster Engineering Corporation, the contractor, had asked fabricators for bids on fabrication work only and evidently had expected to be able to obtain the plain material. A leading producer of structural steel is accepting some business at the Government price of 3c., Pittsburgh, plus a service charge approximating $10 per ton for prompt delivery. Other mills selling shapes and plates in small tonnages from stock exact an even higher premium, which they maintain they are justified in charging as a recognized trade extra.

Iron and Steel Bars.—Makers of iron bars are firmly convinced that their product cannot escape Government price regulation, and hence some of them are willing to accept first-class specifications for delivery over the remainder of this year and first half of next year at 4.25c. or less. Offerings for next year at 4c. are reported. Not all mills are accepting orders at such prices, however, and 4.75c. to 5c. is freely quoted. A fair tonnage of steel bars from stock was sold a few days ago by an eastern Pennsylvania mill at 6c., Pitts-

burgh. The same mill took an order, not for Government work, for a round tonnage of concrete reinforcing bars on the basis of 2.90c. for delivery in 60 to 90 days. The Philadelphia Electric Co., which has changed plans for its new plant to reinforced concrete construction, will require about 1000 tons of reinforcing bars. We quote iron bars 4.25c., Pittsburgh, and steel bars 2.90c., Pittsburgh.

Billets and Slabs.—No sales are reported at the prices recently announced by the Government.

Old Material.—In addition to the Pennsylvania Lines East and West, the following railroads now have embargoes on shipments of iron and steel scrap and require permits, with guarantees from consignees to unload promptly: New York, New Haven & Hartford, Boston & Maine, New York Central, Erie, Pittsburgh & Lake Erie and Lehigh Valley. Business is almost at a standstill pending possible price fixing by the War Industries Board. A committee of dealers in iron and steel scrap has presented to the War Board its recommendations as to prices. Dealers point out that the price of heavy melting steel should be only slightly under that of basic iron, whereas the market may now be quoted at $25 to $28. Therefore, it is maintained, the Government has nothing to gain by fixing prices, which might be higher than at present quoted. The American Board of Iron and Scrap Dealers will thoroughly discuss the price-fixing program at a meeting in Pittsburgh on Thursday. We quote the following prices for delivery in the Philadelphia district:

No. 1 heavy melting steel	$25.00 to $28.00
Steel rails, re-rolling	30.00 to 35.00
Low phosphorus heavy melting	35.00 to 38.00
Old iron rails	38.00 to 40.00
Old carwheels	29.00 to 31.00
No. 1 railroad wrought	35.00 to 40.00
No. 1 forge fire	22.00 to 23.00
Bundled sheets	22.00 to 23.00
No. 2 busheling	15.00 to 16.00
Machine shop turnings (for blast furnace use)	15.00 to 16.00
Machine shop turnings (for rolling mill use)	18.00 to 20.00
Cast borings (for blast furnace use)	15.00 to 16.00
Cast borings (clean)	19.00 to 20.00
No. 1 cast	28.00 to 30.00
Grate bars	19.00 to 21.00
Stove plate	19.00 to 21.00
Railroad malleable	32.50 to 35.00
Wrought iron and soft steel pipes and tubes (new specifications)	28.00 to 30.00

British Steel Market

American Crude Steel Easier—Ferromanganese Scarce—Pig Iron Stronger

(*By Cable*)

LONDON, ENGLAND, Oct. 24.

The demand for pig iron is strong and is stimulated by the suggestion that an advance in coal prices will involve an all around revision of maximum iron quotations. American semi-finished steel is easier. Wire rods have sold down to £27 c.i.f. Liverpool, with £26 the nearest price now. Tin plates are firmer. Ferromanganese is unsettled and irregular, small business having been done at about $350 c.i.f. American Atlantic ports for forward shipment, but sellers are very scarce. We quote as follows:

Tin plates, coke, 14 x 20; 112 sheets, 108 lb., f.o.b. Wales, maximum, 30s.
Ferromanganese, £45 nominal.
Ferrosilicon, 50 per cent, c.i.f., £35 upward.
On other products control prices are as quoted in THE IRON AGE of July 19, p. 171.

Buffalo

BUFFALO, Oct. 22.

Pig Iron.—Inquiry continues good and some improvement is shown in the amount of business transacted as compared with a week ago, although the amount iron furnaces have to dispose of is exceedingly limited, even for the period of the first quarter of next year, with practically nothing left to sell for delivery during the remainder of this year. Some furnaces have capacity pretty well taken until next Fall. The bulk of the business consummated during the week was for delivery over the first four months of 1918, and was principally with regular customers, those who have been constant buyers from one source of supply for years, and who, furnacemen feel, are entitled to consideration in purchasing because of the regularity with which their orders have been placed in the past. With the present well booked up conditions, producers are not pushing sales, although business may be more freely sought when price differentials for all grades have been definitely established and the coke situation is straightened out. The most notable sale of the week was a tonnage of about 5000, comprised of No. 2 plain, No. 2 X and No. 1 foundry, for which the prices were on a basis of $33.00, furnace, for the No. 2 plain, $33.50 for 2 X and $34.50 for No. 1 foundry. This transaction, as well as some others covering much smaller tonnages, was made with the understanding between seller and buyer that in the event of the Government differentials not corresponding to this basis, the prices for the sale are to be changed to conform to the Governmental scale. The following is the approximate schedule of prices f.o.b. furnace, on which current business is being transacted. The price scale is approximately as follows, f.o.b. furnace, Buffalo:

No. 1 foundry	$34.50
No. 2 X	33.50
No. 3 foundry	32.50
Gray forge	32.00
Malleable	33.50
Basic	33.00
Lake Superior charcoal, f.o.b. Buffalo	39.75

Old Material.—Buying and selling continues at a standstill, held in abeyance waiting the expected fixing of prices by the Government, which is still delayed. Meanwhile lower price levels are in evidence, due to lack of any buying movement because consumers are holding back. Consumers' stocks are said to be running low, which will undoubtedly necessitate the buying of additional supplies shortly. The principal changes shown in price schedules for the week are: a drop in heavy melting steel of $1.50 to $2.00 per ton, the nominal price now being $28.00 to $30.00; a decline of $3.00 per ton in No. 1 railroad wrought, of $2.00 per ton in old iron rails, and $1.00 per ton in No. 1 machinery cast scrap, railroad malleable and heavy axle turnings.

We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$28.00 to $30.00
Low phosphorus	41.00 to 42.00
No. 1 railroad wrought	37.00 to 38.00
No. 1 railroad and machinery cast	28.00 to 29.00
Iron axles	45.00
Steel axles	45.00
Carwheels	30.00 to 31.00
Railroad malleable	28.00 to 29.00
Machine shop turnings	17.00 to 18.00
Heavy axle turnings	25.00 to 26.00
Clean cast borings	19.00 to 20.00
Iron rails	38.00 to 39.00
Locomotive grate bars	20.00 to 21.00
Stove plate	20.00 to 21.00
Wrought pipe	26.00 to 27.00
No. 1 busheling scrap	25.00 to 26.00
No. 2 busheling scrap	17.00 to 18.00
Bundled sheet stamping scrap	19.00 to 20.00

St. Louis

ST. LOUIS, Oct. 22.

Pig Iron.—Inquiry in the local market has continued heavy, but so far transactions have been held up by absence of certainty as to prices for the deliveries wanted as well as the unwillingness of furnaces to make sales while current deliveries were still behind contract allotments. The inquiry of the Scullin Steel Co. for 20,000 tons of basic, southern product, and of the Commonwealth Steel Co. for 10,000 tons northern basic are in this category. The inquiries continue to come from sections not hitherto considered. St. Louis territory and about 10,000 tons in the aggregate in lots of 1000 tons and downward have been asked for from Chicago territory, the apparent hope being that the local furnace could meet the call. A considerable inquiry mentions no specific tonnage, the desire probably being to get a price. According to reports in the market during the past week, offers have been received for Dec. 1 to July 1 delivery by a number of consumers from the Rockwood furnace at $33.50 Birmingham basis for No. 2 foundry.

Finished Iron and Steel.—In finished products no

business is being done, though there is constant pressure for delivery. On stock out of warehouse we quote as follows: Soft steel bars, 4.55c.; iron bars, 4.50c.; structural material, 5.05c.; tank plates, 7.05c.; No. 10 blue annealed sheets, 9.55c.; No. 28 black sheets, cold rolled, one pass, 9.25c.; No. 28 galvanized sheets, black sheet gage, 10.50c.

Old Material.—The scrap market has been rather quiet, though there has been some stiffening of rolling mill grades because of the needs of local industries. There is also need for steel for the open hearth furnaces, whose stocks of scrap are considerably depleted, and firmer feeling is being experienced. We quote dealers' prices, f.o.b. consumers' works, St. Louis industrial district, as follows:

	Per Gross Ton	
Old iron rails	$36.00 to	$37.00
Old steel rails, re-rolling	35.00 to	35.50
Old steel rails, less than 3 ft	29.00 to	30.00
Relaying rails, standard section, subject to inspection	50.00 to	55.00
Old car wheels	25.50 to	26.00
Heavy melting steel scrap	26.50 to	27.00
Heavy shoveling steel	24.00 to	24.50
Ordinary shoveling steel	20.50 to	21.00
Frogs, switches and guards cut apart	24.50 to	25.00
Ordinary bundled sheet scrap	17.50 to	18.00
Heavy axle and tire turnings	17.00 to	17.50

	Per Net Ton	
Iron angle bars	$33.50 to	$34.00
Steel angle bars	23.50 to	24.00
Iron car axles	40.50 to	41.00
Steel car axles	39.00 to	39.50
Wrought arch bars and transoms	39.50 to	40.00
No. 1 railroad wrought	29.50 to	30.00
No. 2 rialroad wrought	27.50 to	28.00
Railroad springs	25.50 to	26.00
Steel couplers and knuckles	27.50 to	28.00
Locomotive tires, 42 in. and over, smooth inside	29.50 to	30.00
No. 1 dealers' forge	18.00 to	18.50
Cast iron borings	14.00 to	15.00
No. 1 busheling	21.00 to	21.50
No. 1 boilers, cut to sheets and rings	16.50 to	17.00
No. 1 railroad cast scrap	19.00 to	19.50
Stove plate and light cast scrap	16.50 to	17.00
Railroad malleable	25.50 to	26.00
Agricultural malleable	18.50 to	19.00
Pipes and flues	19.50 to	20.00
Heavy railroad sheet and tank scrap	15.50 to	16.00
Railroad grate bars	16.00 to	16.50
Machine shop turnings	14.50 to	15.00
Country mixed scrap	14.50 to	15.00

New York

NEW YORK, Oct. 24.

Pig Iron.—Very active inquiry for pig iron has developed, inquiries amounting to probably 10,000 tons of foundry iron for delivery of all kinds, from prompt to well into next year. The largest was for 2000 tons and most of them were for 200 to 300 tons. While some sales have been made on the basis of Government prices, sellers as a rule are very conservative and in many cases are refusing to quote until the policy of the Government becomes more plainly defined. No action has yet been taken in regard to recommendations submitted to Washington week before last, but word from the Capital is expected in the very near future. For early delivery, we quote as follows, tidewater, for those grades for which prices have been fairly established, omitting other grades for the present:

No. 1 X	$35.25
No. 2 X	34.25
No. 2 plain	33.75
No. 2 Southern	37.25

Ferroalloys.—Domestic ferromanganese has been sold in small lots at $275, but it is believed that an inquiry involving an attractive amount would bring out a lower price. The cause of the decline from $350 in the last few weeks is not clear. Some attribute it to the expectation of price-fixing and a desire to unload higher priced material. The possibility of the Government fixing a price on ferromanganese is not now regarded very seriously, since the ore is a foreign product almost entirely and not subject to regulation, its price largely determining the price of the alloy. Inquiry is of small proportions and consumers seem well provided for. Imports in September were 3402 tons, but indications now are that for the remainder of the year they will be less than in some recent months. One representative of an English producer is quoting $275, seaboard, for delivery next year. This producer was able to secure licenses for the shipment of only 400 tons out of 1500 tons asked to be released. There is an inquiry from a Middle Western consumer for 12,000 tons of 20 per cent spiegeleisen for delivery in 1918 at the rate of 1000 tons per month. There is no quotation for this position available, but for delivery this year $70, furnace, is asked and has been obtained on small lots. Ferrosilicon, 50 per cent, is quiet, with about $200 asked for delivery this year and $150 to $165 for next year's material. There is an inquiry before the market for 1200 tons for 1918 delivery at 100 tons per month.

Cast Iron Pipe.—Following the reduction of $9 per ton in prices of cast iron pipe, making the quotation $56.50 on 6-in. and heavier and $59.50 on 4-in., there has been little inquiry. This is the period of the year when cast iron pipe is almost always dull, and the dullness is pronounced this year. The Government is taking some pipe, principally for delivery at shipyards, as the requirements of the cantonments are well covered. Buyers are hesitating. They probably are hopeful of still lower prices being made.

Old Material.—Buyers and sellers of scrap have their eyes turned toward Washington and are awaiting action of representatives of the scrap dealers and Government officials in regard to prices. Under these conditions very little business is being transacted and dealers are having difficulty in getting cars in which to move the limited tonnages sold. We quote prices of brokers as follows to New York producers and dealers, per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$23.50 to $24.00
Old steel rails (short lengths) or equivalent heavy steel scrap	23.50 to 24.00
Relaying rails	45.00 to 50.00
Rerolling rails	33.00 to 34.00
Iron and steel car axles	41.00 to 42.00
No. 1 railroad wrought	32.00 to 33.00
Wrought-iron track scrap	27.00 to 28.00
No. 1 yard wrought long	27.00 to 28.00
Light iron	7.00 to 8.00
Cast borings (clean)	16.00 to 17.00
Machine-shop turnings	14.00 to 15.00
Mixed borings and turnings	13.00 to 14.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long)	25.00 to 26.00

The cast scrap market is showing some improvement and quotations on No. 1 machinery cast and stove plate are somewhat higher. Dealers in New York City and Brooklyn are quoting as follows to local foundries, per gross ton:

No. 1 machinery cast	$26.00 to $27.00
No. 1 heavy cast (column, building materials, etc.)	21.00 to 22.00
No. 2 cast (radiators, cast boilers, etc.)	21.00 to 22.00
Stove plate	18.00 to 19.00
Locomotive grate bars	16.00 to 17.00
Malleable cast (railroad)	27.00 to 28.00
Old carwheels	27.00 to 28.00

Finished Iron and Steel.—Some specific stock order of plain structural material with deliveries extending in 1918 have been taken at the 3c., Pittsburgh basis, and this is about all of the sizable transactions at the new prices. In the Chicago territory 10,000 tons of steel bars were sold at 2.90c. for the last of this year and through the first quarter of next. Other movement of material has been largely from the so-called boneyards of mills, small in amount, of course, and chiefly in plates, which have been moved at 8c. per lb. Universal plates are obtainable for immediate shipment at 3.25c., Pittsburgh, but sheared mills are giving 85 per cent of their present rollings to Government uses, leaving still no apparent chance for any nearby delivery purchases in tank or hull plates outside of even the A classification. Seekers after plates are still offering to pay more than 3.25c. without success. Bar iron is strong at 4.75c., Pittsburgh, with perhaps somewhat better delivery than latterly obtaining and thus attracting some business which would otherwise go to steel bar mills. On 5000 tons of rails for China a quotation at $80 per ton has been made. In railroad cars neither the 30,700 for Russia nor the 10,000 for France, mentioned last week, have been closed. The delay in the former case seems to be the result of an effort to secure lower prices. A sizable domestic inquiry has appeared from the Union Pacific for 3750 cars and 1000 trucks, but whether or not this is a feeler for lower prices

growing out of the lower agreed steel prices, or whether it is business likely to be soon closed is not certain. In the fabricating field awards may be noted as follows: 1500 tons for the Philadlephia & Reading, Philadelphia, to the McClintic-Marshall Co.; 1900 tons for the nitrate plant at Sheffield, Ala., to the Virginia Bridge & Iron Co.; 200 tons for the model storage building, Department of Yards and Docks, Washington, to Barber & Ross, and 1100 tons for the Pennsylvania, of which 700 tons went to the American Bridge Co. So far as business in Eastern territory is concerned the agreed prices of 2.90c. on steel bars, 3c. on shapes and 3.25c. on tank plates are nominal, but for mill shipments of iron bars we quote 4.945c., New York. Out of store we continue to quote shapes and iron and steel bars at 5c. to 5.50c., New York, and plates at 8c. and higher, with a possibility that 7c. might be done.

Plates and Shapes for New Destroyers

WASHINGTON, Oct. 23.—About eleven steel manufacturers will participate in the supplying of plates and shapes for the construction of the 150 destroyers for which the Navy Department has contracted. The names of these manufacturers and the quantity of steel which each is to furnish at the prices recently fixed by the Government are withheld. Secretary of the Navy Daniels, some time ago, announced the names of the five shipyards which will construct the destroyers. The speed with which the arrangements for the building of the vessels and the distribution of the steel orders were accomplished is looked upon by officials here as satisfactory evidence of the amicable arrangements which have been worked out between the Government and the producers of such products.

The shipbuilders conferred with Secretary Daniels early in the month and the orders for the destroyers were distributed thereupon. The representatives of the eleven leading steel companies conferred with the Secretary on Saturday last and thereupon the orders for the ship plates and shapes were distributed. Admiral Taylor, Chief Naval Constructor, participated in the Saturday conference. The steel to be used in the construction of the destroyers, it has been estimated, will aggregate 75,000 tons.

Before deliveries are to be started, Admiral Taylor's office is waiting upon the five shipbuilders for a detailed schedule. This schedule will give the order of deliveries of the steel supplies for the construction of the destroyers. The steel producers will be called upon to make deliveries in accordance with these schedules from the builders of the destroyers. In order to inforce early delivery of the supplies to the builders in the order called for in the schedules, it is expected the Priorities Committee will be called upon to issue the necessary certificates of prior delivery. While these certificates may not be necessary, inasmuch as the steel producers have promised hearty co-operation, they will serve as a legal protection to the steel men against any claims which may result from delays resulting therefrom to other orders which must be displaced to meet the needs of the Navy program.

The Warren Metal Co., Warren, Ohio, dealer in iron and steel scrap, metals and waste, has sold one of its yards and purchased a larger site for a new yard in the southeast section of Warren, between the tracks of the Baltimore & Ohio and Erie railroads. The company will equip the new yard with modern equipment and railroad track scales. The company has also leased a suite of offices in the New Hippodrome Building, Warren. It will specialize in carload lots of old material. The Warren Metal Co. was incorporated May 1, 1917, with $50,000 capital stock. Its officers are: Jacob Knofsky, president; Isador Knofsky, vice-president; I. L. Knofsky, secretary; F. D. Williams, treasurer, and Roy Knofsky, general manager.

P. M. Armstrong & Co., conducting one of the oldest hardware stores in Lisbon, Ohio, has retired from business. The company was originally organized more than 60 years ago by the late R. B. Pritchard, but since 1883 has been conducted by Armstrong & Co.

Absorbs Canton Sheet Steel Co.

The Hydraulic Pressed Steel Co., Cleveland, has acquired control of the Canton Sheet Steel Co., Canton, Ohio, as a result of negotiations which were concluded last week. It is understood that approximately $4,000,000 was involved in the transaction, of which about one-half was paid in cash. By the purchase of the Canton plant the Hydraulic company has secured its own source of supply for raw material. The plant of the Canton Sheet Steel Co. has a capacity of about 90,000 tons in black and galvanized sheets per year and the company is installing a steel plant to manufacture its own sheet bars. This consists of three open-hearth furnaces and a continuous sheet bar and billet mill. The open-hearth plant will be ready for operation in about three weeks. The Hydraulic company, with its Cleveland subsidiary, the Cleveland Welding & Mfg. Co., expects eventually to consume the entire output of the Canton plant with the exception of the galvanized sheets. However, as long as it has a surplus product it will be disposed of in the market.

The reorganization of the Canton Sheet Steel Co. has been affected by the election of J. H. Foster, A. W. Ellenberger, H. P. McIntosh, Jr., S. H. Tolles and E. I. Heinson as directors, who succeed a majority of the old board. The following Canton men remain on the board: C. A. Irwin, W. W. Irwin and H. S. Renkert. J. H. Foster, president of the Hydraulic company, will be president of the Canton company, C. A. Irwin first vice-president, H. S. Renkert second vice-president, H. P. McIntosh, Jr., treasurer and S. H. Tolles secretary. W. W. Irwin, who organized the Canton company and has been at its head, remains as general manager.

The product of the Hydraulic Pressed Steel Co. includes heavy pressed steel work, automobile frames, stampings, pressed steel concrete structural forms and steel barrels. This company also has a large shell department and has been engaged since the outbreak of the war in making shell forgings, and is now doing a large amount of this work for the United States Government. The products of the plant of the Cleveland Welding & Mfg. Co. include automobile rims, truck tire bases and welded steel tubing.

British Production of Stainless Steel Prohibited

The production of stainless steel for cutlery in Great Britain has been prohibited by an order of the Ministry of Munitions, Sept. 8, 1917. The order reads as follows:

> In view of the difficulties in getting supplies of ferrochrome I am directed to inform you that from the above date the use of the same in connection with the manufacture of stainless steel for cutlery purposes is prohibited. Ferrochrome must only be used in connection with high speed, crucible carbon steel and alloy steel and, in the case of the latter, only where a priority certificate or other permit number has been obtained which will warrant the manufacture of the steel in question.

As will be seen, the prohibition relates only to stainless steel for the cutlery trade and, therefore, such steel can still be made for other uses providing that these are connected with the production of munitions of war. That such uses exist is not generally known, but it appears that the material has proved extremely valuable for various engineering purposes, says an English authority. Apart from cutlery, steel rendered stainless or rustless by the employment of chromium in its composition is likely to become a big factor in the engineering industry of the future.

The Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., in an illustrated pamphlet, announces courses to be given in the technical night school conducted for its employees. The subjects include machine shop practice, blueprint reading, shop drawing and mathematics, practical electricity and shop mechanics. The success with which the initial term met last winter, it is stated, was greater than the management had dared to hope for. A registration fee of $1 is refunded to each man awarded a certificate at the end of the season, and a textbook is supplied at cost.

IRON AND INDUSTRIAL STOCKS

Decline on Wall Street Stopped—Many Gains Are Recorded

NEW YORK, Oct. 24, 1917.

The decline in prices on the Stock Exchange which had been in progress for many weeks was stopped last week and nearly all industrial stocks recorded advances. At the beginning of the week depression was more decided than on any other day since the declaration of war by the United States, but the upward movement soon got under way and throughout the rest of the week sentiment was decidedly stronger. There is a feeling that the liquidation, due to the new revenue bill and the Liberty Loan, has been about finished and as it is not expected that a third Government bond issue will be launched this year, the prospect of a strong stock market up to Jan. 1 is much improved, but the ease with which the market may be depressed was shown by a violent break which took place the early part of last week, due to the suggestion that measures might be taken to close the Stock Exchange on account of the long continued descent of prices.

Among the stocks which recorded gains last week were the following: Allis-Chalmers Mfg. Co., com., 2⅜ points; American Car & Foundry Co., 2¾; American Steel Foundries, 2⅜; Baldwin Locomotive, com., 6⅞; Bethlehem Steel, 10; Bethlehem Steel, class B, 9½; Bethlehem Steel, pref., 9; Lackawanna Steel, 4¾; Midvale Steel, 4; National Enameling & Stamping, com., 3⅜; Pressed Steel Car, 3; Republic Iron & Steel, com., 4½; Sloss-Sheffield Steel & Iron, 2; Superior Steel, 2⅞; United States Steel, com., 3⅞; United States Steel, pref., 1⅝.

The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com.	19¾ - 23½	Int. Har. of N. J., pref.	100 -110
Allis-Chal., pref.	74 - 75½	Int. Har. Corp., com.	65⅜
Am. Can, com.	38½ - 42⅞	Lacka. Steel	76 - 84
Am. Can, pref.	94⅞ - 96½	Lake Super. Corp.	12⅝ - 14⅜
Am. Car & Fdy., com.	63 - 69⅜	Lukens, 1st pref.	101½ -101¾
Am. Car & Fdy., pref.	107½	Midvale Steel	43⅞ - 47⅝
Am. Loco., com.	53 - 61⅞	Nat.-Acme	29⅞ - 30¾
Am. Loco., pref.	97 - 98	Nat. En. & Stm., com.	41⅛ - 45
Am. Rad., com.	292	N. Y. Air Brake.	115 -123
Am. Ship, com.	89 - 89¼	Nova Scotia Steel	78 - 80
Am. Steel Fdries.	58½ - 63⅝	Pitts. Steel, pref.	97
Bald. Loco., com.	51 - 65¼	Pressed Stl., com.	52½ - 59½
Bald. Loco., pref.	95¾ - 96¼	Ry. Steel Spring, com.	38⅞ - 42½
Beth. Steel, com.	74 - 89	Ry. Steel Spring, pref.	95¼ - 97⅞
Beth. Steel, Class B	71 - 87⅛	Republic, com.	72¾ - 81⅞
Beth. Steel, pref.	92 - 93	Republic, pref.	98 - 99¼
Cambria Steel	105 -116	Sloss, com.	37½ - 42
Carbon St., com.	73 - 77	Superior Steel	33¾ - 38⅝
Central Fdry., com.	28 - 30¼	Superior Steel, 1st pref.	100
Central Fdry., pref.	44	Transue-Williams	39 - 40
Chic. Pneu. Tool.	56 - 57	Un. Alloy Steel.	39½ - 41¾
Colo. Fuel	35½ - 40	U. S. Pipe, com.	12¾ - 14
Crucible St., com.	62¾ - 69⅞	U. S. Pipe, pref.	50 - 50¼
Crucible St., pref.	90½ - 91½	U. S. Steel, com.	100⅞ -107⅜
Deere & Co., pref.	99¾	U. S. Steel, pref.	112⅞ -114⅜
Gen. Electric	135¾ -139¾	Va., I. C. & Coke.	55 - 58½
Gt. No. Ore. Cert.	27 - 29¾	Westing. Elec.	40¾ - 44
Gulf States Steel.	90½ - 95		
Int. Har. of N. J., com.	103½ -107		

Republic's Fine Showing

Out of total income of $23,502,521 for the first nine months of the current year the Republic Iron and Steel Co. has laid aside $8,636,605 to cover the full estimated amount of accrued excess profits and income tax for the year to date, according to an official statement just issued by John A. Topping, chairman of the board.

Net profits available for dividends were $13,045,338, and after allowing for the dividends on the preferred, the balance available for the $27,191,000 common stock was equivalent to $43.26 a share. During the nine months' period the company expended $2,467,130 for maintenance charges and repairs.

In his remarks to the stockholders Mr. Topping said: "This statement is submitted in lieu of the usual quarterly statement for the period ended Sept. 30, 1917, to clarify operating results to date. The net profits applicable to dividends for the quarter ended Sept. 30, 1917, calculated on the previous basis of accounting, would have been $6,682,425. The foregoing statement is subject to adjustment at the end of the year, when accounts are finally audited. Our fiscal year ends Dec. 31, and the annual report will be published prior to the annual meeting, which occurs in April."

The income account is as follows:

Net earnings after deducting $2,467,130 for maintenance and repairs		$23,311,988
Other income—interest and dividends		190,533
Total income		$23,502,521
Depreciation and renewal	$737,152	
Exhaustion of minerals	202,585	
Extraordinary depreciation	300,000	1,239,737
Net profits for nine months		$22,262,784
Bond interest	580,841	
Excess profits tax, etc.	8,636,605	9,217,447
Net profits for dividends		*$13,045,338
Preferred dividends	1,312,500	
Common dividends	1,223,595	2,536,095
Surplus for nine months		$10,509,243

*After allowing for dividends on the preferred stock, the balance available for the $27,191,000 common stock is equivalent to $43.26 a share.

Industrial Finances

The American Brass Co., Waterbury, Conn., has declared an extra dividend of 4½ per cent in addition to its regular quarterly dividend of 1½ per cent. Explanation is made that the directors believe that it is their duty to conserve their financial resources against the time when they will be called upon to pay large amounts which will be due the United States Government for excess profits and for income taxes, and to Connecticut and Wisconsin for state taxes.

Dividends

The Canadian Foundry & Forgings Co., quarterly,, 3 per cent on the common and 1¾ per cent on the preferred, payable Nov. 15.

The Crocker-Wheeler Co., quarterly, 2 per cent on the common and extra 1 per cent, and quarterly, 1¾ per cent on the preferred, all payable Oct. 15.

The Dominion Steel Corporation, quarterly, 1½ per cent on the preferred, payable Nov. 1.

The Lima Locomotive Co., initial semi-annual of 3½ per cent on the preferred, payable Oct. 31.

The Taylor-Wharton Iron & Steel Co., quarterly 1¾ per cent, payable Nov. 1.

The Warwick Iron & Steel Co., 30c. per share, payable Nov. 15.

Nova Scotia Steel & Coal Co. Production

The output of the Nova Scotia Steel & Coal Co., New Glasgow, N. S., for the three months of July, August and September compares with that of the previous quarter as follows:

	June Quarter, Tons	September Quarter, Tons
Coal	152,076	139,795
Ore	4,238	7,174
Limestone	20,890	17,069
Coke	25,874	25,268
Pig iron	21,971	21,874
Steel ingots	33,377	30,847
Finished steel and forgings	28,908	32,657

An examination for inspector of supplies and repairs has been announced by the Municipal Civil Service Commission, New York. Candidates should have practical experience in the purchasing, storage, inspection or handling of supplies required in the city service or experience in building construction and repairs or related experience tending to qualify them for the duties of the position. The salary is $1,800 to $2,400 per year. Applications will be received at room 1400, Municipal Building, New York, until Nov. 2 at 4 p. m.

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
Oct.	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
17	23.50	23.50	61.25	6.90	6.77½	8.25	8.00
18	23.50	23.50	61.25	6.50	6.37½	8.25	8.00
19	23.50	23.50	61.50	6.40	6.27½	8.25	8.00
20	23.50	23.50	....	6.40	6.27½	8.25	8.00
22	23.50	23.50	61.50	6.25	6.12½	8.25	8.00
23	23.50	23.50	61.62½	6.25	6.12½	8.25	8.00

NEW YORK, Oct. 24.

Dullness pervades all the markets. Copper continues unsettled and nominal at the Government price. Tin is quiet and firm. Lead continues to decline with no demand. Spelter is still stagnant and unchanged. Antimony is weaker.

New York

Copper.—That copper has sold in small lots as high as 30c., New York, is acknowledged. That no copper can be bought in quantity from large producers at the Government or any other price is a certainty. These are the only two facts that are definitely known in a market concerning which other reliable or official information is almost impossible to obtain. It is stated that the general situation is working out satisfactorily and that consumers having Government contracts are getting supplies on old contracts. The position of the small dealer is the difficult one, faced as he is with the rumor that sales made above the Government price are liable to confiscation. The entire situation depends on how much copper is left after the war needs are supplied. We continue to quote he Government price as nominal at 23.50c., New York, for both Lake and electrolytic. The London market is unchanged.

Tin.—The leading fact of interest in the tin market is that indications point in some respects to easier shipping permits. Nothing definite is known about this but the feeling is based on a belief that the American and British governments have reached an understanding so as to make deliveries easier. It is recognized that tin-plate manufacturers must have tin to make tin plate for cans. The market was very dull in the last three days of last week, the earlier good demand having flattened out. Monday the market was nominal and on Tuesday it was practically the same, although a moderate business in futures was quietly done. At the close of business yesterday also there was more interest in futures which may later develop into good business. The market has been firm, fluctuating close to either side of 61.50c., New York, with the quotation yesterday, 61.62½c. Arrivals to Oct. 23 inclusive, were 1910 tons, with 4300 tons reported afloat. The London market for spot straits is only 5s. under its level last week, or £247 5s. per ton.

Lead.—Another reduction on Thursday of last week by the American Smelting & Refining Co. of ½c. per lb., bringing its quotation to 6.50c., New York, has further unsettled an already weak and inactive market. The quotation yesterday was 6.25c., New York, in the outside market. The bottom has apparently not yet been reached, but it is believed it is near. Independents continue to cut the leading producer's price and are now asking 6.40c., New York, for prompt lead, 6.25c., New York, for October and November delivery, and 6c., New York, for December. A fair amount of lead has been sold in transit, but it did not command a premium, which is unusual. Buyers in general are ordering only what they need and what they can quickly lay their hands on.

Spelter.—Inquiry is only spasmodic and not for large amounts in any case. The market is lifeless and discouraged. Buying for the galvanizing trade has dwindled to small proportions compared with what it was before the war. Brass manufacturers are not in the market, whereas a year ago they were covering their requirements for large quantities a year ahead. If our own Government has made any plans for its own ammunition, it is not reflected in the spelter market. If Government price-fixing is decided on, it is believed it will ultimately result in higher prices, for present quotations are very near cost levels. Price fixing would be, however, a temporary burden. The market for prime Western is quoted nominally at 8c., St. Louis, or 8.25c., New York, for early delivery, but this can probably be shaded on desirable inquiries. For later delivery ⅛ to ¼c. higher is asked. Transactions are reported as very few.

Antimony.—Because of lack of demand the market has declined and Chinese and Japanese grades are obtainable for 14.75c., New York, duty paid.

Aluminum.—No. 1 virgin metal, 98 to 99 per cent pure, is inactive and unchanged at 38c. to 40c. per lb., New York, for early delivery.

Old Metals.—We are quoting nominally on the basis of the Government arrangement with the producers, but purchasers other than the Government are obliged to pay from 26c. to 27c. per lb. for heavy crucible copper. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible (nominal)	23.50
Copper, heavy and wire (nominal)	23.50
Copper light and bottoms	22.50 to 23.00
Brass, heavy	18.00 to 18.25
Brass, light	13.00 to 14.00
Heavy machine composition	25.00 to 25.25
No. 1 yellow rod brass turnings	17.25
No. 1 red brass or composition turnings	19.00 to 21.00
Lead, heavy	6.25
Lead, tea	5.00
Zinc	6.25

Chicago

OCT. 22.—In copper there is no general market, each individual transaction determining its own price. The fulfilment of contracts is being permitted by the Government, and it is interesting to note that up to 32c. figures in some of these. Buying is sparse in all the metals, most of it being hand-to-mouth business, although there is some effort being made to buy future lead and spelter, certain consumers believing that these metals have touched the bottom. Activity is restrained by the difficulty, if not impossibility, of finding sellers of futures. The official maximum price on copper has operated to bring old metals down sharply. We quote as follows: Casting, Lake and electrolytic copper, 28c. to 30c.; tin, carloads, 62c.; small lots, 64c. to 65c.; lead, 6.45c.; spelter, 8c.; sheet zinc, 19c.; antimony, 17c. to 18.50c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible wire, crucible shapes, 20c.; copper clips, 20c.; copper bottoms, 19c.; red brass, 19c.; yellow brass, 14.50c.; lead pipe, 5c.; zinc, 5.50c.; pewter, No. 1, 35c.; tinfoil, 42c.; block tin, 47c.

St. Louis

OCT. 22.—Non-ferrous metals have been rather quiet, with a weaker tendency. The close to-day on lead in carload lots was 6.42½c., with no business reported; spelter in carload lots, dull at 8c. In less than carload lots the quotations were: Lead, 7.90c.; spelter, 9c.; tin, 65½c.; Lake copper held at 28c.; Asiatic antimony, 18c. In the Joplin district ore was generally weaker. Zinc blende was held on a range, basis of 60 per cent metal, at $55 to $70 per ton, with some special lots, on premium analysis, going higher. The average for the week for the district was $66 per ton. Calamine was $35 to $42, basis of 40 per cent metal, with the average for the district for the week $39 per ton. Lead dropped from $90 to $80 per ton, basis of 80 per cent metal, with the average for the week at $84 per ton. About seventy-five plants have shut down because of the price conditions.

J. M. Faris of the Youngstown Sheet & Tube Co. recently made an address before the Rotary Club of that city on "Increased Production as Effected at the Plants of the Youngstown Sheet & Tube Co." Starting with the old style skelp mill with its capacity of possibly 10,000 tons per month, its force of 200 employees or more, Mr. Faris spoke of the modern skelp mill of today at Youngstown, which can turn out 17,000 tons of skelp per month with a force of only 40 men.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

(Some of these quotations are nominal, showing prices which prevailed when last sales were made. Published as a matter of record.)

Freight rates from Pittsburgh on iron and steel articles, aside from wrought iron and steel pipe in carloads, per 100 lb. New York 19.5c.; Philadelphia 18.5c.; Boston 21.5c.; Buffalo 11.6c.; Cleveland 13.5c.; Cincinnati 18.5c.; Indianapolis 20c.; Chicago 21.5c.; St. Louis 27c.; Kansas City 47c.; minimum carload 36,000 lb.; St. Paul 35.5c; minimum carload 36,000 lb.; Denver 79c.; minimum carload 36,000 lb.; Omaha 47c.; minimum carload 36,000 lb.; New Orleans 30.7c.; Birmingham 46c.; Pacific Coast 75c.; minimum carload 80,000 lb. To the Pacific Coast, the rate on steel bars and structural steel is 90c.; minimum carload 40,000 lb. and 85c.; minimum carload 50,000 lb. On wrought iron and steel pipe, the rate from Pittsburgh to Kansas City is 40c. per 100 lb., minimum carload 46,000 lb.; to Omaha 40c., minimum carload 46,000 lb.; to St. Paul 35.5c., minimum carload 46,000 lb.; Denver 79c., minimum carload 46,000 lb.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in., angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 3c.

Wire Products

(Prices of independent mills.)

Wire nails, $4 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire, $4.05 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.95; galvanized wire, $4.65; galvanized barb wire, and fence staples, $4.85; painted barb wire, $4.15; polished fence staples, $4.15; cement-coated nails, $3.90 base these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 43 per cent off list for carload lots, 42 per cent off for 1000-rod lots, and 41 per cent off for small lots, f.o.b. Pittsburgh.

Nuts and Bolts

Discounts in effect for large buyers are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days.

Carriage bolts, small, rolled thread, 40 per cent; small cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent with c. p. nuts 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq. blank, $1.70 off list, and tapped, $1.50 off; hex. blank, $1.50 off, and tapped, $1.30 off; nuts, c. p. c. and t. sq. blank, $1.25 off; and tapped, $1 off; hex. blank, $1.25 off, and tapped, $1 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Wire Rods

Soft Bessemer and open-hearth rods to domestic consumers at $57; high-carbon rods made from ordinary open-hearth steel, $95 to $100, and special steel rods with carbons running from 0.40 to 0.60, $100 to $1.10 at mill; above 0.60 carbon, $115 to $120.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $5 to $5.50; ¾ in., 7/16 in. and ½ in., $7.00 base. Boat spikes are occasionally quoted $7 to $8, all per 100 lb., f.o.b. Pittsburgh, but some makers are quoting higher. Track bolts with square nuts, 7c. to 7.50c. to railroads, and 8c. to 8.50c. in small lots for fairly prompt shipment.

Steel Rails

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails and on carload and smaller lots, 4c. to 4.25c. at mill. Light rails 25 to 45 lb., $75 to $80; 16 to 20 lb., $80 to $81; 12 and 14 lb., $82 to $83; 8 and 10 lb., $83 to $84; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard Bessemer rails, $38; open hearth, $40 per gross ton, Pittsburgh.

Tin Plate

Effective July 31, prices on all sizes of terne plates were advanced from $2 to $2.50 per package and are now as follows: 8-lb. coating, 200 lb., $16 per package; 8-lb. coating, I. C., $16.30; 12-lb. coating, I. C., $17.50; 15-lb. coating, I. C., $18.25; 20-lb. coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery

Iron and Steel Bars

Steel bars at 2.90c. for delivery late this year, and 4.50c. to 5c. from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c., railroad test bars, 5.25c. in carload and larger lots f.o.b. mill.

Wrought Pipe

The following discounts on steel are to jobbers for carload lots on the Pittsburgh basing card in effect from May 1, 1917, all full weight, except for LaBelle Iron Works and Wheeling Steel & Iron Co., which quote higher prices, and National Tube Co., which adheres to card of April 1.

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	42	15½	⅛ and ¼	23	+4
½	46	31½	⅜	24	+3
¾ to 3	49	35½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	42	29½	2	26	12
2½ to 6	45	32½	2½ to 6	8	15
7 to 12	42	28½	7 to 12	25	12
13 and 14	32½	..			
15	30	..			

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	38	20½	⅛, ¼ and ⅜	22	5
½	43	30½	½	27	14
¾ to 1½	47	34½	¾ to 1½	33	18
2 to 3	48	35½			

Lap Weld, extra strong, plain ends

2	40	28½	2	27	14
2½ to 4	43	31½	2½ to 4	29	17
4 to 6	42	30½	4½ to 6	28	16
7 to 8	38	24½	7 to 8	20	8
9 to 12	33	19½	9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

Nominal discounts on less than carload lots, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in	28	1¾ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3¼ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in.	No quotations
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths. Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net or 2 per cent discount in 10 days:

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer

	Cents per lb.
Nos. 3 to 8	8.00 to 8.50
Nos. 9 and 10	8.25 to 8.50
Nos. 11 and 12	8.50 to 8.75
Nos. 13 and 14	8.75 to 9.00
Nos. 15 and 16	9.00 to 9.25

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	8.30 to 8.80
Nos. 22 and 24	8.35 to 8.85
Nos. 25 and 26	8.40 to 8.90
No. 27	8.45 to 9.00
No. 28	8.50 to 8.95
No. 29	8.55 to 9.05
No. 30	8.65 to 9.15

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11	8.50 to 9.00
Nos. 12 and 14	8.60 to 9.10
Nos. 15 and 16	8.75 to 9.25
Nos. 17 to 21	8.90 to 9.40
Nos. 22 and 24	9.05 to 9.55
Nos. 25 and 26	9.20 to 9.70
No. 27	9.35 to 9.85
No. 28	9.50 to 10.00
No. 29	9.75 to 10.25
No. 30	10.00 to 10.50

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	7.80 to 8.30
Nos. 17 to 21	7.85 to 8.35
Nos. 22 and 24	7.90 to 8.40
Nos. 25 and 27	7.95 to 8.45
No. 28	8.00 to 8.50
No. 29	8.05 to 8.55
No. 30	8.05 to 8.55
Nos. 30½ and 31	8.10 to 8.60

Pittsburgh and Nearby Districts

An interesting suit expected to come up at Charleston, W. Va., in November or December, is that of George W. Shera against the Carbon Steel Co. of Pittsburgh. The case involves an alleged misapplication of funds as special bonuses to certain officers of the company instead of dividing the profits among the stockholders. It is said that Shera's wife owns stock in the company, and for that reason he is the plaintiff. The Carbon Steel Co., it is alleged, during the war has been engaged in manufacturing munitions and has realized handsome profits. However, the plaintiff charges that instead of voting these profits as dividends, large bonuses were voted to certain officials of the company for alleged promoting of sales. Judge Keller has appointed Fred O. Blue, former tax commissioner, to take testimony in the case and act as special master. Charles McKnight, president of the Carbon Steel Co., has issued a statement declaring that the suit is an attempt on the part of certain stockholders to gain control of the company at its annual meeting to be held in Pittsburgh on Nov. 1.

Stockholders of the Westinghouse Air Brake Co. met at Wilmerding, Pa., last week, where its main offices are located, and elected directors as follows: H. H. Westinghouse, chairman of the board; John F. Miller, president; A. L. Humphrey, vice-president and general manager; R. F. Emery, secretary and treasurer; S. C. McConahey, acting vice-president; Charles A. Rowan, comptroller, and John Eicher, auditor. The following officers were re-elected: Cyrus S. Gray, E. M. Herr, A. L. Humphrey, Charles McKnight, John F. Miller, Morris S. Rosenwald, John R. McGinley, W. D. Uptegraff and H. H. Westinghouse. Following the meeting the stockholders visited the new plant of the Union Switch & Signal Co., now being built at Swissvale, Pa.

Stockholders of the Stungo Radium Rubber Co., Washington, Pa., held a meeting last week and have reorganized the company, which got into financial trouble some time ago. It is now known as the Washington Rubber Co.

The Schaefer Equipment Co., Oliver Building, Pittsburgh, dealer in railway materials, has been appointed selling agent in the Pittsburgh district for a gun for removing open hearth slag, made by the Rivet Cutting Gun Co., 220 East Second Street, Cincinnati, an illustrated description of which appeared on page 807 of THE IRON AGE of Oct. 4.

The Columbia Steel & Shafting Co. is building a modern laboratory adjoining its general offices at Carnegie, Pa.

The Pittsburgh Iron & Steel Foundries Co., Midland, Pa., is reported in the market for one 10,000-lb. steam hammer and several heavy lathes.

The West Virginia Water & Electric Co., Charleston, W. Va., will build an addition to its boiler house, 46 x 75 ft., and will need some new equipment.

The National Carbide Co. will build a new chemical plant at Bramwell, W. Va., reported to cost $500,000. The general contract has been placed with Westinghouse, Church, Kerr & Co., New York.

Liberty Mill Started

WASHINGTON, Oct. 23.—Chairman Hurley of the Shipping Board has received a telegram from Pittsburgh signed by President J. A. Farrell announcing the completion of a new mill to manufacture steel ship-plates exclusively. The telegram was dated Oct. 18 and read as follows:

"The Carnegie Steel Co. put into successful operation to-day its new 110-in. plate mill with a capacity of 150,000 tons per annum of ship-plates. This mill was built in exactly six months and is known as the Liberty Mill."

Imports of machine tools into Italy in 1916 are reported to have been 22,488 metric tons as compared with 6690 tons in 1915 and 8988 tons in 1914.

Lake Ore to St. Louis by Water

Coincident with the arrival at St. Louis of the first barge tow of iron ore from Minnesota for the Mississippi Valley Iron Co.'s blast furnace, Secretary of Commerce Redfield, at a dinner given by the Chamber of Commerce Saturday, Oct. 20, in honor of the event, announced that the Government was prepared to support to the limit the opportunity for the development of waterways traffic, both by the construction of steel barges under the direction of the United States Shipping Board and by the utilization of money from the $100,000,000 defense fund at the disposal of President Wilson, if the Shipping Board was unable to supply all needed funds. He also stated that the Shipping Board had set aside $3,500,000 for the construction and equipment of four fleets of barges and tow boats, 24 of the latter and four of the former, and that any part or all of the contracts for this construction could be had by St. Louis concerns able to undertake the work with assurance of rapid completion.

The arrival of the first tow of ore from the North was made an official event. The tow was met some miles up the river by Secretary Redfield, escorted by the Mayor of St. Louis and other prominent officials and citizens of the city. The six barges with about 4000 tons of iron ore were then escorted to their destination with flags flying and whistles blowing on both sides of the river as well as on the harbor water craft. Following the ceremonies on the river, a dinner was given in the evening at the Planters' Hotel which was attended by the city's most prominent business men. It was there that Secretary Redfield made his announcement.

At the dinner Edward F. Goltra, president of the company, made the announcement that the experimental trips with coal up the river and ore down the river had been made at a saving over the rail rate of more than a dollar per ton and predicted that with regular service and equipment established the saving would be doubled or more. The barges to be built by the Government will be 310 ft. long, 50 ft. beam, with a capacity of 2000 tons each and a draft loaded of less than 4 ft. The trip of the tow from St. Paul was made in five days, despite the difficulties of unusually low water.

Incidental to the meeting, Charles W. LaPorte, Peoria, Ill., made the announcement that his company, in an experiment with water transportation, had brought pig iron from Birmingham, Ala., in barges in seven days as against fourteen by rail with its uncertainties of movement of cars when loaded.

A saving in the use of about 56 cars per day in the transportation of less-than-carload freight from the city of Baltimore, says the Pennsylvania Railroad, is being achieved as the result of the "shipping day" or "sailing date" plan for handling this traffic which was inaugurated Oct. 1. This is the beneficial result of co-operation between the public and the railroad in the effort to make the most efficient possible use of transportation facilities. The purpose of the "shipping day" plan is to concentrate less-than-carload freight, as far as practicable, into full carloads at the point of origin. It has been estimated that when the new system is in full operation it will save, on the Pennsylvania Railroad east of Pittsburgh and Erie, alone, the use of upward of 1000 cars per day in the transportation of less-than-carload freight. The plan was first made effective in Philadelphia, where it went into operation one month earlier than at Baltimore. Within the near future it will be extended to New York, for which the detailed schedules have almost been completed. Ultimately the plan will be effective at all principal freight shipping centers on the lines of that railroad.

The W. G. Knight Machinery Co., St. Louis, Mo., has acquired a site on which it will erect a new and larger plant than it now has for the manufacture of fine machines and tools. A thoroughly modern machine shop will be equipped.

BUYING LIBERTY BONDS

United States Steel Corporation Increases Its Investment—Other Subscribers

The United States Steel Corporation this week increased its investment in the Liberty loan by $33,300,000, making a total of $43,300,000 of the second loan which it has taken. Other manufacturers of iron and steel products have contributed largely in swelling the fund. The campaign closes Saturday, Oct. 27, and a large volume of subscriptions is expected this week from the iron and steel trade. Among those whose subscriptions have been received since last week's issue are the following:

H. W. Johns-Manville Co.	$850,000
Railway Steel Spring Co.	500,000
Gaston, Williams & Wigmore	500,000
Marlin-Rockwell Corporation	1,500,000
Underwood Typewriter Co.	250,000
Rogers, Brown & Co.	250,000
National Enameling & Stamping Co.	100,000
William A. Rogers, Buffalo	100,000
Atlas Crucible Steel Co.	100,000
Electric Storage Battery Co.	250,000
New York Air Brake Co.	500,000
The American Radiator Co.	100,000
Charles A. Schieren Co.	100,000
American Smelting & Refining Co. (additional)	$3,500,000
Charles M. Schwab	1,000,000
United States Cast Iron Pipe & Foundry Co.	250,000
Joseph Dixon Crucible Co.	$500,000
Joseph Dixon Crucible Co. of New Jersey	500,000
Remington Typewriter Co.	285,500
United Shoe Machinery Co.	1,000,000

Machinery Men Active

The special Liberty loan committee of the New York machinery and machine-tool trade, of which J. W. Lane, president E. W. Bliss Co., Brooklyn, is chairman, had raised about $7,000,000 up to Monday, Oct. 22. The goal was fixed at $20,000,000 and members of the committee are working constantly to bring the total of subscriptions up to that amount. Among the largest subscribers are the following: E. W. Bliss Co., $500,000; Railway Steel Spring Co., $500,000; Niles-Bement-Pond Co., $500,000; the Babcock & Wilcox Co., $450,000; the Worthington Pump & Machinery Corporation, $300,000; Henry W. Prentiss & Co., $100,000; Manning, Maxwell & Moore, Inc., $100,000; American Machine & Foundry Co., $50,000; Fairbanks, Morse & Co., $50,000.

Cleveland Subscribers

Late subscriptions for Liberty Loan bonds in Cleveland include $1,500,000 by the Valley Mould & Iron Corporation, Sharpsville, Pa.; $1,000,000 by the Otis Steel Co., $150,000 by the Pittsburgh Steamship Co., $100,000 by the Cleveland Crane & Engineering Co., and $100,000 by the Chandler Motor Car Co. The Cleveland Cliffs Iron Co., which recently made a $500,000 subscription, has increased this to $1,000,000.

Youngstown Subscribers

YOUNGSTOWN, OHIO, Oct. 22.—It was estimated here to-day that the corporations and people of Youngstown had taken Liberty Bonds in the sum of $4,500,000. One subscription received at the banks Saturday night was $275,000 as a part of the bonds sold in the campaign that is going on at the works of the Youngstown Sheet & Tube Co. Monday the Brier Hill Steel Co. introduced a bond buying campaign in which all employees will have an opportunity to purchase these securities under a 10 months payment plan. It is expected that more than 90 per cent of the men will go in under the plan, great encouragement being given by interested officials during the first two days of the drive.

The Ohio Iron & Steel Co. through Robert Bentley, its president, has taken securities to the amount of $500,000. Of this amount $300,000 is in Liberty bonds and $200,000 in four per cent Government certificates.

The Brier Hill Steel Co., Youngstown, Ohio, whi h subscribed for $2,000,000 of Liberty bonds has inaugurated a plan among its employees of allowing them to subscribe for Liberty bonds on a monthly payment plan, the company to carry the loans until the bonds are paid for.

Officials of the Youngstown Sheet & Tube Co. are highly pleased with the results of the efforts of the company so far to sell Liberty bonds to its employees. Committees were organized in every department of its numerous plants to solicit subscriptions among employees, and fully 95 per cent or more have subscribed. The campaign started on Thursday, Oct. 18, and will last for one week.

Strike of Building Trades at Arsenal

When 900 men employed by three contractors engaged in important extensions at the Watertown Arsenal, Watertown, Mass., went on strike, Oct. 22, and the leaders stated that 2000 more men would not return to work the next morning, it appeared as though the structural trades had thrown down the gauntlet to the United States Government, as the contractors were carrying on their work strictly in obedience to the conditions agreed upon by President Wilson and Samuel Gompers, president of the American Federation of Labor. The urgency of the work is such that any delay in completion of the buildings would have been of vital moment to our fighting forces. The patriotism and good sense of the men, however, prevailed, and most of them repudiated the action of the labor leaders by returning to work the next day, only about 250 men remaining out.

The contractors concerned were the Stone & Webster Corporation, the New England Structural Steel Co. and the Norcross Brothers Co. The latter company employs union labor and the men had no grievance against their employer, only a few men going out in sympathy with the other strikers. A demand was made that the New England Structural Steel Co. employ only union men and that the Stone & Webster Corporation pay double time for overtime instead of time and one-half as was being paid under the Government agreement. Secretary of War Baker was expected to visit the plant Oct. 24 and it is reported that one labor leader stated that the strike was called at this time in order to make a show of force that would compel the War Department to ac-

$100,000,000 for Ordnance Depot in France

WASHINGTON, Oct. 22.—The Ordnance Division of the War Department has authorized announcement of the letting of a contract for the $100,000,000 ordnance depot and arsenal to be erected by the United States at its base in France. All of the labor and special machinery for the erection of the plant are to be transported to France from this country. The Stone & Webster Engineering Corporation, Boston, received the contract, and has been busy for some weeks in purchasing the machine-tool equipment, structural steel and other necessary material for the buildings. Payment for the work will be on a cost-plus 10 per cent arrangement. The equipment alone for the shops it is estimated will cost $6,000,000.

The St. Louis Malleable Casting Co., St. Louis, Mo., has purchased an additional three and one-half acres, on which it will erect a gray-iron foundry, a steel foundry of about 60 tons' daily capacity and a forging and a brass shop. About half of the additional capacity will be used by the company for its own line of products and the remainder for job work for its customers.

The Colonial Steel Co., Pittsburgh, has subscribed $500,000 for Liberty Bonds, Standard Underground Cable Co. $500,000 and Dilworth, Porter & Co., Ltd., spike manufacturers, $700,000. Employees in the mills of the American Steel & Wire Co. in the Pittsburgh district subscribed for $635,000.

For the meeting of the National Machine Tool Builders' Association to be held at the Hotel Astor, New York, Oct. 30 and 31, no program has yet been announced.

PERSONAL

Robert S. Alter, vice president and foreign manager, American Tool Works Co., Cincinnati, at a recent meeting of the Foreign Trade Association of the Cincinnati Chamber of Commerce, was unanimously re-elected president of that association. For some time past Mr. Alter has been very much interested in extending American trade through Spanish-America. He is also in communication with Mexican Government officials endeavoring to establish a through freight package car service between Cincinnati and Mexico City, which idea has now the approval of both the railroad and Mexican Government officials. At a recent meeting of the National Foreign Trade Association, of which James A. Farrell is president, Mr. Alter extended an invitation for this association to hold its next annual convention in Cincinnati, and it is understood that this invitation has received favorable attention by the officers of that association.



R. S. ALTER

John T. Heffernan, president and treasurer of the Heffernan Engine Works, Seattle, has been called to Washington to work on the Government's extensive program for construction of merchant vessels. Mr. Heffernan is associated with the American International Corporation, which has been asked by the Government to undertake the construction of 200 steel cargo steamers, each with capacity of 7500 tons dead weight, and make delivery of the vessels within 24 months. During the next two years his time will be spent between Washington and Philadelphia.

D. J. Murphy, formerly in the New York sales office of the American Steel & Wire Co., has resigned to become manager of sales of the West Leechburg Steel Co., of Pittsburgh, in charge of New York and New England territory, and will have his offices at 50 Church Street, New York.

Murray Shipley, formerly of the Lodge & Shipley Machine Tool Co., Cincinnati, is now affiliated in an official capacity with Sechler & Co., Cincinnati, builders of carriages and of automobile and auto-truck trailers.

Henry M. Wood, who was formerly with the Lodge & Shipley Machine Tool Co., Cincinnati, is now connected with the sales department of Sechler & Co., Cincinnati.

J. C. M. Des Islets has become sales engineer of the Duquesne Steel Foundry Co., Pittsburgh. He was formerly connected with the Pressed Steel Car Co., in the sales, engineering and cost departments, and later as designing engineer for the Defiance Machine Co., Defiance, Ohio.

Frank R. Bacon, president Cutler-Hammer Mfg. Co., Milwaukee, who was appointed captain in the industrial reserve early this year, has been detailed to active service as general supervisor of the execution of Government contracts for the manufacture of machine guns at New Haven, Conn. The position carries with it promotion to the rank of major. Because the new duties require his entire time, Major Bacon temporarily has relinquished active connection with the Cutler-Hammer company.

William L. Thorkelson, general superintendent Belle City Mfg. Co., Racine, Wis., resigned Oct. 15 to engage in business on his own account. The employees presented him a watch, chain and charm at a farewell banquet.

Lee T. Pond, who has been associated with the office of the attorney general of Wisconsin for many years, has resigned to accept the position of assistant secretary of the United States Switch Co., Eau Claire, Wis., a corporation organized recently to manufacture automatic switch and switch lock appliances for railroads.

Norman B. Livermore, president N. B. Livermore & Co., San Francisco, has been commissioned a captain in the United States Engineer Corps, and has received orders for immediate foreign service.

The Western Engineering and Technical Headquarters has been opened in the Sheldon Building, San Francisco, with George C. Ryno and U. R. Grant as managers. The organization is planned on the same lines as the Chemical Club of New York, providing comfortable quarters for visiting technical men and assistance in obtaining employment, if desired.

J. A. McGregor, president Union Iron Works, San Francisco, has left for the East to complete arrangements with the Government for the construction of war vessels to be built at the works during the next two years.

John McConnell, Canton, Ohio, who resigned last spring as general superintendent of the United Alloy Steel Corporation, Canton, has opened an office in Canton as a consulting metallurgical engineer, to pay particular attention to problems pertaining to alloy steels. The United Alloy Steel Corporation is one of his principal clients.

Harry A. Butz, chief engineer Donner Steel Co., has been engaged as resident engineer in charge of the construction of the iron and steel works which the Compania Siderurgica Del Mediterraneo will build at Sagunto, Spain, and for which Frank C. Roberts & Co., Philadelphia, are the engineers.

William O. Renkin, recently chief engineer for A. M. Byers & Co., Pittsburgh, where he had charge of experimental work and the installation of a powdered coal plant on puddling and reheating furnaces, is now connected with the Quigley Furnace Specialties Co., Inc., New York, which is devoted particularly to powdered coal installations. He is manager of the engineering department of the company. He was resident engineer at the time of the organization and construction of the works and town at Sakchi, Bengal, India, for the Tata Iron & Steel Co.

Everett Morss, president Simplex Wire & Cable Co., Boston, has been appointed member of the Priority Committee of the Council of National Defense by Judge R. S. Lovett.

Guy L. Bayley, who was chief mechanical and electrical engineer for the Panama-Pacific Exposition, where he also served on an International Jury of Awards, is now assistant to the president of the Federal Export Corporation. He has had a long experience in the Far East as consulting and erecting engineer for railroad, mining and industrial projects.

W. H. Bramman has been appointed assistant to the president of the Walter A. Zelnicker Supply Co., St. Louis. He was formerly associated with the American Carbon & Battery Co.

The Youngstown Sheet & Tube Co., Youngstown, Ohio, resumed operations last week on one of its two suspended 51-oven units at its Koppers by-product plant. This was made possible by an increased coal supply. The company now has 153 of its 204 ovens in operation, and as a result, likely will be able to continue operation of its blast furnaces. Otherwise the coal situation from the industrial viewpoint is much as it has been at Youngstown for some days. Plants are just able to operate. Some weeks ago plant operators thought they were skating on thin ice when they had but a few days' fuel supply ahead, but now many plants often do not have more than 24 hours' supply of coal ahead.

The Atikokan Iron Co., Port Arthur, Canada, whose blast furnace has been long idle, is being prodded by the City Council, which will ask to have the plant operated under the supervision of the Canadian Government. The Council is also taking steps to inquire into the company's finances and mineral resources.

OBITUARY

DR. EUGENE F. ROEBER, editor *Metallurgical and Chemical Engineering*, died at his home in East Orange, N. J., Oct. 17, after a long illness. He was born in Torgau, Germany, Oct. 7, 1867, and was graduated from the universities at Jena, Halle and Berlin. The degree of doctor of philosophy was bestowed on him by the University of Berlin. His first work in the United States was in association with Dr. Carl Hering of Philadelphia, in electrical engineering, soon after



DR. E. F. ROEBER

his arrival in this country in 1894. He was one of the originators of the American Electrochemical Society in 1902 and was its president in 1913-1914. He was also a member of the American Institute of Mining Engineers, the American Institute of Electrical Engineers and the American Chemical Society. His chief work had been in the editorial line, having become editor of the *Electrochemical Industry*, now *Metallurgical and Chemical Engineering*, when it was started in 1902. The growth of this paper under his direction in influence and as a power in the electrochemical industry of the country has been striking. He will be remembered by many friends and associates, not only for this achievement, but for his unique and forceful editorials as well as his genial personality and helpful counsel. Work was his keenest source of enjoyment and in this his example will be enduring.

FRANK H. ZIMMERS, secretary of the Pittsburgh Foundrymen's Association since its inception more than 20 years ago, and well known in the foundry trade all over the country, died at the Presbyterian Hospital, N. S., Pittsburgh, on Tuesday morning, Oct. 23, after an illness of several weeks. Mr. Zimmers took keen interest in the affairs of the Pittsburgh Foundrymen's Association, seldom having missed a meeting for more than 20 years, and also attended regularly the annual meetings of the American Foundrymen's Association, in whose councils he will be sadly missed. He was born in Blairville, Pa., and when 16 years of age joined the engineering corps of the Baltimore & Ohio Railroad, later going with the Pennsylvania Railroad in the same capacity. He was identified with the latter railroad during the famous railroad riots in Pittsburgh in 1877. He then went back to Blairsville, where he operated a shoe business for some years, and then returned to Pittsburgh, where for years he was connected with the Union Foundry & Machine Co., whose plant was on West Carson Street, Pittsburgh, continuing with that concern until its plant was destroyed by fire about three years ago, when the company retired from the foundry business. Later he represented, in Pittsburgh, the United States Steel Foundry Co., of New Cumberland, W. Va., manufacturer of steel castings, but in the early part of this year retired from this position, and organized the firm of Zimmers & Co., with offices in the Hartje Building, acting as brokers in iron and steel and manufacturers' agents. Mr. Zimmers was very prominent in Masonic circles, having held in the past few years high positions in that fraternity.

EDWARD D. FLOYD, senior member of the firm of Chandler & Floyd, New York, iron and steel merchants, died on Wednesday, Oct. 17, at his home, Westfield, N. J., following a stroke of apoplexy. He was a director of the Allegheny Steel Co., Pittsburgh, and had been active in the affairs of Chandler & Floyd for the past 20 years. He was 51 years old. His clubs included the Pittsburgh Athletic Club, the Westfield and Baltusrol golf clubs and the Engineers' Club and Elks' Club of New York.

FRANK L. STEWART, secretary and general manager of the Cincinnati Iron Fence Co., Cincinnati, died at his residence in that city Oct. 18, following an operation at a local hospital. He was 51 years old and was connected for more than 12 years with the firm, of which he was general manager at the time of his death.

JOSHUA WOLFE ZEEVE, president of the Chicago Machinery & Equipment Co. of Seattle, Wash., died at his home in that city recently. Mr. Zeeve was born in Russia in 1858, coming to this country when 12 years of age. He has been in business in Seattle for 16 years.

SOLVING FUEL PROBLEMS

Dr. Garfield Endeavoring to Regulate Supply of Steam Coal

WASHINGTON, Oct. 23.—Dr. Harry A. Garfield, Fuel Administrator, is in the midst of the very difficult task of regulating the supply of steam coal in the United States. Large consumers of this coal have been making inquiries quietly of the Fuel Administration as to where they are to obtain contracts for their winter supply. It is said many coal operators are refusing to sell at the price fixed by the President. They hesitate about accepting a higher price from consumers for fear of being punished under the law. The question of prices, however, is but one of the many perplexing phases of the situation.

Coal operators of the Fairmount, W. Va., field have asked that the price fixed for coal in their district be raised to meet a wage increase demanded by miners. The miners are asking increases similar to those which recently were granted in the central competitive field contingent on a raise in coal prices. The operators presented estimates to show that from 28 to 39 cents will be added to the cost of producing coal if the wage increases are given. Labor difficulties have also been experienced in Illinois, Indiana and Ohio. Dr. Garfield was compelled to give his sole attention to this latter strike threat during the week.

The labor situation is being handled incident to the development of a general scheme for distributing coal. The Fuel Administrator has about completed his regulations for limiting coal exports to Canada. Control of such shipments will be exercised through the issuance of special permits to shippers, who will be allowed to forward cargoes up to the amounts prescribed by the Fuel Administration without obtaining special export licenses. The plan is to hold Canada through the remainder of the year to supplies not exceeding 10 per cent more coal than was received last year. This arrangement is based on a 10 per cent increase in production in the United States this year and permits the Dominion to share equally with us. Permits for shipments will be granted only to shippers who sent coal to Canada last year.

Measures have been taken by the Shipping Board to relieve the coal shortage in New England and thereby facilitate the extensive manufacturing industries of that section of the country. The New England coal supply is dependent chiefly upon water transportation through Long Island Sound and up the coast. Under the direction of the Shipping Board, there was organized the New England Coal Barge and Towing Association.

TABLE OF FIXED PRICES

Explanation, Giving More Additional Details, Issued at Washington

WASHINGTON, Oct. 23.—James B. Bonner, acting on behalf of the subcommittee on steel distribution of the American Iron and Steel Institute, has issued a table of fixed prices in explanation of the basic prices already promulgated from the White House. The explanatory table of prices gives in detail those differentials and further explanations which were not given in the officially announced list. For instance, it was explained the fixed price of $51 per gross ton on billets is the price for billets under 4 by 4 in. for rerolling but not for forging. The official prices announced heretofore merely gave the base.

The subcommittee on steel distribution is to act independently of the Council of National Defense, but in co-operation with it, after the fashion of the War Board of the American Railway Association. This subcommittee occupies the local offices of the American Iron and Steel Institute and is composed of the following: J. A. Farrell, chairman; J. B. Bonner, vice-chairman; E. A. S. Clarke, J. A. Topping and F. J. Hall.

The table of prices in explanation of the Government fixed prices issued by this committee follows:

COMMODITY	BASE PRICE F.O.B.	REMARKS
Pig Iron	$33.00 gross ton furnace	Full differentials extra list, pig iron
Blooms and Billets 4 in. x 4 in. and larger (for rerolling but not for forging)	$47.50 gross ton, Pittsburgh, Pa., or Youngstown, O.	Full differentials extra list, semi-finished material
Billets under 4 in. x 4 in. (for rerolling but not for forging)	$51.00 gross ton, Pittsburgh, Pa., or Youngstown, O.	Full differentials extra list, semi-finished material
Slabs ..... Comprising sections width of which is at least twice the thickness, not under 16 sq. in. sectional area.	$50.00 gross ton, Pittsburgh, Pa., or Youngstown, O.	Full differentials extra list, semi-finished material
Sheet Bars.....	$51.00 gross ton, Pittsburgh, Pa., or Youngstown, O.	Full differentials extra list, semi-finished material
Skelp, Grooved ...	2.90c lb. Pittsburgh	Prices net, no extras apply
Skelp, Universal...	3.15c lb. Pittsburgh	Price net, no extra applies
Skelp, Sheared ...	3.25c lb. Pittsburgh	Plus standard classification of extras on steel bars and small shapes
Wire Rods.....	$57.00 gross ton, Pittsburgh, Pa.	
Steel Bars (not including Shell Steel)	2.90c lb. Pittsburgh or Chicago	Plus standard classification of extras on steel bars and small shapes
Small Shapes (under 3 in.)...	2.90c lb. Pittsburgh or Chicago	Plus standard classification of extras on standard structural shapes
Standard Structural Shapes (3 in. and over)	3.00c lb., Pittsburgh or Chicago	Plus standard classification of extras on steel plates
Plates (3/16 in. thick and heavier)	3.25c lb., Pittsburgh or Chicago	Rounds, round cornered squares or Gothic section
		Diameter of round and diagonal of Gothic section or round cornered square are the governing dimensions
Shell Steel:		Material to be furnished in multiples of customer's unit, down to and including the single unit.
3 in. to 5 in. inclusive	3.25c lb. *Net*, Pittsburgh	Specifications to be practicable and satisfactory to the steel manufacturer so long as the specifications secure material suitable for the purpose intended
Over 5 in. to 8 in. inclusive	3.50c lb. *Net*, Pittsburgh	
Over 8 in. to 10 in. inclusive...	3.75c lb. *Net*, Pittsburgh	
Over 10 in.	4.00c lb. *Net*, Pittsburgh	

The customary practice with respect to adding the freight rate in effect at time of shipment, from the basing point to destination, is also to be effective in arriving at delivered prices.

INCREASED EFFICIENCY

Good Showing of Railroads with Slight Increase in Equipment

WASHINGTON, Oct. 23.—Reports received by the Railroads' War Board show that on Oct. 1 the excess of unfilled orders from shippers for freight cars over and above the idle cars at different points numbered 70,380. This is the figure, it was said, which has been commonly, but inaccurately, referred to as car shortage. This compares with the excess of unfilled car requisitions amounting to 77,682 on July 1; 33,776 Aug. 1, and 34,605 on Sept. 1.

The actual number of unfilled car orders on October 1 was almost identical with the number on Oct. 1 last year, the figures being 94,572 for Oct. 1, 1917, and 94,854 for Sept. 30, 1916. The difference in the excess of unfilled orders over idle cars for the two years is accounted for by the fact that on Sept. 30, 1916, as many as 34,157 cars were idle, whereas on Oct. 1, 1917, only 24,192 were reported as idle, thus indicating a more efficient use of the available equipment on the part of the railroads.

Returns to the Railroads' War Board show that the actual number of cars and locomotives now in service on American railroads is only slightly in excess of the number at this time last year. The War Board on Oct. 10 had been in existence exactly six months and the returns just at hand show that during that period the railroads of the country have rendered upward of 15 per cent more service than they did during the same period last year with practically the same plant.

The outstanding feature of the present situation is the degree to which the railroads are co-operating wholeheartedly with one another and with the Railroads' War Board in the effort to produce a maximum of transportation efficiency. As the demands upon the railroads incident to the war are apt to increase, the need for the utmost co-operation on the part of all concerned will become increasingly greater, it was pointed out.

Merryweather in Charge of Machine Tool Matters

WASHINGTON, October 23.—G. E. Merryweather of Cleveland has taken charge of the machine tool question for the Government. R. S. Brookings, of the War Industries Board, has charge of finished products and under him recently was created the machine tool section, which has been placed in charge of Mr. Merryweather. Explaining his duties to the representative of THE IRON AGE, Mr. Merryweather stated that his work falls into three parts:

1. In the first place, he has made a survey of the output of machine tools in American factories. This survey is now practically complete and the Government has the advantage of knowing approximately the capacity of our own industries.

2. Mr. Merryweather has also listed all available equipment. This includes tools in transit or tools in stock and tools held at the ports for shipment abroad. The latter is a most important item inasmuch as it is discovered that many of the shipments intended for foreign account may be utilized by the United States. Some of these shipments were to go to neutral countries, but cargo space is not available and it is possible that other shipments may be embargoed by the War Industries Board. Mr. Merryweather has a complete list of this supply of tools.

3. The other duty of Mr. Merryweather is to make up a complete list of the requirements of the War and Navy Departments. This is now being done. The list when completed will be used as a guide to American tool builders in organizing their shop program from now on. Some of the designs are now coming from abroad, notably France. It is discovered that in some lines the American plants are more than supplied with a sufficient number of tools whereas the production of other lines of tools must be greatly increased to meet the war needs.

Machinery Markets and News of the Works

PRIORITY ORDERS TANGLED

War Industries Board at Work on Solution

G. E. Merryweather Appointed to Take Charge of Machine-Tool Section and Summons Builders to Assist Him

The appointment of G. E. Merryweather, president Motch & Merryweather Machinery Co., Cleveland, in charge of the Machine Tool Section of the War Industries Board, is expected to result in a straightening out of the tangles which have resulted from the many and conflicting priority orders of Government departments for deliveries of machinery and machine tools to companies engaged on Government work. Mr. Merryweather, soon after assuming his new duties, summoned about 15 of the foremost machine-tool engineers of the country to the headquarters of the War Industries Board, Munsey Building, Washington, to consult with him regarding ways and means of improving methods of delivery on priority orders and various related matters, the correct solution of which will make the Government's program of providing war equipment more effective.

The Government is also giving attention to the prices which are being charged by the machine-tool builders for their products. In connection with a recent order placed by the Watertown Arsenal for about 20 planing machines, it is understood that formal protest was made by the Government against the price. A recent advance on planers approximated 20 per cent.

Buying in all of the markets continues on a large scale. There is less and less competition for business as sellers feel that they can get all of the orders they can satisfactorily take care of with a minimum of effort. Large orders, which in a normal market would cause considerable excitement, are under present conditions being accepted by builders of machinery under protest because of the already over-crowded condition of their shops.

In the New York market the largest volume of purchasing has been the result of the Navy Department's torpedo boat destroyer program. The Fore River Shipbuilding Corporation has closed for about 50 large machines for its plate and angle shop at Squantum, Mass., and will probably buy tools for its machine shop at Buffalo, N. Y., this week. The boiler shop at Providence, R. I., is also to be provided with equipment. Cranes of various types and capacities, to the number of about 60 to 70, will be bought by the Aberthaw Construction Co., Boston, for the shops. The New York Shipbuilding Corporation, Camden, N. J., which will build 20 destroyers, may issue lists of its requirements this week. The William Cramp & Sons Ship & Engine Building Co., Philadelphia, has inquired for six new tools, but will undoubtedly require more. The Union Iron Works, San Francisco, which has taken over the Risdon Iron Works, will rebuild and equip the latter plant for the building of 16 destroyers. The Union Iron Works has a contract for 40. The Newport News Dry Dock & Shipbuilding Co., Newport News, Va., closed last week for additional equipment.

Yards for the building of merchant ships for the Emergency Fleet Corporation are progressing rapidly, considering the labor situation. The American International Shipbuilding Corporation has purchased between 25 to 30 locomotive cranes from the Industrial Works, Bay City, Mich., for its Hog Island shipyard. The Submarine Boat Corporation and the Lackawanna Bridge Co. have bought five overhead shop cranes for their shipyard near Newark, N. J. Contracts are being made by both of these yards for fabricated steel sections for the ships.

The Federal Shipbuilding Co., New York, an affiliation of the United States Steel Corporation, has taken over from the Dominion Bridge Co., contractor for the new Quebec bridge, a sufficient number of cranes for the 12 shipways which are to be built at the yard on the Hackensack Meadows. The Federal Shipbuilding Co. will, however, require from 12 to 15 new overhead electric shop cranes, for which a list will be issued this week. A list of tools for the new machine shop will also be sent to the trade soon, and later the equipment for the forge shop and other buildings will be bought. The Eastern Shore Shipbuilding Corporation, a new concern, whose president is R. R. Livingston, 2 Rector Street, New York, is equipping its yard at Baltimore, and has just closed for cranes for shipways.

The Savage Arms Corporation appeared as a large buyer last week, closing orders for about $200,000 worth of tools for its Utica, N. Y., plant, where Lewis machine guns are being manufactured. The J. G. White Engineering Corporation has inquired for a few tools. It is reported that this company will engage in making airplane engines for the Government, in which event it will require considerable equipment.

In the Philadelphia machine-tool market, the expansion of plants making ball bearings has attracted attention. The Hess-Bright Mfg. Co. has bought a large number of tools for making bearings for airplane engines. The Wright Roller Bearing Co., which will move its plant from Spring City, Pa., to Philadelphia, and the Carlson & Wenstrom Co., which will build and equip a new factory in Philadelphia, are active buyers. The Simplex Automobile Co. has bought a few grinders, and may soon buy heavily for a Government contract for airplane engines. The H. T. Shearer Machine Co., Waynesboro, Pa., has issued a list of about 20 tools and has also bought some tools for work on a crank shaft contract received from the Ford Motor Co., Detroit. The Frankford Arsenal has placed orders for about $35,000 worth of automatics in Philadelphia. The Pennsylvania Railroad Co. has bought 10 24-in. lathes for shipment to France. The Bartlett & Hayward Co., Baltimore, has closed for a number

of tools and will probably buy more. The Jeanesville works of the Worthington Pump & Machinery Corporation, Hazelton, Pa., is reported to have received its expected shell contract, and may close soon for more equipment.

An Ohio manufacturer has sent an inquiry for about 25 machine tools to the Cleveland market. The Detroit company recently organized by important manufacturing interests of that city to make gun mechanisms for the Government is expected to come into the market very soon for equipment.

The Hart-Parr Co., Charles City, Iowa, is inquiring in the Chicago market for 30 large lathes for 9.2-in. shells. The Rock Island Arsenal and private munitions makers continue to buy. The Root & Van Dervoort Engine Co., East Moline, Ill., has made additional purchases. A central Illinois manufacturer is inquiring for about $100,000 worth of tools for munitions work. A company in northern Michigan wants tools quickly for gun mount building and a similar inquiry emanates from Minneapolis. The Waukesha Motor Co., Waukesha, Wis., will increase its facilities about 50 per cent for work on 2500 army motor trucks. The Allis-Chalmers Mfg. Co., Milwaukee, Wis., is reported about to close a $10,000,000 contract with the Emergency Fleet Corporation for marine turbines.

In New England the Fore River Shipbuilding Corporation, the Watertown Arsenal and the Osgood Bradley Co. are the largest buyers. The Osgood Bradley Co. is reported to have in contemplation considerable additions to its plant at Worcester, Mass., for building gun mounts. The General Electric Co. has bought but little for its West Lynn, Mass., plant, the bulk of the orders on its recent list not yet having been awarded.

Locomotive crane builders were recently called to Washington to assist the Government in its war program, which will require deliveries of more than 300 locomotive cranes in the next few months.

New York

NEW YORK, Oct. 23.

Requirements of the shipbuilding plants to be erected by the Navy Department for constructing 150 torpedoboat destroyers now comprise the greatest buying activity in the New York machinery market. The Fore River Shipbuilding Corporation last week closed for about 50 machines for its plate and angle shop at Squantum, Mass., and will buy tools this week for its machine shop for turbine work at Buffalo. Representatives of crane builders were summoned to Boston on Monday to participate in a division of the crane orders by the Aberthaw Construction Co., which is erecting the manufacturing buildings. A list of 19 cranes of 3 and 5-ton capacity, in addition to the list of about 44 cranes recently issued, came out last week. It is understood that orders for all of these cranes will be awarded this week.

The New York Shipbuilding Corporation, which will build 20 destroyers at its plant at Camden, N. J., has lists prepared, and will issue them this week. Its requirements are not as large as those of the Fore River shipyard. The William Cramp & Sons Ship & Engine Building Co., Philadelphia, issued a list of six tools last week, and it is understood will need other equipment. The Newport News Dry Dock & Shipbuilding Co., Newport News, Va., has closed for a number of machines for its plate and angle shop.

The Federal Shipbuilding Co., 54 Dey Street, New York, will issue a list this week of from 12 to 15 cranes required for its shops at the new plant being erected on the Hackensack Meadows. Cranes for the shipways have been obtained from the Dominion Bridge Co., which has just completed the construction of the Quebec Bridge. In a week or so a list of about 150 tools required for the company's new machine shop will be issued. A list of forge-shop equipment will come out later.

Work is progressing rapidly on the new plant of the Submarine Boat Corporation and the Lackawanna Bridge Co., near Newark, considering the difficulties encountered in obtaining sufficient labor. The buildings now being erected include an administration building, a hotel and restaurant, two fabricating shops, a terminal building, a hospital, two garages, two principal storehouses for the fabricating shops, a storehouse for heavy machinery, a machine shop, an office building, a main substation and meter house, a transformer station, an engine house, and other smaller buildings. The equipment for the shops is being purchased. An order for five cranes has just been placed.

The Savage Arms Corporation last week began the purchasing of about $200,000 worth of machine tools for its Utica, N. Y., factory, where work is being done on Lewis machine guns. A new contract has been closed for guns for airplanes.

The J. G. White Engineering Corporation, 43 Exchange Place, New York, has inquired for a few tools. It is reported that this concern will engage in the manufacture of airplane engines for the Government, and that a large number of machine tools will soon be bought.

Locomotive crane builders met recently in Washington to devise ways of co-operating with the Government in turning out more than 300 locomotive cranes which will be required within the next few months for shipbuilding work, army cantonments, etc. One plant is reported to have been so completely filled with orders that it cannot consider any other work for months, while all of the companies building these cranes will have enough Government work to keep them comfortably busy for the next 60 or 90 days. One locomotive crane builder has speeded up production so that its present output is one crane a day.

Crane business continues active. Some of the smaller plants which have not at any time taken orders for more than a few months ahead are now in a position to quote fairly good deliveries. In the case of the 13 cranes recently taken by the Chesapeake Iron Works, Baltimore, Md., for the Tacony Ordnance Corporation, Tacony, Pa., it is understood that deliveries will be begun in December. A crane builder in the East has been unable to make deliveries of a number of electric overhead cranes because of inability to procure the motors, and hence is now offering deliveries in from three to four weeks of jib cranes up to 3-tons capacity, wall cranes up to 3-tons, and all types of hand-power cranes up to 10-tons capacity and up to 40-ft. span. The Groton Iron Works, New London, Conn., is expected to close this week for three overhead shop cranes. The Eastern Shore Shipbuilding Corporation, 2 Rector Street, New York, has bought several cranes for its new shipbuilding plant near Baltimore. The Watertown Arsenal is taking bids on three cranes. Lindeteves Stovkis, 11 Broadway, is in the market for three hand-power cranes of ½ ton, 30 ft. 6 in. span, and five hand-power cranes of ½ ton, 26 ft. 10 in. span.

The Thorner Mfg. Co., 144 West Eighteenth Street, New York, manufacturer of metal furniture, has leased about 15,000 sq. ft. of floor space at Second Avenue and Twenty-second Street for extensions.

The Sanborn Sectional Weight Co., New York, has been incorporated with a capital of $15,000 to manufacture weights, etc. C. Somberg and B. Berger, 305 East Eighth Street, New York, are the incorporators.

The Erie Specialty Corporation, New York, has been incorporated with a nominal capital of $5,000 to manufacture metal parts for aircraft and kindred specialties. R. E. J. Corcoran, E. Roeder and J. Lorenz, 44 Morningside Drive, are the incorporators.

The Bureau of Yards & Docks, Washington, D. C., is receiving bids for a new six-story, reinforced-concrete power plant, about 58 x 110 ft., at the Brooklyn Navy Yard, to cost about $100,000.

The Old Colony Machinery Co., New York, has been incorporated with a capital of $30,000 to manufacture candy-making machinery. V. M. Turner, C. L. Franklin and H. L. MacMartien, 114 West Fourteenth Street, are the incorporators.

The American Steel Products Corporation, New York, has been incorporated with a capital of $1,000,000, to manufacture iron and steel products. W. S. Brewster, W. P. Kellett and W. B. J. DeLacey, 233 Broadway, are the incorporators.

The Liberty Tractor & Truck Corporation, New York, has been incorporated with a capital of $250,000, to manufacture motor trucks, tractors, etc. G. H. Stelleck, G. Cohen and B. Eversley, 2 West Twenty-ninth Street, are the incorporators.

The Aluminite Mfg. Co., New York, has been incorporated with a capital of $50,000, to manufacture metal specialties. F. J. Pasotti and J. G. Anderson, 272 East 199th Street, are the incorporators.

The Heden Flying Vehicle Co., New York, has been incorporated with a capital of $100,000 to manufacture air-

planes. G. Heden, A. Johnson and H. Leth, 529 East Twenty-ninth Street, are the incorporators.

The Russell Motor Co., New York, has been incorporated in Delaware with capital of $1,000,000 to manufacture motor cars and supplies. George V. Reilly, Samuel B. Howard and Arthur W. Britton, 28 Nassau Street, are the incorporators.

The Galvanizing Corporation of America, Brooklyn, N. Y., has been incorporated with a capital of $36,000 to operate a plant for the manufacture of machinery and treating metals. H. Gerson, W. Statter and I. Seegmiller, 29 Broadway, New York, are the incorporators.

The Asbestos Filter Mfg. Co., New York, has been incorporated with a capital of $10,000 to manufacture filter apparatus. E. S. Moore and W. Hallan, 565 Sixty-eighth Street, Brooklyn, are the incorporators.

The Ithaca Gun Co., Lake Street, Ithaca, N. Y., is building a three-story addition to its plant, about 70 x 100 ft., to cost $40,000. George Livermore is president.

L. E. Fry & Co., Clayton, N. Y., have been incorporated with a capital of $10,000 to manufacture metal equipment and specialties for ships. G. M. Hawn and L. E. Fry, Clayton, are the principal incorporators.

The proposed new plant for the manufacture of tin cans to be erected at Binghamton, N. Y., by the Hires Condensed Milk Co., 913 Arch Street, Philadelphia, will consist of a one-story main building of brick and steel, 150 x 650 ft.; with two-story section, 150 x 160 ft.; one-story factory, 120 x 400 ft.; two-story administration buliding and one-story power plant. John L. Lewis, 36 Wall Street, Binghamton, has the contract, the total cost being about $500,000.

The Seneca Falls Mfg. Co., Seneca Falls, N. Y., manufacturer of leather and wood-working machinery, has been incorporated with an active capital of $575,000. Lathes and other machinery will also be manufactured. L. S. Chapman, H. E. Newell and H. J. Crane are the incorporators.

The Buffalo, Rochester & Pittsburgh Railway Co., Buffalo, is building, at East Salamanca, N. Y., a new machine shop and erecting plant to be used for heavy locomotive repair work. The roundhouse will be increased in capacity and the power house remodeled and enlarged. The company is also building a new engine terminal, 16-stall roundhouse and other buildings at Punxsutawney, Pa.

The Pilot Tire & Rubber Co., Rochester, N. Y., has been incorporated with a capital of $50,000, to manufacture tires and rubber products. F. E. Brown, J. M. Johnson and A. L. Dunton, all of Rochester, are the incorporators.

The Delaney Forge & Iron Co., 300 Perry Street, Buffalo, manufacturers of steel and iron forgings, has been incorporated with capital of $750,000 to provide for expansion. The company is planning to consolidate its works with those of the Canadian Foundries & Forgings, Ltd., Welland, Ont., the latter plant to be used for the production of ship forgings, now manufactured at the Buffalo works. John T. Dillon is president and G. O. Condree, John M. Hull and Charles B. Lascelles, Buffalo, are directors.

The Fore River Shipbuilding Corporation, Quincy, Mass., a subsidiary of the Bethlehem Shipbuilding Co., Bethlehem, Pa., has acquired a site consisting of about 20 acres on Vulcan Street, near the city line, Buffalo, for the erection of a new plant to manufacture turbines. The main building will be about 300 x 700 ft., with a number of smaller shops. It is expected to have the plant ready for operation in about three months, giving employment to over 2000 for initial work. The company proposes to manufacture hulls at its Quincy works and boilers at its Providence, R. I., plant. Joseph W. Powell is president.

The New York Central Railroad, Buffalo, has had plans prepared for the construction of a new power plant on Curtiss Street to cost about $30,000.

The Pullman Co. has filed plans for the erection of a new shop to cost about $6,000 at its car works, Buffalo.

The Cousins & Son Boiler Works, 74 Wabash Street, Buffalo, manufacturer of boilers, stacks, tanks, etc., is considering the erection of a new one-story addition to its plant, about 80 x 120 ft.

The Newark Gear Cutting Machine Co., 69 Prospect Street, Newark, N. J., manufacturer of gear-cutting machinery, will build a four-story addition, about 42 x 50 ft., to cost $18,000.

The Newark Bearing Co., 293 Halsey Street, Newark, has been organized to manufacture ball bearings. Harry Rubin, 101 East 140th Street, New York, heads the company.

The Federal Tool & Machine Co., Newark, has been incorporated with a capital of $10,000 to manufacture machinery and tools. Joseph Ovsiovitch, 24 Scott Street, and Arthur Joseph, Newark, are the incorporators.

The United States Cast Iron Pipe & Foundry Co., Burlington, N. J., manufacturer of cast-iron pipe and fittings, will build a one-story addition to foundry No. 4, 25 x 40 ft., to cost about $10,000. The contract has been awarded.

John R. Proctor, Inc., Bayonne, N. J., has been incorporated with a capital of $30,000 to manufacture metal products and rubber specialties. John R. Proctor and Lewis L. Ransom, 721 Broadway, Bayonne, are the incorporators.

The Lacharnay Carburetor Co., Hackensack, N. J., has been incorporated with a capital of $200,000, to manufacture carburetors. Harvey J. Osborn, Hackensack, and Lemuel Skidmore, Summit, N. J., are the principal incorporators.

The General Appliance Co. of America, Jersey City, has been incorporated with a capital of $50,000 to manufacture telephone apparatus. William Fitzgerald, Jersey City, and Henry Solbel, New York, are the principal incorporators.

The Hercules Storage Battery Co., West New York, N. J., has been incorporated with a capital of $20,000. A. J. Ellis and Robert G. Wiencke, North Bergen, are the principal incorporators.

The Kramer Mfg. Co., Carlstadt, N. J., has been incorporated with a capital of $100,000 to manufacture hooks and eyes, and other metal specialties. Edwin and Alfred Kramer, Carlstadt, are the incorporators.

The Common Sense Mfg. Co., Newark, has been incorporated with a capital of $250,000 to manufacture shock absorbers, and allied products. William C. Paul, Anthony Sauer and Frederick C. Fischer, Newark, are the incorporators.

The Ampere Supply Co., 216 Berlin Street, Newark, will build an addition to its foundry, about 35 x 190 ft., to cost $14,000.

The Foxon Graphite Co., Hague, N. Y., is preparing plans for a new plant to be erected at an estimated cost of $300,000.

The Standard Mirror Co., Buffalo, 1168 Seneca Street, W. L. Hodney, president, has completed plans for the erection of a two-story brick and steel factory, 200 x 400 ft., at Milton Street and the Pennsylvania Railroad.

The Russell Motor Co., Toronto, Ont., has purchased the former plant of the Cyphers Incubator Co., Dewey Avenue and the New York Central Railroad Belt Line, Buffalo, which it will equip for the manufacture of time fuses and munition parts. A new company is being organized to take over and operate the plant.

Catalogs Wanted

Catalogs, particularly of machinery, are wanted at the Sandy Hook Proving Grounds, Fort Hancock, N. J. They should be addressed to the commanding officer, care of the purchasing department.

New England

BOSTON, Oct. 22.

As a result of the tremendous purchases directly and indirectly by manufacturers everywhere, the machine tool manufacturers of New England are flooded with orders and deliveries are being pushed months ahead, as was the case when the Allies first began the big munition output. Locally, the Fore River Shipbuilding Corporation, Quincy, Mass., the Watertown Arsenal, Watertown, Mass., and the Osgood-Bradley Co., Worcester, Mass., have been placing large orders, mostly for the heavier kinds of machinery. The last named company is to engage in the manufacture of gun mounts, in addition to its present output of passenger coaches and trolley cars. It is expected that immediately following the orders for the heavy machinery will come some large lists of smaller machine tools for tool rooms, etc. It is reported that the big list issued sometime ago by the General Electric Co. for its West Lynn, Mass., plant has not been closed, but the company has been in the market during the week for some minor equipment.

One item of the Watertown Arsenal purchases was a list of about 19 large planers. The price on planers has been advanced by virtually all the makers, advances differing in degree but reaching a total of between 20 and 25 per cent on deliveries eight months or more distant. It is understood that the two largest makers of big planers are sold up for well over a year ahead and that the New England planer builders will soon be in a similar condition, if the present demand long continues. One New England maker has quoted an advance of 10 per cent on planers for January and February delivery; 15 per cent for March and April delivery, and 20 per cent for May and June delivery. These advances are thus announced as a protection against expected advancing costs, particularly of labor.

One of the biggest deals of the past few days has been the taking over of the Bridgeport Projectile Co., Bridgeport, Conn., by the Liberty Ordnance Co., which has just been incorporated with a capital stock of $4,000,000, as noted last week. This plant was originally formed at the outbreak of

the war in Europe, as reported at that time by German interests, and in April, 1915, received an order from the German Government for 2,000,000 shrapnel cases at a cost of $5,000,000, of which amount $2,000,000 is said to have been advanced by Carl Heynan, reported to be a special representative of the German Emperor. The contract was cancelled when delivery became impossible, and Heynan ended his connection with the company when the United States entered the war. The present capacity of the plant is 30,000 3-in. shells, 5000 4.7-in. shells, and 3000 6-in. shells per day. The company has just completed a new gun plant which has a capacity for 300 complete 5-in. navy guns per annum. Kenneth W. McNeil, president Liberty Ordnance Co., has announced that the new company has unreservedly placed itself at the disposition of the War and Navy departments.

The Marlin-Rockwell Corporation, New Haven, Conn., has begun work on three additional buildings, including a machine shop, 112 x 112 ft.; heating plant, 47 x 57 ft., and barracks, 50 x 60 ft.

The American Steel & Wire Co., Worcester, Mass., is building a one-story factory, 90 x 128 ft., at its South Works.

Peter A. Frasse & Co., Inc., Hartford, Conn., has awarded a contract for a one-story addition to its steel plant at 47 Boulevard.

The Stanley Works, New Britain, Conn., has taken out permits to build three small structures on North Burritt Street: 12 x 17 ft, 20 x 100 ft., and 34 x 60 ft., respectively.

Landers, Frary & Clark, New Britain, Conn., are planning an addition which it is expected will cost about $35,000.

The Rockwood Sprinkler Co., Worcester, Mass., is building a two-story annealing house and carpenter shop, 52 x 80 ft.

The Barnum Forge Co., Stratford, Conn., has been incorporated with authorized capital stock of $4,500. The incorporators are Charles J. Hermansen, Sam Smegelsky and Gottfried Hockert, all of Bridgeport.

The General Electric Co., Lynn, Mass., has started the construction of an addition, 60 x 160 ft., one story, to its River Works.

The B. F. Sturtevant Co., Boston, has tentative plans for an addition to its factory at Readville, Mass.

The Blake & Knowles Works of the Worthington Pump & Machinery Corporation, Cambridge, Mass., is building an addition, 65 x 120 ft., four stories, and has awarded a contract for a one-story foundry extension, 80 x 120 ft., to be built at once. The company is busy on a contract for pumps for torpedo boat destroyers.

The Springfield Aircraft Corporation, Springfield, Mass., is building an addition to its plant to cost about $50,000.

The United States Bobbin & Shuttle Co., Eddy Street, Providence, R. I., has commenced the construction of a new one-story plant at Barton, Vt., to cost about $25,000.

Potter & Johnston, Newport Avenue, Pawtucket, R. I., manufacturers of automatic machines, are building a new two-story machine shop, about 85 x 290 ft., to cost $60,000.

W. S. Randall, Portland, Me., and associates have recently incorporated in Delaware the McKee Safety Appliance Corporation, with capital of $1,500,000, to manufacture safety devices and special machinery.

The Hardman Railroad Tie Corporation, Fall River, Mass., has been incorporated in Delaware with a capital of $1,000,000, to manufacture railroad ties. George E. Hardman, Frank S. Brunage, William H. Brown and Alvin G. Weeks, Fall River, and Ernest Haynes, Pawtucket, R. I.; Robert A. Smith, Newport, R. I., and Joseph Mercer, Providence, R. I., are the incorporators.

Philadelphia

PHILADELPHIA, Oct. 23.

Considerable buying activity is now noted in the Philadelphia machinery market in connection with the requirements of shipbuilders and for airplane work.

The American International Shipbuilding Corporation, now located in its new offices at 142 North Broad Street, Philadelphia, is going ahead rapidly with the construction of its ship assembling plant at Hog Island. Several contracts are said to have been completed for the fabrication of standardized steel sections. It is the plan of the corporation to let contracts for about 95 per cent of all the fabricated steel used in the ships, the remaining 5 per cent to be done on the ground. For construction work and the handling of material on the ground, nearly 30 locomotive cranes have been purchased from the Industrial Works, Bay City, Mich.

The William Cramp & Sons Ship & Engine Building Co. and the New York Shipbuilding Corporation are making plans for work on torpedo boat destroyers. The Cramp shipyard has issued a small list of new machine tools, but it is understood will buy more, while the New York Shipbuilding Corporation will place orders shortly on a large list to be issued this week.

A large number of machine tools have been purchased by the Hess-Bright Mfg. Co., Philadelphia, which will manufacture a considerable part of the ball bearings to be used in airplane engines. The Carlson & Wenstrom Co. will build a new plant, having obtained a contract for ball bearings from the J. G. White Engineering Corporation, which, it is now understood, will engage in the production of airplane engines. The Carlson & Wenstrom Co. has bought a number of grinding machines and is in the market for automatics and other equipment. The Wright Roller Bearing Co. has purchased the old Lubin motion picture plant at Nineteenth Street and Indiana Avenue, Philadelphia, and will move its entire equipment from Spring City, Pa., within 60 days. This company has also received contracts for ball bearings and is buying new machine tools, one substantial order having been placed last week.

The Simplex Automobile Co., New Brunswick, N. J., is reported to have finally obtained its Government contract for airplane engines. An order has been received by one company for several grinding machines, but a large number of machine tools are yet to be purchased.

The H. T. Shearer Machine Co., Waynesboro, Pa., has issued a list of about 20 tools and has purchased eight grinding machines for use on a contract for crank shafts obtained from the Ford Motor Co., Detroit. The Espen Lucas Machine Works, Philadelphia, has been buying a few tools for work on machinery for torpedo boat destroyers.

The Frankford Arsenal is placing orders for equipment for its new fuse factory, orders for automatics placed last week aggregating about $35,000.

The Pennsylvania Railroad Co. has bought 10 24-in. lathes for locomotive repair work in France.

The Bartlett & Hayward Co., Baltimore, is placing orders for tools. The Worthington Pump & Machinery Corporation is reported to have closed its contract with the Government for shell work and will buy additional tools on a list issued some weeks ago. The Jeanesville plant, where the work is to be done, will turn out 20,000 shells a day.

The Norfolk & Western Railroad has bought two 20-ton locomotive cranes and the Cramp shipyard has bought one locomotive crane.

The Frankford Taxi Co., Philadelphia, has been incorporated in Delaware with capital of $10,000 to manufacture automobile supplies. Harry A. and E. S. Beddow and George Schlafer, Philadelphia, are the incorporators.

The Ford Chain Block & Mfg. Co., Philadelphia, manufacturer of chain blocks and metal products, will erect an addition to its machine shop at Diamond and Palethorp streets.

C. Trevor Dunham, Inc., Philadelphia, has been incorporated in Delaware, with capital of $50,000 to manufacture automobiles. Herbert L. and E. P. Maris, Philadelphia, are the incorporators.

The S. S. White Dental Mfg. Co., Twelfth and Chestnut streets, Philadelphia, manufacturer of scientific and professional instruments, is having plans prepared for extensions and improvements.

The Luzerne Rubber Co., Muirhead Avenue, Trenton, N. J., has filed plans for the erection of a one-story, brick and steel addition.

Albrecht Pagensticker, Jr., Trenton, N. J., has awarded a contract for the erection of a new one-story machine shop, about 53 x 85 ft., at 520 Brunswick Avenue, to cost about $7,000.

The Bay Ridge Specialty Co., Trenton, N. J., manufacturer of bathroom fixtures, has acquired the plant of the Royal Rubber Co., Stokes Avenue, which it will equip for manufacturing. A one-story building will also be erected. J. O. Hunt, 114 North Montgomery Street, Trenton, is architect.

The Empire Tire & Rubber Co., North Clinton Avenue, Trenton, will erect a one-story, brick and steel addition to cost about $40,000.

The Naceskid Service Chain Co., Trenton, N. J., has been incorporated with a capital of $100,000, to manufacture anti-skid chains. Frank Nace, John G. Hann and Thomas T. Woodhouse, Trenton, are the incorporators.

The Zee Zee Tire & Rubber Co., Yardville, near Trenton, N. J., manufacturer of automobile tires, tubes, etc., is having plans prepared for a two-story, reinforced-concrete addition, about 40 x 120 ft., to cost $20,000.

The Yardville Rubber Specialty Co., Trenton, has been incorporated with a capital of $10,000 to manufacture rubber goods. Solomon Berman, S. J. Lewis and Harry Johnson are the incorporators.

The South Jersey Foundry Co., Camden, has been incorporated with a capital of $250,000 to manufacture cast-iron pipe and kindred specialties. K. L. Praisen, Herbert J. Koehler and J. F. Sutton are the incorporators.

The Baldwin Locomotive Works, Philadelphia, has received a contract from the Government for 600 gasoline locomotives, dinkey type, to be used for trench service in France, aggregating about $4,500,000.

The Wridgway Co., Scranton, Pa., manufacturer of pistons for airplane motors, has acquired property at Hazleton, for its proposed new works, adjoining the Lehigh Valley Railroad, near the plant of the Hazleton Separator Co. It is proposed to construct an initial plant consisting of two two-story buildings, about 60 x 150 ft. and 36 x 80 ft. respectively. The plant will be ready for operation at the earliest possible date.

The Pressed Steel Co., North and Penn streets, Wilkes-Barre, Pa., has awarded a contract for the erection of a one-story addition, about 57 x 80 ft., to cost in the neighborhood of $15,000.

The Badenhouse Boiler Co., Cornwall, Pa., has awarded a contract for the construction of a new one-story plant, 200 x 225 ft., to cost about $75,000. It is also considering the erection of a smaller, three-story building.

The Minersville Tube Mill, Minersville, Pa., has been organized to manufacture pipes and tubing. A site at the town limits has been acquired for a plant and contract awarded to the W. H. Gaylord Construction Co., Scranton. It is said that the initial works will give employment to about 150.

The Cochrane Brass Foundry Co., East Wallace and Sherman streets, York, Pa., manufacturer of brass and bronze products, has awarded a contract for the erection of an addition to its plant. It has received a contract from the Government for castings for gun mounts, machine guns and submarine boats. A. M. Hake & Co., York, are the contractors.

The Safety Machine Co., Reading, Pa., manufacturer of safety devices, with plant at Topton, Pa., and assembling works at Reading, is planning for the establishment of new works at Reading to consolidate all branches of operation. It is said that the proposed new plant, site for which is now being selected, will cost about $200,000. Meyer Axelrod is president.

The Lycoming Foundry & Machine Co., Oliver and High streets, Williamsport, Pa., manufacturer of gas and gasoline engines, has acquired five acres adjoining its plant and is said to be contemplating the erection of additions.

S. L. Allen & Co., Philadelphia, reported as taking bids for an addition to their plant, state that they are simply getting bids on work necessary to strengthen the floors in one of their present buildings.

Baltimore

BALTIMORE, Oct. 22.

The American Propeller & Mfg. Co., 233 to 249 East Hamburg Street, Baltimore, has awarded a contract for a two-story brick addition, 150 x 200 ft., at Jackson and Gittings streets, to cost about $5,000.

The Poole Engineering & Machine Co., Woodberry, Md., will build a one-story fireproof gun factory, 154 x 504 ft., to cost $338,000. The contract has been awarded to the H. D. Watts Co., Garrett Building, Baltimore.

The Chesapeake Iron Works, Westport, Md., plans to erect an additional shop, 49 x 250 ft.

The Pusey & Jones Co., Wilmington, Del., will make improvements totalling about $130,000, which include a foundry to cost $70,000, pattern store room to cost $50,000 and an addition to the pattern shop to cost $10,000.

The W. G. Krussman Co., Wilmington, Del., has been incorporated with a capital of $10,000, to manufacture automobile parts and supplies. Edward G. Cook and W. G. Krussman, Wilmington, are the incorporators.

The Waitt Wrench Co., Wilmington, Del., has been incorporated with a capital of $100,000 to manufacture wrenches and tools. George G. Stiegler and E. E. Wright, Wilmington, are the incorporators.

The Mays Accounting Machine Co., Asheville, N. C., has been incorporated with a capital of $600,000, to manufacture adding machines. M. V. Moore, Baxter Shemwell and Philip R. Moale are the incorporators.

The Newport News Shipbuilding & Drydock Co., Newport News, Va., is said to be planning for additions to its foundry, machine shop, marine ways and other structures.

Chicago

CHICAGO, Oct. 22.

Inquiries from companies having Government contracts are appearing steadily, and it is apparent that the Government is looking more than formerly to the Northern Central States for munitions and equipment for the production of machine tools. An inquiry has come from central Illinois for about $100,000 worth of tools for munitions manufacture, the details of which are withheld. A firm in northern Michigan wants tools for gun-mount work, and wants them quickly. A similar inquiry emanates from Minneapolis.

The Hart-Parr Co., Charles City, Iowa, is inquiring in this market for 30 large lathes for making 9.2-in. shells. The company suffered a serious loss by fire Oct. 9, the forge shop and one of the shell shops being damaged to the extent of about $200,000. The shops had been idle several months, since the completion of a British shell order, but negotiations were under way to start the machinery on a domestic shell order. Several large lathes and grinding machines were destroyed, and it is presumably for the replacement of these that the present inquiry is out. A large forging press for forming shells, an important part of the company's equipment, was but slightly damaged by the fire.

The Rock Island Arsenal is buying steadily, and private munitions makers continue in the market for tools required to balance their equipment, one of these being the Root & Van Dervoort Engine Co., East Moline, Ill. Inquiry continues active for heavy tools, and the great majority can be traced to Government work. A sprinkling of industrial buying is noted, but the smaller jobbing shops are doing very little purchasing. There is almost an oversupply of small lathes. As a rule, dealers' stocks are complete, except for large machines, due to forethought in ordering months ago.

It is recognized everywhere that the Government must be liberal in allowing exemptions from military duty where it is justified for industrial reasons. A step in securing such exemptions is believed to lie in the action of the Council of National Defense in a recent request to manufacturers for lists of their orders which spring from war contracts.

The J. K. Stewart Mfg. Co., manufacturer of metal parts for automobiles, 327 Wells Street, Chicago, has let the contract for a one and two-story mill construction factory, 299 x 300 ft., at 4535 to 4561 West Fullerton Avenue, to cost $150,000.

Plans are being prepared by J. C. Llewellyn, architect, 38 South Dearborn Street, Chicago, for a three-story factory, 100 x 125 ft., at 110-116 South Jefferson Street, for the Rumely-Wachs Machinery Co. It will be of mill construction, and cost about $60,000. No definite date has been set for beginning the work.

The International Harvester Co., 606 South Michigan Avenue, Chicago, will erect a six-story factory, 63 x 248.8 ft. and 33 x 42.4 ft., at its tractor works, 2600 West Thirty-first Street, to cost $175,000.

The Gas & Electric Motor Bus Corporation, Chicago, has leased from the Chicago Surface Lines a one-story machine shop at Racine and Belden Avenues, which will be used as a repair plant and factory for making parts.

The Edwards Cylinder Mfg. Co., Pekin, Ill., has been incorporated, with a capital stock of $10,000, to manufacture pump cylinders and well and pump supplies. The incorporators are Charles R. Edwards, D. H. Learned, and N. H. Lee.

The Decker Machine & Tractor Co., Chicago, has been incorporated in Delaware with capital of $200,000 to manufacture tractors and allied machinery. John A. Decker, J. G. Burns and Harry Lewis, all of Chicago, are the incorporators.

Milwaukee

MILWAUKEE, Oct. 22.

The principal feature of the week in the local machine-tool industry has been the stream of orders for milling machines coming from shops holding Government contracts. The demand for these tools has been exceptionally heavy during recent weeks, but in the last few days became particularly brisk. Business in other tools is maintained at a high rate, with no slackening in demand, and shops find it wholly impossible to make any headway in catching up on deliveries.

Metal-working shops continue to make additions whenever it is possible to obtain building materials, labor and

the equipment. In the case of contractors executing orders of especial urgency for the Government, it is not difficult to provide for extensions and equipment, but shops with no priority claim do not fare so well.

The Waukesha Motor Co., Waukesha, Wis., which has an order for 2500 Liberty motors for the new class B military truck, 15,000 of which will be built for the Government, has been obliged to increase its facilities about 50 per cent to handle the additional business. Work has been started on an addition 100 x 225 ft. to shop No. 1, and an addition 90 x 180 ft, to shop No. 2. both to be ready by Dec. 1. From 200 to 300 additional workmen will be required. Harry L. Horning is vice-president and general manager.

The Allis-Chalmers Mfg. Co., Milwaukee, expects to close contracts this week with the Emergency Fleet Corporation for furnishing marine turbines. The amount involved is said to be approximately $10,000,000.

The Ampco Shipbuilding Co., Security Building, Milwaukee, which is being organized by interests owning the Ampco Rolling Mills Corporation to establish a shipbuilding plant and a dry dock in Milwaukee, is not yet ready to make formal announcement of its plans. It is stated that the project is progressing.

The board of school directors, Milwaukee, has engaged Van Ryn & DeGelleke, architects, Caswell Block, to prepare plans for a new high school, with manual training department, at Lenox and Montana streets, Bay View, to cost about $600,000. Bids will be taken early in December. Frank M. Harbach is secretary and business manager.

The Packard Stoker Corporation of America, Milwaukee, has been organized with a capital stock of $25,000 to manufacture stokers and other mechanical devices for factories, shops, mills, etc. The incorporators are James A. Packard, Charles B. Nehring and John L. Stecker.

The core room of the Western Malleables Co., Beaver Dam. Wis., was damaged $3,500 by fire last week. Operations were not seriously interrupted, other core-room facilities being available.

The Crary Tool Co., 220 Becher Street, Milwaukee, has been succeeded by the Milwaukee Tool & Forge Co., which will enlarge the plant and install considerable new equipment.

Alfred C. Clas, architect, Colby-Abbot Building, is designing a four-story fireproof manufacturing building, 60 x 150 ft., of reinforced concrete and brick, costing about $50,000, for the Kletzsch Realty Co., Third and State streets, Milwaukee. Bids will be taken about Nov. 15.

The Auto Parts Mfg. Co., 313-317 Milwaukee Street, Milwaukee, sustained an estimated loss of $50,000 by fire, but repairs have been undertaken and operations will only be slightly interrupted. Walter H. Schwab is vice-president and general manager.

The Washington Cutlery Co., Watertown, Wis., is erecting a shop addition costing about $15,000 and contemplates a new heating and power plant which will cost about $10,000.

The Seeger Mfg. Co., Milwaukee, which established a plant some time ago at 1001 Thirtieth Street, for the manufacture of garage heaters using coal as fuel, has incorporated in Illinois, with a capital stock of $7,400. Headquarters are located at 175 West Jackson Boulevard, Chicago. F. G. Hudson is secretary.

The Northwestern Pattern Works, 253 Fourth Street, Milwaukee, owned by Rudolph Mueller, has been incorporated in Illinois, with an authorized capital stock of $2,500.

The Ajax Forge Co., Chicago, has been incorporated in Delaware, with an authorized capital stock of $1,750,000, to take over the drop forge plant now being completed at Superior, Wis. It is said to be closely affiliated with the Ajax Frog & Switch Co., Blue Island, Ill. The company has also been granted a charter in Wisconsin. William E. Crocombe is secretary.

Tomahawk, Wis., has engaged R. W. Richardson, St. Paul, Minn., consulting engineer, to prepare specifications for improvements to the municipal waterworks costing about $20,000, which will include a new pumping station, 20 x 25 ft., and an electrically driven centrifugal pump with a capacity of 300 gal. per min.

The New Way Machinery Co., Eau Claire, Wis., organized recently with $60,000 capital to manufacture a 5-purpose combination motor truck, tractor, concrete mixer, etc., will also build a 4-wheel-drive truck designed by Jonas Bergh, Eau Claire, who will be superintendent of the machine shop. The new plant is rapidly being equipped and is expected to be in full operation by Nov. 1.

The M. & S. Electric Co., Milwaukee, owned by A. C. Mantel and O. E. Stark, has opened a machine shop at 1209 Layton Boulevard and will do a general line of repair work on gas engines, electrical equipment, storage batteries, etc.

Detroit

DETROIT, Oct. 22.

The machine-tool market continues unusually active. The largest orders placed were by the American Car & Foundry Co., but many small orders have also been received. Deliveries on standard machines are very slow. Indications are that the lack of coal in this district, which has handicapped manufacturers to a considerable extent, will be overcome within two weeks. The Government has promised to ship coal to any industry facing a shut-down. Labor is well employed at high wages. A war order amounting to $6,000,000 has been offered to local metal-stamping firms which are now bidding for the contract.

The Campbell Mfg. & Foundry Co., Muskegon, Mich., is rushing completion on two additions to its plant which is manufacturing radiator castings for Army trucks. It is completing one addition, and another building is under construction.

The Grand Trunk Railway will open its new shops at Port Huron, Mich., Dec. 1. Most of the lighter machinery will be installed by Nov. 1, but the heavy machinery has not been received. The cost of the work will be in the neighborhood of $1,000,000.

The Advance Brass Mfg. Co., Muskegon, Mich., has been organized by Oscar Berg, Wallach Foote and Felig St. Louis, and will locate in the building formerly occupied by the Racine Boat Mfg. Co. Alex. G. Wilson, Chicago, a brass foundry expert, will be general manager.

The J. T. Wilson Co., Detroit, announces that it will place a new 5-ton truck on the market the first of the year.

The Olympian Motors Co., Pontiac, Mich., has purchased the equipment of the Meridian Mfg. Co., Indianapolis, Ind., and will build bodies for its own automobiles.

The Auto Body Co., Lansing, Mich., is making changes in its machine department.

The Parker Mfg. Co., Detroit, manufacturer of drill chucks, has purchased the plant of the Star Motor Co., Ann Arbor, where it will remove. Gorhman C. Parker, Detroit, is president. The company is to be reorganized and incorporated for $150,000.

The Flottorp Mfg. Co., Chicago, has shipped its machinery to Grand Rapids, Mich., where it will remove. Aircraft propellers will be manufactured.

The Brunner Mond Co., a subsidiary of the Solvay Process Co., Detroit, is building a plant near Amherstburg, Ont., at a cost of $8,000,000. A contract has been let for the extension of the Essex Terminal Railroad to the new plant.

The Standard Screw Products Co., Detroit, has increased its capital from $250,000 to $750,000.

The H. Mueller Mfg. Co., Ltd., Decatur, Ill., will build a factory at Port Huron, Mich., costing $200,000, for the manufacture of brass plumbing fixtures. Excavation has begun for a sand-blast foundry and plans are in progress for other buildings.

Cleveland

CLEVELAND, Oct. 22.

The most interesting feature of the week was an improvement in scattered inquiry for small lots of machines, which has apparently supplanted the demand for round lots of tools. A new inquiry, however, has come from an Ohio manufacturer for 25 machine tools. The demand is greatest for heavy drilling, planing and boring machines. While the call is largely for machinery for Government work, particularly for motor trucks, orders are being received from manufacturers having other contracts. An active demand is noted for automatic machinery in lots of one to two or three machines, and a local manufacturer reports a heavier volume of business for these machines this month than during the previous two or three months.

The White Co., Cleveland, is having plans prepared by the Watson Engineering Co., for a service station in Philadelphia to cost $175,000. It will cover a site 215 x 270 ft., and be provided with a boiler house, blacksmith shop, etc.

The National Acme Co., Cleveland, will erect a new two-story factory, 50 x 112 ft., in connection with its present plant on Stanton Avenue. George S. Rider & Co., Cleveland, are the engineers.

The Interstate Foundry Co., Cleveland, has placed a contract for the erection of an addition, to cost about $12,000, for a finishing and shipping department.

The Humphrey Pipe & Foundry Co., Bellefontaine, Ohio, has been purchased by J. L. Simpson, Lima, Ohio, and will be operated by an incorporated company, of which Mr. Simpson is president.

A controlling interest in the Cambridge Machine Co.,

Cambridge, Ohio, has been sold to H. E. Loomis and associates connected with the National Coal Co., that city. It is stated that the plant will be enlarged and new equipment added. Mine cars and locomotives and brass, iron and semi-steel castings will be manufactured.

Cincinnati

CINCINNATI, Oct. 22.

Machine tool lists are more plentiful, with the larger sized machines in demand. There is a call for sensitive drilling machines, however, and makers are very busy. In addition to the machine tools previously bought by J. G. White & Co., New York, the trade has been notified that another large list is pending, the machines to be installed in a large aeroplane factory to be constructed for the Government in Massachusetts. The Standard Ordnance Co., New York, has not yet purchased the machine tools wanted for a munitions plant to be established in Hamilton, Ohio. It is reported, but not officially confirmed, that the Mosler Safe Co., Hamilton, is interested in this project.

The steady ordering of machine tools, portable electric drilling machines and other equipment for shipment to Spain is taken as an indication that manufacturing industries in that country are receiving more attention than heretofore.

The Post Glover Electric Co., Cincinnati, dealer in electrical machinery and supplies, has leased a building on West Third Street. Its former plant on West Fourth Street was recently destroyed by fire.

The Ohio Knife Co., Cincinnati, has engaged B. L. Baldwin & Co., to prepare plans for an addition to its plant in Northside.

The Armstrong-Sinclair Co., Cincinnati, has been incorporated with $5,000 capital stock by George D. Armstrong, L. L. Sinclair and others to manufacture oxy-acetylene equipment.

The J. E. Breese Co., Cincinnati, manufacturer of roofing and building specialties, has let contract for a one-story, brick factory, 40 x 200 ft., on Reading Road.

The John C. Turner Novelty Co., Dayton, Ohio, has increased its capital stock from $55,000 to $100,000 and has let contract for an addition to its toy factory.

The Dayton Display Fixture & Novelty Co., Dayton, will build an addition to its plant at 712 East Monument Avenue.

The Wapakoneta Mfg. Co., Wapakoneta, Ohio, recently incorporated with $50,000 capital stock by Frank Andrews and others, is erecting a plant for the manufacture of fire extinguishers and automobile specialties.

The Ohio Mfg. Co., Xenia, Ohio, is installing a plant for the manufacture of jewelers' hack saws.

The Milnor Electric Co., Cincinnati, has been organized by L. T. Milnor, John Nolloth and W. D. Jackson. An office and warehouse has been opened at 124 East Fourth Street, where a full line of electrical supplies will be carried. Later the company expects to add a number of specialties and catalogs are solicited.

The Central South

LOUISVILLE, Oct. 22.

Machine shops and foundries continue busy. With machine tools in good demand and deliveries slow, shops in position to handle repair work find plenty to do. Inquiries for boilers are numerous, and delivery in reasonable time is usually the condition of an order. No relief from a shortage of coal and coke is in immediate prospect. Labor is scarce.

The Roy C. Whayne Supply Co., Louisville, is in the market for a three-drum hoisting engine, 10 x 12 in.

The E. Z. Comfort Chair Co., Louisville, has been incorporated by George B. Chase, T. Wallace Denhard and Howard B. Haehle, with an authorized capital of $20,000, to establish a plant to manufacture chairs.

Covington, Ky., will receive bids until Nov. 30 for the construction and operation of an electric light and power house. L. L. Applegate is city recorder.

The branch plant of the American Car & Foundry Co., Jeffersonville, Ind., has been enlarged and additional equipment installed at a cost of $100,000.

The Southern Welding & Reclaiming Co., Birmingham, Ala., has recently been organized to operate a local foundry. F. R. Campbell, F. S. Johnson and E. H. Ross, head the company.

The Louisville & Nashville Railroad, Louisville, will soon commence the construction of a new roundhouse and shop at Paris, Tenn., to cost about $60,000.

Indianapolis

INDIANAPOLIS, Oct. 22.

The Steele Mfg. Co., Indianapolis, has been incorporated with $50,000 capital stock, to manufacture machinery and electrical devices for automobiles. The directors are Ben Steele, Gottfried D. Yeager and Frank Fertig.

The Pittsburgh Model Engine Co., Peru, Ind., has a contract amounting to $750,000 from the Baldwin Locomotive Works for engines for locomotives to be used by the American forces in France.

The Sterlite Specialty Co., Auburn, Ind., has been incorporated, with $100,000 capital stock, to manufacture metal specialties. The directors are Arthur A. Lehman, John A. Fletcher, Wayne H. Smitley, William H. Heider and Herman L. C. Thiel.

The Superior Tire Co., Anderson, Ind., capitalized at $750,000, has bought a 10-acre site on which it will erect a factory. O. Hibner, Canton, Ohio, is president; W. I. O'Bryan, Cleveland, vice-president; and W. W. Campbell, Toledo, Ohio, is secretary.

St. Louis

ST. LOUIS, Oct. 22.

The Shamrock Custom Gin Co., Shamrock, Okla., has been incorporated with $60,000 capital by M. H. Newman, K. Farha and G. C. Townsend, and will equip a cotton gin.

Jonesville, La., will equip a municipal electric light and power plant. The mayor is in charge.

The Oil Casing Closing Machine Co., Wirt, Okla., has been organized with a capital of $22,000 for the manufacture of oil well machinery.

The Ashcroft-Hampton Mfg. Co., Fordyce, Ark., has been incorporated with a capital stock of $40,000 by Joseph Ashcroft, G. M. Hampton and others, and will equip an ice-making and cold-storage plant.

The Pan American Pipe Line Co., Tulsa, Okla., has been incorporated with a capital stock of $100,000 by J. M. Burk, C. F. Hopkins and William Sack and will equip a pipe line and oil-pumping stations. It is affiliated with the Pan American Refining Co., Tulsa.

L. O. Crosby and others have bought a lumber plant at Picayune, La., and will add a mill with a daily capacity of 300,000 ft.

The Interstate Metal Works, Laurel, Miss., has been incorporated by C. F. Tarbutton and others and has plans for a metal-working plant, the equipment to cost about $15,000.

The State Normal School, Warrensburg, Mo., will equip a boiler house and power plant requiring about $15,000 worth of machinery.

The Burke Motor Economy Co., Clinton, Okla., has been incorporated with a capital stock of $100,000, to manufacture attachments for gasoline-engine carburetors. W. T. Burke is president and A. J. Welch treasurer.

Ardmore, Okla., W. R. Roberts, mayor, will expend about $250,000 on additional waterworks plant equipment, etc.

The plant of the East Point Gin Co., East Point, La., has been burned with a loss of $21,000 on machinery, which will be replaced.

C. A. Roberson, Cannon Ball Motor Co., Texico, N. M., is reported in the market for foundry equipment, electrical machinery, heating and ventilating apparatus, air-washing machinery, power-house equipment and machinery for manufacturing automobiles, trucks and tractors.

The Midland Machine Works, Muskogee, Okla., is moving into a new factory, 75 x 102 ft.

V. C. and J. E. Scott, Mobile, Ala., are making rapid progress in the construction of a new shipbuilding plant at Shellbank, near Mobile. A shop, 50 x 100 ft., with one shipway, has been completed and other structures will provide for increased operations, in building wooden vessels.

The Turner Terminal Co., Mobile, is planning for the erection of shipbuilding works on the Mobile River. Horace Turner is president.

The St. Louis Screw Co., Clarence Avenue, St. Louis, will build a one-story addition, about 60 x 104 ft.

H. T. Hornsby, for 14 years vice-president and general manager of the United Iron Works Co., Springfield, Mo., and who recently resigned, has purchased the controlling interest of the Central Foundry Co., Webb City, Mo., manufacturer of hard iron and cupola steel castings. J. A. Desbonne, formerly manager of the United Iron Works Co. at Pittsburg, Kan., is associated with the company.

Texas

AUSTIN, Oct. 20.

The demand for small tools is heavier than for several months. The machinery trade in Mexico is constantly growing, and dealers in this section are receiving many orders.

The Planters' Gin Co., Port Lavaca, will build a cotton gin to cost $10,000. W. F. Hollamon is a stockholder.

The Wichita Cotton Harvester Co., Wichita Falls, will build a plant to manufacture a special machine for harvesting cotton. J. A. Kemp is a stockholder.

N. L. Nelson, Sour Lake, will build a waterworks system and electric light plant at Goose Creek.

The Water Corporation of Texarkana will install machinery to supplement the existing pumping plant, the capacity of which will be increased.

California

SAN FRANCISCO, Oct. 16.

Local supply houses report some good orders for heavy tools from new shipyards and for extensions for old yards. Small tools do not command the same attention. Small lathes for garages have met with a ready sale lately, and a considerable amount of logging equipment is being supplied to lumber companies. Several orders for steam shovels have recently been placed, and the scarcity of labor is expected to lead to additional business. Dredges are in demand for Government irrigation projects.

The General Electric Co., Oakland, is erecting a three-story factory at Sixteenth and Campbell streets at a cost of $85,500, for manufacturing electric lamps.

The United Shipsmithing Co., San Francisco, has been incorporated with a capital stock of $5,000 by F. A. and M. D. Schaumieffel and A. M. Geisler.

The Universal Tool Co., Los Angeles, will erect a factory for the manufacture of an adjustable wrench.

A. Meister & Sons, Sacramento, wagon manufacturers, contemplate the erection of a factory for the manufacture of a combination automobile and railroad car.

The Globe Iron Works, Sacramento, will erect two additional one-story reinforced concrete buildings, each 50 x 300 ft.

The American Machine Works, Oakland, is erecting a factory and warehouse, 50 x 100 ft., to cost about $30,000.

H. B. Bush, Redlands, will install a plant for the manufacture of a patent hot wire cutter and other appliances.

W. G. Schell, Uplands, has bought the plant of the Uplands Foundry & Machine Co. and will equip it to manufacture orchard heaters and distillate burners.

With the commandeering by the Government of the Risdon Iron Works, embracing 30 acres of ground and eight shipbuilding slips directly south of the Potrero plant of the Union Iron Works, San Francisco, the latter company will have greatly increased facilities for constructing the 40 torpedo boat destroyers for which it recently received a contract from the Navy Department. The Risdon Iron Works property was bought in May, 1911, by the United States Steel Corporation and has been used since by the United States Steel Products Co. as a supply and shipping point for its export trade. Machine shops, fabricating shops and other buildings will be erected at once and the slips will rapidly be put into condition to handle two destroyer frames each, which means that 16 destroyers can be built at the Risdon plant at one time.

The Pacific Northwest

SEATTLE, WASH., Oct. 16.

The plant of the Clyde Casting Co., Alki Avenue and West Hinds Street, Seattle, was recently damaged by fire, with a loss of $5,000. The pattern shop was saved.

The Aurora Foundry Co., Seattle, has completed the installation of machinery in its new foundry, which is 70 x 100 ft. It is equipped with an electric steel furnace, and has a capacity of 2000 lb. of steel castings per day. Gray iron castings will also be manufactured.

The Coeur d'Alene Foundry & Hardware Co., Wallace, Idaho, has increased its capital stock from $500,000 to $1,000,000.

The Cooley Mfg. Co., Seattle, contemplates the erection of a brass foundry at 1722 Twenty-second Avenue South. The initial plant will be small, with provision for enlargement later.

The Wallace Foundry Co., Ltd., North Vancouver, B. C., has been incorporated for $75,000. It is understood a foundry will be built.

The Salem Iron Works, Salem, Ore., which recently sold its equipment to a Seattle shipbuilding company, will install new equipment in its plant on Front Street.

Walter J. Lunn, Auburn, Wash., will immediately rebuild his sawmill recently destroyed by fire. The new plant will have a daily capacity of 35,000 ft.

The Markey Machinery Company, Seattle, has completed the installation of machinery in its new plant, at a cost of $40,000. The shop will turn out marine machinery, specializing in ship fittings.

The Motorship Construction Co., Vancouver, Wash., is building a 75 x 150-ft. addition to its plant. The company has a contract for more than 300 lifeboats and liferafts.

King Brothers, Portland, boiler manufacturers, will build an addition, 40 x 60 ft., to their plant.

Canada

TORONTO, Oct. 22.

The Dominion Battery Co., Ltd., Montreal, has been incorporated with a capital stock of $200,000 by Eldon Moir, John Campbell, Donald L. McDonald, and others, to manufacture dry batteries, flash lights, lamps, electrical goods, machinery, etc.

The Canada Scale & Slicer Co., Ltd., Toronto, has been incorporated with a capital stock of $150,000 by Charles E. Strowger, Arthur E. Watts, Joseph L. Howard and others, all of Brantford, Ont., to manufacture weighing machines, scales, meat slicers, etc.

The Canuck Automobiles, Ltd., Toronto, has been incorporated with a capital stock of $40,000 by Mervil Macdonald, Traders Bank Building, Edwin Smily, Bruce Williams and others, to manufacture automobiles, motor cars, engines, tools, etc.

The Fairbairn Truck Mfg. Co., Ltd., Toronto, has been incorporated with a capital stock of $40,000 by Gordon A. Fairbairn, Ernest A. Hall, William Parsons, and others, to manufacture motor trucks, motors, engines, automobile accessories, etc.

The Magnet Toy & Novelty Co., Ltd., Port Hope, Ont., has been incorporated with a capital stock of $100,000, by Arthur R. Hoskin, James Macdonald, Daniel W. Markham, 27 Dundonald Avenue, and others, all of Toronto, to manufacture furniture, wood-turnings, toys, machinery, etc. A building has been secured at Port Hope and manufacturing will commence at an early date.

The Tavistock Milling Co., Tavistock, Ont., is in the market for a 25 or 30-hp. boiler for heating purposes.

The plant of the Mountain District Brick & Tile Co. Nanaimo, B. C., was recently totally destroyed by fire with a loss of $25,000. It is expected that the plant will be rebuilt and new machinery purchased.

T. Hobbs, Mail and Empire, King and Bay streets, Toronto, is in the market for an 8 x 8-in. air compressor, 100 lb. pressure.

George McMillan & Co., Sarnia, Ont., is in the market for a second-hand Kotten or Dallett granite junior surfacer.

T. H. Ellis, Mount Forest, Ont., is in the market for a 5-hp., 60-cycle, 220 or 550-volt, single-phase motor.

The Canada Steamship Lines, Ltd., 9 Victoria Square, Montreal, is contemplating the erection of a shipyard at Cap de Madeleine, Que. J. W. Norcross is president.

The Dominion Stamping Co., Walkerville, Ont., has awarded contracts for the erection of a forge shop to cost $16,000. It is in the market for machinery, including drop-hammers, etc.

Work will be started in the near future on the construction of a dam and power house at St. Narcisse, Que., for the Shawinigan Water & Power Co., Shawinigan Falls, Que., to cost $400,000. R. Lindsay, Shawinigan Falls, is engineer.

The planing mill owned by the Peterboro Lumber Co., 163 Hunter Street, Peterboro, Ont., was totally destroyed by fire, with a loss of $30,000.

The Davidson, Smith Co., Grain Exchange Building, Fort William, Ont., is in the market for motors, belting, shafting and general elevator equipment for its new elevator.

The saw and shingle mill at Langley, B. C., owned by W. E. Laking, was destroyed by fire, with a loss of $30,000.

The Ricardo Gramaphone Co., Montreal, has been incorporated with a capital stock of $20,000 by R. Lefebvre, G. Dutand, A. Clermont and others to manufacture talking machines, phonographs, etc.

The Albany Pump Co., 16 Pearl Street, Toronto, is in the market for No. 2 screw machines, with geared head.

THE IRON AGE

New York, November 1, 1917

ESTABLISHED 1855 VOL. 100: No. 18

Intense Patriotism at Institute Meeting

Members Stand Loyally Behind the Government—Many Send Sons to War—Gary, Schwab and Other Leaders Speak with Deep Feeling—Large Attendance at Cincinnati

THE thirteenth general meeting of the American Iron and Steel Institute held at the Sinton Hotel, Cincinnati, last Friday, was dominated by a spirit of intense patriotism. The two business sessions and the banquet were held in a hall elaborately and beautifully decorated with the colors of the United States and its Allies and all of the proceedings were in harmony with the display of the beautiful flags. The speeches were uniformly marked by expressions of loyalty to the Government. The singing of patriotic songs was a feature and the feeling at times was so intense that the delightful humor of some of the prominent members, especially Mr. Schwab and Mr. Butler, was welcome, for it relieved the strain without any undue levity, for no man who spoke was more positive in his loyalty than Mr. Schwab or Mr. Butler. There was possibly a little disappointment that Judge Gary, in his opening address, did not give more specific information in regard to the plans of the Government concerning price fixing. But after all, the proceedings at Washington are regarded as details and the general plan of supporting the Government was enthusiastically supported. As President Farrell remarked, "If Germany should win we would not be thinking about prices."

The attendance was large for a meeting held outside of New York, as 600 members and guests were registered, and 580 attended the banquet. The hospitality of Cincinnati was dispensed under the leadership of such members as D. B. Meacham and James I. Stephenson, the chairman of the committee on arrangements, and was of the heartiest kind. The welcome extended by the American Rolling Mill Co., Middletown, Ohio, and the Andrews Steel Co., Newport, Ky., whose plants were visited by numerous members Saturday, was also extremely cordial. Hon. Charles P. Taft, although not a member of the Institute, took a leading part in the entertaining, and the visit to his home, where his magnificent collection of paintings was inspected, was highly appreciated. The members evinced keen interest in inspecting the much-discussed Barnard statue of Lincoln, which is located a short distance from the Taft home. The luncheon at the Country Club, at noon Saturday, was greatly enjoyed.

While it is always a pleasure for the members to greet their time-honored leaders and hear their words of wisdom, it is likewise highly gratifying to recognize younger men who appear on the program, and of the men of this class at the Cincinnati meeting Eugene P. Thomas, president United States Steel Products Co., and Nicholas Longworth, member of Congress from Cincinnati, carried off the greatest honors.

The opening session Friday morning will never be forgotten by those who attended, for following the able address of Judge Gary came a number of short, informal speeches, of which patriotism was the keynote. A number of those who spoke had demonstrated their loyalty to their country by sending their sons to the front. Judge Gary was so deeply moved that it was difficult for him to speak on this subject. President James A. Campbell of the Youngstown Sheet & Tube Co., when called upon, spoke only a few words, but his sentiments were enthusiastically received. "There is not," he said, "much worth while in this world to-day except to win the war."

President Robert Hobson, Steel Co. of Canada, paid a tribute to what he called "the magnificent silence of the press." He told how he had known of the leaving of many thousands of troops by way of Halifax, but not one word had appeared in the newspapers.

Joseph G. Butler, Jr., vice-president Brier Hill Steel Co., Youngstown, Ohio, spoke of the splendid record made by Youngstown in subscribing to Liberty bonds. He said the city had been given the raising of $5,000,000 in bonds, but that two companies had subscribed that amount. Mr. Butler referred to the criticism by Champ Clark—which has since been retracted by the Speaker of the House—in which he had alleged that a coterie of financiers was discouraging the subscribing to Liberty bonds. Mr. Butler severely condemned this utterance.

Following Mr. Butler's brief remarks, Judge Gary said that he did not feel disposed to question the loyalty of Speaker Clark, whose son is a soldier in the National Army. He believed that if Mr. Clark could visit New York and ascertain the facts he would realize the injustice of the statement which he had made. Judge Gary then paid a hearty tribute to President Farrell, saying that he had been working night and day to do his bit in helping to carry this war to a successful conclusion. "I know," he said, "that Mr. Farrell does not feel like talking, for he has sent his two boys to war, but we must have a few words from him."

Mr. Farrell spoke briefly, referring especially to the importance of carrying out the shipbuilding plan of the Shipping Board. He said that it was proposed to construct 3,000,000 tons of vessel capacity in 18 months, and this would support 700,000 soldiers in foreign lands; but fully double that tonnage must be built. There is the great importance of all connected with the industry working together. "If we lose," he said, "we will not be thinking of prices. Let us help one another and help the Government. While we are hopeful that the war will be over in the spring, I fear

it will be a long struggle; a great deal depends on the men in this room."

W. A. Rogers, of Rogers, Brown & Co., who has two sons in the army; President Clarence H. Howard, Commonwealth Steel Co., St. Louis, and others, spoke briefly. Then Mr. Schwab was called on, and, as usual, was most enthusiastically greeted by the audience. He told an amusing story of his troubles in borrowing money to subscribe for the Liberty Loan. He said that he had gone to numerous bankers in New York, and told them he wanted all the money he could get. The president of one bank said to him: "Why, Mr. Schwab, don't you know that you already owe us $2,000,000?"

"Oh," he said, "I had forgotten all about that."

Mr. Schwab, in commending Judge Gary's speech, said it was a natural outpouring of the heart, on account of having been hastily prepared. He said that of the 80,000 employees of the Bethlehem Steel Corporation and of the 600,000,000 tons of orders on books. 90 per cent was of Government business. He was proud and happy that it was his privilege to have a share in directing this great work for the Government. He spoke of the conference at Washington, and said that Judge Gary's policy had been broad-minded, not being for the benefit of any particular company or class of people, but to promote the best interests of all concerned.

Following Mr. Schwab's remarks, Judge Gary called upon all those present to rise who were willing to do their utmost to increase the production of iron and steel and help the Government in every way. The entire audience arose, after which there was the singing of America.

Patriotic Speeches Made at the Banquet

Congressman Longworth Tells About the Billions Appropriated—Mr. Butler Pays His Respects to Senator LaFollette—Other Responses

The banquet Friday evening was opened by the singing of the "Star-Spangled Banner." Judge Gary was toastmaster and introduced Hon. Charles P. Taft as "Cincinnati's First Citizen." Mr. Taft spoke briefly, dwelling principally on the Liberty loan and the splendid record which had been made by Cincinnati. He referred to the time when Cincinnati borrowed $10,000,000 to help the building of a Southern railroad, on which it paid 7.3 per cent interest, while now the city has subscribed for $38,000,000 in Liberty bonds, on which the Government will pay only 4 per cent interest.

Hon. Nicholas Longworth said it seemed like the irony of fate for a member of the Ways and Means Committee of the present Congress to be introduced to an audience of manufacturers of steel after that committee had been such an important factor in lowering the tariff and raising taxes, but he wished heartily to commend the attitude of the manufacturers of iron and steel for their unselfish action in regard to matters pending in Congress during the past few months. He said that only a few months ago it was estimated that it would be necessary to appropriate $4,000,000,000 for war expenditures. Congress was finally called upon to appropriate very much larger amounts, and the appropriations for the session amounted to $21,500,000,000, a sum 20 times the National debt before the war and four times as great as the total debt of the country, the states, the cities, the villages and townships of the United States. He compared the appropriations of the United States with the expenditures up to date of foreign countries, showing that the United States is already far in the lead; but he called attention to the fact that of the total appropriations, $7,000,000,000 was for loans to the Allies, $2,500,000,000 was for contracts, and a considerable part of the expenditures will add to the permanent wealth of the Nation. He said he believed that not more than 25 per cent of the cost of the war should be paid for by taxation, and this declaration was received with hearty approval. He insisted, however, that no matter how much the war may cost, it must be fought to a finish, so that peace will be permanent and for all the world.

Commenting briefly on Mr. Longworth's speech, which he highly praised, Judge Gary said that the present war shows that we have all been too selfish, too much devoted to business, and he warmly commended the men and women who are now doing their duty to their country.

Frank Billings of the Tod-Stanbaugh Co., Cleveland, spoke of the splendid work which is being done at Cleveland by the bureaus which were organized to manage the movement of iron ore and coal during the present season. He also spoke of other modern methods of transacting business.

When midnight arrived Judge Gary said: "The formal part of the program is ended; what is your wish?" Immediately from all parts of the hall came shouts for "Schwab," "Schwab." The popular chairman of the Bethlehem Steel Corporation responded with another happy speech. He told some stories, but also spoke in a serious vein, saying the time had come not only to talk patriotically but to act patriotically.

Calls by the audience for "Uncle Joe" brought Joseph G. Butler, Jr., of Youngstown, to his feet. He told of his experience at a recent meeting at Atlantic City at which he had advocated the sending of Senator LaFollette to Germany just as President Lincoln had sent another "copperhead," Vallandigham of Ohio, within the Confederate lines during the Civil War. Mr. Butler said that his speech at Atlantic City had not attracted much attention in the newspapers, but later the same idea was taken up by ex-President Roosevelt and thoroughly exploited by the press of the country. He facetiously charged the ex-President with stealing his thunder.

President Farrell was then called upon and responded briefly, speaking in words of high commendation of the Cincinnati committee on arrangements for the meeting. Other speakers were Capt. Robert W. Hunt, Chicago; C. H. Howard, president Commonwealth Steel Co., St. Louis; H. C. Bush, Cincinnati; J. H. Dempsey, Cleveland; George P. Early, American Steel & Wire Co., Pittsburgh, and Robert W. Campbell, Illinois Steel Co., Chicago.

D. B. Meacham Extends Hearty Greetings

Many Industries of the Queen City—Living Up to Ideals of Many Years Ago—Its Influence on Culture

In welcoming the members of the American Iron and Steel Institute, D. B. Meacham, partner of Rogers, Brown & Co., said:

"Cincinnati greets you most cordially. We appreciate the honor conferred on us by the presence of this institute, with the attendance of men so distinguished in the world of iron and steel.

"Your patriotic support of the Government and your

untiring, self-sacrificing efforts in assisting to prepare for and prosecute the war are well known. You are recognized as leaders in the humanitarian movements which are designed to improve the living conditions of your employees and to bring about a closer relation between capital and labor. Notwithstanding the many difficult problems facing you during these unparalleled times, we hope you will all remain to-morrow, and allow us to offer you a day of social entertainment.

"The topic assigned to me is 'Cincinnati and Its Industries.' Every city has its individuality and its characteristics seem to be perpetuated. In a book entitled 'Cincinnati in 1841,' by Charles Cist, is the following:

> The whole mechanic interest here has long since discovered that if they meant to supply this market with what formerly came from the Eastern cities, it would not do simply to make as good work, for the weight of prejudice and fashion was against them, and unless they could show an article which was manifestly of better materials, more neatly or more strongly put together and finished in a higher degree, they felt it was impossible for them to overcome the force of the current. We then made it a settled principle at all hazards and sacrifices to drive out the Eastern article. We knew that we had as good or better materials; that the right kind of workmen could be got, and as long as we met our expenses we must for so desirable an object wait for our profits until we could carry our point. The best workmen were accordingly engaged and brought out at high wages, and every effort made to instruct our apprentices on the latest improved patterns and models, and in the course of a few years by the time our boys became journeymen, or went into business for themselves, we accomplished our purpose, and there is now not $5 worth of work brought out here where $1,000 was imported ten years ago. The whole competition here is who *can* make the best piece of goods, not who *will* make the cheapest one.

"The determination in 1841 to make only the best has been consistently adhered to by our manufacturers, and that is the reason why Cincinnati products are famous throughout the world. Cincinnati occupies about 72 square miles, with a population of 410,000. Including the contiguous cities on both sides of the river, the population of this industrial district is about 600,000. The United States census of 1910 showed that 79 per cent. of the people were native Americans, which was a greater proportion than that of any other large city in the United States. In 1910 male aliens over 21 years of age formed only 2 6/10 per cent. of the population. The principal products of manufacture are: Machine tools, soap, rolling-mill products, clothing, boots and shoes, printing and publishing, slaughtering and packing, furniture, lumber products, leather, sheet metal, special machinery, printing inks, chemicals, wood-working machinery and women's clothing.

"A distinctive and unique feature of Cincinnati is its wide variety of substantial industries. According to the United States census of 1914, in this industrial district there were 2623 manufacturing establishments, and these included 92 of the 264 industries recognized by the census. This diversity of industries is an exceedingly valuable asset to a city, and gives it advantages over one that is dominated by a single line.

"The National Social Unit Organization made a careful and widespread survey and selected Cincinnati as the most typical American city and one in which the citizens of all nationalities and beliefs worked in best accord for social betterment, and its first experimental station is established here. Our people have a firm conviction that the real success of an industrial city rests chiefly on a well educated, self-respecting working population. Many agencies are operating efficiently to bring about the results desired.

"I could tell you of the historic past of our city and of its varied industries and achievements; of its place in the musical world; of its colleges and conservatories of music with thousands of students from the great South and Southwest; of its unexcelled Symphony Orchestra and its Music Festival, which was the pioneer of those now held in various cities. Regarding these musical festivals the highest authority writes:

> They have beyond question exerted a more powerful influence for musical culture than any other institution of their kind

"Our Zoological Garden is said to be the best in the country. Our Exposition was the forerunner of the one held in Philadelphia in 1876, which had our director in charge. Our Art School has started on their careers many of the most noted American artists. Our city owns a railroad, a profitable asset, which it had the foresight and sagacity to build to open up the South. It has a great municipal university, with thousands of students, which has introduced vocational methods now being extensively copied; and its new general hospital is one of the largest and best in the world. The Cincinnati water works demonstrated to other river cities the possibility of eradicating that awful scourge, typhoid fever. I could emphasize the beauties of our residential sections and our 2500 acres of parks, but some of these we expect to show you tomorrow.

"An address like this is occasionally a vehicle carrying a heavy burden of statistics, but our committee has guarded against too great a tax on your patience by presenting to each member a copy of The Citizens' Book, which contains a series of carefully prepared articles by well qualified writers, covering the various functions of our city's life. It is used by all our public school teachers, and is, I think, an example in an educational line that other cities would do well to follow. Please read it and take it home to your children, so that the rising generation also may know more about the 'Queen City.' Allow me to call especial attention to its introduction:

> This is a book for the citizen; for the citizen who would know what his city was, what it is, and how it became so; for the citizen who wants his city to grow better, who has ideals for its improvement, or who is seeking for such ideals; for the citizen who is willing to work with others to help make Cincinnati a community which contributes the greatest possible good to each of its members.

"In closing we again thank you for coming, and hope that when you depart you will carry away many pleasant recollections."

Judge Gary Tells of Work at Washington

Calls for Hearty Support of the President—Reviews the War's Progress and Emphasizes the Importance of the Part Steel Makers Are Taking

After calling the meeting to order, Judge Gary said: "At the last annual meeting of the Institute reference was made to the appointment and the activities of a general committee and sub-committees of the iron and steel industry. These committees were appointed and were serving as auxiliary to the Advisory Committee of the Council of National Defense. However, in view of special legislation of a recent date concerning transactions of a business nature between the Government and private interests, it was, from an abundance of caution, decided to abrogate the appointment of these committees; and immediately thereafter your president, after consultation with his associate directors of the Institute, named a general committee and also sub-committees representing the different special lines of the industry. The general committee and also the sub-committees, directly or through the general committee, have been reporting their recommendations from time to time to the War Industries Board at Washington consisting of Frank A. Scott, chairman; Judge Robert S. Lovett, Robert S. Brookins, Bernard M. Baruch, Hugh Frayne, Admiral Frank F. Fletcher and Col. Palmer E. Pierce. This board in turn has reported its recommendations to the President for decision. From the published accounts you are familiar with the results which have been reached.

Many Disappointed

"Many of you were disappointed when the prices of the commodities in which you are particularly interested were announced. You had expected larger figures. You had been receiving from your customers, in the

ordinary course of trade, much more favorable results. Your profits will be less than you have believed you are entitled to. Your costs of production and construction are increasing by leaps and bounds. Many manufacturers have struggled for existence in periods when business conditions were bad, trusting to the future for improvement, and they have argued that if the law of supply and demand should govern under such circumstances it should control at all times.

"All these things have been considered by the iron and steel committees, and by the representatives of the Government as well. It is only stating facts to say that the former have endeavored to represent the manufacturers conscientiously, intelligently and forcefully and that the members of the War Industries Board have at all the hearings given patient attention, thorough investigation and careful consideration to every claim presented, with the sole purpose of doing justice both to the Government and to the individual.

Insisted Upon Higher Prices

"The members of our committees have insisted upon higher prices than the ones finally agreed upon, but they consented to those which were fixed because they were influenced by motives of patriotism and also because they were convinced that, in the main, the prices came within the original proclamation on the subject by the President which, from the standpoint of the Chief Executive of the nation, was reasonable.

"If, as between the different products, semi-finished and finished, disparities in prices are discovered, then, so far as practicable, they should be removed. The intention of every one connected with the ascertainment of facts and the determination of prices is above reproach.

"It may be suggested that some of the producers may realize larger profits per unit than others owing to greater diversity of commodities, favorable location, better organization, larger production or other facilities which tend to lower costs, but, if so, the progressive rates of Governmental excess profits tax, depending upon the relative net earnings of the different producers, will largely offset the differences in net result. It is estimated some of the manufacturers will be obliged to pay to the Government as high as 50 per cent excess profits tax.

The Committee's Work

"The committee representing the steel industry has labored hard and faithfully in the performance of its duties. It has carefully considered every suggestion which has been made, from time to time, by those engaged in the industry relative to their rights, interests and claims. The facts concerning capacity, advantages or disadvantages, and the claims of cost and profits of each, have been gathered, so far as practicable, with the purpose of determining the relative positions, rights and obligations of all; and these have been honestly presented to the War Industries Board, and, before its appointment, to the Secretaries of War and Navy, and to various boards created by the President or by the Council of National Defense. The general committee has met frequently in New York and Washington, giving these matters attention in preference to all others and regardless of personal comfort and often without adequate rest. Omitting the chairman, who has been frequently relieved of work and favored in many ways, I state with emphasis for the benefit of those who are not fully informed that the other members of the general committee, as well as the members of the sub-committees, are entitled to the gratitude of all others who have been interested in this work. In the collection and distribution of figures affecting the different branches of inquiry the American Iron and Steel Institute has rendered valuable assistance and is entitled to and has received much praise from the members of our committees and also from the Government's representatives.

Efficient Agencies at Washington

"And the members of our committees, better than those who have not had similar experience during the last year, recognize with appreciation the comprehensive and efficient work that has been and is being done by the large number of Governmental agencies in Washington. There has been created a vast business organization, with scores of departments, and a larger number of sub-departments, which are carrying on the greatest of all great business undertakings; and, notwithstanding the unfavorable criticisms which have been made, many, if not most of which, are wholly unjustified, it should, in truth, be said this colossal combination of diversified, ramified and intricate business activities, involving almost every phase of political, social, commercial, financial and industrial life, is being, has almost been, whipped into a smooth running machine. That mistakes have been made, that steps have had to be retraced, that sometimes action has been too hasty and other times too deliberate, that red tape rules, created by legislation or otherwise, occasionally have interfered with the best results, may be assumed; but with patience, skill, persistence, vigor and success, the great varieties of business enterprise as time elapsed have been better and better co-ordinated and the whole structure developed nearer and nearer to the point of perfection. I do not hesitate to say that, so far as there has been opportunity to observe, the results in Washington have excited my surprise and admiration.

Management of Business Men

"The most wonderful feature of this work is not its magnitude, nor even its results, which are becoming exposed to the view of the general public, but rather it is the fact that the work is very largely under the management of very able business men and women who are volunteers and are devoting their time and skill and energy without compensation, or hope or desire for reward of any kind, except in the consciousness of duty performed. There are large numbers who have disregarded personal interests, their personal comfort, and many, even their personal health. These men and women are outclassed, in disposition to sacrifice and serve, only by the members of the Army and Navy who bare their breasts to the destructive forces of warfare.

"Of this vast civil army of effectives, before which the representatives of the institute and its members have appeared, is the War Industries Board, already referred to. The members of this board have other matters of interest which need attention. Some of them had hoped to retire from active business and to enjoy a well earned rest; some of them are in the very prime of life and were actively connected with important business enterprise, with every prospect of a long and successful career. All are possessed of vigor of mind and body. Not one of them personally considers himself or any other individual or any interest that may appear before the board. They have no one in mind to favor or to punish. They are considerate and respectful, but they are obdurate when a claim is presented which seems to them to be unfair or unreasonable. They serve their country by their effort to be practical, discriminating, reasonable, just. And the assistants to this board, representing a diversity of talent and experience, are of great benefit to the board in the ascertainment of facts and the application of principles and comparisons. Some of them you know personally, and with the high qualifications of all of them most of you are acquainted.

Present Duty

"Reference has been made to the general business organization of the Government and its membership for the purpose of suggesting to each of us present today our duty in this time of trouble and sadness; and to the character, disposition and qualifications of the members of the War Industries Board for the purpose of making prominent the inference that the steel committee could not, if it desired, secure from this board at any time a determination or recommendation to the President which was unreasonable; and that every one would be ashamed before such a body of men to urge any claim he did not believe to be sound and proper."

Judge Gary then proceeded to review the history of the war in Europe. Speaking of the plan of the

Prussian Germans to precipitate an international war so that Germany might dominate Continental Europe, Great Britain, United States and nearly all parts of the world, he said that it usually happens that the worst criminals make some fatal mistake in the execution of malignant plans, however carefully studied, and Germany made two great mistakes at the outset. She believed that she could enter Belgium and France without interruption and was mistaken, and she also was in error in assuming that she could violate her solemn treaty with Belgium without offending the sense of honor and decency of the entire neutral world. In conclusion Judge Gary said:

"If the members of the Iron and Steel Institute agree with what has been said thus far, as from a long and intimate acquaintanceship I believe they do, then it is easy to determine and to follow the lines of duty. We occupy a position of the highest importance in the present war. Our country and its allies in the international conflict are in need of every pound of steel which can be produced in this country, and which can be used for war purposes. To insure this supply every furnace and mill having relation to the subject must, without interruption, produce to the fullest capacity and subject to the control of the Government through its lawfully constituted agencies. No excuse for neglect, delay or interruption will or can be accepted by the Government. The Administration desires and intends to pay fair and reasonable compensation, sufficient to maintain existing wage rates, salaries of officials and extensions necessary for war purposes. Up to the present time we have no reason to complain of the attitude and action of the Government, although we have been disappointed in some respects. It is up to us to prove our continued loyalty to the Government; but more than that, our loyalty to ourselves in the performance of duty. Even though there should be dissatisfaction concerning prices or the details relating to production or distribution of tonnage, still production and deliveries must continue without interruption or diminution, leaving any question at issue to be settled at a later date. So long as the attitude of those in control of Governmental affairs toward producers remains as it is at present, it must be the effort, as it will be the pleasure, of every one of the latter to do his part unselfishly, wholeheartedly and assiduously.



W. VERNON PHILLIPS — JOS. G. BUTLER, JR. — D. B. MEACHAM

EUGENE P. THOMAS — ENRIQUE TOUCEDA

SOME OF THE PARTICIPANTS IN THE MEETING OF THE AMERICAN IRON AND STEEL INSTITUTE AT CINCINNATI

If Defeat Should Come

"If our country is defeated in the pending military conflict, your property and business and mine will be of little value. We will have retraced our national steps a century and a half. The wealth of the country would be seized and retained as prize money by other nations. We have been forced into the war and we are compelled to fight in defense of our persons, our property and our sacred honor. There is no escape. We are in the war to the end, however costly and bitter. No man, no country was ever engaged in a more righteous

or a more compulsory defense. If we do not do everything practicable to uphold the hands of the President and to add to the success of the defense against the foreign aggressor, we are less than men; we are weaklings; we are poltroons. I believed for a long time we could and would be kept out of the war, but there was no escape. It was forced upon us. The President delayed as long as he consistently could. We must now fight with every weapon within our reach. We must liberally subscribe to the Liberty Loans. We must cheerfully pay our taxes, and, of still greater importance, we must furnish steel in larger and still larger quantities. If we succeed in this war; if we do our duty, life here will be worth living. Our country will occupy a place in the front rank of worthy nations. Democracy in its truest sense—one that means 'a whole people, unified, with one law for rich and poor, equal opportunities for all men'—will be firmly established. A basis for preventing future prolonged wars will be secured. Our properties, our businesses will be more valuable than ever. Progress and prosperity will be in evidence on every hand. The war will have been a real, substantial benefit to the entire world. The moral strength and power of this country and other similar countries will be greater than ever before. If we believe the Allies can and will win the war, then we may be pronounced optimists for the long future.

"On the battlefields of Europe men are dying by thousands and tens of thousands. Our sons or brothers or other relatives will soon be active participants. I fear the rolls of the dead or injured may be brought across the ocean within a few months, although I hope for the contrary. These men who have cheerfully offered their persons as a sacrifice to a noble cause are appealing to us by thought, if not by word, for such assistance as we may render. Every dollar we expend, everything we do, every sacrifice we make will assist in protecting the patriots who are abroad in defense of our rights. We must not, we cannot, withhold anything that will be of benefit to those splendid men."

Great Merchant Marine Without Subsidy

Earnest Plea for American Ships by President Thomas, Who Discusses Important Effects of the War on Export Business

Eugene P. Thomas, president of the United States Steel Products Co., New York, read a paper on "The Export Trade as Affected by the War." He was listened to most attentively and was heartily congratulated by many on account of the very forceful and clear manner in which he discussed his subject.

In beginning, he said that foreign trade, instead of being merely a contributing factor, has become an indispensable element of our industrial prosperity. He referred to a very important part that metallurgy has played in provoking and prolonging the present conflict. Then he said: "When the Germans seized and, in spite of the Allied victory on the Marne, held the Briey basin, they expected the prompt collapse of France. For this basin contained nine-tenths of all the French deposits of iron ore, and of 127 blast furnaces in active operation in 1913, 95 were in the war zone and in the possession of the enemy. Thanks to the British navy, France still possessed the freedom of the seas, and from England and the United States were poured in supplies of munitions of war pending the utilization of unworked deposits of inferior ore outside of Lorraine. A new equilibrium between supply and demand was finally established, but it is no exaggeration to say that for months the very existence of France hung on her supplies of steel. So also, for that matter, did the victorious advance of Germany."

Capacity in Germany Increased

Representatives of six important industries, addressing the Chancellor on May 20, 1915, assured him that if their production of iron and steel had not been doubled since the preceding August it would have been impossible to continue the war, and dwelt upon the great value of the iron-ore deposits of Lorraine.

As to present and future producing capacity of the world, Mr. Thomas said: "Stimulated by the demand created by the war, the productive capacity of this country has been enormously increased. The same thing has occurred, although not to so great an extent, in Great Britain, Canada and France, while new iron and steel industries have been created or expanded in other countries, as in Australia, India, China and Japan. After the war, we shall find ourselves probably with an annual capacity of 35,000,000 to 40,000,000 tons of finished steel, and if the domestic consumption is not greater than its maximum in the past, it will leave probably 8,000,000 to 12,000,000 tons to find export markets; in other words, from 30 per cent to 100 per cent more than the present abnormal steel exports, which are largely for war requirements.

"England, with 8,000,000 tons before the war, will have 12,000,000 tons after it is over. The productive capacity of France and Germany must largely depend on the future of Lorraine and its ore deposits, as well as of the coal in the valley of the Sarre. The coal mines were acquired by Germany in 1815 and the iron mines in 1871. In the event of the retrocession of both to France, her annual production of iron ore would be raised to 43,000,000 tons, while that of Germany would be reduced to 8,000,000. In addition, France would have a new annual production of 16,000,000 tons of coal—an important addition to her capacity to develop her own iron and steel industries, instead of feeding those of Germany.

"Whatever the distribution of the European ore supply, it may be confidently asserted that our capacity after the war will represent nearly, if not quite, as much as that of all other steel-producing countries combined. We shall thus be as urgently in need of foreign markets for our products as the Germans ever were."

Post-Bellum Demand

Continuing, Mr. Thomas said that there is no reason to fear the post-bellum "glut" of steel which some pessimistic observers have prophesied, at least during the first few years after the advent of peace.

"The destruction which has followed in the track of war has been so thorough and widespread," said Mr. Thomas, "the depletion of existing stocks so complete and the suspension of antecedent enterprises so much the rule, as to preclude any doubt about the steel-making capacities of the world, during the period of rehabilitation, being fully employed. In addition to all this, the regeneration of the shipbuilding industry in this country will continue to provide a tremendous outlet for steel, and the coming demand for structural shapes may be partially gaged from the fact that building statistics show that new construction has been greatly curtailed as a result of the war requirements. The same statement applies to Europe as a whole no less than to the more progressive sections of other continents, and there can be little question that after the war the demand for steel will be sufficient to keep the industry on a stable basis for a considerable period.

Under New Conditions

"As for the prospects of the more distant future, there is one point which cannot be too strongly insisted on, because it is frequently lost sight of, and that is the incalculable influence of the material development of the world of conditions of peace under which it will have been made safe for, and there will be equal opportunity for commerce and industrial enterprise. Take the one item of railroad construction, which in two great continents—Asia and Africa—has been heretofore dominated not by commercial, but by political, considerations. After the peace, which we are all agreed in assuming will not be a German peace, no cloud will rest on the international status of such an enterprise as the Bagdad Railway. It will be one of the chief links in the great chain of overland routes be-

tween Europe and Asia, stripped of all the perils to the world's peace that inhere in so-called "peaceful penetration." Its operation, as a purely business undertaking, will promote the construction of a network of railways in Persia; it will be linked with the India system on the one side and the completed Cape to Cairo line on the other. It will be part of a great international highway that will draw closer the bonds between three continents and will cut in two the time consumed in traveling from Europe to Australia.

"And this is but one of the great world enterprises to which a secure peace among nations, divested aqually of the power and the desire to make war on each other, will bring a stimulus and support hitherto unattainable. It should be safe to predict that the 10 years succeeding the conclusion of peace will be such an era of railroad construction as the world has not seen. And where the railroads go, into lands old and new, there will be created a demand for the utmost volume of manufactures in the service of an improved agriculture, of irrigation, of mining, of the utilization of water power and of the processes of an expanded and diversified industry. No 'glut' of steel should be apprehended in the saner, soberer and chastened world which will emerge from the stern ordeal of the awful struggle by which it is now convulsed, because what we call the process of reconstruction will simply be the beginning of an unexampled development of the productive energy of the newly enfranchised nations.

Must Work Toward Common End

"But it should be recognized that our share of this process will be small or great in proportion as we are able to co-ordinate our vast and varied productiveness to a common end. The necessity of balancing imports and stabilizing exchange; the creation of an American merchant marine; the necessity of compensating the output of additional capacity by increase of exports, and the advisability of meeting the combination of our competitors in foreign markets by the use of similar weapons, would seem to be among the rudimentary requirements of the situation. It is manifestly of the greatest importance, for example, that we maintain imports of necessities, such as manganese ore from Brazil, nitrates from the west coast of South America, pig tin from the Straits, wool, coffee, rubber and other commodities. These extensive and valuable imports must be balanced somehow, either by the maintenance of an export trade with these countries or in the familiar triangular fashion of equalizing them by exports to other countries which make the required payments to our creditors in goods of their own.

"All of the European countries now at war will be under the most urgent necessity of exporting their products to the greatest possible extent as a means of rehabilitating exchange and of paying for needed imports. We may expect, as a consequence of the experience gained during the war, that the manufacturing nations of Europe will have learned the absolute necessity of organization, co-ordination and co-operation. If we are to meet them in foreign markets on terms of equality, it will be necessary not only that we establish methods of mutual co-operation, but that our Government aid and protect us at least as effectively as our competitors will be aided and protected by their respective governments.

A Lesson Learned

"Our country has had to pay dearly for our abject submission to the decay of our merchant shipping in foreign trade. But the lesson has been learned, and with it has come a recognition of these fundamental principles: We must be enabled to freight our products to foreign markets at a cost not exceeding that which will be available to our competitors, and this will be possible only if we have an American merchant marine unhampered by restrictions from which our chief competitors are free. The British shipping industry which for generations has been and is still by far the greatest in the world was built up by the exertions of the men engaged in it. It prospered because it was free from restrictions to which its competitors were subject. Theories to the contrary notwithstanding, we cannot have, in time of peace, an American merchant marine worthy of the name unless it be profitable to operate it without subsidy or subvention. This is manifestly not possible upon any practical or permanent basis so long as it costs more to operate an American steamer in ocean-going commerce than a foreign steamer in the same trade. Unsubsidized steamers have always been able to make a better showing for their owners than the subsidized ones, and it is certain that while a large majority of the British lines have received no subsidies from their Government, they have nevertheless grown and prospered and have found no difficulty in competing with the subsidized lines. I repeat that what is necessary for the future growth and success of the American merchant marine is that it be placed upon a footing of equality with its chief competitors; with a fair field and no favor, repealing all laws which experience has shown to be detrimental to its growth, thereby leaving American enterprise free to achieve a success equal to that which the British shipping industry, unhampered by restrictive laws, has been able to accomplish.

The Steel Industry's Efficiency

"The present plans of the United States Shipping Board, involving the building of millions of tons of ocean-going steamers, are not of greater consequence to the future of the export and import trade of the United States than they are to the maintenance of the steel industry on that high plane of efficiency and maximum output which it has reached during the past year. There has been afforded through the unexpected exigencies of this war a hitherto undreamt of opportunity for Governmental assistance in the upbuilding of a great merchant marine, as well as a striking illustration of the means by which American manufacturers can co-operate under Government sanction and supervision for the supply of materials in enormous quantities. Idealized by the patriotism and loyalty which it has exemplified, we have had a close affiliation between the Government and the great industrial activities of the country, the value of which in solving the special problems of the present is of good augury for the service it may render in meeting the demands of the future."

Wonderful Development of the Iron Business

Joseph G. Butler, Jr., Tells of the Marvelous Progress Which He Has Witnessed—The Biggest Thing Kaiser William Overlooked

In his paper on "Fifty Years of Iron and Steel," Joseph G. Butler Jr., of Youngstown, Ohio, said in part: "In honoring me with a place on your program the committee evidently regarded half a century as long enough for any man to be actively engaged in the iron and steel industries. As a matter of fact, my experience in them covers a period of 60 years, for I became shipping clerk and assistant manager at the iron rolling mill of James Ward & Co., Niles, Ohio, in 1857, after having spent three years as a clerk in the store connected with that enterprise, during which time I added to my accomplishments the musical art of speaking Welsh and also acquired the ambition to become an ironmaster.

"These 60 years cover the greatest progress the world has ever known. They have brought forth so many startling discoveries, so many striking inventions, so many achievements, enriching and broadening human life, that merely to mention all of these would be a tedious task. Most of these were the work of American genius. They are the fruits of individual liberty and just reward for individual effort first known to the world after our forefathers had established freedom in enduring form upon this continent. The mere

contemplation of this progress should serve to remind us of our obligations at this time, when civilization is turning the sharpest corner in its history, and when the right of men to self-government and self-development is threatened as it has never been threatened before.

In Early Days

"Sixty years ago, there was no such thing as the steel business in America. The trifling production of 'blister' steel, amounting to about 2000 tons per year, was not worthy of that designation. But the iron business had already laid the foundations of its future greatness. And this in spite of the fact that we had then comparatively no ore, no efficient fuel, no adequate machinery and very little of the practical and scientific knowledge so widely diffused to-day.

"When I entered the iron business we made iron without coke, a task resembling that of the Hebrews who were compelled to make bricks without straw. We had what would now be considered no ore, for the chief supply was derived from an occasional pocket in the hills or gathered from swamps or the beds of creeks. We had no furnace tops, no blast stoves, no hot blast as we know it now, no metallurgists, and, in the light of the present experience, no markets. We knew nothing of the value of gas, natural or manufactured, a fuel indispensable in the manufacture of iron and steel in large quantities. But we did have grit and energy—the determination to do our best, and the same pride in doing things that we have now.

"There were some compensations, of course. The payrolls were not so large and we were not troubled with a shortage of cars to move our product. I recently came across a statement issued by the superintendent of the Ward furnace, operated under lease at Youngstown, about the time of my entrance into the business. It said: 'Our next payroll will amount to something like $200. We ought to have at least $20 in cash.' The payroll referred to was for one month. The cash was needed to give some of the men a little money for some special purpose. As a rule, they were paid in store goods. Among some other furnace records of these days I have seen an entry reading: 'Paid James Dobson $6 to git married.' At some of the furnaces in that locality, it was the custom to give the men a dollar in cash at Christmas and the Fourth of July. At other times, they got along without any money. From all of which it will be seen that many things, among them getting married and running a blast furnace, were done with less capital than at the present time.

"There was at that time no thought of making steel at the ordinary iron works. The equipment consisted of one or more small heating furnaces, one or two trains of rolls, perhaps a forge fire or two, a few puddling furnaces and occasionally some machinery for making cut nails. The product was usually either simply pig iron, or merchant bars, a commodity which, by the way, has not changed its name in the whole 250 years since iron was first formed by forging into that shape.

The Bessemer Process

"The steel business was really born in America when the Bessemer process came into use here, which was not until about 1864. The idea of removing carbon and silicon from blast-furnace iron in this way was undoubtedly first conceived by an American, although he failed to develop the machinery for its use, and, as a consequence, reaped very little benefit from it. When William Kelly, who first decarburized iron by means of an air blast in a furnace he had erected for that purpose at Eddyville, Ky., about 1850, came to file his claim for a patent in 1856 he found that Henry Bessemer had filed similar claims and been granted patents a few days previously. Kelly had worked for years on his scheme, which was identical in principle, but he had not yet made it a commercial success and did not attempt to make steel in that manner. Nevertheless, his use of the pneumatic process first was not disputed and he was granted an interference as against the Bessemer patent.

"I recall distinctly a visit made by this man to Niles while I was a member of the Ward family, being employed in the Ward store, about 1854. He came there to enlist the interest of James Ward, then regarded as an authority on the iron question, in behalf of his experiments, and was a guest at the Ward table on several occasions. How far he succeeded in his errand may be judged by the fact that Mr. Ward said after he left that he was crazy.

"The invention of the Bessemer process, or rather its perfection and development, is generally regarded as the longest single step in the march of progress that has brought the iron and steel industries to their present stage, but there are other discoveries that seem to me even more important. We cannot make steel without iron, and therefore of even more moment than this invention were such things as the discovery of the Lake Superior ore ranges, the invention of the furnace top, the use of coke and its economical manufacture, the development of high blast temperatures, and, especially in view of its recent rapid adoption, the Siemens-Martin open-hearth furnace.

Kelly's Troubles

"As has been stated, I met Mr. Kelly when he was trying to make his great discovery a practical success. I saw him on a number of occasions later, when he was working to unravel the skein of litigation that tied up the Bessemer process and prevented its adoption in this country until ten years after it was patented here. I can recall the announcement in the technical journals of that day of the discovery by Robert Mushet, a Scotsman, that speigeleisen would recarburize iron blown in a converter and thus produce steel. We did not know of this in America for some time after Mushet's patents were granted in England, which was in the latter part of 1856. Up to that time, Kelly did not suspect that he had found a new way to make steel, and had urged his process on iron manufacturers only as a cheap and rapid method of purifying iron for rolling mills, claiming that it would take the place of puddling, something it has, by the way, never done.

The Hot Blast

"Likewise I was privileged to watch every step in the development of the hot blast. At the Ward furnace at Niles, and in other furnaces in the Valley, the blast was heated by passing it through cast-iron pipes, and these lasted but a short time, their renewal and replacement keeping the local foundries busy and interfering seriously with continuous operation. We had what we called a hot blast, but it was really only warm in comparison with modern practice. The furnacemen tested its temperature with lead and zinc, strips of which were inserted at the point where it entered the furnace. If the blast melted lead it was not quite hot enough, and if it melted zinc, it was too hot, so we believed, and would burn the iron. Between the melting point of lead and zinc, as we now know, there is a very considerable difference, so that our wind varied about as much in temperature as it did in pressure. If you reflect that the blast in those days was blown usually by an engine that had been worn out on a Mississippi River steamboat, and that it was a usual thing for the men about a furnace to operate the walking beam when the engine broke down, you will have some light on the strength and steadiness of the hot blast of that day.

"It was about 1868 that the Player hot blast stove was brought from England to this country. It was a decided improvement. This stove introduced an innovation in being located on the ground instead of at the tunnel-head. The first stove to employ the regenerative principle was the Whitwell stove, and it was lined with fire-brick, also a new idea. Both it and the Player stoves immediately increased the output of furnaces and made larger stacks possible, although it was many years before they supplanted the old Thomas stoves at many American furnaces.

Credit to the Germans

"The use of furnace gas for heating the blast in this country we owe to the Germans, the first effort to bring these gases down and burn them under stoves and boilers in America having been made by C. E. Detmold, a German engineer residing in New York, about 1859. The new plan cost a good deal of money and was slowly adopted for that reason. We did not get to it in Ohio

for some years after it was used in the East. I recall very distinctly the first furnace top installed at Youngstown. It was thought highly dangerous by the workmen, and there was at first some difficulty in getting them to work around the stack.

"With the use of better stoves and the introduction of more powerful blowing engines, furnaces began to grow in size and more attention was paid to their lines. It was realized that much improvement could be made in the output, and progress in this direction was rapid. By 1875 it was known that blast furnaces could be operated successfully up to 80 feet in height, and, with coke for fuel and proper equipment for blowing and heating the blast, could be made to yield much larger product than had been expected up to that time. But it was not until about 1880 that one of these larger furnaces reached an output much above 100 tons per day. This was the Isabella, located at Etna, near Pittsburgh. During three years, 1881, 1882, 1883, this furnace produced an average of 1090 tons per week—the best ever done by a blast furnace up to that time in this or any other country.

The Old Stacks

"To those who have had experience only with the present day blast furnace and modern furnace practice, it is impossible to portray the conditions surrounding this industry at the time when I first became interested in it. The old stack of those days, with its equipment, would be picturesque in the extreme if it could be set up in the vicinity of a modern steel works. The stack was usually about 35 feet in height and built of masonry, lined on the inside with a poor quality of fire-brick. It was square in section on the outside, the bottom being about 24 feet each way and the top somewhat smaller, this depending on the opinion of the man who designed it. The stack was usually located against a bluff, the double purpose being to make construction cheaper by using the hill to reinforce one side and enable a patient mule to perform the functions of a skip hoist by dragging the ore to the top of the hill. A short bridge connected the stockhouse with the top and the material charged was wheeled from this point and dumped in at the open top.

"Only one or two tuyeres were used, and these were often on the same side of the stack, next to the blowing engine. In front was the sand bed, into which the iron was run, and to one side the space reserved for roasting the ores. No water-cooling devices were used except at the tuyeres and the opening in front. It was a very small proposition compared with what we are used to at this time, but was, nevertheless, a source of general public interest and regarded with considerable awe by the uninitiated. I can recall the first furnace in our district whose builders had nerve to locate it away from a hill. They used a hoisting device in which a tank filled with water raised the platform on which two wheelbarrows loaded with ore had been placed. When the barrows were dumped, they were wheeled back on the platform, the water was let out of the tank at the other end of the rope and they came down to be refilled.

Crude Engines

"The blowing engines were of the crudest type and had but little power. There was then no method of gaging the pressure accurately and this was one of the cares of the furnace boss. He was expected also to know when the furnace was ready to cast, the proper color of the iron, and a great many other things. As a rule, he did know these things better than might be expected, and these old furnaces made good iron even if they did not make much of it.

"Even this type of furnace was a great improvement over those in use forty years earlier in that locality, for these used the 'trompe' or water blast, which was, you may be sure, somewhat removed from the Gayley dry blast. This was a contrivance by which a waterfall was made to carry air into a box, compressing it in the top, from which it was carried to the furnace through a small pipe.

"It is a curious circumstance that the first furnace erected by the Carnegie Steel Co. was one torn down at Escanaba and taken to Pittsburgh. It had been erected in Michigan to be near the ore fields, but its owners found that the problems of transportation could not be solved in that way alone.

First Use of Coke

"About 1860 the first coke was regularly used as fuel in a furnace at Pittsburgh, and within a few years it proved so efficient that all other fuels were practically eliminated except for making special grades of iron. Owing to the advantage of this natural fuel, known as 'Brier Hill' coal, we did not begin the use of coke in furnaces at Youngstown until 1869, at which time the coal began to grow scarce."

The employment of coke as a blast-furnace fuel was considered at some length by Mr. Butler, who next gave a brief history of the Lake Superior iron-ore region and the development of ore mining and handling.

"When we began to use Lake Superior ores the ordinary cargo of a lake boat was 500 tons," he said. "It required several days to load and unload this cargo at every point where it had to be handled—four in all. The ore cars then in use carried only ten tons. When their capacity was increased to 25 tons and boats were built that would carry 1000 tons, we thought our problems were solved. Now we have vessels loading as high as 12,000 tons at the upper ports in two or three hours with one or two men on the dock, and unloading their cargo directly into 50-ton cars in about the same time—and with practically no manual labor.

Mill Development

"No less remarkable are the changes that 60 years have witnessed in the fabrication of iron and steel. When I first entered the business the plant of my employer consisted of a small blast furnace, a refinery forge or two and a mill upon which we rolled iron bars for various purposes. After the pig iron had been refined in the furnace, a process somewhat like that of puddling, it was rolled into muck bar. This was then made up into bundles, reheated and rolled on a primitive form of bar mill. My first contribution to the efficiency of the plant was a plan to regulate the size of these bundles so that they would produce a bar of the size and length desired and thus eliminate excessive waste from scrap as each piece was rolled. It was recognized as a discovery and Mr. Ward complimented me highly.

The First Bar Iron

"The first bar iron was rolled in New England about 1825, and the first puddling in this country was done in 1835, both at the Boston Iron Works. The first successful American blast furnace of which there is a reliable record was built in the Ramapo Mountains in 1800, or a short time prior to that date.

"The first successful iron-working plant was on the Hudson, at Cornwall, where some Cornish iron workers gathered soon after the middle of the eighteenth century. It was a simple bloomary and forge. In 1780 a forge at West Point, doubtless an outgrowth of the establishment at Storm King Mountain, produced a great chain which was stretched across the Hudson to prevent the British gunboats from passing up that stream. That chain still holds the honor of being the largest ever forged, a fact which shows that our ancestors could rise to great efforts when inspired by patriotism, even as we are doing to-day.

"I occasionally go into the blooming mills at the Brier Hill plant, where we break down a steel ingot in less than a minute and mentally compare the massive machinery in use in modern steel plants with the equipment of those days. Still, we had achieved a good deal even then. The first successful rolling mill in this country was about as primitive, compared with the equipment of 60 years ago, as was the old Ward mill when compared with a modern rolling mill.

"The pioneers started with nothing. We had at least something to work with. Both they and we of this generation have made the best of our opportunities, and the result is the majestic industry which to-day stands without a rival in the efficiency of its processes, in the zeal of its operatives and in its far-reaching effect on human happiness and welfare.

"Much of this great progress has been undoubtedly due to the men who have been engaged in the iron and

steel business. In justice they must be given credit with a degree of enterprise found in no other industry. They have been willing at all times to face ruin for the sake of adventure into new and more promising fields. They have rewarded courage, vision and genius as no other industry has rewarded these things. They have constantly looked forward to higher achievements, scorning the contentment that sometimes brings stagnation to a great industry.

"All of this progress, however, cannot be credited to the men of the industry. Some of it was undoubtedly due to the greatness of the country, the magnificence of our natural resources and the enterprise of our people as a whole. In no other country in the world, for instance, could there have been a demand for railroad expansion such as to require 500,000 miles of steel rails in less than 30 years, as was the case in this country between 1865 and 1895.

"To one who can recall the early years of iron and steel manufacture there is nothing more inspiring than the ceaseless effort of men engaged in the industry to find better and more economical methods of producing iron and steel. To this must be ascribed in large part the phenomenal advances made in America, which has led the world in the perfection of metallurgical processes and the adaptation of mechanical appliances for these purposes.

The Protective Tariff

"In like manner there is no question that a part of the development was due to the tariff policy which for a great portion of this period encouraged enterprise by protecting the struggling iron and steel industries against competition from abroad and assuring reward for energy and ability expended in this direction.

"You will pardon me if I claim some small part in this, for it was my privilege to be consulted freely by President McKinley during the period in which he labored so faithfully and effectively for wise tariff legislation, as well as to enjoy his personal friendship and confidence during his lifetime. One of the most gratifying tasks of my life has been the effort to repay in some small measure the debt owed by the industries of America to this statesman, whose broad vision had so much to do with our national growth, by conceiving, planning and, with the help of my friends in these industries, erecting to his memory at Niles, Ohio, on the spot where he was born and where we played together as boys, one of the noblest and most beautiful memorials on the American continent. This structure was dedicated on Oct. 5, 1917, and I hope you will permit me at this time, although it may seem foreign to my subject, to extend to every member of the Institute an invitation to visit it. It has cost approximately half a million dollars and is artistically worthy of its purpose.

"I have had the honor to be consulted by the men who framed every tariff bill passed by a Republican Congress since 1875, and have endeavored to consult the framers of every Democratic tariff bill during the same period.

Great Associations

"Still more helpful was the influence of the organizations created and fostered by men of vision in the two industries. These men saw long before it came to be generally realized that the true basis of success in manufacturing enterprises was not so much unreasoning competition as sensible co-operation, and they early put their views into effect by the organization of such associations as the American Pig Iron Association and the Bessemer Pig Iron Association, both of which it was my privilege for many years to serve as president; the American Iron and Steel Association and our own great association, the American Iron and Steel Institute. It would be hard for anyone to estimate what has been accomplished by these organizations toward the stimulation of progress and the conservation of resources in these two lines.

"Even those least friendly to the iron and steel interests must acknowledge that they have led all others in this country in matter of advanced ideas along sociological lines. This has been practically true of the American Iron and Steel Institute, under the able administration of Judge Gary. We have been the first to realize the great truth that business success depends upon co-operation rather than upon competition, a truth now generally admitted. We have been the most generous of all the industries in dividing with labor the rewards of business. We have led all other industries in the matter of safety, sanitation and welfare work, and we have done more than any others to establish in the public mind the fact that the interests of labor and capital are identical, the prosperity of one involving the prosperity of the other, and both owing to the public duties equal to those they owe to themselves.

"It has been my privilege to enjoy the personal acquaintance and friendship of almost every man who has been prominent in the industry in this country, as well as many of those who have achieved fame abroad. Among these are many who have closed long and honorable careers, and many who are still in the heyday of their usefulness. But even more gratifying to me is the fact that in my experience it has been my pleasure to have in a certain sense been tutor and friend to many young men who have since proved their ability and energy by reaching positions of high usefulness and reputation.

"It has been said that 'Youth longs, manhood strives and age remembers,' and this is my excuse for indulging in reminiscences before a body of busy men intensely interested in the present and future. To me it seems that this future can be gaged accurately from the present and the past. The early days of iron making in this country are radiant with the spirit of progress and of patriotism. This spirit had no small part in making America monarch of all the forges, and it has not died out. We can depend on it to still preserve the wonderful lead we have attained in production, and to maintain the institutions to which we owe so much of all that is good for us and for the world.

America the Leader

"It is as true to-day as it ever was that the civilization of a people may be told by their progress in the use of iron and steel, and I hope the time will never come when America will no longer lead all other nations in this respect. I hope also that the time will never come when men in our industry will show less public spirit or less patriotism than in the past. In the present crisis of our national life, we need the high purpose and the unselfish devotion to country that our members have shown. We need the courage and vision of Judge Gary, our president, and we need the energy and ability of our younger manufacturers as never before.

"In 1916 I spent six weeks in France and England with the American Industrial Commission. Had not what I saw there been sufficient to impress upon me the importance of the American iron and steel industries in the world's struggle against despotism and scientific barbarism, the statements made to me by the leaders of the French and English people would have done so. Without the magnificent resources of our mines and mills, the Allied cause would have been lost long ago. The genius, the energy and the rectitude of purpose that made possible the splendid industrial development of America have also made possible the preservation of democracy. There can be no doubt whatever on this point. Our Government was not ready, but our mills were prepared. The biggest thing the Kaiser overlooked in his calculations was the American iron and steel industry.

History's Supreme Hour

"It has been our great privilege, gentlemen of the Institute, to render aid on behalf of the world in the supreme hour of history. We are now called upon to make sacrifices in the same great cause recently brought more directly home to America, but scarcely more ours now than it was at the beginning of the war. That we shall do so with energy and devotion characteristic of our history and in keeping with our traditions, I have not the slightest doubt.

"Aside from this duty to aid our country in every way possible by the efficient operation of our properties and the ready co-operation with the Government already shown, our chief duty, as I see it, is to preserve

the traditions and continue the splendid record of the industries in our care. There is still much to be done. The limit of advancement has not been reached. In the future lies opportunity as great as that of the past. It must be grasped by younger men, for we older ones have reached the summit from which the view most alluring lies behind us. If the facts and reminiscences to which you have so patiently listened to-day give you inspiration to carry out the traditions and emulate the performance of the great industries in which you are fortunate to be engaged, they will have achieved their purpose and I shall have my reward."

Substitution of Electric Power for Steam Necessary

Samuel S. Wales Gives Valuable Facts About Costs and Other Features of Modern Electric Motors in Steel Mills



S. S. WALES

In his paper on "Modern Electric Motors in Steel Mills" Samuel S. Wales, electrical engineer, Carnegie Steel Company, Pittsburgh, said in part:

"The electric motor has been applied to every class of machinery used in the production and finishing of steel, although only very recently has any one plant used electric power throughout. At the blast furnace, electric power is now almost exclusively used in new construction, and is replacing steam and hydraulic power in existing plants, wherever the changes required are not so radical as to make the first cost prohibitive. The automatic skip hoist, the ore bridge and transfer cars are all so familiar as to need no description. In the steel producing departments, cranes, charging machines, transfer cars, etc., are too common to attract notice, though some of the later applications, where the electric motor has replaced the hydraulic cylinder, such as ingot stripping, lifting furnace doors and tipping metal mixers and tilting furnaces, may still be of interest.

"It is in the rolling mill, however, where the ruling spirit is mechanical power rather than metallurgical reactions, that the electric developments have naturally been most spectacular. From the early beginnings on cranes and charging machines, the motor now drives everything, including the screw-downs and manipulator, applications which were long and stubbornly contested by the steam engine and the hydraulic cylinder. One of the later achievements of the electric motor is the direct operation of a large billet shear, abandoning the use of the usual heavy flywheel and clutch, and starting the motor from rest for each cut. This shear has a maximum stroke of 8 in. and the entire apparatus reaches full speed while the shear knife is traveling ¾ of an inch.

Main Mill Drives

"Having become successfully established for all the detail operations in the steel mill, the next natural step was to the main mill drive, which had always been the ultimate goal of both the mill electrical engineer and the manufacturer of electrical equipment. While the same flexibility and lack of reciprocating parts recommended it, several engineering drawbacks retarded the development for large units fully as much as the first cost of the motor itself.

"The main mill drive motor is automatically divided into several types, by the class of mill to be operated such as constant speed non-reversing mills for plates, billets, structural shapes, etc., where the product is sufficiently uniform to have one most efficient running speed; variable speed non-reversing mills, for wide ranges of products, such as merchant bar mills; and reversing mills, for blooms, slabs and universal plates. The straight a.c. induction motor is recommended by common consent by all the large manufacturing companies for the non-reversing constant speed mills, and as the simplest machine that will accomplish a given end is always the best, there is no criticism to be made on this choice.

"For the variable speed non-reversing mills, there is considerable divergence as to the method of producing the changes in speed, i.e., the Kraemer system, in which the regulating apparatus is mechanically connected to and at times supplying part of the mechanical torque to the rolls, by means of the regulating current, and which can be designed to operate either above or below, but not at synchronous speed, and the Sherbius system, in which the regulating apparatus is mechanically separated from the main motor, returning its surplus power to the line, and which can be run at any point below, through and above synchronous speed. For many mills where only small ranges of speed change are required, either of the above systems should be equally satisfactory, though it would seem preferable to do all the driving with one motor rather than supply 5 per cent or 10 per cent of the mechanical power through the shaft of the regulating motor, as is the practice in the Kraemer system. Where wide ranges of speed are called for and the motor may be required to operate at or near synchronous speed, the Sherbius system would appear to be the most adaptable, for with the Kraemer system there will always be a region varying from 2 per cent to 5 per cent on each side of synchronism where the motor is unstable.

"For the reversing mill, all are agreed on the flywheel motor generator set (the Ilinger system), but some difference of opinion is still apparent as to the main motor, whether compound or shunt wound. It is somewhat difficult to reason out the advantage of the compound winding on a motor for this service. It appears doubtful if there is sufficient time when the ingot enters the rolls, and the shock is thrown back on the motor, for the compounding current to overcome the reluctance of the magnetic circuit of the machine so as to have any appreciable effect in cushioning the shock. It is quite apparent, however, that in later passes, after the piece is well in the rolls, and the motor is called upon for power and speed, the compounding will come into full action with a consequent decrease in speed and a reduction in the tonnage output of the mill.

"It must, of course, be thoroughly understood that this compound winding is entirely independent of the inter poles and the main pole-face windings, which are universally used by builders of large reversing motors for securing sparkless commutation by controlling the distribution and density of the magnet field of the motor.

"On all auxiliary mill motors, modern practice is to guarantee a maximum temperature rise of 35 or 40 deg. C. for a continuous full-load run, and it would seem that if such a standard is considered a necessary basis of safety after twenty years of mill electrical engineering, we should not abandon all precedent for a manufacturer's performance guarantee, which must be more or less intangible and cannot be measured. The best and most faithfully kept manufacturer's guar-

(*Continued on page 1105*)

STEEL HEATING ECONOMIES

Smokeless Furnace Operations and Fuels and Stokers—Heat-Balance Data

A DISCUSSION of smokeless operation of steel heating furnaces before the Engineers Society of Western Pennsylvania a few months ago involved the discussion of possible fuel economies as being closely associated with the question of smoke. Mechanical stokers, waste-gas washing, air infiltration for recombustion of waste gases, and gas-producer operation were some of the topics touched.

Furnace Practice

A. N. Diehl, assistant general superintendent, Duquesne Works, Carnegie Steel Co., Duquesne, Pa., opened the discussion. Artificial gas from coke ovens, blast furnaces or producers, as well as oil, tar and powdered coal, he said, have been proposed and are also being used for the purposes of reheating steel. Average soaking-pit practice, he estimated, will require for large ingots about 700 cu. ft. of natural gas per ton to maintain a temperature of 2400 deg. in the pits, or an equivalent of about 715,000 B.t.u. per ton. For secondary reheating, such as demanded in heating furnaces, for slabs, blooms and billets, approximately four or five times as much fuel is required to reheat cold material as is required for the preparation of the ingot from the hot open-hearth steel.

With ordinary product, he held, surface oxidization or scaling is not an essential detriment. Different plants show analyses from pits or heating furnaces, indicating a complete combustion of carbon without experiencing any excessive amount of scale. In some grades of steel, where the ingot surface is pitted, a long heating with a heavy slag has been found beneficial, as is the case in a number of nickel-alloy steels. In others, notably high carbon, heating must be carried on with the greatest care. This is also true of bars and blooms. A great amount of work has been done by engineers on the heating of steel of such form where there is very much surface exposed, as scale or pitting may ruin the surface or otherwise deteriorate the final product. The presence of carbon is generally advocated to prevent this and in consequence we have incomplete combustion.

H. C. Siebert, experimental engineer, Duquesne Works, Carnegie Steel Co., Duquesne, Pa., gave the following data from tests made in the past five years on different heating furnaces in the various plants of that company:

Heat Balances for Various Furnaces

Type of Furnace—Continuous

Kind of Fuel	Width of Furnace, Ft.	Length of Hearth, Ft.	Billet Section, In.	Length of Billet, Ft.	Weight of Billet, Lb.	Weight Heated per Hr., Lb.	Per Cent of Heat Absorbed by Steel	Per Cent Lost in Stack	CO Loss, Per Cent	Radiation Loss, Per Cent	Soot Loss, Per Cent	Carbon Lost in Ash, Per Cent	Total Heat in Fuel per Ton of Steel
Natural gas...	7	21.5	1½ × 1½	5	38.25	11,402	41.8	46.6	2.8	8.8	...	..	1,824.256
Natural gas...	8¾	34.0	4 × 4	3½	190.4	13,634	35.0	49.4	1.2	14.4	...	..	2,036,000
Natural gas...	8	32.0	4 × 4	2¾	148.6	9,340	20.3	45.9	3.2	30.6	...	..	4,072,000
Coal	8¾	37.5	3 × 6½	4	265.0	20,564	14.9	42.9	21.4	6.8	10.0	4.0	5,593,000
Coal	9	28.5	1½ × 1½	6	45.9	3,920	13.4	44.4	5.3	17.3	15.6	4.0	6,227,000
Natural gas...	9	26.5	4 × 4	3¾	204.0	16,503	27.2	39.1	10.7	12.5	10.5	..	2,542,964
Natural gas...	9	26.5	4 × 4	3¾	204.0	16,891	40.0	47.3	...	12.7	...	..	2,009,532

Forty per cent, he said, is by no means the best efficiency on which furnaces are being operated to-day. Furnaces in his company's plant average month in and month out between 60 and 70 per cent, and are smokeless.

Washing Waste Gases

W. H. Smith, engineering department, Ford Motor Co., Detroit, stated that where new installations are made, or changes in old equipment will permit, sufficiently high chimneys should be provided, down draft used, and all waste gases drawn or forced through flues to washers or scrubbers, and delivered to the chimney free from obnoxious matter. This will mean that the incoming air delivered to many departments will be under a pressure, and that the outgoing air from furnaces is received in flues delivered through the washers to high chimneys or stacks. While such gas flues can be located overhead, what seems to be a better plan is to place them in underground tunnels or passageways. Such tunnels will also be the means and ways for help to go to and from their department divisions. In such tunnels will also be located power and water lines, and the conveyances for the supplying of departments, as well as coat-rooms and wash-rooms for the workmen.

Julian Kennedy, engineer, Pittsburgh, suggested that to do away entirely with the emission of smoke into the atmosphere, heating furnaces be connected to a common draft flue and the spent gases conducted either through waste heat boilers or direct to a scrubbing chamber and washed in the way Mr. Diehl has successfully used to clean his blast-furnace gases. This would be a simple process and would require much less water than is necessary where gases have to be brought to a low temperature to eliminate moisture so as to fit them for fuel.

Stoker-Fired Furnaces

Dr. J. S. Unger, manager, central research bureau, Carnegie Steel Co., Pittsburgh, objected to a mechanically-stoked, coal-fired pit or furnace as he believed a situation might arise in mill operations where it is necessary to shut off all the gas and rapidly reduce the temperature. A stoker used in connection with a steel furnace is full of burning fuel, which continues to give off heat for some time, even after the operation of the stoker is stopped. For ordinary mill temperatures for forging and rolling this is not so serious an objection as where stoker-fired furnaces are used for low temperatures between 400 and 850 deg. C., as in the heat treatment of steel.

Considerable experimental work, he said, is being done with heating furnaces fired by mechanical stokers. The newer types of such furnaces operate with very little smoke, as the knowledge gained in the study of highly efficient boiler firing without smoke has been applied in the construction of such furnaces. Underfeed stoker, forced-draft, coal-fired billet heating furnaces and stoker-fired continuous furnaces 70 ft. long and 20 ft. wide are, he claimed, being operated without smoke.

W. G. Graham, manager, Standard Steel Car Co., New Castle, Pa., stated that his company has five plate heating furnaces and two billet heating furnaces equipped with underfeed stokers all of which are practically smokeless. From the billet furnaces it obtains about three tons per hour. These furnaces are 26 ft. long by 7 ft. wide. The five plate furnaces average 15 ft. by 7 ft. hearth surface and are used for heating plates and shapes such as are required in car construction. He has never seen smoke from any stack of these seven furnaces more than five minutes at a time and that very rarely, say two or three times a day of 10 hr.

The billets heated are for 6-in. sheet forgings. A uniform temperature of 2300 deg. Fahr. is possible at all times and no trouble is experienced in meeting the physical test requirements which are: Tensile strength, 84,000 to 90,000 lb. per sq. in.; per cent elongation, 20 to 24, and reduction in area, 30 to 35 per cent. He does not believe this system of heating could be improved upon for the class of work mentioned.

J. R. Knopf, engineer, George J. Hagan Co., Pittsburgh, discussed the application of stokers to heating furnaces for bars or sheets in sheet and tin-plate mills. He knows of hundreds of sheet and pair and annealing furnaces being successfully heated by underfeed stokers. Many of these manufacturers report 25 to 30 per

cent fuel saving, and some as high as 50 per cent. They are also getting a better product. Their bars and sheets are free from oxide and pitting and there are fewer stickers and imperfect sheets than formerly.

The old idea that a smoky flame is necessary for the production of sheets is hardly worth considering in view of the fact that stoker-fired furnaces are operating with so little smoke that to look at the stack without seeing the furnace it would be impossible to tell whether the furnaces were being operated or not. A properly designed underfeed stoker gives a very even and easily controlled fire.

Recombustion by Air Infiltration

M. F. McConnell, superintendent, Mingo Works, Carnegie Steel Co., Mingo Junction, Ohio, stated that in sheet and tin-plate mill furnaces, where the temperatures must be maintained so low as to preclude the welding of the sheet packs under the great pressure of the rolls, the flame must always carry sufficient unsatisfied fuel to make formation of scale in the furnace an impossibility, and so ideal conditions for smoke formation exist. The only solution seems to be the introduction of sufficient additional air to complete the burning of the gas at a point where the steel is not subject to oxidation.

German High Air Temperatures

W. E. Snyder, mechanical engineer, American Steel & Wire Co., Pittsburgh, emphasized the necessity of a regular supply of gas to the heating furnaces and that the air must be supplied at a high temperature. The first is fairly well secured by modern-type, mechanically-poked gas producers. If hand-fired, hand-poked producers are used, the gas goes to the furnace irregularly. At times there will be a large surplus of gas, which simply chokes the furnace and makes excessive smoke. He has seen modern types of German continuous-heating furnaces operating with an air temperature of from 1000 to 1200 deg. All combustion took place in the first third of the furnace; the remaining two-thirds of the furnace was almost as clear as the air outside, and of course there was no smoke. This high temperature of air was obtained by the use of regenerators, and diverting part of the hot gas from the furnace into the regenerator. He has never seen regenerative furnaces of this type in this country, but recuperator furnaces are common, and it is becoming customary to pay more attention to the design of the ducts or stoves used to heat the air for the purpose of getting the temperature as high as possible.

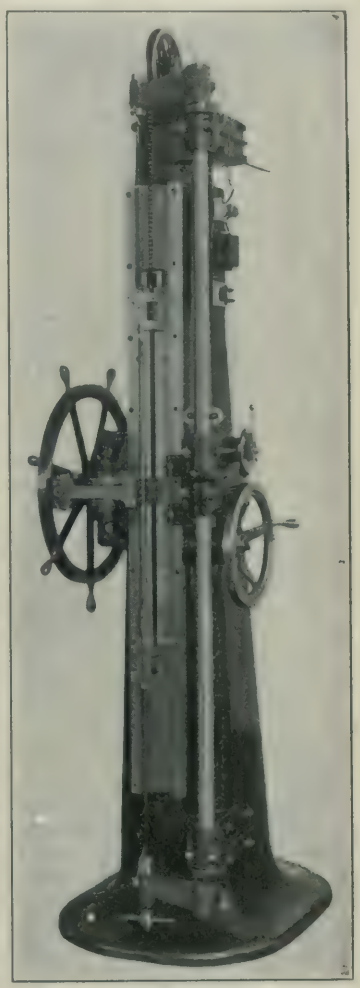
Rushing Ore Shipments

Blast-furnace operators in the Youngstown, Ohio, district believe that furnace stacks in that district will be adequately supplied with ore throughout the winter and until the navigation seasons opens again next spring. A centralized control plan for the distribution of ore to interior furnaces is now being tested. A schedule has been prepared, involving weeks of work, showing the actual ore tonnage needed by each furnace to continue operating up to June 1, 1918, when the next navigation season will be in full operation. Ore is now being distributed from Lake Erie docks to furnaces in that district under direction of the Central Iron Ore Committee of Cleveland. Every effort is being made to reduce delays both at the docks and at interior furnace yards. It is stated the plan is expected to result in placing a sufficient reserve in furnace yards to carry each stock through the winter, if the railroads can furnish the cars.

The Empire State Steel Products Co., Inc., 910-911 Park Row Building, New York, has been reorganized to conduct a general business in iron and steel products, scrap iron and metals, rails, pipe and new and used machinery. M. D. Adelson is president; James P. Touhill, vice-president and general manager; Robert G. Jeffery, secretary and treasurer, and Albert R. Bergstrom, assistant manager.

Straightening Machine for Gun Barrels

To enable the barrels of rifles to be straightened after being drilled or turned off, the Sponsel Co., Inc., 647 Main Street, Hartford, Conn., has brought out a calibrating and straightening machine. Heretofore a deviation of 0.002 in. throughout the entire length of the bore of a barrel, it is explained, has been permissible even though the other operations involved in gun manufacture call for a greater degree of accuracy. The machine, which was designed by Charles W. Sponsel, president of the company, consists of a sensitive electrical apparatus for detecting minute variations from straightness in the bore and the mechanism for applying pressure at such points to bring the barrel into the proper alignment, all of the work being done without removing the barrel from the machine after it has once been placed in position.



The Accuracy of the Interior of a Gun Barrel Is First Determined, After Which the High Spots Are Removed by Causing a Permanent Set of the Metal by a New Calibrating and Straightening Machine

In the operation of the machine the barrel is held in the position shown by two adjustable brackets moving over planed ways on the column. A wire carrying a V-shaped platinum feeder is stretched between the top and bottom of the machine and passes through the bore of the barrel that is being tested. This feeler is fixed in position and the gun barrel is moved past it by manipulating the handwheel at the right of the machine. If the feeler comes in contact with the inner circumference of the barrel, one of the two small electric lights shown directly above the handwheel is extinguished, the other continuing to burn. When the feeler is not making contact with the barrel, both of the lights which are connected in series burn at half the voltage. The arms in which the wire is fastened are mounted at the ends of the vertical shaft to the left of the handwheel and are operated by moving the lever directly above the handwheel. This lever actuates a screw to give an oscillatory movement that brings the feeler toward the wall of the gun barrel or away from it as the feeler is located so that the knife edge always points directly toward the column of the machine.

In straightening a gun barrel the feeler is brought almost in contact with the barrel which is traversed up the column of the machine past the feeler. If this is accomplished without extinguishing one of the lights, the feeler is brought closer to the barrel, the distance of this movement being indicated by a micrometer dial reading to 0.00025 in. The traversing of the gun barrel and the adjustment of the feeler after each movement are continued until a point is reached where one of the lights is extinguished, indicating that contact has been made between the barrel and the feeler. The gun barrel is rotated on its centers through the series of tests to secure accurate results.

If the test indicates the presence of a high spot, a hammer is forced against the front of the barrel by manipulating the handwheel at the left of the machine. This hammer is located opposite an anvil with two supporting points on which the gun barrel is held from the back, the feeler being located midway between the two supporting points. This arrangement is relied upon to produce a permanent set in the metal and remove the high spot, subsequent tests being made with the calibrating apparatus to insure a true circular bore. In straightening a barrel in this way the highest spot determined by the calibrating apparatus is removed first and the work is continued until the bore is perfectly straight or within the limit of accuracy possible with the machine.

Energy Consumption and Other Data on Electric Furnace

Operating characteristics of a 15-ton Heroult furnace, using 60-cycle, three-phase curr ent, were described by Walter C. Kennedy, sales manager Cutler Hammer Mfg. Co., Pittsburgh, in a paper presented before the Association of Iron and Steel Electrical Engineers, at Philadelphia, Sept. 10. The furnace, he explained, has a rating of 3750 kva., its reactance is approximately 10 per cent, and its transformer is arranged with star and delta connections to give 173 or 100 volts on the secondary. An abstract follows:

In normal operation, the high voltage is used to melt down the cold charge, which requires about three hours (input 2500 to 3000 kw.). After the charge is melted the low voltage at about 1000 kw. is used to refine the steel. Also, the temperature proper for pouring is regulated by varying the input a short time before tapping.

A typical run, the furnace being charged with cold open-hearth scrap and pig, low in phosphorus, gave a consumption of 500 kw.-hr. per ton. One slag only was used, the final analysis of the steel being approximately: Carbon 0.15, manganese 0.37, phosphorus 0.02, sulphur 0.03 per cent. However, local conditions will considerably affect the operation and power consumption.

On low voltage (Y connection) to get a power factor about 90 per cent, the maximum input is limited to 1000 to 1200 kw. It is better to keep within this range, as the current is then kept down to 7000 to 8500 amperes, and the conductor loss therefore correspondingly reduced. On high voltage (delta connection) 3200 kw. input can be obtained without any difficulty, although in practice 2400 to 2800 kw. is the usual load. The power factor is practically unity for all values of current and either low or high voltages—if anything, higher on the high voltage.

Successful operation is dependent upon using two or possibly more voltages. At least it is a big advantage to have more than one voltage available, the high voltage to be used for melting down and low voltage for refining. The inductance in the secondary leads need not cause any concern, but the skin effect of the conductors is the greater item.

In this furnace, as in all others at present constructed, the three-phase leads are grouped into three cables before leading to the electrode holders on the furnace. To reduce skin effect, at least on 60-cycle furnaces, the phases should be broken up, say into six leads with the phases interlaced. These six, or possibly 12 leads, should run from the transformer to the furnace. The delta connection should then be mounted on the furnace. It would be entirely feasible to do this and still take care of any current transformers in the secondary circuits. In the present case this would save probably 30 kw.-hr. per ton of metal.

The value of 500 kw.-hr. per ton of metal is a good average figure. This power consumption was obtained at first when low phosphorus scrap was used and one slag. However, later results, using two slags, have not shown any great increase in power consumption.

Carnegie Steel Co.'s "Liberty Mill"

The new plate mill of the Carnegie Steel Co., called "the Liberty mill," at West Homestead, Pa., is a 3-high mill of standard design, with 36-in. rolls, and is served by eight regenerative heating furnaces. The erection of this mill was authorized on April 17 last, work was started at once, and the first plates rolled on Oct. 17, just six months to a day from the time work was started. The mill is driven by a General Electric Co. motor of 2500 hp. and is the first electrically driven plate mill to be operated by the Carnegie Steel Co. It is a cold steel proposition, the slabs being taken from the Homestead Steel Works, or other steel plants of the company, as conditions may require, and reheated in the regenerative furnaces. The mill will roll up to 110 in. wide, and will have a capacity of about 15,000 tons of plates per month. The fact that a mill of this size could be constructed under present unfavorable conditions as regards labor and materials is certainly a creditable record. The task of building this mill in six months was accomplished only by the closest co-operation of everyone that had to do with its erection, and it is a notable fact that clerks and other employees from the Pittsburgh offices of the Carnegie Steel Co., also from the Homestead Steel Works offices and elsewhere, went out in the evenings during the week and on Sundays, unloaded brick from cars, and did everything in their power to hasten the completion of the mill. The mill has been christened as the "Liberty mill" from the fact that most of its output for some months to come will go to the Government to be used in the building of boats and other equipment for the prosecution of the war. The plate mill proper was built jointly by Mackintosh, Hemphill & Co. and the Mesta Machine Co., Pittsburgh, and the Homestead Steel Works. Three large shears were furnished by the Morgan Engineering Co., Alliance, Ohio; the roller tables by the Homestead Steel Works, and the plate straightening rolls by R. S. Newbold Son & Co. of Norristown, Pa.

The starting of the mill was made the occasion of a celebration, and James A. Farrell, president of the United States Steel Corporation, came over from New York to Pittsburgh and pressed the electric button that put it in operation. The buildings cover a site of about 1000 ft. in length and 400 ft. wide. There was a parade prior to the starting of the mill, and one of the streamers carried by Red Cross women read, "When All the Men Go to War, We Will Run the New Mill." Another carried in the parade read, "Six Days Shalt Thou Labor at Regular Work, But on the Seventh and Eighth, also at the 110-in. Mill." Several prominent naval officers were present at the starting of the mill.

Bank for Employees

The American Rolling Mill Co., Middletown, Ohio, has been instrumental in establishing a bank at its East Side plant. The plant is located nearly two miles from the center of the city, and it was found that employees were inconvenienced in getting their pay checks cashed after the regular banking hours. While the building will be constructed and owned by the company, the new bank will be operated exclusively by outside interests. A savings department will be maintained and it is predicted that the experiment will prove to be very satisfactory for the employees, and from the employers' standpoint it will obviate the necessity of workmen cashing their checks in saloons, as is frequently the custom.

The New York Shipbuilding Co., Camden, N. J., has adopted a plan of insurance for all employees, paying the premiums and bearing all expense with funds accruing to the family of the employee in case of death. Those who have worked at the plant for less than two years have been insured for $500 and for every additional year this amount is increased $100.

NEW WAY TO BURN CRUDE OIL*

Gasifying the Oil in a Specially Designed Vaporizer

BY W. A. JANSSEN

THE first spray nozzle for burning oil was developed in America. Since then there have been innumerable modifications of spray and jet burners. These may be divided into two classes, high pressure and low pressure types. Aside from the pressure of operation, they also vary in design and construction, depending upon the atomizing agent used. These burners are dependent for their success on the use of air or steam as an atomizing agent. In addition some burners also have incorporated in their construction some form of spiral for mechanical atomization.

The spray burner consists essentially of a fan-shaped spray of steam or compressed air upon which a stream of oil is allowed to trickle, the oil being diffused or atomized and burned. The jet burners, of which there are many types, are so constructed that a stream of oil is swept into and becomes a part of a stream of air or steam, being atomized therein and subsequently burned. The spray and jet types of burners have their limitations, because of their inability to maintain a positive adjustment of the definite amounts of oil and air necessary to assure and produce perfect combustion. This condition is further aggravated by the use of oils of variable specific gravity, which congeal in cold weather, making perfect combustion almost impossible without the almost constant attention of the furnace operator.

Because of the inability to properly control the air supply to definite combustion proportions, the quantity of air is usually in excess of theoretical requirements for complete combustion, causing a reduced flame temperature. In the spray and jet types of burners, it is essential that there be an abundance of air in order to assure complete atomization and avoid smoking. If the burners are adjusted so as to admit a theoretical amount of air, the oil is not thoroughly atomized, resulting in imperfect combustion, accompanied by excessive smoking and attendant reduction in flame and furnace temperature. The great objection to the present methods of oil burning is because the vaporization and combustion are practically simultaneous and that both occur within the combustion chamber.

Gasifying the Oil

During the past year there has been developed a system of oil burning wherein the oil, instead of being atomized or vaporized, is gasified in a specially designed vaporizer outside of the furnace. The gaseous product is forced into a combustion chamber under positive pressure, resulting in perfect combustion. This method of oil burning consists essentially of producing an oil-gas in a specially constructed vaporizer outside of the furnace proper, through the union of oil and heated air in definite proportions for perfect combustion. The air for combustion is delivered by a compressor at about 2-lb. pressure and a velocity of 150 ft. per sec. The air is forced to the vaporizer through cast-iron preheater boxes placed in the path of the outgoing waste gases. With the admixture of oil in the vaporizer, a gaseous product is formed which is delivered to the combustion chamber under continuous pressure.

The cast-iron preheater, Fig. 1, consists of a closed cast-iron box with openings to connecting boxes for the admission of incoming air. A series of vertical flues are provided to permit the passage of the outgoing waste gases through the apparatus, thus providing a source of heat for preheating the air for combustion. The number of preheaters required is dependent on the oil consumption for which the furnace is designed. They are stacked one over the other, and are so placed in the path of the outgoing gases that their walls will transmit the maximum amount of heat. Each heater is provided with an inlet and outlet opening for the admission of air. They are located on the opposite ends of the heater, necessitating a complete passage of air through the apparatus. As the heaters are stacked, the inlet opening of one connects with the outlet opening of another. With this arrangement the vertical flues are thrown out of line, thereby retarding the flow of the outgoing gases, permitting a greater heat absorption through the walls of the preheaters.

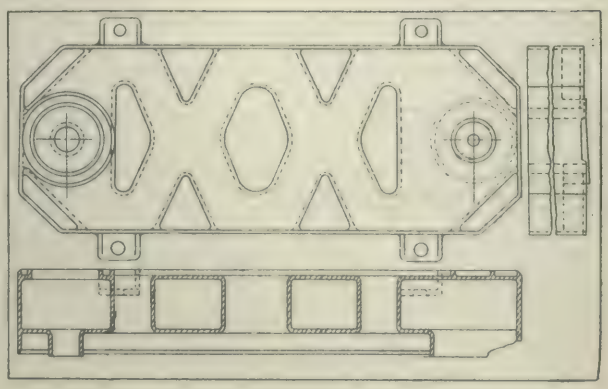


Fig. 1—General Arrangement of the Cast-Iron Preheater

Description of Vaporizing

The vaporizer, Fig. 2, is a hollow cast-iron fitting. Its size is dependent on the calculated oil consumption. It has conveniently arranged inlet and outlet openings. Within the vaporizer are a series of baffles which form a winding zigzag path for the gaseous mixture of air and oil. The long winding passage is essential for complete gasification. The preheated air enters the inlet of the vaporizer and commingles with the oil stream. On striking the first baffle, gasification is begun. The mixture of air and oil gas then winds past the succeeding baffles. It finally is discharged from the vaporizer through a pipe in the furnace wall leading to the combustion chamber.

If perfect combustion is to be attained, the proportions of oil and air must be right and the temperature of the preheated air also must be correct. The installation operates most efficiently when the temperature of the air is about 800 deg. Fahr. Allowing a temperature drop of about 100 deg. for radiation and the conversion of oil to gas, the net temperature of the gaseous mixture is about 700 deg. Fahr. The velocity of the gaseous mixture should be about 150 ft. per sec. in order to prevent back-firing or flame propagation in the direction of the source. This is most essential, as the temperature of ignition, 1050 deg. Fahr., is only a few hundred degrees higher than the temperature of the gaseous mixture, which in the proximity of the heated combustion chamber almost instantly is brought to ignition temperature.

The heavy fuel oils of commerce are practically all

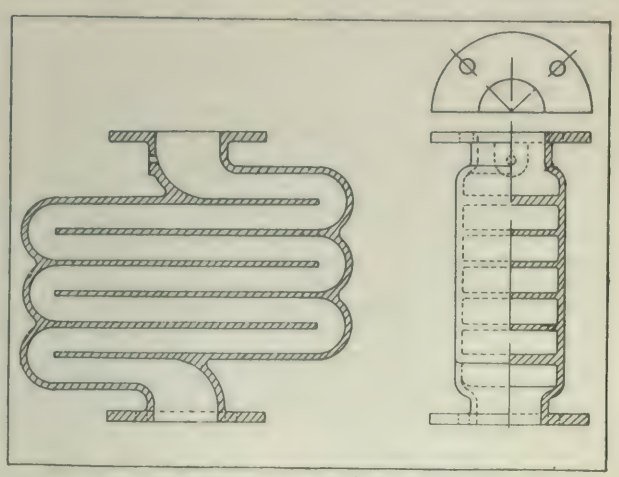


Fig. 2—Two Sections of the Cast-Iron Vaporizer

*From a paper presented at the annual meeting of the American Foundrymen's Association at Boston, Sept. 27, 1917. The author is in charge of production, Canadian Steel Foundries, Ltd., Montreal, Quebec.

of the following composition: Carbon, 84.9 per cent; hydrogen, 13.7 per cent, and oxygen, 1.4 per cent. The Baumé gravity is 26 deg. and the oil weighs 7.4 lb. per gallon. For perfect combustion this necessitates about 3.4 lb. of oxygen or 14.5 lb. of air per pound of oil. This is equivalent to 180 ft. of free air per pound of oil, or about 1500 cu. ft. of free air per gallon. This may be more easily expressed as 25 cu. ft. per minute per gallon per hour.

This method of oil burning lends itself very readily to every type of furnace in which the atomizing types of burners have been used. Oil economies of 40 per cent are not uncommon. A 10 per cent economy alone is effected in the preheating of the combustion air.

UTILIZING BURNED SAND

Experiments on Foundry Facing Sand Mixtures—Success with Pan Muller

A SERIES of experiments to determine the most economical method of mixing and blending sands for foundry facings was described in a paper read by R. F. Harrington, Hunt-Spiller Mfg. Corporation, Boston, at the meeting of the American Foundrymen's Association, Boston, on Sept. 28, 1917. The object of the experiments was to discover a combination that would permit the use of the greatest possible amount of burned sand, and so decrease the cost of sand per ton of castings produced.

Three methods of testing the sands were used in the investigation, the bond test, the sieve test, and the transverse strength test. The first study was the replacement of the sand ordinarily used by a sand carrying 20 per cent higher bond, which because of the high bond or active clay substance present allowed the use of 10 per cent more old sand in the mixture. The properties of the two sands are shown below.

Composition:	Original Mixture	Mixture No. 1
Jersey sand No. 3	72	62
Old sand	20	30
Sea coal	8	8
Total bond	307	435
Transverse strength, grams	440	396

Another mixture consisting of 47 per cent of Jersey sand, 44 per cent of old sand, 1½ per cent clay and 7½ per cent of sea coal gave a total bond of 434 and a transverse strength of 226 grams. While the bond and texture had been maintained, scabbing appeared on many of the castings. Mixing by machine partially overcame the difficulty, but an attempt to decrease the amount of new molding sand by the further addition of clay showed conclusively that the limit had been reached unless a more complete blending of the component parts was made possible by some other type of machine.

There was nothing to be gained in the operation of the mixer in so far as use of less new material was concerned. The only advantage was that it usually permitted the same mixing at a lower labor cost per ton. A careful study of the mechanically and hand mixed sands under the miscroscope revealed no marked difference, in so far as the coating of the burnt grains of sand with the new sand and clay was concerned. Results of the breaking of transverse test bars also revealed no greater tenacity of the grain particles, which would be a criterion of the thoroughness of mixing.

To increase the efficiency of all new material used in the facing by more complete blending, a so-called pan muller was purchased for this purpose. This machine consists essentially of a cylindrical pan, with a bottom of cast iron, about 5 ft. diameter, and sides of sheet steel about 1 ft. high. Resting on this pan are two heavy cast-iron rolls approximately 2 ft. diameter and 8 in. wide. These rolls are held in position by guides which allow revolution only about their respective axes due to contact with the pan and its contents.

While awaiting the arrival of the muller, the mixture designated as No. 2 was run in the foundry for a period of two months. This mixture, which used 1½ per cent of Jersey fire clay together with a high bonded Jersey sand was mixed in a mixer. Eventually it replaced the mixture previously used with a consequent saving of approximately 22 per cent of new material, or approximately 95c. per ton of facing mixed.

The first test employing the muller as a means of mixing was made for the purpose of determining the effect of the mulling action on the character of the facing. The effect of this action, so far as increased efficiency of all new material added is concerned, is best shown by a study of the tabulated results which are recorded below. They represent the breaking loads on three sets of bars made from the same mixture of sand but mixed by hand, in the mixer, and in the muller, respectively.

From the following data it is seen that the mixer offers no better means of mixing so far as the strength of the sand obtained is concerned, but that the muller does by its peculiar action offer a far more efficient means of mixing or blending. The results of the tests are given in an accompanying table.

Hand Prepared Mixture No. 1		Machine Mixture No. 2		Muller Mixer No. 3	
Bars	Ounces	Bars	Ounces	Bars	Ounces
A	9.5	A	10.0	A	12.5
B	10.5	B	9.5	B	13.5
C	10.5	C	10.5	C	14.5
D	10.5	D	11.0	D	12.5
E	10.0	E	9.5	E	10.5
F	11.0	F	10.0	F	14.0
G	10.3	G	9.5	G	14.0
H	10.0	H	10.0	H	12.0
I	10.0	I	10.0	I	13.0
J	11.0	J	10.0	J	12.0
Average	10.3	Average	10.0	Average	13.0

The first sand mixtures for facing purposes prepared in the muller varied in clay content from 1 to 7 per cent and in new sand content from 10 to 50 per cent, these mixtures making use of varying proportions of new sand and clay, in some instances consisting of clay and old sand only and in other instances of only new and old sand.

After a long series of experiments it was found that the bond test could no longer be used as a means of measuring the strength of the sand, the muller so increasing the effectiveness of the mixing as to make bond tests no longer comparative. The transverse test and a mechanical analysis were found to be the most satisfactory for judging the character of a sand. The mixtures given in the following table were finally decided to be the best for the foundry in which the experiments were conducted.

Composition:	Mixture No. 3	Mixture No. 4	Mixture No. 5
Old sand	60	57	57
Jersey sand	30	15	..
Beach sand	..	..	20
Clay	3½	..	..
Millville gravel	..	20	15
Sea coal	6½	8	8
Total bond	441	383	262
Transverse strength, grams	355	310	210

These mixtures all received 1½ min. mulling action, and although prepared for different classes of castings, they are based on the principles of the use of such proportions of new sand, old sand and clay as to give a facing which would not when in contact with the hot metal be subject to scabbing or blowing.

The comparative new material costs of the different mixtures are as follows:

Original Mixture

72 per cent Jersey at $4.	$2.88
8 per cent Sea Coal at $9.	.72
	$3.60

Mixture No. 1

62 per cent Jersey at $4.	$2.48
8 per cent Sea Coal at $9.	.72
	$3.20

Mixture No. 2

47 per cent Jersey at $4.	$1.88
1½ per cent Clay at $7..	.11
7½ per cent Sea Coal at $9	.67
	$2.66

Mixture No. 3

30 per cent Jersey at $4.	$1.20
3½ per cent Clay at $7..	.25
6½ per cent Sea Coal at $9	.58
	$2.03

Mixture No. 4

15 per cent Jersey at $4.	$0.60
20 per cent Millville at $4	.80
8 per cent Sea Coal at $9.	.72
	$2.12

Mixture No. 5

20 per cent Beach at $1.60	$0.32
15 per cent Millville at $4	.60
8 per cent Sea Coal at $9.	.72
	$1.64

SCRAP DEALERS MEET

Vernon Phillips Says Pocketbooks Must Be Forgotten During the War

A meeting of the American Board of Scrap Iron Dealers, which was organized on May 15, this year, was held in the Fort Pitt Hotel, Pittsburgh, on Thursday, Oct. 25, at which about 100 leading scrap dealers from all parts of the country were present. There was a very free discussion among the members of the serious problems facing the scrap industry, and the necessity for prompt and decisive action. The iron and steel scrap trade went on record as determined to do everything possible to help the Government solve the war problems that especially concern the scrap industry, and particularly to co-operate with the railroads in conserving the freight car supply. There was a meeting of the executive committee of the Board on the previous day for the purpose of considering the steps necessary to take to meet the situation, in order to recommend them to the general meeting for action. The result was a presentation of a resolution, which was unanimously carried, in reference to the handling of rejected cars, which is one of the most serious propositions facing the scrap trade, and is the cause for considerable delay in the movement of cars. This resolution embodied the formation of a Bureau of Scrap Inspection, by which all rejected cars are to be handled through an inspection office conducted by the American Board of Scrap Iron Dealers, to which the mills rejecting scrap are to send a notice of each and every rejection, with the cause for the rejection and the name of the shipper. This bureau agrees to see that the rejected car is disposed of or moved within 48 hours of such notice. In order to cover the expense involved, the shipper in each case shall pay an agreed-upon fee for each rejected car. It was also provided that the executive committee should work out a detailed plan so that the bureau could start this work at once. For the present the bureau will be conducted from the office of Secretary C. A. Barnes, Widener Building, Philadelphia, and it is the intention eventually to extend it so as to cover other districts. W. Vernon Phillips of the sub-committee on scrap iron and steel of the American Iron and Steel Institute, and a member of the executive committee of this board, presented a paper on matters of vital interest to the scrap trade.

The Question of Prices

In opening the meeting President Shroder stated that an erroneous idea had gone abroad that this meeting had been called to act in the matter of prices to be fixed for scrap by the Government. He made it plain that, while the question of price fixing was important to the dealers, the matter of rejections and re-consignments of scrap is of vastly more importance to the industry and to the country, and that it must be given immediate attention to prevent railroads from taking drastic action. Representatives of the American Railway Association were present at the meeting and stated the willingness of this association to co-operate with the dealers, and also answered several questions of interest to the trade submitted by several of the members.

The Work at Washington

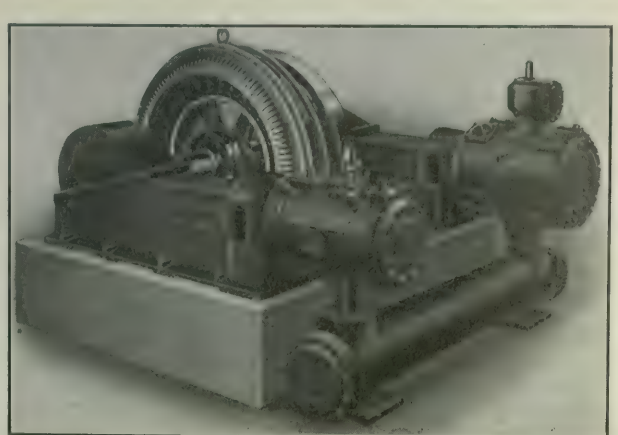
Mr. Phillips in his paper said that the most serious problem of all is that of transportation. He urged that dealers load cars to the maximum whenever possible and that all unnecessary delay in unloading cars should be avoided. Another serious question relates to rejection, and dealers have been warned by the American Railway Association that unless there is some improvement in this matter drastic action will be taken. He said the association should make itself a committee of the whole to punish anyone deliberately "doctoring" a car, a practice which has more than anything else caused ill-repute in the scrap business. Another practice which should be avoided is the making of sales through two or three different hands. In regard to Government action concerning the fixing of prices, Mr. Phillips said in part: "We have been before various committees, last the War Industry Board, and we are glad to say that they were impressed with and have recognized the importance of this business and took our recommendations most seriously. As to whether they will fix the price on scrap material, or at what levels they will fix them, we cannot say. All prices on steel products so far determined have been in agreement with the makers, and as it will be practically impossible to have all scrap producers enter into an agreement, it is apparently difficult to attempt price-fixing without resorting to laws which will make it compulsory. These the Government has no doubt prepared and in good time will be in a position to enforce. So in my opinion they eventually must be fixed. It is to the interest of the country, the trade, and the steel industry that they should be fixed. We do not want to witness rises and falls in the price which prevent the manufacturer from figuring his cost or which encourage dealers to speculate wildly, causing possibly real suffering to many of the smaller dealers in the business. The Government does not want to make any mistake in this matter. It has England's experience to follow, which has been rather a wide one and not an altogether satisfactory one, but while this matter is under consideration by Washington we should use our greatest efforts to regulate the industry in such a way as to prevent abuses and reduce the number of cars being used.

Forget About Profits

"We must forget our pocketbooks to some extent to-day. I know it is hard for anybody to actually do this. Men may want to and may try to, but it is human nature to intuitively reach for our profits and try to save losses before any other consideration. We must change our way of looking at things. So many people in the business are so ready to blame someone else—the railroads, the mills, the dealers with whom they transact business, or anyone but themselves—and if you will all go home resolved to change this point of view, at least until the war is over, you will be doing more for the country than you could do by enlisting, by buying bonds (but every man here should buy Liberty Bonds) or almost any other thing one could mention. Harmony and co-operation is the one needful thing in all lines of effort to-day. I hope and believe that after the war the scrap business will be an industry which will be on a parity with any other industry. We have a magnificent opportunity now to show what we are good for, to prove our sincerity, and it will not take the consumers long to offer you their full support if you give them a reason for doing so."

Small Direct-Connected Air Compressor

In 1904 the Laidlaw-Dunn-Gordon Co. furnished an air compressor to the General Electric Co. for installation at the latter's Schenectady plant. This was directly driven by a 175-hp. motor. Since that time high-speed automatic strip and disc valves have been developed until compressors having a capacity of 1500



Air Compressors with the Driving Motor Mounted Directly on the Compressor Shaft Are Now Built in Sizes Ranging from 400 to 6000 Cu. Ft. Per Minute

cu. ft. per min. have been built in which the driving motor is mounted on the compressor shaft. Further development of the valves and the smaller sizes of synchronous motors have made it possible for the Worthington Pump & Machinery Corporation, 115 Broadway, New York, to develop a standard line of direct-connected air compressors varying in size from 400 to 1500 cu. ft. per min.

The general construction of the compressor is the same as the larger sizes which have been on the market for some time. The air end is equipped with the Laidlaw feather air valve which was brought out about three years ago. Since that time approximately 1000 compressors equipped with these valves have been built and installed. The capacity of these machines varies from 200 to 6000 cu. ft. per min., the total being in excess of 750,000 cu. ft. per min.

Busy Plants at Seattle

The growth of Seattle, Wash., as a center for the iron and steel industry in the Northwest is illustrated by the fact that new plants and enlargements in iron and steel manufacturing, exclusive of shipyards, during the last four months amount to nearly $900,000. According to reports specially prepared by the Seattle Chamber of Commerce and Commercial Club, 12 new plants have either been erected or are in course of erection, since July of this year, valued at more than $800,000. Four plants have increased their capacity by additions made at a cost of more than $75,000. Never in the history of the city has there been such an unparalleled number of machine shops, foundries, manufacturing plants, forges, etc., and every plant is rushed to capacity with work.

Despite the lumber situation, which has resulted in the closing of most of the larger mills throughout the Northwest, the Puget Sound Machinery Depot, one of the largest plants manufacturing sawmill equipment in the West, has been so crowded with work that a $60,000 enlargement of the machine shop and works is now being made, that will double the plant's capacity.

New Carnegie Shape Book

The sixth edition of the Shape Book of the Carnegie Steel Co. has been issued. As compared with the fifth edition, issued only two years ago, the 227 pages devoted exclusively to profiles of sections have increased to 265 pages. Noteworthy increases in the number of sections rolled are to be found in the portions of the book devoted to shipbuilding bulb angles, sash and casement sections, automobile sections and cross ties. The increase in the number of these sections rolled is due to the remarkable expansion in shipbuilding, to the extensive use of steel cross ties for industrial and railway purposes, to the great increase in the automobile industry and particularly to the great development in the use of steel in frames for windows, doors and skylights in modern factory buildings. As heretofore, the book is bound in green leather, with gilt tops, and can be obtained at any of the district offices of the Carnegie Steel Co. for $1 per copy.

Technical Men Needed

Major J. E. Bloom, U. S. A., 266 Market Street, Newark, N. J., calls attention of all technical men to the need of the Army for men, aged 18 to 40, in sundry branches of "Technical Troops." He says any technical men who are exempt or who from any cause cannot volunteer can efficiently co-operate, by forming technical patriotic educational guilds in their several industries or home neighborhoods, especially to look after the welfare of men in the service, and to give them the opportunity of obtaining technical assistance, opinions and advice from home, in any war industry, from time to time.

The Spicer Mfg. Co., South Plainfield, N. J., manufacturer of small screw machine products and universal joints, has changed its firm name to the Spicer Mfg. Corporation.

Light Rail Freight Rate Decision

WASHINGTON, Oct. 30.—A reduction in the carload rates on light steel rails from Huntington, W. Va., to New York and other Eastern basing points has been ordered by the Interstate Commerce Commission in the complaint of the West Virginia Rail Company against the Chesapeake & Ohio and other railroads. The commission holds that the domestic rates heretofore in effect are not justified and that they should not exceed the authorized basis of 77 per cent of the Chicago-New York rate, or $3.80 to New York, $3.60 to Philadelphia and $3.50 to Baltimore. The rates for export, the commission orders, shall not exceed 77 per cent of the contemporaneously maintained export rate from Chicago to New York.

While the normal basis for making class rates from Huntington to the East is 87 per cent of the Chicago-New York class-rate scale, the carriers serving Huntington have, in respect of commodity rates, accorded it something less than the rates which would result from that percentage relation, and have adopted, on many commodities, including steel rails, a basis of 77 per cent of the Chicago-New York rates. The rates from Huntington to the interior basing points, taking rates lower than the Atlantic seaboard cities, were made approximately on a basis of 82 per cent of the Chicago rates to these points based on the Chicago-New York scale, with the rates to New York made on the basis of 77 per cent of the Chicago-New York rate as maximum. But, although the 77 per cent basis was adopted as a fair and reasonable one on certain commodities, including iron and steel products, the domestic rates from Huntington to Eastern seaboard points have never been published on that exact percentage, and it was not until Feb. 24, 1917, when that relation would permit of an increase in the export rates from Huntington, that the export rates were so adjusted. For example, at the time the complaint was filed the Huntington-New York export rate was related to the Chicago-New York export rate as 96 is to 100, or 92c. over Pittsburgh per 100 lb. If the export rate from Huntington in effect prior to Feb. 24, 1917, had been on a basis of 77 per cent of the Chicago-New York export rate, it would have been $2.54, or 70c. over Pittsburgh. While the export rate from Huntington to New York was thus increased from $3.16 to $3.54, or 38c., the increase from Pittsburgh was from $1.84 to $2.76, or 92c. Corresponding increases of 92c. were made from Newark and the Ohio points which carry a 40c. differential over Pittsburgh. The increase from Chicago was from $3.30 to $4.60 in the export rate to New York, and from Cumberland, Md., from $1.64 to $2.56.

The rates which will go into effect were made upon voluntary agreement by the roads. The decision of the commission made these concluding remarks: "We find that the carriers' proposed basis of 60c. over Pittsburgh to the seaboard, domestic and for export, is not unreasonable. It would virtually make Huntington a 73 per cent point, as related to the Chicago export rate, and would yield per ton-mile 5.12 mills, as against a ton-mile yield of 5.29 mills from Newark, Ohio, its nearest competitor. It is proposed with a view to relieve Huntington from a competitive standpoint, and carriers may accord rates to meet competition which we would not require established. It is expected that within a reasonable time the respondents will in good faith establish the basis proposed, which will remove the discrimination in respect to the Baltimore & Ohio and align their rates to the Eastern basing points to accord therewith." W. L. C.

A table showing that more than 18 lb. of metal enters into the composition of articles required for the equipment of each infantryman has been prepared by the Ordnance Bureau of the War Department. The metal equipment carried by each infantry soldier weighs 294.65 oz. and an additional weight of 114.7 oz. is added by equipment of cotton, wool, leather and wood. The Ordnance Bureau, therefore, supplies each soldier with approximately 25 lb. of equipment, which is exclusive of that supplied by the quartermaster corps.

GATHERING CONTRACT DATA

Federal Trade Commission Asking Iron and Steel Trade for Contract Details

WASHINGTON, Oct. 30.—A comprehensive canvass of the iron and steel industry has been undertaken by the Federal Trade Commission, presumably for the purpose of securing data upon which to base a recommendation to Congress for the incorporation in the pending Pomerene steel price-fixing bill of a provision abrogating existing contracts. The commission has gone to work systematically to gather data relating to this subject and intends to reinforce its recommendations not only with statistics showing the extent to which the output of the coming six months or more is tied up by contracts, but also with a general consensus of the views of both producers and consumers. The scope of the inquiry undertaken may be gathered from the questionnaire sent out by the commission under date of Oct. 20 to a very large number of corporations and individuals, as follows:

The Federal Trade Commission desires information with respect to the extent to which the manufacturers of iron and steel products are covered for the next nine months with respect to chief raw materials.

Please furnish as promptly as possible and as nearly as may be practicable, information regarding the chief materials used by you (including iron ore and coke) for the manufacture of iron and steel and the products thereof, which were contracted for but have not been delivered prior to Oct. 29, 1917, as follows:

1. The total quantities of each.

2. The quantities of each for the principal contracts, severally, the date on which each of such contracts was made, the periods of delivery and the prices (indicating the f.o.b. point). State which, if any, of these contracts are with affiliated companies.

Please indicate any of these contracts which are subject to change in any important terms, stating how, or subject to cancellation or non-fulfillment at your option.

Please furnish information regarding the extent to which you have outstanding contracts for the sale of your products for the remainder of the calendar year and for the first and second quarters of 1918.

(a) The total quantities, by classes, distinguishing those ordered by the United States Government, and as far as possible those ordered for domestic consumption and for export;

(b) The chief contracts, with quantities, dates, and period of delivery and prices.

Please furnish similar particulars, both for purchases and sales contracts, with respect to any controlled or affiliated companies.

The commission would also be pleased to receive from you an expression of opinion, in case prices should be fixed by law, of the advantages and disadvantages of providing that prior bona fide contracts for materials and for products bought and sold should be abrogated. In connection with any opinion, statistical data additional to that requested above, in support of your views, are also desired.

Enough replies have been received to show the diversity of interest on this important question and to demonstrate that however strong the Commission's recommendation for the abrogation of contracts may be —if such recommendation should be forwarded to Congress—it is certain to meet the organized opposition of those whose interests are opposed to the projected drastic action. Many manufacturers have assumed that the constitution of the United States forbids Congress to pass a law abrogating a contract not in itself contrary to public policy, believing that such agreements may not be interfered with by the Federal Government even in the exercise of the right of eminent domain or pursuant to the extraordinary authority rather loosely described in the term "war powers." Experienced lawyers, however, freely admit that Congress can nullify all such agreements as those in contemplation and furthermore that the method of procedure is reduced to an academic question by the fact that the Federal Government has the broadest powers with respect to the commandeering of products essential in the carrying on of the war. It is, therefore, suggested that the question before Congress is not a problem in constitutional law but one of national policy.

That the Federal Trade Commission has deepseated convictions respecting the advisability of abrogating existing contracts in the iron and steel trade has been evidenced by various expressions of opinion by individual commissioners. Commissioner Davies made a statement before the Senate Committee on Interstate Commerce during its consideration of the Pomerene bill which has been taken in some quarters as a suggestion that the Trade Commission be clothed with power not to abrogate all contracts but merely those made at prices above the schedule fixed by the President. This opens up a vista of possibilities of great significance to the industry as a whole. The situation would be further intensified should the Commission be invested with authority to use its discretion in abrogating contracts so that it might cancel only those involving serious hardship to one of the parties thereto. In view of all the ramifications of this grave problem the development of the Commissioner's project will justify the closest attention on the part of interested parties. W. L. C.

German Dismantling of Belgian Steel Plants

The dismantling of Belgian steel plants by Germans is thus described by a correspondent of the London *Ironmonger*, serving with the Belgian army:

As long ago as May 25 the Germans dismantled the plant of the Angleur Steelworks, and announced their intention of removing the traveling cranes. By order of the invaders, the blast furnaces of Ougrée had to stop work on May 24 and the Germans are now dismantling the plant there also to send it to Germany. The Cockerill works at Seraing had in some measure been spared but several hundreds of German workmen recently arrived there from Westphalia and proceeded to strip the place. At other plants the Germans are removing the rolling equipment (cylinders made of high-grade castings), shafting, belting and even the foundation plates. The Germans are breaking up the big cast-iron posts to be recast. The big blowing machines of the Usines Bonehill and the Usines Boël, the 4-cylinder machine of the Providence Works, which was exhibited at Liège International Exhibition in 1905, and the blooming mill of the same company are reported to have been converted into scrap iron.

Germany's Iron and Steel Output

In the months of June, July and August, this year, the German pig-iron and steel output "showed absolutely brilliant figures," while the production of finished products has been brought to a level which "at any rate in a certain measure meets the requirements of the army," according to a recent report on the Rhenish-Westphalian steel industry in the *Kölnische Zeitung* and published in the London *Ironmonger*. The pig-iron syndicate has increased the prices of all grades of pig iron, with the exception of Luxemburg iron, as from Sept. 1. The advances in hematite and in low-phosphorus steel-making irons are very considerable, but the other grades have only gone up by a few marks.

A Cast Pipe Freight Rate Complaint

A complaint against the carload rate of $5.37 per net ton on cast-iron pipe from North Birmingham, Ala., to Watervliet, Mich., has been filed with the Interstate Commerce Commission by the American Cast Iron Pipe Company, naming the Louisville & Nashville and other railroads as defendants. It is declared that a reasonable rate would have been $5.11 per ton. The rate is said to violate the long and short haul clause as it exceeds the rate from North Birmingham to Grand Rapids, Mich., and other points on the Pere Marquette.

About 2000 steel workers employed by the Union Drawn Steel Co., the Moltrup Steel Products Co. and the Standard Gauge Steel Co., Beaver Falls, Pa., are out on strike with demand for a 10 per cent increase in wages.

The Lalance & Grosjean Mfg. Co., Harrisburg, Pa., manufacturer of enameled ware, has advanced the wages of employees 10 per cent., effective Oct. 26. This is the third such advance this year.

PROPERTIES OF BRASSES

Working Qualities—Rolling Mill Alloying Problems—Bronzes

THAT non-ferrous alloys such as are employed in the brass rolling mills for the manufacture of sheets, strips, wire, rods, tubes and shapes of various cross-section designs, must be made from mixtures which permit elongation and reduction of cross-section area without fracture was emphasized by R. A. Wood, Cheshire, Conn., in a paper presented before the American Institute of Metals at Boston, Sept. 27. This he said places certain restrictions on the selection of the metals used in making the alloy which are described in the following abstract.

General Requirements

The metals employed must be of good quality and practically free from impurities. Care must be taken to avoid even traces of antimony or bismuth, for these metals if present will tend to cause the metal to break up during fabrication, to fire crack in annealing and to develop season cracks.

Copper and its alloys readily absorb sulphur and this tends to cause the metal to become spongy and porous in spots. Sulphur present in considerable quantity will cause the metal to be brittle and to break up in fabrication. Absorption of sulphur takes place in the melting operation and is caused by improper protection from the gases of combustion. Care should be taken to select a fuel as free from sulphur as circumstances will permit. Charcoal, when broken up into fine pieces, absorbs sulphurous gases and the metal should be protected by a good covering of charcoal in the melting operation. Metals containing arsenic to any considerable amount should be avoided for the influence of this metal on the alloy is similar to that of both bismuth and antimony. Also care should be taken to select a grade of zinc suitable for the uses to which each particular alloy is to be applied. Only the best grades of copper are safe and it is well to have the copper cut into small pieces in order that it will not protrude over the top of the crucible and be exposed to the gases of combustion.

Copper and Zinc Alloys

A mixture of approximately 50 parts of copper and 50 parts of zinc has the highest content of zinc the alloy may contain and be workable. It is possible to roll such an alloy into a sheet or draw it into a wire, but the operations are tedious.

Alloys of from 57 to 63 parts of copper and the balance zinc are used in the extruding process for making rods, tubes and shapes. Mixtures of this nature may be rolled hot and are representatives of the commercially hot worked alloys. These mixtures are known under various trade names such as Muntz metal, yellow metal, yellow sheathing, condenser tubing, extruded metal, etc.

The grade of metal for making hot working alloys must be carefully selected and the casting operation carefully carried out. It is not necessary to buy new material as some mills make a practice of buying up scrap and melting it in a reverberatory furnace, casting this in bars which may be either rolled hot or extruded; but these mills have a highly specialized melting crew which can tell from experience and certain physical tests when the metal is in proper condition for casting.

A mixture of 60 parts of copper and 40 parts of zinc is about as cheap an alloy as can be successfully worked cold, although there are mixtures of from 57 to 59 parts of copper and 43 to 41 parts of zinc which may be rolled into sheets or drawn into wire. Alloys of this nature are used mostly for hard soldering purposes.

Working Copper-Zinc Alloys

The successful working of the foregoing mixtures depends primarily on the skill with which the casting operation is carried out. Alloys containing a high percentage of zinc do not, as a rule, polish up nicely. Care must be taken in annealing these alloys. They are apt to run in places if slightly overheated. They are very soft and pliable at a red heat but upon cooling become somewhat hard and springy. If plunged into a tank of water immediately after being removed from the annealing furnace they will remain much softer than if allowed to cool gradually. This is more or less a risky procedure for if the plunging temperature is not just about right some of the metal will split and crack. These cracks are known as water cracks and they must not be confused with fire cracks which they closely resemble. If the hot metal is cooled off by means of a stream of water, such as is thrown from a hose pipe, water cracks will develop, but if a fine overhead spray of water is used this will not occur.

Fire cracks are caused by an unequal stress within the metal which causes an unequal expansion tending to pull it apart. A metal which has been thoroughly worked seldom fire cracks. Season cracks are caused by the gradual equalization of strains within the metal. However, overworked metals will, in some instances, develop season cracks. The grade of metals used in the alloy, the melting practice and the mechanical operations applied to the metal all contribute to the cause of season cracking. Straight copper-zinc alloys containing more than 65 per cent copper, if properly worked, seldom cause trouble due to water, fire or season cracking.

Metals which have been properly cast and rolled or drawn should, if rightly annealed, have a good surface and a close grain and in almost every instance, when a porous, open or coarse-grained metal is encountered, the trouble is in the annealing operation.

Alloys containing 80 per cent or more of copper often cause trouble due to the presence of small pinholes and blisters. These defects invariably have their origin in the casting shop and if the caster understands the melting and pouring of the rich metal mixtures no more trouble need be experienced than with the alloys containing a higher percentage of zinc.

Influence of Lead and Tin

The foregoing alloys possess the common characteristic of being of a tough and tenacious nature, and will be found difficult to work under a tool for milling, turning, drilling or engraving purposes. To impart the free working qualities a certain amount of lead is added to the mixture.

Lead impairs the cohesive quality of the metal and alloys containing it will not stand as great a reduction without cracking as will the alloys free from lead. Alloys containing lead do not have as close a grain as those which are free from it and consequently do not polish up as well. Leaded mixtures are as a rule poured at a lower temperature and care must be taken not to overheat them in melting as this will most likely cause fine black specks.

For a number of purposes a very tight and close-grained metal high in tensile strength is wanted and this is generally produced by the addition of tin. The casting of alloys of this nature must be carefully carried out, otherwise the surface of the finished material on being bright-dipped or polished will show numerous fine white streaks and, in some instances, slivers. The molten metal should not be brought to a higher heat than is necessary and the tin should be pushed under the surface of the metal as quickly as possible, shortly before it is poured. The mixture is then given a thorough stirring. Alloys containing tin seem to develop season cracks much quicker than some of the other mixtures and this is especially true of the spring tempered brasses.

Use of Phosphorus and Iron

The addition of a small percentage of phosphorus (generally in the form of phosphor-tin or phosphor-copper) to copper-tin alloys greatly simplifies the casting operation as it tends to reduce the oxides and causes the molten metal to become more fluid producing a more solid and malleable as well as a more ductile casting. Alloys of this nature are generally put on the market under the name of phosphor bronze. As a rule the phosphorus is added to the mixture shortly before

it is ready to be poured. Many manufacturers do not consider it good policy to add phosphorus to mixtures containing zinc, claiming that it has a tendency to produce fine pinholes in the castings. This question may be open to some argument. The addition of too much phosphorus should be avoided as an overdose will not only cause pinholes in the casting but will also increase the difficulties of rolling, due to cracking, etc. Many manufacturers consider .05 of phosphorus good practice. Certain classes of work call for a metal of a very dense grain and exceedingly high in tensile strength and for these properties iron is added. The shrinkage of the casting while cooling is excessive in alloys of this nature and unless the melting and pouring operations are skillfully carried out the castings will pipe. The iron if not properly introduced to the mixture will segregate in small nodules as hard as steel. It is customary to first make an alloy of copper and iron. A little manganese in the form of cupromanganese materially assists in distributing the iron evenly throughout the mixture. Alloys containing iron are more or less hard and springy and some of the mixtures are very refractory, but if the melting and pouring operations have been properly carried out, they may be rolled or drawn, though the reductions cannot be as heavy as is the case if alloys are free from iron.

If spelter is used care should be taken to select a brand free from lead, for if any appreciable amount of lead is contaned in the alloy it is likely to break up in the rolling operation, or give trouble due to fire cracking. The lead will also cause low tensile strength.

Federal Export Corporation Establishing Quarters in Orient

Dwight S. Guthrie, Guy L. Bayley and Burtin Honig of the Federal Export Corporation left Vancouver Oct. 25 for Yokohama, where temporary Oriental headquarters will be established.

Mr. Guthrie, a vice-president of the corporation, has been closely associated with its development, having had charge of the iron and steel department since its formation. He has traveled in Europe, where he lived as resident foreign sales manager for the National Steel Co. and the American Steel Hoop Co., but before joining the Federal company he was district sales manager for the Republic Iron & Steel Co. in St. Louis, Birmingham, Cleveland and Chicago.

Mr. Bayley was chief electrical and mechanical engineer of the Panama-Pacific International Exposition, and when the new water system for San Francisco was undertaken he was made chief engineer of the project. He was a resident consulting engineer in Japan for a number of years, covering mines, railroads and industrial concerns.

Mr. Honig, who will have charge of the Oriental mercantile department, has spent the past seventeen years in selling American products in India, Japan, China, Java and Australia.

It is expected that Mr. Guthrie and Mr. Bayley will return to the United States in the early summer of 1918 and later Mr. Bayley will make his residence in Shanghai or Yokohama, where the warehouses of the Federal company will be situated. Mr. Honig is accompanied by his family and will remain in the Far East permanently.

Manganese Ore Exports from India

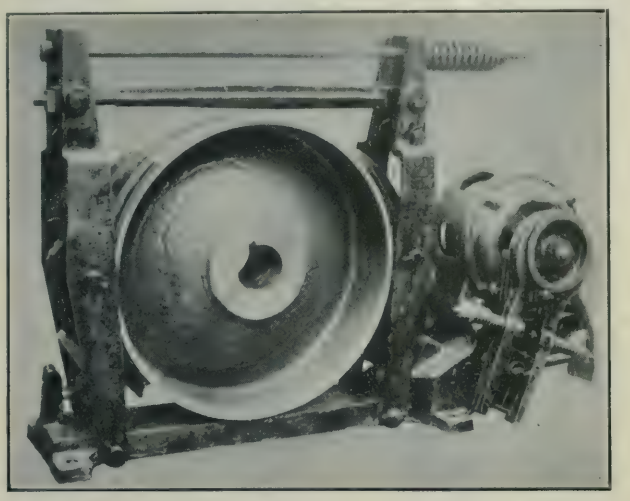
Apparently exports of manganese ore from India have been larger in recent months than a year or two ago. For the fiscal year ended March 31, 1917, the total was 631,083 gross tons, of which 459,150 tons went to Great Britain, as compared with 472,563 tons to March 31, 1916, of which 380,967 tons went to Great Britain. The March exports this year were 63,885 tons against 28,201 tons in March, 1916.

The Johnston Harvester Co., Batavia, N. Y., has effected a reorganization by the formation of a new corporation, the Massey-Harris Harvester Co., Inc.

A Motor-Operated Clasp Brake

Two new types of clasp brakes have been developed by the Cutler-Hammer Mfg. Co., Milwaukee, Wis. One of these, that illustrated, is designed for use on alternating-current circuits and is actuated by an electric motor, while in the other, which is designed for direct-current work, the motor is replaced by a solenoid.

The brake is driven by a high torque squirrel cage motor geared to a sector which in turn is linked to the brakeshoe arms. The application of power causes the motor to revolve until the brake is released after which it stalls and keeps the brake in the released position



A Recently Developed Alternating-Current Brake Is Operated by a Squirrel Cage Motor Geared to a Sector Which in Turn Is Linked to the Brakeshoe Arms

until the current is interrupted. One of the points emphasized in connection with this arrangement is that the brake is silent at all times. Adjustments for wear are made by turning a nut on the end of the thrust rod at the top of the brake and it is explained that this adjustment is required only two or three times during the life of the brake lining.

The construction of the direct-current brake is the same except, of course, for the substitution of a solenoid for the motor. This brake is made in six standard sizes ranging from 8 to 27 in. with ratings up to 250 hp. The range of sizes in which the alternating-current brake can be supplied is from 8 to 30 in. with the same maximum horsepower.

New Oil Cups as Substitute for Grease Cups

A self-closing, spring lid oil cup, made in several models, and designed to supplant grease cups on automobiles, although adapted also for use on grinding machines, porcelain and brick-making machinery, etc., is manufactured by the Gits Bros. Mfg. Co., 553 West Monroe Street, Chicago. The cups are made of brass, and the hinged cover is actuated by a powerful spring. They have been substituted on some makes of automobiles in place of grease cups and can be applied to any automobile. A feature of the device is the strength of the hinge, tests having demonstrated that if great force is applied the lid will break without destroying the hinge, the bracket of which is brazed to the cup proper. The cups can be filled without touching them with the hands. They are made straight where they are to be used in a vertical position, and with angles where the lubrication is done from the side.

The National Rivers and Harbors Congress will hold its fourteenth annual convention in Washington, D. C., in the new National Museum on Dec. 5, 6 and 7. The fundamental purpose, it is explained, is not to urge appropriations for new projects but to plan how the Government, the cities and the people of the United States may most effectively co-operate to "Use the Waterways and Win the War." S. A. Thompson, 824 Colorado Building, Washington, is secretary.

Speeding the Shipbuilding Program

WASHINGTON, Oct. 30.—Following the announcement last week that France would be supplied with American ships, the United States Shipping Board has consented to charter 25 American ships to Italy, representing about 100,000 tons dead weight. All will be steel freighters of sufficient speed to make it practicable to operate them through the submarine zone. Deliveries under charter are to begin immediately. They will include new vessels just off the ways and American ships commandeered by the Shipping Board. The commandeered tonnage will be withdrawn from Central and South American trade chiefly and from the coastwise trade where possible. American ships will not be withdrawn for the present from the Pacific, where they are being used to bring wheat and rubber from India and hemp from the Philippines. These ships, however, will be ultimately withdrawn for the Atlantic trade.

The duty of supplying vessels to meet the war needs is gradually being shifted to the United States. Great Britain has answered the demand to her limit, and now the United States must meet the emergency; therefore the Shipping Board is directing its greatest energies to increasing the supply. Admiral Capps, general manager of the Emergency Fleet Corporation, has been subjected to severe criticism, but most of this has been unjustified. The shipbuilding program has been materially hampered by the shortage of labor. We have at present approximately 200,000 men working in American shipyards. The Fleet Corporation is striving to increase this number to 500,000. The task is monumental. It is estimated that one workman will produce a ton dead weight per month. Therefore, it will require 500,000 workmen to produce the 6,000,000 tons of ships next year now on the program. How to find the extra 300,000 laborers needed is the great problem. If 500,000 workmen can be secured American shipyards will work three shifts a day, thereby strictly observing the eight hour law. Running American yards on a three shift plan will be an innovation, but not one which is absolutely untried. It is now in operation in two plants on the Pacific coast, and, it is said at the offices of the Shipping Board, one wood shipyard in Maine is thus being run.

The Emergency Fleet Corporation begins this week a new line of action calculated to increase the output of American yards. To-morrow, Wednesday, Admiral Capps will hold a conference with representatives of all the Atlantic shipyards to consider all matters relating to existing conditions. Assistant Secretary of the Navy Roosevelt and other officials will participate. Admiral Capps has also invited representatives of the American Federation of Labor and of the Department of Labor to join in the conference, which is expected to be momentous in the shipbuilding program. The output of the yards in the past three months has fallen behind the output for the month of June. This is due, it is felt, to the delay in settling the steel price controversy, labor strikes and the uncertainty regarding commandeering.

Admiral Capps has, however, practically completed all the preliminary work and finally settled upon contractual questions. That the building program may be rushed, he will surround himself with a group of experts drawn from shipyards and contractors' forces and including other men of business experience.

W. L. C.

Government Limits Use of Cars

WASHINGTON, Oct. 30.—To provide cars for the transportation of coal, coke, ore and limestone for the iron and steel industry and raw materials for the sugar and fertilizer industries, Robert S. Lovett, administrative officer under the provisions of the priority shipments act, has issued an order foreshadowing the drastic treatment to be given the transportation problem whenever necessary to keep in full operation the industries of prime importance in the waging of the war. Judge Lovett's order forbids the use of open top cars for the transportation of articles not essential to the national defense or security. The policy upon which this order is based contemplates additional rulings from time to time discriminating against the transportation of the materials or finished products of industries which may be held to be non-essential from the war-waging standpoint, and further developments will be awaited with the liveliest interest. Judge Lovett's order is briefly as follows:

> On and after the first day of November, 1917, and until further order, all common carriers by railroad in the United States in the distribution of open top cars, other than flat cars, and in the transportation of freight in such cars shall deny the use of open top freight cars other than flat cars to shipments of the following commodities and articles, except in shipments for the United States Government:
>
> 1. Materials and supplies, other than coal, for the construction, maintenance, or repair of public or private highways, roadways, streets or sidewalks.
>
> 2. Materials and supplies other than coal, for the construction, maintenance or repair of theaters or other buildings or structures to be used for amusement purposes.
>
> 3. Materials and supplies other than coal, for the manufacture of pleasure vehicles, furniture or musical instruments.
>
> 4. Passenger vehicles, furniture and musical instruments, which articles the undersigned finds are not essential to the national defense and security.

Numerous reports are current to the effect that other industries are soon to be made the subject of discriminatory rulings similar to the above, but it can be stated on the highest authority that no decision has been reached as to any immediate extension of the newly adopted policy.

W. L. C.

Frank A. Scott's Health Compels Retirement

WASHINGTON, Oct. 30.—Frank A. Scott of Cleveland, formerly of the Warner & Swasey Company, has been forced by the recurrence of a serious physical difficulty from which he suffered in 1912 to resign the chairmanship of the War Industries Board. His position is being filled by Robert S. Lovett, vice-chairman of the board, pending the selection and appointment of a successor. At Mr. Scott's earnest request, his resignation was accepted by Secretary of War Baker, the chairman of the Council of National Defense. In accepting the resignation Secretary Baker said it was with the deepest regret, and added:

> I have no doubt that some appropriate minute of recognition of your services will be entered upon the record of the Council of National Defense, but, in anticipation of formal action, I beg leave to assure you that we deeply appreciate the self-sacrifice as well as the value of the service you have rendered, and count it a most fortunate thing for the Government that it was able to have your knowledge, zeal and splendid spirit as a part of the organization with which it faced the early and difficult tasks of industrial organization for the war.

Mr. Scott began his work in Washington as expert adviser of the War Department, giving his special attention to the requirements of the Ordnance Bureau. At that time the War Department was seeking to expand the resources of many private establishments with which the Ordnance Bureau desired to place contracts. Mr. Scott's broad knowledge of the metal-working industry proved of great value, and with his aid a substantial measure of order was brought out of the existing chaos. One of his chief functions was to take up obstacles encountered by manufacturers unable to secure certain materials or the co-operation of other producers and to develop a co-ordination that served to remove obstructions and greatly increase production. So valuable was his work to the Ordnance Bureau that the Munitions Board was organized with Mr. Scott as its head, and under this board the work of the War Department and of the Ordnance Bureau in particular developed with great rapidity. Subsequently, when it became necessary to do for the entire Government what had been done so successfully for the War Department, the War Industries Board was formed, with Mr. Scott as chairman and with Judge Lovett and Mr. Brookings as his most active assistants.

For the past three months Mr. Scott has worked

night and day, with utter disregard of his personal comfort and with little or no attention to the admonitions of his physicians. His task has been unusual in that he has been called upon not only to develop the broad policies of the Government with respect to the purchase of war material and allied problems, but also to give his attention to the multitudinous minute details that have arisen daily in the work of the War Industries Board. All branches of the Army and Navy have relied upon him for advice and assistance, and his knowledge of the manufacturing industries of the country has been daily drawn upon by scores of purchasing agents and other officials of the various departments.

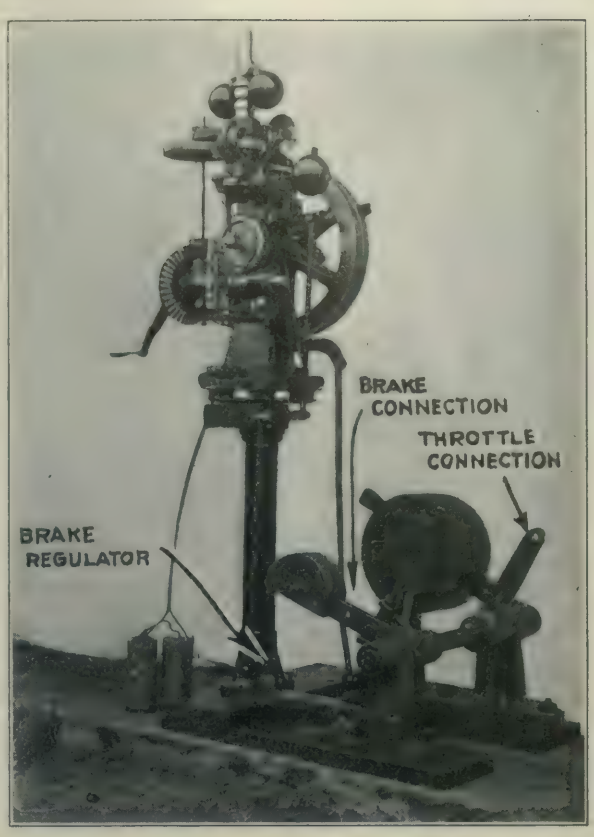
While there have been rumors of friction in the relations of almost every important official with his associates, not a suggestion of this kind has been heard with respect to Mr. Scott. His defense of the contracts of the War Department for rifles silenced all criticism among members of the House Committee on Appropriations, and the satisfactory rate of delivery since secured has amply justified his course. W. L. C.

Controller for Hoisting Engines

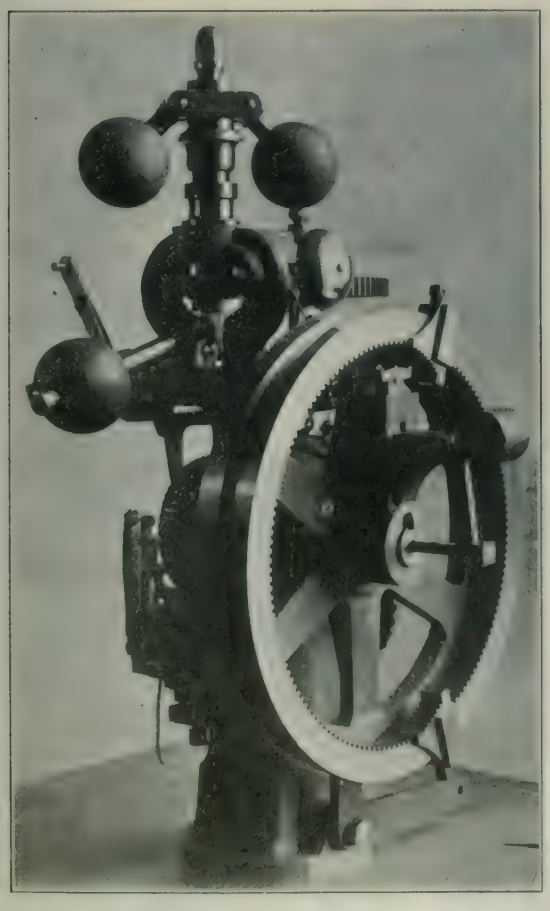
To guard against overtravel and overspeeding of mine hoists operated by steam engines the Maritime Motor Car Co., Ltd., Vancouver, B. C., has placed on the market a controlling apparatus, here illustrated. The action of the controller is variable in its rapidity, depending upon what is to be done. When it is brought into play it shuts off the throttle and sets the brakes and where necessary will reverse the valve gear and operate the relief valves. After the throttle has been closed and the brake set, if the engineer finds it necessary, he may reverse the engine and again open the throttle and turn steam against the pistons to assist in stopping the engine.

The controller works in unison with the drum of the hoist. It has an internal ratchet wheel which is supported on a sleeve extending from the central portion of the stand. An arm carrying a governor-operated tripping pawl travels within this ratchet wheel in clockwise and counterclockwise directions in direct ratio to the travel of the cages in the shaft. Adjustable notched stops are secured to the rim of the wheel at the end of the travel for the top and bottom landings. In the case of overwinding or overspeeding in hoisting or lowering, or failure on the part of the engineer to slow down the engine at a safe distance from either of the landings, the pawl will engage with the notches of the stops or with the teeth of the wheel, thus causing the latter to rotate. It is emphasized that the movement of 1/16 in. on the rim of the wheel trips a weighted lever, which in turn shuts off the throttle, sets the brakes and performs any other operation that may be found necessary to bring the engine to a stop without dangerous shock or jar. After the controller has performed its functions the weight is again raised into place and latched.

The controller, it is explained, does not take the levers from the hands of the engineer unexpectedly, as an alarm is sounded to notify the engineer of overspeeding or of running beyond the safety point. The controller may, of course, be used with those driven by electric motors.



Overtravel and Overspeeding of Mine Hoists Are Prevented by a Controller for Hoisting Engines Which Automatically Closes the Throttle and Applies the Brake



The Ratchet Wheel and the Tripping Pawls Which Operate the Controller

Tin-Plate Export Regulations

WASHINGTON, Oct. 30.—In response to inquiries concerning applications for license to export tin plate, the War Trade Board, upon recommendation of its bureau of imports and of the committee on the conservation of tin plate, has made the following announcement:

1. That no licenses will be granted for the exportation of tin plate for use for any other purpose than as food containers, except on satisfactory evidence that the plate will be used in such a way as to contribute to the military needs of the nations at war with Germany and her allies.

2. That, as to applications for license to export tin plate to be used as food containers, preference will be given to those cases in which satisfactory evidence is presented that the food to be packed will be for the use of the nations at war with Germany and her allies.

Shop Dividends Due to Personnel Work*

Accident Prevention, Welfare Work, Education and Other Sociological Activities Have a Direct Relation to High Production and Low Costs

BY THOMAS T. READ†

PERSONNEL work covers the great variety of activities in industrial work that deal with the with the human factor. Individual phases of personnel work are accident prevention, sanitation, welfare work, reducing labor turnover, and so on. These are inter-related. Thus high labor turnover is one of the most important causes of a high accident rate, and unsatisfactory housing conditions are an important cause of labor turnover.

It must be kept in mind, as a major premise of this discussion, that through the rapid increase of invested capital in recent years and the much slower increase of labor supply most corporations have already passed over from the position of buying labor to selling employment. Without going into details it is my purpose to discuss briefly what has been and is being done and some results so far attained.

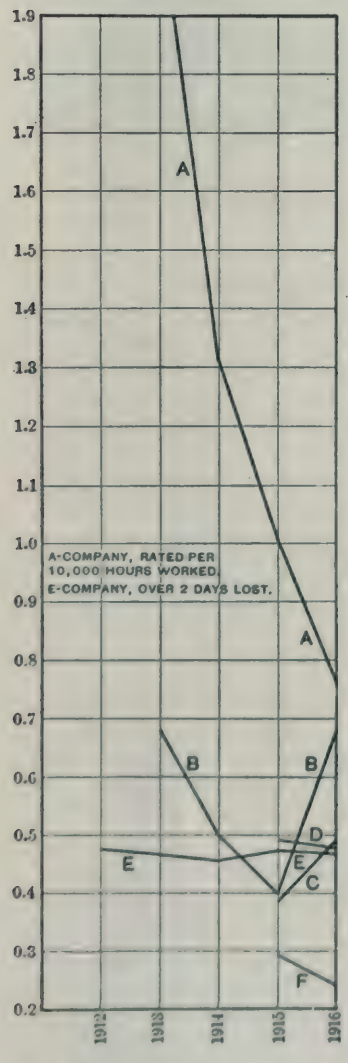


Fig. 1—Lost-time accidents of seven companies

Accident Prevention

Accidents are a source of loss in industry for four reasons: 1. The injured man and his fellows who come to his assistance lose time from their work, and machinery is often shut down, thus interfering with production. 2. The employer, in nearly all States, is obliged to provide medical aid for the injured man and, if the injury causes more than a brief loss of working time, to pay wage compensation as well. 3. While the man is out someone must be hired to take his place, thus decreasing efficiency, increasing the labor turnover and increasing the accident hazard by the employment of a new man. If there are many accidents in a given plant, employment there is less desirable, and the workmen are less efficient, since the fear of injury hampers their work.

There are two classes of methods of accident prevention, mechanical and psychological. The former endeavors to remove accident hazards, the latter aims to teach the men to avoid them. The psychological may be subdivided into two classes which may perhaps be designated as amateur and professional, since the question of money reward is the distinguishing feature. In the former the emphasis is placed upon the use of posters, voluntary committees, public gatherings, moral exhortation, etc., and in the latter the chief reliance is placed upon some form of reward, either money or prizes, to the foreman of a gang, or preferably to the men themselves, for decrease in the accident rate. The first method is the one more commonly used, and it is important to discover, if possible, which is the better.

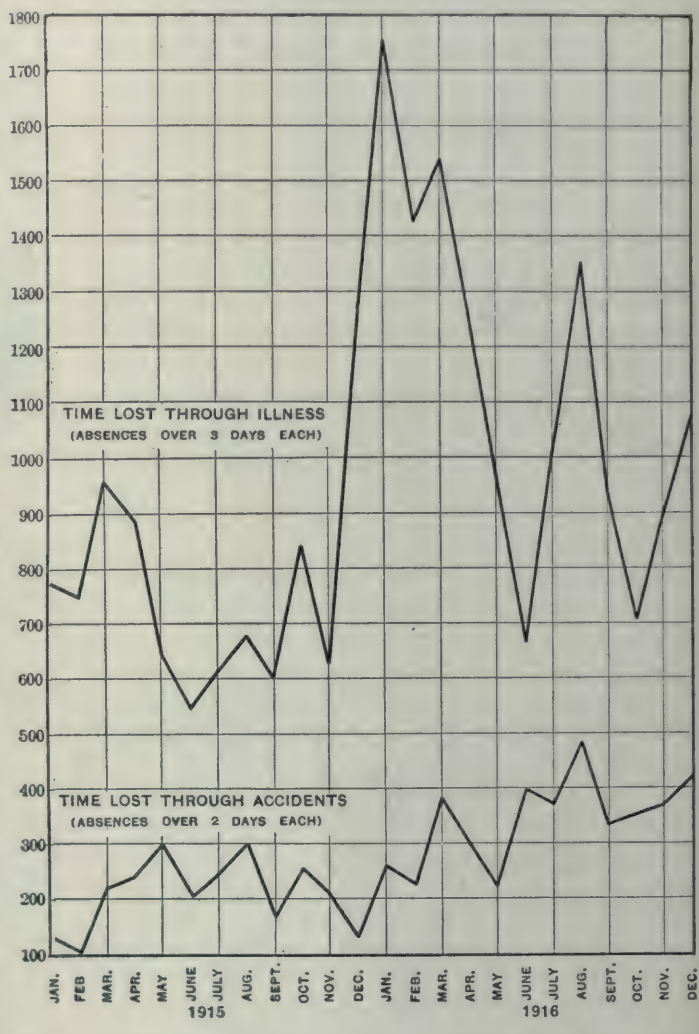


Fig. 2—Illness has a much more serious effect on the attendance at the plant than accidents

In the accompanying diagram are plotted the records of seven companies. These are all "lost-time" accidents, minor injuries not being included. All the records are plotted on the basis of 1000 shifts worked, with the exception of company A, which keeps its records on the basis of 10,000 hr. worked. Most of the other companies work chiefly 8-hr. shifts but make no allowance for overtime, so that the discrepancy is probably not very important. The number of hours worked is, of course, the only exact basis upon which to make comparisons of accident records.

Companies C D E and F use the amateur method of accident prevention, but F has recently supple-

*From a paper read at the St. Louis meeting of the American Institute of Mining Engineers.

†Technical department, New Jersey Zinc Co.

mented this by the use of prizes. Company E may be taken as typical of the group. It began work with a qualified safety inspector in 1912 and now has a safety inspector, an assistant safety inspector, a clerical assistant, and an experienced man to train first-aid teams. Safety suggestion boxes and bulletin boards for safety bulletins are used, occasional lectures and moving pictures are given, weekly plant inspections are made, all accidents are investigated, the plant men are put through a safety class, and there are more or less active safety committees in the different departments of the works. Many thousands of dollars have been spent for safeguards to machinery and other dangerous places about the works, and yet in spite of all this no appreciable change has been made in the accident rate. A further study of their recent accident records disclosed that of all their accidents (both minor and lost-time) 75 per cent were due to the workman doing the work in an improper manner, taking unnecessary risks, or exhibiting simple carelessness. Of the remaining 25 per cent nearly all, 22½ per cent, were classified as unpreventable; these were mostly minor accidents that a reasonable amount of care on the part of the workman would not have enabled him to foresee or prevent. In only 2½ per cent of the cases was the accident due to any lack of safeguards, dangerous conditions about the works. This is confirmed by Fig. 3, in which the total accidents in 1915 and 1916 are plotted by months in comparison with the number of men working on jobs that are new to them. The upper line shows the number of new men hired plus the men who have been transferred from one kind of work to another. The close parallelism between the two curves, besides showing that green men increase the accident rate, indicates that the most important factor in accident prevention is the man himself.

Company A, Fig. 1, is a mine at which the officials decided, on beginning safety work, that it was impracticable to employ safeguards and determined to rely almost wholly on the foremen and men themselves. A series of prizes was therefore offered, large enough to be worth working for, at first to the foremen and men, to the gangs who showed the greatest progress in accident reduction over monthly, half-yearly, and yearly periods. A small reward, handed over by the superintendent himself with a word of commendation, seems to produce the best results.

My personal opinion is that the first method has in many plants been carried quite far enough or even overdone. Not a few guards are almost as dangerous as the conditions they are supposed to remedy. I do not decry the use of suitable safeguards; they would be necessary even if for no other purpose than to demonstrate to the men that the company is sincere in its efforts to decrease the accident rate. But even those who insist most strongly on mechanical safeguards admit that they cannot be relied upon to prevent more than one-third of the accidents.

Illness Prevention

Fig. 2 shows the relative importance of accidents and illness as a source of lost time in industry, the figures being those of one company that has good medical supervision. It appears that the time lost from illness is, in the case of this company, four times as great as that due to accidents. As in the case of accidents, when the man is absent another man must be supplied to take his place, and this both increases the labor turnover and the accident rate; in other words, it is a source of considerable loss to the company as well as to the man himself.

Almost every company nowadays has some provision for medical supervision of its personnel, and in many instances the equipment provided is quite elaborate. In practically every instance, however, this is only employed to take care of the man who is injured in the course of duty, and it is a common practice for the plant hospital to send men to their family physicians, after giving them any immediate attention they may require. The result, of course, is that in many cases they go home and apply home treatment, if any at all, and a case that might have been cured in a day or two results in a protracted absence from work.

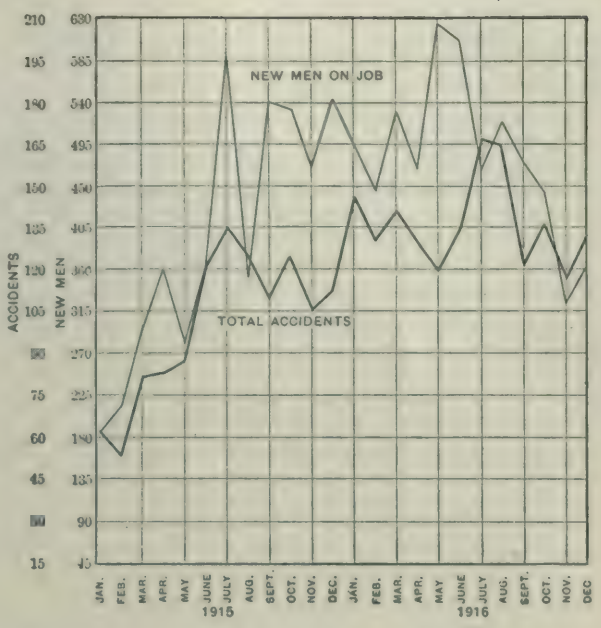


Fig. 3—The number of new men on the job has a direct relation to the number of accidents

It is clear that a corporation is justified in doing anything that is legal and tends to the improvement of its business, and it is equally clear that the preventing of illness among its workers does tend toward the improvement of its business. I look forward confidently to the day when the medical departments of large corporations will not only render medical attention to injured men but will give them any other medical attention they may require.

Labor Turnover

The system of having all hiring and discharging of men done by an employment manager has now been adopted by a number of corporations, with most satisfactory results. One concern, of only modest size, reports that through the use of an employment department the company, in the first year, decreased its labor turnover 48 per cent., decreased the hours worked 9 per cent. along with a 10 per cent increase in output, introduced a bonus system for regular work that cut down its lost time, remedied unsatisfactory conditions that had previously been undetected in a number of departments, and has done away with strikes and wage disputes.

The sources of the cost of hiring men are: 1. The cost of hiring the man, interviewing him, making a medical examination, placing him on the pay roll, sending him to his foreman, and getting him assigned to work. 2. The difference between the standard amount of work and that which he does while getting used to his job. 3. The extra materials which a new man spoils. 4. The extra supervision required by a green man. 5. Interference with the work of fellow-workmen. 6. Accidents caused by the green man. Various executives have computed the total amount of these costs for their own conditions and the results range from $25 to $100 as the cost to a company of bringing a green man up to the stage of a productive workman. To this must be added the cost of those men who work only for a short time and then leave. In most cases the number of men who must be hired in order to keep a working force at normal strength varies from 100 to 200 per cent. It is evident, therefore, that the costs involved are enormous, and no phase of personnel work will better repay study than this.

The most important and effective method is the creation of an employment department under a capable manager. Such a man should rank as an assistant superintendent if he is to perform his work effectively. The fields of accident prevention and labor turnover are so closely connected that it is desirable that both should be under the supervision of one man. The other methods of reducing the labor turnover may best be discussed under welfare work, since the primary pur-

pose of such work is to bring about conditions that will induce men to remain in the employ of the company, and thus cut down labor turnover.

Welfare Work

The primary purpose of welfare work is to decrease labor turnover. It may be an effort of the company to provide for the men as a whole comforts and conveniences that they could not individually provide for themselves except at a prohibitive cost. The other alternative is the paying an abnormally high wage rate. The latter is much the simpler and easier way, but it is hard to justify it from the standpoint of political economy. It is obviously better, from the standpoint of society, for a company that is selling employment to offer a man in return for his labor a combination wage made up of the most desirable proportion of cash, which he expends as he desires, and "kind," which in this case consists of those things which the company can provide to better advantage and at less expense. The necessity for such work is not always evident in industry, for manufacturing plants are, or were in former years, commonly established in the neighborhood of large cities, where the employee is expected, and usually prefers, to provide for himself. The company store, for example, in itself a desirable institution, was so grossly abused that it has become discredited.

Recently it has become the fashion in starting large new enterprises to build industrial towns *de novo*. This insures freedom from the complexities of local politics and permits the organization to choose the conditions under which it will operate, instead of attempting to adjust itself to conditions already existing, as well as to secure the necessary real estate at a reasonable cost. Unfortunately, the management of some companies has not been intelligent enough to perceive that to continue control over such public utilities as must be provided beyond the stage in which it is essential, is an unwarranted interference with the functions of public government that is certain to produce trouble in time.

The statistics of those companies that keep adequate records show that the chief element in labor turnover is furnished by the men without families who board. In an industrial town where good homes are available at a reasonable rent, good schools, well-kept streets, adequate stores that sell supplies at reasonable prices, and where the general tone of the community is good, steady workmen with families will be glad to make their permanent homes. The company is therefore able to buy productive labor at less cost to itself and can afford to invest capital to bring about so desirable a condition just as it invests capital to lower its other operating costs.

The cost of maintaining a roof over his family's head is the largest single item in the expenditures of a man of moderate means. It is evident that it is most desirable for the employee to own his own house. This is not now difficult for a man who is regularly employed, since there are reputable firms that will not only sell building material on credit to the owner of a lot, but will actually loan him enough money to pay the major part of the cost of construction. On this basis it would be profitable for a company that owns sufficient land to give to a steady employee a deed to a lot, with the proviso that he must build upon it a house to cost over a fixed minimum sum within a reasonable length of time. No additional capital investment is thus required of the company, and its return on the original capital invested in the land comes back to it in a decrease in the tax rate through the increase in the taxable valuation of the town. If all the houses in an industrial town have to be built by the company, the amount of capital thus tied up is enormous, returns on the capital are slow, and there is a possibility of an enormous shrinkage of values if for any reason the venture is not a success. Not the least advantage of such a plan is that it would do away with the undesirable uniformity of industrial towns, where a man can secure any number of houses renting at $8 or $12 a month, all alike, but cannot find any houses renting at $20 or $30 a month. It is so obviously to the company's advantage to have its foremen and subforemen well housed that this phase of the problem is worthy of the most careful study, and if the man who has charge of personnel work is not in charge of housing he should at least be constantly consulted regarding it.

Unless the workmen are provided with clean, commodious, and well-designed change houses, ample toilet and bathing facilities in connection with their work, it seems idle to attempt through welfare workers to raise the standard of living in the homes. Toilet facilities should be of the modern type that do not lend themselves to the transmission of disease. It is important that such conveniences shall be well built and well kept. Keeping such facilities in good condition requires plenty of hot water, scouring soap and elbow grease, and the man in charge should be vigorous enough to apply all of these effectively.

The schools of a community may be below grade and the company may wish to improve them. This can best be done through the instrumentality of sagacious employees who act in their private capacity as citizens. Social work, where it is done, is commonly in the hands of trained welfare workers. The kindergarten is an excellent means of introduction to the homes of the parents, and the Boy Scouts and Camp Fire Girls organizations are similarly useful among the older children.

Religious affairs are particularly difficult because religion is a matter of sentiment rather than reason and is therefore not open to logical analysis. The best thing to do is to leave religious matters alone, but unfortunately they will not leave industry alone. Religious festivals frequently interrupt the work of a plant for days at a time, quarrels in a church organization frequently interfere seriously with the attention of workmen to their work, and differences in religion often lead to friction between the members of a gang of workmen. A difficult situation should not be further complicated by permitting a person of a strongly religious turn of mind to engage in personnel work.

Teaching of English to foreigners is popular just now and there is a good deal of weight behind this desirable movement. Some concerns have well-organized schools for training the workman before letting him loose on the plant; one concern puts an experienced man in charge of a gang of new men and rates his pay upon the output of the gang. The apprentice system is good wherever conditions are suitable for its use. It is obvious that any education of the workman improves his efficiency and benefits his employer unless the education is so badly directed as to make him discontented with his work and to want to get into a "white collar" job. When, as now, a bricklayer can earn more money than a college graduate, it is curious that this desire for "white collar" jobs should exist, but it does and it needs to be reckoned with in directing educational work.

Conclusion

Labor has become the largest cost factor in productive industry and seems likely to continue its relative increase. The ideal of industry is a laborer who is sober, efficient and steady. The first is in progress of attainment by the advance of prohibition of the liquor traffic. Efficiency in the workman is attained through better management and training of the worker. Lost time is overcome by the prevention of accidents and illness, and through a great variety of means that bear indirectly, as indicated above, on the labor supply. Industrial accident prevention looms large in the public eye through the recent enactment of compensation laws, but as a source of lost time to the plant and lost wage to the worker it is much less important than illness. Health insurance is now being urged in many quarters, and if it comes about we may expect a transfer of emphasis from accident to illness prevention. Lost time through religious holidays and other personal activities, or inactivities, of the worker is much more important than either; their relative values being something like 1, 4 and 10 in most cases. The only practicable means of dealing with the latter seems to be the offering of a bonus, over and above wages, to the workmen who lose no time each month. The underlying purpose of personnel work is to conserve the labor supply and decrease the net cost of productive labor.

Spelter Statistics for 1917

Figures compiled by the U. S. Geological Survey from reports submitted by all zinc smelters operating during the first six months of 1917 show that the production of spelter from domestic ore in that period was 311,539 net tons and from foreign ore 49,599 tons, a total production of 361,138 tons, compared with 351,004 tons for the last half of 1916 and 316,452 tons for the first half.

The output of spelter by Illinois smelters increased about 4000 tons for the 6 month period and that of Oklahoma over 14,000 tons, but the production of Kansas fell off nearly 25,000 tons as a result of the declining price of spelter combined with the high cost of natural gas and other fuel. The remaining spelter producing States made a large gain, especially Pennsylvania. The output of primary electrolytic spelter also advanced.

The stocks of spelter held at smelters on June 30, 1917, amounted to 33,147 tons against 17,598 tons at the beginning of the year and 23,879 tons at the middle of 1916. This shows some gain in stocks since the beginning of the year, yet the total stocks are small if distributed between the more than 70 plants, including regular smelters, refining and electrolytic plants. The average smelter usually carries several hundred tons of spelter, including working stock on hand and spelter in transit and in agent's hands.

From the foregoing figures and the records of the Bureau of Foreign and Domestic Commerce it is calculated that the apparent consumption for the period was 221,434 tons, as compared with 229,342 tons for the last half of 1916 and with 229,086 tons for the first half. This was not altogether normal domestic consumption, however, for it must include the zinc content of the exports of brass which were largely increased during the first half of the present year. The value of exports of articles made from brass, however, fell off decidedly, but this was due in part to the lower price of spelter.

The exports of spelter of domestic origin were 93,000 tons, against 105,130 tons in the last half of 1916 and 58,007 tons in the first half.

The number of retorts at zinc smelters at the close of 1916 was 219,418, and there were then building or planned 13,632 additional retorts, a total of 233,050. The number at smelters June 30, 1917, was 232,202, and about 15,000 additional retorts were building or planned, a total of over 247,000 retorts.

Owing to the low price of spelter at the close of the first half of 1917, many smelters were idle, either wholly or in part. More than 35,000 retorts were idle June 30, 1917, and this number does not include retorts engaged in refining prime western spelter or in redistilling zinc ashes and skimmings. Fourteen plants were wholly idle.

Pneumatic Ash and Flue Dust Plant

A pneumatic ash-handling plant installed by Ed. Bennis & Co., Ltd., Little Hulton, England, and described in *The Engineer*, London, has an auxiliary conveyor pipe for removing flue dust and soot from the flues, economizers, and chimneys entirely separate from the ash pipe, but joined to it at its foot leading up to the ash tank. The dust pipe main is provided with connections, to which may be attached lengths of flexible pipes, which can be taken about as desired and inserted into openings in the flues and economizer chambers, which are provided with cover plates for use when the dust is not being removed. Also a hand hole with an air-tight door, is located at each end of every bend of the ash pipe for removing any obstructions, which may accidentally become lodged in the pipes.

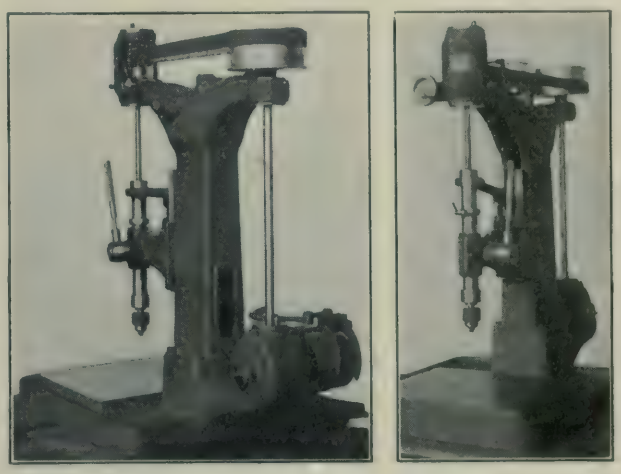
The National Steel Products Co., Bessemer, Ala., recently organized, is planning for the early establishment of a local plant. Bids have been received for the principal equipment for a works with initial capacity of about 15 tons of steel castings per day. A 3-ton open-hearth furnace will be installed. J. V. Calvin is secretary.

Interesting Sensitive Drilling Machine

The Detroit Tool Co., Detroit, has developed a line of high-speed sensitive drilling machines of the single-spindle type. Both bench and floor styles are made, the former being the one illustrated. The quarter-turn driving belt is eliminated and the belt shifter is located in a convenient position for the operator.

From tight and loose pulleys at the back of the machine, power is transmitted through rawhide and steel bevel gears incased in a gearbox to a vertical shaft having a single-diameter aluminum pulley at the top. A straight belt with an idler pulley to provide the proper amount of tension passes from here to a two-step aluminum pulley at the top of the spindle. The idler pulley which is provided to secure the proper tension is operated by a handwheel, screw and idler lever. This arrangement, it is emphasized, gives more belt contact on the spindle pulley on the slow speed with its required increase in belt torque, without sacrificing the arc of contact on the driving pulley.

The belt shifter is located on the same side of the machine as the hand lever. Frequently, it is pointed out, in a belt-driven drilling machine the operator will exert sufficient pressure on the drill when it breaks through to stop the spindle and cause the belt to slip.



Bevel Gears and a Vertical Shaft Have Eliminated the Quarter-Turn Belt for Driving a Sensitive Drilling Machine

This necessitates shifting the belt, backing up the spindle and starting the machine again. With the arrangement provided in this new machine, all that has to be done is to remove the hand from the feed lever and take hold of a knob located on the belt shifter about 1 ft. above the feed lever. This enables the belt to be shifted from the larger step of the spindle driving cone pulley to the smaller one just above. It is then possible to back the spindle clear of the burr at the bottom of the hole and by pulling down on the knob the spindle is started forward again. This, it is emphasized, requires only about 1 sec., and the operator does not have to touch the belt, and in addition one hand can remain on the work or jig.

The tables of both machines have been made large to permit the use of big jigs as well as providing space for piling up stock for quick handling when it is found desirable. The spindles, it is stated, may be operated at a speed of 8000 r.p.m. Ball bearings with dust caps and special oiling arrangements are used for the revolving parts.

Washington Office for Youngstown Sheet & Tube Co.

In addition to its district sales offices now located at New York, Boston, Philadelphia, Pittsburgh, Chicago, St. Louis, Denver, San Francisco, Seattle, Dallas, Atlanta and Detroit, the Youngstown Sheet & Tube Co. has opened a branch in the Munsey Building, Washington, D. C. This office will be in charge of W. B. Blowers, district sales agent, assisted by H. E. Richardson, who has been transferred from the Philadelphia office and who will reside in Washington.

Tremendous Exports of Steel to Europe's Warring Nations

Exports of munition steel from the United States, as represented by crude steel and steel bars, have reached astounding figures.

Exports of Crude or Semi-Finished Steel

Crude steel exports have attained proportions that are nearly staggering. For the fiscal year ended June 30, 1917, the outgo of billets, ingots and blooms was 1,936,252 gross tons. This compares with 220,416 tons for the year ended June 30, 1915, and with 962,097 tons on June 30, 1916. For the first six months of 1917, the total has been 1,031,191 tons or 171,865 tons per month. The following table shows the exports of this important product as well as the destination where possible:

Exports of Steel Billets, Ingots and Blooms from the United States in Gross Tons

1917	Total	To Great Britain	To France
January	183,656	50,083	85,966
February	131,566	30,579	68,910
March	193,469	61,239	65,685
April	162,209	65,404	57,052
May	168,158	52,578	55,234
June	192,133	56,671	44,346
Totals	1,031,191	316,554	377,193
Average per month	171,865	52,759	62,865
Fiscal year, 1915	220,416	198,919	.....
Fiscal year, 1916	962,097	240,802	576,109
Fiscal year, 1917	1,936,252	540,174	829,486
Calendar year, 1913	91,847	51,013	.....
Calendar year, 1914	50,496	35,291	.....
Calendar year, 1915	560,704	359,125	.....
Calendar year, 1916	1,508,727	289,414	902,499

The increase for the fiscal year ended with June 30 this year represents a growth in exports of double what it was the year previous and of about 9 times what it was for the same year in 1915. Taking 1913 as normal, the 1916 increase was 15 fold.

The comparison of the amounts taken by Great Britain and France is interesting. The proportion of the former has been steadily declining while that of France has been decidedly expanding. Where figures are available, France took 60 per cent of the 1916 exports while Great Britain took less than 20 per cent; whereas in 1915 Britain took 65 per cent of the total. But for the fiscal year ended June 30, 1917, Great Britain took about 28 per cent of the total while France absorbed about 43 per cent. But the table also shows that as late as June Great Britain was taking large quantities of raw steel, even more than France.

Taking the July and August statistics, the latest published, we find the following exports of crude steel:

	Total	To Great Britain	To France
July, 1917	112,085	17,807	43,066
August	189,083	....	....

The average is less than that maintained in the first six months, but the total in August is nearly equal to the best month in the first half. The total to Sept. 1, 1917, has been 1,332,359 tons comparing with 888,565 to Sept. 1, 1916.

Nearly 3,500,000 tons of semi-finished steel has been exported from the United States in the 32 months from Jan. 1, 1915, to Sept. 1, 1917, or over 100,000 tons per month. Before the war these exports were less than 6000 tons per month.

Steel Bar Exports

Exports of steel bars have continued to expand as the war has progressed until to-day they exceed the records of any other country at any time. For the fiscal year ended June 30, 1917, they had reached practically 750,000 tons and at the end of the first six months of this year steel bars were being sent out at the rate of 57,049 tons per month. The scope of this expansion is given by the table at the bottom of the preceding column.

For 1916 the exports of this one product—774,455 tons—were not far from four times the former pre-war record of 211,716 in 1913.

Since June these exports have declined to some extent due to Government regulation but this is probably only temporary. For July they were 32,009 tons and for August, 48,810 tons, bringing the total to Sept. 1, 1917, to 423,216 tons or 52,902 tons per month.

Exports of Steel Bars from the United States in Gross Tons

1917	Total	1917	Total
January	57,339	April	73,228
February	44,544	May	62,541
March	52,367	June	52,258

Total to July 1, 1917	342,297 or 57,049 per month
Fiscal year ended June 30, 1915	230,274 or 19,189 per month
Fiscal year ended June 30, 1916	634,514 or 52,876 per month
Fiscal year ended June 30, 1917	749,106 or 62,425 per month
Calendar year, 1913	211,716 or 17,643 per month
Calendar year, 1914	123,009 or 10,250 per month
Calendar year, 1915	425,677 or 35,473 per month
Calendar year, 1916	774,455 or 64,538 per month

Campaign to Reduce Waste of Gasoline Inaugurated

A campaign against the wasting of gasoline has been inaugurated by the American Automobile Association, the Motor and Accessory Manufacturers, the Society of Automotive Engineers, the Petroleum Division of the United States Bureau of Mines and the Council of National Defense. It is estimated by the Bureau of Mines that the daily consumption of gasoline by the army, navy and aircraft operations in the coming year will be 959,000 gal., while production this year is at the rate of 6,849,000 gal. per day. Approximately 4,800,000 gal. of this is used by motor cars and trucks and the remainder serves as fuel in motor boats and stationary internal combustion engines and is employed in various industries. It is estimated that a total of 1,500,000 gal. is wasted daily in various ways. If care is taken by the owners of the 4,200,000 motor vehicles and the 25,500 garages of this country, it will easily be possible to take care of the nation's war needs, as these are less than two-thirds of what is now wasted.

Magnetic Separator in Coal Pulverizing Plant

Pulverized fuel has been substituted for natural gas for firing the water-tube boilers in the shops of the Missouri, Kansas & Texas Railroad at Parsons, Kan. The plant is designed to handle either run of mine or slack coal which is dumped from cars into a concrete track hopper adjoining the separate building containing the equipment for pulverizing and drying the fuel. A set of rolls designed to reduce the coal to cubes having a maximum length of 5 in. in a single operation is located underneath the track hopper and after passing through the crushing rolls the coal drops on a belt conveyor, the upper end of which passes over a magnetic separator pulley built by the Cutler-Hammer Mfg. Co., Milwaukee, Wis. Stray pieces of iron or steel are removed in this way from the coal which is delivered to a set of corrugated crushing rolls, the output of which will pass through a ¾-in. mesh screen.

Carbohydrates As a Steel Deoxidizer

A new method of deoxidizing steel in the furnace bath has been suggested by a German patent issued in this country (U. S. 1,238,409) to Adolph Klinkenberg, of Dortmund, Germany. It is based on the addition of carbohydrates. Claim is made for complete deoxidation with only traces of carbon entering bath. A special advantage is found in the production of a very soft iron. The purer the carbohydrate, the better the results obtained. Sugar, starch and cellulose are used with the best effect, though wood and herbaceous plants such as leather have been used with success, it is claimed. When sugar or starch are used, 2.5 kg. are sufficient to completely deoxidize 1000 kg. of steel. With wood shavings 4 to 5 kg. are necessary. Desulphurization also is claimed to be accomplished by this process.

At a conference of truck owners held at the Hotel Statler, Detroit, it was decided that a national uniform system of costs should be adopted. One developed by S. S. Merithew, truck sales department, Packard Motor Car Co., was selected as the basis.

Expansion of Davis-Bournonville Co.

The Davis-Bournonville Co., Jersey City, N. J., has purchased the factory and grounds of the H. G. Kotten Co. located opposite its general offices and factory. The Kotten building will be used for the manufacture of electrolytic oxygen apparatus and accessories, which in turn will release considerable space in the company's recently completed building for the production of oxy-acetylene welding and cutting apparatus. It is planned to erect a four-story brick and mill construction warehouse, 60 x 100 ft., on the Kotten property and sufficient space will still be left for a five-story factory, 60 x 150 ft., which may be built in 1918.

The plant and factory of the Davis Acetylene Co. at Elkhart, Ind., has also been taken over. The construction of acetylene lighting generators and accessories will be discontinued and the manufacture of special products and acetylene pressure generators for the oxy-acetylene process will be commenced. The Davis Acetylene Co. has been dissolved and the factory at Niagara Falls, Ont., which the two companies occupied jointly, has also been taken over and will be used for manufacture of oxy-acetylene apparatus for the Canadian trade exclusively.

A sales office has been opened in the Colorado Building, Washington, in charge of Henry R. Swartley, Jr. This office was established to facilitate sales of oxy-acetylene welding and cutting apparatus and oxygen and hydrogen producing apparatus to the Government for use in the army and navy.

Holland Plans to Have Its Own Steel Plants

The utter dependence of Holland upon foreign countries during the war for the supply of means necessary for her defense has brought the country face to face with the necessity of placing it on a practical basis so far as its supply of iron and steel is concerned. According to a Dutch technical paper, a meeting of leading persons in the industrial and banking world was called recently at The Hague by Dr. Lely, Minister of Water Engineering, to discuss the erection, with the assistance of the Treasury, of blast furnaces and rolling mills in Holland. The cost of the scheme is estimated at over $10,000,000. The result of the discussion is not yet known, but it is thought that the proposals have a fair chance of being adopted. The old argument that iron and steel could not be produced in Holland as cheaply as the raw materials could be imported, especially from Germany, has lost much of its force.

According to *L'Echo des Mines*, Paris, a company has been formed at Rotterdam for the construction of a blast furnace and steel plant at the Hook of Holland. The share capital, about $5,400,000, has been subscribed, the company being backed by one of the leading Rotterdam banks and by two Dutch shipping companies.

New Protective Tube for Thermocouples

As a substitute for the foreign product which was formerly imported, Charles Engelhard, 30 Church Street, New York, is offering a domestic protecting tube for pyrometer thermocouples. It is designed to protect the platinum wires used. While the fusing point of the body of the tube has not been accurately determined, it is stated to be above 3500 deg. Fahr., and the glaze of the tube while different from that on those formerly imported, has a softening point which is claimed to be more than 100 deg. C. higher. The glaze thus does not adhere to the outside protecting tube when heated above the softening point and then permitted to cool.

The record size plate mill being built for the Lukens Steel Co., Coatesville, Pa., by the United Engineering & Foundry Co., Pittsburgh, employs two relatively small middle rolls backed up by very large top and bottom rolls. The plate will be rolled back and forth between the two small middle rolls, this design being employed on account of the great width of plate handled. The roll bodies are 204 in. long.

Factory Calling and Fire Alarm Systems

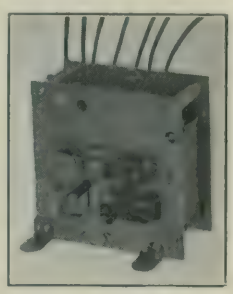
Two new electric specialties have recently been placed on the market by the Standard Electric Time Co., Springfield, Mass. These are equipment for fire alarm and calling systems for use in industrial establishments of all kinds. Both are fully electric in operation and employ the selector system.

The calling system, which is mounted in a wooden case that can be placed on a shelf by the telephone switchboard, employs eight keys, seven of which control the selector mechanism in a separate cabinet in a closet or other out-of-the-way location and a ringing key at the extreme right. All of the keys are of the type used in telephone central office switchboards and are therefore familiar to the operators. In use the keys required to secure the code number are pressed and the instrument started in operation by depressing the key at the extreme right which is red to distinguish it from the seven black selector keys. The system can be used with either battery voltage or alternating or direct current of 110 volts and as the signals are rung the code is flashed to the operator by a small tell-tale lamp located above the keys. The system being electric, the instrument does not require any crank or levers for hand winding.

The fire alarm system employs a master selector of simple construction which will ring any selected code three times or indefinitely as may be desired. Any type



The Combination of Rings in a New Factory Call System Is Secured by Manipulating the Selector Keys at the Left and Is Rung by Depressing the Red Key at the Extreme Right



The Fire Alarm System Is Designed for Use with Ordinary Fire Alarm Stations and Operates Any Kind of Signal

of signal such as vibrating or single stroke bells or horns can be employed, the system being designed for use with the standard break glass fire alarm stations or for push button operation. The instrument will operate from any battery capable of delivering 16 volts or more and can thus be employed in connection with the one operating the electric clock system.

The selector is similar for both equipments, the mechanism being operated by a spring that is wound by a powerful electric magnet operating through a rack and pinion. The arrangement of contacts, however, is different for the two systems, that for the calling instrument having a series of contacts which alternately bear against a revolving flat spring, while the fire alarm selector has a definite code actuated by teeth cut on the cam. An escape wheel and a weighted pendulum capable of adjustment for different ringing speeds provides the time element feature.

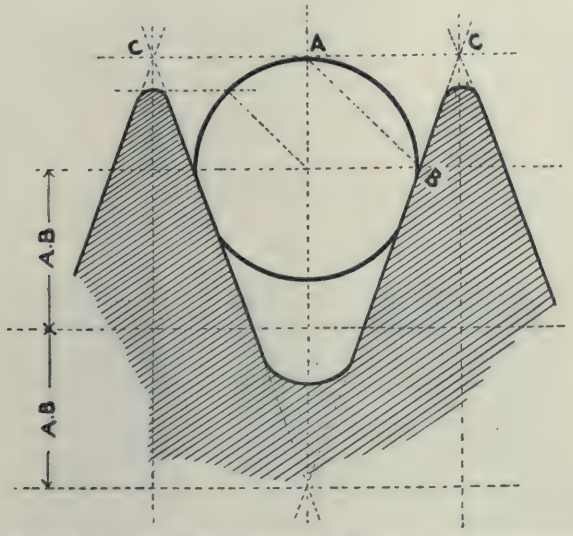
The Aborn Steel Co. is now occupying its new warehouse and office building at 22 Clarke Street, New York, where stocks of cold drawn and rolled steel products, shafting, drill rods, music wire, high-speed carbon tool and alloy steels, etc., will be carried. Branch offices are also maintained at Rochester, N. Y., and Philadelphia. J. T. Slingsby is president and treasurer; H. Ross Slingsby, vice-president; J. Ciegerich, secretary, and R. W. Pilger, assistant secretary.

E. P. Reichhelm & Co., Inc., 26 John Street, New York, representatives of the American Gas Furnace Co. and the American Swiss File & Tool Co., have purchased the six-story building in which their offices have been located for a number of years.

English Practice in Mill Rope Drives

Cotton Rope Preferable to Manila — Data on Sheaves, Velocities, Working Stresses, Etc.— Some Long-Life Installations—American Practice

IN a paper recently presented before the Engineers Society of Western Pennsylvania, J. Melville Alison, engineer, William Kenyon & Sons, Dukinfield, Manchester, England, discussed some salient features of English rope drives for power transmission and endeavored to demonstrate that cotton is a better material than manila for this purpose, also that much may



Design of Sheave Grooves for Ropes Over 1-In. Diameter. From the center of a circle of diameter equal to that of the rope a distance equal to twice the length of cord AB is measured downward on the vertical diameter. The point so determined is the apex of the inverted angle of the groove. The sides of this angle passing through the terminal points of the horizontal diameter midway between this point and the center of the circle form the center of the curve at the bottom of the groove

be gained by the application of scientific principles to rope construction and sheave design. A review of his paper together with some comments made in the discussion by Frank L. Egan, H. Koppers Co., Pittsburgh, follows:

Cotton ropes have supplanted all others for power transmission in England. These ropes are efficient and give long service. The longest life is of ropes which were installed in September, 1878, for 24-hr. day work and are still giving service, but it is common to find cotton ropes doing night and day duty for periods of 20 yr. and over. In rolling-mill practice up to 10 or more years of service is obtained for hot-roll work, and 15 or more in cold-roll tin plate mills. Although cotton costs more than manila, its superior resilience, grip and groove impact add so greatly to its driving capacity that up to one-third more horse-power may be transmitted, and this with the life of cotton rope approximately three times as long as that of manila rope will reduce apparently excessive first charges.

The use of three strands in making up a rope gives one which in construction is superior to that of four or any other number of strands. A rope wedged in its groove is preferable to a revolving one and will transmit more power and last longer. Also good sheave-groove design such as is illustrated does much to increase the driving capacity of the ropes.

Sheave diameters are important and while in England the minimum standard is taken as 30 times the diameter of the rope, in America 40 to 50 times is accepted. Here again cotton scores over manila, since its softness readily admits of superior bending properties.

As to the life of cotton ropes much, of course, depends on their size and the conditions under which they have to work. All things being equal, durability is determined by sectional area, and the most economical diameters range from 1½ in. to 1¾ in., more of the latter being used in England than any other size. For rolling-mill work, however, it so often becomes a matter of sheave widths that 2-in. ropes are generally used. A remarkable case of longevity may be mentioned of 24 cotton ropes 1¾ in. in diameter, employed to transmit 820 hp. in a Lancashire cotton mill and running at a velocity of 4396 ft. per minute directly from the engine flywheel, which is 28 ft. in diameter. These were fixed in September, 1878, and are still running in 24 hr. a day service, a period of over 38 yr. Another set has been working 28 yr. on an average of 20 hr. per day and appears little the worse for wear.

Short Drives and Over-Roping

By adding sufficient rope to make up any deficiency in contact, driving may be successfully accomplished when sheaves are almost touching. An illustrative case is of an engine in Scotland. Its spur gearing was removed and rope sheaves were fixed on the same centers, permitting only a clearance of 8 in. between sheave rims. A load of 360 hp. is easily transmitted by 16 ropes 1¾ in. in diameter. At a mill in the north of France the sheaves are so close that a finger would scarcely pass between them. At the present time a drive is being fitted for the Armstrong-Whitworth Co. of Canada, Montreal, in which the sheaves are 108 in. and 72 in. on a rolling-mill plant, with only 15-ft. centers and grooves for twelve 1¾-in. ropes. This drive is being fitted under a guarantee of maintenance from the rope maker, who originally was consulted on the scheme.

Over-roping certainly retards efficiency. The fault sometimes manifests itself by the slack changing with the pulling side, and at other times by the rope traveling across the grooves or even leaving the pulleys altogether. When such troubles arise it is best to remove one or several ropes if need be, without interfering with the splicings. Mr. Alison knows of instances where half the original number were taken off before satisfactory driving was obtained. This state of things frequently arises, even under fairly regular loads, when actual requirements come below the calculated power.

Rope Slack on Bottom

While it is generally accepted that the slack side of the drive should come on top, this position is not always obtainable, nor is it under all circumstances desirable. With an erratic or fluctuating load such as obtains in rolling-mill practice the slack should come on the bottom. The variable load of the mill tends to set up considerable oscillation in the ropes, and if the slack is above, may cause the ropes to ride or even jump off the sheaves. On the other hand, if the slack is below, any tendency of the rope to wander from its appointed track is held very largely in check by the pull on the tight side, also the weight of the rope will reduce the oscillations. If, however, ropes persist in wandering from their appointed track, a rope guard placed in comb fashion approximately 10 per cent off the centers away from the driven sheave should be used. In rolling-mill practice in England this is freely adopted.

Rope Velocity and Capacity

As affecting rope drives, many tables have been compiled showing a steady decrease of transmitted power for speeds exceeding 4800 ft. per minute, and indicating that ropes running at 7000 ft. per minute are capable of transmitting only half the load of the

same rope running at 4800 ft. per minute. While few cases of rope transmission exceed a velocity of 5000 ft. per minute, those of higher speeds totally disprove the theory of centrifugal detraction at the higher velocities. Drives in England and France are running at over 7000 ft. per minute, but all are out-done by a drive in Cleveland where the ropes are running at 7800 ft. per minute. The driving sheave is 14 ft. 4 in. in diameter, and is making 168 r.p.m. The driven sheave is 4 ft. 7 in. in diameter and fitted with 19 2-in. ropes to transmit approximately 1400 hp. The driven sheave is only 27½ times the diameter of the rope but is giving comparatively good service.

While an effective working tension of about 200 lb. per square inch of rope section may be used in calculations pertaining to three-strand cotton ropes this figure may, in some cases, be exceeded. This was well demonstrated in a large motor-driven sheet mill, which, when first installed, was driven by 26 ropes, 2 in. in diameter, and, to provide against a peak load of 1500 brake hp., was helped by the momentum of two heavy flywheels making 35 r.p.m. or a peripheral velocity of 3516 ft. per minute. Tests conducted under working conditions revealed a high rate of resistance, which diminished as the load rapidly advanced from 150 to 900 hp. This was considered due to over roping at the lower power. Six of the ropes were accordingly removed. Running with only 20 ropes lowered the average friction from 5.8 to less than 3 per cent brought about steadier transmission and materially improved the output.

English Cotton-Rope Installations

Examples of rolling-mill drives showing the life obtained from cotton rope in England follow:

An installation with which Mr. Alison was personally associated was fitted with 18 ropes 2 in. in diameter running on a driving sheave 10 ft. 6 in. in diameter making 110 r.p.m., and driving a sheave 30 ft. in diameter at 38.15 r.p.m. With this peripheral speed of 3636 ft. per minute the ropes were calculated to transmit 846 hp., allowing a fair margin of safety, and leaving a balance of 154 hp., or about 15 per cent, for a momentary peak load of 1000 hp. to be carried through by the momentum of the flywheel. This was on a six-stand hot-roll tin-plate mill. The ropes lasted seven years but underwent various hardships, such as standing in a flooded pit for two weeks, and were also subject to some very inferior take-up splicing.

Another hot sheet-mill drive employs 16 2-in. ropes to drive six stands. The engine is of the uniflow type with driving sheave 8 ft. in diameter running at about 145 r.p.m. and a mill sheave 36 ft. in diameter and weighing 150 tons, making about 33 r.p.m. While this drive has given fairly good rope life, in that the present ropes are on as installed in September, 1910, the over run of the heavy mill wheel appears to cause a very heavy lashing of the ropes at starting and stopping.

A rope-driven wire-drawing mill at William Cooke's Mills in Sheffield has proved successful. The rope speed is about 5000 ft. per minute with 1¾-in. ropes driving forward to two lines of rolls, with the engine shaft taking the other. About two years ago Mr. Alison inspected the drives, the engineer being afraid one set of ropes was giving way. The drive was doing splendidly in spite of seven years continuous night and day service. The ropes on one drive were slack enough to be taken up, and this he advised, but the engineer explained that the company was on urgent war orders and could not afford to stop. It was decided, therefore, that a spare lot be ordered immediately. However, the engineer had trouble before this arrived. He could have had splicers at once and they would have obviated any stoppage. So far as Mr. Alison knows these ropes have not been fitted.

American Practice

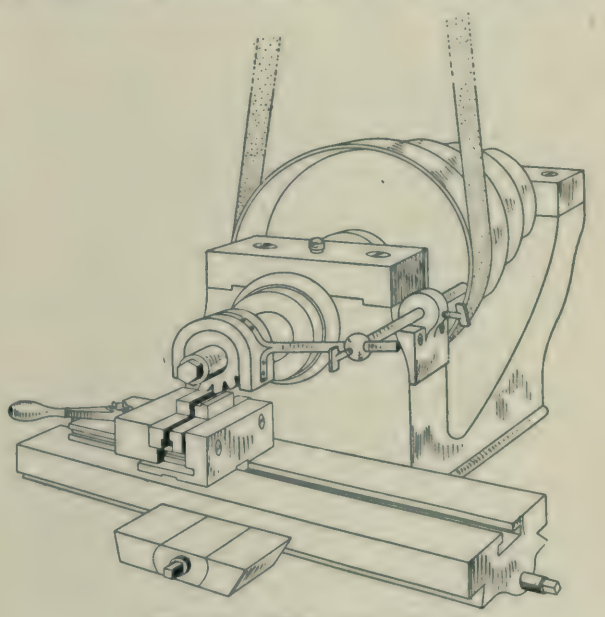
Frank L. Egan, H. Koppers Co., Pittsburgh, participating in the discussion indicated his interest in the statement made by Mr. Alison that the power transmitted actually increases up to a speed of 7000 ft. per minute. American engineers, he believes, consider 5000 ft. per minute as a good average for economy, taking into account cost of rope and drive complete and also upkeep on the entire drive.

His company has a drive, installed nine years ago which uses rope 1⅛ in. in diameter, running continuous over the driver and four driven shafts at different angles and transmitting 200 hp. at about 5000 ft. per minute. It has 2100 ft. of rope and two tension carriages. This rope averages about one year in 24-hr. service and does not show any external wear. The inside of the rope chafes to a fine powder so that it will shake out as dust when the strands are opened. This drive would pay if the rope life were only three months.

Another drive was installed about 15 years ago to transmit approximately 2000 hp. from a cross-compound engine to four line shafts for driving electric light and power generators. One continuous rope 1¾ in. in diameter was used to each line shaft, or four in all. Service was about 18 hr. a day. This drive was so successful that it continued in service 11 years with the original four ropes. They were spliced twice to his knowledge, perhaps more. Manila ropes of high quality were used. It was still capable of good service when discarded.

Adjustable Milling Cutter Guard

The accompanying illustration shows a form of adjustable milling cutter guard employed by the Remington Typewriter Works, Ilion, N. Y. How the guard or



Adjustable Milling Cutter Guard

hood may be removed is indicated as well as the adjustment which may be made in a direction parallel to the arbor.

New German High-Speed Steel

A new high-speed steel has been patented by a German company, the Stahlwerke Richard Lindenburg of Remscheid. The patent specification states that the steel shall contain carbon, 1.2 per cent; manganese, 1.2 per cent; silicon, from 0.1 to 0.3 per cent; chromium, from 3 to 10 per cent, and cobalt, 1.5 per cent. This material is said by the inventor to be an improvement upon a similar steel which he patented last year containing molybdenum. In the manufacture of the new steel the molybdenum is omitted and the percentage of manganese and chromium increased.

Over 500 employees of the Bethlehem Steel Co., South Bethlehem, Pa., have taken advantage of the offer made by the company through the Bethlehem Securities Co. to loan second-mortgage funds to build or purchase homes. The company has now made loans for such purpose to employees totaling about $1,700,000.

J. M. Betton, sand blast machines and accessories, has moved from his former location at 26 Park Place, New York, to 59 Pearl Street.

PLASTIC METAL DEFORMATION

Bibliography of Literature on Extrusion, Rolling, Punching, Shearing and Other Processes

A bibliography on the plastic deformation or flow of metals, or what he calls the theory of extrusion, rolling, drawing, punching and shearing processes as applied in the mechanical working of metals, has been compiled by E. C. Buck, New York, as follows:

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1837—Colthurst, J.
An account of some experiments to determine the force necessary to punch holes through plates of wrought iron and copper.
Inst. Civil Engrs., Minutes of Proceedings 1837-1841, v. I, pp. 60/61.

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Theoretical considerations on the effect of pressure in lowering the melting point of ice (freezing point of water).
Trans. Roy. Soc. Edin., 1849, v. 16, pp. 575/581.

1850—Thomson, W.
The effect of pressure in lowering the freezing point of water experimentally demonstrated.
Phil. Mag. 1850 (3d Series), v. 37, pp. 123/27.

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Pogg. Annalen d. Physik u. Chemie, 1865, v. 125, p. 304.

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Paris, Annal. Conservatoire, 1866, v. VI, pp. 9/62.
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The Stanley Works' Employees are Doing Their Bit

More than 100 employees of the Stanley Works, New Britain, Conn., have left their positions to fight for Uncle Sam. They have gone with the National Guard, Officers' Reserve Camps, the New National Army, Navy, Ambulance Corps, and some, who for physical reasons were not accepted in other divisions, have entered the Government Munition Inspection Service. Those employees who still remain at their regular work are doing everything that they can to back up the soldiers. Under the auspices of the Stanley Club, a weekly letter on office and factory happenings is being sent to each former employee now in the Government service. Recently an entertainment was given for a fund to buy tobacco for Stanley Works' soldiers.

An average of 100 girls employed in the office do Red Cross work one evening a week. They do this work in the office and the company supplies them with supper. A fund has just been raised among the employees of the Stanley Works to purchase a complete ambulance equipment and present it to the Government, and one of the men now working in the cold rolled steel mill has volunteered to drive it.

For both the first and second Liberty loans the company has sold bonds to its employees for weekly payments extending over a year. On this basis over $100,000 worth of bonds was subscribed to for each loan, or an average of about $40 worth of bonds for each employee.

Shipments are being made by the William B. Pollock Co., of Youngstown, Ohio, of the steel work for blast furnaces for the Tata Iron & Steel Co., of Sachki, India. Regular shipments will be made from time to time during the next month or two. The first shipment was loaded last week and consisted of about three carloads. It was consigned to New York, from which point it was transferred to boat, and will be taken to India by way of the Panama Canal. The Pollock company has a contract for three furnaces, which are nearing completion and will be sent to India as soon as possible.

CORRESPONDENCE

A Why for Government's Labor Shortage

To the Editor: Noting the announcement in the Oct. 18 issue of THE IRON AGE, "Workmen Badly Needed," the writer wishes to call attention to some obstacles which prevent the Government's securing enough efficient labor to carry on the war industries. It is a known fact that there are many thousand engineers, carpenters, mechanics, etc., now engaged in other occupations, and in case of the present emergency would be glad to set aside their personal interest and enlist in Government service, if it were not for the fact that several branches of the Civil Service Commission have an established form of application which many of the most competent workmen cannot answer to in full.

One instance may be cited. A mechanical engineer of proved ability and reliability applied for a position as mechanical engineer in experimental work, in answer to the call published in THE IRON AGE of Sept. 6. The application was executed on the form furnished by the local board of examiners and mailed to the proper officials. After a few days the application was returned for correction, the only correction desired being that the application be made on another form. The applicant at once proceeded to make the required change, but found one question in the vouchers that no acquaintance could positively answer; in fact, the question could not be answered absolutely for anyone applying. Therefore the matter was dropped by the applicant.

In a national emergency the application form should be as concise as possible, so that prospective employees will not be embarrassed by a multitude of unnecessary questions and the uncertainty of getting a job. An authentic medical certificate, together with reliable vouchers as to reliability, theoretical and practical knowledge of the applicant, is all that should be required. With a slight modification in forms and system of employment, our Government should be able to secure all the skilled labor necessary for the prosecution of this war.

SAMUEL H. KENNEDY.

Tunnel Hill, Ga., Oct. 26.

Manganese in Ordnance Steel

To the Editor: Replying to the caution of J. J. Mahon in your issue of Aug 23, page 438, about going slowly in raising manganese, the caution is of course to be observed. Eat meat or cheese, not both. Manganese is to replace carbon. If you raise your manganese, you must lower your carbon proportionately. If the object is to be quenched, the quenching must be less violent than if it were of low-manganese steel. One cannot be sure beforehand whether the great advantages of replacing carbon with manganese apply to ordnance steel. They certainly would not unless the precautions of lowering the carbon content and lessening the violence of the quenching are observed.

Yours very truly,
H. M. HOWE.

Bedford Hills, N. Y., Oct. 26.

Will Need Equipment

The Defiance Machine Works, Defiance, Ohio, is expected to come in the market shortly for considerable additional machinery equipment. This company recently secured a large Government order for 3-in. anti-aircraft guns and several weeks ago purchased about $200,000 worth of heavy machinery, but will need additional machine tools.

The A. Cooper Metal Co., Inc., dealers in metals, 1226 Orange Street, Syracuse, N. Y., has bought the plant and equipment of the Barnes Gear Co., Oswego, N. Y.

ESTABLISHED 1855

THE IRON AGE

EDITORS:

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CHARLES S. BAUR, *Advertising Manager*

Published Every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

Owned by the United Publishers Corporation, 243 West 39th Street, New York. H. M. Swetland, *Pres.* Chas. G. Phillips, *Vice-Pres.* W. H. Taylor, *Treas.* A. C. Pearson, *Secy.*

BRANCH OFFICES—Chicago: Otis Bldg. Pittsburgh: Park Bldg. Boston: Equitable Bldg. Philadelphia: Real Estate Trust Bldg. Cleveland: Guardian Bldg. Cincinnati: Mercantile Library Bldg. San Francisco: 320 Market Street.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

Abrogation of Contracts

The canvass of iron and steel manufacturers undertaken Oct. 20 by the Federal Trade Commission on the subject of abrogation of contracts has already brought forth some strong expressions of opinion, and no doubt can be entertained that the producers will make it clear that the proposition is altogether objectionable.

In one of its phases the proposition is distinctly of a character best described by the common expression "heads I win, tails you lose." There are contracts both at higher and at lower prices than those fixed. If the producer were to agree to the abrogation of contracts he would have relatively plain sailing with those of his customers who held contracts at higher than the set prices, but the case would be quite otherwise with those who held contracts at lower prices. The seller could hardly be asked to defend himself against the lawsuits which might be brought and the Government would be placed in a curious light if it appeared as defendant in such suits, when the plaintiff would naturally base his case largely on constitutional grounds.

Even in the case of contracts at higher than the set prices the purchaser in many cases would doubtless have objections to abrogation. The spread between the set price and the contract price might be regarded as an advantage rather than an encumbrance, as holding out promise of an earlier delivery, or valuable service in some other manner. The producers have not agreed to sell to the public at the set prices, for they cannot agree to sell more material than they have. The essence of the agreement, as regards sales to the public, is that if sales are made they are to be at not higher than the set prices. The buyer deprived of his contract would have no assurance that he could duplicate it at the set price.

There are two general classes of steel contracts, one covering specific construction jobs, the other covering prospective requirements, whether of distributers or of manufacturing consumers. In the case of the former, the buyer of the steel is one who has contracted to deliver to his customer possession of a certain thing—a bridge, a building, a given number of cars or locomotives or something of that general description. There certainly would be no justice to anyone in abrogating such a steel contract and not abrogating the contract for the delivery of the finished product, while on the other hand the ultimate buyer is naturally not one who would have a claim.

Doubtless some cases could be found in which enforcement of a steel contract would work hardship on the buyer, who may be selling in a competitive market in which some of his competitors would have an advantage through being able to buy at the set prices. Endless confusion would be created by any attempt to divide contracts into two classes, the one to be abrogated, the other not. It is generally felt that it would be difficult to find constitutional grounds for the abrogation of contracts, but to find grounds for the abrogation of some contracts and not of others would indefinitely increase the difficulty.

Contract revision is not an unknown thing in the steel industry. In every market decline there has been more or less give and take. Steel manufacturers have not undertaken to enforce contracts that would put customers out of business, and Washington has no occasion to assume that steel manufacturers would be less disposed to treat their customers fairly at this time than at other times. If Government price fixing has placed any buyer of steel in an impossible position the seller should be given an opportunity to take action on the particular case.

There is, however, probably no occasion for much alarm. The Federal Trade Commission appears simply in the light of seeking information. It asks questions that astonish the trade, but it is a case of asking questions, not of outlining a course of conduct. Grammatically the sentences are interrogative, not declarative. It is their suggestiveness that has disturbed the trade, but when the trade finds the suggestions impractical it should be assumed that the Federal Trade Commission will have occasion to reach the same conclusion.

There is no hint that the questionnaire looks to action by the Administration, through the War Industries Board or otherwise. No such idea can be entertained. It is purely a detail in the formulation of an iron and steel price control bill which may or may not be submitted to Congress in December, and which if submitted would certainly

be subject to thorough discussion. There is no harm done in thus early giving the matter airing. If this airing results in the contract abrogation idea being definitely abandoned before the proposed measure reaches Congress, it will be much better than having the matter broached as a new idea on the floor of either house.

Price Revision Jan. 1

Buyers and sellers alike in the iron and steel industry have been attaching great importance to the qualification in the Government's announcements of set prices for iron and steel that the prices are subject to revision Jan. 1 or later. It appears to be rather a common view that a revision Jan. 1 or soon afterward was distinctly contemplated.

There is good ground for argument, however, that the clause inserted was merely a saving one, to cover contingencies. To say nothing as to the probable duration of the set prices would be to create uncertainty, for they could not be expected to last forever. The Government desired that an agreement be announced as soon as possible, hence it was undesirable to consume additional time in endeavoring to arrive at a precise understanding with respect to the time element. From this viewpoint the setting of a date would merely indicate a limit, that the prices announced would at any rate not be changed before Jan. 1.

With the assumption that a revision of prices may occur Jan. 1 or soon thereafter, the question is raised whether the revision is likely to be upward or downward. The majority opinion is that any revision would be downward rather than upward. The one argument for an upward revision is based on the fact that the set prices are in the main an approximation to the average billing prices of the large steel interests at the time the announcement of set prices was made. These invoice prices have been continuously increasing for about two years and a half, trailing the open market, as lower priced contracts were worked off at intervals. From this viewpoint the service rendered by the set prices would be that of protecting the consumer not well provided with contracts against the competition of those who had been forehanded in buying. With contracts allowed to remain in force, the average billing price would be higher on Jan. 1 than on Oct. 1.

Arguments are more common, however, that if there is a revision in the iron and steel prices the revision will be downward. One argument is based on the circumstances attending the reaching of an agreement. It was a case of strategy, more or less. The manufacturers on the whole were disinclined to accept the "one price for all" principle. They were quite willing to make large concessions on steel required for prosecuting the war, but were indisposed to make equal concessions on material sold to the general public. The great objective of the Government, therefore, was to secure adoption of the "one price for all" principle and get the set price system established. Once established there might be opportunity for the securing of further concessions. Another argument used is that the iron and steel manufacturers may find the set price principle a better one, in actual practice, than they had expected, through the removal of uncertainties balancing the price concessions they have made. It is pointed out also that the iron and steel market had started to decline, in a modest way, before price fixing was definitely undertaken, and if the market taken over by the Government was a declining market there might possibly arise conditions that would suggest further declines, eventually, following the large reduction effected in the initial price setting.

It has been the common view that the prices that have been set—for pig iron, unfinished steel and certain finished rolled products—are in line with each other and constitute a well-proportioned structure. If so, any radical revision in one product would naturally suggest revision in others. Now it is well known that the authorities at Washington considered the $33 pig-iron price as rather a high one. It is stated that there has been strong feeling in certain circles in Washington that the pig-iron price should be as low as $27, and the prediction has even been ventured that if pig-iron prices are revised it will be to a $30 basis. Naturally the Government would be quite indisposed to reopen the subject for the sake of a minor revision of $1 or even $2 a ton, and if pig iron were readjusted to $30 it is improbable that the remainder of the list would entirely escape revision.

Considering all the views entertained, the preponderating opinion seems to be, first, that a downward revision is more probable than an upward revision, and, second, that the balance of probability is that there will be no revision Jan. 1 or soon thereafter.

War and Peace Business

Trade is in the midst of a conflict of two ideals —business as usual and marshalling all our industrial forces for prosecuting the war. Both are necessary, but they conflict or overlap, and no one can draw the line. All peace activities that do not interfere with striving to win the war are desirable, but the application of the definition is difficult.

In the early weeks after our declaration of war there was much false preaching from the text "business as usual." Some held that "business," no matter of what kind, should be stimulated. What is business at one end, however, may be pleasure at the other. Running a theater is business but attending the performance is not. Yet giving up amusements does not necessarily help win the war. Mind and body require relaxation and play at intervals that they may work the better when they are engaged at work.

It has become obvious that for the iron and steel industry no line can be drawn between the material that is needed for the war and the material that is not so needed. Washington takes the position that war orders must be considered first, but can present no budget. It is not a question of a precise tonnage being required of this or that material, for the material must be worked into its final form and the rapidity with which it can be handled is not known.

The Government does not require the tonnage of plates necessary to build a certain number of vessels. It desires all the plates that can be used in shipbuilding.

What adds complication to the issue between war and commercial steel is that the war steel is divided into two distinct categories—that which is needed for getting started and that which will be needed continuously, and presumably in larger and larger quantities. The equipment of the army cantonments falls in the one category, the supply of shells in the other. Steel for war craft lies largely in the first category, steel for merchant shipping lies in the second, with constantly increasing requirements as merchant shipbuilding capacity increases and is made more efficient. Some descriptions of war steel orders are practically completed, other descriptions are just appearing. In this respect the war work is passing out of its initial stage and tending to strike its more permanent gait.

A new complication is about to arise. The priority classification adopted a few weeks ago by the War Industries Board provides three great divisions —steel required directly for the war, steel indirectly involved, and all other. Relatively little has developed thus far that would fall in the second category, but undoubtedly much will develop. The railroads are very great consumers of steel and their efficient operation is necessary for prosecuting the war as vigorously as possible. One of the great questions Washington now has before it is what shall be done with, or for, the railroads. The matter cannot be approached without "eventual Government ownership" arising in its full height as a specter not to point the way but to show how serious is each step that may be contemplated.

To marshall all our industrial forces for the prosecution of the war means, in itself, that there should be no steel left for the third category in the priority sequence. Washington may not find it possible to map out such a course, but the attitude of the authorities in their dealings with the steel makers is that such a condition should be provided for. When the steel makers adopt the suggestion they produce complaint on the part of some buyers of steel. The mills have a large mass of business on books, and for smoother conduct of trade it would be better if they had less. The trend should be in the direction of reducing the tonnage on books, at a time when large additional orders are being placed by Washington.

As the volume of business on steel-mill books is reduced the situation will be made clearer for the producers, but not necessarily so for the consumers, who naturally cling to the belief that it is better to have an order on file, with no delivery, than to have nothing due them at all. If they have an order they can secure some semblance of a promise as to delivery, or at least an intimation, but when they have no order they can seek no more than a statement as to when material may be available and a statement under such circumstances naturally carries very little weight.

An unfortunate feature of the situation is that the reduction in the volume of business on steel-mill books now in progress may easily be misinterpreted by buyers. In the past such a decrease has been an unerring sign that steel is to become more plentiful, also cheaper. At this time the reduction is caused, in part at least, by an entirely new influence, that of the Government holding before the mills the prospect of an uncertain amount of business—uncertain as to its total tonnage and uncertain as to the classes of material that will make up the total. The commercial buyer of steel is not helped in his effort to judge whether or not steel will be available for him by the Government's request that those who receive orders from it refrain from giving information as to their character or extent. The commercial consumer may wish to conduct his business as usual, but he must take his own chances. It is one of the hardships of war, but, if possible, means should be found for lightening the hardship.

Organized Labor's Misguided Acts

Week before last the leaders of certain labor unions of the building trades called a strike of workmen engaged in the erection of an $8,000,000 addition to the Watertown Arsenal. The strike did not seriously interrupt construction because most of the men returned to work the next day, against the protests of their chosen leaders. This voluntary action encourages the belief that American workmen are at heart loyal and patriotic.

The thing that is of real moment is that strikes, threatening a delay to the rapid completion of war preparations, are possible. Local union leaders who call a strike to establish conditions contrary to the agreement, implied if not real, made between the Government and the head of the American Federation of Labor, lay themselves open to a charge of unpatriotic, if not treasonable, conduct. Col. Tracy C. Dickson, commandant of the Watertown Arsenal, states the opinion of the public, as well as of the War Department, when he says that an attempt to institute a closed shop policy and double time for overtime by means of a strike, without submitting differences to arbitration so that war work shall not be delayed, is unpatriotic.

The Watertown condition is wide-spread. Strikes and threats of strikes have hampered work in shipyards, steel mills, munitions plants and other vital industries, not to mention transportation and mining. One such threat, with which the Watertown strike is believed to be connected, is that made by the Boston Central Labor Union against the Aberthaw Construction Co., which has the contract to build the Government $9,000,000 destroyer plant that is to be operated by the Fore River Works of the Bethlehem Shipbuilding Corporation. President McGrady of that union is quoted by the Boston press as having stated that the destroyer plant "will not be completed by Jan. 1, as guaranteed to the Government, unless the job is made fair to union labor." Reputable papers claim that a movement is on foot to force the Aberthaw company to operate a closed shop or "every treasury of every labor union in the State will be exhausted, if necessary, to help the trade unions win this fight," as was alleged to have been said in the union meeting.

It will be difficult for labor leaders to get the

public to accept their statement that strikes for closed shops and extravagant overtime pay are necessary to prevent "the breaking down of our wage and working system," as was claimed to have been said by the agent of the structural steel workers on the Watertown job. The non-union public will not complacently look on while workmen, whose wages are higher than private industry not employed on war work can pay, engage in a campaign to block or delay the war program of the nation.

Labor leaders and editors of the labor press have an unwarranted belief that the great mass of working people indorse the full labor union program. Col. Francis J. Kernan was president of a board of army officers which investigated and reported, Jan. 4, 1917, upon the Government manufacture of arms, munitions and equipment. This report shows that in the whole country there were 18,654 plants capable of turning out war supplies, and of these only 1867 or 10 per cent were unionized. The figures for New England showed 2846 plants of which 259 were unionized. In other words, 90 per cent of the plants that are available for production of war supplies do not recognize the labor unions. Organized labor represents only a portion, and that a small portion, of the working people of the country. Its attempts to dictate to the Government will sooner or later bring upon it undesired legislative action.

The private interests of organized labor must give way before public necessity. The question is even more than a national one; it is international. It is unfair to bring an indictment of unpatriotic and selfish conduct against the rank and file of the unions. They are enlisting with patriotic ardor in the fighting forces and giving their money freely to aid the nation to win the war. The indictment rests upon their unwise and short-sighted leaders. It is these leaders who must provide prompt relief from the present harassing labor conditions. They must formulate a policy of loyal co-operation with the Government's program. Otherwise they may expect to see Government regulation of labor employed in the public service. Public opinion would not now countenance labor conscription; a few more strikes and threats of strikes may swing the sentiment of the public in favor of enlistment of labor.

When James A. Campbell, president Youngstown Sheet & Tube Co., said at the Cincinnati meeting of the American Iron and Steel Institute, "There is not much worth while in the world today except to win the war," he struck a responsive chord in the hearts of his hearers, as did also President Farrell of the Steel Corporation when he declared that "if the United States and its Allies should be defeated in the war, we should not be thinking of prices." There was, of course, keen interest in the future course of officials at Washington in regard to prices, but patriotic thoughts dominated everything. The meeting was noteworthy for the large attendance not merely at the opening session but at all the meetings. It was clear that the members profoundly appreciate their responsibilities and intend to perform their duty to the utmost of their ability.

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New Classification of Extras on Steel

Differentials Announced by Sub-Committee on Steel Distribution of American Iron and Steel Institute

WASHINGTON, Oct. 30.—The sub-committee on steel distribution of the American Iron and Steel Institute has prepared a list of differentials and extras on the basic prices which have heretofore been announced by the President. These differentials supplement those reported in THE IRON AGE of last week. In explanation of the extra lists James. B. Bonner, vice-chairman of the sub-committee, explains that they are "a compilation of the extras and differentials applicable to the various products shown, the base prices on which were recently fixed by the War Industries Board after approval by the President." Many of the extras shown have been in commercial use for a long period and the additions represent extras that have been applicable but have not been included in some of the extra cards. The present compilation is intended to assemble all of the extras and differentials in compact form for quick reference. Following is the list as promulgated:

STANDARD CLASSIFICATION OF EXTRAS ON STEEL BARS (EXCEPT SHELL STEEL) AND SHAPES UNDER 3 IN.

Extras in cents per pound to be added to the base price per pound.

Rounds and Squares

¾ to 3 1/16 in.	Base
⅝ to 11/16 in.	.05c. extra
½ to 9/16 in.	.10c. extra
7/16 in.	.20c. extra
⅜ in.	.25c. extra
11/32 in.	.30c. extra
5/16 in.	.35c. extra
9/32 in.	.40c. extra
¼ in.	.50c. extra
15/64 in.	.75c. extra
7/32 in.	1.00c. extra
3/16	1.25c. extra
3⅛ to 3 9/16 in.	.075c. extra
3⅝ to 4 1/16 in.	.125c. extra
4⅛ to 4 9/16 in.	.15c. extra
4⅝ to 5 1/16 in.	.20c. extra
5⅛ to 5 9/16 in.	.25c. extra
5⅝ to 6 1/16 in.	.375c. extra
6⅛ to 6 9/16 in.	.50c. extra
6⅝ to 7¼ in.	.025c. extra

For intermediate sizes, the next higher extra to be charged in all cases.

Flats

1 to 6 in x ⅜ to 1 in.	Base
1 to 6 in. x ¼ to 5/16 in.	.10c. extra
11/16 to 15/16 in. x ⅜ to ¾ in.	.20c. extra
11/16 to 15/16 in. x ¼ to 5/16 in.	.25c. extra
9/16 to ⅝ in. x ⅜ to ½ in.	.25c. extra
9/16 to ⅝ in. x ¼ to 5/16 in.	.35c. extra
½ in. x ⅜ to 7/16 in.	.50c. extra
½ in. x ¼ to 5/16 in.	.60c. extra
7/16 in. x ⅜ in.	.70c. extra
7/16 in. x ¼ to 5/16 in.	.80c. extra
⅜ in. x ¼ to 5/16 in.	1.00c. extra
1⅛ to 6 in. x 1 1/16 to 1 3/16 in.	.05c. extra
1⅛ to 6 in. x 1¼ to 1½ in.	.10c. extra
1 ¾ to 6 in. x 1⅝ to 2¾ in.	.15c. extra
3⅛ to 6 in. x 3 to 4 in.	.20c. extra

For intermediate sizes, the next higher extra to be charged in all cases.

Angles

1½ x 1½ in. and wider, but under 3 in. wide x 3/16 in. and heavier	.10c. extra
1½ x 1½ in. and wider, but under 3 in. wide x ⅛ in.	.15c. extra
1 x 1 to 1¼ x 1¼ in. x 3/16 in. and heavier	.15c. extra
1 x 1 to 1¼ x 1¼ in. x ⅛ in.	.20c. extra
⅞ x ⅞ in. x 3/16 in.	.20c. extra
⅞ x ⅞ in x ⅛ in.	.25c. extra
¾ x ¾ in. x 3/16 in.	.25c. extra
¾ x ¾ in. x ⅛ in.	.30c. extra
⅝ x ⅝ in. x ⅛ in.	1.10c. extra
⅝ x ⅝ in. x 3/32 in.	1.30c. extra
½ x ½ in. x ⅛ in.	1.60c. extra
½ x ½ in. x less than ⅛ in.	1.80c. extra
3 in. on one or both legs by less than ¼ in. thick	.35c. extra

Unequal leg angles are subject to special prices, which will be furnished on application.

For intermediate sizes, the next higher extra to be charged in all cases.

Channels

1½ in. and wider, but under 3 in. wide x 3/16 in. and heavier	.15c. extra
1½ in. and wider, but under 3 in. wide x ⅛ in.	.25c. extra
1 to 1¼ in. x 3/16 in. and heavier	.25c. extra
1 to 1¼ in. x ⅛ in.	.35c. extra
1 to 1¼ in. x 7/64 in.	.50c. extra
¾ and ⅞ in. x 3/16 in. and heavier	.30c. extra
¾ and ⅞ in. x ⅛ in.	.40c. extra
¾ and ⅞ in. x 7/64 in.	.55c. extra
⅝ x ⅛ in. and heavier	1.20c. extra
⅝ x 3/32 in.	1.40c. extra
½ x 7/64 in. and heavier	1.80c. extra
½ x 5/64 in.	2.00c. extra

For intermediate sizes, the next higher extra to be charged in all cases.

Tees

1½ x 1½ in. and wider, but under 3 in. wide x 3/16 in. and heavier	.20c. extra
1 x 1 to 1¼ x 1¼ x 3/16 in. and heavier	.40c. extra
1 x 1 to 1¼ x 1¼ x ⅛ in.	.50c. extra
⅞ x ⅞ x 3/16 in.	.50c. extra
⅞ x ⅞ x ⅛ in.	.60c. extra
¾ x ¾ x 3/16 in.	.60c. extra
¾ x ¾ x ⅛ in.	.70c. extra
⅝ x ⅝ x ⅛ in.	1.30c. extra
½ x ½ x ⅛ in.	1.80c. extra

Unequal leg tees are subject to special prices, which will be furnished on application.

For intermediate sizes, the next higher extra to be charged in all cases.

Hexagons

¾ to 3 in.	.15c. extra
⅝ to 11/16 in.	.25c. extra
½ to 9/16 in.	.35c. extra
7/16 in.	.55c. extra
⅜ in.	.65c. extra
5/16 in.	.75c. extra
¼ in.	1.00c. extra

For intermediate sizes, the next higher extra to be charged in all cases.

Half Rounds

1 to 3 in.	.20c. extra
¾ to 15/16 in.	.35c. extra
⅝ to 11/16 in.	.50c. extra
½ to 9/16 in.	.70c. extra
⅜ to 7/16 in.	1.10c. extra

For intermediate sizes, the next higher extra to be charged in all cases.

Half Ovals

Gages shown are Birmingham Wire Gage

1 to 4 in. x ¼ in. and thicker	.25c. extra
1 to 4 in. x Nos. 7, 8, 9 and 3/16 in.	.35c. extra
1 to 4 in. x Nos. 10, 11, 12 and ⅛ in.	.50c. extra
¾ to 15/16 in. x 3/16 in. and thicker	.50c. extra
¾ to 15/16 in. x Nos. 10, 11, 12 and ⅛ in.	.65c. extra
¾ to 15/16 in. x Nos. 13, 14 and 15	.80c. extra
⅝ to 11/16 in. x 5/32 in. and thicker	.60c. extra
⅝ to 11/16 in. x Nos. 10, 11, 12 and ⅛ in.	.75c. extra
⅝ to 11/16 in. x Nos. 13, 14 and 15	.90c. extra
½ to 9/16 in. x ⅛ in. and thicker	.80c. extra
½ to 9/16 in. x Nos. 13, 14 and 15	1.05c. extra
⅜ to 7/16 in. x 3/32 in. and thicker	1.35c. extra
⅜ to 7/16 in. x Nos. 14 and 15	1.60c. extra

For intermediate sizes, the next higher extra to be charged in all cases.

Ovals

¾ to 2½ in. x ⅜ in. and thicker	.20c. extra
¾ to 2½ in. x ¼ in. to 5/16 in.	.30c. extra
¾ to 2½ in. x 5/32 in. to 3/16 in.	.45c. extra
⅝ to 11/16 in. x 5/16 in. and thicker	.35c. extra
⅝ to 11/16 in. x 3/16 in. to ¼ in.	.50c. extra
⅝ to 11/16 in. x ⅛ in. to 5/32 in.	.65c. extra
½ to 9/16 in. x ¼ in. and thicker	.55c. extra
½ to 9/16 in. x ⅛ in. to 3/16 in.	.70c. extra
½ to 9/16 in. x 3/32 in.	.95c. extra
⅜ to 7/16 in. x 3/16 in. and thicker	.95c. extra
⅜ to 7/16 in. x ⅛ in. to 5/32 in.	1.20c. extra
⅜ to 7/16 in. x 3/32 in.	1.45c. extra

For intermediate sizes, the next higher extra to be charged in all cases.

Bands

Gauges shown are Birmingham Wire Gauge

1½ to 6 in. x No. 7, 8, 9 and 3/16 in.	.20c. extra
1½ to 6 in. x Nos. 10, 11, 12 and ⅛ in.	.30c. extra
1 to 1 7/16 in. x Nos. 7, 8, 9 and 3/16 in.	.25c. extra
1 to 1 7/16 in. x Nos. 10, 11, 12 and ⅛ in.	.35c. extra
13/16 to 15/16 in. x Nos. 7, 8, 9 and 3/16 in.	.35c. extra
13/16 to 15/16 in. x Nos. 10, 11, 12 and ⅛ in.	.40c. extra
11/16 to ¾ in. x Nos. 7, 8, 9 and 3/16 in.	.50c. extra
11/16 to ¾ in. x Nos. 10, 11, 12 and ⅛ in.	.60c. extra
9/16 to ⅝ in. x Nos. 7, 8, 9 and 3/16 in.	.60c. extra
9/16 to ⅝ in. x Nos. 10, 11, 12 and ⅛ in.	.65c. extra

¼ in. x Nos. 7, 8, 9 and 3/16 in.	.65c. extra
½ in. x Nos. 10, 11, 12 and ⅛ in.	.75c. extra
7/16 in. x Nos. 7, 8, 9 and 3/16 in.	.90c. extra
7/16 in. x Nos. 10, 11, 12 and ⅛ in.	1.05c. extra
⅝ in. x Nos. 7, 8, 9 and 3/16 in.	.95c. extra
⅝ in. x Nos. 10, 11, 12 and ⅛ in.	1.20c. extra

For intermediate sizes, the next higher extra to be charged in all cases.

Quantity Differentials

All specifications for less than 2000 lb. of a size will be subject to the following extras, the total weight of a size ordered to determine the extra, regardless of length and regardless of exact quantity actually shipped.

Quantities less than 2000 lb. but not less than 1000 lb.	.15c. extra
Quantities less than 1000 lb.	.35c. extra

Straightening

Machine straightening	.10c. extra

Machine Cutting Rounds and Squares 1½ In. and Larger to Specified Lengths

Machine cutting to lengths over 48 in.	.15c. extra
Machine cutting to lengths over 24 in to 48 in., inclusive	.25c. extra
Machine cutting to lengths over 12 in. to 24 in., inclusive.	.35c. extra
Machine cutting to lengths of 12 in. and less, extra will be furnished on application, but will not be less than	.45c.

The above extras apply only to 0.50 carbon and under. Extras for machine cutting over 0.50 carbon will be furnished on application.

Extras for machine cutting rounds and squares under 1½ in., flats, etc., will be furnished on application.

Cutting to Specified Lengths

Other than machine cutting

Cutting to lengths of 60 in. and over	No charge
Cutting to lengths over 48 in. to 59 in., inclusive..	.05c. extra
Cutting to lengths over 24 in. to 48 in., inclusive..	.10c. extra
Cutting to lengths over 12 in. to 24 in., inclusive..	.20c. extra
Cutting to lengths of 12 in. and less extra will be furnished on application, but will not be less than	.30c. extra

STANDARD CLASSIFICATION OF EXTRAS ON STEEL PLATES

Extras in cents per pound to be added to the base price per pound.

Conditions

Rectangular plates, tank steel, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are Base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered ¼ in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft. down to the weight of 3/16 in. take the price of 3/16 in. plates, and all extras for width of 3/16 in. plates, as well as gage.

Allowable overweight, whether plates are ordered to gage or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Width

(Applies to plates ¼ in. thick and heavier)

Widths over 100 in. to and including 110 in.	.05c. extra
Widths over 110 in. to and including 115 in.	.10c. extra
Widths over 115 in. to and including 120 in.	.15c. extra
Widths over 120 in. to and including 125 in.	.25c. extra
Widths over 125 in. to and including 130 in.	.50c. extra
Widths over 130 in. to and including 135 in.	1.00c. extra
Widths over 135 in. to and including 140 in.	1.25c. extra
Widths over 140 in.	1.50c. extra

Gages

Gages lighter than ¼ in. to and including 3/16 in. in thin edges up to 72 in. wide, inclusive	.10c. extra
Gages lighter than ¼ in. to and including 3/16 in. on thin edge over 72 in. wide to 84 in. wide, inclusive	.20c. extra
Gages lighter than ¼ in. to and including 3/16 in. on thin edge over 84 in. wide to 96 in. wide inclusive	.30c. extra
Gages lighter than ¼ in. to and including 3/16 in. on thin edge over 96 in. wide to 100 in. wide inclusive	.40c. extra
Gages lighter than ¼ in. to and including 3/16 in. on thin edge over 100 in. wide to 103 in. wide inclusive	.45c. extra

Grades

Pressing steel	.10c. extra
Flange steel (boiler grade)	.15c. extra
Ordinary firebox steel	.20c. extra
Stillbottom steel	.30c. extra
Locomotive firebox steel	.50c. extra
"Marine" steel	1.50c. extra
Material subject to Navy Department inspection..	.10c. extra
High tensile hull steel to U. S. Navy Dept. or equivalent specifications	1.00c. extra
Navy Department boiler steel, Classes A and B.	1.50c. extra

Hull plates to hull specifications required to stand cold flanging take extra for flange steel.

Cutting

Rectangular Plates.

Lengths 3 ft. and over	No extra
Lengths under 3 ft. to 2 ft. inclusive	.25c. extra
Lengths under 2 ft. to 1 ft. inclusive	.50c. extra
Lengths under 1 ft.	1.55c. extra

Regular Sketches

(With not more than four straight cuts—including straight taper plates)

Length 3 ft. and over	.10c. extra

Irregular Sketches

(With more than four straight cuts)

Lengths 3 ft. and over	.20c. extra

Sketches sheared to a radius take circle extras.

Circles

Diameters 3 ft. and over	25 per cent of base price

Half circles take circle extras.

Special.

Wasteful or difficult sketches, including hexagons, octagons, etc., are subject to special extras.

Sketches or circles over 100 in. in width or diameter take width extras in addition to sketch or circle extras.

Sketches cannot be sheared with re-entrant angles.

All sketches, regular, irregular, circular, semicircular or special, with greatest dimension under 3 ft., take length extras shown under rectangular plates, in addition to sketch or circle extra.

For cold sawing such items that cannot be sheared (such as stem bars), extra of 0.25c. will apply.

Floor Plates

Ribbed, diamond, checkered	1.75c. extra

(Floor plates are not furnished to sketch).

Inspection

Charges for Lloyd's inspection or American Bureau of Shipping for buyer's account.

STANDARD CLASSIFICATION OF EXTRAS ON STANDARD STRUCTURAL SHAPES

Extras in cents per pound to be added to base price per pound.

Standard structural beams and channels 3 to 15 in., inc.	Base
Angles, structural sizes, 3 to 6 in. on one or both legs, ¼ in. thick and over	Base
Zees, structural sizes	Base
Standard structural beams, over 15 in.	.10c. extra
Angles, structural sizes, over 6 in. on one or both legs	.10c. extra
Tees, structural sizes, excepting elevator, hand rail, car truck and conductor rail tees	.05c. extra
Bulb beams	.30c. extra
Bulb angles (not including special bulb angles for torpedo boat destroyers)	.30c. extra
Cutting to lengths under 3 ft. to 2 ft. inclusive	.25c. extra
Cutting to length under 2 ft to 1 ft. inclusive	.50c. extra
Cutting to length under 1 ft.	1.55c. extra

No charge for cutting to length 3 ft. and over; all material is subject to the following tolerances.

	Over.	Under.
Beams and channels	⅜ in.	⅜ in.
Angles, tees, zees and other shapes—structural sizes	¾ in.	0 in.
Cold sawing to exact length	.25c. extra	
Material subject to Navy Department inspection..	.10c. extra	
Navy Department high tensile steel	1.00c. extra	

Charges for Lloyd's inspection or American Bureau of Shipping for buyer's account.

Extras on special sections subject to determination.

EXTRAS ON OTHER FORMS OF STEEL

Concrete Reinforcing Bars

Twisted squares	.125c. extra
Deformed sections	.075c. extra

Rivet Rods

Medium steel	Base
High tensile (subject to Navy specifications)	4.05c. extra

Spring Steel

Railway spring steel	.25c. extra
Automobile spring steel	.25c. extra
Open hearth vehicle spring steel.	.25c. extra

(Full extras spring steel card Aug. 20, 1914, for size and cutting, etc.)

Hoop

No. 13 gage and lighter	.60c. extra

(Full extras per hoop card of Jan. 2, 1913, for size, cutting, etc.)

Tire

Iron finish, 1½ x ½ in. and larger	Base
Iron finish under 1½ in. x ½ in.	.15c. extra
Planished and machine straightened	.20c. extra

(Extras per tire card of Sept. 1, 1909, for size and quantity.)

Specifications and Inspection

Material subject to Navy Department inspection..	.10c. extra
Navy Dept. high tensile steel (excepting rivet rods)	1.00c. extra

Charges for Lloyd's inspection or American Bureau of Shipping for buyer's account.

Extras on special sections subject to determination.

Carbon Extras

If specified up to 0.20 per cent.	No extra
If specified 0.21 per cent to 0.50 per cent.	.05c. extra
If specified 0.51 per cent and over.	.15c. extra

Iron and Steel Markets

MAKERS FIXING PRICES

Washington Showing Confidence in Trade

Price Meetings Now in Progress—Further Recessions Toward Expected Levels

Events continue to show that the War Industries Board is taking a minor position in price fixing. A list of extras to apply to bars, shapes and plates has been announced through a subcommittee of the American Iron and Steel Institute, and the general committee of the Institute and its subcommittee chairmen are now in session in New York to settle finally the price question on products not yet fixed. It is doubtful if a conclusion will be reached at the one conference, but the situation now points to a clearing in a matter of days of the atmosphere of uncertainty.

The whole movement indicates that a broad spirit of confidence is reposed in the representatives of the steel makers. The trade may accordingly expect schedules of prices with spreads commensurate with those of the prices already established. Like the extras just promulgated, recognized trade practices will undoubtedly be followed, even to adopting, as in this case, the minor departures which the special demands coming originally from Europe brought into being.

Meanwhile prices have been dropping toward levels which are regarded as marking the new maxima. Blue and box annealed sheets are now obtainable at 3c. per lb. less than in late September and galvanized sheets and tin mill products at 2c. less. Last week cold-rolled strip steel fell from 9c. to 7c. per lb. On Government business, to be sure, but also indicating the tendency, about 4000 tons of rivets were sold at $5 to $7 below regular quotations.

The low rate at which business has been booked for some months and the relative smallness of the specific orders yet given out for ship and shell material have lightened order books. One steel maker expects shortly to be able to take on contracts for the first quarter of 1918 in the finished steel lines for which prices were fixed. What a difference the new conditions impose is shown in a statement that the company has already received complete specifications for fourth quarter business, which averages 4.25c. for bars against 2.90c., the fixed price, and 4.50c. for shapes and 8c. for plates, against 3c. and 3.25c., respectively.

While mills have been able to reach rolling of fourth-quarter commitments, even of plates in some cases, deliveries on new general business will, of course, be upset if the Government begins to call for large quantities. An outside estimate of the structural steel alone to be required for shipbuilding in 1918 is 2,000,000 tons, and the minimum 1,300,000 tons, which compares with slightly over 3,000,000 tons, the country's annual capacity in shapes.

Added to the structural-steel ship needs is 1,500,000 tons of steel shortly to be distributed for 51,000,000 shells, to be turned out naturally as fast as possible, and some of it, of course, on structural rolling mills.

No complaint is heard of the delivery of ship material. In fact, it has reached yards ahead of needs. The labor shortage is the all-important point, and shipbuilders are in session in Washington at this writing, chiefly to discover how they can get the 300,000 men which it is estimated must be had.

Buying of pig iron is not very active on account of the unwillingness of furnaces to take on additional tonnages. As the weeks pass, the scarcity of iron for delivery this year and in the first quarter of next is being emphasized. Southern furnaces are especially conservative. They believe that all the iron which Northern furnaces can possibly furnish will soon be sold, and that then there will be no difficulty in disposing of the Southern product, which in competitive markets would have to be moved at less than the maximum price set. During the past week there has been fair buying of basic, Bessemer and foundry grades in the Pittsburgh district at Government prices.

The coke situation continues to annoy furnace operators, and more of them are in danger of being compelled to bank on account of inadequate supplies. The fuel administrator has agreed to apportion the supply of coke according to the amount of business in hand for the Government.

A conference in Washington on Wednesday, on tin plate, is expected to be followed shortly with an announcement on tin-plate prices. A meeting has been called for Thursday to smooth out the question of steel supplies to the automobile trade.

The United States Steel Corporation's statement for the third-quarter earnings gives a sidelight on the increased cost of doing business. Earnings before deductions on account of income and war taxes were close to $132,000,000, while for the second quarter they had been nearly $145,000,000. A part of this difference covers "allowances for estimated proportion of extraordinary cost of facilities installed by reason of war requirements." The income and war taxes amount to 11½ per cent more than the net income of $55,245,377 after making depreciation charges.

Chicago

CHICAGO, Oct. 29.

In no direction is the market active, except where Government needs are concerned. For the emergency fleet, notable orders for plates and shapes continue to be placed. With plates, shapes and bars, the situation is unchanged with respect to the requirements of ordinary industry, but it is pointed out that the mills are now working into their fourth quarter contracts and some relief for the new buyer may come with the end of the year. As for the mills, they are hampered by the fact that the so-called official prices on the products named obtain only until Jan. 1, and this fact, together with other uncertainties, makes it difficult for them to plan ahead. No more bars at 2.90c. are being offered,

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

	Oct. 31, 1917.	Oct. 24, 1917.	Oct. 3, 1917.	Nov. 1, 1916.
Pig Iron, Per Gross Ton:				
No. 2 X, Philadelphia...	$34.25	$34.25	$34.25	$22.50
No. 2, Valley furnace...	33.00	33.00	33.00	23.00
No. 2 Southern, Cin'ti...	35.90	35.90	....	19.90
No. 2, Birmingham, Ala.	33.00	33.00	....	17.00
No. 2 furnace, Chicago**	33.00	33.00	....	24.00
Basic, del'd, eastern Pa.	33.75	33.75	....	21.50
Basic, Valley furnace...	33.00	33.00	33.00	22.00
Bessemer, Pittsburgh....	37.25	37.25	37.25	26.95
Malleable Bess., Ch'go**	33.00	33.00	....	24.00
Gray forge, Pittsburgh..	32.75	32.75	....	22.95
L. S. charcoal, Chicago..	37.50	37.50	....	20.25
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	....	....	....	$33.00
O.-h. rails, heavy, at mill	....	....	....	35.00
Bess. billets, Pittsburgh..	*$47.50	*$47.50	....	50.00
O.-h. billets, Pittsburgh..	*47.50	*47.50	....	50.00
O.-h. sheet bars, P'gh...	*51.00	*51.00	....	50.00
Forging billets, base, P'gh	....	....	....	75.00
O.-h. billets, Phila.....	....	....	....	50.00
Wire rods, Pittsburgh...	57.00	57.00	....	60.00
Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	4.25	4.25	...	2.659
Iron bars, Pittsburgh...	...	...	...	2.85
Iron bars, Chicago.....	4.50	4.50	...	2.40
Steel bars, Pittsburgh...	2.90	2.90	...	2.75
Steel bars, New York...	3.095	3.095	...	2.919
Tank plates, Pittsburgh..	†*3.25	†*3.25	...	4.00
Tank plates, New York..	...	...	...	4.169
Beams, etc., Pittsburgh..	3.00	3.00	...	2.75
Beams, etc., New York..	3.195	3.195	...	2.869
Skelp, grooved steel, P'gh	*2.90	*2.90	...	2.70
Skelp, sheared steel, P'gh	*3.25	*3.25	...	2.80
Steel hoops, Pittsburgh..	...	...	...	3.00

*Agreed prices. †As yet only a few sales made.

**The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

	Oct. 31, 1917.	Oct. 24, 1917.	Oct. 3, 1917.	Nov. 1, 1916.
Sheets, Nails and Wire, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh	...	...	...	3.40
Sheets, galv., No. 28, P'gh	...	...	...	4.90
Wire nails, Pittsburgh..	...	...	...	2.70
Cut nails, Pittsburgh....	...	...	...	2.70
Fence wire, base, P'gh..	...	...	...	2.65
Barb wire, galv., P'gh...	...	...	...	3.55
Old Materials, Per Gross Ton:				
Iron rails, Chicago.....	*$34.00*	$36.00	$36.00	$22.00
Iron rails, Philadelphia.	38.00	38.00	43.00	21.00
Carwheels, Chicago.....	26.00	26.00	24.00	16.00
Carwheels, Philadelphia.	29.00	29.00	29.00	16.50
Heavy steel scrap, P'gh.	27.00	27.00	33.00	19.00
Heavy steel scrap, Phila.	25.00	25.00	25.00	16.50
Heavy steel scrap, Ch'go.	26.00	26.00	27.00	18.75
No. 1 cast, Pittsburgh...	27.00	27.00	30.00	16.00
No. 1 cast, Philadelphia.	28.00	28.00	28.00	16.75
No. 1 cast, Ch'go (net ton)	20.00	20.00	21.00	14.75
No. 1 RR. wrot, Phila...	35.00	35.00	43.00	23.00
No. 1 RR wrot, Ch'go (net)	28.50	28.50	30.00	19.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	$6.00	$6.00	$6.00	$7.50
Furnace coke, future....	6.00	6.00	6.00	4.00
Foundry coke, prompt...	†*6.00	†*6.00	...	7.00
Foundry coke, future....	†*6.00	†*6.00	...	4.50
Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.	23.50	23.50	23.50	29.00
Electrolytic copper, N. Y.	23.50	23.50	23.50	28.50
Spelter, St. Louis.....	*7.75*	8.00	8.12½	10.37½
Spelter, New York.....	*8.00*	8.25	8.37½	10.62½
Lead, St. Louis.....	*5.62½*	6.12½	7.82½	6.90
Lead, New York.....	*5.75*	6.25	7.95	7.00
Tin, New York.....	**66.00**	61.62½	60.50	41.87½
Antimony (Asiatic), N. Y.	*14.25*	14.75	15.00	13.00
Tin plate, 100-lb. box, P'gh	....	....	....	$5.75

presumably because the mills have not got them to offer. Rail carbon bars are quoted at 4c., Chicago, and higher, and are quiet, largely because of the uncertainty surrounding re-rolling rails. Consumers are hoping that the Government will readjust scrap prices, but many of the dealers are averse to this being done, believing that the prices will automatically arrive at their proper levels when prices for finished products are fixed. In the absence of definite price announcements, sheets are weak and uncertain. From Washington it is reported that prior to Sept. 1, 1918, the ordnance department of the army alone will require 1,500,000 tons of shell steel, and the question arises how far this will detract from production in other directions. Similar thoughts have arisen, of course, with regard to all of the Government's gigantic requirements. Though the volume of sales has not been large, and the market as a whole is quiet, the pig iron market is being more firmly established on the basis of $33, furnace, for foundry iron. Dealers report that the old material market is hardening, also that the mills are sounding the situation, but the fact remains that consumers have not yet started to buy.

Ferroalloys.—The market is quiet, and prices soft at $275 quoted for next year and $300 for this, although it is probable that the lower price would secure delivery this year, also. For 10 per cent Bessemer ferrosilicon, $57.50, furnace, is quoted, and for 11 per cent, $61.50, delivery next year. An inquiry for 500 tons of Bessemer ferrosilicon, 1918 delivery, is before the trade.

Plates.—No change of moment can be reported, the makers continuing to point out their sold-up condition so far as this year is concerned, while the Government demands are looming up greater than ever. It is reported that one lot was sold on the basis of 4.50c., Pittsburgh, domestic bill of lading, although it was understood that it was for export to a neutral country. Another lot is reported to have been sold for Japanese delivery on the basis of 3.25c., Pittsburgh, the official price. The most reassuring thing about the plate situation is that the mills are now working out of their fourth quarter contracts and plates may be more easily obtainable after Jan. 1, but, on the other hand, it is expected that some material, the export of which has been held up by Government order, may be released for foreign delivery. A new 160-in. sheared-plate mill at the Gary works of the Illinois Steel Co. has been completed and it will soon be in commission on Government orders.

For material out of warehouse the quotation is 7c.

Pig Iron.—Taken as a whole, business is light, but some sales have resulted from what inquiry has come out, all of it on the basis of so-called Government prices. Re-sale foundry iron in consumers' hands has almost disappeared, but enough has been available to permit of small sales from day to day. Small lots of Southern iron have been sold at $33, Birmingham, or $37, Chicago. The principal Northern producer has no iron to offer this side of next February, in which month a new furnace goes in. Orders have been booked against this new source at prices based on the official figures. A Milwaukee consumer has taken 1000 tons of standard Bessemer at $36.30, furnace, this price carrying the agreed differential of 10 per cent or $3.30 over No. 2 foundry or basic. Some off basic has sold as low as $28, delivered, in this market. A Chicago foundry is inquiring for 2000 tons of No. 2 for next year, and a plow manufacturer wants 500 tons of high silicon iron for this year. No sales in malleable Bessemer are reported. Most of the large consumers are covered for this year and the first half of next, the current inquiry coming mostly from the smaller melters who want prompt iron. A Southern producer is offering No. 3 at $32.50, furnace, and some No. 4 at $32.25, both these prices being predicated on the official base; shipments to be in the last three months of this year. Much difference of opinion—it is all guesswork—exists as to what action on pig iron the Government will take at the end of this year when the present price agree-

ment expires. It is predicted that if the base price is lowered, some of the smaller furnaces which are not self-contained will be forced out of business. At the same time, some buyers feel that a reduction is so probable that they hesitate about buying into next year at present prices. Some Lake Superior charcoal, but not a great deal, has been placed at the base price of $35.50, f.o.b. furnace. A Jackson County, Ohio, producer of silvery has authorized his agent here to dispose of silvery grades, delivery next year, on the basis of $43, furnace, for 7 per cent silicon, each unit of silicon over or under being figured at $3, this making 6 per cent $40, 8 per cent $46, etc. For 10 per cent, $52.50 is asked. Nothing is said of prompt deliveries. These prices take a freight rate of $2.54 to Chicago. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 1 to 4	*$37.50
Lake Superior charcoal, Nos. 5 and 6 and Scotch	*40.00
Northern coke foundry, No. 1	†33.50
Northern coke foundry, No. 2	*33.00
Northern coke foundry, No. 3	†32.50
Northern high-phosphorus foundry	†33.00
Southern coke No. 1 foundry and 1 soft	†37.50
Southern coke No. 2 foundry and 2 soft	*37.00
Malleable Bessemer	†33.00
Basic	*33.00
Low-phosphorus	†58.00
Silvery, 7 per cent	†45.54

*Agreed prices at which sales have been made.
†Agreed prices—sales not reported.
Note.—All sales limited in volume.

Structural Material.—After Jan. 1, next, some relief may come to consumers of shapes, but until that time there does not seem to be much hope, not only because of the overloaded condition of the mills, but because of the steady demands of the Government for both shapes and plates required for the creation of the emergency fleet. Therefore the Government price of 3c. may well be called theoretical. No structural lettings are announced. The Illinois Central Railroad has placed 500 hopper cars, and is in the market for 1000 70-ton gondolas.

For material out of warehouse the quotation is unchanged at 5c.

Bars.—Makers of rail carbon bars, who continue to quote 4c. to 4.50c., Chicago, are keenly interested in the proposed Government price-fixing of scrap, inasmuch as their raw material consists of rerolling rails. An Eastern mill, which recently sold some hard steel bars at 2.90c. has no more to offer at present, but expects to come in the market again on the same basis. Very little is being done and this situation will continue until some definite steps are taken to fix the price of rerollers. Bar iron is quiet at 4.50c., Chicago. None of the mills is offering mild steel bars, having none to sell for this year's delivery.

We quote warehouse prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c.; reinforcing bars, 4.50c. base, with 5c. extra for twisting sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Sheets.—The much delayed "Government" prices have not yet appeared; meanwhile buyers and sellers are puzzled. The mills, however, appear to want business despite recent Government orders. One will take a limited tonnage at a price to be determined later. A good tonnage has been placed at 5c., Pittsburgh, for No. 28 black, this price being acceptable where a buyer refused to accept a tentative price subject to revision when some agreed price was reached by producers and the Government. It may be that some definite price information will follow a meeting of the sheet interests at Pittsburgh to-morrow. Blue annealed (No. 10) are quoted at 5.50c. to 6c., Pittsburgh; No. 28 black at 6c., and No. 28 galvanized at 7.50c. to 8c., Pittsburgh, each taking a freight rate of 21.5c. Jobbers have reduced their prices on sheets out of warehouse.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 8c.; No. 28 black, 8.50c.; and No. 28 galvanized, 9.50c.

Bolts and Nuts.—No price changes are reported. Specifications against contracts are more active, and consumers, including two or three railroads, are inquiring for 1918 delivery. They would like to buy at a lower level than now prevails, but so far the makers see no justification for lowering their quotations. They find it a troublesome matter to get sufficient bars and rods wherewith to make their products. For prices and freight rates see finished iron and steel, f.o.b. Pittsburgh, page 1091.

Store prices are as follows: Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to ⅞ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to ⅞ x 6 in., 40-2½; larger sizes, 30-5; hot pressed nuts, square, $2, and hexagon $2 off per 100 lb.; lag screws, 50 per cent off.

Cast-Iron Pipe.—Langdon, N. D., is expected to let 250 tons to-day, and Kansas City, Kan., will let an equal quantity to-morrow, these 500 tons about summing up the situation. Quotations are unchanged.

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., $53.50; 6 in. and larger, $50.50, with $1 extra for class A water pipe and gas pipe.

Wire Products.—As was expected, the leading interest has advanced its quotations, now naming 3.50c. instead of 3.20c., Pittsburgh, for nails, as its base. The new quotations, on this basis, are as follows: Plain fence wire, 3.25c.; painted barb wire, 3.65c.; galvanized barb wire, 4.35c.; polished staples, 3.65c., and galvanized staples, 4.35c., all Pittsburgh. In the past few days, demand for barb wire for farm use has been especially active. Independent makers continue to quote on the basis of 4c., Pittsburgh, for nails. We quote their prices to jobbers, per 100 lb., as follows:

Plain fence wire, Nos. 6 to 9, base, $4.189; wire nails, $4.189; painted barb wire, $4.339; galvanized barb wire, $5.039; polished staples, $4.339; galvanized staples, $5.039; all Chicago carload lots.

Old Material.—Dealers feel that the market is stronger, probably because they realize that certain needs of the mills are becoming acute. That the latter is true is indicated in part by the fact that consumers are casting around for information, but as yet there is no active trading. Activity appears to be held up pending determination as to what, if any, agreement will be reached between the dealers and the War Industries Board, altogether a puzzling proposition, some interests asserting that prices will be officially fixed, others that they will be left to adjust themselves. Whether or not a price agreement is reached, the mills must sooner or later enter the market. The proposal that heavy melting steel be officially put at $30 is not favorably regarded except by the scrap interests. A fair-sized list issued by the Rock Island was closed to-day, this being the only one reported. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$34.00 to $35.00
Relaying rails	50.00 to 55.00
Old carwheels	26.00 to 27.00
Old steel rails, rerolling	34.00 to 35.00
Old steel rails, less than 3 ft.	31.50 to 32.50
Heavy melting steel scrap	26.00 to 27.00
Frogs, switches and guards, cut apart	26.00 to 27.00
Shoveling steel	23.50 to 24.00
Steel axle turnings	19.00 to 20.00

Per Net Ton

Iron angles and splice bars	$33.00 to $34.00
Iron arch bars and transoms	34.00 to 35.00
Steel angle bars	23.00 to 24.00
Iron car axles	40.00 to 41.00
Steel car axles	40.00 to 41.00
No. 1 railroad wrought	30.50 to 31.50
No. 2 railroad wrought	28.00 to 29.00
Cut forge	26.00 to 27.00
Pipes and flues	17.50 to 18.50
No. 1 busheling	20.50 to 21.50
No. 2 busheling	14.50 to 15.50
Steel knuckles and couplers	29.00 to 30.00
Coil springs	35.00 to 36.00
No. 1 boilers, cut to sheets and rings	17.00 to 18.00
Boiler punchings	29.00 to 30.00
Locomotive tires, smooth	31.00 to 32.00
Machine-shop turnings	15.00 to 15.50
Cast borings	14.25 to 15.25
No. 1 cast scrap	20.00 to 21.00
Stove plate and light cast scrap	15.50 to 16.50
Grate bars	14.50 to 15.50
Brake shoes	15.00 to 16.00
Railroad malleable	24.00 to 25.00
Agricultural malleable	20.00 to 21.00
Country mixed scrap	15.50 to 16.50

Rails and Track Supplies.—Authorities in close touch with the railroads and their needs are deeply concerned over the extent to which the roads need supplies and equipment and the scanty supply there is wherewith to serve them. It is predicted that the Government may yet have to take a hand in securing for them material with which they may keep themselves in a position to handle the traffic imposed on them by the war. We quote more or less nominal prices as follows:

Standard railroad spikes, 4.50c. to 5.25c., base; small spikes, 4.75c. to 5.50c., base; track bolts with square nuts, 5.50c. to 6c., all in carloads, Chicago; tie plates, $70 to $90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base (nominal); open hearth, $40 (nominal); light rails, 25 to 45 lb., $70; 16 to 20 lb., $71; 12 lb., $72; 8 lb., $73; angle bars, 3.25c., base.

Philadelphia

PHILADELPHIA, Oct. 30.

An increasing number of transactions in finished steel at the Government prices is noted in this market. A leading producer of structural shapes has not only been accepting business, but has been soliciting it, promising deliveries of moderate tonnages in two to four months at the 3c. price. Another Eastern steel company, with sales office here, will begin accepting contracts in a week or ten days for delivery of plates, shapes and steel bars in the first quarter of 1918 at the fixed prices. This company has just received complete specifications for fourth quarter from its customers, and reports not a single cancellation, though its shipments will average about 4.25c. for bars, 4.50c. for shapes and 8c. for plates, Pittsburgh. There is no activity as yet in semi-finished material, on which new prices were recently announced. Apparently authentic reports are heard of business being done in finished material at premium prices, though it is not clear that any of the mills which agreed on prices with the Government have been a party to such selling. Steel men here declare the time has come for the Government to insist upon every one in the iron and steel trade doing his full duty in upholding the war program, and it is broadly hinted that companies which have adopted an unpatriotic policy will hear from Washington. It is no secret that a majority of the steel companies would prefer to follow the Government program willingly than to be placed under such control as would be exercised if the Pomerene bill were passed.

Pig Iron.—The pig iron market here is described as being as nearly normal as could be expected under the circumstances. There is no large volume of buying either for prompt or forward delivery, but a fair number of small tonnages for delivery over the remainder of the year have been booked during the past week, mostly in foundry grades, and there is a good inquiry for next year. The trade is awaiting anxiously the expected announcement from Washington on the differentials to be charged above and below the $33 base price, which may come at any time. The suggestions of the pig iron producers, as conveyed to the War Industries Board by the committee of the American Iron and Steel Institute, have caused discussion in Washington, and the sellers here give credence to reports that members of the War Industries Board have objected to some of the differentials as being too high. A reduction of $5 per ton in the prices of low phosphorus iron, which were fixed in the recommendations at $53 and $58 for copper bearing and copper free, respectively, is suggested as probable. The differentials tentatively established on foundry grades were criticised also, it is learned, and the War Industries Board may suggest a reduction from $1 to 50c. per half unit; that is to say, iron analyzing 2.75 to 3.25 per cent silicon would be fixed at $1 above the base price, or $34, instead of $34.50, as suggested by the producers. Orders which have been placed recently by the Navy Department have been on the basis of a 50c. differential for each half unit above 1.75 to 2.25 per cent silicon, the standard fixed for No. 2 foundry. It is said that producers of foundry grades which run low in silicon and low in sulphur maintain that they should not be compelled to accept a price below the $33 base price, their contention being based on the fact that sometimes a coke iron analyzing low in silicon and sulphur is acceptable by certain melters—car wheel makers, for example—as a substitute for some grades of charcoal iron which, under the tentative schedule were to bring higher prices, warm blast Lake Superior charcoal iron having been tentatively fixed at $35.50. It is said that a few contracts for pig iron have been placed in this market, with a clause providing that the price will be revised to meet any change which the Government may make on Jan. 1, next, but some sellers insist that with this clause omitted contracts made now for next year's delivery must stand regardless of any change in the Government price. Pressure is said to have been brought to bear in Washington by several makers of finished steel for a lower price on pig iron Jan. 1, or higher prices on steel, particularly plates. Sales of low phosphorus iron, while not numerous, have been made in a few instances at a tentative price, later to be revised to the price the Government fixes. We quote the following standard grades at furnace; to these prices the freight rate to destination should be added:

Eastern Penna. No. 2 X	*$33.50
Eastern Penna. No. 2 foundry	33.00
Virginia No. 2 X	*33.50
Virginia No. 2 foundry	33.00
Basic	33.00
Gray forge	*32.00
Bessemer	*36.30

*Subject to revision.

Ferroalloys.—Very little business in ferromanganese is being done in this market, hence it is difficult to quote a price. There are reports of small tonnages at $250 to $260. Spiegeleisen has been sold recently at $75, furnace, but there is no doubt $67.50 to $70, furnace, could be done. One lot of 1000 tons is offered here at $70.

Coke.—The coke situation shows no material improvement, though small lots of furnace coke for prompt delivery have been sold in the past week at $6, ovens. A coke maker who declined to ship coke at $6 to a customer who had a contract for a specified quantity each month at the current market price has been ordered by the Fuel Administration to fulfill his contract. A few small lots of foundry coke have been sold for 1918 delivery at a tentative price of $7 per ton at ovens, this price to be revised, if necessary, to conform to the Government price announcement.

Sheets.—Competition for business and the expectation of an announcement in Washington of fixed prices on sheets has been driving prices down. To-day several large consumers were quoted 6c. to 6.25c. base, Pittsburgh, on blue annealed and black sheets and 7c. to 7.50c. on galvanized. A few makers have accepted orders at going market prices, with the proviso that when the Government announcement is made any unfilled tonnage will be delivered at the new price. Deliveries on mill rollings are being promised in four to six weeks. A leading seller of sheets reports a brisk demand for small lots and offerings on its stock sheets bring quick response, indicating that many consumers are going along from hand to mouth until the price is fixed.

Finished Steel.—More business is being done at the Government prices, especially in shapes. A leading producer of shapes has been actively soliciting business in the past week, offering small tonnages, say 100 to 200 tons, for delivery in two to four months, from mill rollings. In most instances, these rollings are worked in with Government orders. It has been and will continue to be this company's policy not to contract more than a few months ahead, and its sales will undoubtedly relieve the building situation to a small extent. An Eastern steel company, with sales office here, will open its books in a week or 10 days for orders for first quarter delivery at the Government prices. This company has required its specifications for fourth quarter to be in its hands by Nov. 1 and reports that there was not a single cancellation, though much of its business was taken at 4.25c. for steel bars, 4.50c. for shapes and 8c., Pittsburgh, for plates. Other companies are now considering what they may be able to do next year for their regular contract customers. One com-

pany says it may be able to award such customers only 25 to 50 per cent of their regular specifications. It is apparent that there will be less of a tendency to contract ahead for next year, not only because of the sold-up condition of the mills and the uncertainty as to extent of Government demands, but because of the mills' experience in the past year, when customers, with low-priced contracts, specified so heavily on a rising market that it proved an embarrassment to the producers. Reports that are apparently authentic are heard that fair tonnages of plates have been sold at 7c. to 8c., Pittsburgh, for prompt delivery. These plates were sold to Japan, but on account of the embargo cannot be shipped. Warehouses are doing an abnormal business in all lines of finished steel, but it is declared that when their present contracts are run out, many of them may not find it possible to keep up their stocks. Large prospective orders from the Emergency Fleet Corporation are now being received, with more to follow, and a majority of the mills will be so fully occupied with these rollings that they will have barely enough left to take care of commercial business now on their books, and deliveries on some of the latter material may be postponed. Several selling offices here state they are not at all disposed to consider any new business for nearby or forward delivery at the present time. This applies particularly to plates, shapes and bars. Concrete bars and special alloy bars are to be had in some instances for fairly prompt delivery. The Belmont Iron Works received the contract for fabricating 1500 tons of structural material for the Watertown Arsenal.

Old Material.—Dealers in iron and steel scrap who attended the meeting of the American Board of Scrap Dealers in Pittsburgh last week returned to their offices resolved to do everything possible to co-operate with the American Railway Association in reducing losses in time and efficiency from frequent re-consignment of cars. It is estimated that 15,000 cars are in constant use for the transportation of iron and steel scrap, and by careful methods it is believed that this number can be reduced to 10,000. One who attended the Pittsburgh meeting says that only by the patriotic co-operation of the trade can drastic embargoes by the railroads be prevented. A bureau will be opened in the office of C. A. Barnes, Widener Building, secretary of the association, for the inspection of rejected material, and it will be the aim of this bureau to prevent more than one re-consignment of rejected cars. Business is almost at a standstill, some sales, however, being made to brokers who have orders to fill. The probability that if the Government fixes prices, they will not be lower than on the basis of $30 per ton for No. 1 heavy melting steel has, to a certain extent, stiffened the views of those having stocks on hand. Mills have offered $25 for melting steel, but apparently without success. A few sales have been made at about $28. The prices quoted below for delivery in the Philadelphia market are more or less nominal and represent the views of dealers rather than actual sales:

No. 1 heavy melting steel	$25.00 to $30.00
Steel rails, re-rolling	38.00 to 40.00
Low phosphorus heavy melting	35.00 to 38.00
Old iron rails	38.00 to 40.00
Old carwheels	29.00 to 31.00
No. 1 railroad wrought	35.00 to 40.00
No. 1 forge fire	22.00 to 23.00
Bundled sheets	22.00 to 23.00
No. 2 busheling	15.00 to 16.00
Machine shop turning (for blast furnace use)	15.00 to 16.00
Machine shop turnings (for rolling mill use)	18.00 to 20.00
Cast borings (for blast furnace use)	15.00 to 16.00
Cast borings (clean)	20.00 to 22.00
No. 1 cast	28.00 to 30.00
Grate bars	20.00 to 22.00
Stove plate	20.00 to 22.00
Railroad malleable	32.50 to 35.00
Wrought iron and soft steel pipes and tubes (new specifications)	28.00 to 30.00

Billets, Slabs, Etc.—So far as can be learned no sales of billets, slabs, sheet bars or wire rods have been made in this market since the new Government prices were announced.

Bar Iron.—A few small mills in this district which were selling bar iron as low as 4.25c., Pittsburgh, for delivery over the remainder of this year and into next year have apparently taken all of the orders they can conveniently handle, and the larger producers continue to book business at prices ranging from 4.75c. to 5c., Pittsburgh, with occasionally a price as low as 4.50c. being heard. A fair volume of business is being done.

Cleveland

CLEVELAND, Oct. 30.

Iron Ore.—Heavy snow storms and low temperature interfered seriously with shipments from the head of the Lakes the past week. The loading of boats has been delayed by frozen ore and vessels have been kept in shelter for some time waiting for better weather. Other delays having occurred during the month because of storms, it is probable that October shipments will show some falling off as compared with September. Boats are behind on the shipping schedules worked out by the sub-committee of the Council of National Defense, but if weather conditions are normal during November it is expected that consumers will be supplied with enough ore to cover their requirements until the opening of the 1918 season of navigation. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, $5.95; old range non-Bessemer, $5.20; Mesaba Bessemer, $5.70; Mesaba non-Bessemer, $5.05.

Pig Iron.—The demand for foundry iron for the first half of 1918 in lots up to 1000 tons continues fairly active and some orders for malleable iron are being booked for the same delivery. There is also some demand for both grades for November and December shipment, part coming from consumers unable to get shipments on regular contracts as fast as needed. Iron for this year's delivery is scarce and sellers could doubtless get premium prices for early shipment were they disposed to sell at higher than the Government prices. In fact, one consumer who has an inquiry out for 1000 tons of malleable iron for this year's delivery has virtually offered $10 per ton above the Government price for this iron. Sellers, however, will not sell any iron that they have left at prices higher than those fixed by the Government. Requirements of the Emergency Fleet Corporation are being tabulated and several thousand tons are expected to be required from this source shortly. The Southern iron market, which has been inactive since the Government regulation of prices, has taken on some life and several sales are reported for early shipment at regular prices. A sanitary interest has purchased 3000 tons of No. 1 Tennessee iron at $34.50, Birmingham. As Southern iron is shut out of price competition with Northern iron in this territory, all sales reported have been made to consumers who either use Southern iron exclusively or need it in their mixtures. The first sales of Ohio silvery iron since the Government regulation of prices were made during the week, orders for several lots of 8 per cent silvery, mostly for the first half delivery, being taken at the Government price of $46, at furnace. We quote, delivered Cleveland, as follows:

Bessemer	$37.25
Basic	33 30
Northern No. 2 foundry	33.30
Southern No. 2 foundry	37.00
Gray forge	32.30
Ohio silvery, 7 per cent silicon	44.62
Standard low phos., Valley furnace	58.00

Coke.—Foundry coke is in good demand for early shipment and some foundries are having trouble in getting a sufficient supply to keep running. This scarcity is also threatening to curtail production in two steel foundries engaged largely in Government work. Producers are so well sold up that but little coke is being offered for early shipment. We note the sale of 10,000 tons of standard Connellsville foundry coke for delivery through 1918 at $6 per net ton at oven, subject to price revision should the Government change present prices.

Finished Iron and Steel.—The demand for steel for Government work has increased, and a great deal of inquiry is coming from consumers for contracts for the first quarter and first half of next year, mostly for steel bars. While mills generally so far have declined to take contracts, consumers are now showing anxiety to

get under cover and it is expected that several mills will open their books to their regular trade within the next week or two for such tonnage as they will have to offer at the 2.90c. price for bars, the price not to be subject to revision should the Government fix a lower price Jan. 1. An Ohio maker of spark plugs who was inquiring a few days ago for 10,000 tons of steel bars for the first half is understood to have succeeded so far in placing only 2000 tons. An Ohio mill is now offering Bessemer steel bars for early shipment at 2.90c. In spite of reports of sales of hard steel bars in other localities at 2.90c., these are being sold in this territory at 3.60c. to 3.75c., or slightly lower than recent prices. Plates have eased off about $10 per ton in the local market for early shipment, now being quoted at 6.50c., Pittsburgh. New inquiries include one from France for 3000 tons. There is considerable inquiry for forging billets, for which mills are quoting $90. An inquiry for 6000 tons of forging billets for automobile axles for Government trucks is still pending. Among new inquiries for Government work is one for 500 tons of steel for ties for portable track and another for 1000 tons of tire steel for army wagons. The demand for bar iron is inactive and two local mills have been only partially operated for the past two weeks. The price of bar iron is unchanged at 4.50c., Pittsburgh. There is good inquiry for sheets, and the volume of sales has improved now that it is the general belief that sheet prices will not be fixed by the Government. Black sheets are quoted at 6c. to 7c., Pittsburgh, for No. 28, and there is a wide range of from 5.50c. to 7c. in quotations on No. 10 blue annealed. On galvanized sheets the market at present is fairly well established at 7.50c., although some mills are asking 8c. for No. 28. Consumers are anxious to cover for first quarter requirements but mills generally are declining to quote for that delivery, although one mill has made a quotation of 6c. for black sheets for the first quarter. Mills report that consumers are rather slow in taking sheet tonnage bought at the high prices recently prevailing. Warehouse prices are unchanged at 4.50c. for steel bars, 7c. for plates and 5c. for structural material.

Bolts, Nuts and Rivets.—The Government placed orders the past week for about 4000 tons of rivets, the bulk of the business going to Cleveland rivet makers and at prices from $5 to $7 per ton below regular quotations. Some of this business is understood to have been placed on a conversion basis. A new inquiry has come from shipyards for 6000 tons of rivets for 40 boats for the Emergency Fleet. The demand for bolts and nuts is heavy, being largely for Government work. Much of the Government business is special and makers are quoting on each inquiry according to the specifications. It is now generally understood that there will be no Government regulation of either rivet or bolt and nut prices. Rivet prices to the trade are unchanged at 5.25c., Pittsburgh, for structural and 5.35c. for boiler rivets. Bolt and nut discounts, subject to further discouts of 5 to 10 per cent for round lot orders, are as follows:

Common carriage bolts, ¾ x 6 in., smaller or shorter, rolled thread, 35 off; cut thread, 30 and 5, larger or longer, 20. Machine bolts, with h. p. nuts, ⅝ x 4 in., smaller or shorter, rolled thread, 40; cut thread, 35; larger and longer, 25. Lag bolts, cone point, 40. Square h. p. nuts, blank, $1.90 off list; tapped, $1.70 off list. Hexagon, h. p. nuts, blank, $1.70 off; tapped, $1.50 off. C. p. c. and t. hexagon nuts, all sizes, blank, $1.25 off; tapped, $1 off. Cold pressed semi-finished hexagon nuts, 50 and 5 off.

Old Material.—Information is being passed around in the scrap trade and given general credence that the Government will not regulate scrap prices if they remain around the present levels or ar not advanced to the extent of bringing heavy melting steel to about the same level as pig-iron prices. The market is inactive and weak. Mills are still well supplied, so that there is no demand from consumers. However, there is some trading between dealers who are still covering on old sales. Dealers are engaged in looking after their old orders and are not making efforts to secure new ones from the mills, although some are making price concessions to move small lots of scrap quickly. Heavy melting steel is reported to have been sold as low as $26 but some sales are said to have been made at $28. Sales of grate bars and stove plate are reported at $16. Dealers' prices, f.o.b., Cleveland, are as follows:

	Per Gross Ton	
Steel rails	$26.00 to	$27.00
Steel rails, rerolling	36.00 to	37.00
Steel rails, under 3 ft.	30.00 to	31.00
Iron rails	35.00 to	36.00
Steel car axles	45.00 to	46.00
Heavy melting steel	27.00 to	28.00
Carwheels	26.50 to	27.50
Relaying rails, 50 lb. and over	50.00 to	60.00
Agricultural malleable	22.00 to	23.00
Railroad malleable	27.00 to	28.00
Steel axle turnings	21.00 to	22.00
Light bundled sheet scrap	20.00 to	20.50
	Per Net Ton	
Iron car axles	$44.00 to	$45.00
Cast borings	16.75 to	17.25
Iron and steel turnings and drillings	16.00 to	16.75
No. 1 busheling	22.00 to	23.00
No. 1 railroad wrought	34.00 to	35.00
No. 1 cast	23.00 to	23.50
Railroad grate bars	16.00 to	17.00
Stove plate	16.00 to	17.00

Cincinnati

CINCINNATI, Oct. 30. (*By Wire*)

Pig Iron.—An Indiana melter wants 2000 tons of foundry iron for delivery during the next eight months. A number of small inquiries are out for first half shipment, but very few orders have been booked the past week. As far as this year's delivery is concerned, the Northern and Southern furnaces have practically no iron to offer, and there is very little to be obtained in Virginia with the exception of some high silicon and manganese iron. A few foundry melters have purchased small tonnages of this special iron to enable them to increase the percentage of scrap used. There is some demand for the Ohio silvery irons, but no definite prices have been fixed, and only a few carload transactions have been reported lately. It is generally conceded that $33 at furnace represents the price on No. 2 foundry in all districts. Only a few furnaces in the South are able to take on any business for the last quarter, and the majority of them claim that their order books are fairly well filled for the first half of next year. Very little malleable iron is to be had, and melters have not yet been able to reach an agreement with producers as to what price should be charged. The general opinion now is that the Government, before taking any further definite steps, is permitting the seller and buyer to reach some agreement themselves as to differentials between grades. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, prices as follows:

Southern coke, No. 2 f'dry and 2 soft	$33.00
Southern Ohio coke, No. 2	33.00
Basic, Northern	33.00

(*By Mail*)

Finished Material.—An advance on wire nails of 30c. per keg made by a leading producer has not yet affected the local market, although it is freely predicted that the jobbers' price of $3.90 per keg, base, will soon be marked up. However, there is not much of a demand for nails from any source. Barb wire is also quiet, and the store price is $5 per 100 lb. Structural shapes are now firm at 5.15c. and steel bars at 4.65c. Flat bars, 2 x 1 in. and heavier, and also rounds 3 in. in diameter and over are quoted at 5c. Plates are unchanged at 7c., although very little business is reported. A radical reduction has been made on No. 10 blue annealed sheets that are now quoted from stock at 8c., base. The nominal quotation made by nearby mills on No. 28 black sheets is 7.65c., and on No. 28 galvanized 9.15c. Shipments are being urged forward by contractors of galvanized sheets at such a rate that it is extremely difficult for either jobbers or the mills to take on any new business for this year's delivery.

Coke.—Inquiries sent to Pittsburgh representatives for Connellsville foundry coke to be shipped this year are invariably returned with the information that no furnace or foundry coke can be obtained in that district at the Government's price of $6 at oven. It is stated on good authority that the ovens in all the producing districts are operating now at only 60 to 65 per cent capacity, which is just about sufficient to take care of contracts. The situation has not yet become acute with

local foundry users, but unless there is some change at an early date, a number of nearby plants may be compelled to shut down for want of fuel.

Old Material.—Careful estimates of the amount of business being done at the present time shows that the record is far below any similar period at this time of the year for a long time past. The dealers are naturally somewhat apprehensive as to what effect the proposed Government regulation will have on prices and they are buying very little scrap of any kind. Melters who need scrap iron for their different mixtures are only willing to purchase carload lots and at bargain prices. The figures given below are as close to the general average as can be obtained, but some of the quotations are necessarily only nominal. The following are dealers' prices, f.o.b. cars, southern Ohio and Cincinnati:

	Per Gross Ton
Bundled sheet scrap	$17.50 to $18.00
Old iron rails	32.00 to 32.50
Relaying rails, 50 lb. and up	44.00 to 44.50
Rerolling steel rails	33.00 to 33.50
Heavy melting steel scrap	24.50 to 25.00
Steel rails for melting	24.50 to 25.00
Old carwheels	25.00 to 25.50

	Per Net Ton
No. 1 railroad wrought	$27.50 to $28.00
Cast borings	12.00 to 12.50
Steel turnings	12.00 to 12.50
Railroad cast	18.50 to 19.00
No. 1 machinery cast	22.50 to 23.00
Burnt scrap	13.00 to 13.50
Iron axles	40.00 to 40.50
Locomotive tires (smooth inside)	33.50 to 34.00
Pipes and flues	15.50 to 16.00
Malleable cast	19.00 to 19.50
Railroad tank and sheet	14.00 to 14.50

Birmingham

BIRMINGHAM, Oct. 29.

Pig iron producers are making little effort to sell their make, and delays in contracts are being noted throughout the district. Many old contracts are being worked on, and, it is stated, several months will be necessary to complete some of them. The spot market is inactive, except for a few sales being made to old customers of certain companies. The prices are those fixed by the Government. That manufacturers are not making any effort to sell their make is due, they assert, to the fact that they believe they will have a ready market when the opportunity comes. And they do not expect this opportunity for two or three months. Producers here declare that Northern furnaces, selling at the Government prices, will soon be sold out, and the Southern market will come into its own. Production is showing an increase. The Shelby Iron Co. has started two new furnaces, and the Little Belle furnace, relined and the capacity tripled, was blown in this week. Other companies announce tentative increases in production, and the prediction is made that November will witness the greatest output of any month this year. Steel production in the district is being pushed to the limit, and every ton is sold far in advance. The Tennessee company is pushing with all rapidity its new Fairfield works, but no prediction is made as to when it will be producing shapes and bars. Some rails and other shapes for domestic purposes are being rolled at the local mills, but the greater part of the production is for the Government and for the Allies.

Old Material.—The old material market is very quiet, and prices remain unchanged, as follows:

Old steel axles	$32.00 to $33.00
Old steel rails	24.00 to 25.00
No. 1 wrought	26.00 to 27.00
Heavy melting steel	20.50 to 21.50
No. 1 machinery	23.50 to 24.50
Car wheels	23.00 to 24.00
Train carwheels	20.00 to 21.00
Stove plate	18.00 to 19.00
Shop turnings	11.00 to 12.00

Coke.—The coke production in the district is good. Coke producers insist that the Government price of $6, Connellsville, does not affect this district, and it is understood that not a few spot sales have been made at prices nearly, if not quite, as good as those prevailing before the announcement of Government regulation some weeks ago. However, practically none of the coke-makers is taking on any new contracts, due to uncertainty regarding this phase of the situation. In the meantime every effort is being concentrated on production, and it is declared that less coal production is the only thing that could cause a coke curtailment.

San Francisco

SAN FRANCISCO, Oct. 23.

The uncertainty as to the full effect of the Government regulation of prices is apparently as great as ever and serves to keep the local market in a very unsettled condition. A number of jobbers and mill agents have practically withdrawn from the market, and there is a general disinclination to name prices. Others who are still taking orders are doing so conditionally, and firm quotations are hard to get except for immediate delivery out of jobbers' stocks. As all the mills are sold far in advance, there is little prospect that steel will be delivered here at the new prices for a long time. Jobbers are doing some business out of stock, though the demand is generally light owing to the anticipated drop in prices. A good demand for wire nails at the old prices is reported.

Bars.—The demand for bars is still below normal on account of the expected recession in price. No orders for future delivery are being booked, but local mills have sufficient advance orders and contracts to keep them busy for some time. Jobbers are making sales out of stock at 6.50c. to 6.75c. for immediate delivery, but the quantities moving are small and no contracts for future delivery are reported.

Structural Materials.—Structural materials are reported as steady with nominally unchanged prices; but owing to the prevailing uncertainty no appreciable amount of business is being done. There is a lot of work in prospect and inquiries are numerous; but buyers are holding off until fabricators can get a line on Government needs and until the price question is solved.

Plates.—Practically the entire demand at the present time is coming from the Government. Prices are steady and unchanged. Some sales of floor plates at 8.75c., f.o.b. San Francisco, for eight and ten weeks' delivery are reported. These sales have been in single car lots. No figures on next year's delivery are quoted.

Sheets.—The movement in the price of sheets has been more marked than in any other material. Twice during the past two weeks the price has been reduced, the quotations of to-day being 1.50c. below those of two weeks since. For No. 28 gage, the present jobbing price here is 11c. At the lower prices, a good deal of buying is being done; and as jobbers' stocks are already low, they are expected to begin to replenish at an early date.

Wrought Pipe.—The Government regulations of steel prices have had no effect on the market here for tubular goods, and there has been no change in quotations. The demand from the oil fields remains heavy, but the principal demand is now coming from the various army cantonments and from the Coast shipbuilding plants. It is expected that the latter demand will increase as more new shipyards come into the market.

Cast Iron Pipe.—The local market for cast iron pipe has responded to the Government's action with considerably reduced prices; and it is thought that an active demand will develop, though at present there is little movement. Municipal work continues at a standstill, as Coast cities are making no attempts to float bonds in competition with the Government. Prices quoted to-day are: Class B., 6-in. and larger, $58 f.o.b. San Francisco; Class B., 4-in., $61; gas pipe, $62. There has been a considerable inquiry for shipment to the Orient, but as yet no business has resulted.

Pig Iron.—The market is very confused. Some buyers are paying about $50 for spot iron pending readjustment, and others have withdrawn altogether from the market. Few sales are being made, and no quotations can be considered as representing any considerable part of the trade, though a few dealers, fearing that a shortage of cars may prevent deliveries later, are ordering rather freely.

Coke.—All the larger foundries have long-term contracts for their coke, and they will not be affected by the readjustment of coke prices for some time. Brokers are quoting no prices, and such sales as are made are based entirely on telegraphic instructions from the East on the day of sale. Some coke has been sold for shipment to oversea American possessions. For these sales, prices of from $35 to $40 were paid.

Old Materials.—Receipts of scrap have fallen off. The market is now well supplied, though a shortage may develop later when the rains prevent the bringing in of supplies from a distance. The market is somewhat spotty, and there is a tendency to go below the quoted prices. Heavy machine cast iron is quoted at $33 to $35, with some sales made as low as $32 and bidders offering as low as $30. Stove plate has sold at from $24 to $25; heavy melting scrap at $27 and light country scrap at from $17.50 to $18.

St. Louis

ST. LOUIS, Oct. 29.

Pig Iron.—Inquiries continue to flow in for small tonnages of foundry iron, running, however, into a considerable aggregate, but furnace representatives are unable to do business because of the sold up conditions of their principals. Some of the resale concerns are beginning to sell iron at a higher price than commensurate with the Government figures, taking the ground that they are not affected by the agreement on price fixing. There is difference of opinion in the market on this question and it may take Government action to settle it. The Scullin Steel Co. has succeeded in getting 5000 tons of the basic for which it was in the market, but has taken Northern instead of Southern iron. It has also obtained 2000 tons of spiegeleisen for delivery over the next four months. Most of the large producers represented here declined to consider the business at any figure, because of the present situation. The inquiries coming in are in large part representative of the needs of small concerns, but there is a certain proportion indicating that they are sent out for the purpose of obtaining a price. The local furnace is not taking any new business at present, but is deferring acceptance of orders until later in order to develop its prices on a more definite foundation than exists at present.

Coke.—One sale of furnace coke of 2500 tons was made in the market during the week, but general business was still an uncertain quantity. There is doubt in the minds of representatives as to the price owing to the apparent non-existence of a differential between furnace and foundry grades. This is one of the problems to be ironed out. The local and near-by by-product producers are not at present in the market at any price.

Finished Iron and Steel.—No new business appears in finished products and the pressure for material on existing contracts is growing more severe. Stock out of warehouse is being adjusted to the fixed prices laid down by the Government and for material out of stock we quote as follows: Soft steel bars, 4.55c.; iron bars, 4.45c.; structural material, 5.05c.; tank plates, 7.05c.; No. 10 blue annealed sheets, 8.05c.; No. 28 black sheets, cold rolled, one pass, 8.55c.; No. 28 galvanized sheets, black sheet gage, 9.55c.

Old Material.—While in some classes of material there is a better tone, there is, as a matter of fact, no increase of business and it is still a dealers' market, with the transactions depending entirely upon dealers' need to fill existing orders. Consumers are not inclined to take anything outside of what they have already contracted for and are apparently waiting for the settlement of the price fixing problem as to scrap before making anything more than immediately needed purchases. Dealers report increasing difficulty in getting cars and are handicapped by the unwillingness of customers to take any other than the usual equipment because of the unloading difficulties. Because of the situation, dealers are inclined to criticise some customers as not being patriotic in their recognition of the difficulties. Railroads are supplying open cars only under pressure. As some of the scrap is going to plants having Government contracts, efforts are to be made to get Federal action to aid the dealers in making deliveries on their contracts which are being held up by the attitude of the receivers. No lists appeared during the week, but a number are expected during the latter part of the current seven days. We quote dealers' prices, f.o.b. consumers' works, St. Louis industrial district, as follows, with the reservation that the figures are estimates of value, the absence of transactions preventing the establishment of a real market:

Per Gross Ton	
Old iron rails	$36.00 to $37.00
Old steel rails, rerolling	35.00 to 35.50
Old steel rails, less than 3 feet	35.00 to 35.50
Relaying rails, standard section, subject to inspection	50.00 to 55.00
Old carwheels	28.00 to 28.50
No. 1 railroad heavy melting steel scrap	27.50 to 28.00
Heavy shoveling steel	25.50 to 26.00
Ordinary shoveling steel	22.50 to 23.00
Frogs, switches and guards cut apart	27.50 to 28.00
Ordinary bundled sheet scrap	18.00 to 18.50
Heavy axle and tire turnings	18.00 to 18.50

Per Net Ton	
Iron angle bars	$34.50 to $35.00
Steel angle bars	24.00 to 24.50
Iron car axles	41.50 to 42.00
Steel car axles	39.00 to 39.50
Wrought arch bars and transoms	40.50 to 41.00
No. 1 railroad wrought	29.50 to 30.00
No. 2 railroad wrought	27.50 to 28.00
Railroad springs	25.50 to 26.00
Steel couplers and knuckles	27.50 to 28.00
Locomotive tires, 42 in. and over, smooth inside	29.50 to 30.00
No. 1 dealers' forge	18.00 to 18.50
Cast iron borings	15.50 to 16.00
No. 1 busheling	22.00 to 22.50
No. 1 boilers, cut to sheets and rings	16.50 to 17.00
No. 1 railroad cast scrap	19.00 to 19.50
Stove plate and light cast scrap	16.50 to 17.00
Railroad malleable	25.50 to 26.00
Agricultural malleable	18.50 to 19.00
Pipe and flues	20.50 to 21.00
Heavy railroad sheet and tank scrap	16.50 to 17.00
Railroad grate bars	17.00 to 17.50
Machine shop turnings	15.00 to 15.50
Country mixed scrap	15.50 to 16.00

Buffalo

BUFFALO, Oct. 29.

Pig Iron.—Inquiry for the week has been brisker and orders more frequent and of larger total than for the preceding week. One large producer reports sales of 6500 tons, 1000 tons of which was basic and the remainder No. 2 plain foundry, and another producer has sold an aggregate of 2000 tons of foundry iron for the week. The first of these two producers, which made the larger aggregate of sales, is, however, easing up in new business and confining sales to the taking care of old customer trade. The only drawback to the making of larger total sales in all grades of iron is the limited tonnage furnaces have to offer, and only one or two of them are in position to offer more than extremely small quantities. While some sales have been made for 1918 shipment, the preference of producers is to confine their offerings to prompt shipment and over the remainder of 1917, and not to sell for forward shipment beyond that time until it is definitely known what action the Government will take with reference to prices for the period after Jan. 1. Coke is practically unobtainable in any grade. Blast furnace interests, foundries and companies requiring coke for heating purposes are unable to find even as much as carload lots. As nearly as can be approximated the price schedule for the various grades of pig iron, f.o.b. furnace Buffalo, is as follows:

No. 1 foundry	$34.50
No. 2 X	33.50
No. 3 foundry	32.50
Gray forge	32.00
Malleable	33.50
Basic	33.00
Lake Superior charcoal, f.o.b. Buffalo	39.75

Finished Iron and Steel.—Mills and agencies are not taking on any new business other than for war materials, the attitude of both seller and buyer apparently being that neither desires to deal on business outside of classifications A and B for delivery after Jan. 1 until it is known on what basis the Government re-

vision of prices is likely to be made. A number of selling agencies report that inquiries for the past week have been greater in number than for any week in the past two months, although consisting principally of small tonnages of the materials sought for. One inquiry for a large tonnage, said to be artillery wheels for the Ordnance Department of the Government, was before the market, but so far as learned the order has not yet been placed. Mills are reported as crowded with work of classifications A and B. The leading interest announces that all warehouse material prices are now made f.o.b. the warehouse, instead of f.o.b. Buffalo. The Ferguson Steel & Iron Co., this city, has a contract for an 8-bay addition to the Watertown Arsenal, Watertown, Mass., now being constructed for the United States Government, requiring 350 tons of fabricated steel. The same company has also just received the contract for the fabricated steel for a machine shop to be built at the Watertown Arsenal, involving 1000 tons, and a contract for 500 tons of structural steel for a storehouse to be built in France by the United States Government.

Old Material.—Dealers are looking forward to a buying movement which they believe will be due when the decision in the matter of price regulation is arrived at by the Government, although there is as yet no intimation of the basis on which the scale of prices can be established. The uncertainty and delay in the fixing of prices and consequent sluggish interest in present buying, however, are having a tendency to cause prices to sag for such business as is being transacted, which is very limited in extent. Heavy melting steel, No. 1 railroad wrought, No. 1 railroad and machinery cast scrap, machine shop turnings, cast borings and old iron rails all show a further decline of $1 per ton as compared with last week's quotations, and low phosphorus a drop of $4 to $5 per ton. The scarcity and high price of labor are preventing the replenishing of yard stocks by dealers, even at reduced prices, and some lessening of stocks has been a consequent result. The exceeding difficulty of obtaining gondola cars is having a restricting effect on shipments and is hampering the completion of old contracts by dealers. We quote as follows, per gross ton, f.o.b. Buffalo, the prices for a number of commodities being nominal:

Heavy melting steel	$27.00 to $28.00
Low phosphorus	36.00 to 38.00
No. 1 railroad wrought	36.00 to 37.00
No. 1 railroad and machinery cast	27.00 to 28.00
Iron axles	45.00
Steel axles	45.00
Carwheels	30.00 to 31.00
Railroad malleable	28.00 to 29.00
Machine shop turnings	16.50 to 17.00
Heavy axle turnings	25.00 to 26.00
Clean cast borings	18.00 to 19.00
Iron rails	37.00 to 38.00
Locomotive grate bars	20.00 to 21.00
Stove plate	20.00 to 21.00
Wrought pipe	26.00 to 27.00
No. 1 busheling scrap	25.00 to 26.00
No. 2 busheling scrap	17.00 to 18.00
Bundled sheet stamping scrap	19.00 to 20.00

British Steel Market

Ferromanganese Sellers Scarce and Business Restricted—Pig Iron Strong

(By Cable)

LONDON, ENGLAND, Oct. 31.

Pig iron is generally strong with Cleveland iron in active demand but sellers reticent. Hematite iron deliveries are rigidly controlled. American semi-finished steel is idle and unchanged. Tin plates are quiet but firm. The scarcity of ferromanganese sellers is restricting business. We quote as follows:

Tin plates, coke, 14 x 20; 112 sheets, 108 lb., f.o.b. Wales, maximum, 30s.
Ferromanganese, £45 nominal.
Ferrosilicon, 50 per cent, c.i.f., £35 upward.
On other products control prices are as quoted in THE IRON AGE of July 19, p. 171.

(By Mail)

Output of Basic Iron Increasing—Ferromanganese Sellers fo America Few

LONDON, ENGLAND, Oct. 9.—The strain upon the country's resources is greater now than at any time since the war began. Official control has been tightened to a degree which has practically obliterated all merchant trading or a resumption of pre-war overseas activities.

The tendency of pig iron generally is strong, with home users readily paying full maximum prices, for demand has been intensified, and there is but little surplus material to meet additional export requirements. There is an ample supply of Cleveland iron to satisfy all home demands. The output of basic iron for steelmaking is being further added to at the expense of foundry grades. Iron foundries are busier and will be able to absorb the current output, but deliveries are impeded by lack of labor and trucks. Forge iron is wanted in larger quantities. Export business is more restricted pending further allocations. The hematite position is stringent, but should become easier due to additional capacity in the near future, although deliveries are still confined to urgent needs.

Semi-finished steel is unchanged, but is entirely governed by the continuous war requirements whereby the great bulk of current home output is taken up, keeping down the surplus for general purposes. Official prices remain undisturbed at £10 7s. 6d., delivered, for Welsh steel bars and billets. American material is practically a dead letter, the demand having been slack throughout, although there are no offers of billets and only limited quantities of wire rods in merchants' hands are obtainable at £28 to £29 c.i.f. Liverpool.

In finished steel there is a big accumulation of orders, and great difficulty is experienced in placing new business, especially for material intended for the merchant trade. Government requisitions are as heavy as ever, and there is no abatement of pressure of demand from shipbuilders in connection with new standardized boats. Where prices are controlled they are at the full maxima, while uncontrolled prices tend upward, though showing no great alteration. The market is badly congested and the impending Birmingham quarterly meeting will probably do no more than reaffirm recent stringent conditions. The Scotch works are practically swamped with orders, and overseas business is at a minimum.

Owing to steel restrictions the tin plate and sheet mills are kept going at much reduced capacity. The present output of the tin-plate mills is only about 30 to 35 per cent of normal. The market is featureless but distinctly firm, makers being pretty fully booked over the year's end and disinclined to take additional orders below the maximum basis price of 30s. per basis box for cokes, 20 x 14 net, at makers' works. A marked scarcity of heavy plates exists in contrast to light ones, for which slight concessions are made occasionally. Current output is barely sufficient to satisfy essential needs and substitutes have to be resorted to increasingly. Merchant business has been badly crippled and there is no hope of relief for an indefinite period.

The official order confirming the recent fixing of maximum prices for black sheets has not yet made its appearance, but there seems to be a little more business doing, while makers have become somewhat reconciled to the new conditions so far as the home trade is concerned. Some merchants are still quoting net f.o.b. prices as before, in the belief that the new regulations will not apply to export business, but there is not a great deal done in this direction. Orders for the home trade are being booked at the official price of £17 10s. for C. A. 24-gage sheets, net at makers' works, while the extra cost for painted sheets is 30s.

A few small orders for ferromanganese have been booked occasionally for Continental ports at £80 f.o.b. for loose for forward shipment. Business for America is kept in abeyance and c.i.f. quotations are rather easier at $350 to $375 for January-June shipment. The market, however, is firm on the whole with very few sellers. Indian manganese ores are firmly held at 3s. 5d. to 3s. 6d. per unit, but business is hindered by lack of freight.

The Irvine Sales Co., Minneapolis, Minn., is inquiring for five 60-in. boring mills, one 84-in. boring mill and one 60-in. x 14 to 18-ft. planer.

New York

NEW YORK, Oct. 31.

Pig Iron.—The demand for pig iron has quickly absorbed any tonnage offered by the furnaces, and it is becoming increasingly difficult to place orders, as furnaces are conserving what little iron they have to sell for the remainder of this year and the first quarter of next. This is particularly true of Virginia irons. There is a multitude of inquiries for spot delivery, ranging all the way from a carload or two to several hundred tons. Although several foreign nations, especially Italy, would be glad to get additional iron, foreign inquiries are in a quiescent state because of the uncertainty as to obtaining vessel capacity and the difficulty of getting permits to ship. The American Brake Shoe & Foundry Co. is in the market for about 2500 tons for shipment to its Central Western plants, and the Crane Co. for about the same tonnage for shipment to its Bridgeport, Conn., plant, deliveries to extend through the remainder of this year and the first quarter of next. The Crane Co. has covered for about a part of its requirements, the iron being understood to be somewhat below standard analysis. For early delivery we quote as follows, tidewater:

No. 1 X	$35.25
No. 2 X	34.25
No. 2 plain	33.75
No. 2 Southern	37.25
No. 2 X Virginia	36.50 to 36.75

Ferroalloys.—Both inquiries and sales of domestic ferromanganese are few. The market is considered stronger than last week at $275 for delivery this and next year, though a sale of about 200 tons at $250 is recorded as made under special conditions. Whether any more could be bought under $275 is doubted. Receipts from abroad are said to be growing smaller with deliveries on contracts considerably in arrears. Competition from the British alloy is becoming each month less of a factor so far as the future is concerned and price fixing of the domestic alloy is no longer expected. Spiegeleisen, 20 per cent, is quiet. The 12,000-ton inquiry before the market last week has not been awarded yet, but a sale of 500 tons for this year's delivery at $70, furnace, is noted. Ferrosilicon, 50 per cent, for this year's delivery is quoted at $175 per ton, with $150 as a minimum for 1918.

Finished Iron and Steel.—The slowness with which specific orders emanate from Washington for ship and shell material results in some mills being able to do a small volume of relatively prompt business. Naturally all of this is taken with stipulation that deliveries are subject to shelving on account of priority orders. The result has been some export business and exporters have sold steel bars at 4.25c. and sheets at close to 6c. Moderate amounts of plates seem to be obtainable at 5c. to 6c. per pound for export to buyers for which licenses are obtainable, as for Allied Government use. Bars from discard steel, suitable for reinforcing purposes, have sold at 3c. at mill. Considerable quantities of universal plates were taken at 3.25c., Pittsburgh, so that deliveries are now extended to two months or more. The 3 per cent transportation tax going into effect in November will need to be taken into account, making the freight rates substantially 0.201c. from Pittsburgh to New York, against the recently ruling rate of 0.195c. per pound, at least for sales on a f.o.b. mill basis. While the shipbuilding program will take possibly 2,000,000 tons more of structural steel in 1918, it is held that material will still be available for general building work. According to the Dow Service Building Reports, building costs to-day are not more than 30.7 per cent more than those ruling in 1914-15, and this fact on becoming known is encouraging building interests to push postponed projects. Meanwhile the large fabricated steel offerings continue to be for Government work, including 4500 tons for hangars at Langley Fields; 4000 tons for a machine shop at Washington and 1000 tons, awarded to the American Bridge Co., for the General Electric Co. at Lynn, Mass. Other work includes 200 tons for the Morse Dry Dock Co., Brooklyn; 450 tons for a new pier for the Robbins-Ripley Co., Brooklyn, and 170 tons for a bridge for the Long Island Railroad. About 150 tons all told have been awarded to the American Bridge Co., for the Delaware & Hudson and the Philadelphia & Reading. So far as business in Eastern territory is concerned the steel bars range from 2.90c. to 4c., Pittsburgh; shapes are obtainable in two or three months at 3c., Pittsburgh, and tank plates are nominal at 3.25c., Pittsburgh, but obtainable in small lots at 5c. to 6c., Pittsburgh. For mill shipments of iron bars we quote 4.945c., New York. Out of store we continue to quote shapes and iron and steel bars at 5c. to 5.50c., New York, and plates at 8c. and higher, with a possibility that 7c. might be done.

Cast Iron Pipe.—An occasional order for private contracts is placed, but no tonnage of importance has developed either from private sources or for public uses. The recently named prices of $56.50 on 6-in. and heavier, and $59.50 on 4-in. are maintained without difficulty on the limited business which is being transacted.

Old Material.—Keen interest was felt among dealers in this district in the proceedings of the meeting of scrap dealers at Pittsburgh last week, but no action as to prices was taken and the market remains in about the same condition of dullness as for a number of weeks, awaiting action by the Government in regard to prices. The only activity reported has been in cast scrap, on which prices are apparently somewhat higher, although reports in regard to quotations made on recent sales vary. We quote prices of brokers as follows to New York producers and dealers, per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$24.00 to $25.00
Old steel rails (short lengths) or equivalent heavy steel scrap	24.00 to 25.00
Relaying rails	45.00 to 50.00
Re-rolling rails	33.00 to 34.00
Iron and steel car axles	41.00 to 42.00
No. 1 railroad wrought	32.00 to 33.00
Wrought-iron track scrap	27.00 to 28.00
No. 1 yard wrought long	27.00 to 28.00
Light iron	7.00 to 8.00
Cast borings (clean)	16.00 to 17.00
Machine-shop turnings	14.00 to 15.00
Mixed borings and turnings	13.00 to 14.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long)	25.00 to 26.00

Dealers in New York City and Brooklyn are quoting as follows to local foundries, per gross ton:

No. 1 machinery cast	$26.00 to $27.00
No. 1 heavy cast (column, building materials, etc.)	21.00 to 22.00
No. 2 cast (radiators, cast boilers, etc.)	21.00 to 22.00
Stove plate	19.00 to 20.00
Locomotive grate bars	16.00 to 17.00
Malleable cast (railroad)	27.00 to 28.00
Old carwheels	27.00 to 28.00

Pittsburgh

PITTSBURGH, Oct. 30.—(*By Wire*)

The sub-committee on tin plate is to meet with the Food Administration Board in Washington, D. C., on Wednesday, Oct. 31, and as a result it is expected that the Government price on tin plate will be announced this week. It is understood the tin plate manufacturers recommended the price of $8.20 per base box on tin plate, but the Government price is expected to be not higher than $7.75 per base box for tin plate made from Bessemer stock and $8 from open hearth stock for delivery over the first nine months of 1918. In regard to prices on other leading products, such as sheets, pipe, wire products, scrap and shafting, it is not known definitely at this writing whether the Government will fix prices on these products or not, but from reliable sources it is learned that probably the matter of further price fixing on these iron and steel products, and also on the lighter forms of finished iron and steel, will be left with the co-operative committee on steel and steel products of the American Iron and Steel Institute. The War Industries Board found it was a stupendous task to try to fix prices on the almost countless items of iron and steel and it has been practically decided to allow the American Iron and Steel Institute committee to work out these prices and submit them to the manufacturers for their adoption. This is not absolutely authenticated, but comes from sources that are in close touch with the situation. It is possible, however, that at the last minute the War Industries Board may decide to fix prices on sheets, wrought iron and steel pipe and boiler tubes, wire products, scrap and shafting, and then allow the institute committee to

work out the other prices. However, the fact that the American Steel & Wire Company last week readjusted its prices on wire products to a higher basis and that this same action may be taken on one or two other lines, leads to the belief that the whole matter of further price fixing may go up to the American Iron and Steel Institute co-operative committee. The whole trade is at sea and no one seems to have any definite idea as to how the problem of price fixing will be eventually worked out. In the meantime, new business on steel products on which prices have not yet been named is practically at a standstill, the buying trade simply holding off placing orders until the situation has cleared. The cold rolled strip steel manufacturers at their conference in Chicago last week reduced prices on large lots from 9c. to 7c. per pound, or $40 per ton. It is sincerely hoped that before this week ends, the price situation will have cleared to the extent at least that will permit consumers to start placing orders for material which they badly need.

Pig Iron.—There seems to have been less trouble in the adoption of the Government prices on pig iron than on any other commodity on which prices have been fixed. As soon as these prices were announced Sept. 24 leading producers here stated at once that they would adhere strictly to them and would not charge one cent more or less on any iron sold. This policy has been rigidly carried out and fair sized sales of all grades of pig iron have since been made at the agreed prices. In the past week there have been sales of 5000 tons of basic, 2500 tons and 2000 tons at the official price of $33 at furnace, and also a sale of 300 tons of off basic iron at $32.50 at furnace. We also note a sale of 2500 tons of Bessemer and one of 1500 tons at the official price of $36.30 at valley furnace. There have also been sales of 3000 to 5000 tons of No. 2 foundry iron at the official price of $33 at valley furnace, and several leading producers of foundry iron have advised their larger consumers that they will take care of their needs at the $33 price. There is a scarcity in the supply of Bessemer and basic iron, due largely to falling off in output on account of shortage in coke.

We quote as follows: Basic pig iron, $33; Bessemer, $36.30; gray forge, $32; No. 2 foundry, $33; No. 3 foundry, $32.50, and malleable Bessemer, $33.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being 95c. per ton.

Billets and Sheet Bars.—No sales of billets by the steel mills at the Government price of $47.50 or of sheet bars at the $51 price have been reported. It is said that on inquiries for billets and bars submitted to the mills the prospective buyers are advised that the mills are sold up on contracts and have no steel to sell for delivery this year. It is said some consumers would be willing to pay an advance over the Government price for billets and sheet bars to obtain quick delivery. Several concerns here that formerly handled large quantities of billets and sheet bars say they have not made a single transaction since the Government prices were announced on Oct. 4, and they do not expect to handle any steel for some time to come. They state the mills advise them they have no steel to spare, needing their entire output to apply on contracts with regular customers. We quote soft Bessemer and open hearth billets at $47.50 and sheet bars at $51, Pittsburgh or Youngstown mills. We omit quotations on forging billets, as the differentials on these have not yet been established.

Ferroalloys.—The trade is awaiting some announcement from the Government or other source as to prices on the different grades of alloys, which has not yet come out, and as a result there is practically no new buying. Domestic 80 per cent ferro-manganese is held at about $300 per ton, delivered, for prompt or future shipment. We quote 18 to 22 per cent spiegeleisen at about $70 and 50 per cent ferrosilicon in carload lots at $140 to $150, delivered, lower prices being made on 100-ton lots and over. As yet, prices on Bessemer ferrosilicon and silvery iron have not been officially promulgated, and until these come out we omit quotations.

Structural Material.—The local market is extremely quiet and has been for some time. Local fabricators are turning out a great deal of Government work, details of which are withheld. The McClintic-Marshall Co. has taken 1500 tons of bridge work for the Philadelphia & Reading Railroad, and about 1000 tons for a new steel building for the Reading Iron Co., Reading, Pa. The Jones & Laughlin Steel Co. has taken about 250 tons for binders for a large open hearth steel furnace for the Erie Forge Co., Erie, Pa. We quote beams and channels up to 15-in. at 3c. per lb. f.o.b. Pittsburgh.

Plates.—Most of the new buying in plates is on Government direct or indirect orders, the demand from the domestic trade being quiet. The formal order for 30,000 8-wheel cars to be bought by the Government for Russia has not yet been placed. Some new inquiries from domestic railroads for cars have recently come out, the first in a long time. The Pennsylvania Railroad is inquiring for 1000 70-ton coal cars, the Union Pacific for 500 50-ton underframe flat cars, 1000 50-ton steel hoppers, 1000 50-ton all steel drop bottom gondolas, 1000 40-ton steel underframe stock cars, 1000 logging trucks, 200 oil tank cars and 50 cabooses. The Seaboard Air Line has an inquiry out for 500 box cars, the Central Railroad of Georgia for 500 box cars, the Illinois Central for 1000 steel hoppers, and the Western Pacific for 1000 box cars. As to whether these contracts will be placed is a question, but if they are, delivery will no doubt be greatly deferred, as the Government order for 30,000 cars for Russia, if placed, will have priority. Some sales of plates have been made at the Government price for fairly prompt delivery, and these are getting more numerous. We quote ¼-in. and heavier sheared plates at 53.25c. at mill f.o.b. Pittsburgh.

Steel Rails.—We do not hear of any new orders being placed for light rails or standard sections, aside from several Government orders said to have been placed lately for both standard sections and light rails for shipment to France. Prices on light and heavy section rails are given on page 1091.

Sheets.—To-day (Tuesday) a general meeting of all manufacturers of black and galvanized sheets is being held in the William Penn Hotel in this city, for the purpose of considering the present situation in the sheet trade, and to devise some means of putting it on a more satisfactory basis, if possible to do so. It was expected that three weeks ago, or more, the Government would announce prices on sheets, but up to this time has not done so, with the result that makers and consumers of sheets alike are in the dark, and do not know how to proceed. Several weeks ago, a committee of sheet manufacturers submitted to the War Industries Board, prices on sheets which they believed were fair to the mills and to consumers. It is understood these prices were 4c. for blue annealed sheets, 5c. for Bessemer black, and 6.25c. for galvanized, all of No. 28 gage, Bessemer stock, an advance of 25c. per 100-lb. to apply on open hearth stock. It was fully expected that very shortly after these prices were submitted, the Government would announce prices on sheets, but this has not been done, and now there is some doubt whether the Government intends to name prices on sheets, or allow the market to adjust itself to a lower basis, taking into account the $51 price on sheet bars announced by the Government on Oct. 4. In the meantime, the market on sheets is considerably lower, sales of No. 28 Bessemer black having been made as low as 5.25c., and mills are perfectly willing to sell at 6c. or lower. Until something more definite is known as to the actual market, we have reduced prices on blue annealed sheets 3c. per lb., No. 28 Bessemer black the same, galvanized 2c. per lb., and tin mill black 2c. per lb. However, it should be understood that these prices are purely nominal, and are only given for the purpose of record. They will be found on page 1091.

Tin Plate.—The sub-committee on tin plate, consisting of J. I. Andrews of the American Sheet & Tin Plate Co., E. R. Crawford of the McKeesport Tin Plate Co., and E. T. Weir of the Phillips Sheet & Tin Plate Co., will be in conference on Wednesday, Oct. 31, with the Food Administration Board at Washington, D. C., and as a result of this meeting, it is probable that the price on tin plate for delivery in the first nine months of 1918 will be announced by the Government. It is

stated that the price submitted by the tin plate manufacturers to the Food Administration Board for delivery over the first nine months of 1918 was $8.20 per base box at mill, but whether this price will be accepted by the Food Administration Board is not known at this writing. It will be recalled that the price on sheet bars of $51, made by the Government on Oct. 4, is effective only for the present quarter, being subject to revision on Jan. 1, or after. The manufacturers of tin plate take the ground that they must be covered on sheet bars at a definite price for the first nine months of 1918 if they are to sell tin plate for that period. While, as stated above, the price of $51 is good only until Jan. 1. This is one of the complications that came up in the effort to try to fix a price on tin plate for delivery the first nine months of next year. It would be useless for the Government to fix a price on tin plate for this year, as none of the manufacturers has any to sell for that period, and they will have very little to sell for first quarter of 1918.

Wire Products.—A general meeting of manufacturers of wire products was held in Chicago on Monday, Oct. 29, and is understood to be still in session to-day (Tuesday). Some complications have come up in the effort to settle on a Government price for wire and wire nails. Just how this will work out is a question. As noted last week, the American Steel & Wire Co. readjusted its price on wire products to the basis of $3.50 for wire nails; $3.25 for fence wire; $3.65 for polished fence staple; $4.35 for galvanized fence wire; $3.65 for painted barb wire and $4.35 for galvanized barb wire. However, these prices were not sent out generally to the trade, and, we are advised, have not yet been officially promulgated by the company. The adoption of these prices by the American Steel & Wire Co. was done for the purpose of removing certain complications encountered by the Government in fixing prices on wire products. As a result of the meeting in Chicago it is possible that another general adjustment in prices on wire products will be made by all the mills, so that their prices will all be on a uniform basis. However, this is surmise, as nothing definite is known at this writing as to what action was taken at the Chicago meeting or may be taken before it adjourns. Some of the independent mills have sold wire and wire nails at the price adopted last week by the American Steel & Wire Co., but this was not general by any means. Until more definite information is obtained as to the action taken at Chicago, and what may be done by the Government, we simply repeat the former nominal prices of the independent mills on wire and wire nails, which are given on page 1091.

Iron and Steel Bars.—The mills are more generally quoting the new price of 2.90c. on steel bars, but have very few to sell for delivery this year. No definite change has yet been made in prices on iron bars, but it is expected these will soon be readjusted to put them more in line with prices on steel bars. Some mills rolling steel bars have their output sold up for months ahead, and have not quoted the new Government price of 2.90c. Nominal prices on iron and steel bars are given on page 1091.

Cold Rolled Strip Steel.—At the conference of manufacturers of cold rolled strip steel held in Chicago last week, prices on contracts were reduced from 9c. to 7c. per pound, small lots ranging from 8c. to 9c. per pound at mill. Terms remain 30 days, less 2 per cent off for cash in 10 days when sold in quantities of 300 lb. or more. It is not known at this writing whether it is the intention of the Government to name prices on cold rolled strip steel, and it is the general belief here that it will not do so, but possibly revised prices on cold rolled strip steel may come later from one of the subcommittees of the American Iron and Steel Institute.

Wrought Pipe.—This is also one of the items on which the Government has been expected for three weeks or more to name prices, which have not yet come out. Some complications came up in the effort of the War Industries Board to name prices on iron and steel pipe, and these have not yet been adjusted. It is still expected that either the Government, or the mills themselves, will announce prices on iron and steel pipe as represented in the discount adopted on May 1 by the independent mills, and which are still in effect, with the exception that the LaBelle Iron Works and Wheeling Steel & Iron Co. are naming higher prices. Discounts of the National Tube Co. have not been changed since April 1, and its prices on wrought steel pipe have been $12 per ton lower than those of the independent mills that adopted the May 1 card.

Coke.—There is still a good deal of dissatisfaction among consumers of blast furnace and foundry coke over the methods being used by some of the coke producers to evade making sales of coke at the Government price at $6 per net ton at oven for furnace and foundry. It is said that some of the practices of a few of the coke operators have placed them in the position of being liable to prosecution, and that some of their acts will not stand close Government scrutiny. On the other hand, some of the larger coke operators are filling to the absolute letter their obligations on coke, and customers who have open contracts for furnace coke at $6 per net ton at oven, are receiving regular supply and have no cause for complaint whatever. It is said that in order to secure furnace coke promptly, old contracts at $8 and $8.50 have been extended, and that coke is being shipped in this way that nets the operators $2 and even $2.50 more than the Government price. It is true the supply of cars is bad, but at the same time it is large enough to permit freer shipments of furnace coke than are being made. Some users of furnace coke, who claim they are not receiving fair treatment, threaten to take proceedings unless certain sharp practices are speedily stopped. We quote standard grades of furnace and foundry coke for prompt or future shipment at $6 per net ton at oven. The *Connellsville Courier* gives the output of coke in the Connellsville regions for the week ending Oct. 20, as 346,239 tons, an increase over the previous week of 7237 tons.

Old Material.—There is absolutely no change to note in the situation in the local scrap trade over that given in this report for several weeks past. A large meeting of scrap dealers from all over the country was held in this city on Thursday, Oct. 25, but no definite action was taken that seemed to clarify the situation as regards prices on scrap. It is understood that the subcommittee on scrap iron suggested to the War Industries Board that a fair price to dealers and consumers of steel scrap would be $25 and other grades in proportion, but it is not definitely known whether the Government intends to name prices on scrap or not. In the meantime, practically no material is sold by dealers to consumers, the latter holding off placing orders until the situation as regards prices is clearer. In this condition nothing remains to do but repeat former prices, which are purely nominal. Dealers quote for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$27.00 to $28.00
No. 1 foundry cast	27.00 to 28.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md., and Franklin, Pa.	31.00 to 32.00
Hydraulic compressed sheet scrap	22.00 to 23.00
Bundled sheet scrap, sides and ends, f.o.b. consumer's mill, Pittsburgh district	21.00 to 22.00
Bundled sheet stamping scrap	19.00 to 20.00
No. 1 railroad malleable stock	23.00 to 24.00
Railroad grate bars	16.00 to 17.00
Low phosphorus melting stock	38.00 to 40.00
Iron car axles	41.00 to 42.00
Steel car axles	41.00 to 42.00
Locomotive axles, steel	48.00 to 50.00
No. 1 busheling scrap	22.00 to 23.00
Machine-shop turnings	18.00 to 18.50
Cast-iron wheels	28.00 to 30.00
Rolled steel wheels	33.00 to 34.00
*Sheet bar crop ends	33.00 to 34.00
Cast-iron borings	19.00 to 19.50
No. 1 railroad wrought scrap	30.00 to 31.00
Heavy steel axle turnings	22.00 to 23.00
Heavy breakable cast scrap	22.00 to 23.00

*Shipping point.

IRON AND INDUSTRIAL STOCKS

Campaign for Liberty Bonds Detracts from Interest in Stocks

NEW YORK, Oct. 31.

The close of the great campaign for the second Liberty loan dominated the stock market last week and interest on the Exchange lagged, so that the week's transactions were less than 60 per cent of those of the previous week and only 35 per cent of the total for the corresponding week last year. There was great irregularity, beginning with a reaction Monday, uncertainty Tuesday, with declines of most securities and about the same condition on Wednesday when there was only a half day's session, owing to the observance of Liberty Day, further declines, mostly in railroad shares Thursday, and a decided improvement Friday, when the success of the loan was assured.

The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal. com..	19½- 22⅛	Int. Har. Corp., com.	58 - 63
Allis-Chal. pf....	73⅞- 75	Lack. Steel	77 - 81¼
Am. Can com...	39 - 43¼	Lake Sup. Corp.	12¾- 13¾
Am. Can pf.....	97 - 98	Lukens 1st pf.....	101½-
Am. Car. & Fdry. com.	62⅞- 68	Midvale Steel...	43½- 46¾
Am. Car & Fdry. pf	107½	Nat.-Acme.	29⅞- 30½
Am. Loco. com..	55⅛- 59¼	Nat. En. & Stm. com	37 - 44⅛
Am. Loco. pf....	98¾- 98⅞	N. Y. Air Brake.	107 -114
Am. Rad. com...	292 -295	Nova Scotia St..	75⅝- 79
Am. Ship com..	89¼- 90½	Pressed St. com.	54⅛- 58
Am. Steel Fdrys.	58 - 62⅞	Ry. St. Spring com.	40 - 42½
Bald. Loco. com.	56¾- 63	Ry. St. Spring pf.....	96
Bald. Loco. pf..	95½- 95⅞	Republic com. ...	74¾- 81¼
Beth. Steel com.	79¼- 87	Republic pf.	98¾- 98½
Beth. Steel, Cl. B.	78⅜- 86⅞	Sloss com.	39¼- 40¾
Beth. Steel pf.....	91	Superior Steel. ..	36½- 37
Cambria Steel	115	Transue-Wms. ..	38 - 39
Central Fdry. com.....	30	Un. Alloy Steel..	39⅞- 40
Central Fdry. pf.....	41	U. S. Pipe com..	13 - 13¾
Chi. Pneu. Tool.	54½- 55	U. S. Pipe pf....	50 - 50½
Colo. Fuel	36⅜- 39¾	U. S. Steel com..	101¾-107
Crucible St. com	61½- 68	U. S. Steel pf...	112¾-114
Deere & Co. pf..	99 - 99¾	Warwick	 9
Gen. Electric....	128 -137¼	Westing. Elec. ..	40¾- 42½
Gt. No. Ore Cert.	26½- 29		
Gulf States Steel.	93¼- 97		
Int. Har. of N. J. com.	102 -105		

Dividends

The Atlantic Steel Co., 3½ per cent on the preferred, payable Nov. 1.

The Pressed Steel Car Co., quarterly, 1¾ per cent on the common, payable Dec. 5, and 1¾ per cent on the preferred, payable Nov. 26.

The Stewart-Warner Speedometer Co., quarterly, 1½ per cent, payable Nov. 15.

The Superior Steel Corporation, quarterly, 2 per cent on the first and second preferred, payable Nov. 15.

STEEL CORPORATION EARNINGS

Report Shows Some Decrease in the Third Quarter—Extra Dividend

The report of the United States Steel Corporation for the quarter ending Sept. 30 shows very handsome earnings, but a decline as compared with the preceding quarter. After allowing $63,733,013 for war income and excess profits taxes, the earnings were $68,243,784, compared with $85,817,067 for the same quarter in 1916 and $38,710,644 in 1915. An extra dividend of 3 per cent, the same as in the two preceding quarters, was declared on the common stock in addition to the regular quarterly dividend disbursement of 1¼ per cent. The directors also declared the regular quarterly dividend of 1¾ per cent on the preferred stock. The earnings for the past 11 quarters have been as follows:

	1917	1916	1915
First quarter	$113,121,018	$60,713,624	$12,457,809
Second quarter	90,579,204	81,126,048	27,950,055
Third quarter	68,243,784	85,817,067	38,710,644
Fourth quarter	.....	105,968,347	51,232,788

In the quarter ending June 30 the Steel Corporation reported net earnings of $90,579,204 after allowing $53,918,872 for war taxes; hence the earnings for that quarter would have been $144,478,076, while for the last quarter they would have been $131,976,797 except for the wax taxes. The decrease of about $12,500,000 in net earnings reflected the slackening in the industry, due largely to uncertainty concerning the Government's attitude on prices, but in part to the inability to keep up production on account of inadequate coke supply. The comparison of monthly earnings shows that the greatest were in June, 1917, when they amounted to $31,284,562. In the last quarter, September had the lightest earnings. The total surplus of the nine months ending Sept. 30 was $80,962,547.

Statement of United States Steel Corporation and Subsidiary Companies for the Quarter Ending Sept. 30, 1917.

EARNINGS.

	Earnings before charging interest on the subsidiary co.'s bonds outstanding.	Less: Interest on the subsidiary co.'s bonds outstanding.	Balance of earnings.
July, 1917	$23,500,463	$739,795	$22,760,668
August, 1917	24,287,844	739,119	23,548,725
September, 1917 ...	22,673,788	739,397	21,934,391
	$70,462,095	$2,218,311	

Total earnings after deducting all expenses incident to operations, comprising those for ordinary repairs and maintenance of plants, allowances for estimated proportion of extraordinary cost of facilities installed by reason of war requirements, also taxes (including $63,733,013 for account of war income and war excess profits taxes), and interest on bonds of the subsidiary companies		$68,243,784
Less, charges and allowances for depreciation, applied as follows, viz.:		
To depreciation and extraordinary replacement funds and sinking funds on bonds of subsidiary companies	$11,159,843	
To sinking funds on U. S. Steel Corporation bonds	1,838,564	12,998,407
Net income		$55,245,377
Deduct: Interest for the quarter on U. S. Steel Corporation bonds outstanding	$5,288,436	
Premium on bonds redeemed.....	224,612	5,513,048
Balance		$49,732,329
Dividends on stocks of the United States Steel Corporation, viz.:		
Preferred, 1¾ per cent.....	$6,304,919	
Common, 1¼ per cent.....	6,353,781	
	$12,658,700	
Extra dividend: Common, 3 per cent.....	15,249,075	27,907,775
Balance of surplus for the quarter.....		$21,824,554
Net surplus reported for six months ending June 30, 1917.....	$71,854,717	
Less, additional allowances for first half of 1917, for war income and war excess profits taxes pursuant to Revenue Bill as finally passed..	12,716,724	
Balance of surplus for six months ending June 30, 1917		59,137,993
Total surplus for nine months ending Sept. 30, 1917		$80,962,547

Superior Steel Corporation Financial Report

The Superior Steel Corporation, Union Arcade Building, Pittsburgh, works at Carnegie, Pa., has issued the following statement of income for the eight months ending Aug. 31:

Shipments—Net Tons	Shipments—Value	Cost of Shipments	Profit
68,407	$7,291,021.39	$4,782,060.85	$2,508,960.54

Gross manufacturing profit.....		2,508,960.54
Miscellaneous income		39,711.59
Gross income		$2,548,672.13
Deductions from income:		
Administrative expenses	$70,898.06	
Selling expenses	107,873.52	
Discount on sales.....	89,595.00	
Taxes	31,467.30	
Plant depreciation	124,476.18	
Reserve for accounts receivable....	2,250.00	
Charter and organization expenses (written off)	7,740.20	
Contribution to American Red Cross	15,000.00	
		449,300.26
Net income Jan. 1 to Aug. 31, 1917.....		$2,099,371.87
Add net income Dec. 26-Dec. 30, 1916.....		29,895.02
Total net income.....		$2,129,266.89
Disbursements and appropriation of earnings:		
Dividends paid by Superior Steel Corporation	$260,016.00	
Reserve for common stock disbursements, Dec. 26, 1916, to May 31, 1917	155,000.00	
Additional reserve for Excess Profit Tax	577,946.76	
		992,962.76
Balance Aug. 31, 1917.....		$1,136,304.13

In connection with the above, E. W. Harrison, president of the corporation, made the following statement:

The Superior Steel Corporation has been extremely careful, particularly in recent months, not to overreach itself, and has built up a very strong cash position. It has already made provision to take care of all estimated war profits and income taxes, and its position is such that working capital will be ample for all purposes after making due allowance for depreciation, and dividends on both preferred and common issues. We believe the 6 per cent rate being paid on the latter to be conservative in view of the large earnings and strong position of the company. The company has no maturing obligations either in the form of notes or bank loans, and no financing operations of any sort will be necessary. Inasmuch as the company has a contract running for eight years to come for all the coal it needs at a very favorable price, and owns its own coal cars in which the supply is hauled a distance of only 16 miles from the mines, there is little likelihood of any trouble on this score, either on account of price or difficulty in securing delivery. The labor situation is quite satisfactory and the company's needs in the matter of raw materials are better covered at the present time than for many months.

Pittsburgh Steel Co. Annual Report

The annual report of the Pittsburgh Steel Co., Union Arcade Building, Pittsburgh, has been issued for the fiscal year ended June 30, 1917. All the plants of the company were operated continuously through the year to maximum capacity. The net sales for the year were $33,066,083.48, as against for the previous year $21,848,035.67, an increase of $11,218,047.81. The net profits for the year (after setting aside $1,507,278.58 for depreciation of plants and for extinguishment of mines, and $1,823,548.16 for estimated war profits tax) were $7,811,444.19; which, compared with the previous year, $4,564,067.18, shows an increase of $3,247,377.01.

The products of your company shipped during the year, compared with the preceding fiscal year, were as follows:

	1916-1917	1915-1916
Pig iron and billets	$11,867,999.52	$5,364,608.42
Hoops, bands and cotton ties	2,618,274.70	1,260,842.15
Wire rods, plain wire, nails, fencing, etc.	17,387,285.18	14,506,901.88
	$31,873,559.40	$21,132,352.45
Miscellaneous products	1,192,524.08	715,683.22
Totals	$33,066,083.48	$21,848,035.67

SUMMARY OF RESULTS

The available cash of the companies was increased from the following sources:		
Profit from operations of all companies		$7,811,444.19
Amounts charged to operations not represented by cash expenditures		3,650,996.84
Increase in accounts payable		363,947.09
Decrease in bills receivable		28,075.86
Sale of re-acquired securities		10,100.00
		$11,864,563.98
Of this sum there was applied in reduction of liabilities as follows:		
Coupon gold notes	$2,384,000.00	
Less appropriation therefor at June 30, 1916	1,019,378.32	
	$1,364,621.68	
Further cash was required on account of:		
Increases in the following assets:		
Real estate buildings, etc.	$1,100,791.31	
Accounts receivable	732,900.15	
Inventories	1,987,120.08	
Bonds and stocks	742,045.24	
Loan	500,000.00	
Payments in advance	160,318.68	
Deferred charges	43,898.89	
	5,267,074.35	
Dividends paid	2,695,000.00	
		9,326,696.03
Leaving as the net increase in available cash		$2,537,867.95
Cash at banks and on hand, June 30, 1917	$3,541,464.89	
Cash at banks and on hand, June 30, 1916	1,003,596.94	
		$2,537,867.95

In his accompanying remarks to the stockholders, Wallace H. Rowe, president, said:

During the year there was expended for maintenance $1,265,506.22, and for bettterments and improvements $85,799.74, all of which was charged to operating expenses. The two open hearth furnaces under construction at the time of making last year's report were completed and put in operation—one on Oct. 8, 1916, the other on Nov. 6, 1916. From time to time during the year the output of the open hearth furnaces and finishing mills was reduced by reason of a lack of natural gas for fuel purposes, and as your directors were advised that probably the difficulties would continue and increase rather than diminish, the construction of a complete unit of gas producers for the twelve open hearth furnaces was authorized. The work is progressing satisfactorily, and it is expected will be sufficiently far advanced before cold weather sets in to materially improve this situation. The cost is estimated at $1,000,000.

"During the year your company purchased 90¾ acres of land in Washington County, Pa., about five miles from your Monessen works. Your company acquired during the year, on favorable terms, a large interest in the Bennett Mining Co. of Minnesota, which gives assurance of a better supply of ore for your blast furnaces. Reference was made in the report of last year to the remaining $2,000,000 of coupon notes of the company then outstanding, but called for redemption. All of these notes have been redeemed and the trust indenture securing same cancelled. On Jan. 2, 1917, the outstanding notes of the Pittsburgh Steel Ore Co., amounting to $375,000, were purchased from the holders, cancelled and the trust indenture terminated."

Regular quarterly dividend payments on the preferred stock of the company were made throughout the year. The regular quarterly dividends on the common stock likewise were paid, and, in addition, an extra dividend of 20 per cent.

Industrial Finances

The Luthol Research Laboratory Co., Columbus, Ohio, has increased its capitalization from $50,000 to $250,000.

Wheel Manufacturers Organize

About 45 manufacturers of wheels for use in the United States Army and Navy met last week at the William Penn Hotel, Pittsburgh, and organized a subcommittee of the Council of National Defense. The meeting was at the request of that organization and the sub-committee will co-operate with it to devise ways and means whereby the largest number of wheels may be manufactured in the shortest possible time. The committee appointed will be known as the Wheel Manufacturers' War Service Committee and is as follows: T. A. White, St. Marys Wheel & Spoke Co., St. Marys, Ohio; E. H. Archibald, Archibald Wheel Co., Lawrence, Mass.; H. F. Harper, W. K. Prudden & Co., Lansing, Mich.; O. B. Bannister, Muncie Wheel Co., Muncie, Ind., and O. W. Mott, Mott Wheel Works, Jackson, Mich. According to the manufacturers attending the meeting they have recently encountered considerable difficulty in obtaining proper material for the manufacture of wheels for Government service. This shortage, it is claimed, has resulted from the great increase in the manufacture of large trucks.

A Patriotic Appeal

Recently the United Engineering & Foundry Co., Pittsburgh, declared and paid a regular dividend of 2 per cent and an extra dividend of 4 per cent on its common stock. Accompanying the dividend checks sent to stockholders was an engraved card bearing an American flag, on which was printed: "It is the sacred duty of every American citizen to buy Liberty bonds to the fullest extent of his or her ability. With this divided in your hands, it is an opportune time to perform this sacred duty." The United Engineering & Foundry Co. has thus far this calendar year declared and paid a regular and extra dividend on its common stock to the amount of 23 per cent.

Owing to the shortage in the supply of coke, two blast furnaces at the Ohio Works of the Carnegie Steel Co., Youngstown, Ohio, have been banked, and Niles furnace of the same company at Niles, Ohio, has also been banked.

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
		Electro-	New	New	St.	New	St.
Oct.	Lake	lytic	York	York	Louis	York	Louis
24	23.50	23.50	61.75	5.50	5.37½	8.25	8.00
25	23.50	23.50	62.00	5.50	5.37½	8.25	8.00
26	23.50	23.50	63.00	5.50	5.37½	8.12½	7.87½
27	23.50	23.50	....	5.50	5.37½	8.12½	7.87½
29	23.50	23.50	65.00	5.50	5.37½	8.00	7.75
30	23.50	23.50	66.00	5.75	5.62½	8.00	7.75

NEW YORK, Oct. 31.

Copper is unchanged and nominal at the Government price. Tin is active and higher. Lead, after another decline, is very active and strong. Spelter is in poor demand and lower. Antimony has nominally declined.

New York

Copper.—The market is completely in the hands of the Copper Producers' Committee, with deliveries and sales regulated according to consumers' needs and with a view to protecting the Government and its Allies. Very little information as to the actual situation is available, most of the newspaper accounts being unconfirmed. No sales in a large way of either Lake or electrolytic are reported at the Government price of 23.50c. per lb., which we continue to quote as nominal. There is no official clearing up of the jobbers' or small consumers' difficult position but small lots continue to be sold at prices higher than the Government's. This phase of the market is easier, however, the prices paid more nearly approaching the official price than at any time. The London market is unchanged.

Tin.—The development of an acute shortage in spot tin, together with the uncertainty as to future supplies for small buyers, has caused the market to become active and higher. It has advanced daily until spot tin yesterday was quoted at 66c., New York, an increase of over 4c. in the week. The activity started on Thursday, Oct. 25, when good inquiries for early delivery appeared with but few sellers. Spot buyers became nervous, thus stimulating other positions, so that on Friday, Oct. 26, over 500 tons of all brands for all positions changed hands. Yesterday and Monday the spot situation became even more acute and was rendered more difficult by delayed cables which have continued late each day. A buyer for 50 tons could obtain only small lots when bidding up to 65c. on Monday and 66c. yesterday. Buyers are plentiful but sellers are few. Arrivals to Oct. 29, inclusive, have been 2060 tons with 4300 tons afloat. The London market has also advanced, spot Straits being quoted yesterday at £256 10s. per ton, an increase of over £9 in the week.

Lead.—Another drastic cut by the leading producer of 1c. per lb. on Wednesday, Oct. 24, bringing the quotation to 5.50c., New York, dumbfounded the entire market. The price has thus been halved in two months. It has been, however, a good thing for the industry and has had the effect evidently intended. Consumers and dealers, believing the bottom had been reached, started in to buy and since then purchasing has been on a large scale. At the end of last week prompt and November was selling at 5.50c. to 5.60c., New York. So far this week the market has continued to gain strength with sales still large. By yesterday independent sellers and others had withdrawn, leaving no one to supply the demand except the leading interest, whose quotation was and is still 5.50c., New York. Heavy sales yesterday pushed the price to 5.75c., New York, with a few sales reported at 5.87½c., New York. The cause of the present healthy tone is the fact that consumers' stocks have been at a minimum.

Spelter.—The market continues dull and uninteresting. In sympathy with the large decline in lead, prime Western spelter has also softened until yesterday the quotation was 7.75c., St. Louis, or 8c., New York, at which one or two 100-ton lots changed hands. Some few sales are also reported at 7.62½c., St. Louis, or 7.87½c., New York, but all sellers do not meet this price. Galvanizers and brass makers are still largely out of the market.

Antimony.—Chinese and Japanese grades are lower and in the absence of demand they are quoted nominally at 14.25c. to 14.50c., per lb., New York, duty paid.

Aluminum.—The market is easier with No. 1 virgin metal, 98 to 99 per cent pure, quoted at 37c. to 39c., New York.

Old Metals.—The market is very unsettled, as nobody seems to know what prices will be acceptable to the Government.

Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible (nominal)	23.50
Copper, heavy and wire (nominal)	23.50
Copper light and bottoms	21.00 to 21.50
Brass, heavy	18.00 to 18.25
Brass, light	12.00 to 12.25
Heavy machine composition	25.00 to 25.25
No. 1 yellow rod brass turnings	16.50 to 17.00
No. 1 red brass or composition turnings	19.00 to 21.00
Lead, heavy	5.00
Lead, tea	4.25
Zinc	6.25

Chicago

OCT. 29.—Leading Chicago jobbers in copper are satisfied the Government has no intention of putting them out of business, or restraining them from selling at over 23.50c. when they must do so to get back what they have paid for their stocks, to say nothing of getting a fair profit. Their course is similar to that of jobbers in iron and steel. Considerable copper is being purchased, though it is not being widely distributed. Indications point to preparation by large melters for the shortages which usually come with winter and interrupted transportation. Lead is lower, and moving fairly well, although the independent producers are not meeting the price of the leading interest. For tin there is normal inquiry. Spelter is inactive, and antimony without interest. Old metals are quiet. We quote as follows: Casting, Lake and electrolytic copper, 28c. to 30c.; tin, carloads, 64.50c. to 65c.; small lots, 66.50c. to 67c.; lead, 5.45c.; spelter, 7.62½c. to 7.75c.; sheet zinc, 19c.; antimony, 16c. to 17.50c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible wire, crucible shapes, 20c.; copper clips, 20c.; copper bottoms, 19c.; red brass, 19c.; yellow brass, 14.50c.; lead pipe, 4.50c.; zinc, 5c.; pewter, No. 1, 35c.; tinfoil, 42c.; block tin, 47c.

St. Louis

OCT. 29.—Non-ferrous metals weakened somewhat during the early part of the week, but stiffened toward the close and to-day were quoted, in carload lots, as follows: Lead, 5.50c., with some producers asking 5.75c.; spelter, dull and nominal, at 7.87½c. In less than carload lots, the quotations were: Lead, 7c.; spelter, 8½c.; tin, 68c.; Lake copper, nominally, 27½c.; electrolytic copper, nominally, 27c.; antimony, Asiatic, 18c. In the Joplin district, ores were affected considerably by the condition in the metal market, with the result that the figures on the basis range in zinc blende, 60 per cent metal, were, although quoted at $55 to $70 per ton, really saleable at the lower end of the range to a greater extent than elsewhere, and the average for the district for the week consequently fell down somewhat to about $61.50 per ton. Calamine was in much the same condition, with the basis range for 40 per cent metal at $33 to $40 per ton and the district average for the week about $37 per ton. Lead ore was weak and sold down again to about $75 per ton, basis of 80 per cent metal, and the average for the district for the week was about the same figure. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 11c.; heavy yellow brass, 15c.; heavy red brass and light copper, 19.50c.; heavy copper and copper wire, 21.50c.; pewter, 25c.; tinfoil, 42c.; zinc, 5c.; lead, 5.25c.; tea lead, 5c.

The Youngstown Sheet & Tube Co. still has one unit of 51 ovens at its Koppers by-product coke plant down for lack of coal.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

(Some of these quotations are nominal, showing prices which prevailed when last sales were made. Published as a matter of record.)

Freight rates from Pittsburgh on iron and steel articles, aside from wrought iron and steel pipe in carloads, per 100 lb. New York 19.5c.; Philadelphia 18.5c.; Boston 21.5c.; Buffalo 11.6c.; Cleveland 13.5c.; Cincinnati 18.5c.; Indianapolis 20c.; Chicago 21.5c.; St. Louis 27c.; Kansas City 47c.; minimum carload 36,000 lb.; St. Paul 35.5c.; minimum carload 36,000 lb.; Denver 79c.; minimum carload 36,000 lb.; Omaha 47c.; minimum carload 36,000 lb.; New Orleans 30.7c.; Birmingham 46c.; Pacific Coast 75c.; minimum carload 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is 90c., minimum carload 40,000 lb.; and 85c., minimum carload 50,000 lb. On wrought iron and steel pipe, the rate from Pittsburgh to Kansas City is 40c. per 100 lb., minimum carload 46,000 lb.; to Omaha 40c., minimum carload 46,000 lb.; to St. Paul 35.5c, minimum carload 46,000 lb.; Denver 79c., minimum carload 46,000 lb. *A 3 per cent transportation tax now applies.*

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in., angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 3c.

Wire Products

(Prices of independent mills.)

Wire nails, $4 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire, $4.05 per 100 lb.; annealed fence wire Nos. 6 to 9, $3.95; galvanized wire, $4.65; galvanized barb wire, and fence staples, $4.85; painted barb wire, $4.15; polished fence staples, $4.15; cement-coated nails, $3.90 base, these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 43 per cent off list for carload lots, 42 per cent off for 1000-rod lots, and 41 per cent off for small lots, f.o.b. Pittsburgh.

Nuts and Bolts

Discounts in effect for large buyers are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days.

Carriage bolts, small, rolled thread, 40 per cent; small cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent with c. p. nuts 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq. blank, $1.70 off list, and tapped, $1.50 off; hex. blank, $1.50 off, and tapped, $1.30 off; nuts, c. p. c. and t. sq. blank, $1.25 off; and tapped, $1 off; hex. blank, $1.25 off, and tapped, $1 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Wire Rods

Soft Bessemer and open-hearth rods to domestic consumers at $57; high-carbon rods made from ordinary open-hearth steel, $95 to $100, and special steel rods with carbons running from 0.40 to 0.60, $100 to $110 at mill; above 0.60 carbon, $115 to $120.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $5 to $5.50; ¾ in., 7/16 in. and ½ in., $7 base. Boat spikes are occasionally quoted $7 to $8, all per 100 lb., f.o.b. Pittsburgh, but some makers are quoting higher. Track bolts with square nuts, 7c. to 7.50c. to railroads, and 8c. to 8.50c. in small lots for fairly prompt shipment.

Steel Rails

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails and on carload and smaller lots, 4c. to 4.25c. at mill. Light rails 25 to 45 lb., $75 to $80; 16 to 20 lb., $80 to $81; 12 and 14 lb., $82 to $83; 8 and 10 lb., $83 to $84; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard Bessemer rails, $38; open hearth, $40 per gross ton, Pittsburgh.

Tin Plate

Effective July 31, prices on all sizes of terne plates were advanced from $2 to $2.50 per package and are now as follows: 8-lb. coating, 200 lb., $16 per package; 8-lb. coating, I. C., $16.30; 12-lb. coating, I. C., $17.50; 15-lb. coating, I. C., $18.25; 20-lb. coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.90c. for delivery late this year, and 4.50c. to 5c. from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c., railroad test bars, 5.25c. in carload and larger lots f.o.b. mill.

Wrought Pipe

The following discounts on steel are to jobbers for carload lots on the Pittsburgh basing card in effect from May 1, 1917, all full weight, except for LaBelle Iron Works and Wheeling Steel & Iron Co., which quote higher prices, and National Tube Co., which adheres to card of April 1.

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	42	15½	⅛ and ¼	23	+4
½	46	31½	⅜	24	+3
¾ to 3	49	35½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	42	29½	2	26	12
2½ to 6	45	32½	2½ to 6	8	15
7 to 12	42	28½	7 to 12	25	12
13 and 14	32½	..			
15	30	..			

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	38	20½	¼, ¼ and ⅜	22	5
½	43	30½	½	27	14
¾ to 1½	47	34½	¾ to 1½	33	18
2 to 3	48	35½			

Lap Weld, extra strong, plain ends

2	40	28½	2	27	14
2½ to 4	43	31	2½ to 4	29	17
4 to 6	42	..	4½ to 6	28	16
7 to 8	38	24½	7 to 8	20	8
9 to 12	33	19½	9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

Nominal discounts on less than carload lots, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in.	28	1¾ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3¼ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in.	No quotations
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths. Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net or 2 per cent discount in 10 days:

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer

	Cents per lb.
Nos. 3 to 8	5.00 to 5.50
Nos. 9 and 10	5.25 to 5.50
Nos. 11 and 12	5.50 to 5.75
Nos. 13 and 14	5.75 to 6.00
Nos. 15 and 16	6.00 to 6.25

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	5.30 to 5.80
Nos. 22 and 24	5.35 to 5.85
Nos. 25 and 26	5.40 to 5.90
No. 27	5.45 to 6.00
No. 28	5.50 to 5.95
No. 29	5.55 to 6.05
No. 30	5.65 to 6.15

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11	6.50 to 7.00
Nos. 12 and 14	6.60 to 7.10
Nos. 15 and 16	6.75 to 7.25
Nos. 17 to 21	6.90 to 7.40
Nos. 22 and 24	7.05 to 7.55
Nos. 25 and 26	7.20 to 7.70
No. 27	7.35 to 7.85
No. 28	7.50 to 8.00
No. 29	7.75 to 8.25
No. 30	8.00 to 8.50

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	5.80 to 6.30
Nos. 17 to 21	5.85 to 6.35
Nos. 22 and 24	5.90 to 6.40
Nos. 25 and 27	5.95 to 6.45
No. 28	6.00 to 6.50
No. 29	6.05 to 6.55
No. 30	6.05 to 6.55
Nos. 30½ and 31	6.10 to 6.60

Machine Tool Builders Vital Factor in War

Director General Japp of British Munitions Board Pays Tribute to Assistance American Trade Has Rendered the Allies—Association in Convention

"Without the machine tools of America, the Allies could not have reached their present dominating position," said Henry Japp, Deputy Director General in the United States for the British Minister of Munitions, in an address at the opening session of the annual convention of the National Machine Tool Builders' Association, Hotel Astor, New York, Tuesday morning.

Mr. Japp's address was one of the interesting and inspiring features of the convention. He said in part.

"I am sure you gentlemen who manufacture machine tools must all realize the great responsibility that rests on your shoulders to-day. Need I tell you how much the Allies, more especially the British Empire, appreciate the work that the machine tool builders of this country have done toward winning the war? In equiping the munition works of this country alone, you have done marvels; but when one considers the millions of dollars' worth of machine tools and accessories you have exported to Great Britain, France, Russia, Italy and Canada, it is surely with a deep feeling of gratitude that we must regard the great work you have accomplished; and let me say we still need your help, we depend on you, gentlemen, and we know you will not fail us. Every machine ordered over here by Great Britain is urgently required for munition work. So hurry, please hurry deliveries, and please don't forget that above everything the boys now at the front must be kept supplied, and to withhold their needs in any respect would be disastrous.

War of Machinery

"This is a war of machinery, of the building up in three years of a machine to smash the war machine of Germany that was surreptitiously built up in the last 40 years with malice aforethought to conquer the world. As you are aware, the Machine Tool Department of the British Ministry of Munitions is under the care of Sir Alfred Herbert, a well-known machine tool builder. In order to prevent machine tools standing idle or being insufficiently employed, he has established a machine tool clearing house. In the last seven months, his clearing house has investigated 22,000 applications and released 43,000 machines, which are valued roughly at $15,000,000. The production of munitions, of course, depends almost solely on machine tools, and you will be glad, and probably astonished, to hear that the output in England is to-day 20 times what it was two years ago. The Woolwich arsenal, which was our main supply in 1914, employed then a staff of 11,000, and the staff to-day is 74,000; and while in 1914 only 125 women were employed in this arsenal, there are now 25,000 employed there.

"The cost of the manufacture of munitions for Great Britain has resulted during the last year in a saving of $200,000,000 over the costs of production for the previous year, and workmen have been so prosperous that out of their savings they have contributed $200,000,000 to the war funds. The employment of women in the manufacture of munitions and the dilution of labor with women, in the case of machine work, amounts to as high as 60 per cent, and these women have been able to earn, working piece-work, 90 per cent in excess of the time rate. They are employed in all manners of industries, viz., gage making, machining shells, foundry moulding, glass blowing and shipbuilding, and of course agriculture. In the inspection of munitions, which employs some 50,000 people, 60 per cent are women, and in one large powder factory the proportion is 290 girls employed for each man worker. The above information is taken from the reports of Dr. Addison's speech in the House of Commons.

"It is encouraging to learn that the maimed soldiers are being carefully equipped with artificial limbs and trained as skilled workmen. Queen Mary's training workshop at Brighton has been particularly successful in this beneficent work as well as that at Roehampton. The problem of making the maimed soldiers independent of charity is a most important one, and the cheerful way in which these brave men have faced the problem of making themselves useful and independent is very inspiring. The perfection of the machine tool and modern methods has made possible the employment of maimed soldiers and women in countless capacities, thus relieving men who are physically fit for the more arduous work of the trenches.

Participation of the United States

"Now that this great country has enlisted with the Allies to destroy the destroyer in self-defense, final victory is assured. I am sure that you all realize that you are not fighting to save France or the British Empire but you are fighting in self-defense. It is your war as much as ours, and among other things victory will bring freedom to the German people in much the same way that George Washington, without knowing it, helped to bring freedom to the English people, and his victory in America over George III, the German King of England, established not only the democratic government of the United States but also of Great Britain and of the British Empire.

"With wonderful wisdom, President Wilson guided this country along the lines of strict neutrality until the people learned for themselves of the schemes of Germany to place this country, along with the rest of the world, under the heel of autocracy. Gradually the people were prepared for the great decision as bit by bit the evil intent of Germany was uncovered and revealed until the point was reached when President Wilson said: 'The time has come to conquer or submit; for us there is but one choice; we have made it.' And although to some it may seem to take a long time for your army to strike, make no mistake, this country is getting under way, it is like a huge flywheel, which takes time to reach its full speed and to develop its full energy, but ultimately becomes irresistible, overcoming all opposition in victory. The time will come for every country that is neutral to-day to decide whom they shall serve, as there appears to be no neutrality possible for country or individual in this war of right against might, of good against evil.

The Final Outcome

"When you consider that Great Britain has more than five million men under arms and that the United States has a population of more than double that of Great Britain and has practically unlimited resources, it is impossible to understand those who doubt that the final outcome will be the overwhelming defeat of Germany. The Germans have set up as their god military power and they worshipped this god for the last 40 years, giving it all their trust and faith, and now they are waking up to find that this false god of theirs cannot even feed them, let alone bring victory. They profess to be fighting for the freedom of the seas. The freedom they are aiming for is really nothing but license to murder and destroy while the freedom that America and the Allies are fighting for is the freedom for all controlled by will.

Future Outlook, Restoration

"As to the outlook after the war and the restoration that will be necessary, let us look forward with hope and courage. This is a wonderful time we are living in and a wonderful war we are waging, inasmuch as we are not only destroying the lust for conquest and

military power in Germany but throughout the world and we are setting ourselves and the peoples of the earth free from bondage to all manner of abuses.

"The employer and workmen, the rich and poor, the educated and the uneducated, are meeting in the trenches and spilling their blood together for the brotherhood of man, and in doing so are learning to admire and love each other, and can we doubt that a new Heaven and a new Earth are being revealed to-day and that the lookout is bright with promise.

"The business world is already preparing for the readjustment necessary by scaling down the excessive stock exchange values and plans are now under way to provide work for the returning soldiers after the war. If the British Army is disbanded at the rate of 40,000 men per week it will require three years for the work, but as arrangements are perfected, this work will no doubt be accelerated. Probably the same scale will apply to all the Allies. The skilled tradesmen should be released first so that by their industry there will be built up the supply of necessities that will be required for the devastated sections of France, Belgium and Servia, and to replenish the depleted stocks throughout the world.

"The machine shops of this country are the real reserves of the army. Napoleon would perhaps have called them his Imperial Guard. We can have a peculiar pride in knowing that upon our shoulders rests such a responsibility, and those of us who cannot go to the firing line can do our part back at our shops, because the fighting man is not the only one who must go over the top. We must do the same thing with good tools and plenty of them at greatest speed.

Increased Output

"But this war will end some time—no man knows when—and then the business man with a large plant and a large payroll will have some real questions to solve, requiring clear vision and courage. A prophet may indulge in predictions based on natural laws and past experience. Without, however, making any attempt at prophecy, I want to direct the attention of this membership to the fact that during the last three years there has been built about the same number of machine tools as would ordinarily be built in 10 years.

"They are, of course, through a process of long hourly service and a lack of skilled operators, being worn out more rapidly than usual, but even under such conditions the life of a well designed and well built machine tool is quite long. Therefore, I ask you, how long will it require the world market to absorb this over-supply which even now is apparent in some kinds of machine tools? Mind you, I am not predicting, simply calling your attention to a condition, with a view to having each manufacturer answer the question as best he can, but I would also like to add the old warning, 'the good sailor trims his sails for a squall.'

"This country has long been pre-eminent in the machine tool building industry, because we have cheap raw material, the inventive mind, labor efficiency and business organization. In the future, however, we must add additional qualifications, namely, we must further improve, we must grow more efficient, and we must deal with all nations in the same open-minded, honest, straightforward way. There must be no scraps of paper in our business dealings, no secret diplomacy, simply old-fashioned, dyed-in-the-wool, painstaking business transactions, which will permit us to extend our world trade to every country where a machine tool is used. In other words, in time of war prepare for peace.

"Our country needs our service now more than it ever has before. This terrific struggle means more than physical effort—it means strains of every kind, it means heavy taxes, it means personal sacrifices, it means work and lots of it—but I am quite sure that the machine tool builders of this country are fully equal to their task."

What the War Means.

An address on "What the War Means to American Business" was delivered at the Tuesday morning session by George E. MacIlwaine of Babson's Statistical Organization, Wellesley Hills, Mass. He dwelt upon the economic advantages which must result in European countries from the struggle. He urged American business men to prepare for a slump in business when peace comes, this to be followed by an era of peace prosperity, which may last, he said, from one to five years. After that, he predicted, is certain to come the worst period of business depression the civilized world has ever known.

Tuesday afternoon's session was devoted to five addresses on the prospects for foreign trade in machine tools after the war. R. Poliakoff, assistant professor of mechanical technology at the Technical Institute, Moscow, Russia, talked on Russia; E. G. Todd, member of the firm of E. Isberque & Co., Antwerp, Belgium, on Belgium; Roger P. Redier on France; Henry S. Moos, member of American Machinery Syndicate, New York, on Spain, and C. E. Briggs, National City Bank, New York, on South America. These addresses will receive more attention in the next issue of THE IRON AGE.

Committee meetings occupied all of Wednesday morning. At the Wednesday afternoon session an address was delivered by G. E. Merryweather, president Motch & Merryweather Machinery Co., Cleveland, who was lately appointed head of the machine-tool section of the War Industries Board.

Work to Be Done

"There will be endless work to be done after the termination of the war in construction and reconstruction so that all mankind will be fully and actively employed. The building of steamships to make up the curtailed building and losses sustained during the war will keep the shipyards busy for several years to come. The supplies required to reinstate the devastated industrial sections of France and Belgium, to say nothing of making up for the neglect in the up-keep of the British railroad systems and other public utilities on account of all facilities being impressed during the war for munition work will surely keep the machine-tool trade fully occupied for many years, especially as at present so much machinery is allowed to run without repair, and the same applies to all other industries that supply the needs of man.

"So let us look forward cheerfully to the future, inspired by the self-sacrifice that our boys are making for all we hold dear."

President's Address

The convention was called to order by the president, J. B. Doan, the American Tool Works Co., Cincinnati, who, among other things, said:

"It is a fitting time for instant and complete friendship among us—this is a day when we should knit our hearts together in a new and profound loyalty, which begins with our association and from there goes out to our beloved country. We need each other, and America needs all of us. As President Wilson has said: 'We must co-operate in the whole field of business, the Government with the merchant, the merchant with the employee, and all with each other.'

"Through this association and its membership our leaders at Washington have been able to quickly inform themselves of the condition of our plants, and every member, I am sure, has done his utmost to speed up shipments and to satisfy as best he could the Governmental requirements. Hours are extremely valuable in warfare; even minutes often win battles. Any machine tool builder who does not bend all his mental energy in the solution of the problem of rapid output is a lame soldier in the fighting line. We must literally spend sleepless days and nights, for we are the machines behind the men behind the guns. No machines—no guns.

The Bucyrus Steel Co., Bucyrus, Ohio, has been incorporated with a capital stock of $50,000. The company will make steel castings and different grades of alloy steel. The present authorized capitalization will be increased to a larger amount as soon as complete organization is effected.

PERSONAL

Charles T. Main, an industrial engineer, Boston, has been nominated for president of the American Society of Mechanical Engineers. Spencer Miller, Lidgerwood Mfg. Co., New York, has been nominated to one of the vice-presidencies. For managers, Fred A. Geier, president Cincinnati Milling Machine Co.; D. R. Yarnall, general manager Nelson Valve Co., Philadelphia, and Fred N. Bushnell, vice-president Stone & Webster Engineering Corporation, Boston, have been nominated. William H. Wiley, John Wiley & Sons, New York, who has been treasurer since 1884, has been renominated.

Randolph H. Fox, research engineer Fafnir Bearing Co., New Britain, Conn., has been commissioned a first lieutenant in the Ordnance Officers' Reserve Corps. Mr. Fox was graduated from the Massachusetts Institute of Technology in 1912.

A. W. Hatch, superintendent of the gun stock department, Remington Bridgeport Works, Remington Arms Union Metallic Cartridge Co., was tendered a banquet, Oct. 21, by 350 workers in his department. H. E. Wells, superintendent of the machine shop division, was toastmaster, and E. F. Ryan, assistant works manager, was one of the speakers. Mr. Hatch was connected with the gun stock department of the Springfield Arsenal for 15 years and later was in charge of the department at the Rock Island Arsenal.

Harvey M. Clymer, formerly connected with the Lebanon Valley Iron & Steel Co., Lebanon, Pa., has resigned to become chief clerk in the offices of Luria Bros. Co., dealers in iron and steel scrap, Park Building, Pittsburgh.

Carmi A. Thompson, who served two terms as secretary of state of Ohio, and was later private secretary to President Taft, has been made general manager of ore properties of the Tod-Stambaugh Co., Cleveland, and assumed his new duties Nov. 1. For several years he had been manager of the Great Northern ore properties, with headquarters at St. Paul, Minn.

Rollin C. Steese, a director and former general manager of the Brier Hill Steel Co., Youngstown, Ohio, has been named one of the five members of the advisory committee of the Ohio Fuel Administration.

C. O. Miniger has been named as vice-president of the Willys-Overland Co., Toledo, Ohio. He will devote his attention to the production department, in which he will be associated with William H. Birchall, general superintendent.

H. L. Hopwood, industrial lawyer, specializing in the negotiations and sales of industrial plants and businesses, has moved his office to the New First National Bank Building, Columbus, Ohio.

F. P. Bassett has been appointed superintendent of the blast furnace department of the Compania Fundidora de Fierro y Acero de Monterey, Monterey, Mexico. The company's furnace, of 300 tons capacity, was blown in on Oct. 3 and is to produce foundry and basic iron, using native raw materials.

H. E. Mills, superintendent of construction for the Buick Motor Co., Flint, Mich., in charge of building that company's new foundry, and later chief draftsman, has joined the organization of the H. M. Lane Co., Detroit, foundry and metallurgical specialists.

William A. Battey, who has been connected with the Shepard Electric Crane & Hoist Co. since its start in this field, as eastern sales manager and sales director, will sever his active connection with the business on Dec. 1, but will retain his interest in the company and continue as a director. He is vice-president of the Pennsylvania Crusher Co. and finds it necessary to devote his entire attention to its rapidly expanding business in the manufacture of hammer pulverizers, Bradford breakers and special crushing machinery for the by-product coke industry and other industries requiring reduction apparatus. W. C. Briggs, for the past ten years associated with Mr. Battey in the Shepard company's New York office as sales engineer, will become district manager. On Nov. 1 Robert T. Turner will join the New York organization as sales engineer, at 30 Church Street.

E. R. Swanson, assistant superintendent of the Duquesne Steel Foundry Co., Coraopolis, Pa., has been appointed superintendent of the plant, succeeding L. A. Way, resigned. Mr. Swanson was formerly with the Commonwealth Steel Co., Granite City, Ill.

James A. Freed, employment agent for the Youngstown, Ohio, district Carnegie Steel Co. mills, has been named also land agent for the company in that district, having directly in charge the sale and rental of houses being erected at McDonald, Ohio, where the new bar, hoop and band mills are being built.

J. Mathews has been appointed general superintendent of the Standard Steel Castings Co., Cleveland.

R. J. Morgan has been appointed supervisor of sales of the American Steel Export Co., New York. He has been identified with the Midvale Steel & Ordnance Co., following thirteen years with the Carnegie Steel Co.

Jonathan Warner, president of the Trumbull Steel Co., Warren, Ohio, has been elected president of the Y. M. C. A. of Youngstown, Ohio.

J. D. W. Snowden, who for about 15 years has been connected as salesman with the Cleveland sales office of the Cambria Steel Co. and its successor, the Midvale Steel & Ordnance Co., has resigned to become associated with the sales department of the American Steel Export Co., New York. He has been succeeded by G. W. Pratt, who for a long time has represented the Cambria company in Toledo, Ohio.

R. C. Garlick will leave Chicago Nov. 1 to assume a position in the sales department of the Sharon Steel Hoop Co., at Sharon, Pa. S. J. Mertz, who has been connected with the Sharon and Chicago offices for a number of years, will succeed Mr. Garlick as city and traveling salesman from the Chicago office.

W. T. Pursglove has become manager of the Lindholm Metal Stamping Co., Front and Erie Streets, Camden, N. J., manufacturer of grease cups and kindred specialties.

Charles N. Replogle, general manager, Ralston Steel Car Co., Columbus, Ohio, has resigned to become vice-president and general manager of the Symington Forge Co., Rochester, N. Y.

William C. Hood, South Brownsville, Pa., has been appointed assistant general superintendent at the plant of the H. C. Frick Coke Co., with headquarters at Scottdale.

Allen Hoffer, Coatesville, Pa., superintendent of blast furnaces for the Worth Brothers Co., has resigned, effective Nov. 15, to become associated with the Cleveland-Cliffs Iron Co., Cleveland.

At the annual meeting of stockholders of the Columbia Wagon Co., Columbia, Pa., manufacturer of wagons and parts, W. T. Garrison was elected president and H. F. Yergey, treasurer and manager. Edward B. Smith is secretary.

F. L. Converse, electrical engineer for the Midvale Steel Co. at its Coatesville, Pa., works, has resigned to become connected with the Tacony Ordnance Co., Philadelphia.

William S. Quigley, president Quigley Furnace Specialties Co., Inc., New York, will address the Brooklyn Engineers' Club on Thursday evening, Nov. 1, on the "Use of High Temperature Furnace Cement in Furnace Construction," illustrated by means of an electric furnace in operation.

Charles Piez, president Link-Belt Co., Chicago; Charles Day, Day & Zimmermann, Philadelphia, and Arthur Mason, have been appointed as a special committee by President Capps of the Emergency Fleet Corporation to make a survey of shipyards in the country and suggest ways of increasing efficiency.

The War Excess Profits Tax Problem

WASHINGTON, Oct. 30.—The Internal Revenue Bureau has been swamped with inquiries concerning the proper interpretation to be put on the provisions of the war excess profits tax as found in title II of the war revenue act of Oct. 3, 1917. After an ineffectual attempt to frame a series of rulings covering the most important of the questions that have arisen, Secretary of the Treasury McAdoo announces that he will appoint an Advisory Board to assist the Commissioner of Internal Revenue in construing and applying the excess profits provisions. In the meantime the bureau will refrain from issuing formal rulings concerning this feature of the new law and local collectors of internal revenue will refer to the department all inquiries they may receive in this connection.

The creation of this new board, the membership of which will be given out in a few days, is said by Secretary McAdoo to be one of the most important steps contemplated by him in the reorganization of the internal revenue service for the administration of the great task imposed by the new act. The war revenue law has the greatest productive capacity of any statute passed in the history of the country, and it is the desire and purpose of the Secretary to administer it effectually with the least possible inconvenience to the public and especially to the business of the country. Experienced observers here anticipate that the United States Supreme Court will ultimately be asked to construe certain features of the law, and supplemental legislation at the coming session of Congress is a further possibility. W. L. C.

Higher Transcontinental Rates Asked

WASHINGTON, Oct. 30.—Applications filed by transcontinental railroads to increase rates to the Pacific coast will be subjected to hearings next month. These applications include iron and steel and other important commodities from Eastern producing points. The rate structure proposed is in strict conformity with the long and short haul clause of the interstate commerce act. Instead of reducing the rates to interior points the roads propose to increase the rates to Pacific terminals. This action is in response to the decision issued by the commission some time ago, in which it pointed out that the water competition through the Panama Canal had ceased as the result of war conditions, and therefore the roads should obey strictly the long and short haul clause, inasmuch as competitive conditions no longer exist.

Hearings will be held at room 1809, 165 Broadway, New York City, Nov. 5; at Federal Building, Chicago, Nov. 12, and at United States Court rooms, Portland, Ore., Nov. 21, in order that the commission may determine (1) whether or not the rates proposed are in compliance with the order of the commission aforesaid, and (2) to receive evidence upon the reasonableness and propriety of the increased rates proposed. The tariffs which the carriers ask permission to file are voluminous. They may be inspected at the office of the commission.

Bituminous Coal Price Advanced

Effective Oct. 29, the Fuel Administration has granted the bituminous coal producers of the United States permission to increase the price of their coal by 45c. per ton at the mine. This advance in the price set by President Wilson Aug. 21 is intended to meet exceptional conditions in certain localities, mainly higher wages to miners. The increase does not apply to any coal sold at the mine under an existing contract containing a provision for an increase in the price of coal thereunder in case of an increase in wages paid to miners. President Wilson sanctioned the increase after having received a recommendation to that effect from H. A. Garfield, Fuel Administrator.

Gentele & Co., Ltd., doing a business in trading and manufacturing and established on March 7, 1917, has taken over the business carried on by the firm of Heljestrand, Gentele & Dorenberg. Its offices are located at 22, Mjasnitskaja, Moscow, Russia.

OBITUARY

SERGT. ALBERT P. BOWE, formerly advertising manager of the Hydraulic Press Mfg. Co., Mount Gilead, Ohio, was accidentally shot and killed on the morning of Oct. 27. Sergeant Bowe was called to the colors Sept. 19 and was recently chosen from the Chillicothe cantonment to take gun practice on the rifle range at Camp Perry, Ohio. He was shot while on the line of duty through the careless handling of a gun in the hands of a lieutenant. The company says of him: "Mr. Bowe was not only capable and conscientious in his publicity work for our industry but was representative of the standards that make for good citizenship. While we must chronicle his tragic death, we are glad to be able to speak unreservedly of his sincerity, his loyalty, his concept of what constituted a man, and attest the fact that he lived in strict alignment thereto."

ISAAC GERSON, head of the firm of I. Gerson & Sons, Toledo, Ohio, died Oct. 18 following a prolonged illness from diabetes. The firm of I. Gerson & Sons was established in 1885. Elmer Gerson, son of Isaac Gerson, was admitted into partnership about 1900 and for some time conducted the scrap iron and metal business of the firm, which also operates the American Foundry Co., manufacturer of sash weights. I. Gerson & Sons are also stockholders in the Detroit Metal Refining Co., Detroit, and Mr. Gerson was a director and a member of the finance committee of the Commercial Savings & Trust Co.

AQUILA ADAMS, Sandwich, N. H., died at the Parker House, Boston, Oct. 21, at the age of 85 years. Mr. Adams was graduated from the Lawrence Scientific School and engaged in heavy machine manufacture in Boston. While in this business he built the monitor Chino, at about the end of the Civil War. He later was connected with the Adams Sugar Refinery and at the time of his retirement in 1883 was president of the Broadway National Bank, Boston.

JOSEPH REID, founder and president of the Joseph Reid Gas Engine Co., Oil City, Pa., died Oct. 23, aged 69 years. He was born in Scotland and had lived in Oil City since 1877. He developed an engine using natural gas as fuel and later organized the company that engaged in its manufacture. He was also the inventor of a line of oil burners and various other oil refiners' supplies.

SHERMAN BLAKESLEE, president Blakeslee Forging Co., Southington, Conn., died at his home in Plantsville, Oct. 23. He founded the company in 1877.

Chain Companies Will Be Consolidated

COLUMBUS, OHIO, Oct. 31 (*By Wire*).—The merger of the Columbus Chain Co. of this city and Lebanon, Pa., and the McKinnon Chain Co. of Buffalo and St. Catharines, Ont., which is now in progress, will make the Columbus-McKinnon Chain Co. the largest concern of the kind in America, and that means in the world. The McKinnon stockholders already have ratified the merger, and the stockholders of the Columbus company yesterday met to ratify the action of the board of directors. The Columbus-McKinnon Chain Co. will be an Ohio corporation with a capital stock of $2,500,000. The general offices will be in Columbus. Many improvements lately have been made in the Columbus plant, and the plant at Lebanon, Pa., has been greatly increased. It is the intention of the merged company to enlarge the St. Catharines plant so that a complete line of chains will be produced, ranging all the way from the smallest chain to the largest anchor chain. C. M. Wambaugh is president of the Columbus company and L. E. McKinnon is president of the Buffalo company. Details of the merger will be worked out within the next few days and the new company organized.

HELPED AT THE FINISH

Iron and Steel Industries Do Their Full Duty on Liberty Bond Subscriptions

In the final big drive for subscriptions for Liberty bonds the iron and steel manufacturers and metal working trades throughout the country did their full part. In Pittsburgh, Youngstown and other important industrial centers employers and employees alike subscribed for immense amounts. Some cities having a large German population, such as Cincinnati and Milwaukee, were among the very first to report that their maximum subscriptions had been attained. In the City of New York the hardware, metal and allied trades division distinguished itself by obtaining a total of $42,218,250, while the machinery and machine tools division subscribed $12,888,650. Among the subscriptions not formerly noted were the following:

Westinghouse Electric & Mfg. Co. employees	$2,233,000
Valley Mold & Iron Corporation	1,500,000
LaBelle Iron Works	2,000,000
Wheeling Mold & Foundry Co.	100,000
American Bridge Co. and employees	225,000
Penn Seaboard Steel Co.	250,000
Blaw-Knox Co.	150,000
American Malleables Co.	1,000,000
American Malleables Co. employees	90,000
Interstate Iron & Steel Co.	100,000
American Woodworking Machinery Co.	68,500
J. H. Williams Foundry Co.	51,000
American Radiator Co.	50,000
Eastern Steel Co.	250,000
Eastern Steel Co. employees	81,000
Packard Motor Car Co. and employees	2,000,000
Hyatt Roller Bearing Co.	300,000
Cary Mfg. Co.	300,000
Victor Talking Machine Co.	1,000,000
Goldschmidt Thermit Co.	25,000

Pittsburgh's Millions

Subsidiary interests of the United States Steel Corporation of the Pittsburgh district subscribed for Liberty bonds as follows: National Tube Co., $2,200,000; American Sheet & Tin Plate Co., $1,730,000; American Steel & Wire Co., $1,255,000; Carnegie Steel Co., $5,500,000; H. C. Frick Coke Co., $1,500,000. Other subscriptions included: Pittsburgh Plate Glass Co., $1,000,000; Standard Steel Car Co., $1,000,000; Harbison-Walker Refractories Co., $3,000,000; Aluminum Co. of America, $3,500,000; Pittsburgh Steel Products Co., $250,000; Vanadium-Alloys Steel Co., $300,000; Allen S. Davison Co. and allied interests, $200,000; Pittsburgh Coal Co., $2,500,000; McKeesport Tin Plate Co., $3,000,000; Oliver Iron & Steel Co., $1,000,000; Oliver & Snyder Steel Co., $500,000; Firth-Sterling Steel Co., $500,000; Spang-Chalfant & Co. Inc., $1,000,000; Fayette Coal Co., $100,000; Jones & Laughlin Steel Co., $2,000,000; Westinghouse Air Brake Co., $500,000; Crucible Steel Co. of America, $1,500,000; Lockhart Iron & Steel Co., $300,000; West Penn Steel Co., $500,000, and Jamison Coal & Coke Co., $600,000.

Youngstown's Record

YOUNGSTOWN, Oct. 29.—The Youngstown steel district did nobly by the second Liberty loan, the total for the city alone being close to $11,000,000. This entrenched the municipality solidly with the 200 per cent cities of the country. The subscription of the Youngstown Sheet & Tube Co. in this recent loan drive was $2,725,000. It is also announced that the corporation has purchased a total of $10,000,000 worth of Government securities, including Liberty bonds of the first and second issues. In addition to this, employees of the company purchased about $1,000,000 worth of bonds in the second issue and in the first loan about $600,000.

In the first issue the company subscribed for $3,000,000 in bonds, but received only $875,000. In the open market the company purchased a big block. The total securities of $6,000,000 in Liberty bonds and $4,000,000 in Government notes add to the sum total.

The Trumbull Steel Co. of Warren took Liberty bonds to the total of $300,000. Employees of this company took Liberty bonds to the amount of over $100,000.

Through the Youngstown banks the Republic Iron & Steel Co. took Liberty bonds to the sum of $800,000. Employees of the company here subscribed to nearly half a million.

The Brier Hill Steel Co. took bonds to the sum of $2,000,000. Its employees subscribed to Liberty bonds to the amount of about $250,000. The Carnegie Steel Co., through the Youngstown banks and for the purpose of helping the Youngstown district, took Liberty Bonds to the amount of $400,000. Its employees took over $300,000 worth of the securities.

All of the smaller steel concerns boosted the Liberty loan and helped to swell the total for this city.

Fine Record of Hardware Men

The special Liberty loan committee of the Hardware Metals and Allied Trades Division in New York, which has been actively engaged since Oct. 18 in soliciting subscriptions, obtained the splendid total of $42,218,250. The work has been carried on by William A. Graham, chairman of the committee; Edgar Higgins, secretary; Edward H. Darville, director of publicity, and the following other members: R. H. Ismon, vice-chairman, American Can Co.; William H. Taylor, THE IRON AGE and *Hardware Age;* H. S. Demarest, Greene Tweed & Co.; George F. Taylor, Corbin Cabinet Lock Co.; John Sargent, Sargent & Co.; T. H. Taylor, American Steel & Wire Co.; G. H. Richards, Remington Typewriter Co.; Bernard Ris, U. T. Hungerford Brass & Copper Co.; William F. Forepaugh, Herring-Hall-Marvin Safe Co.; R. J. Atkinson, representative Metropolitan Hardware Association; George Chatillon, John Chatillon & Sons; R. B. Budd, U. S. Steel Products Co.; W. A. Tucker, H. A. Rogers Co.; R. G. Thompson, Lufkin Rule Co.; D. T. Mallett, *Hardware Dealers' Magazine;* A. C. Penn, A. C. Penn, Inc.; E. T. Kiggins, E. T. Kiggins.

Miscellaneous Subscriptions

Of the 1016 men on the payrolls at the Farrell, Pa., works of the American Steel & Wire Co., 1008 subscribed for Liberty loan bonds to the extent of considerably over $100,000.

The Wheeling Steel & Iron Co., Wheeling, W. Va., subscribed for $1,000,000 of Liberty loan bonds.

Among the late Cleveland subscriptions to the Liberty loan are the following: Bourne-Fuller Co., $500,000; Upson Nut Co., $250,000; B. F. Bourne, $100,000; Ohio Foundry Co., $50,000; Union Rolling Mill Co., $50,000; Empire Rolling Mill Co., $25,000; Steel Products Co., $25,000.

The Bethlehem Steel Co., Bethlehem, Pa., arranged for a subscription of $2,000,000 for the Liberty loan for purchase by employees.

Employees at the works of the New Process Gear Corporation, Syracuse, N. Y., subscribed $15,100 for Liberty bonds.

Industrial plants at Buffalo liberally supported the Liberty loan, including both companies and employees. Among the subscriptions were: The American Radiator Co., $100,000; Buffalo Machine & Foundry Co., $140,000; Buffalo General Electric Co., $250,000; Pratt & Letchworth Co., manufacturer of castings, $100,000. Employees at the following plants have subscribed for the Liberty bonds to the total noted: Atlas Steel Casting Co., $100,000; Seneca Iron & Steel Co., $49,750; Ford Motor Co., Buffalo plant, $50,000; Acme Steel & Malleable Castings Co., $50,000.

The American Brass Co., Waterbury, Conn., subscribed $500,000 to the second Liberty loan. The company subscribed $1,500,000 to the first loan.

The New Departure Manufacturing Co., Bristol, Conn., subscribed $200,000 to the second Liberty loan.

In addition to subscribing for $2,500,000 of Liberty bonds, the Jones & Laughlin Steel Co., Pittsburgh, has agreed to duplicate dollar for dollar every subscription for Liberty bonds made its employees, in all parts of the country. This includes the blast furnaces, steel mills, ore mines and transportation systems owned by the company in Pittsburgh, and in the ore fields. It includes not only furnace and mill employees, but also office employees in Pittsburgh, and all other places where it has business interests. This company was among the first of the industrial concerns to adopt this plan.

Machinery Markets and News of the Works

TOOLS FOR EXPORT TAKEN

War Industries Board Seizes Machines in Storage

Between 500 and 600 Commandeered for Use in This Country—Buying of Machine Tools and Cranes by Shipbuilders Feature of Past Week

Under the authority of the War Industries Board a representative of a New York machine-tool company made a canvass of export warehouses last week and listed between 500 and 600 tools, boxed and ready for shipment to foreign countries, which had not left this country because of difficulty in obtaining shipping space. In view of the urgent needs of such tools by American manufacturers it was decided by the Machine Tool Section of the War Industries Board that they should be commandeered, which has been done. It is understood that the machine-tool builders will assist the exporters in obtaining duplicate machines when it appears certain that they will be able to ship them abroad. The Government will not, however, under present circumstances, permit tools needed for the war industries to leave this country except for equally urgent war needs of the Allies. Moreover, it is now practically necessary for machinery makers to show priority certificates in shipping machines from their plants, as in many instances under the present embargo conditions the railroads will accept only those shipments which are shown to be needed by companies engaged on war contracts.

Production of machine tools is to be accelerated by the War Industries Board by the granting of contracts to companies which have the equipment to build them even though they have not had previous experience in machine-tool manufacture. The Hall Printing Press Co., Dunellen, N. J., for example, has been given a contract for boring lathes.

Shipbuilders are large buyers in Eastern markets, the New York, Philadelphia and Boston trade feeling the effect of the demand for equipping torpedo boat destroyer plants of the Fore River Shipbuilding Corporation and the New York Shipbuilding Corporation. The merchant shipbuilding yards are also continuing to buy. The Submarine Boat Corporation has just placed a $150,000 order for locomotive cranes.

For munitions work there is an inquiry by the International Bureau of Supplies, 135 Broadway, New York, for 300 screw machines on behalf of a client whose name is being withheld. The Standard Ordnance Corporation, 115 Broadway, New York, is seeking equipment for an Ohio plant. The Tioga plant of the Taylor-Wharton Iron & Steel Co., Philadelphia, has received a shell contract and is inquiring for equipment. The Milton Mfg. Co., Milton, Pa., will engage in ammunition-making.

The Chicago market is receiving a large demand for tools for shell work. The Holt Mfg. Co., Peoria, Ill., which has a shell contract, will require about $100,000 worth of equipment. The Stenotype Co., Indianapolis, Ind., has an inquiry out for machines needed in munitions work. The Edward Valve Mfg. Co. is making 3-in. shells.

In the Cleveland market the Standard Parts Co., Cleveland, continues to buy. The Cromwell Steel Co., Lorain, Ohio, has issued a small list. A Detroit automobile company wishes to buy 46 lathes.

New York

NEW YORK, Oct. 30.

Shipbuilders have been large buyers of machine tools and cranes during the past week. The largest orders have been placed by the Fore River Shipbuilding Corporation for its new destroyer shops. The Cleveland Crane & Engineering Co., Cleveland, received an order for 27 cranes, 20 of small capacity, and other orders are to be placed probably this week, making a total of between 70 and 80 cranes. The orders are being placed by the Aberthaw Construction Co. Large orders for machine tools have been received during the week in New York.

The Submarine Boat Corporation is buying steadily for its new merchant ship plant at Newark, N. J. A large order has been placed for locomotive cranes. An inquiry has been sent out for radial drills. The Federal Shipbuilding Co., New York, has issued a list of ten shop cranes described as follows: Four 10-ton, 65 ft. span, 25 ft. lift, double trolley, for the plate and angle shop; four 20-ton, 45 ft. span, 34 ft. lift, single trolley, and two 35-ton, 28 ft. span, 58 ft. lift, for the boiler shop. The Groton Iron Works, New London, Conn., has closed with the Erie Steel Construction Co., Erie, Pa., for three small shop cranes. It is in the market for radial drills and other machine tools. It is reported that the Union Iron Works, San Francisco, is placing large orders, though none of these, so far as reported, has come to New York offices. The Newburgh Shipyards, Inc., which is to build ships for the Emergency Fleet Corporation at Newburgh, N. Y., is again in the market for machines.

The International Bureau of Supplies, 135 Broadway, is in the market for 300 screw machines for a munitions manufacturer. It is also seeking machinery and supplies for export to India. The Standard Ordnance Corporation, 115 Broadway, is reported to be trying to place orders for a plant in Ohio.

Considerable interest was excited in the machine-tool trade during the past few days by reports that the Simplex Automobile Co., New Brunswick, N. J., is preparing lists of machine tools to be bought and that it will positively do considerable buying. There has been such a delay in the placing of business by this company and the General Vehicle Co., Long Island City, N. Y., for the tools needed to manufacture airplane engines that it was feared some hitch had occurred in the granting of Government contracts.

The Hall Printing Press Co., Dunellen, N. J., is buying equipment for work on two war contracts, one for boring lathes, and the other for printing presses, which are to be mounted on motor trucks for use on the battlefields of France.

The General Electric Co., Schenectady, N. Y., has bought a 50-ton traveling crane.

A good inquiry for machine tools for export to Italy, Japan, India and other countries is reported. The J. G. White Engineering Corporation has bought a number of cylinder grinders for export to an airplane engine plant in Italy.

The Bureau of Yards and Docks, Washington, D. C., will receive bids until Nov. 19 for fitting out cranes and other work at the Brooklyn, N. Y., Navy Yard, to cost about $850,000. It is also planning for the construction of a new 50-ton crane to cost $150,000.

The Reliance Grant Elevator Equipment Corporation, New

York, has been incorporated with a capital of $50,000 to manufacture elevator equipment. R. C. Bennett, J. L. Lockwood and G. C. Pillotson, 2 Rector Street, are the incorporators.

The Blancke Twist Drill & Tool Co., New York, has been incorporated with a capital of $500,000 to manufacture twist drills, tools, etc. L. C. Blancke, C. Ter Meer and A. J. Talley, 6 Mount Morris Park West, are the incorporators.

Rubel Brothers, Inc., Glenmore Avenue, Brooklyn, N. Y., are having plans prepared for a new one and two-story ice manufacturing plant, about 100 x 200 ft., to be erected on Blake Avenue at a cost of $75,000.

The Taylor Motor Truck Co. of New York, New York, has been incorporated with a capital of $10,000 to manufacture motor trucks. C. K. Christy, W. J. Heffernan and E. F. Twyman, Jr., Fifty-fifth Street and Broadway, are the incorporators.

The Gas Engine & Power Co. and Charles L. Seabury & Co., Morris Heights, New York, manufacturers of gas and gasoline engines, etc., have had plans prepared for the construction of three shipways for boat construction at 177th Street and the Harlem River.

The H. B. Shontz Co., New York, has been incorporated with a capital of $50,000 to manufacture engines, motors, etc. H. B. Shontz, J. A. Smith and P. J. Durham, 244 West Forty-ninth Street, are the incorporators.

The Frederick A. Koch Mfg. Corporation, East Thirty-fifth Street, Brooklyn, N. Y., manufacturer of surgical instruments, will make alterations and improvements in its plant to cost about $15,000.

The Triangle Sheet Metal Works, New York, has been incorporated with a capital of $5,000. J. Streimer and H. Lieberthal, 601 West 172d Street, are the incorporators.

The Willard F. Meers Machine Co., New York, has increased its capital from $100,000 to $150,000.

The Gasoline Engine Equipment Co., 390 Webster Avenue, Astoria, L. I., manufacturer of gasoline engines, etc., is planning for the construction of a one-story addition, about 30 x 35 ft.

The Spadone Machine Co., New York, has been incorporated with a capital of $20,000 to manufacture machinery. A. A., W. A., and H. Spadone, 126 Duane Street, are the incorporators.

The Master Steam Boiler Equipment Co., New York, has been incorporated with a capital of $50,000 to manufacture boiler apparatus. W. J. Bauer, T. B. Hustwick and A. W. Palmer, 27 Cedar Street, are the incorporators.

The National Toggle Co., New York, has been incorporated in Delaware with a capital of $1,000,000 to manufacture machines for assembling toggles, etc. Maurice Rubinger, Theodore F. von Dorn and Edwin S. Merrill, New York, are the incorporators.

The Pelican Motor Ship Co., New York, has been incorporated with a capital of $350,000 to operate a shipbuilding works. M., P. H., and C. Zornow, 1270 Broadway, are the incorporators.

The Chris Spence Co., New York, has been incorporated with a capital of $10,000 to operate a shipbuilding works. Chris Spence, W. S. Dorethy and C. W. Jesler, 257 West Street, are the incorporators.

The Empire Electric Steel Corporation, New York, has been incorporated by E. H. Rapp and G. R. Hamilton, 2 Rector Street, with a capital of $500,000.

The Auburn Vulcanizing & Storage Battery Co., Auburn, N. Y., has been organized to operate a plant at 18 Clark Street. John W. McKinley heads the company.

The Henry Cheeny Hammer Co., Little Falls, N. Y., manufacturer of hammers, has been incorporated with a capital of $100,000. K. E. Morgan, J. V. Hemstreet and D. J. Williams, are the incorporators.

The Oxford Foundry & Machine Co., Oxford, N. J., has been incorporated with a capital of $50,000 to manufacture iron and steel products. William A. Bartley, Oxford; Bernard Brady, Lake Hopatcong, and Howard L. Coas, West Orange, are the incorporators.

The Picatinny Arsenal of the United States Government, Dover, N. J., has secured an appropriation of $40,000 for the construction of a new assembling plant and igniter building. Plans are now being prepared.

The Riverside Iron & Steel Co., Riverside, Paterson, N. J., has been incorporated with a capital of $10,000 to manufacture iron and steel products. Samuel Seager and Abraham Beaver, Paterson, are the incorporators.

The Barge & Lighter Repair Co., Jersey City, N. J., has been incorporated with a capital of $100,000 to operate a local boat works. John H. Patterson, William N. Sewell and Charles J. Gormley, Jersey City, are the incorporators.

The Davis-Bournonville Co., Van Wagnen Avenue, Jersey City, N. J., manufacturer of oxy-acetylene welding and cutting equipment, will build a four-story, brick and concrete addition about 59 x 100 ft.

The Everlasting Valve Co., West Side Avenue, Jersey City, N. J., will build an addition to its machine shop to cost about $15,200.

The Kaufman Potato Cutting Machine Co., Paterson, N. J., has been incorporated with a capital of $10,000 to manufacture vegetable-cutting machines and other machinery. Alexander and Wolff Kaufman, 155 Hamburg Avenue, are the incorporators.

The Essex Foundry, Murray Street, Newark, N. J., specializing in the manufacture of cast-iron pipe, is taking bids for the construction of a one-story addition, about 70 x 115 ft.

The United States Piston Ring Co., Newark, has been incorporated with a capital of $100,000 to manufacture piston rings. Emanuel P. Scheck, Newark; Lewis Fisher, Jersey City; and E. I. Quinn, Arlington, are the incorporators.

The Gill Piston Ring Co. of New Jersey, 293 Halsey Street, Newark, has been organized to manufacture piston rings. Harry Rubin, 101 East 140th Street, New York, heads the company.

The Lackawanna Bridge Co., 2 Rector Street, New York, has filed plans for the construction of two one-story, brick and steel factory buildings, 60 x 630 ft., to cost $252,000; and two one-story, brick and steel buildings, 60 x 60 ft., to cost $28,000, at Port Newark Terminal, Newark.

The Newark Machine & Engineering Co., Newark, has been incorporated with a capital of $100,000. Emanuel P. Sheck, Newark, is the principal incorporator.

The Johnson Products Co., Newark, has been organized to manufacture aluminum goods. Charles Johnson, 529 South Tenth Street, heads the company.

The Alberger Pump & Condenser Co., 140 Cedar Street, New York, whose plant is at Newburgh, N. Y., has purchased 18 acres of land on which it will erect a new foundry much larger than the existing one and which will enable it to produce all of its own castings. Eventually a complete new plant will be built.

Plans have been completed to convert the American Car & Foundry Co.'s works at Depew, N. Y., to turn out 6-in. shells for the Government. From 3000 to 4000 men will be employed, and it is expected that operations will begin about Jan. 1.

Plans have been drawn for a one-story power-house, 40 x 80 ft., to be erected by the city of Rochester at Irondequoit. E. H. Pierce, City Hall, Rochester, is commissioner of Public Works Department.

The Fulton Steel Corporation, Woolworth Building, New York, is having plans drawn for a steel castings plant at Fulton, N. Y., to cost approximately $60,000. Howard W. McAlteer is president.

The Jamestown Iron & Metal Co., Jamestown, N. Y., has been incorporated with a capital stock of $10,000 by L., M. M. and A. L. Meeker.

The Stewart Motor Corporation, Buffalo, has had plans drawn for an addition, 60 x 100 ft., to its plant at East Delavan Avenue and the New York Central Railroad Belt Line.

New England

BOSTON, Oct. 29.

No large lists originating in New England have been reported by machine tool builders and distributors. The munitions plants and the Fore River works are steadily placing orders for large equipment and buying such machine tools as can be picked up in New England factories. Deliveries on all large sizes are being pushed so far into the future that some method of obtaining larger output seems essential if Government plants are to be equipped for production as soon as the buildings are ready.

Phenomenal prices are being paid for second-hand machinery that is available for immediate use on Government work. A typical instance is that of a large boring mill, bought 15 years ago for $6,500 and which has been in constant use since, which was sold on the floor of the plant for $27,000, the purchaser to take it away. It is expected that the question of prices for machine tools will be one of the chief topics discussed at the committee meetings at the National Machine Tool Builders' convention at New York this week. It is probable that the increasing wages and taxes will more than offset the possible saving in cost of materials, with the result that prices will move upward on most tools.

The plant of the Hopkins & Allen Arms Co., Norwich, Conn., has been sold to the Belgian Government and will be

turned over to the Marlin-Rockwell Corporation, New Haven, Conn., which will assume the outstanding obligations amounting to nearly $4,000,000. The latter company will complete the Belgian rifle contract and will then make Browning guns for the United States Government. It is understood that a large addition is to be added to the plant and that the number of employees will be increased to about 2500.

The Boston Belting Corporation, Boston, has been incorporated with authorized capital stock of $1,000,000 to take over the plant and business of the Boston Belting Co. William F. Lawton, Quincy, is president and Herman A. Dolbeare, Weston, treasurer.

The Adams-Holland Electric Co., Revere, Mass., electrical machinery, has been incorporated with capital stock of $25,000. James Buchanan, Chelsea, is president and Alfred T. Timayenis, Revere, treasurer.

The New Haven Screw Co., New Haven, Conn., has increased its capital stock from $100,000 to $150,000.

The Gorham Co., Providence, R. I., has awarded a contract for a loading plant for munitions at East Providence, R. I., comprising several frame structures.

The Eastern Machine Screw Co., New Haven, Conn., has awarded a contract for an addition, 30 x 105 ft., one story.

The Victoria Iron Works, machinery, Northampton, Mass., has been incorporated with authorized capital stock of $10,000. D. Edward Hennessy is president and Richard H. Dickson, treasurer.

The Perry-Buxton-Doane Co., Boston, is building a one story factory, 42 x 144 ft., in South Boston.

The Hoosac Lumber Co., Boston, ship construction and timber, has been incorporated with authorized capital stock of $600,000. Huntington P. Faxon, Cambridge, is president and Philip Atwater, Dorchester, treasurer.

The Beaman & Smith Co., machine tools, Providence, R. I., has awarded a contract for an addition, 15 x 60 ft., one story.

The Bethlehem Shipbuilding Corporation, Fore River works, has begun the erection of a one story boiler plant, 140 x 550 ft., with two ells, at Fields Point, Providence, R. I.

The United States Auto Gear-Shift Co., Portland, Me., has been incorporated with authorized capital stock of $1,500,000. Clarence G. Trott is president and P. B. Drew, treasurer.

The Fairmount Foundry Co., Woonsocket, R. I., has awarded a contract for a foundry, 70 x 85 ft., one story.

The William J. Nangle Machine Co., Lynn, Mass., machinery, has been incorporated with authorized capital stock of $5,000. William J. Nangle, Danvers, is president and Herbert W. Simmons, Lynn, treasurer.

The Geometric Tool Co., New Haven, Conn., is building an addition to its office, 18 x 52 ft., two stories, and a garage, 68 x 116 ft., one story.

The Biddeford Shipbuilding Co., Portland, Me., has been incorporated with authorized capital stock of $100,000 by Ernest L. Morrill, Saco; George C. Fogg, Biddeford; George C. Agnew, New York, and others.

Morris C. Rosenbaum and others have taken over the plant of the John Davenport Co., Stamford, Conn., and several additions are contemplated. Bridgeport and Newark companies will be consolidated with the new organization in the manufacture of gasoline engines and electric truck equipment.

Landers, Frary & Clark, New Britain, Conn., will add another story to a building, 50 x 317 ft., and will build a one-story storehouse, 36 x 120 ft.

The Trumbull Electric Co., Plainville, Conn., manufacturer of electrical supplies, is building a three-story and basement addition, 50 x 100 ft., to cost about $50,000.

The Standard Electric Time Co., Logan Street, Springfield, Mass., manufacturer of electric clocks, has commenced the erection of a three-story addition to cost about $25,000.

The Heald Machine Co., 10 New Bond Street, Worcester, Mass., manufacturer of grinding machines, etc., will build a one-story addition to its machine shops, about 80 x 200 ft.

Philadelphia

PHILADELPHIA, Oct. 30.

The New York Shipbuilding Corporation, Camden, N. J., is the biggest buyer at present in this market, its requirements for extensions for torpedo boat destroyer construction running into large figures. In most instances, sellers of machine tools, cranes, etc., have been invited to visit the offices at Camden, inspect the lists and select what they can furnish. An inquiry has been sent out for four locomotive cranes. The William Cramp & Sons Ship & Engine Building Co., Philadelphia, is making inquiries for new equipment. It is reported here that the Newport News Dry Dock & Shipbuilding Co., Newport News, Va., will buy about $1,000,000 worth of new equipment. All three of the new destroyer plants will build galvanizing shops, for which cranes or hoists and other equipment will be needed. The Philadelphia and Norfolk navy yards have placed orders aggregating $45,000 for hoists for new shops. The American International Shipbuilding Corporation has made inquiry for a few machine tools and reports that it will shortly buy a considerable number. Bolt machines and tapering rolls are among its requirements. A number of radial drills will probably about be bought.

The Tioga plant of the Taylor-Wharton Iron & Steel Co., Philadelphia, has received a shell contract and is inquiring for the necessary equipment. This plant is also being equipped for making gun forgings for the United States Navy. The Bartlett & Hayward Co., Baltimore, at work on munitions contracts, continues to buy. The Milton Mfg. Co., Milton, Pa., will engage in ammunition work and may require additional machine-tool equipment.

The Badenhausen Co., Philadelphia, is making additions to its shops at Bound Brook, N. J., and Norristown and Bridgeport, Pa., and is building a new shop at Cornwells, Pa., all of which will be engaged for the next 15 months in the manufacture of boilers for the Emergency Fleet Corporation. A considerable number of machine tools have been bought. An order for four traveling cranes for the new Cornwells shops has been awarded to Maris Bros., Philadelphia. The Shutte & Koerting Co., Philadelphia, is making a few purchases for its shops at Cornwells, Pa., which are engaged in making parts for battleships.

An inquiry for several hundred small tools for shipment to British munitions plants is reported here. A large number of twist drills is wanted.

The C. H. Wheeler Mfg. Co., Eighteenth and Lehigh avenues, Philadelphia, manufacturer of pumps, is contemplating the construction of a two-story addition to its machine shop.

The Keystone Needle Works Co., Philadelphia, has been incorporated with a capital of $30,000. Angelo Gambino, 1228 South Eighth Street, is the principal incorporator.

The S. A. Ashman & Son Co., East Tioga Street, Philadelphia, manufacturer of iron and steel forgings, will build an addition to its forge shop, about 19 x 44 ft.

Lindsay Hyde & Co., 2130 East York Street, Philadelphia, manufacturers of machinery and parts, will build a one-story, brick addition to their machine shop.

Paul Snyder, Philadelphia, has filed plans for the erection of a new machine shop at 176 East Tulpehocken Street.

The Link Belt Co., Nicetown, Philadelphia, manufacturer of elevating and conveying machinery, etc., will make alterations and improvements in its plant to cost about $20,000.

The Bureau of Yards and Docks, Washington, D. C., has had plans prepared for the installation of new mechanical equipment at the Government marine works, Philadelphia, to cost about $99,000.

The Union Machine Works & Iron Foundry, Philadelphia, manufacturer of iron and steel castings, etc., will make improvements in its foundry on South Water Street to cost about $5,500.

The Scranton Foundry & Engine Works, Scranton, Pa., has commenced the erection of a new two-story machine shop, about 50 x 60 ft.

The Seamless Tube Machinery Co., Sewickley, Pa., has been incorporated with a capital of $10,000 to manufacture machinery. Edward Hoopes, 33 Thorn Street, is the principal incorporator.

The Carpenter Steel Co., Exeter Street, Reading, Pa., is having plans prepared for a one-story addition, about 50 x 110 ft.

The William F. Remppis Co., 226-236 Spruce Street, Reading, Pa., manufacturer of iron and steel shapes, ornamental iron products, etc., has been reorganized with increased capital to provide for expansion. William F. Remppis, Lambert R. Behr and Ferdinand Thun head the company.

The Reading Chain Block Co., Reading, Pa., manufacturer of chain blocks, and iron and steel castings, is building an addition to its plant to cost about $25,000. F. H. Howard is president.

The National Stamping Co., Crafton, Pa., has been incorporated with a capital of $5,000 to operate a local plant. John A. McGhee is treasurer.

The Lee Tire Corporation, Norristown, Pa., manufacturer of automobile tires, is removing its office to New York. The former office space at the Spring Mill plant will be utilized for manufacturing.

The Butler Steel Co., Hazleton, Pa., has completed the erection of a new foundry which will be placed in immediate operation.

The Paquet Window Glass Machine Co., Jeannette, Pa., has been incorporated with a capital of $10,000 to manufacture glass machines. Robert Hordis, Jeannette, is treasurer.

Veale Brothers, Hazleton, Pa., have acquired the machine shop of Frank Mumaw, which they will enlarge for increased capacity.

The United States Rubber Co., Williamsport, Pa., is planning for the erection of a five-story addition for increased capacity. A new power plant will also be built.

The Berks Foundry & Machine Co., Reading, Pa., has acquired the plant of the Watsontown Foundry Co., Watsontown, which it has been operating under lease.

Baltimore

BALTIMORE, Oct. 29.

The National Equipment Co., Wilmington, Del., has been incorporated with a capital of $100,000 to manufacture ventilators, etc. William F. Smalley and John P. Cann, Wilmington, are the incorporators.

The Porcelain Enamel & Mfg. Co., O'Donnell Street, Baltimore, is taking bids for the erection of a one-story building, about 120 x 220 ft., at Bayard and Ridgeley Streets, to cost about $100,000.

The Baltimore Dry Dock & Shipbuilding Co., Baltimore, is taking bids for the construction of six one-story, brick and concrete shop buildings. Day & Zimmerman, Philadelphia, are the architects.

The Chesapeake Iron Works, Westport, Md., is taking bids for the erection of a reinforced-concrete machine shop, about 50 x 250 ft.

Chicago

CHICAGO, Oct. 29.

What is described by machine-tool men as the first real wave of demand for shell-making equipment is making itself felt in this section, and it is predicted that as soon as a sufficient number of shops are engaged in the manufacture of guns, mounts and 6 and 9-in. shells, there will be an avalanche of demand for the smaller sizes of machines which are a requisite in the manufacture of shells under 6 in. Of course, there has been buying of shell-making equipment here, but most of it called for fairly large tools and has been restricted to a few companies. In the past few days at least two agencies of the Government have asked light on the number of plants in or near Chicago which are equipped to make certain sizes of shells. Investigation has shown that their number is not great. An East Moline company already is delivering guns to the Government.

The Hart-Parr Co., Charles City, Iowa, previously reported in the market for large lathes for shell work, to replace tools destroyed by fire, has not yet placed its orders.

The Holt Mfg. Co., Peoria, Ill., which has Government contracts for tractors running into the miillions, has also taken an order for shells, and will require about $100,000 worth of equipment.

The Stenotype Co., Indianapolis, has inquiries out in this market for machines required for munitions work. This is one of the companies that handled similar foreign orders and is in a good position to serve the home Government.

The Ajax Forge Co., Chicago, is working on hubs for artillery wagons.

The Edward Valve Mfg. Co. is making 3-in. shells.

The demand for heavy machines such as planers, horizontal and vertical boring mills, lathes, etc., is still a leading feature, one dealer stating that he could readily dispose of at least 20 large horizontal boring mills to buyers who would be glad to pay premiums to insure quick delivery. The inquiries come from the Atlantic seaboard on the East and Denver on the West; in fact, some inquiries have come from the Pacific coast shipyards. Among the industries anxious to get tools are makers of shoe machinery.

The G. M. Davis Regular Co., manufacturer of valves, has purchased a site, 120 x 300 ft., at Twenty-fifth Street and Washtenaw Avenue, Chicago, on which it will erect a one-story building to cost about $75,000. Frank D. Chase, industrial engineer, Chicago, is preparing the plans.

A permit has been issued for a one-story brick factory, 163 x 234 ft., at 2662-2664 Southport Avenue, Chicago, to cost $60,000, for the A. Nelson Mfg. Co., 564 West Randolph Street, maker of automobile accessories.

The Chicago Universal Cement Mold Co., Chicago, has been incorporated with a capital stock of $50,000 by Jacon Mullen Thompson, Henry Van Houten and Johanna S. Becker.

The Liberty Foundries Co., East Rockford, Ill., has increased its capital stock from $5,000 to $25,000.

The Wagner Castings Co., Decatur, Ill., has been incorporated with a capital stock of $40,000 by Albert W. Wagner, Thomas W. Samuels and Charles W. Leforgee.

Work on the new plant of the Peoria Malleable Iron Co. is being rushed and it is expected that it will be ready for operations Jan. 1. It will give employment to 400 men, including about 200 molders.

Ground has been broken for the factory which the U. S. Smelting Furnace Co. will build at Belleville, Ill. The company has many orders in hand, and before its machinery is entirely installed will begin to assemble furnaces, the parts of which will be made in Belleville foundries. The officers are: President, Arthur Jones; vice-president, George B. McRogers; treasurer, John Marsh, and secretary, Walton Marsh The officers also compose the directorate.

Negotiations are under way looking to the removal of the Graham Supply Co.'s plant from Chicago to Grand Rapids, Mich. It manufactures electric heat-control devices and other specialties. Several Grand Rapids men are interested in the company, which has a branch office in the Powers Building, that city.

The General Electric Co., Cleveland, will erect a one-story power house, 42.8 ft. sq., to cost $10,000, at 2240 Flournoy Street, Chicago, in connection with the new plant it is building.

The J. C. Born Machine & Foundry Co., Belleville, Ill., has been incorporated with a capital stock of $10,000 by John C. Born, W. F. Born and E. W. Twenhoefel.

The Rotary Compressor Co., Belleville, Ill., has been incorporated with a capital stock of $2,000 by Anthony J. Stockel, L. N. Perrin and T. E. Kircher.

The American Steel & Wire Co., Chicago, has purchased warehouses and leasehold interests at Twenty-first and Morgan streets, Chicago, part of which it has occupied for some years.

The Kenwood Bridge Co., Chicago, preliminary to the enlargement of its works, has acquired a tract of land in Seventy-ninth Street, adjacent to Kenwood and Dorchester avenues.

The Sioux City Welding & Machine Works, Sioux City, Iowa, is soon to start the construction of a one-story welding and machine shop to cost $30,000. The contract has been awarded and the shop is to be finished in the spring. It will be used for the manufacture and repair of automobile parts. The present plant will be used for storage purposes.

Milwaukee

MILWAUKEE, Oct. 29.

The demand for machine tools shows no abatement, and if anything is even more extensive than it has been in recent months for both Government and private requirements. So many milling machines are desired that if the capacity of local builders were twice as great, it would hardly be possible to turn them out in time to meet delivery specifications. Tool builders have been relieved of much worry and trouble by the establishment of an organization to direct distribution according to the most urgent needs.

Shopowners are making every effort to avoid new construction work until conditions become more favorable, but for such production as field and naval guns, which is a new field of endeavor in this section, it has been necessary to erect new groups, and three projects of this kind are in course of establishment.

The Four Lakes Ordnance Co., Madison, Wis., has been organized by George A. Steinle and other officials of the Steinle Turret Machine Co., Madison, to manufacture naval ordnance for the Government. It is the second ordnance company to become established in Madison, and the third in Wisconsin. As previously noted, the Northwestern Ordnance Co., Madison, organized by the Gisholt machine-tool interests, will manufacture 4.7-in. field pieces, and the Wisconsin Gun Co., Milwaukee, will build 3-in. guns of the 1916 model. Each of the three corporations is nominally capitalized at $100,000, but the actual investment in each instance will approximate $1,000,000, it is believed. The Four Lakes Ordnance Co. will erect a complete manufacturing plant, further details of which will be made public as they mature.

The Standard Steel Corporation, Milwaukee, incorporated with a capital stock of $60,000, has increased its capital to $300,000 and announces that it will break ground early in 1918, for its new manufacturing plant at Lake Street and

Hopkins Road, North Milwaukee, the initial investment to be about $200,000. Steel barn and dairy equipment, concrete mixers and sanitary devices for farms will be manufactured. Tentative plans call for a foundry, machine-shop and assembling room, about 100 x 250 ft. The main offices are at 1002 Majestic Building, Milwaukee. E. J. DeGuenther is president and treasurer.

The Cruiser Motor Car Co., Madison, Wis., will award contracts this week for the erection of the first unit of its new plant, 60 x 250 ft., of brick, steel and concrete, part two-story and basement and the remainder one-story, with sawtooth roof. The second floor will be used for offices and drafting rooms. A convertible touring-camping car adapted for army field service will be manufactured. It is said that motor, transmission and axle units will be purchased. The new plant is to be ready Jan. 1.

The Keller Pneumatic Tool Co., Fond du Lac, Wis., has completed the transfer of its entire works and headquarters to Grand Haven, Mich., where local capital has provided a new plant of increased capacity. The company has been reincorporated under the laws of Michigan. The space vacated at Fond du Lac has been leased by the Rex Typewriter Co., which will buy additional equipment from time to time.

The LaCrosse Tractor Co., LaCrosse, Wis., has authorized the purchase of new machinery and equipment amounting to $75,000, in order to increase its facilities about 75 per cent. An addition to its north side plant is contemplated for early next year. B. F. Hamey is general manager.

The International Harvester Co., 784 Park Street, Milwaukee, is taking bids for the erection of an ell-shaped forge shop, 75 x 147 ft., and 27 x 327 ft., and a new cream separator building, 72 x 80 ft. Paul F. Schryer is superintendent.

The board of education, West Allis, Wis., will soon call for bids for the erection of a $150,000 high school building, including manual training and domestic science departments.

Frank Holton & Co., Chicago, manufacturers of band and other musical instruments, will build a gas producer plant in connection with its new factory now being completed at Elkhorn, Wis.

The Charles Skidd Mfg. Co., Janesville, Wis., manufacturer of pasteurizing and other dairy machinery, will build a two-story addition, 45 x 75 ft.

The Rassman Mfg. Co., Beaver Dam, Wis., maker of steel barn equipment and other farm machinery, has purchased the foundry and machine-shop group of the former J. S. Rowell Mfg. Co., and will take possession Nov. 1. The acquisition gives the company complete casting shop facilities and enables it to more than treble its output.

Cleveland

CLEVELAND, Oct. 29.

The demand for machinery from companies having Government orders continues fairly heavy, a large part of which is for motor truck work. A Detroit automobile company which inquired some time ago for 60 or more machines, but which did not make purchases, now announces that it wishes to buy the 46 lathes on the list. The demand for turret lathes and screw machines is very good. While there is no round lot buying, makers are receiving numerous orders for single machines. The effect of priority orders is being felt by manufacturers not engaged on Government work, who are being disappointed on deliveries of machines ordered some time ago.

The Standard Parts Co., Cleveland, is in the market for the following equipment for Government motor truck work in its American Ball Bearing plant, Cleveland: One end drilling machine, one 26-in. lathe, one heavy duty drilling machine, one multiple spindle drilling machine with 20-in. spindle, two horizontal drilling machines, one radial drilling machine, two No. 3 horizontal plain milling machines.

The Cromwell Steel Co., Lorain, Ohio, has issued the following list of machinery requirements for its repair shop: One 20-in. shaper, one 25-in. upright drilling machine, one 2½-in. bolt cutter, two high-speed hack saws, two wet-tool grinders, one No. 3 universal milling machine, one 62-in. vertical boring mill.

The Griscom-Russell Co., Massillon, Ohio, has purchased the old plant of the Massillon Foundry & Machine Co. and will move its present boiler shop to the new quarters. It will also build an addition, 60 x 80 ft., to its warehouse. The Massillon Foundry & Machine Co. is moving into its new plant.

The Reliance Mfg. Co., Massillon, has commenced the erection of a new factory, 200 x 300 ft., which will be used for the manufacture of cold drawn steel used by the company. The contract has been awarded to the Austin Co., Cleveland.

To provide additional capital necessitated by its increased business the Morgan Engineering Co., Alliance, Ohio, will add $573,000 to its preferred stock. The company states it has about $10,000,000 worth of work on its books, including an order from the Government for gun carriages for 5 and 6-in. guns amounting to between $3,000,000 and $4,000,000.

The plant of the Seneca Chain Co., Kent, Ohio, has been sold to the Kent Chain Co., recently incorporated with a capital stock of $400,000. It is stated that operations will begin in about 60 days.

The Bunting Bronze & Brass Co., Toledo, Ohio, has taken over the plant of the Standard Die & Tool Co. in that city.

The Lewis Electric Welding & Mfg. Co., Toledo, with a capital stock of $100,000, has taken over the business of the Lewis Foundry Co., and will make some extensions to the plant. It will specialize on semi-steel cast head valves for gas, gasoline and oil engines.

The Broadway Foundry Co., Cleveland, will erect a new foundry, 66 x 116 ft.

The United States Malleable Iron Co., Toledo, has increased its capital stock from $250,000 to $300,000.

The Central Machine & Tool Co., Toledo, has increased its capital stock from $50,000 to $100,000.

The City Brass Foundry Co., Cleveland, has taken bids for the erection of a one-story addition, 40 x 60 ft., on St. Clair Avenue.

The Canton Rim Co., Canton, Ohio, is taking bids for a one-story addition, 60 x 240 ft., to cost about $15,000. William T. Beardsley is president.

Detroit

DETROIT, Oct. 29.

Continued demand by makers of munitions for machine tools has kept the market active the past week. Labor is in good demand with skilled machinists receiving high wages. The shipbuilding yards in Detroit are working to capacity. Plans for the incorporation of the $3,000,000 company to manufacture munitions in Detroit are progressing, and the business men behind the organization expect to build or secure a mammoth factory as soon as organization details are settled.

The Manistee Shipbuilding Co., Manistee, Mich., has invested $60,000 in new machinery to repair old boats. About 300 more men will be employed.

The Novo Engine Co., Lansing, Mich., has announced a building program, including the erection of a new foundry and machine shop.

The Russel Motor Axle Co., Detroit, has changed its capitalization from $500,000 common stock and $100,000 preferred to $750,000 common stock only. It has just completed a new addition and purchased $50,000 worth of machinery which will increase its output 60 per cent.

The Columbia Motor Truck Co., Pontiac, Mich., has received a large foreign order for two-ton Columbia trucks. A new assembling plant is being rushed to completion. A. F. Clark and Leigh Lynch are in charge.

The Enterprise Iron & Metal Co., Grand Rapids, Mich., has taken bids for the erection of a new plant.

Indianapolis

INDIANAPOLIS, Oct. 29.

The Hoosier Gas & Power Co., Indianapolis, has been incorporated with $100,000 capital stock to generate electricity. The directors are Francis J. Catternin, Wilkins W. Wiswell and Justice D. Detwiler.

Swift & Co., Chicago, will construct a fertilizer plant at Hammond, Ind., at an estimated cost of $500,000.

The Laurel Motors Co., Anderson, Ind., a new organization, which will establish a plant, has taken offices in the Union Block.

The Shotwell Pump & Tank Co., Indianapolis, has increased its capital stock from $60,000 to $100,000.

The Eagle Machine Co., Indianapolis, has been incorporated with $15,000 capital stock to manufacture tools, fixtures and gages. The directors are Horace J., Charles W. and J. Edward Yount.

The New Process File Co., Newcastle, Ind., has been incorporated, with $10,000 capital stock, to manufacture files. The directors are W. S. Crum, A. A. Brown and John W. Rodgers.

The Polhamus Co., Fort Wayne, Ind., has been incorporater with $100,000 capital stock to manufacture oil generators, automobile accessories and tools. The directors are Albert Z., Russell H. and M. J. Polhamus.

The Indiana Portland Cement Co., recently organized at Huntington, Ind., with $1,000,000 capital stock, has bought 500 acres of land near the city and will build a plant which will give employment to about 150 men. Adam L. Beck, Huntington, is president; Marshal Beck, treasurer, and William H. Hart, secretary. W. S. Creveling will be superintendent.

The Stutz Motor Car Co., North Capitol Avenue, Indianapolis, is building a new one-story machine shop, 98 x 180 ft., to cost about $38,000.

The American Steel & Foundry Co., Hammond, Ind., is building a one-story addition, 40 x 120 ft., to cost about $15,000.

Cincinnati

CINCINNATI, Oct. 29.

Many orders for machine tools are coming from manufacturers not engaged on Government work, and dealers in both new and second-hand machines state that the scattered inquiry for single tools was never better. Exception to this may be taken as compared with conditions three years ago when the call for machine tools was almost entirely from makers of war material for England and France and also for export to those countries. To-day the small manufacturing plants are buying machinery, not only for replacement, but also to increase their output. Orders from the South for lathes, small grinding and portable electric tools have recently increased. Pacific coast business is also better. Some trouble is being experienced in shipping machinery, due to the scarcity of cars, which does not apply, however, to machines needed for war purposes.

The Gordon Machine Co., Cincinnati, has had plans prepared for a new one-story brick plant 48 x 115 ft., to be erected at Spring Grove Avenue and Township Street.

The Fox-Klein Motor Co., Cincinnati, is having plans prepared for the erection of a three-story building 65 x 100 ft., on Gilbert Avenue, near Eighth Street. A small repair shop will be provided for automobile and auto-truck repairs.

The Standard Register Co., Dayton, Ohio, has completed an addition to its plant that will greatly increase its present output of autograph registers. Practically all the necessary equipment has been bought.

The Ohio State University, Columbus, Ohio, will open bids Dec. 3 for power plant equipment, including a stoker for a 600 hp. boiler. Specifications may be obtained from Carl E. Steeb, secretary.

Jacob Seeger, stone contractor, 697 East Fulton Street, Columbus, has purchased a quarry at Reynoldsburg, Ohio, and will need additional crushers and other equipment.

The Capital Die, Tool & Machine Co., Columbus, recently incorporated, has taken over the plant formerly operated by J. B. Hoover, at 619 North Fourth Street, where it will continue the manufacture of dies, jigs, and other small tools. The company also manufactures metal heat-treating furnaces.

The Hercules Gas Engine Co., Evansville, Ind., is making plans to double the capacity of its machine shop. Later an addition to its foundry is contemplated.

The Central South

LOUISVILLE, Oct. 29.

Second-hand machinery is in good demand. Inquiries from manufacturers and distributers of power equipment are numerous, but many orders are deferred on account of the uncertain price situation.

The Roy C. Whayne Supply Co., Louisville, is in the market for a 7½ or 10-hp. motor, 25-cycle, direct current, 220 or 440-volt; also for a 4-ton electric locomotive, 250-volt, direct current, 40-in. gage.

Truman Drury, Morganfield, Ky., is asking for addresses of manufacturers of gasoline hosting engines, with a capacity of 1½ tons, to hoist 60 ft.

The Estill Water & Gas Co., Irvine, Ky., willl purchase a pump, 225-ft. lift with a capacity of 250 gal. per min., and other equipment for a waterworks system.

The John G. Duncan Co., Knoxville, Tenn., is in the market for a second-hand, 40 or 50-hp. boiler, locomotive type preferred.

The Southern Equipment Co., Memphis, Tenn., has been incorporated with capital stock of $25,000, by R. H. McWilliams, N. M. Dickson, A. W. Fisher, Jr., and others, to do general foundry and machine shop work.

The Louisville Gas & Electric Co., Louisville, will install new generating machinery and auxiliary equipment at its electric power plant. H. M. Byllesby & Co., 208 South La Salle Street, Chicago, are the engineers.

The Peerless Sign Co., Louisville, has been incorporated with a capital of $40,000 to manufacture metal signs. Calvin F. Thomas and George C. Murphy are the principal incorporators.

Thomas H. Wright and Charles E. Taylor, Wilmington, N. C., are planning for the construction of a shipbuilding plant on the Cape Fear River.

The shipbuilding plant of the United States Maritime Co., Brunswick, Ga., site for which has been acquired in the Clubb's Creek section, will consist of six shipways, steel fabricating mill, machine shop, power plant, etc. It also arranged for the erection of about 100 houses nearby for employees.

Texas

AUSTIN, Oct. 27.

Dealers report an improvement in the demand for machinery and machine tools. It is stated that more irrigation plants will probably be installed in this section during the next few months than in any similar period for many years.

The Fireplace Hot Water Heater Co., El Paso, recently incorporated, will build a plant for the manufacture of water heaters.

Bowie will issue $15,000 in bonds for the construction of an electric light and power plant.

The municipal electric light plant at Decatur is to be equipped with a new engine and other machinery.

The City Council, Wolfe City, plans to increase the municipal water supply and will probably install a new pumping plant.

Charles Sommer and associates, Quanah, contemplate the construction of a waterworks system, including a pumping plant to cost about $150,000.

The Gulf, Colorado & Santa Fe Railroad, Temple, will build a power house and machine shop and make other improvements to cost $150,000.

J. D. Seamonds, Dilley, will install an irrigation pumping plant on the Leona River near Dilley.

California

LOS ANGELES, Oct. 23.

The Leach Motor Car Co., Los Angeles, has acquired property at Sixteenth and Figueroa streets for the erection of a three-story building, about 100 x 155 ft., to cost about $150,000. On the third floor two complete repair departments will be installed, with machine shop and tool room, etc., one for used cars and the other for new automobiles. A large parts department will be located on the second floor.

The Novelty Brass Works of California, Los Angeles, has been incorporated with a capital of $10,000 to manufacture brass goods. Louis N. and Frances Auger and Oscar W. Cave are the incorporators.

The United Light & Power Co., Los Angeles, will build an electric power plant on the San Gabriel River. The initial capacity will be about 10,000 hp. and is estimated to cost $300,000.

The Woodward Garage & Truck Attachment Co., 2019 West Pico Street, Los Angeles, has been organized to manufacture motor truck attachments. E. J. Woodward heads the company.

The Master Carburetor Co., Los Angeles has been incorporated with a capital of $200,000 to manufacture carburetors, etc. The incorporators are Charles G. Harness, George Beebe, D. F. Poyer, E. M. Chandler and J. C. Crouch.

The United States Spring Co., Los Angeles, has increased the capacity of its plant on South Los Angeles Street, to include a department for the manufacture of wire wheels and the repair of old wheels. J. F. Rauen is secretary and treasurer.

The Gilfillan Brothers Smelting & Refining Co., Los Angeles, has completed the erection of a new plant at Wall and Eleventh streets, for the manufacture of electric drills and grinders, magneto parts and motor and generator brushes.

The Los Angeles Brass Foundry, Los Angeles, has been organized to operate a plant at 1539 East Sixteenth Street. Fred Freitag heads the company.

The Pacific Gas & Electric Co., San Francisco, is building a machine shop in connection with its new generating plant near the West Side branch of the Southern Pacific Railroad, near Fresno, Cal.

The Pacific Northwest

PORTLAND, ORE., Oct. 23.

The general resumption of work at the shipyards in the Columbia River and Puget Sound sections Oct. 29 will have a big influence on the demand for machine tools. The call from lumber mills is increasing, many of which have completed plans for enlargement to meet Government or other requirements. Marine engines and other marine equipment are in active demand.

The Beebe Co., Portland, manufacturer and distributer of marine engines and motors, has opened a branch at Astoria.

The North Bend Mill & Lumber Co., North Bend, Ore., has bought the adjoining property of the North Bend Iron Works and is installing an electrically driven planing mill and lumber finishing plant, 140 x 160 ft., at a cost of about $100,000.

The Quilicum Sawmill Co., Quilicum Beach, Vancouver Island, B. C., has been incorporated with a capital stock of $25,000 to take over the business of H. S. Galbraith and to operate saw mills and build ships.

Macdonnell, Ltd., Ogden Point, Victoria, B. C., has completed plans for an assembling plant for installing marine engines and auxiliary machinery in wooden vessels now under construction in British Columbia for the British Munitions Board.

T. Danielson, Vancouver, Wash., will equip a factory on East Fifth Street for the manufacture of motor boats.

The plant of the Klamath Iron Works and the mill of the Ewauna Box Co., Klamath Falls, Ore., were recently burned with a loss of $300,000.

The American Powdered Coal Co., Portland, has bought two and one-half acres in South Portland on which it will erect a coal pulverizing plant at a cost of about $75,000.

The Ames Shipbuilding & Dry Dock Co., Seattle, has bought four lots on the water front on which it will erect a shipbuilding plant.

The Sitka Spruce Co., Coquille, Ore., has secured additional water power and will install machinery and electric lighting equipment preparatory to doubling its capacity.

The Donohoe-Rathbone Shipbuilding Co., Seattle, has been incorporated for $1,500,000, and will erect a plant to build wooden vessels. Sites in Seattle, Port Orchard and Everett are under consideration.

The J. H. Chambers sawmill, Cottage Grove, Ore., was recently destroyed by fire with a loss of $75,000. It will probably be rebuilt.

The Pacific Marine Iron Works, Portland, has completed its plant and started work on the construction of ship engines, Ballin water tube boilers and auxiliary machinery.

The Sumner K. Prescott Foundry, Seattle, will increase the capacity of its plant more than 100 per cent by construction of an addition and installation of new equipment. It is turning out lumberyard gasoline tractors, and will manufacture the Hendricks truck attachment.

The Olympic Steel Works, Seattle, which recently moved into its new foundry on the Canal Waterway, contemplates the construction of an addition to its plant to cost $10,000. It manufactures 3000 lb. of castings per day, and employs 50 foundrymen.

H. N. Rothweiler & Co., Seattle, are constructing a new plant at a cost of $25,000 to manufacture automobile appliances.

The Oceanic Shipbuilding Co., Portland, has been formed by B. G. Skulason, Isaac Gratton, D. E. Streib and P. K. Enebo. It is understood a shipbuilding plant will be established.

The Belmont Iron Works, Philadelphia, has opened offices in the Arcade Building, Seattle. Murry Jacobs is in charge.

Chester Coulter, Seattle, for many years identified with machinery and equipment business in the Northwest, has formed the Coulter-Taylor Co., with offices in the L. C. Smith Building, to deal in iron and steel products, railroad equipment, etc.

The Kennedy Valve Mfg. Co., Elmira, N. Y., has opened a branch office in the Arcade Building, Seattle.

The Pacific Machine Shop & Mfg. Co., Seattle, is having plans prepared for a new machine shop at Pike Street and Railroad Avenue, to cost $15,000.

The Patterson-McDonald Shipbuilding Co., Seattle, is having plans prepared for a one-story boiler shop, 92 x 240 ft., to cost $20,000. It will also erect a two-story construction shed and mold loft, 80 x 460 ft.

Canada

TORONTO, Oct. 29.

M. J. O'Brien, Ltd., Ottawa, Ont., has been incorporated with a capital stock of $20,000,000 by Michael J. O'Brien, Joseph L. Murray, both of Renfrew, Ont.; John A. O'Brien, Ottawa, and others, to take over the smelter, electrical plants, etc., owned by Michael J. O'Brien, at Renfrew.

The Warwick Machine Co., Ltd., Quebec, has been incorporated with a capital stock of $100,000 by Joseph E. Julien, Samuel Fleury, Joseph A. Boule, and others, to manufacture agricultural implements, saws, kneading machines, tools, etc.

The Anglo-American Shipping Co., Ltd., Montreal, has been incorporated with a capital stock of $20,000 by George V. Cousins, Aubrey H. Elder, Solomon Vineberg, and others, to build ships.

The foundry owned by Clare Brothers, Galt, Ont., was damaged by fire Oct. 19 with a loss of $15,000.

The Ignition Repair & Supply Co., Ltd., Toronto, has been incorporated with a capital stock of $40,000, by Lawrence J. Pashler, 9 Grafton Avenue; Bertrand T. McAvoy, M. P. Van der Voort, and others, to manufacture engines, motors, batteries, magnetos, etc.

The Multipost Co. of Canada, Ltd., Toronto, has been incorporated with a capital stock of $40,000 by Donald B. Menzies, John A. Ryan, 1464 King Street West; Alpha I. Hodgins, and others, to manufacture machinery, tools, etc.

The Spruce Falls Pulp & Paper, Ltd., Spruce Falls, Ont., has been incorporated with a capital stock of $3,500,000, by Thomas H. Barton, 840 Davenport Road; Charles M. Garvey, 60 Victoria Street; Thomas M. Weatherhead, and others, of Toronto, to manufacture pulp, lumber, etc.

The Welding & Supplies Co., Ltd., 1227 Ontario Street East, Montreal, has been formed to do general oxy-acetylene welding. C. Roger, formerly Canadian manager of the L'Air Liquide Society, is manager.

The Liquid Air Co., 1 Ernest Street, Montreal, has purchased a site at Dartmouth, N. S., where it will erect an acetylene plant to cost about $40,000.

The St. Andrews Wire Works of Canada, Ltd., Watford, Ont., has taken a building at Starthroy, Ont., which it will remodel and equip for the manufacture of wire products, etc. G. M. Haldane is local manager.

The Sydney Foundry & Machine Co., Ltd., Sydney, N. S., will build a foundry at Halifax, to cost $7,500. Wilfred Clarke is manager.

The Toronto Electric Supply Works will make alterations to a factory on Hanna Avenue, Toronto, and install equipment to cost $3,000.

Bids will be received by W. A. Mitchell, clerk, Chapleau, Ont., until Nov. 15, for a turbine pump with a capacity of 400 gal., operated by 40-hp. motor. Specifications may also be had from Chipman & Power, engineers, Mail Building, Toronto.

The Ucan Specialties of Canada, Ltd., Montreal, has been incorporated with a capital stock of $100,000 by Samuel W. Jacobs, Gui C. Papineau-Couture, Louis Fitch, and others, to manufacture hardware, steel, brass, machinery, etc.

The Gold Medal Broom & Brush Co., Ltd., Laval de Montreal, Que., has been incorporated with a capital stock of $150,000 by Paul Demers, William H. Langlier, Claude Bourdier, and others, all of Montreal, to manufacture brooms, brushes, toys, etc.

The shell loading plant of the Canadian Explosives Co., Ile Perrot, near Vaudreuil, Que., was totally destroyed by fire and explosions Oct. 26 with a loss of $1,600,000.

The Magnet Metal Co., Ltd., Winnipeg, Man., has been incorporated with a capital stock of $5,000 by G. A. Maclean, H. R. Eade, G. M. Larson, and others, all of Winnipeg, to manufacture iron, steel, metals, machinery, tools, etc.

Government Purchases

WASHINGTON, Oct. 22.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, opening dates unassigned, schedule 1546 for two duplex milling machines, bases 29 x 33 in.; schedule 1540 for one motor-driven direct-connected squaring shear, all for Mare Island, Cal.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until 11 a. m., Nov. 5, on specifications 2562 for fuel-oil systems at Mare Island, Pearl Harbor, San Diego, and Puget Sound.

The quartermaster general of the Army has directed that purchase be made of 15,000 Army motor trucks according to the new standard type recently adopted by the War Department. It is probable that the bids will be opened by the depot quartermaster at Washington, the date of such has, however, not yet been decided. Bids will be asked for the truck body and for parts of the vehicle. It is intended to purchase 10,000 trucks of Class B type, 3 ton, and 5000 of the Class A type, 1½ ton.

The following bids were received by the chief of the Bureau of Yards and Docks, Navy Department, Washington, Oct. 8, under specification 2541, for furnishing and installing a 10-ton electric traveling crane for pattern and machine shop at the naval station, New Orleans, La. Item 1 work complete; 2, work complete, bidder's specification.

Niles-Bement Pond Co., 111 Broadway, New York, item 2, $8,800, 360 days. Carroll Electric Co., Washington, item 2, $12,660, 275 days. Cleveland Crane & Engineering Co.,

Wickliffe, Ohio, item 2, $11,495, shipment, 180 days. The Whiting Foundry & Equipment Co., Harvey, Ill., item 1, $13,780, 180 days.

Bids were received at the Bureau of Supplies and Accounts, Navy Department, Washington, on Oct. 5, for furnishing material and supplies for the naval service as follows:

Schedule 1863½, Steam Engineering, Class 41, Portsmouth and Boston—Gasoline engines and spares—Bid 8, item 1, $3,589; 2, $283.35; 3, $2,594; 4, $249.95; delivery, items 1 and 2, 5 in 8 weeks; items 3 and 4, 5 in 6 weeks, 5 in 8 weeks, 10 in 10 weeks, and 10 in 12 weeks; total $124,062; bid 18, item 1, $3,640; 2, $722.55; item 3, $3,640, $3,940, and $2,940; item 4, $722.55 and $684.05; bid 32, item 1, $3,401.50; 2, $445.41; 3, $2,669; 4, $420.61; total, $131,157.40; delivery, 90 days; bid 37, item 1, $3,795; 2, $490.40; 3, $2,750; 4, $469.20; total, $139,430; delivery, 90 days: Bid 47, item 1, $2,822; 2, $352; 3, $1,785; 4, $262; total, $93,171; delivery, 150 days.

Schedule 1905½, Steam Engineering, Class 42, Brooklyn—12 precision bench lathes—Bid 13, $485; 16, $1,165.60; 26, $658, $660 and $659; 33, $1,120, $1,165, $1,112, $1,160, $1,090, $1,425, $1,470, $1,415, $1,460, and $1,390; 38, $1,572.

Schedule 1918½, Steam Engineering, Class 81, Philadelphia—Five universal milling machines, motor driven—Bid 16, $2,985; 25, $2,873.75.

Names of the bidders and the numbers by which they are designated follow:

Bid 2, the American Laundry Machinery Co., 134 West Twenty-seventh Street, New York; 13, the Elgin Tool Works, 67 North State Street, Elgin, Ill.; 16, the Fairbanks Co., 416 Broome Street, New York; 18, Gas Engine & Power Co., and Chas. L. Seabury & Co., Consolidated, Morris Heights, N. Y.; 37, the Sterling Engine Co., 1252 Niagara Street, Buffalo, N. Y.; 47, the Niagara Motors Corporation, Dunkirk, N. Y.; 26, Kemp Machinery Co., 223 North Calvert Street, Baltimore; 33, D. Nast Machinery Co., Bourse Building, Philadelphia; 38, W. E. Shipley Machinery Co., Morris Building, Philadelphia; 25, Kearney & Trecker Co., Milwaukee, Wis.

Coal Exports to Canada Restricted

WASHINGTON, Oct. 30.—The Fuel Administration has completed statistics showing the past fuel consumption of the Dominion of Canada and the future requirements of coal for the railroads, factories, public utilities and domestic consumers of that country. On the basis of these statistics a definite allotment of coal for Canada has been made. For the next two months the allotment will total about 2,000,000 tons of bituminous and 700,000 tons of anthracite. Dr. Garfield has insisted that Canada be treated as well in the matter of coal as the States of the Union but no better. The figures referred to show that the first nine months of this year coal has been shipped into Canada in much larger quantities than in former years, so that the allotment now being made will involve a limitation not only of the amount to be exported by individual shippers but of the aggregate tonnage going into Canada the coming winter.

From this time forward the shipment of coal into Canada will be under definite control by the Fuel Administration, and only shippers with its permits will be allowed to export coal to that country. These limitations have been arranged in consultation with the Canadian authorities, who recognize that the United States is warranted in taking such steps to protect the interests of American consumers.

The Merchants Shipbuilding Co., Bristol, Pa., has awarded the contract for its new buildings to the Fred T. Ley Co., Springfield, Mass. The buildings include a molding and loft building, 200 x 300 ft., three stories; a pattern and joiner shop, a machine shop, a pump house, a transformer house, and a large addition to the power plant. Further work contemplated includes 250 six-room bungalows, 603 five, six and seven-room dwellings in groups of seven or nine each, 50 detached six or seven-room houses, a number of more expensive single houses, four 37-family apartment houses, several rooming houses for single men, two commissary buildings, administration buildings and other structures to care for the large number of employees expected.

PATRIOTIC COUNCIL

United Alloy Steel Corporation Employees Form a Novel Organization

W. A. Field, the general manager of the United Alloy Steel Corporation of Canton, Ohio, recently conceived the idea of forming an organization along the lines of the Council of National Defense, to supplement the work of that Council in the city of Canton and more especially in the plant of the United Alloy Steel Corporation.

As a step in the organizing of this council, a dinner was given in the Courtland Hotel to about 250 employees of the corporation and invited guests. The speakers of the evening were Judge Henry W. Harter, chairman of the Liberty loan campaign in the Canton district; George H. Clark, chairman of the Canton Draft Board; John Marshall, special agent of the Department of Justice; J. M. Criley of Cleveland, and Judge A. H. Head of Cincinnati.

The objects of the organization are best set forth in the opening remarks of Mr. Field, which were in part as follows: "We have come together with one aim and one object and that is for each man to take stock of himself and in his own way and with his own brains devise ways and means of using his abilities in the best possible manner in this great crisis which confronts our nation to-day. In order that we may all benefit by such thoughts and ideas as may come to each individually the idea has occurred that we organize ourselves into the Auxiliary Council of National Defense. We can do nothing of material moment alone, but we can organize into a well-regulated, systematic body along lines similar to that of a well-directed army. In this connection, I would suggest that you men here to-night observe these aims and objects carefully at the start and let all of those with whom you come in contact know exactly what this organization means and what you have made up your minds to do as your bit."

There was considerable enthusiasm displayed at the meeting and each speaker was warmly received. At the conclusion of the meeting all the men faced the flag and repeated the following pledge:

> I pledge allegiance to my Flag
> And to the Republic for which it stands.
> One Nation, indivisible,
> With liberty and justice for all.

I further agree: To do everything in my power to assist the President of the United States and all branches of the Government in bringing the war to a successful issue at the earliest possible moment. I promise to refrain from destructive criticism and to try to make my every effort count for the honor, dignity and glory of my country and its institutions.

W. A. Field was elected president, and Francis Miller, secretary and treasurer. A director was elected from each department.

The organization undertook the sale of Liberty bonds, and up to date has sold to 90 per cent of the employees, and these sales amount to about $225,000.

The firm name of H. L. Latshaw & Co., 220 Broadway, New York, has been changed to the Latshaw Steel & Metal Products Corporation. The lines handled include shafting, screw stock, cold drawn shapes, steel tubing, sheets, plates, bars, rods, wire, tool steels, etc.

The Geuder, Paeschke & Frey Co., St. Paul Avenue and Fifteenth Street, Milwaukee, Wis., has completed arrangements with the Maxim Silencer Co., Hartford, Conn., for the exclusive production and sale of Maxim silencers for motor trucks and passenger cars.

Emil F. Steiner & Co., makers of sectional and portable ovens for japanning, enameling, core drying, etc., have moved from their former location at 58 Union Street, Newark, N. J., to a new plant at 117-119 New Jersey Railroad Avenue.

Intense Patriotism at Institute Meeting

(*Continued from page 1045*)

antee does not and cannot reimburse a mill owner for loss of time and tonnage while a mistake is being made good, and the mill electrical engineer is not true to his responsibilities if he allows any modification of what experience has dictated as the line of safety, and it is to be hoped that all manufacturing companies and purchasers will be able to reach some equitable agreement on this vital detail.

Cost of Equipment

"Although frequently stated offhand that the cost of equipment for electrical devices, especially for reversing mills, is so far in excess of the cost for steam as to offset any saving in operating cost that may be shown, the statement does not appear to be borne out by a close analysis of the subject. For the straight running mills, the comparison of first cost of equipment may be less favorable to the electric drive than with the reversing mill.

"With the steam drive, the boiler house must be located quite near the mill to avoid long steam lines, which, often involving costly engineering details, do not tend to concentrate the plant. If condensing engines are used, the large amount of water required may have to be carried for a considerable distance to the engine. All of this is avoided with the electric drive, as the power station and boilers may be located at the most convenient place, not necessarily inside the plant, where fuel and water can be supplied at a minimum cost.

"On reversing mills, the actual consumption of steam with electric drive will probably be about half of the equivalent steam drive, but in this case the peak load must be taken into consideration, as it may represent from four to five times the normal power required, and, in the case of the steam-reversing engine, it must be absorbed by the boiler. With the electric drive, this shock is almost entirely taken up by the motor generator fly-wheel set which is interposed between the line and the main motor so that on an average only one-seventh of the peak load is thrown back on the boiler plant.

"Where a saving of three-fourths of the coal used for power generation can be shown, the substitution of electric power for steam becomes as much an economic necessity as the use of the by-product coke oven.

Costs of Operation

"The comparison of actual money costs in the operation of electric motor with other methods is difficult and more or less unsatisfactory on account of the differences in cost of power, works organization and accounting systems, so that all comparisons here are made on a basis of kilowatt-hours per ton of product. Even this is only approximate as the applications of electric power vary in different plants and the finished product, sizes of ingots, drafts used, temperature and composition of steel rolled all enter into the main roll problem. However, some approximate figures have been arrived at which are given below, although probably subject to further modification as more data become available.

Kilowatt-hours, per ton of pig iron produced.....10.25
Kilowatt-hours, per ton of open-hearth steel produced.. 4.15

"In the rolling mills the diversity is so great as to make anything like accurate estimating equivalents practically impossible, but the following will give some idea of what to expect, although they are not directly comparable:

Non-Reversing Mills, Electric Drive

Raw Material	Finished Material	Main Rolls Kw.-Hrs. per Ton
7 x 7 in.	30-lb. rail	60
6 x 7 in.	3½ to 8-in. angles	33
22 x 22 in.	Standard rail	46
20 x 24 in.	4 x 4 in.	31
	Reversing Mills, Electric Drive	
20 x 20 in.	5 x 5 in.	25.5
20 x 20 in.	8 x 8 in.	17.0
18 x 20 in.	4 x 4 in.	26.0

"As the mill requirements can be readily determined, these figures are only indications and each problem should be the subject of special calculation.

Historical

"The first large installation of electric motors was made at Edgar Thomson Works in 1905 for rolling light rails, where power equal to 3000 kw. was generated and transmitted for a short distance only at 250 volts d.c., the equipment being in perfect operating condition today. The latest installation was at Homestead Steel Works on a 110-in. plate mill, where a 25-cycle alternating current equivalent to 3000 kw. is transmitted at least three miles at 6600 volts. This mill was started Oct. 15 of this year, less than six months after breaking ground, the electric drive being finished in five months from placing of the order.

"Between these two dates there have been installed in the United States 170 non-reversing rolling mill drives of over 1000 hp. capacity. The first large reversing equipment using the Ilinger system in this country was installed at Illinois Steel Co. in 1907, after which only two equipments were built in the following ten years. The rapid development of this class of equipment began in 1916, for there are on record 15 plants from 8000 to 15,000 hp. maximum rating operating or to be installed during 1917, and up to date five equipments from 9000 to 19,000 hp. for 1918 delivery.

"It would therefore appear that the electric motor has proved itself to be wholly reliable, extremely adaptable, not excessive in first cost and very economical to operate, and there should be no question as to its general adoption."

Malleable Iron and Its Uses Discussed

Paper Read by President Pope, of the National Malleable Castings Co.—Question Why Use Malleable Instead of Steel Castings Considered

The paper by Henry F. Pope, president of the National Malleable Castings Co., Cleveland, on "Malleable Iron and Its Uses," was as follows:

"It is well to give a little time to the consideration of malleable iron, for by many its characteristics are little understood.

"Iron as it is run from the furnace and poured into the molds, in the process of making malleable iron castings, is not malleable at all, but is extremely hard and brittle. When broken, it shows a white fracture. But this brittle iron is of such composition that when subjected to the proper annealing heat for the requisite length of time, it is transformed into an iron with entirely different physical qualities. After annealing, instead of showing a white fracture, it shows a black one, giving it the name of 'black heart.' This distinguishes the malleable iron made in this country from that made on the continent of Europe, which has a steely fracture due to the fact that the carbon is almost entirely removed by oxidation in the annealing process. Graphitization of the carbon is more easily controlled commercially than oxidation: therefore, the 'black heart' is the more reliable product. The black fracture of our iron is due to the fact that in the annealing process the carbon, which in the original casting was all combined, has been separated out by decarbonization and is now found as free carbon or graphite of non-crystalline form deposited between the molecules of the iron. This form of carbon is called 'temper carbon' by Ledebur to distinguish it from its other forms. The presence of a large amount of temper carbon gives the material its black appearance.

"The iron itself, therefore, is left almost entirely free from any combination with carbon and possesses the malleable quality of wrought iron. It can be bent without fracture and withstands great shock and stress without breaking. It has the superiority of wrought iron in the respect of malleability without the sometimes objectionable fibrous structure of that material and with the very great advantage that it can be cast into all sorts of intricate shapes without difficulty, saving the large cost of laboriously shaping and building up the wrought iron. And this is not belittling wrought iron, which has its important place. Often combinations of wrought and malleable iron are made in a structure with very distinct gain.

"Some one will say: 'Why use malleable iron any more when steel castings may be had?' Well, that is a very plausible question, for great strides have been made in steel casting production and certain castings have been changed from malleable iron to steel with improved results, but there are several reasons why steel will never displace malleable iron for a multitude of articles. In the first place, in most cases if the steel could be produced in the form and section of the malleable casting, it would be more expensive and no better, for it must be remembered that while the tensile strength of malleable iron is somewhat below that of soft steel, its elastic limit is just as high, which means that it will stand just as much punishment as the steel. Furthermore, it is easier and cheaper to produce many articles in malleable iron. The iron is fluid at a much lower temperature than steel. To procure steel as fluid as the iron costs more and when the fluid steel, at a high temperature, is poured into the mold, much more difficulty and expense are encountered than with the cooler iron; the problems of the foundry are comparatively simple in the case of the iron.

Poor Iron Brings Discredit

"Malleable iron has, unfortunately, not been produced in conformity with the best standards by all of its makers, and the poor iron made by some has brought much discredit upon the industry, as a whole. There is no justification for this, because the inferior metal can be easily distinguished from the good by the examination of the fractures of removed test lugs. All important castings should have test lugs cast on them for this purpose. Many manufacturers have, however, for several years, given serious scientific study to their product with wonderfully good results, so that from many of them malleable iron can now be obtained of uniform quality and of greatly increased tensile strength without any sacrifice of ductility, for one peculiar feature of malleable iron is that while the tensile strength increases, the elongation also increases. This is not true of any other commercial metal. There are two essentials necessary in the production of malleable iron. One is the proper composition of the hard iron and the other the proper heat treatment in the annealing process. With increased knowledge and with better practice, the former has been greatly improved and the latter is secured by a proper observation of the temperatures. The excellence of malleable iron will doubtless be greatly increased by the use of the electric furnace, which insures certainty of proper mixture before the iron is poured, besides eliminating objectionable oxides.

"Malleable iron, then, due to its unique qualities, has a usefulness which is entirely its own and which cannot be taken away. Years ago it began to be used advantageously for agricultural implements, all sorts of farm tools, wagons and carriages, harness, stoves, pipe fittings, and for many other purposes. Later, the railroads began to use it, for many parts of the car could be made lighter and less subject to fracture by the substitution of malleable for gray iron. The railroads use it also in places where the iron is exposed to the corrosive action of the weather, for malleable iron is as non-corrosive as any of the iron products and much more so than steel. Tie-plates, for instance, ought to be made entirely of malleable iron, for the corrosion of the steel makes it much more expensive in the end. More recently the malleability, the lightness and the good machining qualities of malleable iron, as well as the fact that it could be cast into desired shapes with ease, have made malleable iron very popular for use in automobile construction. Malleable iron has other good qualities. Its permeability is as high as soft steel and its magnetic hysteresis is less. These qualities render this material very desirable for certain electrical machinery.

"It is seen, therefore, how important a place malleable iron holds in the iron and steel industry."

Great Importance of the Scrap Business

W. Vernon Phillips Gives Some Very Interesting Statistics and Describes Ways of Handling Iron and Steel—Subject Never Before Discussed Before Institute

In his paper on "Iron and Steel Scrap" W. Vernon Phillips of the Perry Buxton Doane Co., Philadelphia, said:

"I have been asked to address you on a subject which Mr. Farrell tells me has never before been put before you, namely, iron and steel scrap, and I feel very fortunate in having the opportunity to tread on virgin ground. The subject, however, is such a broad one that I can only touch upon certain features, but I hope it will leave the way open for further and more scientific discussions, which I am sure will be both interesting and helpful to both the producer and consumer. For the present, my purpose shall be to acquaint you with the great importance of this too lightly regarded business—we can not call it an industry, though it is fast approaching that stage.

Importance of the Business

"But first let me point out its importance as a business. For instance, it is second only to pig iron in point of tonnage. The total consumption of iron and steel scrap in the year 1916, over and above that made by the consumer, was in excess of 12,000,000 tons, exclusive of cast-iron scrap and material used for chemical and other unusual purposes, also exclusive of the large tonnage of borings and turnings used in the blast furnaces, all of which would make an additional 2,000,000 to 5,000,000 tons, but we are without statistics, or the present opportunity to secure them on this tonnage, so we will confine our consideration for the present to the 12,114,000 tons consumed in 1916, which represents 9,646,617 tons of iron and steel scrap melted in open-hearth basic and acid furnaces including a small tonnage which was used in electric furnaces. Of the remainder, approximately 2,000,000 tons was worked in rolling mills by the various methods employed, namely, busheling, puddling, piling and direct rolling into bar iron and soft steel, while over 600,000 tons was converted by mills rolling old rails down to lighter sections, to angles, to concrete bars and including axles, shafting, etc., rolled to steel bars.

"During the present year the increased open-hearth capacity will probably have called for at least 2,000,000 tons more scrap than in 1916; in fact, due to the inability of pig iron to keep up with the demand, such enormous calls were made on the scrap business that prices were advanced nearly 100 per cent. However, this had the desired effect and scrap was brought to the consumer from the remotest parts of the country and including many points out of the country, so that the price quickly receded with the satisfied demand.

"As I said before, we have no means of accurately estimating the tonnage, but from the figures available, we can safely say that during 1917 there will be consumed over 15,000,000 tons of all grades of iron and steel scrap, valued at about $400,000,000; in fact, many of you will probably be surprised to learn that there are single companies doing an annual business of over

$50,000,000 and a great many whose turnover exceeds $10,000,000.

"You will see by now that my prime object is to impress you with the importance of this business, for the simple reason that it has been so hopelessly misunderstood and it was not until the United States entered the war and began to take serious stock of itself that the subject was considered of sufficient importance to be recognized. As an illustration, when the subcommittee on iron and steel scrap was appointed in connection with the Council of Defense, one paper seriously remarked that even the humble scrap dealer was to be called on for help.

The Sources of Supply

"There is also an erroneous impression regarding the source of iron and steel scrap and it is likely that not half a dozen men in the industry would figure the same way, but it is the opinion of authoritative judges that 25 per cent of all the iron and steel scrap is produced by the railroads, 40 per cent by the industrial plants in the form of new crop ends, structural crops, ship plate, stampings, turnings and borings; the other 35 per cent is shipped by scrap yards of which probably one-half consists of railroad and industrial scrap sent to the yards to be sheared and prepared, leaving 15 per cent to 20 per cent which is collected by the junk dealers. But while the collection of old agricultural house and city scrap represents a comparatively small portion of the entire production, it is at the present time a most important part, as *that* is the only source which can be increased. The railroads are producing less, due to labor conditions; industrial plants can only produce scrap in proportion to the amount of the steel they receive, while all scrap which comes from replacements is smaller in volume, due to the great difficulty in replacing machinery or equipment of any kind. Besides, we are shipping millions and millions of tons of our steel out of the country, from which we are getting no scrap and will get no scrap; and, in addition, the trade is being called upon to ship thousands of tons of scrap itself. Italy, in particular, has been starving for steel scrap, and there has already been shipped out over half a million tons. The Government has taken a hand in this, as it will in many ways, to regulate this business during the war; but if the war keeps up long, we shall soon reach a point where iron and steel scrap will become a vital matter, and I want to use this opportunity to impress all of you with the importance of regarding this subject seriously.

The Need of the Dealer in Scrap

"You are all either consumers or producers of scrap. There are *millions* of producers and *hundreds* of consumers who are served by *thousands* of dealers who are in turn served. The hundreds have always used this great advantage to discourage and discredit the thousands by the very simple, though probably innocent, expedient of buying something they want, but something the dealer can not always deliver. This is at the root of all the so-called dishonesty in the scrap business. In normal time, the competition is very severe and the scrap dealers go beyond their own powers in their efforts to please the buyer.

"Scrap is not produced, it is a by-product or a discard of something and it can rarely conform to specifications calling for strict sizes, weights, shapes and characters, especially under existing circumstances, when the stock piles of the country have been depleted, with labor scarce and unwilling, and with shipping facilities so limited. The greatest good a buyer can do to-day is to buy what the dealer or producer has to sell, rather than to buy something which he has to try to get out and get.

"Scrap has no value without a demand. For instance, when I was in the tin-plate manufacturing business about 20 years ago, we were always at a loss to know what to do with our tin-plate clippings or what is known as tin snap, and we paid money to have it hauled to the dump. Within a few years, Dr. Goldschmidt discovered a method of detinning, producing chloride of tin and oxide of tin and removing 97 per cent of the metal, leaving the residue of steel sufficiently free from tin to be used in the open-hearth furnace, the black sheet trimmings left being hydraulically compressed. The detinning business has greatly expanded; tin scrap became a commodity and ever since has had a market value.

The Value of Scrap

"The value of iron and steel scrap is in exact proportion to the value of material it replaces. Thus United States steel scrap is based on basic pig iron and over the last 15 years has sold at approximately 10 per cent less than the delivered price of pig iron at Pittsburgh. In all other sections, the percentage below pig iron has been greater, due to the increased cost of delivering pig iron and the fact that Pittsburgh is usually the highest market for steel scrap, it being the largest consumer and a relatively smaller producer. All other grades of steel scrap down to light turnings are worth their relative value to No. 1 steel scrap; but scrap does not always bring its intrinsic value, as it is entirely based on supply and demand. Steel scrap has frequently sold above basic pig iron, though not in the last few years, and there has usually been sufficient scrap to keep it well below its parity. Thus we come back to the same point that scrap is worth only the price that it will bring. It has no manufacturing cost basis.

Helping the Government

"The larger dealers in the iron and steel scrap business met immediately after the declaration of war and formed an association known as the American Board of Scrap Iron Dealers, for the sole and specific purpose of furnishing the Government with help and information. Up to the present time, the sub-committee of the American Iron and Steel Institute has been cooperating with the various Governmental boards and commissions; but now that the plans are to be put into actual operation, the American Board of Scrap Iron Dealers is about to take up the work of establishing and maintaining bureaus for the purpose of assisting in that most serious of questions, transportation, working in harmony with the American Railway Association, and also for the purpose of eliminating in so far as possible the question of rejection, and I speak for it in asking the heartiest co-operation of all the consumers. Do not reject unless you have to. Do not reject for technicalities. Do not reject because the price has declined, but when you find what is known as a doctored car (for the information of the uninitiated, a doctored car contains good scrap on top and poor scrap underneath) do not take it under any circumstances, and if possible, do not let anybody else take it; have it returned to the shipper and report him to the bureau. There are men in the business who give it a bad name and this is a good time to get rid of all bad men.

Some Interesting Features of the Scrap Business

"I have been talking in a purely elementary manner. I have not touched on the grades, classes and specifications nor on the peculiar nature of this most interesting business. It is unlike any other large business. The competition is to buy, not to sell. There are a hundred different kinds of iron and steel scrap, and possibly a hundred different users. It is the business of a scrap dealer to know what each mill uses and wants and what each producer makes. People often ask why the seller does not buy back the scrap from his own steel; but only in rare cases can he use it in the form it is made, and even then some other user needs it more than he does and is willing to pay a higher price. There is a use for every kind of scrap made; and while economists are making this wonderful discovery, it has long been known to the scrap dealer and there is no such thing as waste to-day.

"The successful scrap dealer must not only know his own business but that of each of his consumers, and the better he is informed the better he can serve them. He has yards all over the country to-day that are really manufacturing plants representing millions of dollars of investment in land, buildings, shears,

drops, cranes, presses, locomotives, magnets, etc., many of these yards representing an outlay of several hundred thousand dollars. These yards are steadily growing and they will soon be supplying 50 per cent of the scrap requirements of the country. The old idea of storing scrap and selling on a high market has disappeared, at least for the present. The unprepared scrap comes in at one end, so to speak, goes through its various operations and goes out the other end prepared and ready for the charging box, rolling mill or foundry, as the case may be.

"I fear I have tired many of you, but the subject is such an endless one that I fear it must wait for a future time when it may be discussed under its various headings. I would like to tell of the wonderful, yet unorganized, system by which this great volume of material reaches its markets, of the methods of financing in which many dealers virtually act as bankers, of the short selling and long buying and of many amusing incidents in connection with the ignorant, small dealer's efforts to market his material, also of the methods employed in the scrap business abroad, particularly in England and Germany, where scrap has become of such prime importance as a result of the war, but I fear that I have already overstepped my privilege and must thank you for the interest you have shown in this rather general description."

NEW TRADE PUBLICATIONS

Piston Pumps.—Worthington Pump & Machinery Corporation, 115 Broadway, New York. Bulletin W-308-25. Illustrations and descriptive matter explain the construction and operation of a line of duplex piston pattern pumps. A short statement of the uses of the pump, which is designed for general service work where the water pressure is not more than 150 lb. per sq. in. and where a direct-acting steam pump is the proper piece of apparatus to use, is briefly given. This is followed by illustrations and brief descriptions of the various forms and types of the pump. As a rule, two pages are given to each style, an illustration of the pump being presented on one page with a concise description and condensed table of sizes and capacities on the facing one. Mention is made of accessories such as check and foot valves and a strainer box and strainer for use in the suction pipe to prevent foreign matter from entering the pump. A numbered list of parts and instructions on setting the steam slide valves are included.

Silent Chain Drives.—Link-Belt Co., Thirty-ninth Street and Stewart Avenue, Chicago. Book No. 342. Describes a line of casings for the company's silent chain drives and points out the precautions to be observed in lubricating them. Drawings of the standard casing and the various arrangements that can be supplied are included.

Electric Mine Hoists.—Wellman-Seaver-Morgan Co., Cleveland. Bulletin. Calls attention to the advantages of the application of electric power to mine hoists. Descriptions and specifications of the various types are given with illustrations showing hoisting units that have been installed for a number of iron ore, copper, gold and coal mining companies.

Pipe and Boiler Covering.—Magnesia Association of America, 702 Bulletin Building, Philadelphia. Booklet. Is a study of the cause and prevention of heat losses in the transmission of steam for power or heating purposes, the object being to present the latest and best information on heat insulation. The history of the development of magnesia boiler and pipe covering is briefly touched upon followed by a discussion of the subjects of heat and heat losses, how heat escapes, some properties of steam and the use of pipe covering to reduce heat losses. The manufacture and application of 85 per cent Magnesia coverings is gone into at some length and condensed information on the correct thickness and application of the covering for every form of steam service is given. The text is supplemented by numerous illustrations of buildings in which the coverings have been installed, as well as a number of views of the installations of the coverings themselves.

Air Compressors.—Sullivan Machinery Co., 122 South Michigan Avenue, Chicago. Two bulletins. The first, No. 75-C, gives a description of an angle-compound air compressor designed for either belt or direct-connected drive. The uses and advantages of the compressor are briefly touched upon, the text being supplemented by numerous views of installations and the various parts of the compressor. The other bulletin, No. 75-F, relates to a tandem compound Corliss type of compressor. The advantages of small steam consumption, little floor space, flexible capacity and a minimum amount of attendance and repairs are brought out in a series of short paragraphs, followed by a detailed description of the construction of the compressor. As was the case with the other bulletin, views of installations are included as well as illustrations of the various parts. In both bulletins condensed specification tables are presented.

Grinding Machines.—Diamond Machine Co., P. O. Box 1188, Providence, R. I. Two bulletins. The first deals with a line of disk grinding machines for all classes of materials. Each machine is given a separate sheet in the bulletin with an engraving, brief description and condensed table of specifications. The various accessories that can be supplied for use with the machines are mentioned. The other bulletin treats of the part played by the face grinding machine in modern manufacturing. It is made up entirely of loose leaves, each of which relates to some installation of this type of machine in an industrial establishment. In every case a view of the machine and the work turned out by it is given, together with data on the operations that are performed. The plants covered include automobile, aircraft motor, tractor, electric motor, pump, automatic stoker and plow factories and railroad shops.

Induction Motors.—Crocker-Wheeler Co., Ampere, N. J. Bulletin No. 182. Treats of a line of squirrel cage induction motors designed for constant speed operation on 60-cycle polyphase circuits. The construction of the motor, which is built in sizes ranging from ½ to 3 hp., is gone into at some length, the text being supplemented by numerous illustrations. An illustrated description of the motor appeared in THE IRON AGE, Oct. 11, 1917.

Air Conditioning and Drying Equipment.—Carrier Engineering Corporation, 39 Cortlandt Street, New York. Folder. Contains a list of some of the industries using air conditioning and drying equipment. Among those included are munition plants, printing establishments; rubber, tin can, electric light and automobile factories; silk and paper mills and moving picture producers, etc. Illustrations of typical installations for humidifying and dehumidifying air are presented.

Optical Pyrometers.—Leeds & Northrup Co., 4901 Stenton Avenue, Philadelphia. Bulletin No. 860. Describes an optical pyrometer for works' use which was illustrated in THE IRON AGE, Aug. 2, 1917. The pyrometer makes use of a small tungsten lamp, the filament of which shows against the background formed by the object looked at. The current through the lamp filament is adjusted until it merges or disappears in the background, this arrangement serving to measure the temperature of the body.

Screw Products.—Corbin Screw Corporation, New Britain, Conn. Catalog. Illustrates a full line of screw products including wood, machine, cap, set and special screws, bolts of all descriptions, nuts, etc. There is practically no descriptive matter in the catalog, illustrations of the various products and tables of the sizes in which they can be supplied being relied upon to tell the story. Mention is also made of the facilities which the corporation has for turning out special work.

Oxy-Acetylene Welding and Cutting.—Prest-O-Lite Company, Inc., Indianapolis. Book No. 5. Pertains to the possibilities of reclaiming broken and worn machinery and metal parts by the oxy-acetylene process. Representative examples of reclamation welding work in practically every field of the industrial world are shown. The applications of the process to general manufacturing work are also mentioned.

Wire and Wire Products.—Wright Wire Co., Worcester, Mass. Catalog. Embodies a brief historical account of the development of the company with short descriptions of its products. The text is supplemented by numerous illustrations of the different departments of the factory and the goods produced therein.

Pipe and Pipe Fittings.—Pittsburgh Piping & Equipment Co., Thirty-fifth and Smallman Streets, Pittsburgh. 1917 tables of standards. List the various kinds of pipe and fittings which the company is prepared to supply, together with dimension tables and diagrams. The tables, which are in looseleaf form, are punched for binding and are printed on thin paper so that they can be blueprinted if desired.

Pot Valve Pressure Pumps.—Worthington Pump & Machinery Corporation, 115 Broadway, New York. Bulletin W-500-25. Describes and illustrates a line of pressure pumps of the pot valve type where the pressure is 150 lb. or more. A brief description of the water end of the pump is presented, followed by others of the different styles of pumps, a pair of facing pages being given to each kind. Mention is made of a line of pumping engines, condensing apparatus and various types of pumps that can be supplied.

THE IRON AGE

New York, November 8, 1917

ESTABLISHED 1855 VOL. 100: No. 19

Plant of the Wickwire Steel Co.

From Molten Iron to Wire Rods Under One Roof—Handling Without Railroad Switching—Blooming Mill a Feature

THE new steel plant of the Wickwire Steel Co. is now in operation. It comprises an open-hearth plant and rolling-mill machinery for producing wire, nails and tacks. From the standpoint of design it is especially noteworthy. The most noticeable features of the new mills are the compactness and the handling of all material from one mill to the next by overhead cranes without the usual railroad switching and the placing under one roof of the necessary operations from molten pig iron to wire rods. Special reference may also be made to the blooming mill, shown in the accompanying illustrations.

Construction work on the expansion of the Wickwire plant, which is located on the Niagara River just north of Buffalo, N. Y., was started in May,



A slide transfers ingots from the crane in open-hearth section to the crane in the blooming mill section for delivery to the heating furnaces

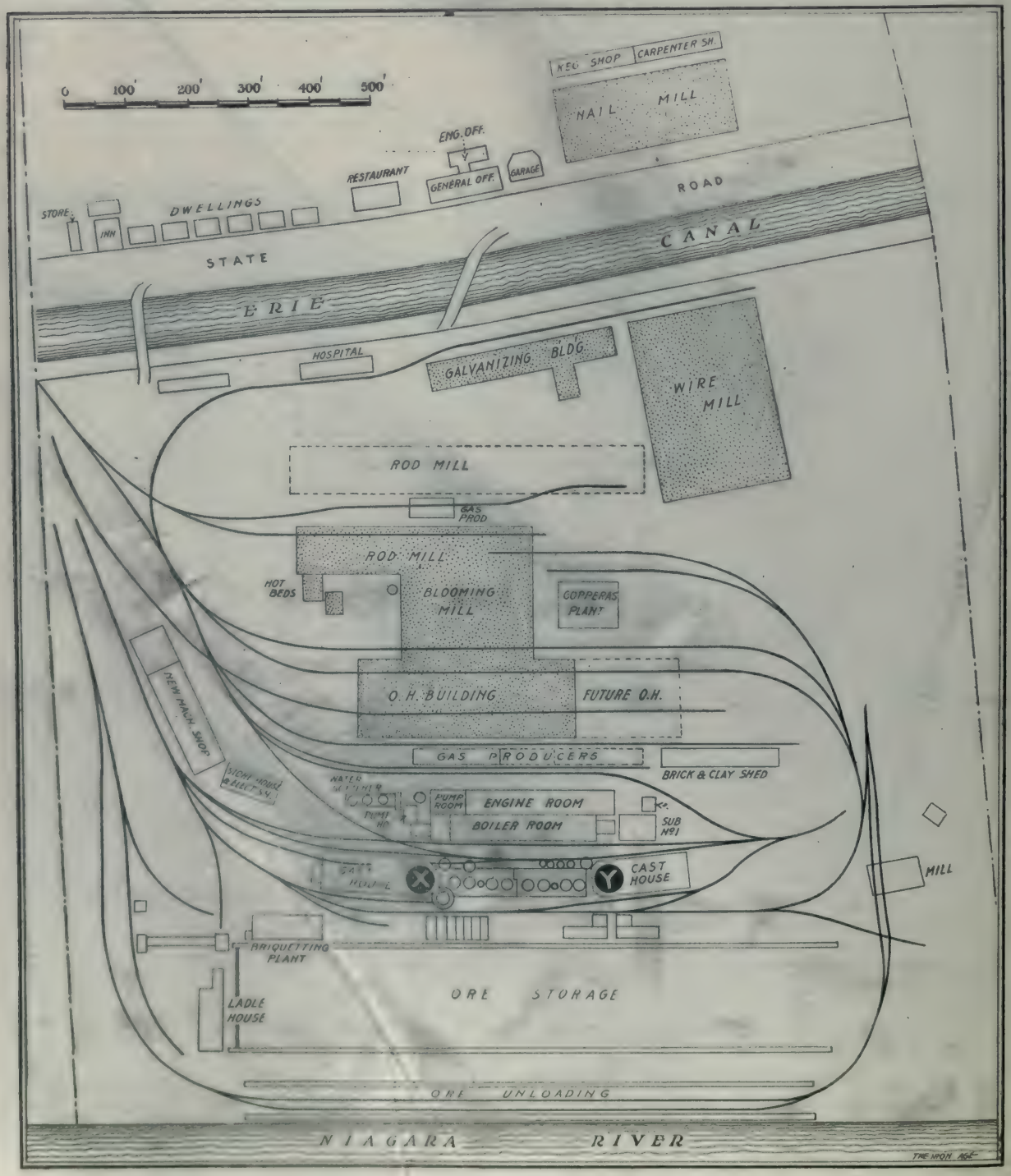
1916. The four open-hearth furnaces, gas producers, blooming mill, rod mill, wire mills, nail mills, etc., are now practically in full operation. An accompanying plan of the property, showing the arrangement of the mill buildings, indicates also the proximity to the steel plant of the two Harriet blast furnaces of the Wickwire company. The first steel was made Jan. 8, 1917, and the blooming mill started operating in July and the rod mill in August. The buildings were erected by the Lackawanna Bridge Co.

There are four 60-ton open-hearth furnaces. They were designed and erected by Alex. Laughlin & Co. and are equipped with a Wallman-Seaver-Morgan low-type charging machine. There are eight Morgan automatic gas producers, coupled two to each open hearth, these producers were built by Morgan Construction Co., Worcester, Mass. A traveling bucket crane takes the coal from a bin under the cars, empties it into a bin above a crusher and also takes the crushed coal to the producer bins.

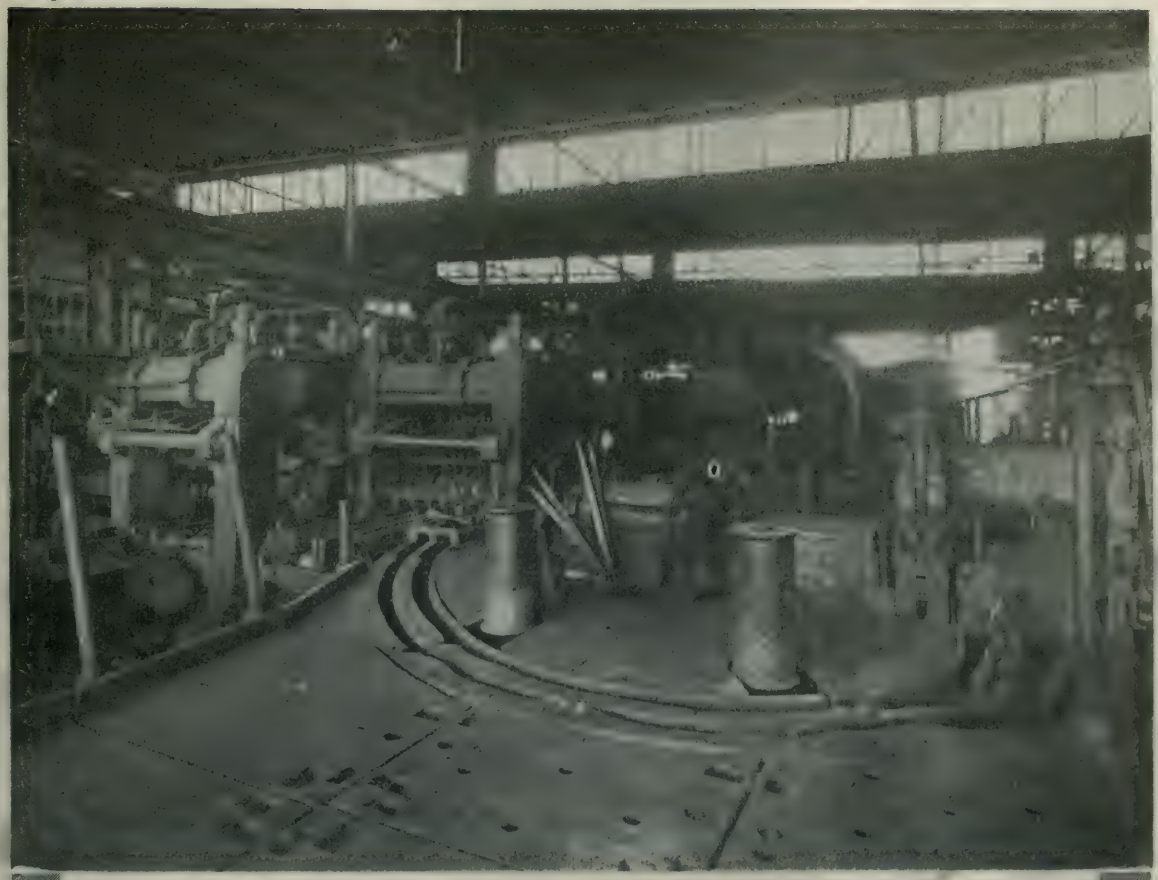
A 50-ton Alliance crane serves the charging floor and a 100-ton Alliance crane travels over the pouring side. The furnaces are served by a 400-ton metal mixer built by the Variety Iron & Steel Works Co. A 10-ton Alliance crane on the same runway with the pouring crane sets the molds, strips and puts the ingots on a slide that delivers them under the crane in the heating furnace building.

There are two continuous heating furnaces charged by an overhead 10-ton crane. The heating furnaces were designed for the use of coke oven gas or producer gas, and at present are operating with coke oven gas. A hydraulic pusher delivers the heated ingots to the blooming mill tables.

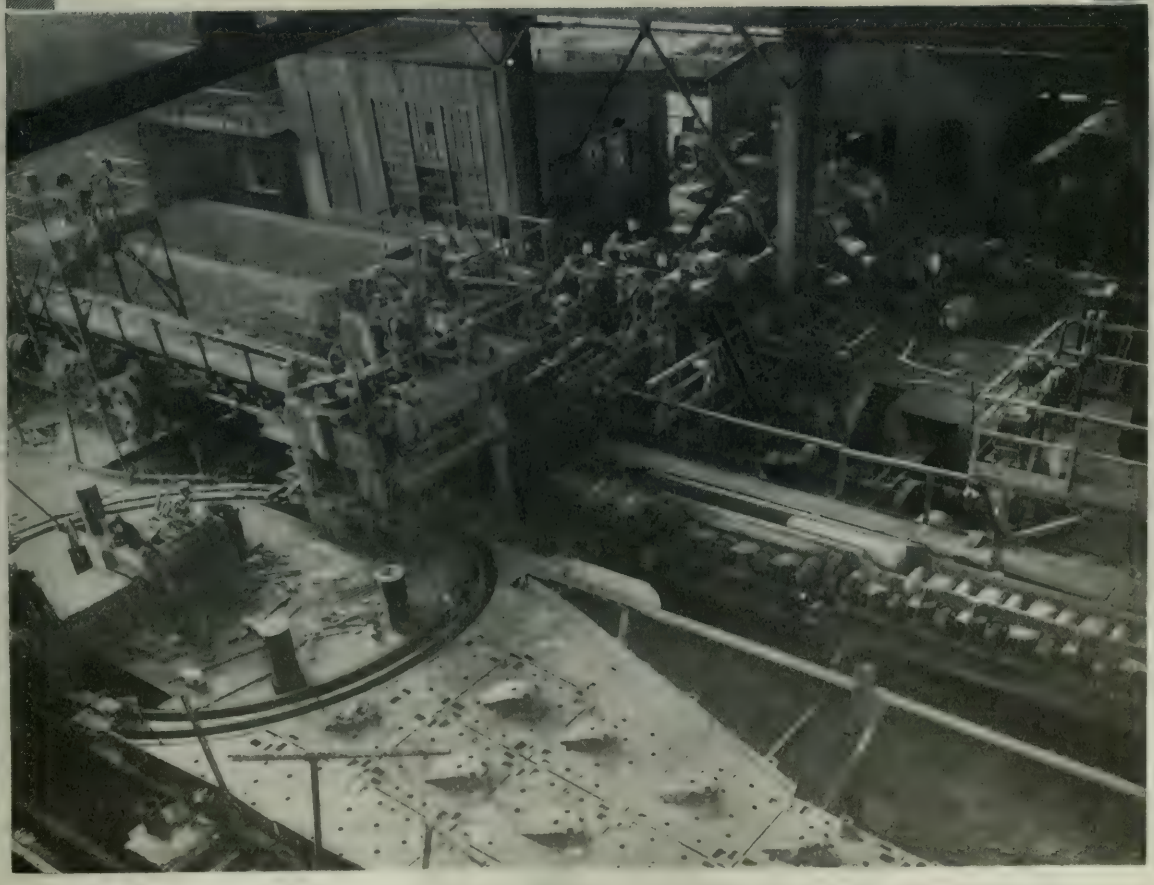
The blooming mill was built by the United Engineering & Foundry Co., and consists of three stands, two 32-in. two-high sets and one 24-in. These are driven by a 2200-volt alternating-current



General Map of Works of Wickwire Steel Co., Buffalo



The blooming-mill consists of three stands, two of 32-in. two-high sets and one 24-in. two-high set. The stands are staggered and there is no reversing. Movable tables serve the two larger sets, so the piece passes back and forth in a horizontal plane and is finally looped twice in the repeater which serves the 24-in. stand. The photographs are views of the mill taken in opposite directions





A hydraulic pusher forces the ingots into the blooming mill heating furnace. The ingots are arranged alternately as to the position of the ends to allow for the taper of each ingot

General Electric motor of 1400 hp. rating. The stands are staggered and driven through a gear set so that there is no reversing. The piece to be rolled is delivered to a movable table and passes through one set of rolls to another table; it moves back and forth as in a three-high mill, only in a horizontal plane in place of a vertical one.

The bloom is cropped at 4 x 4-in. size and then loops in a repeater through the 24-in. stand and is finished to 1¾-in. size with the second loop. The 1¾-in. bar is run out to a shear and cut to 30-ft. lengths on a hot bed that has its delivery end under the rod-mill crane.

There is under construction a Morgan six stand 18-in. continuous mill to take 4 x 4-in. billets from the blooming mill and finish 1¾-in. bars for the rod mill and any merchant billet or bar sizes to 1½ in., also sheet bars, etc. When this is completed, the looping feature of the blooming mill will be discontinued.

A Morgan continuous double-strand rod mill is installed, driven by two General Electric alternating-current variable-speed motors of 1300 and 2400 hp. rating. This rod mill has new features in rod-mill construction, aiming at the production of a better rod than usual, more closely to desired section. It delivers the product to an inclosed conveyor arranged so that the bundles are not exposed to the air, thus eliminating excessive scale and producing a soft rod.

A wire mill with 300 wire-drawing blocks and the necessary equipment for finishing all kinds of market wire is just starting into operation. A nail mill is about to start with 70 nail machines, 24 barbed-wire machines and 50 tack machines. A number of other additions have been built, such as new machine shop, wood-working shop, brick sheds, dolomite burners, galvanizing and tinning buildings, etc.

The Youngstown & Suburban Railroad plans to erect a power plant at Southern Park, near Youngstown, Ohio, and also an addition to its present power plant in that city.

Christmas Card Money for War Relief

The following letter, which is being given wide circulation, is signed by the Illinois Steel Co., Morden Frog & Crossing Co., American Steel & Wire Co., Universal Portland Cement Co., Lackawanna Steel Co., Carnegie Steel Co., Inland Steel Co., Chicago Railway Equipment Co., A. M. Castle & Co., The P. & M. Co., A. J. O'Leary & Son Co.:

CHICAGO, Oct. 27, 1917.

Dear Sir:

At this time of world war when money is so sorely needed to alleviate suffering, reduce hunger and care for the sick and wounded, it seems sheer waste to spend money for such unnecessary and unproductive things as holiday greeting cards.

A number of companies and individuals, among them the undersigned, whose custom it has been to distribute such cards, have decided not to do so this year, but instead to contribute the money to war relief organizations, where it will perform some real service.

As lack of time prevents a personal canvass of other steel producers and consumers, as well as business houses and banks in general, this form of letter is substituted, and it is hoped the suggestions offered may meet with wide approval and be productive of generous results.

Contributions should be sent direct (together with a copy of this circular, if desired) to the American Red Cross, the American Fund for French Wounded, or any other relief organizations that may appeal to the giver.

What is called a modified welding process to repair broken aluminum parts, for example, has been developed by the Aluminite Mfg. Co., Inc., 427 Fourth Avenue, New York. The edges of the metal to be consolidated are cleaned, as with gasoline and a wire brush, followed by filing, and then a solder is applied with the aid of a blow torch to tin the surfaces to be joined. Finally the parts are brought together and a torch used together with solder, which is introduced into the crack in a pasty form. The company has issued a sheet of directions which emphasizes that the process does not subject the metal to excessive heat strains.

The Woodville Lime Products Co., Nicholas Bldg., Toledo, will shortly place in operation a new stone crushing plant for the manufacture of dolomite at Woodville, Ohio. This plant will have a daily capacity of 60 to 80 cars of dolomite.

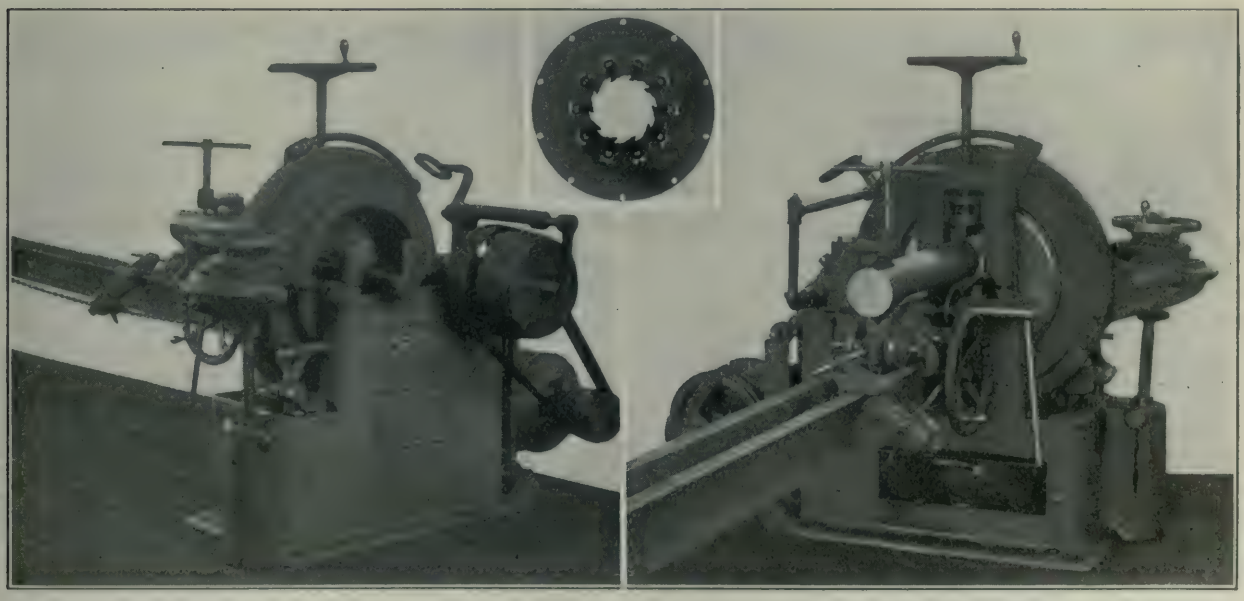
New Internal Bar Cutting-Off Machine

For handling rounds, squares and any other shape that can be contained within a circle 4½ in. in diameter, the George Gorton Machine Co., Racine, Wis., has brought out a new heavy-duty cutting-off machine. It is of the builder's standard internal tooth type of cutter blade, the 10 cutters used being held in blocks which in turn are driven into pockets in the bore of the blade. The machine is designed particularly for use in rolling mills and car and locomotive works and by builders of engines and machinery.

The blade used is of chrome vanadium manganese steel which is heat treated and ground on both sides after the cutter pockets have been roughly milled out. These pockets are tapered on one edge to correspond with a taper on the edge of the block, the cutters and blocks being centrally located by a system of tongues and grooves. It is pointed out that with this arrangement the cutters can be keyed in very rigidly without distorting the blade thus giving the effect of a heavy band surrounding the cutters and securely fastened around periphery to a heavy cutter drum. After the blade has been ground a light cut is taken to finish the pockets to the desired size. The cutters which are of high-speed steel are made alternately wide and narrow, with the latter projecting a slightly greater distance toward the center of the blade than the wider ones. This arrangement provides for the cutting out of the metal in the center of the cut by the narrow cutter, while the corners are cleaned up by the wide one.

An adjustable automatic power feed mechanism of new design is employed. This it is pointed out obviates the necessity for the reversal of any clutches when the operator is ready to raise the cutterhead to position after finishing a cut. The adjustment of the cutterhead either up or down is controlled by the handwheel as the feeding pawls are automatically disengaged when the cutterhead is being raised, thus permitting the screw to be turned in the opposite direction. A large spring under the cutterhead serves as a counterbalance to take the weight off the screw. In tests stock was cut off with a feed of 1½ in. per min. and a feed of 1 in. per min. or more can be maintained in regular operation, depending upon the hardness of the stock that is being handled.

A belt-driven cutter grinding machine is provided for sharpening the cutters employed. This is provided with tight and loose pulleys and does not require a countershaft. A stock rack operated by a handwheel located at the side of the machine is furnished where the machine will be operated practically without interruption. The builder's patented measuring device is provided, thus eliminating the necessity for the operator to walk to the back of the machine to measure the stock that is being cut off. Where only a few cuts are to be made from each bar, the single roller stand can be provided. This is adjustable for height to compensate for unevenness in the floor of the shop to which it is fastened by bolts.



Cutters Keyed Into the Bore of the Blade Are Employed in a New Internal Type Machine for Handling Any Shape or Size of Material that Can Be Contained within a 4½-In. Circle

Westinghouse Electric Employees Make Fine Record

Setting as their goal subscriptions amounting to $1,500,000 of Liberty Bonds, the employees of the Westinghouse Electric & Mfg. Co., at the close of the campaign secured subscriptions amounting to $1,610,000 or an over-subscription of $110,000 beyond the goal. The employees of the subsidiary companies subscribed approximately $620,000, and the company itself subscribed for $2,500,000, making a grand total for the company of about $4,730,000. An interesting fact in connection with this bond subscription is, that out of approximately 30,000 employees, 22,000 subscribed to bonds. With the hearty approval and co-operation of the management, the employees divided the immense works into 18 sections with a captain over each. They in turn, selected their own lieutenants and teams. This sales force, embracing many salesmen of experience, aggregated 400 employees and made an enthusiastic as well as systematic canvass of each and every employee of the company with the result as noted above. In many cases, the sections reported 100 per cent subscriptions; in other words, every employee in the section subscribed. In some cases where earnings of the office boy or other employees were not large enough in the opinion of the committee for his department to buy a bond, the employees of this particular section contributed and purchased a bond for him. The progress of the campaign was thoroughly advertised to the employees by means of large wooden thermometers installed at the various entrances to the works, which were up each day to indicate the number of bonds subscribed to that time. Placards were also printed daily giving the total amount subscribed up to the previous day.

The Bond Foundry & Machine Co., Manheim, Pa., announces that it has purchased the property and good will of the Queen City Foundry Co., Ashbridge's Bay, Toronto, Canada, which will be operated as the Bond Engineering Works, Ltd. The new company will continue the manufacture of gray iron castings for the trade, and also will make a line of power transmitting specialties. The new works will be under the management of H. M. Lee.

Prospects for Machine Tool Exports

Symposium at Convention Reveals That American Manufacturers Have Excellent Opportunity to Capture Foreign Markets After the War

ONE of the most interesting features of the annual convention of the National Machine Tool Builders' Association at Hotel Astor, New York, Oct. 30-31, was a symposium arranged by C. E. Hildreth, general manager of the association, on prospects for the exportation of machine tools after the war. Russia, Belgium, France, Spain and South America were represented by able and carefully prepared addresses from men who are thoroughly in touch with conditions in each of those countries. The present large scale of production of machine tools in this country—estimated by President J. B. Doan of the association to have reached in the past three years a total volume equal to the preceding 10 years—makes the subject of post-war business of vital importance to all machine tool builders.

R. Poliakoff, Mech.E., assistant professor of mechanical technology, Technical Institute, Moscow, Russia, commissioner of the Russian Government Purchasing Commission in the United States, spoke on Russia in part as follows:

"In considering the prospects of exportation of machine tools to Russia, we have to find out first if there are any such prospects. This is a most natural question, and it can be answered only in one way: in the affirmative, of course. Russia became acquainted with American machinery many years before the war broke out, has learned its value, and has acknowledged its superiority, as compared with similar products of other countries. It is true that the amount of machinery imported into Russia from the United States before the war was considerably less than the number of machines imported from other countries, chiefly from Germany and England, but this fact is being accounted for by specific reasons—some of which are as follows:

Russia's Foreign Trade

"In the last two or three years preceding the war, the imports of machinery to Russia amounted approximately to $5,000,000, of which about three-fourths, to the value of $3,500,000, originated in Germany, about $1,000,000 in England, and about $1,000,000 in the United States. I do not deem it necessary to point out why Germany obtained the bulk of the business. It has been explained on many an occasion, and it is being pointed out every time one refers to the past superiority of Germany in any line of industry—be it machine tools, or just buttons for ladies' waists. However, with reference to machinery in particular, we have to point out the following specific reasons:

"While there cannot be the slightest doubt that in most cases the German machine tools were of inferior quality, they, however, served the purpose quite satisfactorily, supplying the ordinary user with a cheaper machine. Some places in Germany made a specialty of cheap lathes, for instance, as the Chemnitz districts in Saxony, which turned out lathes in big quantities and at cheap prices. If some of you ever happened to be in Chemnitz, you probably have seen these factories; employing cheap labor, getting their castings from another factory, supplying with beds a number of shops, etc.—circumstances which allowed the Chemnitz manufacturers to sell a 16-in. lathe, with an extra treadle drive at $170 in Moscow, freight, duty and agents' commission all included.

"It is noteworthy that the types of the German machinery were so to say inspired by the United States products and in many a case they were an imitation, a copy, of the American machine, yet they were better adapted for the sale. An instance which I am going to cite now will make clear to you how this was attained by the German manufacturers.

"Take a bolt and rivet forging machine of certain size, which is classified by the American manufacturer for making rivets up to say 1 in. diameter; the German manufacturer took this machine, copied it, but specified that it is capable of producing rivets up to 1¼ in. or even 1½ in., and so he was able to produce a machine which was considerably cheaper than the American machine of 1½ in. capacity. But the German manufacturer often turned out to be victorious also in the practice of using the machine. Why? Because a 1½-in. machine is not always used to produce 1½-in. rivets only, more often it is used for making rivets of smaller size, which work the German machine naturally withstood all right, and if a breakdown sometimes occurred to the machine when worked on 1½-in. size well, the metal might have been too cold or too strong, so far as tensile strength was concerned, etc., and finally the Russian user, not going too deep into the whys and wherefores, simply reinforced sometimes a certain part of the machine which he found out to be too weak when called upon to work on the limit size, and when this was done, the machine was all right.

"You all know that the best German machine-tool building concerns were manufacturing their machines on American lines; take, for instance, the firms of Ludwig Loewe & Co. in tools for machine shops; De Fries and Hasenclever in machines for forge shops; Pittler, in automatics, etc., but naturally they produced them cheaper than the corresponding firms in the United States. They were all nearer, so to say, so far as means of communication and intercourse were concerned, and naturally succeeded more easily in doing business with Russia than other countries, the United States included.

Neglected Export Business

"There is one more reason which ought to be mentioned here; after all, taking everything into consideration, you, American manufacturers of machine tools—at least the majority of you, to be just to the minority—did not look after export business, did not care much about the export trade, and in cases when you did care, you wanted the Germans to do all the bother for you, you only wanted to receive the checks. While this may have been a good business policy in ante-war times, it cannot hold good now and especially after the war. Not having attended personally to the Russian export market, you did not get any knowledge of it, and if you really now want to enter the field, you have to do so afresh, without any previous experience, this latter having been buried in the offices and heads of your former German agents. This was, so to say, your first pre-war mistake. Let us now see what happened during the war.

"The war created, of course, an enormous demand on machine tools in all the warring countries, in Russia among them. The former supply of machine tools to Russia, i.e., Germany, having been cut off, all eyes and hopes were turned toward England, the ally of Russia, and the United States. England could not satisfy all the Russian wants, though she did satisfy many, and America was therefore called upon, but here again the American manufacturer made the same mistake which he had made before the war; he allowed a number of responsible and irresponsible persons to act for him, and in many cases these persons did not act as they should have acted.

An Interesting Experience

For example, promises were made which evidently could not be fulfilled under any circumstances. To illustrate: In May, 1915, a certain young Russian ceramic engineer applied to me in Moscow asking me to help

him get a position in his specialty. At that time I had no such position for him in view. In July, 1915, I met him on the main promenade in Petrograd, and asked him how he was getting along. 'Very well,' he said. 'I now sell lathes.' 'Lathes?' I was surprised. 'What has this to do with ceramics? Whose lathes do you sell?' and he mentioned an American firm—which for my illustration we shall call East Kent. 'I can offer you 100 lathes a month, delivery starting next September.' A few days later I went to London, came in touch with different dealers, and one of them offered me again 100 East Kent lathes a month, delivery starting next September. One day I went from London to Leicester, and visited there a certain manufacturer who also acted as agent for some American machine tool manufacturers and among his machines he offered me East Kent lathes at the rate of 100 per month starting next September.

"I came to New York in August, 1915, called on a certain forwarding agent to arrange about some of our shipments. It turned out that he had in his office also a man who was selling machine tools, who offered me—what do you think?—East Kent lathes at the rate of 100 per month, delivery starting next September. I did not order 100 lathes, but I ordered four to be delivered in October, 1915, and have not got them yet in October, 1917.

"Here we have a case where the manufacturer had nearly as many agents as there were units in the advertised rate of his monthly deliveries, who all took orders for him without any chance of living up to the promises.

Will It Be Continued?

"The question naturally arises whether the same policy will be continued after the war. There is not the slightest doubt that the demand for machine tools in Russia after the war will be very great. To understand this assertion, the following factors must not be lost sight of. First of all, the rehabilitation of the regions, the devastation of which was so thoroughly attended to by the Germans, will have to be carried out as quickly as possible when peace permits. Apart from this, another perhaps even more influential factor is coming into play during the present war as a direct result of the revolution. Whatever conditions exist now in Russia, which are not as hopelessly bad as they are pictured by some sensation-seeking newspapers and newspaper correspondents and so-called eyewitnesses, the country is undergoing a process of regeneration and reconstruction which will result in a more democratic level of life than that which existed heretofore, and it can be accepted as an axiom—and statistics prove it—that in a democratic country the income per capita and also the needs which incomes create are much higher than in a non-democratic country.

"By what means will these increased needs of the country be met? By importing everything she wants? Certainly not. This would be a financial fallacy, leading to bankruptcy. The debt of Russia is now large enough, and certainly it will be out of question for any form of government still to increase it by allowing foreign goods to be imported in unlimited quantities, and in this way still more to turn down the lever of financial stability.

"To summarize: First, there is not the slightest doubt that Russia can be a good market for American machine tools after the war; second, to avail themselves of this market, the American manufacturers must be interested in it; and third, provided such an interest will exist, the pre-war business policy of the American machine-tool manufacturer will have to be changed, and a new policy substituted."

Prospects in Spain

Henry S. Moos, M.E., member of American Machinery Syndicate, New York and Spain, spoke on Spain in part as follows:

"I have been living in Spain for 12 consecutive years, devoting my time to the introduction of American machinery, machine tools almost exclusively, carrying on a continuous fight with the rest of your European competitors combined. It has been my experience while in Spain to find out that customers, when their orders are shipped promptly, their specifications carefully observed and their machines are above criticism, will pledge their loyalty and their trust with the man or the manufacturing concern they deal with, and this to such an extent as to make it extremely hard to win them over to the competition. It is by no means unusual for a customer to continue placing his orders at a higher price and upon less favorable terms of delivery and payment than offered him elsewhere solely because he has learned to trust his man or manufacturer with whom he places his orders, knowing, as he does, that his confidence in him will not be taken advantage of and the higher price he may be called upon to pay he considers ample justification in return for assurance of fair treatment.

"A great number of manufacturers have not paid much attention to the Spanish market, possibly because they thought Spain was prominent rather in producing beautiful black-haired girls, painters of fame, high-paid bull fighters, olives, oranges and sardines, more than prospective customers willing to spend their dollars for a high-duty lathe or a high-speed drilling machine.

Spain's Progress

"The Spain of to-day is beginning to take a more prominent position in the world's markets of machine tools than heretofore. With the outbreak of the war, the country has been suddenly cut off from its accustomed sources of supply, causing the paralyzing of its industrial life due to the disorganization of the market. Pretty soon, however, Spanish capital and industries began to realize to what extent they had been depending on the foreign markets and immediately steps were taken to readjust local conditions. Thanks to individual effort combined with the Government's encouragement, industrial life in Spain has now reached a degree of activity never known before, in peace times. Spain's neutrality is turning out extremely productive to its economical situation. During 1916, Spain's foreign commerce, showing a total of $540,000,000 for imports and exports, set a record for itself. The increase of activity along metallurgical industrial lines constitutes an important factor in the compilation of these figures. The national treasury found new strength by the unusual increase in value of the national monetary unit which, during the last years, had suffered from slow depreciation. The railroads immediately recovered from a period of depression while the merchant marine became so prosperous that the Government decided to discontinue the subsidies granted in the past to encourage the successful operation of certain navigation companies. Although in many instances factories and mills suffered for lack of raw materials and necessary machinery, the higher prices obtained for the finished product resulted in larger profits. The Spanish industries gradually realized the necessity of freeing themselves of foreign market dependency and acted accordingly until at present Spain is manufacturing a score of products to which no thought in the least had been given until the country entered this era of prosperity.

Government Helps

"While some suffering was caused by the higher cost of living, sometimes resulting in strikes, the difficulties of the moment for the most part were successfully solved by governmental measures coupled by private initiative. The transformation of Spain, set out to rank as a commercial and industrial power in the world's market, cannot but be considered as a good omen for the future.

"Amongst the many, the Spanish Government has under consideration the establishment of a National Bank of Foreign Commerce, with a view of promoting the establishment of new industries and proposing to grant special protection and privileges to industries by advancing them funds up to 50 per cent of their capital invested, guaranteeing minimum dividends on the invested money, tax exemptions for a number of years, favoring import duties on raw material not produced in the country, imposition of low transportation charges, etc.

"The steel mills of Altos Hornos of Bilbao can be favorably compared with the largest plants on the continent, handling alone in the neighborhood of 3,000,000 tons of iron ore per year.

"The shipbuilding yards of Spain on both sides of the peninsula are actively at work since the outbreak of the war, and they are continually enlarging their facilities and putting in new and additional equipment. The merchant ships now on the ways represent an estimated total displacement of 180,000 tons.

"Several concerns in Spain are beginning on a large scale the building of ships' engines—Diesel and internal combustion—and inquiries for a large number of machine tools for such shops have recently come in. A new concern in the northern part of Spain specializes in the construction of steam and oil driven fishing vessels and has already placed substantial orders for machinery.

"Spain started to build her railroads in 1840 and at the beginning of 1916 possessed 8700 miles of track. Up to 1915, the State had contributed $139,000,000 toward railroad construction. The street railways represent some 600 miles of track. Heavier locomotives have now been acquired and many bridges are being strengthened to support them. Some rolling stock has been imported and Spanish car builders have been active in producing material both for domestic use and for export.

"A prominent industry in Spain is the railway and tramway car building industry. There are five factories in Spain, two of which are very important. The automobile industry in Spain is making a notable progress. The largest factory in this line has bought in 1915 about $300,000 worth of American machinery, and recently there has been established in the center part of Spain a new company for the manufacture of motor trucks which, in the last few months, has placed orders for American machine tools amounting to close $250,000, and is continually purchasing new and additional equipment. Five aeroplane factories are working under contract for the Spanish and Allied governments.

Entirely New Industry

"As a consequence of the difficulties which a number of Spanish manufacturers have experienced in securing machine tools during the period 1914-1915 from the United States, an entirely new industry has been created in Spain. Before the war practically no machine tools were produced there and at that time only one concern had started to build a facsimile of a German lathe, while some other concerns were making woodworking machinery and two or three types of upright drills, a slow-speed hack saw, bench grinders and some power presses, also some tinsmith machinery, which to my knowledge, covered the Spanish machine tool industry in toto.

Conditions Changed

"To-day conditions are somewhat different; there are now at least 20 firms, some of them employing as many as 500 and more men, engaged in the manufacturing of a wide range of machine tools, principally upright and sensitive drilling machines, screw cutting engine lathes, planers, shapers, etc., and at the present time all of these concerns are selling all they can produce. If our manufacturers at home had been better able to pay more attention to these Spanish orders, early in 1915, when orders for machine tools were pouring in, and in a position to make deliveries, it is very likely that numbers of these Spanish enterprises now producing machine tools would not even had a chance to start in this new line.

"The opportunity for American manufacturers to obtain a lasting foothold in Spain is greater now than it has ever been. Just consider that the considerable number of machine tools shipped to Spain in the last three years from this country alone is probably larger than the sum total of such machinery shipped into that territory during the 20 preceding years. With but few exceptions, these machines have established for themselves and their producers a wonderful reputation which, let us hope, may be everlasting and serve as a stepstone for what may justly be expected in that direction."

France Will Need America

Roger P. Redier spoke optimistically of the outlook in France.

"France has deeply bled herself," he said; "her life for the last three years has been but sacrifices over sacrifices of all kinds; she has voluntarily dropped everything that had not a direct connection with the war, she has seen nothing else but her 'sacrifices for victory,' and when victory comes, she will have to face a serious problem, and that is, to restore her economic and industrial life. At the present time, most of her home trade and all of her export trade have gone and although the demand will still exist, it will require capital and labor to rebuild the business. Both of these essential factors will be scarce.

"We shall then see an evolution, another way of handling the business; we shall see labor-saving machinery used where it was not before the war; we shall see a better feeling among manufacturers that will encourage the development of the trade; we shall see, I hope, associations like this one that have accomplished so much for their members through the everlasting efforts of their officers; we shall see a new France, a new activity, no more easy-going. France will become, and has to become industrially, a money-making country.

This Country First

"This evolution cannot be made without the aid of America and of American machinery, because this country was the first to face the problem of an every day increase in the cost of labor, as well as a constant demand for larger production, and has become in the line of labor-saving devices, the master of the world. That France will enter the field of making machine tools I do not believe, because it would mean for her the loss of too much valuable time in experiment before she could ever begin to compete in an already taken up market. France, to make money, to re-establish her exchange, will have to export and to increase her export in goods for which she always had a world-wide reputation. She will have to create at home machinery for her special industry; she will have to rebuild and re-equip her destroyed factories, to rebuild her rolling stock as well as her merchant marine. She will have to organize herself, in one word, for the trade of export, for which she has never been properly prepared. All this will demand machine tools.

"If the demand for machine tools exists, which it no doubt will, then the way of selling will surely change, and dealers on the other side will have to face another situation.

Two Classes of Customers

"There will be two classes of customers, the ones that have been engaged since the beginning of the war in manufacturing war material, and the ones less fortunate whose factories have been destroyed or closed during the struggle. While the first class have been developing enormously, in certain cases passing from 4000 hands to over 20,000 hands, buying machinery in large quantity, and enjoying a very prosperous trade, the other class will find themselves when peace is restored with empty shops; in most cases machines having been requisitioned for Government purposes, and their capital is in a very precarious condition.

"The first mentioned class of customers, although they will require machine tools of certain types to stabilize their regular manufacture, will not be for a little while what we might call heavy buyers, and the attention of dealers will lean toward the other class whose needs will be greater and more general. There is no doubt that these customers in order to restart their business will require easy terms of payment, and will apply to the dealers for this; machine tools being the elementary first necessity in any manufacturing proposition.

"What will be the position of the dealer? While on one side he will be anxious to do business and to push forward the machines he represents, on the other

side, limited by his cash resources, he will have to ask for help from his manufacturers in the same form as he will have to help his customers, and whether you might call this easy terms of payment, or consignment of machines, it will mean credit. I have no doubt that arrangements of this kind which will mean a closer collaboration between manufacturers and dealers are probable, and if realized, will certainly lead to the development of the trade and to the benefit of both nations which are already allied in arms and will also be so industrially.

"At the beginning, however, a small cloud might darken a little the blue horizon of the situation, and that is the heavy buying done by the American Government for export to France for military purposes. The machines already bought aggregate, I understand, a few thousand, and are only the beginning. There are good reasons to believe that these machines will never come home again ,and will be sold on the spot after the campaign, creating at that time a little disturbance in the market.

"But after all, we cannot really expect to supply the same demand twice."

After the War in Belgium

E. G. Todd, of E. Isbecque & Co., New York, spoke on Belgium in part as follows:

"Belgium has never been a country which has produced any great number of machine tools, even though it is one of the most industrious and densely populated countries on the globe. Aside from a few shops which produced heavy lathes for railroad work, which were not of a modern design, and two or three lathe constructors, the country was devoid of machine tool builders. To give you an idea of the industry of this country, there are situated in the district of Liége alone 250 machine shops, including, of course, both large and small.

"Now, dealing with the prospects of exporting American machine tools at the present time, this is not quite as hopeless as most of the American manufacturers think. While, of course, it is impossible to ship directly into Belgium, it does not mean that the Belgian manufacturers are just being idle, but there are at the present moment several large live inquiries for machine tools to be delivered as soon as ever circumstances permit. In other cases certain Belgian firms are actually placing these orders, giving the American manufacturers where necessary the deposits asked for, and upon delivery of the machines becoming due paying fully for them and storing them either at the manufacturer's plant or in a public warehouse in the large cities.

"This, therefore, will partly answer the question which is uppermost for the moment in the American manufacturers' minds as to whether the Belgians will have any funds at their disposal after the war for the payment of the tools which will be necessary to re-equip their factories.

"Again, most Belgian shops were never very well organized, and their equipment has been added to as and when required, but, during this idle period the Belgians have rearranged their plants and also made layouts by which they will become much more modern and better organized immediately they can re-equip them.

Germans Have Stripped Plants

"Another point which you are probably not aware of is that for the first two years of the war certain factories in Belgium were working, not at full capacity, but were keeping fairly busy, and were allowed by the German Government to export their products to Holland and other countries. This, however, has since been discontinued, as the British Government would not allow the full value which the Belgian manufacturers received for their goods to be remitted to Belgium. Also the Germans have now stripped every plant in Belgium of all the machine tools they could find.

"Dealing with the situation after the war, there are one or two serious points which have to be considered. First of all as to whether Belgium will have her independence restored, and I do not think there is a doubt in the mind of any gentleman here present that this will not be fully accomplished with the assistance of the Allies.

"Secondly, should the Allies find it necessary to blast their way through Belgium as they have had to do in the northern part of France to make the Germans retire, and should the Germans also pursue their tactics in Belgium as they have in France of razing everything to the ground as they retire, it is easily conceivable that no machines will be required immediately after the war.

"This is looking at the situation in its gloomiest aspect and one which I do not think will be brought about, but think after the war we shall find Belgium in about the same state as it exists to-day.

"Assuming this, I would like to have been able to give you gentlemen some statistics of the importation of machine tools from Germany, England and America for the two years prior to the war, but I regret to state that I have been unsuccessful in obtaining these figures, due to the great difficulty in communicating with any Belgians who have these data.

"However, one thing I can definitely say, and that is that there are absolutely no machine tools left in that country to-day, and they, therefore, must all be replaced. In some of the large factories the Germans have taken as many as 1500 tools, and in some of the medium-sized factories 500, and so on all the way down to the smallest shops in which they have only taken two or three. Some persons assume that the Germans will be compelled to give these machines back after the war, as they have all been very carefully tagged and tabulated from the various works from which they have been taken. Personally, I think these machines will be useless after the war for performing any high-class precision work, as we all know the very intense usage which they have had during the war, and even the highest class of tools cannot stand up for any length of time against this rough usage unless they are properly taken care of, which, of course, the Germans have not had time to do.

Second-hand Tools to Be Plentiful

"There will, however, be certain second-hand tools available in England and France after the war, and I would imagine that some of the best American tools which are shipped just before the conclusion of peace will find their way to a certain extent into Belgium, as they will have had very little wear and will be in first-class shape; but the earlier machines which have been delivered, I do not think will be in such great demand, as they will not be in a very good condition; also the Belgians do not look with favor upon the purchasing of second-hand tools, and I am convinced will prefer to commence over again with new machines.

"Before the war the largest exporters of machine tools into Belgium were Germany, then America, then England, and then Sweden in a minor degree.

"You will, therefore, see that the largest competitor will be eliminated, but the Germans no doubt will endeavor to find means of exporting their machine tools again to Belgium. The Belgians, however, will surely devise means to exclude German machines.

"The Germans were exporting to Belgium both the cheap as well as expensive machine tools, but they were rather of the heavier class of tools than most American manufacturers make. They specialized a good deal in railroad tools, a subject which I intend to deal with a little later on. They had very low freight rates granted them by the government, which considerably reduced their cost of freight and enabled them to compete very easily against the American manufacturers. They also had the assistance of the banks, which enabled them to give very lengthy credits, which in some cases were entirely unnecessary, except for spoiling the market.

"The English firms I think we shall find will be the biggest competitors against the American firms in the exporting of their machine tools into Belgium after the war, as they will be very much nearer the seat of action and have at the onset a great advantage over

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Skilled Men Drafted for War Duty

Many Industries Crippled and War Department Will Change Its Methods—Appeal for Legislation to Be Made to Congress—Interesting Statistics

WASHINGTON, Nov. 6.—The announcement that the second call under the selective draft will probably be made early in the new year and will cover at least 600,000 men is causing no little anxiety among manufacturers and especially among those who are producing war material either under direct contracts with the Government or as sub-contractors. Many communications received here reflect the fear on the part of these manufacturers that the new draft, if carried through on the same basis as the first call, will make serious inroads in the ranks of skilled workmen and will increase the difficulty of the labor problem, which is rapidly becoming acute. The declaration of Chairman Hurley, of the Shipping Board, that the working force now employed in the American shipyards must be increased from 200,000 to 500,000 has brought out clearly the pressing need of labor in the shipbuilding industry, while some official figures recently prepared show graphically the results of the indiscriminate drafting of men for the first division of the national army now training in cantonments. Fortunately, however, it can be stated that the War Department officials are already convinced of the unwisdom of the methods pursued in the first call and will make selections for the second division on an entirely different basis and one which will, to some extent at least, conserve the supply of skilled labor, especially that required for the manufacture of war material.

Skilled Men Drafted

The extent to which skilled workmen were drafted into the national army in the first call, regardless of the efforts made by manufacturers of munitions and other supplies for the Government to secure exemptions for valuable men, is being disclosed in reports received from the various training camps where a system of classifying all recruits according to trade or experience is now being put into force. An elaborate card index system has been adopted under which no less than 49 occupations are listed, the data being carefully gathered by a personnel officer who utilizes the information for the purpose of preserving the equilibrium of companies and regiments in the matter of the distribution of skilled workmen whose trades may be called into requisition by the exigencies of the service. As indicating the various fields of industry from which the selected men have been called, the registration for a single day at Camp Upton produced cards showing the presence of 26 machinists, 48 pipe fitters, 22 automobile repair men, 37 carpenters, 22 draftsmen, five firemen, 31 motor truck drivers, nine painters, 40 bookkeepers, six tailors, two dentists, seven druggists, 10 musicians, seven barbers, two moving picture operators, 12 sailors, 26 cooks, 10 grocers, 22 stenographers, 92 clerks, and three nurses. It is evident from these figures that the 600,000 men composing the first draft of the national army include a very large number of skilled mechanics who are now sorely needed in the manufacturing industries tributary to the war and whose places might well have been filled by men whose withdrawal would have had little or no effect upon those lines of industry upon which the Government is now relying to speed up the war program.

Not Enough Exempted

It is now conceded in official quarters that the exemption of skilled workmen in the first draft was by no means as extensive as it should have been. During the period of the sessions of the exemption boards throughout the country, the announcements issued by the War Department from day to day concerning the application of the draft rules deterred many managers and superintendents of munition factories and other manufacturing concerns having Government contracts or sub-contracts from making claims for valuable men. Officials of corporations hesitated to declare under oath that any of their men were "absolutely indispnsable" and the rulings of numerous exemption boards indicated that they would adhere to the principle that "no man is so valuable but that his place can be filled." Under these circumstances, it is not surprising that whole companies and regiments will prove to have been recruited from big industrial centers where the vital work for the prosecution of the war was being carried on.

Under the second call for recruits, the War Department will follow an entirely different plan. The new method may or may not be based upon that adopted within the past 30 days by the Canadian Government, which is just putting into force a new conscription law which became effective Oct. 15. If the expectations of the officials are realized, the new regulations will result in the drafting of men who can easily be spared by their families and by the important manufacturing industries of the country.

In selecting the first 600,000 men, the War Department took them in the order in which their numbers were drawn from the wheel in the lottery presided over by the Secretary of War. Only a sufficient number were examined to make up the first draft and less than one-fourth of the total number registered were examined to secure the desired quota. Under the new plan to be pursued to obtain the second contingent, all the remaining registrants will be divided into five classes or grades of eligibility and the so-called lottery numbers will be ignored except as they fix the rank of each registrant in his particular class. As a result a registrant, who, under the old system, would be the first to be called, for the second contingent may find himself at the top of the fifth class instead of at the head of the entire register, and may thus escape service, while the last man of the old list, who would have stood little chance of being included in the second call, may find himself drafted as the last man in the first class.

The New Classification

The new classification adopted by the Provost Marshal-General divides the remaining registrants into five groups indicating the order in which they will be called to service as follows:

CLASS I

1. Single men without dependent relatives.
2. Married man (or widower) with children, who habitually fails to support his family.
3. Married man dependent on wife for support.
4. Married man (or widower) with children, not usefully engaged; family supported by income independent of his labor.
5. Men not included in any other description in this or other classes.
6. Unskilled laborer.

CLASS II.

1. Married man or father of motherless children, usefully engaged, but family has sufficient income apart from his daily labor to afford reasonable adequate support during his absence.
2. Married man, no children; wife can support herself decently and without hardship.
3. Skilled farm laborer engaged in necessary industrial enterprise.
4. Skilled industrial laborer engaged in necessary agricultural enterprise.

CLASS III.

1. Man with foster children dependent on daily labor for support.
2. Man with aged, infirm, or invalid parents or grandparents dependent on daily labor for support.

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New Hardness Measuring Instrument

The Scientific Materials Co., 711 Forbes Street, Pittsburgh, is marketing a new instrument for measuring the hardness of metals which was designed by its president, Chester G. Fisher. The instrument employs the Brinell method of measuring the indentation made by a hardened steel ball when forced by a given pressure into the metal being tested.

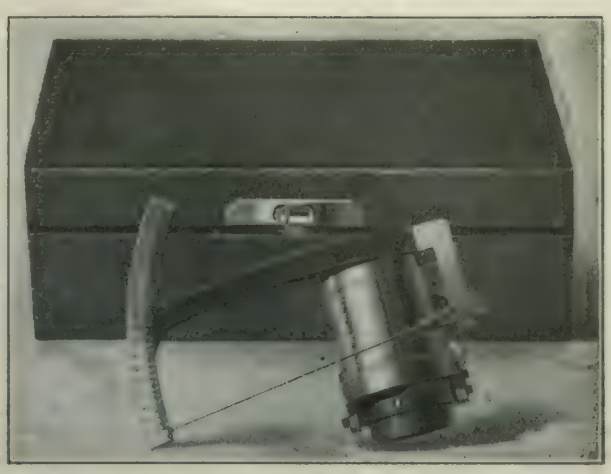
The machine is a hydraulic press with a heavy base in which the facilities for generating and transmitting the hydraulic power are provided and an upper neck cast integral with the base and supporting the hydraulic piston with the hardened steel testing ball. A movable stage, upon which the piece to be tested is placed, is provided together with two pressure gages, one for regular use in measuring the pressure applied and the other, which is reserved as a test gage, for checking the applied pressure readings. The liquid employed is glycerine and the press is constructed with a seal or trap of this fluid which is relied upon to prevent air from leaking in behind the plunger during compression.

The depth gage which is of new design is attached to the hydraulic piston carrying the hardened ball. The pointer of the gage may be moved independently and is set at zero when the ball comes in contact with the metal and the lower ring rests on the upper surface of the piece to be tested. By turning the spindle wheel attached to the front of the base, pressure is applied to the ball and the depth to which it penetrates the metal is indicated by the movement of the pointer over the scale. The movement of the pointer is magnified in the ratio of 50 to 1 thus making small differences in the depth of indentation quite perceptible on the scale. The depth of the indentation made by the ball can be read directly from the scale as fine as 0.01 mm.

One of the points emphasized in connection with the machine is that any spring which may occur in the goose-neck casting will not register on the depth gage, the entire gage moving downward with the piston when this occurs. If the position of the object should shift while the pressure is being applied this also does not affect the readings since it is compensated for by the universal joint attaching the lower ring to the gage.



The Hardness of Metals Is Tested by the Brinnel Method in a Hydraulic Press Having Two Gages to Measure the Pressure Applied



The Depth to Which the Steel Ball Penetrates the Metal Is Measured by the Movement of the Pointer Over the Scale

Council of National Defense Has New Building

The Council of National Defense, its advisory commission and the subordinate committees of both bodies, including the War Industries Board, are now housed in a new but temporary office building, at Seventeenth and C streets, Washington. The building contains slightly in excess of 100,000 sq. ft. of space, with heating, toilet and fire protection facilities customary in office buildings. The type of construction is wood frame, with wire lath and stucco exterior and wall board finish inside. The work was started on Sept. 4, and on Oct. 23 the occupants moved in, a lapse of 49 days, not deducting for Sundays, holidays or bad weather. No night work was done.

The cost of the completed structure will be under $225,000, which is at the rate of less than $2.25 per sq. ft. of space, which is comparable with office rent paid for one year in many cities. So that it is fair to say that if the building is occupied for two years it will save its entire cost in office rent. The new building will house upward of 600 in the personnel of the Council and its subordinate bodies. Aside from this, office space has been given to the representatives of the purchasing commissions of the allied governments. The contract for the construction was awarded to the George A. Fuller Co. So far as is known, no similar structure has ever been attempted, namely, a building which combines the features of temporary frame construction with the characteristics of permanent office building construction.

Ferromanganese Imports in September

Ferromanganese imports for September, as furnished THE IRON AGE were 3402 gross tons or the largest for any month since April. This, however, is only about one-half of the average monthly receipts for the first four months of this year. The September imports were received as follows: Through the port of Philadelphia, 1902 tons; through Baltimore, 500 tons, and through New Orleans, 1000 tons, nothing having been received through Norfolk or New York.

The Miner-Morse Corporation, Erie, Pa., has contracted with Constable Bros. Co. for a modern steel warehouse, and ground will be broken within a few days. The building will be of steel with brick side walls, 60 by 120 ft., with a system of electric cranes and other equipment The company will carry a complete line of shafting, screw stock, cold drawn and hot rolled alloy steels, steel bars, refined iron bars, carbon and high speed tool steels.

The offices of the Laughlin-Barney Machinery Co. are now located at 481 Union Arcade, Pittsburgh.

Widening Fields for Malleable Iron

Speakers at American Iron and Steel Institute Predict Greater Use of This Product—Large Possibilities in Making Munitions

AT the meeting of the American Iron and Steel Institute at Cincinnati, Oct. 26, the paper by Henry F. Pope, president National Malleable Casting Co., Cleveland, on "Malleable Iron and Its Uses," which was published in THE IRON AGE of Nov. 1, was discussed by F. E. Nulsen, Missouri Malleable Iron Co., East St. Louis, Ill.; Prof. Enrique Touceda, Rensselaer Polytechnic Institute, Troy, N. Y.; Frank Lanahan, Fort Pitt Malleable Iron Co., Pittsburgh, and J. S. Haswell, Dayton Malleable Iron Co., Dayton, Ohio.

In his discussion Mr. Touceda said:

"I have listened with much pleasure to the interesting paper just read by Mr. Pope, who happens to be one of a few of the manufacturers who make both steel as well as malleable iron castings. For this reason I attach great weight to his remarks in connection with a comparison of these two products. He has admirably set forth the reasons why there will always be a large demand for the malleable iron casting, and why it has, by reason of low melting point, superior fluidity, high elastic limit and low cost, a certain field from which it is not going to be forced by any product at present on the market. To the foregoing characteristics I would add those of superior soundness and ease of machining. I do not share, in entirety, his comparisons of the physical characteristics of malleable with those of wrought iron, but the former certainly possesses a superior elastic limit, and is more rust resistant than the latter.

"When it is considered that malleable iron is a cast material and that wrought iron is hot worked, that their physical characteristics should be as close as they are is truly wonderful.

Enthusiastic About Malleable

"I have always been very enthusiastic about malleable iron as a metal, even from the very start of my practical experience with it, back in 1896. I felt then that I could predict for it a bright future and great possibilities provided the manufacturer would depart from the crude methods at that time in vogue and realize that he could not attain refinements with equipment that he could not control, etc. That he has certainly done this will be instantly apparent to all who will take the trouble to visit many of the up-to-date plants, where they will find that the most approved furnaces and ovens, pyrometer equipments, testing departments, laboratories and live organizations have replaced the old order of things.

Field Will Widen

"I not only heartily endorse his thought that there is a certain field for the malleable casting that will always be occupied by it to the exclusion of any other kind of casting, but in addition feel strongly that this field is going to be widened in the very near future, because I have lately seen castings of so superior a quality that, if such can be uniformly produced, there is no question whatever of their marketability in huge quantity.

"It must be borne in mind that the most important step in the manufacture of this product is in the heat treatment of the white iron casting. We all know that the efficacy with which this can be done depends, first, upon one's knowledge of the scientific fundamentals underlying this process, and, second, in the possession of equipment that will enable one to faithfully carry out what these fundamentals indicate must be done. Improvement started with a realization of these facts by the manufacturer, and to-day his aim is to adopt any suggestion, introduce any change or install any equipment that may give promise of increasing the uniformity and physical characteristics of his product.

"It is this disposition on his part that gives me faith in the thought that what I have predicted will come true. Not the least gratifying and encouraging sign is the increasing attendance at the meetings of the various technical societies of so many engaged in this industry. Where five or six years ago this was the exception, it is to-day the rule. This is but natural, for with each step toward progress comes the desire to learn more, and I know no surer, easier and more congenial manner to absorb knowledge than through contact with the talented men who form these bodies, and from a study of the papers printed in their transactions, many of which are classic."

Mr. Nulsen's Views

"Mr. Pope's paper, in spite of its brevity," said Mr. Nulsen, "has so fully and completely covered the ground that he has left no new points for me to bring out. Nor can I differ with him on a single statement he has made. I can only therefore discuss and amplify some of the points he has brought out.

"As Mr. Pope says, the manufacturers of agricultural implements were the first to recognize the merits of malleable iron. American farm implements, because of their superiority, have found their way to every part of the globe. Their lightness and great strength have made them successful in competition with foreign-made implements. The ability of the American manufacturer to build a lighter and stronger machine than his competitor was due almost entirely to his liberal use of malleable iron; malleable iron, by the way, being a product which for some reason is but very little known in Europe, its manufacture being almost an exclusively American industry.

"Malleable iron possesses one quality which Mr. Pope has not brought out—its ability to resist wear. Several manufacturers have for years been making wagon skeins of this material and guarantee their malleable skeins to outwear two or three sets of steel skeins, a guarantee they have no difficulty in making good on.

Fine Bearing Surface

"The reason that malleable iron makes a fine bearing surface is because of the presence of a large percentage of graphitic carbon.

"The field for malleable iron has been greatly broadened in the past few years, due to the high cost and inability to secure deliveries on brass castings, aluminum castings and forgings. A vast number of parts, formerly made of these materials, have therefore recently been made of malleable iron. Because of its cheapness and the satisfaction it has given it will probably in most cases be used permanently in these new fields.

"I want to lay stress on what Mr. Pope has said about the resistance to oxidation of malleable iron. I have seen tie plates made of malleable iron which have been in use for 10 or 12 years, and which showed scarcely a depreciable loss in thickness due to oxidation, whereas, the average life of steel tie plates, due to wastage from oxidation, is about five or six years. In this field a higher first cost has prevented the extensive use of malleable iron tie plates. Due to the present high cost of steel a malleable tie plate can be produced to-day as cheaply as a steel one and railroad engineers would do well to take advantage of this condition and thoroughly test the malleable tie plate.

Heat Treatment

"We are hearing a great deal these days of the advantages of heat treatment. Heat treatment reduces the crystalline structure, removes internal strains

and consequently greatly increases the ability of the material to withstand shock. Malleable iron, because of its process of manufacture, is essentially a heat-treated product. Its crystalline structure is very fine and to this quality is due its ability to withstand shock and vibration and to stand up well in extremely cold weather.

Quality Improving

"The one great argument used against the more extensive use of malleable iron has been its lack of dependability. That argument, however, is rapidly disappearing. The old rule of thumb in the manufacture of malleable iron has been replaced by scientific methods. Only a decade ago it was the exception rather than the rule to see a malleable iron plant equipped with a chemical laboratory. To-day every first-class institution is not only equipped with a chemical laboratory but is equipped to make microscopic examinations which have been found to be a greater aid in the production of a uniform quality of metal than the chemical analysis. This equipment has shown the importance of temperature control, and annealing ovens in most up-to-date plants are now equipped with pyrometers connected with recording instruments, making it possible to secure almost absolute uniformity of results.

"Until all plants have introduced scientific methods of manufacture it would be well for every consumer of malleable iron to heed Mr. Pope's advice and have a small test lug cast on every casting, which will conclusively show the quality of each piece and prevent iron of inferior quality getting into service."

Mr. Lanahan's Discussion

Mr. Lanahan opened his remarks by saying it is true, as Mr. Pope stated, that the characteristics of malleable iron are little understood, and while this undoubtedly is true with respect to a portion of users, it is an unpleasant commentary to say that it applies equally well to a small number of foundries. Continuing, he said:

"Fortunately, in recent years there has been a decided change, for a few manufacturers were convinced there were latent virtues in this product, and they with determination worked to develop it to the fullest extent. Quite naturally, advantage was taken of the laboratory, and the inevitable research, finding solutions to these perplexing problems with results that were extremely gratifying.

"It is to be doubted very much whether the pioneer of the malleable iron industry of this country, in the early twenties—Seth Boyden—had the remotest idea of the wonderful future this material had in store.

Old Practice Abandoned

"The malleable iron industry, following the example of the larger iron and steel mills, had to eliminate the 'rule of thumb' practice so prevalent in foundries until a comparatively recent date. The fogy ideas of the old-timers became so entrenched in the minds of foundry operators that they placed sole reliance upon the 'magic eye' of the superintendent. So self-satisfied in their own conceit were these individuals that they regarded their knowledge as to the mysteries of iron much superior to the student of chemistry. Not without much misgiving and dubious predictions as to the outcome did the practice of mixing the iron become the lawful possession of the chemist who had previously been considered a useless personage about the plant. The necessity of knowing the chemical constituents of the raw material purchased was not until recently deemed necessary. This was likewise true of the product.

"Through this avenue, however, the correct ratios of the elements were so worked out and it is now known that with a certain content of carbon there should be a properly balanced silicon to give the physical properties sought. This is likewise true with respect to the sulphur and manganese. The adherence to these known ratios assures the manufacturer physical properties of the highest order.

Methods of Testing

"To appreciate the value of these results it was necessary to establish definite methods of testing the product. Test bars are cast from each heat for static loading, while wedges likewise are made for the dynamic test. The foundries making car castings to-day work under a specification, the minimum requirement of which is 45,000 lb. per square inch tensile strength with an elongation of 7½ per cent measured in 2 in. From the results of the majority of the manufacturers working under this specification it would seem that at a near date it will be possible to increase the requirements for this particular class of material.

"A large majority of the concerns are producing an iron much higher in physical properties than called for in this specification. Here are the results of one firm for the past 12 months, which specializes on car castings. The average results were as follows:

51,000 lb. per sq. in.....Ultimate strength
13 per cent.....Elongation
18.5 per cent.....Reduction in area

"The maximum of these tests was approximately 57,000 lb. per square inch ultimate, 27.3 per cent elongation and 34 per cent reduction. You will readily see this shows uniformity of operation. It is not uncommon to produce an iron with a tensile strength exceeding 60,000 lb. per square inch.

Sound Castings

"In conjunction with the improved quality of product obtainable to-day the founder is producing his castings sound. The question of feeding the castings with heads and risers to insure soundness went hand in hand with the increased strength. There was at one time a fallacy that a malleable iron casting could not be manufactured with a section in excess of ½ in. To-day, in making castings for car work, foundries have not encountered any sections that engender trouble. We are making quite a tonnage of castings ranging in thickness from 1¼ in. to 1½ in.

"The perfecting of the process of making good malleable iron is likened to the adage, 'Perfection is made up of trifles, but perfection itself is no trifle.'

"The excessive demands placed upon the malleable iron industry have been due in a large measure to the advent of the automobile. It is in this field that malleable iron has played an important part in which machinability and strength have been paramount. The automobile manufacturer desires a metal that will machine easily, combined with strength, and yet within a limited weight, so as not to lumber the car with excessive material.

Castings for Cars

"Quite frequently in the past year and a half have the malleable foundries been called upon to make some castings for railway cars, where malleable iron had not been considered previously. This would indicate a renewal of faith in a material that can be depended upon when made by a reputable manufacturer, if the sections are properly designed by the engineer.

"Attention need only be called to the great possibility of malleable iron for munitions in the way of grenades, fuses and various forms of bombs, to show what an important part this material can take in upholding the arm of our Government in the great war of democracy. This industry, in common with every allied craft composing the American Iron and Steel Institute, holds itself in readiness to answer to the utmost of its ability the call of the President and Council on National Defense to serve the Government, with patriotic fervor to the fullest extent of the capacity of the foundries and the energy of their employees."

Malleable for Automobiles

John C. Haswell, president Dayton Malleable Iron Co., Dayton, Ohio, in discussing Mr. Pope's paper said:

"Mr. Pope has ably covered in a brief and comprehensive paper a vast field, touching as he has upon every phase of the manufacture and use of malleable

(*Continued on page* 1171)

Electric Furnaces in Non-Ferrous Industry

Melting Types in the Experimental and Commercial Stage—Practical Results of the Baily, Snyder and Rennerfelt Units

IT is the opinion of Dwight D. Miller, of the Society for Electrical Development, New York, that the present status of the application of the electric furnace in the non-ferrous industry is no further developed than electric melting was in the steel industry 10 years ago. In a paper, "The Electric Furnace as a Medium for Heating Non-Ferrous Metals," before the American Institute of Metals at Boston, Sept. 24, 1917, Mr. Miller discussed the present status of this subject. A portion of this paper relating directly to this was as follows:

As to electric furnaces for use in the non-ferrous field, there is under way at present much experimentation with not a great deal of actual accomplishment in so far as the number of furnaces in commercial use are concerned.

The object of this experimentation is to develop an electric furnace which shall have not only high thermal efficiency but which shall also be able to handle yellow brass and various alloys with small metal loss. In working out this problem simplicity in construction and reliability of operation should take precedence.

What is really needed is a combination of electrical and metallurgical knowledge. It is a comparatively easy matter for the electrical engineer to turn out a furnace which combines simplicity and reliability with high efficiency—one which will give ample heat for the process to be performed, but unless he knows just how the application of this heat at a certain temperature is going to affect the metals composing the alloys which volatilize at comparatively low temperatures, the metal losses will be large. To correct this condition metallurgical knowledge is essential.

Alloys of low zinc content or that melt at low temperatures do not present the same difficulty as do those with high zinc content which must be poured at the higher temperatures.

Furnaces in Experimental Stage

Those furnaces which have been designed and are now under experimentation include:

The Gillett furnace; patent assigned to the Government. Bureau of Mines.

General Electric furnace; controlled by General Electric Co., Schenectady, N. Y.

Conley furnace; controlled by Florance and Hampton. 1270 Broadway, New York.

Thomson-Fitz Gerald furnace; controlled by John Thomson, 253 Broadway, New York.

Northrup furnace; controlled by Ajax Metal Co., Philadelphia, Pa.

Hering Pinch Effect furnace; controlled by Carl Hering, Philadelphia. An option is held by the Ajax Metal Co., for the handling of brass in this furnace.

Bennett furnace; controlled by Scovill Manufacturing Co., Waterbury, Conn.

The Gillett furnace, invented by Dr. H. W. Gillett, is an indirect arc furnace so designed as to bring about a violent agitation of the charge by a rocking motion. The writer was privileged to witness some of the tests that have been going on during the summer, but he is not in a position to reveal any of the results attained.

While the General Electric furnace has been put in the experimental stage, one has been shipped to the Crane Co., Chicago. It will be shortly handling red brass. The furnace, the invention of Edgar F. Collins, is what might be termed a smothered arc furnace—the heating effect taking place both by the arc and by resistance. It is poured by tilting and designed for single, two or three-phase operation, on 25 or 60 cycles, and is made in three sizes, for 1500, 1000 and 500 lb. melted in one hour. The current is brought in through carbon electrodes as in the case of the arc furnace.

On either side of the hearth are two troughs in the bottom of which are located fixed carbon blocks. These troughs are then filled with crushed coke, the current being conveyed to the troughs by the moveable top electrodes which are plunged into this material. There is a critical depth or thickness of this crushed coke surrounding both the top and bottom electrodes, which gives the best results.

Tests made at the General Electric works by their own engineers produced the following results:

When remelting red brass for castings, pouring at a temperature of 2000 deg. Fahr., the power consumption was approximately 250 kw. per ton or 12.5 kw. per 100 lb.

When making red brass for rolling mill practice pouring at 2200 deg. Fahr., the power input was approximately 325 kw. per ton or 16.25 kw. per 100 lb.

The electrode consumption was 4 in. in a length of 5 in diameter electrodes per 24 hr., or 1 in. per electrode.

The efficiency ranges from 70 to 77 per cent according to size of furnace and skill of handling with a power factor of 96 to 98 per cent.

Tests on brass made in the furnace showed 7 to 8 per cent greater tensile strength due to the absence of oxides and impurities.

The Conley furnace, invented by William H. Hampton, is a resistance furnace of the molded resistor type in that the charge is melted in an open graphite crucible which closes the secondary circuit. The furnace is supported on trunnions and is poured by tilting. The current is brought in by bus bars and flexible cables, the ends of which are permanently connected to the sides of the crucible by graphite cement. The crucible is contained in a rectangular enclosure made of iron plates and packed with Kiselguhr, the heating effect being obtained by radiation through the crucible walls. The furnace is designed for single-phase operation at prevailing frequences. Regarding the Thomson-Fitz Gerald furnace, invented jointly by John Thomson and Francis A. J. Fitz Gerald, there is not much to say now, since it is not being pushed. The apparatus is designed for the purification of spelter containing deleterious metals by distillation in an electric furnace, and has been tested mainly for the fuming of impure zinc and condensing it as a highly refined metal. It is a resistance furnace of the reverberatory type—the heating effect taking place by radiation from specially formed resistors and reflected to the charge from the walls and roof of the furnace enclosure. It is used in conjunction with the condenser into which the fumes escape through specially constructed passages.

Mr. Thomson advises that it is suitable for melting brass and bronze, which can be carried on simultaneously by sub-dividing the open retort. The furnace underwent a series of tests at the Fitz Gerald laboratories, Niagara Falls, and while it was successful in producing extremely pure zinc, no other data is available as to its performance for publication. It has never been in commercial use.

The Northrup furnace, invented by Prof. Edward F Northrup of Princeton University, has been under experimentation for the past year and considerable data has been obtained. The furnace is a new departure in design and principle of operation. It is readily adapted to handle almost any kind of metal, and uses an oscillating current at very high voltage, being stepped up to 10,000 volts. The oscillations are produced by discharges from a condenser and the energy conducted to a series of closed coils which are mounted concentrically and insulated from each other. These coils completely surround a cylindrical crucible in which the charge is melted. So far as the writer is aware nothing at present is being done with the Hering pinch effect furnace. There is no information as yet available relative to the Bennett furnace at the Scovill Manufacturing Co.

It will be interesting to note whether as these various furnaces are put into commercial use, they actually meet the claims which have been made on the basis purely of design or as the result of experimental tests.

Furnaces in Commercial Use

The furnaces that are in actual commercial use handling copper-zinc alloys include:

The Ajax-Wyatt furnace; controlled by the Ajax Metal Co., Philadelphia.

The Foley furnace; controlled by Charles B. Foley, Inc., 170 Broadway, New York.

The Baily furnace; controlled by The Electric Furnace Co. of America, Alliance, Ohio.

The Rennerfelt furnace; represented by Hamilton & Hansel, 17 Battery Place, New York.

The Snyder furnace; controlled by The Industrial Electric Furnace Co., 53 West Jackson Boulevard, Chicago.

The Hoskins furnace; controlled by Hoskins Mfg. Co., Detroit, Mich.

The Ajax-Wyatt furnace is best adapted to 24-hr. continuous operation handling the same alloy. In the furnace the enclosure is of metal, cylindrical in form, and contains the pool of metal. It has a V-shaped lower portion containing channels through which the metal flows and in which the process is really carried on, the heating effect taking place in these channels. The electrodes are usually of carbon. A list of furnaces installed or ordered follows:

American Brass Co., Waterbury, Conn., 2-60 kw.; Bridgeport Brass Co., Bridgeport, Conn.; 28-30 kw.; Waclark Wire Co., Bayway, N. J., 1-30 kw.; Washington Navy Yard, Washington, 1-30 kw.; Browns Copper and Brass Rolling Mill, New Toronto, Can., 1-30 kw.; Stamford Rolling Mill, Springdale, Conn., 1-60 kw.

The Foley furnace was invented by Charles B. Foley and while patent applications have been made the writer is unaware of any patents having been issued up to the present time.

Mr. Foley states that there are four furnaces at the Bristol Brass Co., Bristol, Conn.—one of 1000 lb. capacity in operation and three of 3000 lb. capacity each about to start up. As this statement was made late in June the three large furnaces are probably in operation by this time. It very closely resembles the Ajax-Wyatt furnace in both construction and method of operation.

The Baily Furnace

The Baily furnace, after establishing its position for the heat treatment of metals, has now likewise established itself firmly for the melting of alloys and metals in the non-ferrous field. Among its strong points, two stand out prominently, its simplicity of construction and reliability of operation—points which are amply substantiated by the experience of those companies which have had it in use for some time.

This furnace is a resistance furnace of the reverberatory type. [It has been described in THE IRON AGE.]

Mr. Baily, in a recent paper, likens his furnace to "a closed box of fire brick in which are two glowers, which may be likened to huge incandescent lamp filaments."

Regarding the opinions of those using the Baily furnace, three of whom the writer visited, it can be said that they are well pleased with its performance.

William A. Rogers Co., Ltd., state that there are practically no metal losses handling silver which is done in two crucibles holding approximately 500 oz. each, and that the metal appears more homogeneous. Pure silver, copper anodes, scraps and chlorides are melted, thus recovering the silver from their electrolytic process for plating.

Regarding the annealing furnaces, two of which are in use for annealing German silver and brass blanks, 9 tons are treated in 10 hr. annealing at 1450 deg. Fahr. with 175 kw., although the furnaces are rated at 200 kw. for this work.

The Otis Elevator Co. has two annealing furnaces, 300 kw. and 150 kw. capacity, for treating steel and brass castings. About the only trouble experienced has been an occasional crackling of the resistor troughs necessitating patching.

The castings treated vary from 3 up to 7000 lb. each. The larger furnace can handle a charge up to 12,000 lb. of metal, while 7500 lb. can be charged in the small furnace. The metal is treated at a temperature ranging from 1500 to 1850 deg. Fahr. and held anywhere from 16 to 20 hr. Starting with a furnace temperature of approximately 750 deg. Fahr. and running to an annealing temperature of 1600 deg. Fahr, at which time the current was shut off, the cost per ton was approximately $7, the total time the power was on being 19¾ hr.

At the Lumen Bearing Co., Buffalo, copper, Lumen metal, phosphor and manganese bronze are melted. The charge is 600 lb., consisting of scrap and ingots. Short test runs on both Lumen metal and phosphor bronze under far from ideal conditions resulted in a consumption of 12 kw-hr. for Lumen and 22 kw.-hr. for phosphor bronze per 100 lb. It is stated, however, that as soon as the company operates 10 hr. per day six days in the week, it expects to reduce these figures to 10 and 17.5 kw. respectively, based on making the hardener, used with Lumen metal and forming 28 per cent of the melt, separately in a crucible.

The Lumen metal is poured from 1250 to 1600 deg. Fahr.; the phosphor bronze at approximately 2200 deg. Fahr. The heats average about one hour, so that eight or nine heats can be made in a 10-hr. day, according to conditions. The metal loss will vary between 2½ to 3½ per cent for the Lumen metal, the test on the phosphor bronze showing 2 per cent. It is possible to charge manganese bronze immediately after a Lumen heat, since the zinc which might be left in the furnace would have no injurious effect on the manganese bronze.

Of the two furnaces installed one has been in operation for 6 months and the other 2 months. During this time there has been only one renewal of the bottom costing about $50, with some slight patching of same. The second furnace, however, is not run every day.

List of Baily Furnaces Installed or Contracted For

No.	Kw. Capacity	Type	Purpose	Company	Location	Cap., per Hr.	Temp., Deg. F.	Date Installed
1	500	Non-tilting	Melting aluminum bronze	U. S. Aluminum Co.	Massena, N. Y.	1 ton	1600	(On order)
1	105	Tilting	Melting lumen metal	Lumen Bearing Co.	Buffalo	1000 lb.	1300	1916
1	105	Tilting	Melting manganese bronze and yellow brass	Lumen Bearing Co.	Buffalo	600 lb.	2100	1917
1	105	Tilting	Melting yellow brass	Baltimore Copper Smelting & Rolling Co.	Baltimore, Md.	600 lb.	2100	(On order)
1	105	Tilting	Melting yellow brass	Hays Mfg. Co.	Erie, Pa.	600 lb.	2100	(On order)
1	105	Tilting	Melting yellow brass	Bridgeport Brass Co.	Bridgeport, Conn.	600 lb.	2100	(On order)
1	25	Pit (Using Crucibles)	Melting silver	Wm. A. Rogers, Ltd.	Niagara Falls, N. Y.	1000 oz.	2300	1914
2	200	Pusher	Brass annealing	Wm. A. Rogers, Ltd.	Niagara Falls, N. Y.	1 ton	1200	1915
2	150	Pusher continuous	Carbonizing	New England Westinghouse	Springfield, Mass.	1000 lb.	1600	1916
1	150	Car-annealing	Heating steel	Otis Elevator Co.	Buffalo	1000 lb.	1600	1915
1	300	Car-annealing	Annealing	Otis Elevator Co.	Buffalo	1 ton	1600	1916
1	150	Car-annealing	Annealing locomotive axles	Valley Steel Co.	E. St. Louis, Ill.	1000 lb.	1600	1917
1	100	Car-annealing	Annealing aluminum	U. S. Aluminum Co.	Massena, N. Y.	1000 lb.	700	1915
1	300	Car-annealing	Annealing steel castings	Stavanger Electro Stahlwerk	Stavanger, Norway	1 ton	1600	1917
2	600	Automatic-heat treating	Steel draw bar knuckles	National Malleable Castings Co.	Sharon, Pa. (each heat)	3 ton	1600	1914-6
2	600	Automatic-heat treating	Steel draw bar knuckles	National Malleable Castings Co.	Sharon, Pa. (each heat)	3 ton	1050	1914-6
1	600	Automatic-heat treating	Crankshafts	Ingalls-Shepard Forging Co.	Harvey, Ill.	3 ton	1600	(On order)
1	300	Automatic-heat treating	Crankshafts	Ingalls-Shepard Forging Co.	Buffalo	200 lb.	1600	(On order)
1	540	Continuous-heat treating	12-in. high explosive shells	Midvale Steel Co.	Philadelphia	3 ton	1050	(On order)
1	600	Continuous annealing	Steel castings	Morris & Baily Steel Co.	Philadelphia	1½ ton	1650	1916
1	40	Hearth heat treating	Automobile gears	Pierce-Arrow Motor Co.	Wilson, Pa.	6 ton	1400	(On order)

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Important Problems Are Considered

Meeting of Machine-Tool Manufacturers Discusses Matters of Vital Interest, Especially Those Growing Out of the War

A machine-tool meeting under the auspices of the Machinery Section of the National Supply and Machinery Dealers' Association was held at the Hotel Astor, New York, on Wednesday, Oct. 31. A number of subjects of interest to machine-tool dealers were discussed, among them being the machine-tool dealers' economic position, the war profits tax, co-operation with the Government, market prospects and means of increasing good will between manufacturers and their agents.

Capt. Tyler W. Carlisle of the Small Arms Division, Ordnance Department, United States Army, formerly with the Strong, Hammond & Carlisle Co., machine-tool dealer, Cleveland, gave an interesting talk on priority matters, commandeering and other phases of Government purchasing of machine tools. Captain Carlisle said that under the direction of George E. Merryweather, president Motch & Merryweather Machinery Co., Cleveland, who now heads the Machine Tool Section of the War Industries Board, lists of the Government's machine-tool requirements for the next six months have been compiled. He said that dealers had been requested to give complete lists of tools in stock, and from these stocks the Government will order whenever possible.

He explained the difference between a priority order and a commandeering order, and said that not more than 100 commandeering orders, in all, had been issued. No one but the Secretary of War or the Secretary of Navy can sign a commandeering order, he said. He discussed the recent action taken to obtain for the use of the United States Government the tools in export warehouses in New York and elsewhere. The tools seized in New York, alone, were valued at about $10,000,000. Some of them had been in storage for two and a half years. Many were consigned to Sweden, so many in fact that it was obvious that a considerable quantity was for re-exportation to Germany. A large proportion of these tools was designed to cut metric threads and will be returned to the builders for changing the threads.

Captain Carlisle discussed at some length the question of dealers shipping tools from stock from one territory to another. Western dealers, whose stocks have been more complete than those of Eastern dealers, have been receiving orders from the Government for shipment of tools from stock into Eastern territories, and Eastern dealers have in some instances, claimed one half the commission. It was intimated that shipments, in a few cases, had been held up pending discussions between dealers as to their respective rights. Captain Carlisle asked the dealers to be patriotic and, if necessary, waive the question of profits in the interest of the Government.

Competition between different Government departments in buying machine tools will shortly be eliminated by a system of co-operating in purchasing now being worked out, all purchases going through a central bureau. This is a part of the plan on which Mr. Merryweather is engaged. Captain Carlisle paid a tribute to the great service which J. R. Van Dyk of the Van Dyk-Churchill Co., New York, is rendering the Government in handling export matters for the Exports Administrative Board.

Mr. Viall's Address

W. A. Viall, Brown & Sharpe Mfg. Co., Providence, R. I., talked to the dealers from the manufacturer's viewpoint on several matters of current interest, particularly the scarcity of raw material, labor scarcity, the railway and freight car situation, the Government's requirements and the need for their satisfaction before any attention is given to civilian business, the Government prices on steel and the fact that orders are not being accepted for prompt delivery by manufacturers at the Government prices, and the coal and coke situation. Mr. Viall predicted that any manufacturer not engaged in making necessities is going to get a "short deal" before the winter has passed. He cited two plants which have been converted from making luxuries to war necessities, one being the silverware factory of the Gorham Co., Providence, R. I., which is now making shell cases, and a New England toy manufacturer, who has converted his plant from toys to trench periscopes.

The coal situation is more serious than many people realize, according to Mr. Viall, and several drastic measures have been suggested for its relief, one being the suspension of passenger traffic on railroads for one or two days each week. Mr. Viall doubted, however, that this extremity would have to be resorted to. He emphasized the scarcity of labor and spoke of the success which has attended the introduction of female help in some machine shops. On lighter forms of work, women had proved themselves very capable, he said, and were well pleased with the opportunity to make the high scale of wages paid. The extent of the labor shortage is indicated by the fact that in New England it has been difficult to find workmen for the simple operation of unloading pig iron.

Price Fixing

Mr. Viall said that price fixing had not proved successful in other countries, but he hoped it might work out better here. Present indications are, he said, that there will be a scarcity of material. Mr. Viall deplored the fact that there have been rumors of profiteering by builders of machine tools, and said he thought that if the Government decided to fix prices of tools, it would be found that present prices were not out of line with present costs of material and labor.

In discussing transportation difficulties, he said that it is necessary for manufacturers to send car tracers along with practically every large, urgent shipment to facilitate its progress. There were reports, Mr. Viall said, that shipments of machine tools to the Allies might be curtailed. For example, dealers in those countries will not be permitted to receive shipments of tools for stock, but will be limited to actual requirements of the war industries.

Machine tool builders, he concluded, are being pushed to the utmost to supply the Government's tremendous needs, and he emphasized the necessity of every builder concentrating on the lines of tools which are most urgently needed for war work, and cutting down output of the others.

Taxes Discussed

Most of the afternoon session was devoted to a discussion of war profits taxes, trade acceptances, collections and similar matters affecting the financial conduct of the machine-tool business. It developed from the discussion that many dealers are worried as to how to raise the money to pay war taxes. While it it true that many of them have made large profits, these profits have either been divided or have been used in the business because of the greater amount of capital needed to do business in this era of high prices. It was the sentiment of a majority that stocks must be reduced or money borrowed at the bank to meet the Government tax.

Dealers complained that collections are slower than

ever known before. Companies which have always paid their bills in 30 days are now taking 60 to 90 days. Such companies are frequently on Government work, and their excuse for deferring payments is that the red tape at Washington causes a delay in the receipt of their money from the Government. Several dealers said that though the factories insist on dealers discounting bills within 10 days from date of invoice, it was impossible to sell to the trade on these terms, the average buyer insisting on taking his discount within 10 days from date of receipt of bill of lading. This means that the money invested in a machine-tool purchase is frequently tied up without interest for the several weeks required for transportation.

Trade acceptances were urged as a means of obtaining money more promptly. The general adoption of this method would take many of the creaks out of the credit system, it was maintained. Smaller buyers are not averse to the trade acceptance plan, but the larger concerns will have nothing to do with it according to the reports of several dealers who have attempted to inaugurate this method of payment. It was stated that it is becoming more difficult for business houses to borrow money at the banks, owing to the large requirements for Government purposes. It was the general idea that jobbers carrying large investments would be compelled to insist upon shorter terms of payments or reduce their stocks to raise the money needed for meeting the war taxes and the conduct of their business on conservative lines.

The report of the secretary, Thomas A. Fernley, Philadelphia, was in part as follows:

Secretary's Report

"The past year has been very active in the machinery section of this association, largely because of the peculiar problems arising out of war conditions. At the outset, it affords your secretary considerable pleasure to report that the Machinery Section of the association has been of value to the National Government in locating machine tools which have been needed for various arsenals and for numerous private contractors doing work for the Government in which machine tools have been required and have been extremely difficult to secure.

"Several of our members are now connected with various Government departments and among these we will mention the names of Tyler W. Carlisle, formerly with the Strong, Carlisle & Hammond Co., Cleveland, and Charles T. Bush of Charles A. Strelinger Co., Detroit, Mich. The association has assured both of these gentlemen as well as other Government officials interested in the machinery business that our members are willing and glad to be of all possible assistance in connection with government business.

"The association has been of service to members in securing orders from the Government to accelerate the shipment of tools needed to complete important Government work. The association has laid before the Government departments the fact regarding the service rendered by the regularly established machine-tool dealer and it seems that this character of information was necessary because of the large number of irresponsible dealers having no fixed places of business who were endeavoring to supply the Government with tools and whose failure to carry out their contracts have been the cause of much annoyance and disappointment and loss to our Government in its various departments.

"Our position has been that the regularly established dealer can be of great service to the Government depots where machine tools are needed and that as the dealer is actually an extension of the manufacturer's selling department he is a helpful economic factor in government business.

"Lists of machine tool dealers throughout the United States have been supplied to Government departments upon request and our members have individually, doubtless received numerous inquiries from the department as the result of the fact that their names have been supplied by this association. In the event that any house has not received such inquiry, the secretary will be glad to receive its name and supply it to the Government departments for their consideration and information.

Priority Problems

"Some of the important matters which will come before you to-day for consideration will be that of priority in connection with shipment to your stock. We are all familiar with the fact that Class A under the Priority Committee's regulations comprises war work, that is to say orders and work urgently necessary in carrying on the war, such as arms, ammunition, ships, etc., and the material required in the manufacture of the same. It has been the thought of our members that much of the machine tool and contracting machinery and equipment business should come under Class C, which comprises orders and work which while not primarily designed for the prosecution of the war, yet are of public interest and essential to the national welfare, or otherwise of exceptional importance.

"Many of our members have rendered special service to the Government in supplying tools and equipment which has been of particular service to facilitate the prompt completion of important work. Had there been in effect, rules and regulations which would have hampered the quick manufacture and shipment of such goods, the service referred to could not have been performed as efficiently as it was. It is not the desire of any of the members of the association to interfere with shipments of arms, ammunition and other similar goods. It is their desire to help and to carry a stock necessary for the many enterprises which assist in the successful and efficient prosecution of the war.

Standard Thread

"Your association has done considerable work in the matter of bringing about the universal adoption of the United States Standard thread instead of continuing the use of the V thread which has not been uniform and which has been the cause of considerable trouble to members both in the matter of the conflicting standard and in the matter of maintaining the duplicate stock.

"A machinery committee has been actively at work for the past six months in giving close attention to the work of the Machinery Section of this Association. They have been directing much of the work which has been done in the Secretary's office on strictly machine tool matters and it is our belief that the Machine Tool Section of this Association can continue to render active service for the conservation of the interest of machine tool distributors, in numerous directions. It is most helpful to receive the guidance of a body of trained machinery men and our Association is extended to them."

Officers Elected

Officers of the machinery section and members of the machinery committee are as follows:

President, H. W. Strong, the Strong, Carlisle & Hammond Co., Cleveland; vice-president, Crannell Morgan, the Hardware & Supply Co., Akron, Ohio; advisory secretary-treasurer, T. James Fernley, Philadelphia, and secretary-treasurer, Thomas A. Fernley, Philadelphia.

Executive Committee: W. T. Todd, Somers, Fitler & Todd Co., Pittsburgh; E. B. Hunn, the C. S. Mersick Co., New Haven, Conn.; George Vonnegut, Vonnegut Hardware Co., Indianapolis, and J. D. Nicklis, Manning, Maxwell & Moore, Inc., New York.

Advisory Board: Edgar E. Strong, the Strong, Carlisle & Hammond Co., Cleveland; George Puchta, the Queen City Supply Co., Cincinnati; W. M. Pattison, the W. M. Pattison Supply Co., Cleveland; W. L. Rodgers, Pittsburgh Gage & Supply Co., Pittsburgh, and Charles S. Farquhar, Chandler & Farquhar Co., Boston.

Machinery Committee: Anton Vonnegut, Chairman, Vonnegut Machinery Co., Indianapolis; L. H. Swind, Swind Machinery Co., Philadelphia; George H. Cherrington, Brown & Zortman Machinery Co., Pittsburgh; Edward P. Welles, Charles H. Besly & Co., Chicago, and Charles T. Bush, Charles A. Strelinger Co., Detroit.

T. Bissell Everson, dealer in second-hand machinery, has removed from the German National Bank Building to the Granite Building, 313 Sixth Avenue, Pittsburgh.

SECONDARY METALS IN 1916

Huge Increase in Value of Metals Recovered from Scrap

WASHINGTON, Nov. 5.—The value of secondary metals (exclusive of iron, steel, the ferroalloys, gold, silver and platinum) recovered in the United States amounted to $265,377,856 in the calendar year 1916, as compared with $114,304,930 in 1915, according to a report just issued by the United States Geological Survey. While the increase was due in part to higher average prices, it was to a great extent attributable to the larger use of metals of all kinds, the year 1916 having been one of unprecedented activity among dealers in and refiners and smelters of waste metals. "Secondary metals," as the term is employed by the Survey, are those recovered from scrap, sweepings, skimmings and drosses and are so called to distinguish them from the metals derived directly from ores, which are termed primary metals.

It is difficult to estimate the value of ferrous scrap reclaimed in 1916. Some of the scrap ferrous metal contained nickel, tungsten, manganese or other alloys, which made it many times more valuable than the more ordinary commercial products.

The following table shows the quantity and value of secondary metals recovered in 1916 as compared with 1915:

Kind of Metals	1915		1916	
	Net Tons	Value	Net Tons	Value
Secondary copper, including that in alloys other than brass	99,937	$33,498,882	140,000	$68,880,000
Remelted brass	137,500	40,788,000	300,000	127,440,000
Secondary lead	36,400	7,416,600	56,700	13,289,400
Recovered lead in alloys	42,500		39,600	
Secondary spelter	52,900	14,433,600	50,700	14,284,400
Recovered zinc in alloys other than brass	5,300		2,600	
Secondary tin	5,250	10,554,180	7,600	15,131,040
Recovered tin in alloys	8,400		9,800	
Secondary antimony	2	1,811,568	80	2,270,016
Recovered antimony in alloys	3,100		4,400	
Secondary aluminum	5,700	5,802,100	12,900	23,430,200
Recovered aluminum in alloys	2,800		6,400	
Secondary nickel*	.....	.....	16	652,800
Recovered nickel in alloys*	.....	.....	800	
	.....	$114,304,930	.....	$265,377,856

*Recoveries made by International Nickel Co. from scrap nickel or alloys and from nickel in scrap ferrous alloys from any source are not included.

It is impracticable and unnecessary to segregate the statistics relating to the melting, refining and using of secondary metals according to States, but more than 90 per cent of the refining and smelting of drosses and scrap metals in the United States is confined to the territory east of St. Louis and north of the Ohio River. About 43 per cent of the secondary aluminum was reported from Ohio and Michigan, 27 per cent from Illinois and Wisconsin and 18 per cent from New York, New Jersey and Massachusetts. Smelters and refineries in St. Louis and Chicago recovered about 37 per cent of the antimony in alloys, and those in New York and Philadelphia about 45 per cent. The largest recoveries from tin dross, tin scruff and clean tin scrap were made in Pennsylvania, New York and New Jersey. Nearly all the secondary nickel was reported from Connecticut.

The Recovery of Tin

Owing to the scarcity of tin and the unprecedented demand therefor in the past 18 months, the feature of the Survey's report dealing with the subject of secondary tin is of special interest. Although the United States consumes nearly 50 per cent of the world's production of tin, apparently there were no domestic tin ores smelted in the United States in 1916, though some tin concentrates, containing about 140 tons of metallic tin, were shipped from Nome, Alaska, to Singapore, Federated Malay States, for treatment. A new tin smelter, having a capacity of 18,000 tons a year, was put in operation in March, 1916, by the American Smelting & Refining Co., in New Jersey, and tin concentrates from Bolivia were imported and smelted. Another tin smelter is to be built on Long Island by the Williams-Harvey Corporation, which will also use Bolivian ores.

The secondary tin recovered in 1916 was equal to about 24 per cent of the tin imported, as metal or as oxide, into the United States during the year (69,055 net tons). Secondary tin recoveries increased from 13,650 tons in 1915 to 17,400 tons in 1916. The quantity recovered as tin was 7600 tons and that in alloys and chemical compounds 9800 tons.

The recovered tin in alloys includes the tin content of products made in several plants from clean tin-plate scrap and a small quantity of old tin cans. The largest recoveries of tin were made from the scruff and drosses that occur in making tin plate and terne plate, and amounted to more than 4850 tons. About 2600 tons of tin was recovered from clean scrap tin plate. Apparently only about 750 tons was recovered from scrap tin (not tin plate) clippings, old tin pipe and tin foil. Only one plant reported using solely old tin containers, from which the tin coating and solder were first sweated and the black plate was then remelted to make sash weights. An increased quantity of tin was recovered in bronze, and a considerable part of the brass remelted contains a small quantity of tin and of lead. Other alloys from which secondary tin was recovered were solder, babbitt, pewter, terne metal and electrotype metal.

W. L. C.

Cement for High Temperature Furnaces

The place in industry which has been won by a high-temperature furnace cement as a special commodity was discussed on the evening of Nov. 1 before the Brooklyn Engineers' Club, Brooklyn, N. Y., by W. S. Quigley, president Quigley Furnace Specialties Co., Inc., New York. By means of lantern slides and demonstrations with electric furnaces he showed the quality of bricks made from both neat cement and a mixture with ground firebrick which he calls Hytempite. He also exhibited the strength of joints made with the cement. It was brought out that a considerable use had been made of the cement for repairing cracked crucibles and for building hearths of furnaces and for patching furnaces while hot. Sometimes the hearth bricks are made of a mixture of cement and carborundum fire sand, such giving a product which resists the abrasion to which the bottom of a heat-treating furnace for example, is subjected. In repairing hot furnaces, the material is put into place in the form of a paste and rammed or tamped. Slabs large enough to form furnace covers, say 2 x 3 ft. and 5 in. thick, have been made; in such cases the composition slab may be handled in two days, this period sufficing for a surface set, and it is then baked for three or four hours at 1200 to 1400 deg. Fahr. Such slabs were made for drop forging heating furnaces for the Dodge automobile plant at Detroit.

The experiments with the electric furnace included tests to show that the products have a low co-efficient of expansion and that the fracture showed no sponginess or swelling. Instances were mentioned of Schwartz furnaces being given four or five months longer life by the use of the cement introduced on a paddle and pressed into the cracks.

The Parker Supply Co., 785 East 135th Street, New York, maker of sheet metal screws, expansion bolts, sash chain and damper quadrants, has been reorganized and "is now backed up by a $3,000,000 international concern." H. Rosenberg remains as the company's president and sufficient machinery has been installed, it is stated, to double capacity.

The United Steel Co., Seattle, Wash., incorporated for $150,000 by George T. Richards and John Johnson, proposes the establishment of an open hearth steel plant in the Rainier Valley district. The Industrial Bureau of the Seattle Chamber of Commerce is investigating the proposition.

Carbon Steel Company Annual Report

The Carbon Steel Co., Pittsburgh, has issued its annual report for the fiscal year ended Sept. 30, 1917. The development of the business of the company and the improvements in its financial condition during the past five years are shown in a comparative statement as follows:

	End of Fiscal Year Sept. 30, 1912	End of Fiscal Year Sept. 30, 1917	Increase
ASSETS			
Total investment in real estate, plant and equipment	$5,766,766.07	$6,434,629.85	$667,863.78
Accounts and bills receivable	315,100.52	1,070,492.08	755,391.56
Inventories	354,674.71	1,385,142.74	1,030,468.03
Cash	25,249.77	1,231,142.89	1,205,893.12
LIABILITIES			Decrease
Capital stock	$5,000,000.00	$5,000,000.00	None
Bonds and mortgages	719,000.00	464,000.00	$255,000.00
Bills and accounts payable	891,291.06	697,284.67	194,006.39
Surplus	69,792.54 (Deficit)	2,979,563.47	3,049,356.01 (Increase)
MISCELLANEOUS			Increase
Gross sales	$1,523,912.54	$9,620,913.49	$8,097,000.95
Net profits from operation	28,443.22	2,234,545.20	2,206,101.98
Dividends paid	None	430,000.00	430,000.00
Total pay roll	348,423.10	1,813,235.42	1,464,812.32
Average number of employees	707	1,650	943
Estimated value and tonnage of orders and contracts on hand	$255,000.00 6,981 net tons	$8,258,000.00 62,432 net tons	$8,003,000.00 55,451 net tons
Total shipments	41,664 net tons	93,479 net tons	51,815 net tons

Charles McKnight, in his report to the stockholders, said:

In May last the president of your company was offered a controlling interest in the Kittanning Iron & Steel Mfg. Co., a corporation which owns a blast furnace and valuable coal lands at Kittanning, Pa., and your directors authorize the purchase of 51 per cent of the capital stock of the Kittanning company at the option price, namely, $131.25 a share. It is confidently believed that the controlling interest of this property will prove a very valuable asset to your company, not only on account of the assured source of supply of pig iron, but also by reason of the coal acreage, which is now being rapidly developed, and from which it is expected that your company will receive its full supply of coal after Dec. 15, 1917.

During the year, all of the first and second mortgage bonds of the Carbon Iron Co., aggregating $700,000, which matured April 1 last, have been paid and cancelled. There has also been redeemed and cancelled $18,000 par value of the 5 per cent sinking fund gold bonds of the company to comply with the sinking fund provision, so that only $324,000 of this issue are now outstanding. Of the total amount of these bonds authorized, namely, $2,000,000, $206,000 have been redeemed and cancelled, leaving $1,470,000, unissued, in the company's treasury.

Two Lake Superior Mines Change Hands

Two important mines in the Lake Superior district have been acquired by independent consuming interests during the past few days. The mines involved in the transactions are the Scranton on the Mesaba range, and the Plymouth on the Gogebic range. The Scranton mine up to 1917 had shipped 521,841 tons of ore. The Plymouth is a large open pit property which shipped 330,427 tons of ore in 1916, its first year. The lease of the Scranton mine has been owned by the Lackawanna Steel Co., with Pickands, Mather & Co. handling its operation and sales. A new company known as the Hoyt Mining Co. has taken over the lease. The Plymouth mine will be taken over Jan. 1 by the recently organized Plymouth Mining Co. and Pickands, Mather & Co. will operate the mine and sell the ore. Interested in both mines are the Lackawanna Steel Co., Pickands, Mather & Co., Youngstown Sheet & Tube Co., Midvale Steel & Ordnance Co., and the Steel Co. of Canada, Ltd. In addition to these, the Bethlehem Steel Co. and the Wisconsin Steel Co. are interested in the Scranton mine and the Allan Wood Iron & Steel Co. in the Plymouth mine.

The Greene-Wolf Co., 30 Church Street, New York, has been organized to operate in iron and steel products, wrought iron and steel pipe, etc. D. Greene and G. W. Wolf, formerly connected with the Eagle Pipe Supply Co., head the company.

Special Type of Filing Machine

The Newark Engineering & Refrigerating Co., 476 Eighteenth Avenue, Newark, N. J., has developed a special type of filing machine. One of the features is the use of a square shaft supported by two large babbitt bearings, while a large working platen which may be set at an angle enables the machine to handle a great variety of work coming within its scope.

The machine is driven by belt and the belt shifting mechanism is mounted at the lower end of the column on one side where it can be readily reached. From the driving shaft in the base of the column the power



The Use of a Square Supporting Shaft with Long Bearings Is Relied Upon to Eliminate Side Motion in a New Filing Machine and the Resultant Undercutting

is transmitted through a disk and crank to the square shaft in which the file is mounted. The bearings of the shaft are located in the base and the table support which is calculated to eliminate side motion and do away with the tendency to undercut the work when finishing pieces to a line. The platen, which has a diameter of 8 in., can be set at an angle by adjusting screws and locked in position. The height of the platen from the bench is 10 in.

The Haynes Stellite Co., Kokomo, Ind., has established a service department to which manufacturers may return stellite scrap and receive credit on new shipments at the rate of $4 per pound. The offer is to include bar stock and special castings only, and not arc-welded tools. In addition to accommodating stellite users, another purpose is to discourage the practice of some concerns in buying up scrap stock and recasting it. The company states that stellite is recognized as a metal unsuited to amateur tinkering, and it naturally does not wish its product subjected to the possible bungling of inexpert hands. The company reports a steadily increasing business, with exceptionally strong foreign demand.

Revision of Revenue Act Is Proposed

Important Changes Probably Will Be Made at Next Session of Congress—Outlook Is That Radical Differences of Opinion Will Develop

WASHINGTON, Nov. 6.—Although the war revenue act of Oct. 3, 1917, has been on the statute books but a month, a comprehensive measure revising many of its most important features and increasing its revenue-producing capacity approximately 100 per cent is already in course of preparation under the direction of the Treasury Department and will probably be presented to Congress early in the session which convenes on Dec. 3. While this announcement will be far from welcome news to the business community, it should not occasion great surprise, for throughout the debates on the war revenue act in the House and Senate during the recent session the leaders of both parties gave repeated warnings that some revenue would have to be provided by the Sixty-fifth Congress; in fact, the statement was many times made that the income tax, the war excess profits tax, and other levies included in the bill were so framed as to permit of material increase in their productive capacity by the simple expedient of raising rates without modifying the basic and administrative provisions.

The proposition to put through a measure authorizing additional taxation to the amount of $2,500,000,000 at the coming session is based upon a rough estimate that Congress, during the coming winter, will authorize expenditures for the fiscal year beginning July 1 next closely approximating $30,000,000,000, including about $8,000,000,000 in loans to the Allies. This huge sum, which fairly staggers the imagination, represents an increase of about $10,000,000,000, or 50 per cent, over the appropriations and authorizations made at the recent session to cover the activities of the United States, including all ordinary as well as military expenditures during the first year of our participation in the war. Conservative Congressional leaders are yet to be convinced that expenditures during the next fiscal year much in excess of those authorized for the current year can be justified, and administration officials will be obliged to demonstrate by detailed estimates backed up by sound arguments that such a huge sum as that suggested can be judiciously spent by this Government during a single fiscal year.

Some Important Facts

In this connection, two salient facts are emphasized: first, the disappointingly slow progress made in various branches of military activity, and, second, the provision made by Congress at the last session for a vast amount of preliminary work, including the construction of shipyards, ordnance plants, airplane factories, cantonments, etc., which will not require to be duplicated in the budgets for the new fiscal year beginning next July. The Shipping Board, for example, will probably not be able to spend during the current year more than half the vast sums, aggregating nearly $2,000,000,000, appropriated at the last session. Only a very small part of the appropriation of $664,000,000 to provide facilities for the manufacture of airplanes and for the production of planes and engines has thus far been expended, and much less than half the total can be advantageously disbursed before next July. Similarly with respect to the $350,000,000 appropriation for additional torpedo boat destroyers, a large part will be still in the Treasury at the end of the current year. In a general way it can be said that with respect to a very large part of the money granted by Congress for war purposes at the last session the administration has found it a much easier task to secure the funds than to spend them judiciously, and the balance on hand on June 30 next, although largely mortgaged by commitments, will, it is contended, constitute a very substantial proportion of the amounts which have been appropriated heretofore.

Need of More Money

Administration officials insist, however, that additional taxation calculated to produce not less than two and a half billion dollars must be authorized during the coming winter, and in support of this proposition contend that the figure is a conservative one. It is pointed out that of the $20,000,000,000 authorized for the support of the Government, the prosecution of the war and loans to the Allies during the current year, taxation will provide $4,000,000,000, or about 35 per cent of the total disbursements, exclusive of the $7,000,000,000, which, presumably, will cover the loans to the Allies. On the basis of expenditures of $30,000,000,000 during the next fiscal year, it is calculated that the Allies will receive loans aggregating about $8,000,000,000, leaving $22,000,000,000 for ordinary and military expenditures. Thirty-five per cent of this sum would be $7,700,000,000, or $1,200,000,000 more than would be secured from taxation should Congress increase the revenue-producing capacity of existing laws by $2,500,000,000 as proposed.

It is interesting to note in this connection that Great Britain, which is paying a larger proportion of the current cost of the war by taxation, is securing less than 25 per cent through that method and is obtaining the remainder by the sale of bonds. In France, taxation produces about 18 per cent of current expenditures, and in Germany only about 12 per cent. It is, therefore, apparent that the United States is financing the war on a far more conservative basis with respect to the accumulation of national indebtedness than any other important participant.

Proposed Methods

Much interest naturally attaches to the methods to be followed in securing additional revenue, should the administration's views prevail. As might have been expected, the war excess profits tax is counted upon for a further large sum, the projected increase being no less than $1,000,000,000. An increase in the corporate and individual income taxes is also under consideration, but it is believed that the Treasury Department's recommendation as to these levies will be confined to higher surtaxes on large private incomes, and that there may be no increase either in the corporate income tax, which is now 6 per cent on net earnings, nor in the normal tax of 4 per cent levied on individual incomes.

Two important revenue producing devices, considered during the recent session of Congress but abandoned, are again in contemplation, namely, a series of consumption taxes on such articles as sugar, tea, coffee, cocoa, etc., which was inserted in the war revenue bill by the Senate Finance Committee but subsequently withdrawn, and a horizontal increase in the tariff proposed by the Ways and Means Committee and adopted by the House but rejected by the Senate and the Conference Committee. The consumption taxes framed by the Finance Committee were calculated to produce about $100,000,000 and were withdrawn only because the committee decided to raise the excess profits tax to such an extent as to make the consumption taxes unnecessary. There is a strong element in both houses that will oppose these taxes, and the proposed levy on sugar will be antagonized by influential members of both the Ways and Means and Finance committees, but the most experienced observers here believe that sooner or later in the financing of the war imposts will be placed on the articles mentioned.

Proposed Increase of Tariff

The revival of the proposition to make a horizontal increase in the dutiable schedules of the Underwood-

Simmons tariff act and to place a corresponding duty on all articles now on the free list will probably arouse the same vigorous protest that followed the presentation of this plan in the House last summer. The recommendation of the Ways and Means Committee to secure $200,000,000 by this means was adopted by the House as a matter of form and with little hope that the provision would remain in the bill as finally enacted, for the Senate leaders had already expressed their opposition to this method of revising the tariff. When the bill reached the Finance Committee Chairman Taussig of the recently appointed Tariff Commission was called into conference, and after he and his colleagues had examined the House provision with care they unhesitatingly recommended its rejection.

The reasons presented in support of this recommendation are as good to-day as when they were laid before the Finance Committee. A horizontal increase in the tariff was opposed as certain to result in adding materially to the cost of many necessaries, while incidentally affording an unjustifiable increase in the protection enjoyed by certain domestic industries. The imposition of duties on articles which have been carried on the free list for many years was also strongly disapproved by the commission, and it was urged that if this were done it would deal a heavy blow to manufacturers in many important lines. It was also contended that a horizontal increase granting to finished products only the same additional rate of duty as was assessed on the raw materials thereof was unscientific and might work great injury. Finally, the broad contention was made that the tariff ought not to be revised until the commission had had an opportunity to make a careful investigation of the industries of the United States and of the leading manufacturing countries of the world, and that no such satisfactory inquiry could be made during the present abnormal times.

Would Revise More Sections

A feature of the revenue measure now under consideration that will prove of great interest to the business men of the country will provide for the repeal or revision of certain provisions of the act of Oct. 3, 1917. That Congress blundered seriously in the drafting of several important provisions of the revenue act is now frankly admitted by Congressional leaders as well as administration officials. The war excess profits tax is probably the most conspicuous illustration of hastily contrived and badly botched legislation to be found in the entire measure. So difficult have the Treasury officials found it to construe this feature of the law that the Secretary of the Treasury has decided to appoint a commission to assist the Internal Revenue Bureau in its interpretation, and it is now stated that this commission will also prepare a series of recommendations for comprehensive amendments designed to clarify the terms of this section. It is quite possible that Congress may decide to completely recast Title II of the act, which includes the war excess profits tax provision, especially in view of the desirability of establishing a basis for securing further revenue from this source by the simple expedient of raising the graduated scale of rates.

Declared a Misnomer

The chief criticism of the war excess profits tax is that it is a misnomer in that the revenue to be produced therefrom does not necessarily represent profits due in any way to the war. The Finance Committee at one stage in the consideration of the bill proposed the English plan of assessing this tax under which profits in excess of the average gains of the pre-war period, including the years 1911, 1912 and 1913, would be subjected to levy, but this was thrown out, and under the provision as incorporated in the law all profits in excess of 9 per cent of the actual capital invested and under certain conditions in excess of 7 per cent are taxed in accordance with a graduated scale. The adoption of an ambiguous, arbitrary, illogical and altogether unjust definition of "capital" has subjected this feature of the law as enacted to much well-merited criticism, which will no doubt prove influential in hastening revision. Numerous instances have been cited of corporations, conservatively capitalized, which, though earning during the current year much less than they did during the pre-war period, will be called upon to pay into the Treasury a very large part of their gains. The fact that the law allows no credit in capital account for good will, unless purchased for cash or tangible property, will work a great hardship in many cases where brands and trade-marks, the value of which has been created by heavy expenditures extending over a long period of years, constitute the chief assets of the corporation in question.

Tax on Professions

Another provision of the excess profits tax that has been sharply assailed and that may be revised, if not repealed, is that which includes "professions and occupations" within the scope of this feature of the law, imposing a tax of 8 per cent on the salaries and earnings of all individuals in excess of $6,000, notwithstanding the fact that such individuals pay the income tax and the accompanying surtaxes levied by another provision of the act. The sales manager of a corporation, for example, who is in receipt of a salary of $15,000 per annum will be called upon to pay not only the income tax and surtaxes prescribed by Title I of the revenue act, but $720 as a "war excess profits tax," and this, too, in spite of the fact that he may be drawing a smaller salary than during the pre-war period. An individual enjoying an income of $15,000 from stocks and bonds inherited by him would entirely escape the war excess profits tax, although he is engaged in no useful occupation whatever and during the pre-war period was entirely without income.

The Postal Rates

There is every reason to believe there will be a comprehensive revision of those sections of the war revenue act making changes in the postal rates. The increase in the postage on letters from two to three cents per ounce is regarded in many quarters as a serious blunder. The freest possible use of the mails is essential to the development of the country and the prosperity of manufacturers, merchants and consumers. Penalizing the use of the mails is certainly an experiment of doubtful wisdom and precedents are all against its success. In Canada, where a wartax of one cent on each letter or post card, regardless of weight, was adopted in 1914, the receipts have been very disappointing and for a long period showed an actual deficit. Experienced postal statisticians have already gathered figures designed to demonstrate that the Government will secure but a small net increase in revenue from the change, while it will be argued that this negligible gain will be at the expense of the prosperity of the entire country.

The drastic provisions of the war revenue act imposing greatly increased postal rates on business papers, magazines, etc., on a zone basis will undoubtedly be revised at the coming session. The law is so arbitrary and unjust to publishers and subscribers that no attempt has been made to defend it, but, on the contrary, Congressional leaders have frankly stated that it will probably be amended before it takes effect on July 1 next.

W. L. C.

Announcement was made by the Erie Forge Co., Erie, Pa., that the plant additions which have been started by that company will include an open-hearth plant with two open-hearth furnaces with a yearly capacity of 35,000 tons, forge shop and machine shops. It is stated that the plant will be a separate unit to be devoted exclusively to Government work and that it will be operated under the name of the Erie Forge & Steel Co. The Erie Forge Co. at present has two open-hearth furnaces. A 250-acre site was recently acquired, 40 acres of which will be used as a site for the new plant. A contract for four buildings in connection with the new plant has been awarded to the James R. Gloyd Co., contractor, Cleveland.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

Owned by the United Publishers Corporation, 243 West 39th Street, New York. H. M. Swetland, *Pres.* Chas. G. Phillips, *Vice-Pres.* W. H. Taylor, *Treas.* A. C. Pearson, *Secy.*

BRANCH OFFICES—Chicago: Otis Bldg. Pittsburgh: Park Bldg. Boston: Equitable Bldg. Philadelphia: Real Estate Trust Bldg. Cleveland: Guardian Bldg. Cincinnati: Mercantile Library Bldg. San Francisco: 320 Market Street.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year.

Entered as second class matter, June 18, 1873, at the Post Office at New York, New York, under the Act of March 3, 1879.

Eliminating the Unessentials

The elimination by the Government of industrial activities unessential for prosecuting the war is proceeding rapidly. The effect upon industry in general will probably be much greater than has been assumed. The interdependence of industries is so great that each stoppage of a specific activity is likely to produce extensive ramifications.

A typical case, and quite an illuminating one, is the open top car order of Judge Lovett, administrative officer under the priority of shipments act. This order was dated Oct. 27, becoming effective Nov. 1, and covers open top cars, other than flat and work cars and cars used for carrying coal, for carrying materials and supplies for building, maintaining or repairing roads, sidewalks or places of amusement, manufacturing passenger vehicles, furniture or musical instruments, or transporting passenger vehicles, furniture or musical instruments. The railroads are prohibited from furnishing empty cars for such purposes and from moving them if loaded. The object is to increase the supply of cars for carrying coal, coke, ore, limestone and other materials involved in the metal, sugar and fertilizer industries.

At first glance the order may not seem so very formidable since road building is not a particularly active industry in winter, and manufacturers of passenger vehicles, furniture and musical instruments probably receive the major portion of their raw materials in box cars rather than open tops. It is quite improbable, however, that box cars can be found in sufficient numbers to replace the open top cars thus taken out of the service covered by the order, and it is quite clear that if an industry is deprived of one of its raw materials it cannot consume the others. It is necessary to assemble all the raw materials, not merely the major portion of them. No period is assigned for the duration of the order; it is to hold until withdrawn. Made in a season of good weather it is quite unlikely to be withdrawn in a season of bad weather.

The railroads are not getting into better physical condition, but rather their rolling stock and roadways are deteriorating under the pressure of a record traffic movement with material and labor for upkeep scarce and very high priced. In addition the inclement weather that always ties up railroad operations more or less is rapidly approaching. Thus there is prospect that additional orders of this description will be issued from time to time. Washington advices have been that the Government contemplates various restrictions upon industrial activity involved in the unessentials and may resort to additional means, other than through the railroads, for restricting the unessential activities.

To this slowing down in specific activities marked as being unessential there will necessarily be intricate ramifications. All industry will be slowed down more or less. If road building is curtailed the manufacture of road building machinery will likewise be curtailed. If the manufacture of furniture is curtailed there will be curtailment in industries related to the furniture industry, and so all along the line.

There will not likely be much complaint, even on the part of those most interested in these forced curtailments in industrial activity, but it is the part of wisdom for all to look forward and adjust their own affairs accordingly.

One unfortunate feature in connection with the elimination of the unessentials in industrial activity is that it comes after the general principles of the selective draft have become established. It would have helped greatly if it had been possible to know, when the selective draft was first applied, how the Government was going to classify industries as to essential and non-essential. Even in industries, and departments of industries, that were recognized as being directlly associated with war activity, it was very difficult to secure exemptions for skilled workers and for even foremen and superintendents, whereas with so many industries to be slowed down the men thus drawn could have been replaced by others who would not be missed industrially. While we were warned repeatedly not to duplicate the mistakes made in England and France in calling men to the colors, we shall probably find that we have made mistakes a-plenty, and a wholesale return of drafted men having skill in the essential industries, to be replaced by others, may be a development of the next few months.

The Business Situation

While Wall Street has had the reputation of being able to discount the future of business, the declines in share values of the past fortnight or so are open to the criticism, with respect to their being a possible index to the future of business, that they have been too uniform in the different classes of securities. It is quite certain that the curtailment in industrial activity that may occur in certain directions will not extend in all directions. The railroads, for example, are promised the maximum amount of business they will be able to handle, and as to earnings upon the business done, the declines in railroad share values followed the announcement that the Interstate Commerce Commission had reopened the 15 per cent rate advance case.

As to the steel shares, they are undoubtedly worth much more than when they last sold at the prices now ruling. As the steel shares rose last year, the rise was legitimately to be ascribed not so much to the establishment of new rates of earnings, but to increases in assets due to earnings actually realized or in near prospect. Each month added to the assets. In the interim of more than a year during which the shares commanded higher prices than those ruling this week the steel companies have added largely to their assets.

The entrance of the United States into the war was under an unprecedented condition as to the business situation. The effect of a declaration of war has always been to unsettle business. When a country engages in war, there is a decline or a panic in the share market and exchanges are frequently closed. Industries tend to halt. Later they may revive and become very active, but the first effect of war is depressing. All these conditions were reversed in the case of this country's entering the war. At the time gratification was expressed. It appeared that the country had avoided the usual *sequelae* of a declaration of war. Industry and finance had ridden safely over what had in all other cases proved dangerous ground. Instead of there being merely contentment that a danger had been passed, new flights were essayed, and perhaps that is the cause of the present change in affairs.

Government price fixing cannot be blamed for decreases in industrial activity. The high flight of prices tended to restrict consumption. If purchases are not made freely at set prices, it cannot be argued that there would have been more buying if prices had been allowed to remain at higher levels. Eventually market conditions would have forced various price readjustments, and the chief question is when the readjustments would have occurred. If delayed, the readjustment might have proved more injurious. Holders of material always experience losses when market values decline, and if the prospect of Government price regulation held over the situation for months preceding the actual inception of price fixing had the effect of causing holders to reduce their stocks the situation to-day is in that respect better than would otherwise have been the case.

It is quite possible that the present unsettlement is the one that was due the country, according to precedents, when it entered the war. If so, we have been very slow, instead of quick as Americans usually think they are, while it is also to be observed that in that event we may later feel the quickening effect of war upon industry that is usually felt in a country following the disturbance caused in the first place.

The Steel Corporation's Profits

The Steel Corporation's earnings as reported quarterly this year have shown a progressive and rather large diminution when the actual profits have decreased little if at all. The divergence is due to the fact that there was no opportunity, in the case of the first quarter, to make any allowance for the war tax. For the second quarter an allowance was made, in accordance with the provisions of the House bill, while for the third quarter an allowance was made in accordance with the law as enacted. The amounts of these allowances have been stated, and the earnings plus tax allowance for second and third quarters compare as follows with the profits reported for the first quarter, without tax allowance. First quarter, $113,121,018; second quarter, $144,498,076; third quarter, $131,976,797.

There was a large increase in earnings from the first to the second quarter. The apparent decrease from the second to the third quarter may be considerably offset by the fact that before reporting third quarter earnings there was deducted an allowance toward amortizing the extra cost of construction undertaken for the purpose of furnishing war material. If after making all allowances necessary to bring the figures for the quarters strictly comparable a decrease in earnings were still shown, it would be ascribable to decrease in shipments rather than to decrease in prices realized. There is no doubt that on the whole there was a substantial increase in the average prices realized per ton shipped.

The Corporation's allowances for the war tax total $164,233,609 for the three quarters, made up of $33,865,000 for the first quarter and $53,918,872 for the second quarter, mentioned in the second quarter report and computed against the House bill, and an addition of $12,716,724 mentioned in the third quarter report, by recomputing the tax for the half year according to the terms of the law, meanwhile enacted, plus $63,733,013 for the third quarter.

While the Corporation's allowance for the war tax is only tentative, the interpretation of the law being still the subject of considerable doubt, it is of interest to observe that according to the reports the total profits subject to the tax are $389,395,891 for the three quarters, the allowance for the tax being thus 42 per cent on an average. In the case of the third quarter alone the allowance is about 48 per cent.

Numerous manufacturers engaged on work for the Government would like to build additions to their plants but are hesitating about doing so because they will be compelled to pay taxes on earnings expended for new construction and in future years will be allowed to charge off only the ordinary

amount for depreciation. Building to meet extraordinary demands of war is regarded as hazardous for the reason that much of the new capacity is likely not to be in demand when peace is restored. Manufacturers believe that more liberal provision should be made in the form of protection against post-bellum laws and the subject is worthy the careful attention of Congress at its next session in December.

Co-operation in the Manganese Problem

Had the fortunes of war placed Brazil on the side of the Central powers, the steel industry in the United States would have faced a serious peril. With all other sources of manganese ore cut off since the war started, Brazil has been the industry's mainstay, except for the very small supply furnished by our own and a few nearby foreign mines. For several months the country's supply of ferromanganese has not exceeded an amount necessary to run the steel industry more than three months, and there seems no prospect of overcoming this handicap.

The United States Bureau of Mines has undertaken a most important, practical research, as outlined on another page in this issue. The object is to determine to what extent the use of other manganese bearing materials and the conserving of manganese in certain stages of steelmaking processes may be resorted to. Concentration of our manganiferous iron ores, of which the supply is large, is one phase. The use of substitutes and of alloys containing less than 80 per cent manganese, as well as the judicious employment of high manganese pig irons are measures giving some promise. The production of certain manganese-iron alloys in the electric furnace and the electric reduction of high manganese slags are also interesting lines of research, full of possibilities.

The results obtained should be an appreciable reduction of the menace of a great industry dependent totally on foreign sources for an indispensable material. To attain this, however, active co-operation with the Bureau of Mines on the part of steel companies, pig-iron makers and metallurgists is vital. The rewards will be commensurate with the earnestness of the effort put forth. Hearty co-operation is a patriotic duty as well.

CORRESPONDENCE

Repairing German Ships by Electric Welds

To the Editor:—Following is a resumé of a talk given by David H. Wilson before the New York Railroad Club recently on the arc welding process used in repairing the German interned ships. The talk was received with such profound attention, interest and even enthusiasm that I offer it for the benefit of your readers. MYRON F. HILL.

New York.

When the United States took over the German boats it was first found that the Germans had broken large pieces of metal out of many of the cylinders, valves, circulating pumps, condenser casings, etc., and thrown them overboard. The first boat on which electric welding was permitted had two cylinders broken and the estimate on the work was $32,000, with 10 to 12 months to complete it. We began on these cylinders in an open field with nothing but a tarpaulin for protection from the elements. In 52 hr., without any preheating or annealing of the cylinders, the job was completed. The cost was in the neighborhood of $2,600, nearly $800 being for lighterage. When the cylinders were reported finished the Government officials came down to the dry dock and gave the cylinders a hydrostatic test. Ordinarily, cylinders of that character are subjected to a test of 20 per cent over their working pressure. These cylinders were given a test of 50 per cent over their working pressure and there was not the slightest defect in the welding.

Then for 48 hr. a contraction and expansion test was applied and the welding held. A service test was next decided upon, consisting of first lashing the vessel to the dock and turning over the engines, followed by a 48 hr. run at sea. The officers appearing fully satisfied, the ship two days later was loaded and sailed for Europe and has since made at least two round trips without the welds developing any defects. It is now the general opinion that the welding will outlast the engine. We are now finishing two of the largest and most damaged German ships.

Investigation has shown that the reason for non-uniform results with electric welding is the fluctuating temperature used. The blacksmith in our shops who has the best eye for colors has the most uniform welds. A machine was then developed that would control the heat by controlling the current, which is uniform across the arc.

Using the best material at hand in our investigation we found that about 40,000 lb. was the best tensile strength we could get even with a controlled heat, and as it was useless to use such material on boiler plate that was good for 50,000 to 60,000 lb. tensile strength, we next took up the subject of developing suitable metals, i.e., metals having the same characteristics as the metal to be welded. It was found throughout the list of alloys treated that a temperature different from the critical temperature showed uniformly bad results. For instance, a piece of manganese steel having a critical temperature gaged by 100 amperes at 35 volts would give from 55,000 to 65,000 lb. tensile strength and from 12 per cent to 18 per cent elongation; by dropping the number of amperes from 100 to about 85 the tensile strength would drop off very materially, and upon analyzing the weld it showed that the heat was insufficient, since the weld was full of voids and the metal was deposited in globules. Using the same operators, under the same conditions, and raising the current 15 or 20 amperes above the critical 100 amperes, it was found again that the weld would drop off in tensile strength and would show less elongation. The tests are mentioned to show that it is of vital importance that the metal should be flowed at the critical temperature and that this must be maintained to give uniformity.

When the operator is using too high a temperature the metal will sputter and not flow, and when too low a temperature is used the arc will keep snapping and the metal fail to fuse. At the critical point the metal will flow in a plastic continuous stream, and it is this latter condition that the operator for his own protection seeks to maintain, since this makes welding the easiest.

In our experiments we began by using a machine which gave 70 volts. It was not long before it was found that the welds were not uniform, and upon examining the welds that fell below standard they were found to have craters formed in the welded metal. This was due to the high voltage and to the fact that craters occurred every time the arc was broken. Some electric welding experts contend that the voltage does not matter, as 18 to 22 volts is the established voltage across the arc regardless of the voltage of the line; but they neglect to say that when an operator breaks his arc, he has at that instant of breaking the maximum voltage of the line across the arc, which greatly increases the temperature. It is this which causes the craters. After long experimental work it was found

that 30 to 38 volts at the generator is preferable. At 30 volts practically no craters were formed at the break of the arc. At 38 volts on slicing the weld it was found that the crater did not penetrate down into the weld but left just a blister on the surface.

Some may ask the question, "How do you know that the steel went down into the cast iron?" Before welding a cylinder a piece of metal was tested and it was found that the steel was uniting with the cast iron, as proved by the fact that after such treatment the welded stratum may be machined like steel with a curling ribbon of steel coming from the tool.

The Freight Rates Advance Case

WASHINGTON, Nov. 6.—In the presentation of their case in support of a petition for a 15 per cent advance in freight rates, representatives of the Eastern railroads yesterday told the Interstate Commerce Commission that in spite of substantial gains in gross earnings, the net revenues of the roads throughout the East have decreased to such an extent that even should the full amount petitioned for be allowed it would not provide for necessary improvements and a fair return on invested capital. The witnesses for the roads, who numbered no less than seven presidents of large systems and numerous heads of legal departments, were accorded close attention by the commission and express great confidence that the advances asked for will be allowed. They were especially encouraged by the unprecedented action of the Comptroller of Currency, who yesterday issued a formal statement predicting that the commission would authorize the advances and declaring that the present railroad rates are not high enough to maintain the credit of the roads.

No Objections from Shippers

A significant feature of the hearing was the appearance of attorneys for certain shippers' associations which heretofore have consistently fought the railroads in every effort that has been made to secure advances. Clifford Thorne, representing live stock interests, grain dealers and oil companies of the Middle West, told the commission that while his clients were opposed to higher rates they were "entirely willing to abide by the result of the investigation." Ross D. Rynder, counsel for the Chicago packing houses, said that his clients would raise no objection to a percentage increase on all classes of merchandise if the commission should decide it to be necessary and would present no more complaints until after the war emergency has passed.

Increase in Passenger Rates Asked

While it was understood the hearing would be limited to the discussion of freight rates, a new factor in the controversy was injected by the railroads running into Boston, the representatives of which filed applications for authority to increase passenger rates. It is understood that other New England roads will take similar action. The proposed increases are one-quarter of a cent per mile on one way tickets and mileage books and an increase of 25 per cent in rates covering so-called trip tickets.

The commission announces that it expects to have all evidence in this case in by the end of next week. Thursday, Nov. 15, has been set for the cross-examination of such railroad witnesses as shippers may desire recalled and argument will be heard on Saturday, Nov. 17. In the meantime the following hearings will be held: Nov. 7, general commodities, together with Rutland and Lehigh and Hudson rates on live stock in trunk line territory; Nov. 9, petroleum and its products and grain and its products; Nov. 13, lumber and cement shippers interested in the 15 per cent case; Nov. 16, shippers' testimony.

The Graham iron furnace, Graham, Va., recently acquired by John B. Guernsey & Co., Roanoke, will make ferromanganese and spiegeleisen, using Brazilian ore.

Wellman-Seaver-Morgan Co., Cleveland, has established a branch office in Seattle, Wash., in charge of Glenville A. Collins.

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INCREASE IN PIG IRON

October Gain Is 2000 Tons a Day

A Net Increase of Ten in Furnaces in Blast

Pig iron production increased by an average of 2000 tons a day in October, the total for the month being 3,303,038 gross tons, or 106,550 tons a day, against 3,133,954 tons for the 30 days of September, or 104,465 tons a day. October ordinarily is a month in which blast furnace operators make an exceptional showing, but this year coke difficulties prevented any special spurt. A number of additions were made to the list of active furnaces, 355 being in blast Nov. 1, against 345 Oct. 1, a net gain of ten. The rated capacity of the furnaces active on Nov. 1 is 109,059 tons a day as against 107,250 tons a day on Oct. 1.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from October, 1916, is as follows:

Daily Rate of Pig-Iron Production by Months—Gross Tons

	Steel Works	Merchant	Total
October, 1916	81,639	31,550	113,189
November	80,141	30,253	101,394
December	74,264	28,273	102,537
January, 1917	72,394	29,249	101,643
February	65,280	29,193	94,473
March	73,731	31,132	104,863
April	79,031	32,134	111,165
May	77,561	32,677	110,238
June	76,805	32,197	109,002
July	76,440	31,380	107,820
August	71,436	33,336	104,772
September	73,290	31,175	104,465
October	76,664	29,886	106,550

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces in October and the three months preceding:

Monthly Pig-Iron Production—Gross Tons

	July (31 days)	Aug. (31 days)	Sept. (30 days)	Oct. (31 days)
New York	194,255	178,841	182,171	202,939
New Jersey	18,990	21,315	25,169	27,397
Lehigh Valley	116,432	111,583	110,418	117,523
Schuylkill Valley	94,578	91,236	75,727	80,478
Lower Susquehanna and Lebanon Valley	84,540	88,295	84,758	90,386
Pittsburgh district	664,456	664,141	638,611	666,731
Shenango Valley	174,614	164,709	140,205	161,615
Western Pennsylvania	215,192	213,731	211,513	218,814
Maryland, Virginia and Kentucky	89,603	83,233	90,466	100,446
Wheeling district	129,689	124,627	118,195	122,066
Mahoning Valley	322,165	300,740	309,570	316,906
Central and Northern Ohio	299,458	272,109	271,519	275,996
Hock. Val., Hang. Rk. & S. W. Ohio	55,186	59,577	62,499	64,061
Chicago district	503,946	503,723	457,330	455,045
Mich., Minn., Mo., Wis. Col. and Wash.	114,952	105,486	108,325	117,397
Alabama	231,738	232,355	222,687	260,469
Tennessee and Ga.	32,644	32,246	24,791	24,769
Total	3,342,438	3,247,947	3,133,954	3,303,038

Capacity in Blast Nov. 1 and Oct. 1

The following table shows the daily capacity in gross tons of furnaces in blast Nov. 1 and Oct. 1 by districts:

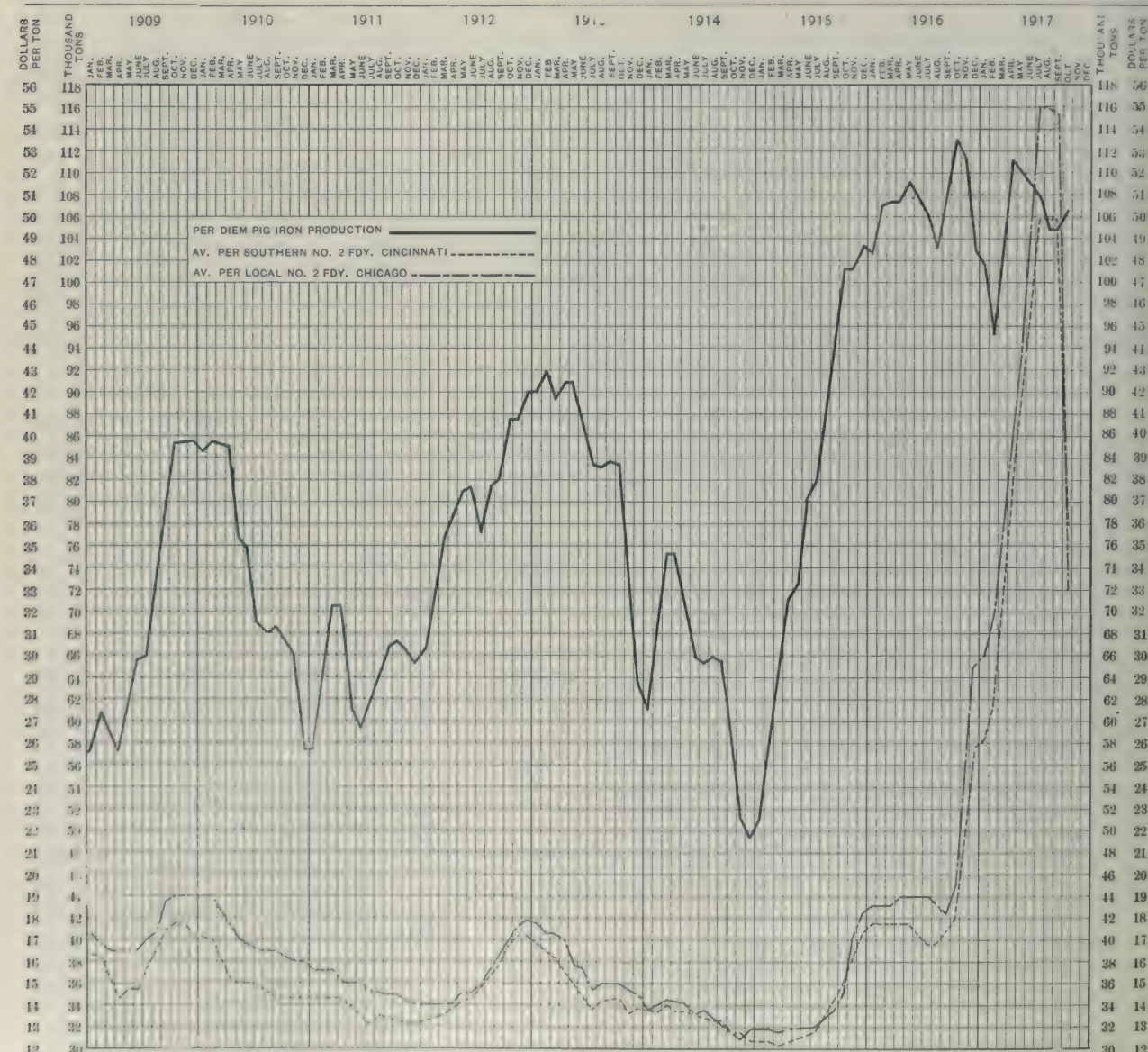


Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from Jan. 1, 1908, to Nov. 1, 1917; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron at Chicago District Furnace

Coke and Anthracite Furnaces in Blast

Location of furnaces	Total number of stacks	Nov. 1 Number in blast	Nov. 1 Capacity per day	Oct. 1 Number in blast	Oct. 1 Capacity per day
New York:					
Buffalo	18	18	6,014	18	5,926
Ferro	1	1	40	1	48
Other New York	4	3	545	2	354
New Jersey	4	4	846	4	863
Ferro	1	1	45	1	49
Pennsylvania:					
Lehigh Valley	21	14	3,546	14	3,729
Spiegel	2	2	245	2	241
Schuylkill Val.	13	9	2,610	8	2,360
Spiegel	1	1	90	1	88
Lower Susquehanna	8	6	1,695	6	1,697
Spiegel	2	2	89	2	84
Lebanon Valley	8	7	1,030	7	900
Ferro and Spiegel	3	2	95	2	97
Pittsburgh Dist.	53	48	21,656	47	20,553
Ferro and Spiegel	4	4	541	3	421
Shenango Valley	19	17	5,193	15	4,627
Western Pennsylvania	25	24	7,007	24	7,221
Ferro and Spiegel	3	2	60	1	80
Maryland	3	4	1,510	2	808
Ferro	1	..	..	1	101
Wheeling Dist.	14	12	4,038	12	4,273
Ohio:					
Mahoning Val.	26	24	10,152	25	10,619
Central and Northern	26	25	9,516	24	9,348
Hocking Val., Hang. Rk. and S. W. Ohio	17	15	2,066	15	1,976
Illinois and Ind.	36	33	15,125	32	15,869
Ferro	1	1	85	2	115
Michigan, Wis. & Minn.	12	10	2,619	10	2,727
Colorado, Mo., & Wash.	7	5	1,155	5	1,362
Ferro	1	1	190	1	142
The South:					
Virginia	18	13	1,585	13	1,579
Ferro	1	1	50	0	0
Kentucky	5	3	510	3	437
Alabama	37	32	8,227	32	7,661
Ferro	1	1	82	1	88
Tenn. and Ga.	16	10	802	9	807
Total	413	355	109,059	345	107,250

Among furnaces blown in last month were Burden at Troy, N. Y., Delaware River in the Schuylkill Valley, one Duquesne and one Edgar Thomson in the Pittsburgh district, one Claire and New Castle No. 1 in the Shenango Valley, Marshall in western Pennsylvania, Victoria in Virginia, one Maryland at Sparrows Point, one Ohio in the Mahoning Valley, one River in northern Ohio, one South Chicago in Illinois and Napier in Tennessee.

The list of furnaces blown out includes one Farrell in the Shenango Valley, Niles and Hannah in the Mahoning Valley and one Miami in the Chicago district.

Production of Steel Companies

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies show the following totals of steel-making iron month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons

	Pig, total production 1915	1916	1917	Spiegeleisen and ferromanganese 1915	1916	1917
Jan.	1,115,944	2,251,035	2,244,203	18,041	24,866	38,792
Feb.	1,237,380	2,183,845	1,829,846	13,319	23,877	32,137
Mar.	1,551,082	2,365,116	2,285,430	12,274	29,388	36,563
Apr.	1,584,111	2,316,768	2,370,937	12,337	31,862	39,595
May	1,694,290	2,408,890	2,404,380	13,440	35,844	37,701
June	1,770,657	2,295,784	2,304,155	19,200	38,597	30,829
July	1,949,750	2,306,303	2,369,630	17,854	31,353	43,884
Aug.	2,101,818	2,313,122	2,214,513	27,463	33,338	39,492
Sept.	2,129,322	2,309,710	2,198,705	23,159	29,451	42,235
Oct.	2,281,456	2,530,806	2,376,589	23,992	34,566	48,691
Nov.	2,198,459	2,404,210	.....	28,741	44,975	.....
Dec.	2,283,047	2,294,620	.....	25,004	43,470	.....

The Record of Production

Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1913—Gross Tons

	1913	1914	1915	1916	1917
Jan.	2,795,331	1,885,054	1,601,421	3,185,121	3,150,938
Feb.	2,586,337	1,888,670	1,674,771	3,087,212	2,645,247
Mar.	2,763,563	2,347,867	2,063,834	3,337,691	3,251,352
Apr.	2,752,761	2,269,655	2,116,494	3,227,768	3,334,960
May	2,822,217	2,092,686	2,263,470	3,361,073	3,417,340
June	2,628,565	1,917,783	2,380,827	3,211,588	3,270,055
July	2,560,646	1,957,645	2,563,420	3,224,513	3,342,438
Aug.	2,545,763	1,995,261	2,779,647	3,203,713	3,247,947
Sept.	2,505,927	1,882,577	2,852,561	3,202,366	3,133,954
Oct.	2,546,261	1,778,186	3,125,491	3,508,849	3,303,038
10 mo.	26,507,371	20,015,384	23,421,936	32,549,894	32,097,271
Nov.	2,233,123	1,518,316	3,037,308	3,311,811	.....
Dec.	1,983,607	1,515,752	3,203,322	3,178,651	.....
Total, yr.	30,724,101	23,049,752	29,662,566	39,039,356	.....

The figures for daily average production, beginning January, 1910, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1910—Gross Tons

	1910	1911	1912	1913	1914	1915	1916	1917
Jan.	84,148	56,752	66,384	90,172	60,808	51,659	102,746	101,643
Feb.	85,616	64,090	72,442	92,369	67,453	59,813	106,456	94,473
Mar.	84,459	70,036	77,591	89,147	75,738	66,575	107,667	104,882
Apr.	82,792	68,836	79,181	91,759	75,665	70,550	107,592	111,165
May	77,102	61,079	81,051	91,039	67,506	73,015	108,422	110,238
June	75,516	59,585	81,358	87,619	63,916	79,361	107,053	109,002
July	69,305	57,841	77,738	82,601	63,150	82,691	104,017	107,820
Aug.	67,963	62,150	81,046	82,057	64,363	89,666	103,346	104,772
Sept.	68,476	65,903	82,128	83,531	62,753	95,085	106,745	104,465
Oct.	67,520	67,811	86,722	82,133	57,361	100,822	113,189	106,550
Nov.	63,659	66,648	87,697	74,453	50,611	101,244	110,394	.....
Dec.	57,349	65,912	89,766	63,987	48,896	103,333	102,537	.....

Diagram of Pig-Iron Production and Prices

The fluctuations in pig-iron production from January, 1909, to the present time are shown in the accompanying chart. The figures represented by the heavy lines are those of daily average production by months of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron at furnace at Chicago. They are based on the weekly market quotations of THE IRON AGE.

A Government Statement on Labor Policy Wanted

A clear and definite official statement of labor policy on the part of the Government is urged in the New York *Sun* of Nov. 2 by Walter Drew, counsel to the National Erectors' Association. It would go far, he holds, to reduce labor troubles to a minimum. It would remove the misconception on the part of the union man as to the attitude of the Government and point clearly for him the path of patriotic duty. It would remove the incentive for the reckless calling of strikes for the closed shop in the mere hope that Government interference in assistance of such strikes would be forthcoming. It would check and discredit the unauthorized and misleading statements of agitators and of certain minor Government agents who come in contact with war work. Last, but not least, such a statement of policy would settle the doubts and hearten the resolution of a vast majority of loyal workmen who have remained out of labor organizations from choice, and who hesitate to seek employment on war work so long as it remains a storm center of conflict over questions of union control.

If it be definitely understood that the "status quo ante" shall be observed, so far as the closed and open shop is concerned, that is, that war work shall not be made the lever either to open a closed shop or to close an open shop, the field of possible labor controversy will at once be greatly reduced. Such a statement of policy would make clear to every one engaged in war work, employer or employee, exactly where he stands, and would be the most effective possible way of making available for such work the full labor supply of the country, both union and non-union.

Enlarged Duties for J. Leonard Replogle

J. Leonard Replogle, a member of the raw materials division of the War Industries Board, has been given enlarged duties. The order announcing the appointment is as follows:

"Under and subject to the raw materials division of the War Industries Board, J. Leonard Replogle is hereby appointed director of steel supply and shall have charge of the distribution and be responsible for the execution of all orders for iron and steel for the United States and allied Governments, including steel billets and bars for ordnance, but not finished ordnance or gun forgings."

Bristol Furnace Sold

ROANOKE, VA., Nov. 5.—The Bristol furnace of the Virginia Iron, Coal & Coke Co. has been sold to a Philadelphia purchaser. It is to be dismantled and it is understood that it will be shipped to Japan. It has an annual capacity of 50,000 tons and was last active in 1908.

Iron and Steel Markets

FURTHER PRICE FIXING

Manufacturers to Bring Others in Line

New Government Contracts for Shell Steel Will Reach 1,500,000 Tons

The situation has been further cleared by Government announcement on Nov. 5 of agreed prices on sheets, wrought pipe, fence wire, tin plate, cold-rolled shafting and scrap. The new finished-material prices, as carefully worked out by the steel manufacturers' committee, are in line with those previously fixed, and the Government makes the important statement that on products not yet covered by official schedules the manufacturers have agreed to adjust prices promptly. Thus it appears that further Washington announcements are not to be looked for, unless at any time a general revision should be made.

It is to be noted that on wrought pipe the new prices represent $4 a ton reduction from the last card of independent manufacturers, but an advance of $8 a ton in prices of the National Tube Co. In wire products the new basis is $10 a ton below prices for some time made by leading independent companies, and about $6 a ton above those of the American Steel & Wire Co., at which, however, little or no commercial product could be had.

While the price basis on which the iron and steel trade now finds itself through Government action is no bar to large production, mill efficiency is reduced both by the embargo on exports and by the way in which Government orders are given out. Frequent roll changes to meet priority requirements have been a handicap, and mill space has been held for ship-steel specifications that have not come as expected. Here and there slack has resulted, and commercial orders have not been ready at the moment to fill the gaps. Thus the market hears now and then that some mill is seeking prompt business at the agreed prices; then along comes more Government work. These dislocations are more or less disconcerting.

The ill-advised agitation of contract abrogation by the Federal Trade Commission has tended to restrict buying of steel for commercial uses. The trade has done no little readjusting on its own account since the shadow of Government price fixing fell upon it over four months ago. To-day the outlook is that the present price basis will not be changed Jan. 1, but official assurance to that effect should come soon, and it should be indicated also that no change will be made in the first half of 1918.

War steel requirements are looming up. Government shell steel now under inquiry amounts to 1,500,000 tons, of which 300,000 tons was distributed in the past week. For the destroyers recently let 60,000 to 70,000 tons of steel has been given out, largely plates.

A measure of the scarcity of plates is found in the estimate that Government merchant ships, representing entirely new demand, will take in each of the next two years 1,500,000 tons of plates. The total production of sheared plates ¼ in. and thicker was not quite 2,500,000 tons in 1916.

Besides the 30,000 cars for Russia, held up until responsibility for payments is firmly settled, and the 10,000 cars for French railroads, builders are to supply 5000 more cars for our expeditionary forces and upward of 6000 for domestic roads are under consideration.

Inability of certain manufacturers to count on steel supply promises to figure more and more in the war toll. The automobile industry is much disturbed by the announcement that alloy steel would be largely withheld from it; yet there is nowhere any definite knowledge as to the amount of such steel Government needs will call for, admitting that gun and airplane requirements will be heavy. It is estimated that the amount of alloy steel already released by the shrinkage in output of pleasure cars would be sufficient for 250,000 airplanes.

The readjustment of prices on various products into which rolled steel enters, such as nuts and bolts, is to be promptly worked out in line with the schedules the steel manufacturers have already made. As to nuts and bolts, opinions of producers show considerable variation. The way in which these various changes are carried out will be a matter of close Government observation.

Pig-iron buying has been encouraged by the definite putting out of differentials in the past week by the American Iron and Steel Institute committee. Transactions covering the first half of 1918 are more frequent, and some contracts have run up to 10,000 tons, all at the established prices.

Pig-iron production increased in October to 3,303,038 tons, or 106,550 tons a day, against 3,133,954 tons in the 30 days of September, or 104,465 tons a day. More furnaces blew in and the net gain for the month was 10. The 355 stacks active Nov. 1 have an estimated capacity of 109,059 tons a day, which compares with 107,250 tons for the 345 furnaces in blast Oct. 1. The year's output of coke pig iron up to Nov. 1 was about 32,100,000 tons, or 450,000 tons less than for the first ten months of 1916.

Pittsburgh

PITTSBURGH, Nov. 6. (*By Wire*)

The situation as to prices on some of the leading finished steel products and also on scrap has been cleared by the announcement from the Government at Washington Monday, Nov. 5, which established prices on sheets, pipe, cold rolled steel, plain wire, tin plate and on scrap. Interviews with prominent local steel manufacturers and several of the larger scrap dealers indicate strongly that the new prices announced by the Government are entirely fair and satisfactory and will be rigidly observed. The only exception to this is the price of 6.25c. on No. 28 gage galvanized sheets, this being regarded by some of the sheet manufacturers as

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Nov. 7, 1917.	Oct. 31, 1917.	Oct. 10, 1917.	Nov. 8, 1916.
No. 2 X, Philadelphia...	$34.25	$34.25	$33.75	$24.00
No. 2, Valley furnace...	33.00	33.00	33.00	24.00
No. 2 Southern, Cin'ti...	35.90	35.90	....	20.90
No. 2, Birmingham, Ala.	33.00	33.00	....	18.00
No. 2, furnace, Chicago**	33.00	33.00	....	25.00
Basic, del'd, eastern Pa..	33.75	33.75	33.75	25.00
Basic, Valley furnace....	33.00	33.00	33.00	23.00
Bessemer, Pittsburgh	37.25	37.25	37.25	27.95
Malleable Bess., Ch'go**	33.00	33.00	....	25.00
Gray forge, Pittsburgh..	32.75	32.75	32.75	23.95
L. S. charcoal, Chicago..	37.50	37.50	....	25.75

Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	....	....	....	$33.00
O.-h. rails, heavy, at mill	....	....	....	35.00
Bess. billets, Pittsburgh	*$47.50	*$47.50	$55.00	50.00
O.-h. billets, Pittsburgh.	*47.50	*47.50	55.00	50.00
O-h sheet bars, P'gh...	*51.00	*$51.00	....	50.00
Forging billets, base, P'gh	....	....	....	75.00
O.-h. billets, Phila.....	....	....	....	50.00
Wire rods, Pittsburgh...	57.00	57.00	85.00	60.00

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	**4.685**	4.25	4.25	2.659
Iron bars, Pittsburgh....	...	...	...	2.85
Iron bars, Chicago.....	4.50	4.50	...	2.40
Steel bars, Pittsburgh...	2.90	2.90	...	2.75
Steel bars, New York...	3.095	3.095	...	2.919
Tank plates, Pittsburgh.	†*3.25	†*3.25	...	4.00
Tank plates, New York..	...	...	...	4.169
Beams, etc., Pittsburgh..	3.00	3.00	...	2.75
Beams, etc., New York..	3.195	3.195	...	2.869
Skelp, grooved steel, P'gh.	*2.90	*2.90	...	2.70
Skelp, sheared steel, P'gh	*3.25	*3.25	...	2.80
Steel hoops, Pittsburgh..	...	...	...	3.00

*Agreed prices. †As yet only a few sales made.

**The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Nov. 7, 1917. Cents.	Oct. 31, 1917. Cents.	Oct. 10, 1917. Cents.	Nov. 8, 1916. Cents.
Sheets, black, No. 28, P'gh	5.00	...	...	3.50
Sheets, galv., No. 28, P'gh	6.25	...	...	5.00
Wire nails, Pittsburgh..	...	...	...	2.85
Cut nails, Pittsburgh....	...	...	...	2.80
Fence wire, base, P'gh..	...	...	...	2.80
Barb wire, galv., P'gh...	...	...	...	3.70

Old Material, Per Gross Ton.				
Iron rails, Chicago.....	**$35.00**	$34.00	$36.00	$23.00
Iron rails, Philadelphia..	38.00	38.00	38.00	21.00
Carwheels, Chicago	**27.00**	26.00	27.00	16.00
Carwheels, Philadelphia..	29.00	29.00	29.00	17.00
Heavy steel scrap, P'gh..	**30.00**	27.00	30.00	20.00
Heavy steel scrap, Phila..	25.00	25.00	25.00	17.00
Heavy steel scrap, Ch'go.	**28.00**	26.00	26.00	19.75
No. 1 cast, Pittsburgh...	27.00	27.00	29.00	17.00
No. 1 cast, Philadelphia.	28.00	28.00	28.00	17.00
No. 1 cast, Ch'go (net ton).	**21.00**	20.00	21.00	15.00
No. 1 RR. wrot, Phila...	35.00	35.00	38.00	23.50
No. 1 RR. wrot, Ch'go (net)	**31.00**	28.50	27.00	20.00

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	$6.00	$6.00	...	$7.50
Furnace coke, future....	6.00	6.00	...	4.00
Foundry coke, prompt...	6.00	†*6.00	...	7.00
Foundry coke, future....	6.00	†*6.00	...	5.00

Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.	23.50	23.50	23.50	29.50
Electrolytic copper, N. Y.	23.50	23.50	23.50	29.50
Spelter, St. Louis.....	7.62½	7.75	8.00	10.50
Spelter, New York.....	7.87½	8.00	8.25	10.75
Lead, St. Louis.....	**6.12½**	5.62½	7.45	6.87½
Lead, New York.....	**6.25**	5.75	7.60	7.00
Tin, New York.....	**68.00**	66.00	61.00	42.25
Antimony (Asiatic), N. Y.	*14.00*	14.25	15.00	12.75
Tin plate, 100-lb. box, P'gh.	7.75	....	....	6.00

low. To sheet mills that are self contained, the price will allow a fair margin of profit, but to galvanizing plants that have to buy sheets in the open market at 5c., galvanize them, and sell them at 6.25c., the margin will be very light, and in the cases of a few concerns a spread of $25 per ton between prices of black and galvanized sheets may possibly mean a loss. The Government announced that it had the assurance of manufacturers that they will promptly adjust prices on all iron and steel products, other than those of which prices have been agreed upon, to the same general standard as those given out by the Government Monday, and also on Oct. 4. It is likely, therefore, that within a very short time manufacturers of steel products on which prices have not been named by the Government will get together and fix prices on their products. The makers of iron and steel tubes are to meet in this city to-morrow and new discounts on tubes will likely be ready for the trade within a few days. While all prices so far fixed by the Government and others to be arranged by the manufacturers through co-operation with the general committee of the American Iron and Steel Institute are in effect only until Jan. 1, it is the general impression here that the prices will be allowed to stand, unless it can be absolutely shown that quotations on some material are unfair and should be changed, but this is not likely to occur. As a result of the prices that have just come out and others to be named shortly, it is believed that very soon consumers will commence to cover on their needs for first quarter and first half of 1918. For this reason the volume of business this month and in December is expected to be much heavier than in the two preceding months.

Pig Iron.—W. P. Snyder & Co. announce the average price on Bessemer iron in October to have been $36.30 and on basic $33 at Valley furnace, based on sales of 1000 tons or more, these being the regular Government prices given out on Sept. 24 last. Compared with September, the price of $36.30 on Bessemer shows a decline of $9.15 and on basic of $8.34. There were sales in October of probably 100,000 tons of Bessemer and basic iron, and of this quantity the Jones & Laughlin Steel Co. is said to have bought upward of 60,000 tons of Bessemer and basic. During the recent labor trouble at its blast furnaces, this company lost a large output of pig iron, which it was compelled to come in the market and replace. The scarcity and bad delivery of coke by the railroads are seriously restricting blast furnace operations. At this writing, six blast furnaces in the Youngstown, Ohio, district are banked for lack of coke and the number may be increased before this week ends. The market on Bessemer and basic is very firm, and it is scarce and hard to obtain for this year's delivery. A fair amount of foundry iron is moving in small lots, but it is stated some large consumers have covered their needs of foundry iron for the first quarter of next year at the fixed price of $33 at furnace.

We quote as follows: Basic pig iron, $33; Bessemer, $36.30; gray forge, $32; No. 2 foundry, $33; No. 3 foundry, $32.50, and malleable Bessemer, $33.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being 95c. per ton.

Billets and Sheet Bars.—The new inquiry for steel is very dull, consumers being covered by contracts and deliveries by the mills are reported to be very satisfactory. So far as can be learned, none of the steel mills is freely offering Bessemer or open hearth billets at the fixed price of $47.50 or sheet bars at $51 at mill, but it is understood that some large consumers of sheet bars, notably tin plate mills, have arranged for their supply of bars for first six months of 1918 at the $51 price, and should this price be changed, the contracts will be re-adjusted to conform to any new prices on sheet bars, whether lower or higher, that may be made. We quote soft Bessemer and open hearth billets at $47.50 and sheet bars at $51, maker's mill Pittsburgh or Youngstown.

Ferroalloys.—There has been another severe decline in prices of 80 per cent domestic ferromanganese, which has been offered for prompt or future delivery at $250 per gross ton, delivered to buyer's mill. It is probable

the makers of ferromanganese, following the suggestion of the Government, will soon announce new prices on ferromanganese and other ferroalloys. We quote 18 to 22 per cent spiegeleisen at nominally $60 to $65 and 50 per cent ferrosilicon in carload lots at $130 to $140 delivered. It is likely, within a few days, producers of Bessemer ferrosilicon and silvery iron will adopt new prices and until this is done we omit quotations.

Structural Material.—Most of the new work being placed is coming from the Government, which has just asked bids on 4000 tons of structural shapes for a large new machine shop to be erected at Washington, the American Bridge Co. has taken 1000 tons for a new steel building for the General Electric Co. at Lynn, Mass., and 1000 tons of bridge work for the Pennsylvania lines west. We quote beams and channels up to 15 in. at 3c. at mill.

Plates.—The Government has placed contracts for 30,000 four-wheel freight cars for shipment to Russia, an order for this quantity placed some time ago having been later temporarily withdrawn. The American Car & Foundry Co. will build 10,000 cars, the Standard Steel Car Co. 10,000, the Pressed Steel Car Co. 7,750 and the Western Car & Foundry Co. 2,250. These cars will each take seven to eight tons of plates and small shapes, and contracts for this material have been placed by car builders with the mills. There is a freer selling of plates by the mills at the Government price of 3.25c. at mill, but the larger plate mills are filled up for a year to 18 months ahead, and are not taking new orders. It is said the Carnegie Steel Co. is furnishing every month to the Government 60,000 tons of plates or more. The entire output of the Liberty plate mill, just finished at Munhall, is going to the Government and will continue to do so for many months to come. This mill is already making good records for output for a new mill, and when in smooth working order will turn out close to 20,000 tons of plates per month. We quote ¼ in. and heavier sheared plates at 3.24c. at mill.

Steel Rails.—It is not known as yet whether prices on light rails and standard sections will be adjusted by the mills to a lower basis, but something definite about this is expected to come out in a short time. Very little new business is being placed, and nominal prices on standard section and light rails are given on page 1147.

Sheets.—The Government prices on sheets were announced from Washington on Monday, Nov. 5, and are based on 4.25c. for No. 10 blue annealed, 5c. for No. 28 Bessemer black and 6.25c. for No. 28 galvanized per lb., all f.o.b. Pittsburgh, for both Bessemer and open-hearth stock. Formerly it was the practice of some sheet mills to charge an advance of 25c. per 100 lb. for sheets rolled from open-hearth stock over the Bessemer price, but the Government prices do away with this custom. These new prices on blue annealed and black sheets were those that were generally expected by the trade, but on galvanized sheets the price is $20 per ton less than looked for. Based on the present price of spelter, which is about 7.75c., this price of 6.25c. on No. 28 galvanized sheets is regarded as absolutely fair to sheet mills that are self-contained, but to small mills that have to buy black sheets in the open market at 5c. and galvanize them for $25 per ton, it will not allow much profit. Prices of labor and acids are so high that it is probable the cost of some galvanizers is over $25 per ton. The practice was to charge about $21 per ton, but labor, acid and other items have gone up so much that the price of galvanizing has been very much increased. The new Government prices on sheets are until Jan. 1 only, being subject to revision on or after that date. How far ahead the mills will sell at these prices has not been determined, but it is likely some mills will sell for first quarter and probably some for first half. It is not generally expected that these new prices on sheets will be changed on Jan. 1 or shortly after, unless it should be found that some of them are unfair, but this hardly seems likely. The new price of 5c. on No. 28 Bessemer black sheets is practically the price at which this grade of sheets has been selling for a month or more, but the price of 6.25c. on galvanized is fully $20 to $25 per ton less than the price recently ruling in the open market. We quote blue annealed sheets No. 10 gage 4.25c., No. 28 Bessemer black 5c., No. 28 galvanized 6.25c. in carloads f.o.b. Pittsburgh, from Bessemer or open-hearth stock. The new prices are given in detail on page 1147.

Tin Plate.—The Government has announced the price of $7.75 on tin plate for Bessemer or open-hearth stock f.o.b. Pittsburgh. This price is 25c. or more lower than the trade looked for, some believing it would be $8 and some possibly $8.20 per base box. However, this price of $7.75 per base box is exactly the same as ruled on tin plate from open hearth stock for the last half of this year. The price is regarded by manufacturers of tin plate as eminently fair. There seems to be no doubt that very soon consumers of tin plate will be covered for the first six months of 1918 at the $7.75 price. The request of the Government that the mills sell their product for first nine months of 1918 was withdrawn, and it is not believed any makers will sell beyond the first six months of next year at the new price. Already large consumers of tin plate have had their regular sources of supply make reservations on their books for their needs, and all this business will be booked at the $7.75 price. Based on sheet bars at $51, the new price will allow a good margin of profit, and with the enormous demand that confronts the tin plate makers for their 1918 output, it would be an extremely profitable one in the tin plate trade. While the price on tin plate is subject to revision on Jan. 1 or after, it is not believed now that it will be disturbed. The new price will also apply on small lots of tin plate from stock for prompt shipment. We therefore quote coke plate at $7.75 per base box, f.o.b. Pittsburgh, for Bessemer or open-hearth stock.

Wire Products.—The Government has announced the price of $3.25 on plain wire per 100 lb. f.o.b. Pittsburgh and has further stated that the wire and steel manufacturers have agreed promptly to adjust maximum prices of all iron and steel products, other than those on which prices have been agreed, to the same general standard as those which have been announced. Accepting this statement, the new prices on wire products figure out $3.50 for wire nails, $3.45 for bright basic wire, $3.25 for numbers 6 to 9 annealed fence wire, $3.95 for galvanized wire, $4.35 for galvanized barbed wire and fence staples and $3.65 for painted barb wire. Cement coated nails are $3.40 base, and the discounts on woven wire fence have been tentatively agreed upon as 47 per cent off list for carload lots, 46 per cent for 1000 rod lots and 45 per cent for small lots, all f.o.b. Pittsburgh. These new prices represent a decline of about $10 per ton on wire nails and wire below prices quoted for some months by the independent mills, representing an advance of about $6 per ton over the price quoted by the American Steel & Wire Co. until about two weeks ago, when that company announced an advance of $6 per ton on its price. These prices have been adopted by all the wire and wire nail makers and will apply on all business booked, starting with Monday, Nov. 5. It is understood that existing contracts are not to be disturbed and that terms are the same as before. Now that prices on wire products have been settled, it is believed that the demand will very soon show a decided increase, as it has been dull for some time, buyers holding off placing orders until the new prices came out. Prices on wire products are given in detail on page 1147.

Wire Rods.—There is a fairly active demand for wire rods, both from the domestic and export trade, but the local makers report they are pretty well filled up over the remainder of this year, and are not quoting on most of the inquiries that come before them. However, some small sales of soft Bessemer and open hearth rods ranging up to 500 tons have been left to the manufacturers to work out for themselves, and prices will probably vary a good deal. However, as nearly as can be learned, the present prices on rods made from high carbon steel are about $85 to $90 on special steed rods, carbons running 0.40 to 0.60, $90

and $95, and above 0.60 carbon $100 to $110. We quote soft Bessemer and open hearth rods at $57 per gross ton f.o.b. Pittsburgh. Detail prices on rods are given on page 1147.

Hoops and Bands.—The Government has not announced any prices on hoops and bands, but it is probable that these will very soon be readjusted to a lower basis by the manufacturers. The price of steel bands will no doubt be put at 2.90c., extras as per the steel bar card, and steel hoops will range a little higher, probably 3c. to 3.50c. at mill, there having been in the past a slight differential in the price of steel hoops over those bands. Until the new prices are given out by the manufacturers we omit quotations.

Iron and Steel Bars.—As yet the manufacturers of refined iron bars have not yet announced lower prices to put them more in conformity with prices on steel bars, but this will no doubt be done in a short time. Local mills that roll iron bars report they are filled up for some months ahead, so that any new price they may name on iron bars would be good only until Jan. 1, and would not cut much figure in the market, as the mills have no iron bars to sell for delivery this year. However, a lower price is likely to be adopted on iron bars within a short time so that there may be a basis on which the mills can figure with large consumers for their needs for first quarter and first half of next year. The new demand for both iron and steel bars is only fair, consumers being well covered over the remainder of the year, and some large consumers of steel bars over first half of next year. We quote steel bars at 2.90c. at mill, f.o.b. Pittsburgh, and we omit prices on iron bars until the market is more definitely known.

Shafting.—On Monday, Nov. 5, the Government announced a discount of 17 per cent on shafting from the discount list adopted on March 15, 1915. For some time the largest discount allowed on steel shafting was 10 per cent and the extra 7 per cent announced by the Government means a reduction over the former lowest price of $7 per ton. It is likely that some contracts made recently for large quantities of shafting on which the price was left open will be adjusted to the basis of 17 per cent off. This discount makes the price of shafting 4.15c. per pound at mill for base sizes and on large lots. The demand has been quiet for some time, consumers waiting for the Government to announce prices. It is likely, now that this has been done, that the new demand for shafting will be much heavier in a short time. We quote cold rolled shafting at 17 per cent off list, f.o.b., Pittsburgh.

Railroad Spikes and Track Bolts.—It is very likely that within a few days makers of spikes and track bolts, probably through the American Iron and Steel Institute general committee, will announce new and lower prices on both spikes and track bolts to put them more in line with prices announced by the Government on other forms of finished steel. Until this is done, we repeat former prices, which are now purely nominal and are given only for purpose of record on page 1147. The demand for spikes and track bolts has been very dull for some time.

Nuts and Bolts.—It is not known at this writing whether the makers of nuts and bolts will adopt new discounts, naming lower prices in view of the Government prices on other forms of finished steel that came out yesterday. It is recognized that present prices of nuts and bolts are somewhat higher and out of line with prices on other forms of finished steel and for this reason there may be a revision on the whole list of nuts and bolts to a lower basis. Until this is done, we repeat present discounts which are given in detail on page 1147. The demand for nuts and bolts has been quiet for some time.

Cold Rolled Strip Steel.—Recently the makers of cold rolled strip steel reduced prices from 9c. to 7c. per pound or a reduction of $40 per ton. It is believed that this price of 7c. per pound will be allowed to remain, but this is not known definitely at this writing. A meeting of cold rolled strip steel makers will be held at an early day to consider the situation as regards prices. We repeat our former price of 7c. per pound at mill for large lots. Terms are 30 days less 2 per cent off for cash in 10 days when sold in quantities of 300 lb. or more.

Rivets.—It is not unlikely makers of rivets will very soon announce a reduction in prices to put them more on a parity with prices on other forms of finished steel. It is probable a meeting of rivet makers will be held shortly to consider the price situation. Until a definite change is made, we repeat former nominal prices of $5.25 per 100 lb. for structural rivets and $5.35 for conehead boiler rivets, f.o.b., Pittsburgh. These are purely nominal prices and are printed for purpose of record only.

Wrought Pipe.—The Government has announced discounts of 52 and 5 and 2½ per cent on ¾-in. to 3-in. black steel pipe which means a list discount of 51 per cent and an extra discount of 1 point and 5 and 2½ per cent to the largest jobbing trade. Basing this card discount at 51 per cent, it means a straight advance of $8 per ton in prices of National Tube Co., which have been 55 per cent off based on the card of April 2 last. On the May 1 card, which is still in use by most of the independent mills, the new Government prices show a reduction of $4 per ton. All the manufacturers of steel pipe will send out new discount cards on which discounts have been extended two points, or a reduction of $4 per ton. The manufacturers of iron pipe have decided that for the time being they will adhere to the present discounts on both black and galvanized iron pipe, but will send out new cards, reaffirming the May 1 discounts, the new cards to be dated as in effect from Nov. 7. The action of the Government now puts the price of black and galvanized iron and steel pipe on a standard basis of discounts, a condition that has not existed in the pipe trade for some months, there having been for some time no less than three separate discount cards that were being used. The Government discounts on black and galvanized steel pipe which have been adopted by all the mills and also the discounts on black and galvanized iron pipe which have been reaffirmed are given on page 1147.

Boiler Tubes.—On Wednesday, Nov. 7, a meeting of manufacturers of lap-welded steel and standard charcoal iron tubes was held in this city to consider the price situation on tubes and to adopt new discounts which will show very much lower prices than those in effect for a long time. These new discounts were not available at the time this report was written and so we repeat for this week former nominal discounts which have not correctly reflected actual prices for a long time. These nominal discounts are given on page 1147.

Coke.—Moderate new sales of furnace and foundry coke are being made at the Government price of $6 per net ton at oven, but it is claimed that a very much larger quantity of furnace and foundry coke is being sold at higher prices and in devious ways that perhaps might not bear close scrutiny by the Government or the public. Recently an absurd report was printed that the Government price of $6 per ton on furnace and foundry coke was not legal, the claim being made that the price was fixed by the War Industries Board at $6, and that this board had no authority to act in the matter. The facts are that the War Industries Board submitted to the President the new price on furnace and foundry coke and he approved it at once. The coke producers wanted a price of $6.50 on furnace coke, but the President made it $6 at oven. Some of the larger producers of the best grades of furnace coke that have contracts at the open market price are rigidly filling them and shipping to consumers as much furnace and foundry coke at the $6 price as they did when the price of furnace coke was as high as $13 and $13.50 and foundry coke $14 and even $14 at oven. Credit should be given these concerns for their honest dealings with their customers, but censure is certainly due some of the smaller coke operators who have not met the issue squarely and are showing an unpatriotic spirit. We quote blast furnace and 72 hour foundry coke at $6 per net ton at oven for prompt delivery and on contracts. The *Connellsville Courier* gives the output of coke in the upper and lower Connellsville regions for the week ending Oct. 27 as 305,980 tons, a decrease over the

previous week of 40,259 tons. This is the largest decrease in output of coke shown for some months and is due primarily to shortage of labor and perhaps to other causes.

Old Material.—The Carnegie Steel Co. has purchased a limited tonnage of heavy melting steel during the past week, but otherwise there has been limited buying. Interest naturally centers in the naming of prices by the Government at $30 per gross ton, f.o.b. consuming point, on No. 1 heavy melting steel, $20 on cast-iron borings and machine-shop turnings and $35 on No. 1 railroad wrought. This is the basis which was recommended by the iron and scrap committee of the American Iron and Steel Institute some time ago. Dealers quote for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$30.00
No. 1 foundry cast	27.00 to 28.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md., and Franklin, Pa.	31.00 to 32.00
Hydraulic compressed sheet scrap	22.00 to 23.00
Bundled sheet scrap, sides and ends, f.o.b. consumer's mill, Pittsburgh district	21.00 to 22.00
Bundled sheet stamping scrap	19.00 to 20.00
No. 1 railroad malleable stock	23.00 to 24.00
Railroad grate bars	16.00 to 17.00
Low phosphorus melting stock	38.00 to 40.00
Iron car axles	41.00 to 42.00
Steel car axles	41.00 to 42.00
Locomotive axles, steel	48.00 to 50.00
No. 1 busheling scrap	22.00 to 23.00
Machine-shop turnings	18.00 to 18.50
Cast-iron wheels	28.00 to 30.00
Rolled steel wheels	33.00 to 34.00
*Sheet bar crop ends	33.00 to 34.00
Cast-iron borings	20.00
No. 1 railroad wrought scrap	35.00
Heavy steel axle turnings	22.00 to 23.00
Heavy breakable cast scrap	22.00 to 23.00

*Shipping point.

Chicago

CHICAGO, Nov. 5.

Requirements coming both directly and indirectly from the Government, all entitled to first consideration as essentials in the prosecution of the war, are being given in steadily growing volume to independent mills. In some cases, as with plates and shapes for submarine destroyers, the orders require such prompt fulfilment that rolling schedules are sadly disarranged, and the consequent frequency in changing rolls is doing anything but help along maximum production. The plaint of more than one mill man is that they do not know where they stand. Of all iron and steel products, pig iron seems to be pursuing the most serene course, the agreed prices of iron having been generally accepted with the result that business is going forward so far as there is iron to sell. A mighty demand, most of it indirect, is expected to reach the furnaces, a realization of which is causing some melters to ask that their deliveries be anticipated. That they have no plates, shapes or bars to sell for delivery this year continues to be stated by mill representatives, but rumor has it that an Eastern mill is offering all these products at the newly established levels. Some standard section rails have been offered at $67. The makers of iron and rail carbon bars cling to their quotations of 4c. and upward, but recognize that these prices will collapse when mild steel bars can be had in sufficient quantity at 2.90c., meanwhile their business is of the straggling sort. Consumers of bolts and nuts are specifying in an active manner, and instances have come to light where railroads and implement makers want to cover for 1918. The old material market stiffened considerably following a purchase of melting steel by the leading interest. Ferromanganese has been offered at $250.

Pig Iron.—Buying has been active in the past week and there is a considerable amount of inquiry yet to be satisfied. Most of the sales have been for 1918 delivery, and all have been on the basis of the price agreed on between producers and the Government. The principal Northern interest is selling chiefly against the expected output of a furnace to be blown in next February. Most of the producers and their agents are looking for heavy Governmental demands, most of them coming indirectly, and these must be filled, whatever happens to private requirements, and perhaps it is a realization of this fact that is causing consumers to request that shipments be anticipated to an extent that would bring 1918 shipments into 1917. In the past two or three days, the representative of a Southern furnace has sold about 2000 tons, chiefly for next year, and is considering inover. The same seller has made some scattering sales for delivery this year, all on the basis of official prices. Southern foundry iron of another brand is not yet released for next year, despite the more active inquiry. The announcement basing Government prices on analyses is acceptable to all, so far as method goes, for the reason that practically all of the Northern iron sold in quiry for several thousand tons additional. The iron offered for next year runs in silicon from 1.50 to 3.50 and this territory has long been sold on analysis, rather than by fracture in view of the greater part of Northern iron being chill cast. To a lesser extent the same situation exists with Southern iron, although in some cases both fracture and analysis are considered. A few oldtimers persist in depending on fracture for guidance, and they are accommodated. In general, it is considered that those who adjusted prices could not well have proceeded otherwise than they did, and that the ultimate effect will be wholesome. Lake Superior charcoal iron is being sold, so far as furnace capacities permit, at $2.50 per gross ton above base for iron averaging 1.25 per cent silicon. October was an active month with the makers, sales being limited only by the quantity available, the furnaces being well sold up to July 1. Consequently sales were made chiefly to old customers. One furnace sold over 7000 tons in the month, part of which is for delivery in the first part of next year. There is fair inquiry for low phosphorus pig iron for the remainder of this year and first half of next. The inquiries are scattered widely over the United States with several round tonnages wanted for export. A Western maker expects considerable activity and that most of the inquiries will be closed on the basis of agreed prices. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 1 to 4	$37.50
Lake Superior charcoal, Nos. 5 and 6 and Scotch	40.00
Northern coke foundry, No. 1	33.50
Northern coke foundry, No. 2	33.00
Northern coke foundry, No. 3	32.50
Northern high-phosphorus foundry	33.00
Southern coke No. 1 foundry and 1 soft	37.50
Southern coke No. 2 foundry and 2 soft	37.00
Malleable Bessemer	30.50
Basic	33.00
Low-phosphorus	58.00
Silvery, 7 per cent	44.54

Ferroalloys.—While the general asking price for 80 per cent ferromanganse is $275, offerings have been quietly made by producers at $250, delivery this year or in the early part of next. A moderate tonnage of 50 per cent ferrosilicon for delivery over the first half of 1918 is being offered at $150. Ten per cent Bessemer ferrosilicon is quoted at $57.50, furnace, and 11 per cent at $60.84, these being agreed prices.

Plates.—Government demand for plates for various purposes overshadows all other requirements, delivery for some of the material being wanted this month, especially that to enter submarine destroyers. In fact, the promptness with which these plates are wanted is likely to play havoc with rolling schedules. Government orders in increased volume are coming to the leading local independent. Rumor persists that Eastern producers are offering plates to domestic consumers at the agreed price of 3.25c., Pittsburgh, delivery to be reasonably prompt, but the representatives of all the mills are unanimous in saying they have none to sell this year.

For material out of warehouse, the quotation is unchanged at 7c.

Structural Material.—Except for Government needs it cannot be learned that much is stirring, although in

shapes, as in plates, it is said that an Eastern mill which has avoided long-time contracts is offering material at the agreed level of 3c., Pittsburgh, with verification equally as intangible. Bids have been taken on a warehouse for Butler Bros., Chicago, which will require 7500 tons of shapes and 1500 tons of reinforcing bars, but a Class B priority certificate will probably be necessary to insure delivery. A theater building in this city which will require about 1000 tons of standard shapes and 1500 tons of Bethlehem shapes has been revived, but there is believed to be little chance of the project coming to fruition in view of the Government's attitude toward expansion not essential to the conduct of the war, also the seeming impossibility of getting open cars in which to ship material not needed for war purposes. No new car inquiries are reported, but six small lettings of structural work are announced, the largest requiring 446 tons. They follow:

Addition to Hotel Stewart, San Francisco, 200 tons. To Central Iron Works.
Chinese Bank Building, San Fracisco, 200 tons. To Central Iron Works.
United States Government, paint shop at Mare Island, Cal., 203 tons. To Western Iron Works.
Office building for H. P. Hynds, Cheyenne, Wyo., 249 tons. To Omaha Structural Steel Co.
International Harvester Corporation, forge shop building, Milwaukee, Wis., 446 tons. To Morava Construction Co.
St. Louis Briquette Machine Co., shop at St. Louis, 144 tons. To Scully Steel & Iron Co.
For material out of warehouse the quotation is 5c.

Bars.—The makers of both iron and rail carbon bars are in a most uncertain state of mind, the Government not having fixed any price for their products. With the agreed price of mild steel bars at 2.90c.—and sales having been made at that figure—consumers are not disposed to pay 4c. and upward for iron or high carbon bars, consequently these markets are extremely quiet. A little business has been done in rail carbon bars at 4c., Chicago. It is conceded that the makers of both rail carbon and iron bars will have to accept 2.90c. when mild steel becomes more easily obtainable at that figure. The high carbon bars usually sell for less than mild steel, and they would probably approach the 2.90c. level without delay were it not for the high cost of rerolling rails from which they are made. The makers would be relieved by some decisive action, one way or the other. Meanwhile the nominal price of bar iron is 4.50c., Chicago, and that of rail carbon 4c. to 4.25c., Chicago.

We quote warehouse prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c.; reinforcing bars, 4.50c. base, with 5c. extra for twisting sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Sheets.—The maximum prices just announced for sheets are regarded by sellers as fair, certainly as fair as putting plates at 3.25c., and it is asserted that mills making both will quote even more readily on black sheets at 5c. than on plates at 3.25c. As a matter of fact, the new maximum sheet prices are not far below the prices at which business has been done recently. The news as first received was so meager that producers were puzzled as to whether open-hearth and Bessemer steel were on the same basis and they at once took steps to ascertain whether open-hearth was entitled to an extra of 25c. In view of the stipulation that maximum production must be maintained, makers will exercise discretion in committing themselves. It is reiterated that the maximum prices apply only to business done with the Government, its allies and domestic consumers. Commercial consumption in allied countries and in neutral countries will not be affected.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 8c.; No. 28 black, 8.50c.; and No. 28 galvanized, 9.50c.

Bolts and Nuts.—The market is much more active, consumers evidently being convinced there is a shortage in prospect, with the result that they have released specifications which they were holding up in the belief that lower prices might be obtainable. Both railroads and agricultural implement interests have sought to buy for next year, and it is likely that some large contracts will be closed soon. Bolt and nut makers emphasize the difficulty they are meeting in obtaining sufficient raw material. Unless there is Government intervention it is not likely that quotations will be reduced, and what the Government will do is a matter of debate. For prices and freight rates see finished iron and steel, f.o.b., Pittsburgh, page 1147.

Store prices are as follows: Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to ⅜ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to ⅜ x 6 in., 40-2½; larger sizes, 30-5; hot pressed nuts, square, $2, and hexagon $2 off per 100 lb.; lag screws, 50 per cent off.

Wire Products.—Makers of wire products have no readjustments to announce, but will make changes soon, and the same is true of other products on which maximum prices were set.

Cast Iron Pipe.—Kansas City, Mo., Nov. 7, will open bids on 600 tons. Langdon, N. D., placed about 100 tons with the United States Cast Iron Pipe & Foundry Co., and an equal amount with the American Cast Iron Pipe Co., Brigham, Utah, has taken bids on 350 tons, the successful bidder being not yet reported.

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., $53.50; 6 in. and larger, $50.50, with $1 extra for class A water pipe and gas pipe.

Rails and Track Supplies.—Standard section rails have been offered, according to good authority, at $67, delivery this year, by a mill outside of this territory, but whether sales resulted is not yet reported. As to the railroads being willing to contract for next year, there can be no question, and it may be that some deals have been quietly put through. The representative of one mill asserts that his company is taking care of its railroad patrons. The following quotations are given more as a matter of record, than as representing the current market.

Standard railroad spikes, 4.50c. to 5.25c., base; small spikes, 4.75c. to 5.50c., base; track bolts with square nuts, 5.50c. to 6c., all in carloads, Chicago; tie plates, $70 to $90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base (nominal); open hearth, $40 (nominal); light rails, 25 to 45 lb., $70; 16 to 20 lb., $71; 12 lb., $72; 8 lb., $73; angle bars, 3.25c., base.

Old Material.—That maximum prices had been fixed on heavy melting steel, cast borings, machine shop turnings and railroad wrought occasioned surprise, as the belief that such action would not be taken was widespread. The first day of restricted prices brought no change to the market, and none will come until the price limits are digested. Dealers would naturally like to obtain the maximum prices, especially in view of the fact that these prices are higher than have heretofore prevailed. All call $30 fair for heavy melting steel, but they are not sanguine about getting it. In the past week, a large consumer paid $29 for both heavy and shoveling steel, but another large consumer still offers only $28 for melting steel and $26 for shoveling. Merely naming the maximum does not make the market. The mills must do that by buying, it is stated. Some dealers assume that the maximum prices were fixed in equitable relation to the fixed prices of finished steel. Therefore, they feel that they should get the maximum prices, asserting that if they do not, the mills will be enabled to increase their profits. A consumer of railroad wrought, the maximum of which was fixed at $35, pronounced the price higher than he had expected. It is $2 to $3 higher than the recent market. With bar iron at 4.50c., the makers could afford to pay $35 for wrought, but should bar iron drop to the level of mild steel bars, they could not pay anywhere near the maximum of their scrap. Except for occasional purchasing, and the buying by the leading interest of a limited quantity of melting steel, there has not been much movement in the market, but prior to the announcement of government prices, prices were stronger. The interest referred to bought heavy melting, shoveling steel and some structural stock, paying $29 for each, thereby ignoring usual differentials. It is asserted by dealers that the market will not go down, the statement being based on the knowledge that at least some of the mills are running short of material and rapidly approaching the time when they must enter the market. No one seems to know what action, if any, may be expected on the part of the Government. Lists have been issued by the Atchison, Topeka & Santa Fe, the Union Pacific, Pennsylvania Lines and Great Northern,

the total representing a good-sized tonnage but one not up to normal. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Old iron rails	$35.00 to $36.00
Relaying rails	50.00 to 55.00
Old carwheels	27.00 to 28.00
Old steel rails, rerolling	35.00 to 36.00
Old steel rails, less than 3 ft.	32.00 to 33.00
Heavy melting steel scrap	28.00 to 29.00
Frogs, switches and guards, cut apart	28.00 to 29.00
Shoveling steel	27.00 to 28.00
Steel axle turnings	20.00 to 21.00

Per Net Ton	
Iron angles and splice bars	$34.00 to $35.00
Iron arch bars and transoms	35.00 to 36.00
Steel angle bars	24.00 to 25.00
Iron car axles	40.00 to 41.00
Steel car axles	40.00 to 41.00
No. 1 railroad wrought	31.00 to 32.00
No. 2 railroad wrought	28.00 to 29.00
Cut forge	28.00 to 29.00
Pipes and flues	18.00 to 19.00
No. 1 busheling	21.00 to 22.00
No. 2 busheling	14.50 to 15.00
Steel knuckles and couplers	29.00 to 30.00
Coil springs	36.50 to 37.50
No. 1 boilers, cut to sheets and rings.	18.00 to 19.00
Boiler punchings	30.00 to 31.00
Locomotive tires, smooth	31.00 to 32.00
Machine-shop turnings	15.00 to 16.00
Cast borings	15.00 to 15.75
No. 1 cast scrap	21.00 to 22.00
Stove plate and light cast scrap	16.50 to 17.00
Grate bars	15.00 to 16.00
Brake shoes	16.00 to 17.00
Railroad malleable	25.00 to 26.00
Agricultural malleable	21.00 to 22.00
Country mixed scrap	16.50 to 17.00

Philadelphia

PHILADELPHIA, Nov. 5.

The greatest activity in this market is in pig iron. Orders are now being quite generally accepted for delivery in the first half of next year, and there is a fairly large inquiry, some of which is for good sized tonnages. The Pennsylvania Railroad Co. wants about 13,750 tons of various grades for its Altoona shops. A Virginia company has sold about 10,000 tons of foundry iron for the first half. Some Alabama foundry iron in small tonnages has been sold for prompt delivery at $33, base, at furnace. The fact that consumers are willing to pay a delivered price of about $38.20 indicates the present scarcity of spot iron from eastern Pennsylvania furnaces. An eastern Pennsylvania steel mill has bought 5000 to 6000 tons of basic iron for prompt delivery. Between 2000 and 3000 tons of standard low phosphorus iron has also been sold. Some consumers of iron have been holding off in the expectation that prices will be reduced by the Government on Jan. 1. Marked improvement in the structural steel situation, so far as deliveries are concerned, is noted, and it is asserted in a few quarters that there will be plenty for all the building that will be done during the war. Sheared plates are being offered for delivery in 30 to 60 days by a new producer. Offerings of fairly prompt delivery of universal plates are made by a few mills. A number of mills are preparing to accept contracts for finished steel for first quarter delivery, and while there will undoubtedly be an easing of the situation with regard to new business for the commercial trade in the very near future, it is certain that the Government requirements will not leave enough to satisfy all of the demands and many manufacturers must content themselves with a short supply. Although there is considerable discussion in the trade as to abrogation of contracts by Congress, there are few who are willing to believe that the Government will take such a drastic step. It is pointed out that where one consumer might gain by the abrogation of contracts another would lose. The general effect on business, it is held, would be demoralizing.

Pig Iron.—A Virginia iron company opened its books a few days last week for first half delivery and easily disposed of 10,000 tons of foundry grades, all that it desired to sell at this time. These were the first orders this company had taken for first half since last April, when a fair tonnage was sold at a delivered price of $38. All of the company's regular customers were given an opportunity to obtain a portion of the iron. Some, it developed, were not anxious to buy. A few feel that the Government is likely to revise pig iron prices downward on Jan. 1, and they would prefer to wait. Quite a number of foundries have not used all of the iron they bought for this year because of the scarcity of molders, and they have a supply sufficient to carry them into next year. Cast iron pipe foundries, hardware manufacturers and stove makers all complain of poor demand for their products, and they are curtailing production. The Alan Wood Iron & Steel Co. came into the market last week for 5000 to 6000 tons of basic iron for urgent requirements. It obtained about half of this quantity from an export shipment, which had been held up for lack of a license, and the other half in various smaller lots. Between 2000 and 3000 tons of standard low phosphorus iron were sold, and the price will be as fixed by the American Iron & Steel Institute committee. Although it was not required by the purchasers, some of the low phosphorus iron sold was below 0.04 in phosphorus, therefore they must pay a premium of $1.50 per gross ton for each reduction of 0.005 per cent below that figure, whether they require the phosphorus that low or not. In other words, the buyer will not always be able to choose the grade he wants, but must take what he can get, even though he pays a higher price than is really necessary for his requirements. The recommendations of the American Iron & Steel Institute committee are generally approved and will without doubt be promptly accepted as a workable basis for future business. The premiums to be charged for high manganese iron are left to the furnaces for adjustment according to the usual customs. The Virginia furnaces have adopted a schedule providing for a premium of 50c. per gross ton for iron containing 1.00 to 1.50 per cent manganese and $1 additional for each half unit above that quantity, and this will undoubtedly become the custom in this market inasmuch as most of the high manganese iron comes from Virginia furnaces. Various other differentials will be worked out by the sellers, particularly with relation to variations in sulphur and phosphorus content. It is definitely established that Southern furnaces will not sell below the $33 base price at furnace to compete with eastern Pennsylvania or Virginia furnaces. A few small tonnages for prompt delivery to this district have been sold in the past week, the buyer paying the $5.20 freight rate from Birmingham. This illustrates the scarcity of spot iron from eastern Pennsylvania furnaces. Inquiries for next year are coming in freely, among them being one for an aggregate of 13,750 tons for the Altoona shops of the Pennsylvania Railroad Co. The specifications call for charcoal, low silicon, high manganese and foundry iron. The Norfolk & Western Railroad and the Chesapeake & Ohio Railroad have announced an advance of about 52c. per gross ton in the freight rate on pig iron from Virginia furnaces to all points in the East, but does not apply on westbound shipments. The advance was made on five days' notice, as provided under the regulations of the Interstate Commerce Commission, but shippers have the right of appeal, and if there are protests a hearing will undoubtedly be granted. This makes the freight rate into the Philadelphia district about $3.27 per gross ton. We quote the following standard grades at furnace; to these prices the freight rate to destination should be added:

Eastern Penna. No. 1 X	$34.50
Eastern Penna. No. 2 X	33.50
Eastern Penna. No. 2 foundry	33.00
Virginia No. 2 X	33.50
Virginia No. 2 foundry	33.00
Basic	33.00
Gray forge	32.00
Bessemer	36.30
Standard low phosphorus	53.00
Low phosphorus (copper bearing)	50.00

Coke.—Despite the promise of the Fuel Administration at Washington to rush coke to steel mills at work on Government contracts, there has been little relief in the coke situation in this district. The Eastern Steel Co. was obliged to bank one of its furnaces. Other steel mills are running at about 60 to 75 per cent of capacity, largely because they cannot get enough coke.

Ferroalloys.—Demand for ferromanganese is light. A few sales of small tonnages for prompt delivery have been made in the past week at $250, and there are

reports that this price has been slightly shaded. Producers of spiegeleisen are quoting $67.50 to $70 at furnace, with little being done. A number of contracts have been taken, however, at about these prices, with the proviso that any unfilled tonnage when the Government price is announced shall be delivered at the new price.

Billets, Slabs, Etc.—There have been a few small sales of forging billets, but so far as can be learned none of re-rolling billets or slabs has been made since the Government prices were announced.

Sheets.—Pending the announcement of Government prices on sheets (which will be found on another page of this issue) there has been very little business in sheets in this market during the past week.

Structural Material.—Although the Government will require from 50 to 75 per cent of the capacity of many of the mills in this district for shipbuilding, it is becoming apparent that there will be a fair quantity of material remaining for such building as is likely to be done during the war. The Bethlehem Steel Co. is prepared to take on a considerable tonnage of its special building shapes. Even a large building project, requiring from 2000 to 4000 tons, might not find it difficult to get satisfactory deliveries, possibly from three to five months.

Plates.—The Bethlehem Steel Co. has started its new 110-in. plate mill and is offering limited tonnages of sheared plates for delivery in 30 to 60 days at the Government price. Offerings of universal plates for fairly prompt delivery are more common. Within a week, or at the most two or three weeks, several mills will doubtless be accepting business for the first quarter. In view of the large Government requirements, it is doubtful, however, whether there will be enough to meet the demand of civilian business, and mills will probably make a division among their regular customers of their excess over Government orders.

Iron and Steel Bars.—Comparatively little is doing in steel bars from mills, though warehouses are enjoying a good business. Concrete reinforcing bars are moving fairly well. The Philadelphia Electric Co. has just placed an order for 2600 tons for its new plant. Iron bar mills are pretty well sold up for this year. A few orders are being placed at prices ranging from 4.50c. to 5c., Pittsburgh.

Old Material.—The market is in a waiting attitude. Talk of price fixing doubtless is largely responsible for the inactivity. We quote the following prices, which are largely nominal, for delivery in the Philadelphia district:

No. 1 heavy melting steel	$25.00 to $30.00
Steel rails, rerolling	38.00 to 40.00
Low phosphorus heavy melting	35.00 to 38.00
Old iron rails	38.00 to 40.00
Old carwheels	29.00 to 31.00
No. 1 railroad wrought	35.00 to 40.00
No. 1 forge fire	22.00 to 23.00
Bundled sheets	22.00 to 23.00
No. 2 busheling	15.00 to 16.00
Machine shop turnings (for blast furnace use)	15.00 to 16.00
Machine shop turnings (for rolling mill use)	18.00 to 20.00
Cast borings (for blast furnace use)	15.00 to 16.00
Cast borings (clean)	20.00 to 22.00
No. 1 cast	28.00 to 30.00
Grate bars	20.00 to 22.00
Stove plate	20.00 to 22.00
Railroad malleable	32.50 to 35.00
Wrought iron and soft steel pipes and tubes (new specifications)	28.00 to 30.00

Cleveland

CLEVELAND, Nov. 6.

Iron Ore.—The sharp decline in the iron ore movement in October together with a falling off in September shipments has caused more or less anxiety among consumers as to whether enough ore will be brought down this season to supply their needs until the opening of navigation. It is the general belief that there will be enough ore to go around and that no consumer will suffer if an equable distribution of the supply can be made, but the railroad situation is making the proper distribution very difficult. Apparently, viewing the situation from the most favorable light, there will be scarcely a ton of ore more than is needed. However, the weather is going to be an important factor in the situation during the next few weeks. It is estimated that at least 6,000,000 tons of ore must be brought down during the remainder of the season and that to remove all doubts as to a sufficiency of supply all around, the movement should be from 8,000,000 to 9,000,000 tons. A November and December movement of 6,000,000 tons would bring the season's shipments slightly above 60,000,000 tons. There is little doubt that the movement during the remainder of the season will be at least 6,000,000 tons. Weather conditions, which were unusually bad during portions of October, have been better at the upper Lake ports during the past few days. In order to assure a more equable distribution of ore, the Sub-Committee on Pig Iron, Lake Ore and Transportation has recently curtailed ore shipments to Eastern and Lake front furnaces. Previously the regulations of this committee had applied only to interior furnaces. Iron ore shipments fell off 1,343,000 tons in October as compared with September and 922,000 tons as compared with October a year ago. The movement during October was 8,193,892 gross tons as compared with 9,536,152 gross tons in September, and 9,116,196 tons in October, 1916. Shipments for the season up to Nov. 1 were 54,253,598 tons, a decrease of 3,679,248 tons as compared with the same time last year, when the movement was 57,932,846 tons. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, $5.95; old range non-Bessemer, $5.20; Mesaba Bessemer, $5.70; Mesaba non-Bessemer, $5.05.

Pig Iron.—The fixing of differentials on pig iron by the Government is expected to result in an increased volume of activity, as some buyers and sellers have been holding off waiting for the announcement of these differentials. Some business has been placed subject to the prices to be named in the differentials, and these orders will now be definitely entered at the Government price. It is expected that the Government differentials will result in strict adherence by producers to the different grades as specified. In the past, there has been irregularity in the classification by producers in the central West, probably a majority of sellers classing iron running 2 to 2.50 per cent in silicon as No. 2. Under the Government differentials, the foundry iron price is based on iron running 1.75 to 2.25 per cent in silicon which is designated as No. 2. Whether producers continue to sell iron under the old nomenclature of No. 1, No. 2, etc., or not, they will doubtless base the grade strictly on analyses embodied in the differentials, eliminating the former irregularities. There is considerable inquiry for foundry grades ranging from small lots up to 2000 tons. Most of these inquiries are for the first half delivery, although some consumers are in the market for prompt shipment iron, practically none of which is available. The Southern iron market is quiet, a few small lot sales being reported to consumers who are willing to pay the premium price over Southern grades. It has been generally understood that the base price of Ohio silvery iron for 8 per cent silicon would be $46, but in the Government differentials this has been reduced to $44.50. Several sales have been made at the $46 price, some during the past few days, but some of these sales, at least, were made subject to a price revision should a different price be named in the Government differentials. Steel-making iron is quiet, the only new inquiry being from the Southern Ohio territory for 1000 tons of basic iron for prompt shipment. We quote delivered Cleveland, as follows:

Bessemer	$37.25
Basic	33.30
Northern No. 2 foundry	33.30
Southern No. 2 foundry	37.00
Gray forge	32.30
Ohio silvery, 8 per cent silicon	46.12
Standard low phos., Valley furnace	50.00

Coke.—The coke situation continues very unsatisfactory. There is considerable inquiry for foundry coke both for prompt shipment and contracts, but no coke is being offered. It is pointed out that there is no inducement for makers to sell coke to the foundries when they can ship their entire output as furnace coke at the

same price. Some by-product coke is available, but makers are not offering it for sale for the reason that they do not know what price they are authorized to quote on it under the Government regulations.

Finished Iron and Steel.—There is still considerable inquiry for first quarter contracts, principally for steel bars, but mills have not yet opened their books, in most cases not yet knowing how much tonnage they will have to offer because of the heavy demands of the Government. The plate market continues to ease off, and 6c. Pittsburgh is now the maximum quotation for early shipment. There is considerable irregularity in plate prices, which range from 6c. Pittsburgh down to the Government price. An eastern mill is quoting universal plates at 3.25c. at mill, for delivery in this territory. A Cleveland mill that is making sales at higher than the Government price has succeeded in securing a limited quantity of slabs at $50 for rerolling into plates to fill a Government order at regular prices. There is an inquiry in the Cleveland market for about 20,000 tons of billets and bars for export. A Cleveland company is inquiring for 5000 tons of billets and bars and is understood to have been quoted $79 for forging billets, although some producers are asking as high as $105. An order has been placed for 900 tons of bars for airplane forgings. In structural work bids have been received for 440 tons for a new plant for the Standard Steel Castings Co., Cleveland. The demand for hard steel bars is light, and the general maximum quotation is 3.75c. at mill, although the market is not firm. The prices fixed by the Government on sheets appear to be generally satisfactory to producers. A great deal of inquiry is pending, and now that prices have been named it is expected that a large amount of business will be booked. The market has been active the past few days, considerable tonnage being sold at lower prices than have been prevailing. Jobbers have been unloading stocks as much as possible, and the prevailing prices have been 6c. for No. 28 black, 5c. for No. 10 blue annealed and 7c. for No. 28 galvanized. It is rumored that warehouse prices will be fixed by the Government this week. These prices are unchanged at 4.50c. for steel bars, 7c. for plates and 5c. for structural material.

Bolts, Nuts and Rivets.—The demand for bolts and nuts is only moderate, but prices are fairly firm. The rivet market is quiet. Two Government inquiries for a few hundred tons are pending. As noted last week, quotations for Government orders are $5 to $7 lower than the regular prices, Government business being based on 2.90c. steel bars. Regular prices to the trade are unchanged at 5.25c., Pittsburgh, for structural and 5.35c. for boiler rivets. Bolt and nut discounts subject to further discount at 5 to 10 per cent for round lot orders are as follows:

Common carriage bolts, ¾ x 6 in., smaller or shorter, rolled thread, 35 off; cut thread, 30 and 5, larger or longer, 20. Machine bolts, with h. p. nuts, ⅝ x 4 in., smaller or shorter, rolled thread, 40; cut thread, 35; larger and longer, 25. Lag bolts, cone point, 40. Square h. p. nuts, blank, $1.90 off list; tapped, $1.70 off list. Hexagon, h. p. nuts, blank, $1.70 off; tapped, $1.50 off. C. p. c. and t hexagon nuts, all sizes, blank, $1.25 off; tapped, $1 off. Cold pressed semi-finished hexagon nuts, 50 and 5 off.

Old Material.—The market is in an unsettled condition as a result of the Government regulation of prices on heavy melting steel, borings and turnings and railroad wrought. The maximum prices of the Government are higher than the present prices in the Cleveland market on the grades regulated except possibly railroad wrought, which declined during the week to close to the Government price. There is a general feeling that the Government regulation will have no effect on prices for the present, but that they will be regulated by the supply and demand, subject, of course, to the Government maximum prices. However, producers are expected to hold their scrap with the hope of getting the maximum prices, and some dealers fear they will suffer losses in covering short orders. The market has been quiet during the week, sales limited almost entirely to transactions between dealers. Heavy melting steel has sold at $27 to $27.75 and busheling at $22.25 to $23. We quote f.o.b. Cleveland as follows:

Per Gross Ton

Steel rails	$26.00 to $27.00
Steel rails, rerolling	36.00 to 37.00
Steel rails, under 3 ft.	30.00 to 31.00
Iron rails	35.00 to 36.00
Steel car axles	45.00 to 46.00
Heavy melting steel	27.00 to 28.00
Carwheels	26.50 to 27.50
Relaying rails, 50 lb. and over	50.00 to 60.00
Agricultural malleable	22.00 to 23.00
Railroad malleable	27.00 to 28.00
Steel axle turnings	21.00 to 22.00
Light bundled sheet scrap	20.00 to 20.50

Per Net Ton

Iron car axles	$44.00 to $45.00
Cast borings	16.75 to 17.25
Iron and steel turnings and drillings	16.00 to 16.75
No. 1 busheling	22.00 to 23.00
No. 1 railroad wrought	30.00 to 31.00
No. 1 cast	23.00 to 23.50
Railroad grate bars	16.00 to 17.00
Stove plate	16.00 to 17.00

Cincinnati

CINCINNATI, Nov. 6.—(*By Wire.*)

Pig Iron.—Definite information on the price differential question between grades of iron is received locally with a feeling of relief. A large percentage of contracts made in October is subject to revision, but the announcement has already tended to clear the atmosphere to a large extent. No appreciable effect has yet been noticed, but it is generally thought that contracting will be on a much larger scale and that buying for the first half will commence in earnest. The principal difficulty in the way of booking any large amount of business is the scarcity of iron, which is more marked in the southern Ohio district than elsewhere. Virginia makers also will probably not have a very large additional tonnage to offer in this territory, but to some extent this will be offset by foundry iron that can be obtained in the South from concerns which have refrained from selling heavily on account of the disturbed conditions and the uncertainty of the coke supply situation. One question that has been discussed and about which some doubt is yet expressed is whether furnaces in the South having a freight differential in their favor on Northern shipment are expected to observe the base price of $33 furnace, or, as heretofore, $33 Birmingham basis. The inquiry for foundry iron is very good. Melters seem more disposed to contract for their first half requirements, but in not many cases are they able to obtain the particular brand of iron generally used by them. Among the larger inquiries out is one from northern Ohio for 7500 tons of foundry iron for first half shipment. Others include lots of 100 to 1000 tons from southern Ohio and Indiana melters. A few cars of Ohio silvery were sold last week at $46 furnace, or $1.50 above the new schedule. Some Lake Superior charcoal has also been sold with the understanding that the government's prices were to rule. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, prices as follows:

Southern coke, No. 2 foundry and 2 soft	$35.90
Southern Ohio coke, No. 2	34.26
Basic, Northern	34.26

(*By Mail*)

Coke.—The market is simply flooded with inquiries for foundry coke, some of which are for prompt shipment, and there is an intense interest taken in first half supplies by foundrymen who find they are running short for that delivery. Some furnace coke is also wanted, and if sales could be made by the different agencies, the tonnage that would change hands in a very short time would be surprisingly large. As far as can be ascertained, no coke of any kind is being sold at $6 per net ton at oven with the possible exception of a few cars of Connellsville foundry grades. Other producing districts are out of the running entirely as far as new business is concerned and are operating so as to take care of old contracts. It is rumored that some of these contracts, made before the $6 price was set, have been extended, but confirmation of this cannot be definitely obtained. It is generally thought that a change of attitude on the part of coke producers will have to be made at a very early date or there will be considerable suffering on the part

of foundrymen, due to the lack of fuel. Already a few in this territory have been compelled to borrow from their neighbors so as to keep their foundries running. To some extent this is due to the car shortage.

Finished Material.—Very few wire nails have been sold at the new jobber's price of $4.20 per keg base, but $4 has lately been done on a few scattered lots. Purchases of nails are much smaller than usual, and in some instances jobbers have been asked by retail merchants to fill their orders for such small quantities as two or three kegs at a time. Structural shapes are in a little better demand, and fairly prompt shipments can be made from warehouse stocks at 5.15c. Steel bars remain at 4.65c., and twist steel bars, 4.70c. Flat bars 2 x 1 in. and heavier and also rounds 3 in. in diameter and over are selling at 5c. Plates remain at 7c., with very light business reported. The store price on No. 10 blue annealed sheets is 8c. a lb., which is now considerably above the Pittsburgh mill quotation, and a further reduction is expected.

Old Material.—Conditions are still very quiet, and leading dealers are willing to let the market drag along until it automatically adjusts itself. No changes in quotations are made, but desirable business would undoubtedly be taken at a reduction from the regular quotations. Inbound scrap is about on the par with outbound shipments. Dealers are making no large purchases, and none seem inclined to add to their stocks just at the moment.

The following are dealers' prices, f.o.b. cars, southern Ohio and Cincinnati:

Per Gross Ton	
Bundled sheet scrap	$17.50 to $18.00
Old iron rails	32.00 to 32.50
Relaying rails, 50 lb. and up	44.00 to 44.50
Rerolling steel rails	33.00 to 33.50
Heavy melting steel scrap	24.00 to 24.50
Steel rails for melting	24.50 to 25.00
Old carwheels	25.00 to 25.50
Per Net Ton	
No. 1 railroad wrought	$27.50 to $28.00
Cast borings	12.00 to 12.50
Steel turnings	12.00 to 12.50
Railroad cast	18.50 to 19.00
No. 1 machinery cast	22.50 to 23.00
Burnt scrap	13.00 to 13.50
Iron axles	40.00 to 40.50
Locomotive tires (smooth inside)	33.50 to 34.00
Pipes and flues	15.50 to 16.00
Malleable cast	19.00 to 19.50
Railroad tank and sheet	14.00 to 14.50

St. Louis

ST. LOUIS, Nov. 5.

Pig Iron.—The inquiries for pig iron continue very heavy and come from many points east, as well as from the St. Louis territory, but are productive of no business because none of the representatives is in position to close, nor will the furnaces accept contracts. One representative reports inquiries ranging from 100 to 4000 tons on his list, and aggregating probably 60,000 tons, all of which is likely to remain in the uncertain state for some time to come. The Commonwealth Steel Co. is in the market for 15,000 tons of Northern basic, but has so far been unable to make a deal therefor. The local furnace is practically sold up for the first half of the coming year, is disinclined to make contracts beyond that period and is therefore not available to the interests outside of the St. Louis territory which have been endeavoring to get iron here which they could not obtain elsewhere.

Coke.—The coke inquiries during the past week have been heavy from foundries in all parts of the St. Louis territory, but no contracts have eventuated because of the inability of representatives to accept any business. One Connellsville concern is reported as having made a price of $7 Connellsville for best selected 72-hour foundry coke through the year 1918, but has limited this to its old customers. The local by-product plant and the nearby producers of by-product coke continue out of the market and are making no quotations or sales.

Finished Iron and Steel.—Mill representatives continue to receive unsolicited orders in considerable quantity, but are filing them as there is no method by which they can put them in the shape of definite contracts with specific deliveries. No large contracts are being offered by regular customers, as they have settled down to the fact that they will be taken care of as best the mills can and are content to accept the situation. Some orders are getting consideration when they are for material which can be shipped out of accumulated mill stock, but such occurrences are rather rare. Movement out of warehouse continues up to capacity and in some classes of material beyond that point. For stock out of warehouse we quote as follows: Soft steel bars, 4.55c.; iron bars, 4.45c.; structural material, 5.05c.; tank plates, 7.05c.; No. 10 blue annealed sheets, 8.05c.; No. 28 black sheets, cold rolled, one pass, 8.55c.; No. 28 galvanized sheets, black sheet gage, 9.55c.

Old Material.—Scrap dealers acquired a buoyant feeling during the latter part of the week, only to lose it again as business opened this morning with notifications from customers having Government contracts that old material coming forward under existing contracts could not be accepted at the price. This was taken as meaning that prices would be abrogated in such cases and in consequence there would be much trouble ahead with possible losses on contracts running for months ahead at figures providing a good profit. Dealers were thrown into a state of extreme uncertainty with no way of determining what the next development would be. In some of the cases affected by the notifications referred to, thousands of tons of scrap are still due. This scrap has, to a large extent, been bought and is in some cases on the way to the mills. The result cannot be foretold at present, but the dealers are naturally extremely pessimistic at the moment. Car troubles are also prevalent, shippers being unable to obtain open cars, other than flats, and the customers, mostly utilizing magnets for unloading, unwilling to accept box cars. Flats boarded up are being used a little but are not satisfactory. Locally there has not been any buying of consequence during the past week, though there has been some demand for steel specialties, such as couplers, knuckles, steel springs, bolsters, etc. Relaying rails are unobtainable at any price. Rolling mill grades were advancing toward the close of the week, but these, like all the rest, were knocked in the head by to-day's developments. Lists appeared during the week from the Kansas City Southern; Nashville, Chattanooga and St. Louis; Minneapolis and St. Louis; Baltimore and Ohio; Northern Pacific, Union Pacific, Mobile and Ohio, Great Northern and the Pennsylvania, the tonnages being heavy and apparently induced by a feeling that the market was likely to drop. What the result of the refusal of mills to accept material at contract prices will be on these lists is not determinable at this writing. We quote dealers' prices, f.o.b. consumers' works, St. Louis industrial district, with the reservation that conditions at the moment of sale govern the figures rather than the quotations now presented:

Per Gross Ton	
Old iron rails	$36.00 to $37.00
Old steel rails, re-rolling	36.00 to 36.50
Old steel rails, less than 3 feet	37.00 to 37.50
Relaying rails, standard section, subject to inspection	60.00 to 75.00
Old carwheels	28.00 to 28.50
No. 1 railroad heavy melting steel scrap	27.50 to 28.00
Heavy shoveling steel	25.50 to 26.00
Ordinary shoveling steel	24.00 to 24.50
Frogs, switches and guards cut apart	27.50 to 28.00
Ordinary bundled sheet scrap	18.00 to 18.50
Heavy axle and tire turnings	18.00 to 18.50
Per Net Ton	
Iron angle bars	$34.50 to $35.00
Steel angle bars	27.00 to 27.50
Iron car axles	43.00 to 43.50
Steel car axles	41.00 to 41.50
Wrought arch bars and transoms	42.00 to 42.50
No. 1 railroad wrought	30.00 to 31.00
No. 2 railroad wrought	28.00 to 28.50
Railroad springs	30.00 to 31.00
Steel couplers and knuckles	28.50 to 29.00
Locomotive tires, 42 in. and over, smooth inside	30.00 to 31.00
No. 1 dealers' forge	21.00 to 21.50
Cast iron borings	16.50 to 17.00
No. 1 busheling	23.00 to 23.50
No. 1 boilers, cut to sheets and rings	18.50 to 19.00
No. 1 railroad cast scrap	20.50 to 21.00
Stove plate and light cast scrap	17.00 to 17.50
Railroad malleable	25.50 to 26.00
Agricultural malleable	21.00 to 21.50
Pipes and flues	21.00 to 21.50
Heavy railroad sheet and tank scrap	18.50 to 19.00
Railroad grate bars	18.00 to 18.50
Machine shop turnings	16.50 to 17.00
Country mixed scrap	17.50 to 18.00

New York

NEW YORK, Nov. 7.

Pig Iron.—The interesting development in the pig iron market, showing the condition of the labor market, is the failure of an important company, having a large plant in New Jersey and contracts for castings with numerous concerns which it hoped to help in obtaining pig iron, to exercise an option for 10,000 tons of foundry grades of Eastern Pennsylvania iron for delivery through the remainder of this year and the first quarter of next year, the reason being that the company and the concerns with which it had contracts for castings were unable to obtain enough molders to keep the plants in full operation. The Singer Sewing Machine Co., which has been in the market for 5000 tons No. 1 foundry for the remainder of this year and the first half of next, has bought about 2000 tons and is still negotiating. The American Brake Shoe & Foundry Co. has sent out a new inquiry for 2000 tons of foundry grades. Some important interests report that they have very little iron to sell for delivery prior to July 1 of next year, this being true particularly of Virginia and Buffalo irons. In Buffalo coke shortage is causing considerable trouble. For early delivery we quote as follows, tidewater:

No. 1 X	$35.25
No. 2 X	34.25
No. 2 Plain	33.75
No. 2 Southern	37.25
No. 2 X Virginia	36.50 to 36.75

Ferroalloys.—The domestic ferromanganese market is quiet and the quotation for delivery this year or next ranges from $250 to $275, furnace. Sales of small lots have been made at $250, $260 and $275 per ton in the last week. Demand is not large. The 12,000-ton inquiry for 20 per cent spiegeleisen, which has been before the market for two weeks, has been awarded but details are lacking. The quotation for 1918 delivery is $65, furnace, with $70 asked for this year's material. A lot of 1000 tons of 16 to 20 per cent alloy for January-February delivery has been sold at about $72, delivered. Ferrosilicon, 50 per cent, is quiet and unchanged at last week's quotations.

Finished Iron and Steel.—Distribution in behalf of the Government among the country's mills has been active since the last report. For destroyers some 45,000 tons of plates have been distributed and for the Emergency Fleet Corporation 15,000 tons. It is now estimated that all of 1,500,000 tons of plates will be required each of the next two years for shipbuilding. The total production of sheared plates ¼ in. and over in thickness in 1916 was 2,453,150 gross tons. The large percentage which will thus be required for an industry which before the war made negligible demands is an indication of how scarce plates will be for business coming under the C classification of the Priority Committee of the War Industries Board. It is stated that 5000 cars are about to be distributed by the Government among 11 car-building companies for the expeditionary force in France. As yet definite conclusion has not been made of the 30,000 cars for Russia or of the 10,000 cars for the French railroads. Domestic road inquiries total some 6000 cars. New steel buying has generally been small in volume. Most of this has been for export on which higher than the fixed prices are asked, but exporters are finding it increasingly difficult to put through such business. In the fabricating field the American Bridge Co. has closed for 1900 tons for the New York Shipbuilding Co. and 1200 tons for repairing the Baltimore & Ohio pier recently burned at Baltimore. For a plant and angle shop at Hog Island for the American International Corporation some 2100 tons will be required. In bar iron more business at 4.50c., Pittsburgh business is noted and some easing is expected in bolts, nuts and spikes. So far as business in Eastern territory is concerned the steel bars range from 2.90c. to 4c., Pittsburgh; shapes are obtainable in two or three months at 3c., Pittsburgh, and tank plates are nominal at 3.25c., Pittsburgh. For mill shipments of iron bars we quote 4.695c. to 4.945c., New York. Out of store we continue to quote shapes and iron and steel bars at 5c. to 5.50c., New York, and plates at 8c. and higher, with a possibility that 7c. might be done. A 3 per cent transportation tax now applies.

Cast Iron Pipe.—The United States Government is in the market for 2750 tons of cast iron pipe ranging from 4 to 20 in. in size, and will receive bids Nov. 10 at Washington. The pipe is for export to France. The bidding will show to what extent makers are willing to make concessions. It is evident that the market is not very strong at the recently named prices of $56.50 on 6 in. and heavier and $59.50 on 4 in.

Old Material.—The old material market continued to drag awaiting developments from Washington and it is not yet clear what effect the price fixing at Washington will have. The limited buying of heavy melting steel by the Carnegie Steel Co. in the Pittsburgh district has not had any effect in this district. We quote prices of brokers as follows to New York producers and dealers, per gross ton, New York:

Heavy melting steel scrap, (for shipment to eastern Pennsylvania)	$24.00 to $24.50
Old steel rails (short lengths) or equivalent heavy steel scrap	24.00 to 25.00
Relaying rails	45.00 to 50.00
Rerolling rails	33.00 to 34.00
Iron and steel car axles	41.00 to 42.00
No. 1 railroad wrought	32.00 to 33.00
Wrought-iron track scrap	27.00 to 28.00
No. 1 yard wrought long	27.00 to 28.00
Light iron	7.00 to 8.00
Cast borings (clean)	16.00 to 17.00
Machine-shop turnings	14.00 to 15.00
Mixed borings and turnings	13.00 to 14.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long)	25.00 to 26.00

Dealers in New York City and Brooklyn are quoting as follows to local foundries, per gross ton, but for delivery to cupola platforms of Brooklyn foundries, about $3 more is quoted:

No. 1 machinery cast	$25.00 to $26.00
No. 1 heavy cast (column, building materials, etc.)	21.00 to 22.00
No. 2 cast (radiators, cast boilers, etc.)	21.00 to 22.00
Stove plate	19.00 to 20.00
Locomotive grate bars	16.00 to 17.00
Malleable cast (railroad)	27.00 to 28.00
Old carwheels	27.00 to 28.00

Buffalo

BUFFALO, Nov. 5.

Pig Iron.—One of the larger producing interests of the district, that is now more actively in the market as a seller than other interests, having a greater available tonnage to dispose of, has sold approximately 10,000 tons during the week, the bulk of it being foundry iron, at $33 per ton at furnace. Melters are manifesting a lively interest in the securing of tonnage to cover their first quarter and first half needs, and there is plenty of inquiry, with indications that it will keep up in good volume for a considerable period ahead. Most furnaces are only able to care for old customer trade, and current sales are almost entirely for 1918 delivery, there being very little tonnage left that is available for delivery this year. The outlook is that there will be a heavy tonnage of iron booked for first half 1918 delivery within a very short period. Prices range at approximately the same level as a week ago, and we continue the same schedule as reported last week, which is as follows for the various grades, f.o.b. furnace Buffalo:

No. 1 foundry	$34.50
No. 2 X	33.50
No. 3 foundry	32.50
Gray forge	32.00
Malleable	33.50
Basic	33.00
Lake Superior charcoal, f.o.b. Buffalo	39.75

Old Material.—Large sales of heavy melting steel are reported, and inquiries for considerable tonnages of this grade of scrap continue to be received, giving a much stronger tone to the market than was noted last week. This commodity is now commanding $27.50 to $29 per ton, as against $27 to $28 last week.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

(Some of these quotations are nominal, showing prices which prevailed when last sales were made. Published as a matter of record.)

Freight rates from Pittsburgh on iron and steel articles, aside from wrought iron and steel pipe in carloads, per 100 lb. New York 19.5c.; Philadelphia 18.5c.; Boston 21.5c.; Buffalo 11.6c.; Cleveland 13.5c.; Cincinnati 18.5c.; Indianapolis 20c.; Chicago 21.5c.; St. Louis 27c.; Kansas City 47c.; minimum carload 36,000 lb.; St. Paul 35.5c.; minimum carload 36,000 lb.; Denver 79c.; minimum carload 36,000 lb.; Omaha 47c.; minimum carload 36,000 lb.; New Orleans 30.7c.; Birmingham 46c.; Pacific Coast 75c.; minimum carload 80,000 lb. To the Pacific Coast, the rate on steel bars and structural steel is 90c.; minimum carload 40,000 lb. and 85c.; minimum carload 50,000 lb. On wrought iron and steel pipe, the rate from Pittsburgh to Kansas City is 40c. per 100 lb., minimum carload 46,000 lb.; to Omaha 40c., minimum carload 46,000 lb.; to St. Paul 35.5c., minimum carload 46,000 lb.; Denver 79c., minimum carload 46,000 lb. *A 3 per cent transportation tax now applies.*

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in., angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 3c.

Wire Products

(Prices, except on annealed fence wire, not announced, but figured to correspond with the price of $3.25 on annealed fence wire as announced at Washington.)

Wire nails, $3.50 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire, $3.45 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.25; galvanized wire, $3.95; galvanized barb wire, and fence staples, $4.35; painted barb wire, $3.65; polished fence staples, $3.85; cement-coated nails, $3.40 base, these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net less 2 per cent off for cash in 10 days

Nuts and Bolts

Discounts in effect for large buyers are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days.

Carriage bolts, small, rolled thread, 40 per cent; small cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent with c. p. nuts 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq. blank, $1.70 off list, and tapped, $1.50 off; hex. blank, $1.50 off, and tapped, $1.30 off; nuts, c. p. c. and t. sq. blank, $1.25 off; and tapped, $1 off; hex. blank, $1.25 off, and tapped, $1 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Wire Rods

Soft Bessemer and open-hearth rods to domestic consumers at $57; high-carbon rods made from ordinary open-hearth steel, $95 to $100, and special steel rods with carbons running from 0.40 to 0.60, $100 to $110 at mill; above 0.60 carbon, $115 to $120.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $5 to $5.50; ¾ in., 7/16 in. and ½ in., $7.00 base. Boat spikes are occasionally quoted $7 to $8, all per 100 lb., f.o.b. Pittsburgh, but some makers are quoting higher. Track bolts with square nuts, 7c. to 7.50c. to railroads, and 8c. to 8.50c. in small lots for fairly prompt shipment.

Steel Rails

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails and on carload and smaller lots, 4c. to 4.25c. at mill. Light rails, 25 to 45 lb., $75 to $80; 16 to 20 lb., $80 to $81; 12 and 14 lb., $82 to $83; 8 and 10 lb., $83 to $84; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard Bessemer rails, $38; open hearth, $40 per gross ton, Pittsburgh.

Terne Plate

Effective July 31, prices on all sizes of terne plates were advanced from $2 to $2.50 per package and are now as follows: 8-lb. coating, 200 lb., $16 per package; 8-lb. coating, I. C., $16.30; 12-lb. coating, I. C., $17.50; 15-lb. coating, I. C., $18.25; 20-lb., coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.90c. for delivery late this year, and 4.50c. to 5c. from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c., railroad test bars, 5.25c. in carload and larger lots f.o.b. mill.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card, as announced Nov. 5 by the Government on steel pipe, those on iron pipe being the same as quoted for some time:

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	44	17½	⅛ and ¼	23	+4
½	48	33½	⅜	24	+3
¾ to 3	51	37½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	44	31½	2	26	12
2½ to 6	47	34½	2½ to 6	8	15
7 to 12	44	30½	7 to 12	25	12
13 and 14	34½	..			
15	32	..			

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	40	22½	⅛, ¼ and ⅜	22	5
½	45	32½	½	27	14
¾ to 1½	49	36½	¾ to 1½	33	18
2 to 3	50	37½			

Lap Weld, extra strong, plain ends

2	42	30½	2	27	14
2½ to 4	45	33½	2½ to 4	29	17
4 to 6	44	32½	4½ to 6	28	16
7 to 8	40	26½	7 to 8	20	8
9 to 12	35	21½	9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

Nominal discounts on less than carload lots, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in.	28	1¾ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3½ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in.	No quotations
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths. Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net or 2 per cent discount in 10 days:

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer

	Cents per lb.
Nos. 3 to 8	4.00
Nos. 9 and 10	4.25
Nos. 11 and 12	5.00
Nos. 13 and 14	4.75
Nos. 15 and 16	5.00

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	4.80
Nos. 22 and 24	4.85
Nos. 25 and 26	4.90
No. 27	4.95
No. 28	5.00
No. 29	5.05
No. 30	5.15

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11	5.25
Nos. 12 and 14	5.35
Nos. 15 and 16	5.50
Nos. 17 to 21	5.65
Nos. 22 and 24	5.80
Nos. 25 and 26	5.95
No. 27	6.10
No. 28	6.25
No. 29	6.50
No. 30	6.75

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	4.80
Nos. 17 to 21	4.85
Nos. 22 to 24	4.90
Nos. 25 and 27	4.95
No. 28	5.00
No. 29	5.05
No. 30	5.05
Nos. 30½ and 31	5.10

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
		Electro-	New	New	St.	New	St.
Oct.	Lake	lytic	York	York	Louis	York	Louis
31	23.50	23.50	66.00	6.00	5.87½	8.00	7.75
Nov.							
1	23.50	23.50	66.00	6.12½	6.00	8.00	7.75
2	23.50	23.50	66.00	6.12½	6.00	7.87½	7.62½
3	23.50	23.50	....	6.25	6.12½	7.87½	7.62½
5	23.50	23.50	68.00	6.25	6.12½	7.87½	7.62½

NEW YORK, Nov. 7.

The markets are generally quiet. Copper continues unchanged and nominal at the Government price. Tin is scarce and higher. Lead is quiet but very strong. Spelter is dull and lower. Antimony has again declined nominally.

New York

Copper.—We continue to quote the Government price of 23.50c. for both Lake and electrolytic copper as nominal. No metal is obtainable at this price in large quantities for early delivery. The Copper Producers' Committee controls the situation absolutely, and official information is unobtainable. The jobbers' position and that of the small consumer continue chaotic, but copper in small lots is being sold at above the Government price. Such jobbers' stocks, however, are growing smaller, and replenishing them at any price is almost impossible. The London market continues dull and unchanged at £125 per ton for spot electrolytic and £121 for futures.

Copper Averages.—In the absence of any sales of Lake or electrolytic copper at the Government or any other price in quantities sufficient to establish a market, there is no monthly average based on quotations in THE IRON AGE possible. The Government price of 23.50c. has been quoted regularly as nominal.

Tin.—The acute shortage in spot tin continues the controlling factor. The market is strong and higher, a small lot of spot having been sold at 68c., New York, on Monday. Tin for this position is practically unobtainable, and the small consumers placed in a tight corner. A buyer desiring 15 tons late last week could not obtain it. There were moderate sales of future tin on Monday. In a quiet way on Oct. 31 and Nov. 1 and 2, considerable metal of all grades was disposed of, mostly for future shipment, but these were not made public. The permit situation is unrelieved, and the future of the spot buyer is uncertain. Arrivals up to Nov. 2 inclusive were 160 tons, with 4300 tons afloat. The London market continues to advance, spot Straits having been quoted on Nov. 3 at £260 10s., an increase of £4 in the week.

Lead.—The market continues to display much strength. Demand is active, and prices have risen almost daily until on Monday the quotation in the outside market was 6.25c., New York, or 6.12½c., St. Louis, for early delivery. The American Smelting & Refining Co. also advanced its price on Monday ½c. per lb., to 6c., New York. There is, however, very little metal available from either source. The leading producer has not been a free seller in the last few days, even restricting its customers' purchases. A higher market is looked for. Buyers desire to purchase but sellers are scarce. It is estimated that in the large buying movement a week ago not far from 20,000 tons were sold, including large amounts for Canada and France.

Spelter.—The market is still stagnant and weak. Demand from the usual large consuming sources shows no sign of revival. Consumption is still considerably behind production, though lower prices are continually forcing certain producers to close down. Small lots have sold as low as 7.50c., St. Louis, with others at 7.75c. The latter quotation is steadily adhered to by some producers. The quotation for prime Western is more or less nominal at 7.62½c., St. Louis, or 7.87½c., New York, for early delivery.

Antimony.—Quotations for Chinese and Japanese grades are unchanged at 14.25c., New York, duty paid. The market is dead.

Aluminum.—Demand for aluminum is not even fair. No. 1 virgin metal, 98 to 99 per cent pure, is nominally quoted at 36c. to 38c., New York.

Old Metals.—The market is unsettled. Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible (nominal)	23.50
Copper, heavy and wire (nominal)	23.50
Copper light and bottoms	21.00 to 21.50
Brass, heavy	18.00 to 18.25
Brass, light	12.00 to 12.25
Heavy machine composition	24.50 to 25.50
No. 1 yellow rod brass turnings	16.00 to 17.00
No. 1 red brass or composition turnings	19.00 to 20.50
Lead, heavy	5.25
Lead, tea	4.25
Zinc	6.25

Chicago

Nov. 5.—Considerable copper is being sold by second hands at prices ranging from 28c. upward. Some of the resellers are manufacturers who have a surplus and believe they can safely take a profit now and replenish their supply early next year at 23.50c. If their judgment fails, they may find themselves in a tight place, as has happened before. In lead there was active buying around 5.45c., the principal producer taking practically all of the business for the reason that the independents did not meet its price. Subsequently the big producer advanced its quotation to 5.95c. and the business tapered off. Tin has been active, and now stands at 68c., with much higher prices predicted. Its future, however, is admittedly fraught with uncertainty, and buying for any purpose, save immediate need, is a gamble. Spelter is inactive. Old metals are quiet. We quote as follows: Casting, Lake and electrolytic copper, 28c. to 30c.; tin, carloads, 68c.; small lots, 70c.; lead, 5.95c.; spelter, 7.50c. to 7.62½c.; sheet zinc, 19c.; antimony, 16c. to 17.50c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible wire, crucible shapes, 20c.; copper clips, 20c.; copper bottoms, 19c.; red brass, 19c.; yellow brass, 14.50c.; lead pipe, 4.50c.; zinc, 5c.; pewter, No. 1, 35c.; tinfoil, 42c.; block tin, 47c.

St. Louis

Nov. 5.—In the nonferrous metals market lead, which weakened during the earlier part of the week, regained a little strength toward the end and to-day closed at 6.12½c. in carload lots; spelter was a little less strong and in carload lots the close to-day was at 7.50c. to 7.62½c. In less than carload lots the closing figures to-day were: Lead, 6.75c.; spelter, 8.50c.; tin, 73c.; copper nominal, with reselling prices around 27.50c.; Asiatic antimony, 18c. In the Joplin district there was a decidedly weaker feeling in zinc blende, with the range from $57.50 to $72.50, basis of 60 per cent metal. The interest which had been holding the top figure up to $75 shortened the price to the top range, but took only the very best ores at that price. The average for the week for the district was $65 per ton. Calamine ranged from $33 to $37 per ton, basis of 40 per cent metal, while the average for the week for the district was $35 per ton. Lead showed extreme weakness early in the week, selling as low as $60 per ton, but recovered to $65, which is still $15 per ton below the price of two weeks ago. The average for the week for the district, basis of 80 per cent metal, was $65. On miscellaneous scrap metals we quote dealers' buying prices as follows, some changes being noted: Light brass, 11c.; heavy yellow brass, 15c.; heavy red brass and light copper, 19c.; heavy copper and copper wire, 21.50c.; pewter, 25c.; tinfoil, 42c.; zinc, 5c.; tea lead, 5c.; lead, 5.50c.

Late last week four blast furnaces in the Youngstown, Ohio, district were banked owing to the shortage of coke. Three stacks at the Ohio works of the Carnegie Steel Co. were idle, and one of the Hubbard furnaces at the Youngstown & Tube Co. Niles stack of the Carnegie Steel Co., at Niles, Ohio, is also banked for lack of coke.

IRON AND INDUSTRIAL STOCKS

Last Week's Slump—More Liberty Bonds—An Important Conference

NEW YORK, Nov. 6.

The remarkable slump in stocks last week is generally attributed to short selling to a large extent, but it is recognized that Government demands for money continue to have a depressing effect on the market. Steel common reached the extremely low point of 93¼ on Thursday. This stock first sold on the curb March 26, 1901, at 38, and rapidly advanced to 55. Following the depression of 1904 and the liquidation that resulted, it dropped to 8⅜, and not until 1908 did it sell above the high record of 55, established in 1901. On Oct. 4, 1909, it sold at 94⅞, and that record stood until September, 1916, when for the first time in its history it crossed par. Following the outbreak of the European war, when the Stock Exchange was closed, Steel common sold on the New Street market Oct. 24, 1914, at 38½. On May 31, 1917, the high record of 136⅝ was established. The stock remained above par until last week, when on Thursday it dropped 93½, but made a good gain later in the week. Gains were also recorded on numerous other stocks. An important feature of the week was that in spite of the low prices prevailing there was at no time a panicky condition.

Among the stocks which recorded losses for the week were the following: American Car & Foundry, 5¾; American Locomotive, com., 9; American Steel Foundries, 6½; Baldwin Locomotive, com., 8¾; Bethlehem Steel, com., 8; Bethlehem Steel, class B, 8; Bethlehem Steel, pref., 2; Colorado Fuel & Iron, 6½; Crucible Steel, 11¾; Gulf States Steel, 12; Lackawanna Steel, 7½; Midvale Steel, 3½; National Acme, 3½; National Enameling & Stamping, 4⅜; Pressed Steel Car, 3; Republic Iron & Steel, 8½; Superior Steel, 6⅜; United States Cast Iron Pipe & Foundry, 1⅞; United States Steel, com., 11¼; United States Steel, pref., 2.

The range of prices on active iron and industrial stocks from Wednesday of last week to Monday of this week was as follows:

Allis-Chal. com..	15½ - 19⅞	Int. Har. of N. J. com	101¼-104
Allis-Chal. pf....	69⅞ - 71	Int. Har. of N. J. pf.	110
Am. Can com....	30 - 39⅞	Int. Har. Corp. com.	54 - 57½
Am. Can pf.....	93 - 96	Lacka. Steel	68 - 77
Am. Car & Fdry. com.	58 - 63½	Lake Sup. Corp.	10¼ - 12¾
Am. Car & Fdry. pf.	106 -107¼	Midvale Steel ..	40⅛ - 43¾
Am. Loco. com.	47½ - 55	Nat.-Acme.	26½ - 27⅞
Am. Loco. pf....	94¾ - 97¾	Nat. En. & Stm. com.	31 - 36⅞
Am. Radi. com..	280 -292	N. Y. Air Brake.	98 -105
Am. Ship. com..	83¾ - 91	Nova Scotia St..	74 - 79
Am. Steel Fdries.	52 - 57⅞	Pr. Steel com...	50 - 55
Bald. Loco. com.	50 - 58¼	Pr. Steel pf.....	90
Bald. Loco. pf..	94¼ - 94⅝	Ry. St. Spring com.	36¼ - 40
Beth. Steel com.	74 - 79	Republic com. ..	68½ - 75
Beth. St., Class B.	73 - 80	Republic pf.	96½ - 97
Beth. Steel pf.....	90	Sloss com	33¾ - 37½
Cambria Steel	115	Superior Steel ..	30¼ - 34
Case (J. I.) pf.....	80	Superior St. 1st pf.....	98
Cent. Fdry. com.....	27	Un. Alloy St. 1st pf.	37¾ - 40
Cent. Fdry. pf.....	36	U. S. Pipe com.	10 - 12⅝
Charcoal Iron com....	5½	U. S. Pipe pf...	48½ - 49
Chic. Pneu. Tool.	40 - 51	U. S. Steel com.	90⅞ -101⅞
Colo. Fuel	30½ - 35⅝	U. S. Steel pf..	109⅝ -113
Crucible St. com.	51⅛ - 63	Va. I. C. & Coke.	50 - 55
Crucible St. pf..	89½ - 90½	Warwick	7⅝
Deere & Co. pf..	99½ - 99¾	West. Elec.	36⅛ - 41⅝
Gen. Electric ...	124⅞ -130		
Gt. No. Ore. Cert.	22⅝ - 26¾		
Gulf St. Steel ...	80 - 90		
Gulf St. Steel 1st pf.	101⅞		

Dividends

The American Radiator Co., quarterly, 3 per cent on the common, payable Dec. 31, and 1¾ per cent on the preferred, payable Nov. 15.

Deere & Co., quarterly, 1¾ per cent on the preferred, payable Dec. 1.

The Eastern Steel Co., quarterly 2½ per cent on the common, payable Jan. 15, extra 5 per cent, payable Dec. 1, and quarterly, 1¾ per cent on the first and second preferred, payable Dec. 15.

The Inland Steel Co., quarterly, 2 per cent, payable Dec. 2.

The International Harvester Co., of New Jersey, quarterly, 1¾ per cent on the preferred, payable Dec. 1.

The International Harvester Corporation, quarterly, 1¾ per cent on the preferred, payable Dec. 1.

The Penn-Seaboard Steel Corporation, quarterly, $1 per share, payable Nov. 1.

The Savage Arms Corporation, quarterly, 1½ per cent on the common, 1¾ per cent on the first preferred, and 1½ per cent on the second preferred, all payable Dec. 15.

OBITUARY

JOSHUA HORROCKS, one of the first manufacturers of poultry wire fencing in the United States, died at his home in Brooklyn, N. Y., Nov. 5, aged 77 years. He was born at Manchester, England, and learned the trade of forming useful articles from wire there. At the age of 28 he emigrated to California, where he first made poultry wire. He subsequently moved to Chicago, and when his plant was destroyed in the fire of 1871 came to New York. For many years he was located at 111 Fulton Street, removing later to the present factory at Brooklyn, N. Y. In 1898, following a stroke of paralysis, the business was incorporated with one son, Edward E., as president and another, Frederick H., as treasurer. Although Mr. Horrocks had been confined to his room for the last seven years, his death was caused by pneumonia. He invented the steel door mat. He left a widow, three sons and one daughter.

JOSEPH DAIN, SR., a prominent member of the Deere & Co. organization, and a resident of Moline, Ill., since 1912, died Nov. 1 at the Eietel Hospital, Minneapolis, Minn. He was taken ill on Oct. 29 while on a business trip through the Northwest. Throughout the farm implement world Mr. Dain was widely known as an inventor and manufacturer. He was especially interested in the development of haying tools. He was president of the Dain Mfg. Co., vice-president and director of Deere & Co., and a director in several of the Deere subsidiary concerns. Last month he retired as president of the National Implement and Vehicle Association. He presided over the sessions of that organization at its convention in Chicago, Oct. 17 to 19.

N. V. SACHS, for 10 years connected with the James H. Mathews Co., steel stamp and stencil manufacturer, Pittsburgh, died Oct. 21. He was manager of the bronze department and previous to that manager of the advertising department. At one time he was connected with the Stephen T. Williams Co., New York.

HAL H. HILL, for about 20 years Cleveland representative of the Erie City Iron Works, Erie, Pa., and the C. & G. Cooper Co., Mt. Vernon, Ohio, died at his country home in Wickliffe, Ohio, Oct. 28, after a three years' illness.

LOUIS F. ZOLINGER, Columbia, Pa., a pioneer iron worker, died Oct. 2, at the age of 78. He was connected with the old Central Iron Co., South Harrisburg, and later the Susquehanna Iron & Steel Co., until its failure.

Machine Shop for Washington Navy Yard Gun Plant

WASHINGTON, Nov. 6.—Bids were opened at the Bureau of Yards and Docks of the Navy Department yesterday for a large six-story machine shop for the great gun plant at the Washington Navy Yard to be used in the manufacture of guns, mounts, torpedoes and miscellaneous ordnance supplies. The building, which will be the largest of its kind ever built by the Government, is to be 502 ft. 6 in. long, 162 ft. 6 in. wide and 85 ft. 6 in. high, with reinforced concrete foundations, structural steel frame, crane girders and monorails, concrete incased steel columns and girders, reinforced concrete floors, gypsum roof, with concrete window sills, brick exterior spandrel walls, concrete cornice and belt course, terra cotta interior partition and court walls, with stucco or plaster finish; plumbing, heating, ventilating appliances, electric lighting, electric elevators, etc.

Warren Moore & Co., Philadelphia, who bid $1,048,000 with 180 days for completion time, appear to be the lowest general bidder on all points. Congress appropriated $7,500,000 for the extension and equipment of the gun plant at the Washington yard, but plans for the expending of the remainder of this large sum have not yet been perfected.

PERSONAL

J. G. Deericks has been made general manager of sales of the Pittsburgh Steel Co., Union Arcade Bldg., Pittsburgh, succeeding Edmund Steytler, who died at Atlantic City, Oct. 8. He has been identified with the steel trade in various capacities. He went to New York some years ago and was in the sales department of the American Steel Hoop Co. when that concern and the National Steel Co. moved their offices from New York to Pittsburgh, both companies later being absorbed by the Carnegie Steel Co., Mr. Deericks then going in the sales department of that concern. Later he went with the American Steel & Wire Co., in its New York offices, and had charge of sales of its wire products to manufacturers in the Eastern district. In April this year he left the American Steel & Wire Co. to accept the position of assistant general manager of sales of the Pittsburgh Steel Co. He was born in Cleveland in 1871. He is a member of the American Iron and Steel Institute, the Engineers Club of New York, the Ohio Society of New York and the Pittsburgh Athletic Association.



John Hunter, chief engineer for the Union Electric Light & Power Company at St. Louis, has been appointed by the United States Government to aid in directing the construction of the American marine fleet, with especial charge of shipbuilding operations on the Passaic River in New Jersey.

Vaughan E. Montgomery, formerly in the sales department, Cincinnati office of Crocker Bros., is now at Chillicothe, Ohio, with the machine gun company of the 330th Regiment. He was recently promoted from private to sergeant and was also appointed special instructor in English for his company.

Norman B. Hickox has been appointed sales and advertising manager of the National X-Ray Reflector Co., Chicago. E. H. Cameron, formerly sales manager, has severed his connection with the company and is now located in Seattle. Hugh D. Butler, formerly manager Chicago sales, has been appointed assistant sales manager. Guy R. Hastings, formerly assistant manager Chicago sales, has been appointed manager Chicago sales. George D. Bryson has been appointed assistant advertising manager.

G. W. Wesley, formerly vice-president of the General Vehicle Co., Long Island City, N. Y., has become connected with the Simplex Automobile Co., New Brunswick, N. J.

C. A. Bachelder, general purchasing agent for the Holt Mfg. Co,, San Francisco, builder of traction engines, is in the East on a month's trip.

James I. Stephenson, president Cincinnati Iron & Steel Co., Cincinnati, was largely responsible in influencing the American Iron & Steel Institute to hold its fall meeting in Cincinnati. He was chairman of the local committee that arranged the entertainment program, and since the convention last month he has received a large number of letters from members who attended, congratulating his committee on the successful manner in which the entertainment features were carried out.



Previous to his connection with his present company Mr. Stephenson was for a numbers of years assistant manager of sales of the Carnegie Steel Co., at Cincinnati.

Walter C. Voss, formerly in charge of the Detroit office of the rim and tube division of this company, is to be transferred to Washington to look after the business of the Standard Parts Co. Mr. Voss is being replaced by Art A. Loeffler, formerly of the Jackson-Church-Wilcox Co., Saginaw, Mich.

Charles P. Bannon, formerly sales manager of the Best Steel Casting Co., San Francisco, has given up that position in order to take a needed rest.

Charles C. Capehart, superintendent of the bar mill of the Pittsburgh Crucible Steel Co. at the Midland, Pa., plant, has been promoted to chief inspector, succeeding J. N. Critchlow, who resigned to accept a similar position with the United Alloys Corporation, Canton, Ohio. M. E. Harty, efficiency expert, has been assigned to the superintendency of the bar mill. E. T. Gants has been appointed steam and hydraulic engineer.

Harry L. Horning, vice-president and general manager Waukesha Motor Co., Waukesha, Wis., and chairman of the motor products section, War Industries Board, was the guest of honor at the weekly luncheon of the City Club of Milwaukee on Saturday, Nov. 3, and discussed the remarkable achievement of American automotive engineers in producing the new military truck in record-breaking time.

L. E. Dunhan, who has been connected with the iron ore department of M. A. Hanna & Co., Cleveland, for a number of years, has been appointed as director of purchases for the various interests with which the Hanna firm is connected as agent. The present purchasing agents and offices in Cleveland, Duluth, Minn., and Wilkes-Barre, Pa., will be maintained as heretofore.

Ambrose Monell, president International Nickel Co., has been commissioned a colonel in the U. S. Signal Corps, aviation section.

F. E. Nulsen, president Missouri Malleable Iron Co., East St. Louis, Ill., who at the recent Cincinnati meeting of the American Iron and Steel Institute discussed the paper by Henry F. Pope, president of the National Malleable Castings Co., Cleveland, on Malleable Iron and Its Uses, has long been a prominent figure not only in the malleable business in St. Louis and vicinity but in the National councils of the manufacturers of malleables. His valuable paper will be found elsewhere in this issue.



Stanton Griffith, for fifteen years superintendent of the foundry, pattern shop and chemical laboratory of the Eclipse works of the Fairbanks-Morse Mfg. Co., Beloit, Wis., resigned Nov. 1 to accept the position of works manager of the South Side Foundry & Machine Co., Charleston, W. Va. Mr. Griffith's first employment as a youth was in the plant to which he now returns as works manager.

Oscar Stegeman, president and general manager Stegeman Motor Car Co., Milwaukee, has resigned and will make new connections.

Charles G. Crocker, general manager Oscillating Sleigh Co., Menomonie, Wis., has resigned to accept the position of works manager of the United States Switch Co., organized recently at Eau Claire, Wis., and now manufacturing automatic railroad and street car switches and signals. Mr. Crocker formerly was factory superintendent of the McDonough Mfg. Co., Eau Claire.

Alfred Marshall, Marshall & Huschart Machinery Co., Chicago, has returned after an absence of about six months, during which time he was a member of an expedition sent by the Carnegie Institute and National Geographical Society to the Ungava Peninsula. Mr. Marshall accompanied the party as an ornithologist.

F. D. Egan, formerly steam and electrical engineer at the Midland, Pa., works of the Pittsburgh Crucible Steel Co., has resigned, effective Nov. 1, to accept the position of works manager of the Pittsburgh Iron &

Steel Foundries Co., of Pittsburgh, works at Midland, Pa. Clyde Brooks, formerly works manager, will now give his entire time to the positions of secretary and general sales manager of the company.

H. W. Graham has resigned as mechanical engineer of the Herman Pneumatic Tool Co., Zelienople, Pa., to become chief engineer of the Ocala Iron Works, Ocala, Fla.

ABROGATION OF CONTRACTS

Views of Producers and Consumers in Various Iron and Steel Lines

THE abrogation of contracts as a possibility under new Federal legislation at the next session of Congress has lately been made a subject of special consideration through the inquiry sent widely to the iron and steel trade by the Federal Trade Commission. The consensus of opinion thus obtained will form a basis, it is presumed, for stipulations of the proposed Pomerene steel and iron price fixing bill. Such a measure, it will be recalled, was to be made an early feature when Congress meets in December. Meanwhile, supplementing its editorial in the last issue, THE IRON AGE has been sounding out the views of various classes of manufacturers of iron and steel products, including particularly those likely to have more at stake in material purchase contracts than in contracts covering products of their own manufacture. Of forty cases, comprising small as well as large manufacturers, two alone indicated a willingness that contracts should be nullified, but with qualifications.

Abrogation With Qualifications.

For example, a maker of rolling mill machinery, intimating an inability to buy for prompt or future shipments on commodities "where the prohibitive profit has been eliminated by the Government," hopes "that the true American spirit will soon be shown that will allow the Government to proceed with their plans, which necessarily should abrogate all contracts, placing same on a fair profit basis, making a uniform standard of prices so that everybody can get busy and do their part."

A builder of industrial plants believes "that if the enforcement of an existing contract for steel at a rate considerably higher than the fixed price will work a hardship on the buyer and penalize him unduly, as compared with a competitor who buys at Government prices, this should have consideration, providing, however, that the Government's fixed price allows the steel men a good profit."

A maker of bolts and nuts says that "as far as our readjustment in price is concerned, when we make it, we will voluntarily reduce every contract on our books, changing the contract to the price announced."

A maker of plumbers' supplies thinks that "whereas it is proper that the mill should expect the quantity to be taken out on the contract, the price should be reduced to the Government standard, although so far the mills do not seem to be disposed to meet these new figures."

Against Abrogation.

The views against contract abrogation may be summarized by the following quotations:

A maker of steel castings: The abrogation of contracts would be a fatal mistake. Endless confusion and months of readjustment would ensue. Presumably, manufacturers, when they sold their product, covered themselves on the materials required, and as soon as existing contracts are thus worked out, then the whole industry comes down automatically to a common plane operating under the fixed prices established.

A maker of forgings: We strongly urge against a move of this kind. To our minds it would establish a precedent, fraught with danger, far reaching in its effects, not only to manufacturers in their relations, one with another, but with labor as well. The keeping of contracts inviolate has been a matter of honor between contracting parties, whether concerning men or industries, and we cannot conceive of any emergency great enough to change a system so honorable.

A maker of shearing, punching and other heavy machinery: We cannot conceive of a state of affairs that would warrant such a brazen defiance of business ethics and common honesty. The U. S. Government being, at the present time, the greatest of all borrowers, is living in a glass house, and can ill afford to father an act that savors of repudiation in any form.

A manufacturer of heating and ventilating equipment: It is out of the question for the mills to accept new business at the fixed prices for private consumers except for delivery after the period for which they are sold up, and we believe that the abrogation of existing contracts would be harmful to all concerned. If the furnaces and mills accept the new prices with good grace, as for the most part they are doing, the market will be stabilized and the prices on the more highly finished products tend to follow the same trend, although counteracted to a greater or less extent by the scarcity and high price of labor.

A maker of rolling mill machinery: We consider contracts sacred, and do not believe that under any circumstance contracts should be violated, broken or abrogated.

A maker of steel plant machinery: Abrogation of contracts, in our opinion, would be a very serious mistake, as it would only add to the chaos that now exists in business. It would lead to a collapse of the business structure on which we have been operating for so many years. Contracts have been held to be a moral and business obligation in the past; and if contracts were to be abrogated even for a short time, it would destroy the integrity of the system of contracts for a long time to come. Unscrupulous parties to the contract who found it to be working to their disadvantage would have some excuse to have it abrogated, at the same time striving to have favorable contracts remain valid, and thus create an undesirable condition.

A maker of cold-rolled strip steel: Legalized abrogation of contracts is likely to have an unmoral effect on the public. We do not want solemn obligations to be considered as "scraps of paper," nor get our business world into the way of considering lightly its commitments. If price fixing could have been made to affect all materials, contracts as well as future purchases, the effect on the prices of all products made from steel would have been immediate. As it is now, nobody knows when $33 pig will reach plowshares or pruning hooks. That is what the public is interested in, rather than to reduce the earnings of the steel companies, who are paying a large proportion of their earnings to the Government in taxes.

A selling agent for various steel makers' products: On the question of abrogating contracts we feel very strongly. If our government is to lend itself to such socialistic policies we have great fear for the future of American business. To us credit means a great deal, but if we have to abrogate our contracts, we fail to see where we will have any credit left. It puts us in exactly the same position as the man who sells and then because the market goes up refuses to deliver, and sells the same tonnage over again at a higher figure. We certainly have a sufficiency of that type to deal with as it is, and so hope that our Government will not stoop to such low practices.

A manufacturer of bar iron: We feel that contracts should not be abrogated, for the reason that in many cases the manufacturer covers the requirements of the contract by purchases of raw material, and if the contract should be abrogated, he would be left with a lot of possibly high priced material on his hands and subjected to a loss that would be beyond his control. Moreover, manufacturers have always felt that contracts should be equally binding on both parties, and not merely options on the part of the purchaser.

A maker of bar iron: My moral training, together with my business education, the latter covering a period of nearly forty years, has instilled in me such a deep-rooted conviction of the inviolability of contracts that I cannot imagine myself considering the advantages of their abrogation. The disadvantages, by reason of the precedent established, would, in my opinion, so far outstrip the advantages as to preclude any discussion of the question. The Constitution of the United States provides in Section 9, among other things, that "No ex post facto law shall be passed." In Section 10 that "No State shall pass any ex post facto law, or law impairing the obligation of contracts." This would seem to clearly indicate the spirit of the framers of that document, a spirit, that, it seems to me, should prevail for all time.

At the monthly meeting of the Philadelphia Foundrymen's Association at the Manufacturers Club, Philadelphia, Wednesday evening, G. H. Clamer, vice-president of the Ajax Metal Co., Philadelphia, explained the Ajax-Hyatt electric furnace for melting non-ferrous metals. The Phoenix Iron Co. was proposed for membership.

Curtailment of Automobile Construction

Need of Chrome Steel for Munitions Calculated to Reduce Numbers of Pleasure Cars—War Business Will Help Maintain Organizations

WASHINGTON, Nov. 6.—Owing to the demand for chrome steel for the manufacture of munitions, the priority officer of the War Industries Board has issued an order which, in effect, forbids the delivery of this kind of steel for the manufacture of pleasure automobiles. The issuance of this order, which was not publicly announced by the War Industries Board, caused general consternation among automobile manufacturers and in connection with semi-official reports that the Government is preparing to take over numerous automobile plants in whole or in part for the manufacture of airplanes, engines and other war material, brought to Washington during the past week a large number of men prominent in the automobile industry. Their protests are now under consideration by the War Industries Board, and it is possible that the chrome steel embargo may be modified, although there is no prospect that it will be rescinded; in fact, this particular order is believed to be the forerunner of a series designed to cut down the production of what are styled by the War Industries Board, "non-essentials," a term rather loosely applied at present to articles that are of no direct value in the conduct of the war.

The advance guard of the automobile manufacturers arrived in Washington soon after the embargo order on chrome steel was issued. A meeting was at once called of the officers of the Automobile Chamber of Commerce and of the Motor and Accessories Manufacturers. This was followed by a general conference participated in by Col. Charles Clifton, president of the National Automobile Chamber of Commerce. C. W. Stiger, president of the Motor and Accessories Manufacturers, and Coker F. Clarkson, general manager of the Society of Automotive Engineers. Before the conference adjourned Howard E. Coffin, of the Advisory Committee of the Council of National Defense, Gen. C. E. Baker, of the Quartermasters Corps, U. S. A., and Hugh Frayne, labor representative on the War Industries Board, were called into consultation.

Reduced Deliveries of Chrome Steel Proposed

The order of the priority officer with regard to chrome steel cuts off immediately the supply of this metal and in the opinion of experienced manufacturers, who took part in the conference, would cause widespread disaster throughout the industry. The conference therefore proposed a substitute, which would provide for reduced deliveries of chrome steel, but which would not put an end to the production of pleasure cars. The priority order was criticized by the manufacturers on the ground that the entire automobile industry consumes less than 5 per cent of the steel production of the United States and utilizes but a very small percentage of the chrome steel. Other industries, which do not contribute to the waging of war, it was asserted, use quite as much chrome steel as the automobile builders; hence, the priority order in question constituted a clear discrimination against a single industry.

Proposed Cut in Pleasure Car Production

The substitute proposition framed by the conference proposed an immediate cut in the production of pleasure cars of 15 per cent with the understanding that this would be followed by a steady curtailment in this branch of the business until within six months the output of pleasure cars would be brought down to 60 per cent of normal. The leading manufacturers of the country are understood to be well protected in the matter of stocks of chrome steel; hence, in the distribution of this metal during the next six months it was proposed to favor those concerns, and especially the smaller ones, which have little or no chrome steel on hand. To prevent disastrous consequences to the automobile industry as the result of the proposed reduced production of pleasure cars, it was suggested that the Government should place orders for shells of small and medium caliber with those factories equipped for this work or which can be fitted up without great expenditure of time or money.

The substitute proposition of the automobile men was laid before the War Industries Board by a committee appointed for the purpose, which supplemented the formal project with a brief oral argument in support of its adoption. The board is giving the matter careful consideration, and it is believed will reach a decision in the present week. Following the meeting of the automobile men with the board, Director Gifford of the Council of National Defense made an informal statement in which he said that the priority order directed against the manufacture of pleasure automobiles should not be regarded as a discrimination against a special industry. The Government, he said, did not mean to injure the business of manufacturing automobiles, but must conserve all raw materials needed for the production of munitions. It was also the purpose of the War Industries Board, he said, to utilize the plants and facilities of many of the large automobile manufacturing plants and this would necessarily interfere with the production of pleasure cars. This might result, Mr. Gifford said, in cutting down the production of this type of car to about one-tenth of the present output. It would not be surprising, he added, if it should become necessary to follow the example of the British Government, which has prohibited the building of pleasure cars while the war is on. The shortage in the production of coal might prove a factor in the problem, emphasizing the necessity of reducing the output of the automobile and other non-essential industries.

War Business for Automobile Plants

The Aircraft Board is planning to increase the number of automobile manufacturers who are to be called upon to build Liberty motors and other engines for airplanes, and this work, it is thought, will absorb the facilities of a considerable number of the largest plants in the country. The Quartermasters Department will also make a wider distribution of orders for military trucks for the army than has heretofore been contemplated, and the Ordnance Bureau of the War Department has already undertaken a survey of the automobile industry to determine the extent to which its plants can be utilized in the production of shells. It is freely conceded, however, that at best the Government will be unable to utilize all the plants that will be interfered with by the chrome steel order, and it is quite possible that many of the smaller concerns, which are fitted up to manufacture but two or three models of small pleasure cars, will be compelled to close down.

The Council of National Defense has undertaken the task of tabulating the essential and non-essential industries, but does not now contemplate making its categories public at this time. Scarcity of coal will probably force the first curtailment of production, and subsequent orders will be influenced by shortages of other materials.

Listing So-Called Non-Essential Industries

The special committee of the Chamber of Commerce of the United States, which is co-operating with the Council of National Defense, has prepared a bulletin in response to many inquiries as to the Government's plans with respect to so-called non-essential industries and especially as to what course will be followed in withdrawing labor and materials therefrom. It is stated in this bulletin that no policy has been definitely announced

by the Government; nevertheless, the course to be pursued by manufacturers is perfectly clear.

No action except in emergencies should be taken, it is said, unless it be in accordance with some general plan based upon a thorough survey of the industries of the country. "If unnecessary hardship is to be avoided," says Waddill Catchings, chairman of the chamber's committee, "and if there is to be no discrimination, the Government should not act until a general plan has been formulated and made known to the business men of all sections. Before a business is classified as non-essential and deprived by act of government of labor and material, the industry through duly elected representatives should be given an opportunity to discuss the matter; to learn the premises of the Government and the reasons for action.

"The motive of the Government—the concentration of industrial energy toward winning the war—appeals to all, and every industry can be relied upon to assist in bringing itself into adjustment with the war needs of the country.

"Where an industry is regarded as non-essential and must be deprived of labor and materials, such deliberate planning may lead to the use of substitute materials of different processes of production. In this manner unnecessary hardship may be avoided. Furthermore, when the Government is forced to deprive a business of materials and labor because it is non-essential, an effort should be made by the Government to place with the industry orders for product needed in the war. If in placing the war orders effort is made to produce war supplies in the centers where labor is housed, not only will congestion in munition centers be relieved, but there will be avoided at the end of the war the great problem of moving labor back to the normal producing centers."

W. L. C.

Decrease in October Lake Ore Shipments

Iron ore shipments down the lakes from the Lake Superior region in October were 8,193,892 gross tons, compared with 9,116,196 tons in October, 1916, a decrease of 922,304 tons, or 10.11 per cent. The following table gives the October and season shipments by ports and the corresponding figures for 1916 in gross tons:

	October, 1917	October, 1916	To Nov. 1, 1917	To Nov. 1, 1916
Escanaba	995,052	876,488	6,162,774	6,507,482
Marquette	461,284	519,806	2,870,100	3,546,651
Ashland	978,029	1,218,134	6,603,238	7,269,846
Superior	1,876,525	1,732,865	12,253,271	11,493,831
Duluth	2,497,629	3,298,314	17,686,997	19,472,473
Two Harbors	1,385,373	1,470,589	8,677,218	9,642,563
Total	8,193,892	9,116,196	54,253,598	57,932,846
1917 decrease	922,304	.....	3,679,248	.....

For the season the 1917 decrease is 3,679,248 tons, or 6.35 per cent. The Duluth percentage to Nov. 1, 1917, was 32.60 per cent against 33.61 per cent last year, while the Great Northern dock at Superior shipped 18.60 per cent of the total this year against 17.29 per cent to Nov. 1, 1916. The decrease in the total this year to Nov. 1 of 6.35 per cent compares with an increase of 38.54 per cent at the same time last year.

The American Zinc Products Co. has been organized by Youngstown, Ohio, parties with a capital of $1,000,000. It is stated that all of the stock to be issued has been sold, and that they will not issue bonds. Prominently identified with the company are D. W. Kerr, F. W. Stillwagon, W. Manning Kerr, R. A. Leitch and G. P. Gilmer, all of Youngstown. The company is building a 10-mill plant for the manufacture of zinc sheets at Greencastle, Ind. The plant will be completed in about six months and have a monthly capacity for rolling about 2400 tons. H. S. Buck will be general manager of the plant. He is also the managing head of the closely affiliated Fort Smith Spelter Co., operating a plant at Fort Smith, Ark., from which the American Zinc Products Co. will secure a portion of its raw material. The Greencastle plant will employ about 400 men when in full operation.

Defends Action in Paying Bonuses

No definite action was taken at the meeting held in Pittsburgh, last week, of stockholders of the Carbon Steel Co., who entered a suit that is being carried on in the courts of West Virginia, and are trying to compel Charles McKnight, president of the company to pay back into its treasury more than $500,000 bonus money voted to him and other officials by the Board of Directors some months ago. The situation as regards this bonus money, which some stockholders claim was illegally paid, was very fully discussed at the meeting. Charles McKnight, president, has issued a long letter to the stockholders in which he defends his action in paying large bonuses to himself and other officials about a year ago, and in part this letter says:

In October, 1916, when your company had completed all its contracts with the British Government, the general business of your company had reached a condition where the salaries being paid to the officers were, in the opinion of your board, totally inadequate in view of the responsibilities and duties entailed for the coming year. This was largely due to the fact that your company's financial condition had not until that time permitted the payment of salaries commensurate with those paid by other companies in the same business. The president had undertaken the management of the company in 1910 as chairman of your board, but served without salary until October, 1912, when he was made president, with a salary of $6,000 a year, under which he had served until this time. The vice-president and treasurer was receiving a salary of $3,600 a year, and the salaries of the other officers had been in proportion. Many companies in the same line of business were paying large salaries, new companies were springing up on all sides which were ready to pay generous compensation to officials skilled in the steel business, and tentative offers had already been made to some of the officials of your company. Your board in October, 1916, increased the salaries of its executive officers, but, to avoid placing heavy fixed charges on the company's business at a time when the prosperity in the steel business was exceptional but its duration problematical, adopted the suggestion of the president, and entered into an agreement whereby for the coming fiscal year, after the company should earn, the required dividends on the preferred stock and 6 per cent upon the common stock, a sum equal to 20 per cent of the net profits remaining should be paid to the president for distribution among the officers of your company. As before, this matter was reported to the stockholders at the annual meeting held in November, 1916, and was by them unanimously approved.

The annual meeting of stockholders of the Carbon Steel Co. will be held in Pittsburgh Nov. 12, and it is stated that at this meeting efforts will be made by some of the minority stockholders to obtain control. Letters have been sent out by two factions of the company asking for proxies to be used at the coming meeting.

Takes Over Iron Foundry

The Wagner Castings Co., Decatur, Ill., A. W. Wagner, president, has taken over the Decatur Foundry Co., maker of light gray iron castings and will continue the production of these castings, although it is probable that early in 1918 malleable iron castings will be made also. The plant just acquired was formerly the Central Malleable Iron Co. and still contains equipment essential to the making of malleable castings. Mr. Wagner, who heads the new company, organized the Decatur Malleable Iron Co. and is still interested in the latter company.

The Niles Tool Works Co., Hamilton, Ohio, is now employing a full force of men in its foundry that had been closed down for several months on account of a strike. The company refused to recognize the moulders' union and has employed its new force simply as individuals. A large percentage of the striking workmen returned under these conditions.

The Hamilton Furnace Co. at Coke-Otto, a suburb of Hamilton, Ohio, will make improvements to its plant, estimated to cost over $500,000. One of the principal improvements will be a movable car dumper. The plant is now operating at full capacity producing basic pig iron.

MORE STEEL PRICES FIXED

Further Announcement as to Finished Products Made at Washington

Announcement was made Nov. 5 in Washington that the President had approved an agreement made by the War Industries Board with the principal steel industries of the United States fixing maximum prices, subject to revision Jan. 1, 1918, on certain steel articles, as follows:

Sheets.—No. 28 black sheets, $5 per 100 lb., f.o.b. Pittsburgh; No. 10 blue annealed sheets, $4.25 per 100 lb., f.o.b. Pittsburgh; No. 28 galvanized sheets, $6.25 per 100 lb., f.o.b. Pittsburgh. The above prices to apply to both Bessemer and open-hearth grades.

Pipe.—On ¾-in. to 3-in. black steel pipe, discount 52 and 5 and 2½ per cent, f.o.b. Pittsburgh.

Cold Rolled Steel—17 per cent discount from March 15, 1915, list, f.o.b. Pittsburgh.

Scrap.—No. 1 heavy melting, $30 per gross ton, f.o.b. consuming point; cast iron borings and machine shop turnings, $20 per gross ton, f.o.b. consuming point; No. 1 railroad wrought, $35 per gross ton, f.o.b. consuming point.

Wire.—Plain wire, $3.25 per 100 lb., f.o.b. Pittsburgh.

Tin Plates.—Coke base, Bessemer and open-hearth, $7.75 per 100-lb. box, f.o.b. Pittsburgh.

In connection with the above, the iron and steel manufacturers have agreed promptly to adjust the maximum prices of all iron and steel products other than those for which prices have been agreed upon to the same general standard as those which have been announced. It is expected that this will be done promptly and consistently in line with the basic, intermediate, and finished products for which definite maximum prices have been established.

MANY HOUSES NEEDED

Committee Reports on Conditions Resulting from War Demands

WASHINGTON, Nov. 6.—The Committee on Housing of the Council of National Defense, appointed Oct. 9, 1917, to investigate and report upon the extent of the housing problem in connection with workers employed on Government contracts and the relation of that problem to the output of war materials, has submitted its findings to the Council.

The testimony and records obtained by the committee clearly indicate that with few exceptions the Government contracts for ships, guns, ammunition and other war materials have thus far been made with little or no Government provision for the housing necessities incident to a rapid and large increase of labor. In its investigation the committee has been materially aided by the report of Philip Hiss, chairman, sectional committee on housing of subcommittee on welfare work of the labor section of the Advisory Commission, which report called the exigency of the situation to the attention of the Council.

The situation may be well instanced by one New England manufacturing city where there exists a distinct community problem. In that city 16 concerns are engaged upon war contracts, and it was disclosed to the committee on housing that nearly 10,000 additional men, for whom there now exists practically no living quarters, will be required by Jan. 1 if the plants in question are to run to their full capacity.

One great steel company, already mainly employed with Government contracts, has extensive additions to its present plant approaching completion. The testimony before the committee on housing disclosed that unless immediate provision be made for necessary housing, the possible production of guns, gun carriages and other munitions will be curtailed fully one-third of the plant's possible output within the next three or four months.

Notwithstanding the existence of such cases as those cited above, the committee on housing deprecates any exaggeration as to the extent of the existing housing problem. As a matter of fact, many communities and individual industries are now taking care of their own housing requirements. Others, where there is serious congestion, are preparing to do so; but there are a number which will need financial assistance in house building if full production capacity is to be had.

In general, it is the opinion of the committee on housing that the existing emergency demands immediate action and is convinced that under proper safeguards the Government should give quick financial aid to such industries or communities as can clearly demonstrate their right to relief. In this regard, it is suggested that any aid which may be given by the Government should preferably be rendered in the form of loans at a low rate of interest. Some loss to the Government may be reasonably expected, but the expenditure necessary to give relief is negligible when measured by the loss incident to delay in the execution of the vast war orders already placed.

It is the judgment of the committee that an organization of reasonable permanency and authority is necessary to administer quickly and effectively such funds as may be available for housing purposes, and that such organization should have broad powers to conduct building operations, to deal in real estate and securities, and to borrow and loan money.

The committee further recommends that, in line with the recent findings of the Advisory Commission of the Council of National Defense, all authorized agencies of the Government making contracts for war materials shall give due consideration in the future to the labor supply and housing conditions prior to closing contracts, and that future contracts shall be distributed, as far as possible, to prevent undue concentration of workers in any one locality.

The committee on housing particularly emphasizes the conviction that any Government aid for industrial housing should be considered as a war measure and be rigidly confined to cases where restriction of output of war materials would otherwise occur.

The committee on housing of the Council is composed as follows: Otto M. Eidlitz, chairman, architect and builder, New York City; Gertrude Beeks Easley, chairman, welfare department, National Civic Federation; William J. Spencer, secretary, building trades department, American Federation of Labor; C. G. Du Bois, comptroller, American Telephone & Telegraph Co.; Theodore Robinson, vice president, Illinois Steel Co., Chicago.

W. L. C.

War-Service Committee of Boiler Manufacturers

Conforming to the resolution adopted at the meeting of manufacturers with the National Chamber of Commerce requesting all lines of business to appoint a war-service committee to act as "point of contact" between said industry and the Government during the period of the war, the American Boiler Manufacturers' Association has appointed a committee, as follows: George W. Bach, manager Union Iron Works, Erie, Pa.; G. S. Barnum, president Bigelow Co., New Haven, Conn., and W. C. Connelly, president D. Connelly Boiler Co., Cleveland, chairman. Anyone having business pertaining to boilers should, it is emphasized, address the chairman at once.

Th Republic Iron & Steel Co. has opened an office in the Munsey Building, Washington, D. C., in charge of W. H. Oliver, Philadelphia manager of sales. Mr. Oliver will divide his time between Washington and Philadelphia.

Differentials in Pig Iron

Statement by E. H. Gary, Chairman of the Committee on Steel and Steel Products of the American Iron and Steel Institute

By agreement between the General Committee on Steel and Steel Products of the American Iron and Steel Institute and the War Industries Board, approved by the President, the base price of No. 2 foundry iron and also of basic iron was fixed at $33 per gross ton, f.o.b. cars furnace. From these base prices the Sub-Committee on Pig Iron, Iron Ore and Lake Transportation has reported to the General Committee a list of differentials which the General Committee believes is fair and reasonable and in accordance with the usages of the trade, and therefore recommends to the iron industry that the same be adopted to take effect immediately. Judge Gary, as chairman of the general committee, in announcing his list, said: "It is hoped there will be no hesitancy in accepting this recommendation."

The grade of *No. 2 foundry iron* to be equivalent in analysis to:

Silicon	1.75 to 2.25
Sulphur	Not over 0.05

No. 2 soft Southern iron equivalent to No. 2 foundry of same silicon content.

Differentials from the above base price for No. 2 foundry iron to be made for the following changes in specifications:

Forge or mill iron	$1.00 per gross ton under base
Foundry iron running silicon 1.00 to 1.75	0.50 per gross ton under base
Foundry iron running silicon 2.25 to 2.75	0.50 per gross ton over base
Foundry iron running silicon 2.75 to 3.25	1.50 per gross ton over base

Foundry iron in excess of 3.25 silicon, add $1.00 per gross ton for each ½ per cent of silicon over the price for 3.25 silicon iron.

Manganese, sulphur and phosphorus variations to be adjusted as formerly customary in each district having respect to the base price.

Where iron is sold by fracture, the usual grading prevailing in each district to continue.

Malleable iron	$0.50 per gross ton above base
Bessemer iron	10% per gross ton above base
Basic iron	Base price.

CHARCOAL IRON

Southern or warm blast charcoal iron a maximum of $10.00 per gross ton above base for iron ranging 0.40 to 0.60 phosphorus and silicon 1.00 to 2.00.

For grades running below these analyses, corresponding reductions as usual to the trade to be made.

Cold blast charcoal iron, a maximum of $22.00 per gross ton above base with customary reductions for lower grades, as recognized by the trade.

Lake Superior iron $2.50 per gross ton above base for iron averaging 1.25 per cent silicon. Other grades to be adjusted as per the custom of the trade, depending upon the silicon, phosphorus and manganese contents of the iron.

All of these charcoal iron differentials to be considered in connection with the base price.

HIGH SILICON OR SILVERY IRON

For iron containing:

6 per cent silicon	$7.00 per gross ton above base
7 per cent silicon	9.00 per gross ton above base
8 per cent silicon	11.50 per gross ton above base
9 per cent silicon	14.00 per gross ton above base
10 per cent silicon	17.00 per gross ton above base

Three dollars per gross ton advance for each 1 per cent silicon for 11 per cent and over.

BESSEMER FERROSILICON

For iron containing:

10 per cent silicon	$22.00 per gross ton above base
11 per cent silicon	25.30 per gross ton above base
12 per cent silicon	28.60 per gross ton above base

LOW PHOSPHORUS IRON

Iron containing phosphorus and sulphur not exceeding 0.04, and silicon not exceeding 2 per cent:

For copper bearing iron	$17.00 per gross ton above base
For copper free iron	20.00 per gross ton above base

A sliding scale of $1.50 per gross ton advance for each reduction in phosphorus of 0.005 per cent below 0.04, and $1.75 per gross ton advance for each 1 per cent of silicon in excess of 2 per cent.

New York, Nov. 2, 1917.

Manufacture Under Enemy Aliens' Patents

Regulations for the Granting of Licenses by the Federal Trade Commission—Form of Procedure, Fees, Etc.

WASHINGTON, Nov. 6.—Regulations for the filing of applications for licenses to manufacture, under the terms of the recently enacted trading with the enemy act, articles patented, trademarked or copyrighted by enemy aliens have been prepared by the Federal Trade Commission. The regulations also cover a method for the payment of patent, trademark and copyright taxes, annuities and fees in enemy countries and filing and prosecuting applications therein, and under these provisions of the law the first license to file and prosecute an application for letters patent in Germany, Austria and Hungary has been issued to the Ajax Metal Co. of Philadelphia for an improvement in "oscillation of current method and apparatus," the invention of Edwin F. Northrup, an American citizen of Princeton, N. J. The commission anticipates receiving a large number of applications for permits to manufacture articles patented in this country by German corporations and individuals, and has perfected an organization designed to expedite their consideration and allowance.

License Requirements

Applicants for licenses under patents or copyrights owned or controlled by an enemy or an ally of an enemy are required to file a verified statement with the Federal Trade Commission in concise and non-technical language covering the following points, stating in each case the facts upon which any conclusion may be based:

(a) If an individual, that he is a citizen of the United States. If a corporation, that it is organized within the United States.

(b) That the patent or copyright desired to be licensed is owned or controlled by an enemy or an ally of an enemy.

If it is claimed that the patent or copyright is controlled by an enemy or ally of an enemy, the nature and origin of the control should be plainly stated, whether by contract, agency, stock ownership, or otherwise.

(c) There shall be attached to the application a Patent Office copy of the patent and a certified abstract of title to it, or a specimen of the copyrighted article and a certified copy of the copyright entries and, in the case of a patent, of a certified copy of the petition and all powers of attorney in the file of the application.

(d) That licensing the applicant is for the patented or copyrighted article or the product of the patented process, demand for which is not being met.

(e) That the applicant is able to make or cause to be made the patented or copyrighted article or exercise the patented process. Specifically, that the applicant is technically and otherwise equipped to undertake or procure the manufacture or operate the process and is in fact able to do so.

(f) That the applicant intends to do so in good faith.

(g) The application must be verified by the person applying for the license, and in the case of a corporation by an officer thereof acquainted with the facts recited.

Form of Application

Each application must be accompanied by a remittance of $100 and should be prepared in the following form:

To the Federal Trade Commission:

Application of ..... for a license under patent to ....., date ..... No. .....

(If under copyright, state title of work, name of copyright proprietor, and date of copyright registration.)

The undersigned, for the purpose of securing a license, represents to the Federal Trade Commission as follows:

(a) The undersigned is a citizen of the United States, residing at ..... Street, in the city of ....., State of ....., United States of America. (If a corporation, state under the laws of what State it is organized; the location of its corporate offices, its business offices, and plants or factories.)

(b) The undersigned is desirous of being licensed under the patent (or copyright) above named, which is owned or controlled by ...., a citizen or subject of ..... (state the enemy country or the ally of the enemy of which the patentee or copyright proprietor is a citizen or subject, or if a corporation where it is incorporated, and if the patent or copyright is not owned, but is claimed to be controlled state fully the facts which establish the nature and origin of the enemy or ally of enemy control, whether it is by means of an agency, by contract, by stock ownership in corporation, or otherwise.)

(c) Attached hereto is a Patent Office copy of the letters patent and a certified abstract of its title from the Patent Office and a certified copy of the petition and all powers of attorney in the file of the application (or, in the case of a copyright, a specimen of the copyrighted work, and a certified copy of the copyright entries from the office of the Register of Copyrights.)

(d) It is for the public welfare that the license applied for be granted because—(here state briefly but completely and in non-technical language the reason why it is for the public benefit that the license be granted and specifically the demand for the article prior to the war, the demand for the article at the present time whether or not this demand is being met or can be met, prices obtained prior to the war and prices at the present time).

(e) Applicant is able to make or cause to be made the patented or copyrighted article because—(here state specifically the applicant's experience in the production of articles of the kind covered by the patent or copyright, his technical equipment for manufacturing and selling such articles and his ability to do so, the estimated cost of manufacture and price proposed to be charged if the license is granted).

(If the applicant does not intend to manufacture but to procure the manufacture of the article, state specifically what arrangements have been made or proposed to this end and their terms and conditions. State the name and address of the manufacturer proposed to be employed and his technical equipment, etc., and attach copies of any contracts or proposals.)

(f) The license desired is exclusive or non-exclusive for the following reasons: (Here state reasons why, in the opinion of the applicant, the license should be exclusive or non-exclusive.)

(g) The license is desired—

(1) For the term of the patent or copyright, (2) the duration of the war, or (3) any other period, stating reasons in each case.

(h) The application is also to contain the following: "The undersigned intends in good faith to manufacture or cause to be manufactured the articles licensed and understands that the license, if granted, may not be assigned and may be canceled by the Federal Trade Commission, after due notice of hearing, upon violation by the undersigned of any of the provisions of the 'Trading with the enemy Act' or of any of the conditions of the license."

(Signed) _____ _____,

Applicant.

The applicant is required to attest his application under oath and to forward it in duplicate to the commission. A separate application is required for each patent or copyright. Personal attendance upon the commission at the outset is not necessary, but it is anticipated that in many cases the commission will require hearings, ample notice of which will be given.

Protection to Enemy Alien Owners

In every case where practicable notice of applications for license to manufacture under patents or copyrights owned by enemy aliens will be given to the attorney of the alien patentee or copyright proprietor whose name appears in the file of the applications in

the Patent Office or in the office of the Register of Copyrights. It is not anticipated that such attorneys will be permitted to contest the issuing of licenses, but such notice may frequently have the effect of preventing an injustice where a patent or a copyright issued to an enemy alien has since been conveyed in good faith either to an American citizen or a non-enemy alien. The commission emphasizes the fact that the burden of establishing affirmatively the facts upon which, under the terms of the act, licenses may be granted, is placed upon the applicant for license. It will be noted that this requirement also tends to protect the owners of the patent or trademark against illegitimate exploitation.

Inasmuch as the trading with the enemy act and the President's proclamation vest in the Federal Trade Commission the duty of prescribing the conditions of the license, the commission, pursuant to the authority thus delegated, has decided that only non-exclusive licenses will be issued unless the public interest shall otherwise require. It is anticipated that this stipulation will have a tendency to prevent manufacturers from undertaking the production of articles covered by patents issued to enemy aliens unless the stipulation concerning the requirements of "the public interest" shall be very liberally construed. It is the essence of the conditions under which the manufacture of the average patented article can be made profitable that the producer shall have the exclusive right to make the goods, and very few manufacturers would care to undertake the production for general sale of patented articles if they must meet general competition therein. In some cases, however, there will be a sufficient market for valuable and popular devices covered by enemy alien patents to induce several manufacturers to engage in their production, and the law is likely to be generally availed of by manufacturers of certain articles who heretofore have been obliged to pay royalties upon necessary or desirable attachments, the patents on which are owned or controlled by enemy aliens.

Cost to the Licensee

The cost to a licensee operating under a permit issued by the Federal Trade Commission, in addition to the license fee of $100, is 5 per cent "of the gross sums received by the licensee from the sale of the licensed subject matter," or 5 per cent "of the value of the use of the licensed subject matter" as it may be established by the Federal Trade Commission. For the information of the commission the licensee is required to file semi-annually, on Jan. 1 and July 1 of each year, and oftener if the commission elects, a full statement of the extent of the use and enjoyment of the license and of the prices received from the sale or use of the subject matter of it, and within thirty days thereafter the licensee must pay to the alien property custodian "not to exceed 5 per cent of the gross sums received from the sale of the licensed subject matter, or, if the Federal Trade Commission so order, not to exceed 5 per cent of the value of the use of the licensed subject matter as established by the commission."

If the licensee is not to be the actual manufacturer or producer of the article in question, he will nevertheless be held accountable to the commission for the observance of the terms of his license by the actual producers and any sum that may at any time be payable under the provisions of a license will have the status of a debt due from the licensee to the United States recoverable in an appropriate action in the Federal courts. The commission reserves the right, in its discretion, to give notice in writing to the licensee to terminate the license in whole or in part if payments are not promptly made, if the licensee has failed to satisfy the reasonable requirements of the public and at reasonable prices, or if circumstances have arisen which, in the opinion of the commission, make it just and equitable that the license should be canceled.

W. L. C.

The production of steel in electric furnaces in Canada was 18,797 tons during the first six months of 1917, compared with 19,639 tons for all of 1916.

Betts Machine Co. Sold

Announcement has been made that E. I. Du Pont de Nemours & Co., Wilmington, Del., have purchased the real estate, buildings and equipment of the Betts Machine Co., also of Wilmington, and will use the plant for construction of machine tools needed for the Du Pont machine shops. The patents and good will and name of the Betts Machine Co. have been sold to Charles H. Stoer and M. A. Sherritt of the Sherritt & Stoer Co., Finance Building, Philadelphia, machinery dealers, who will hereafter manufacture for the trade the machines which the Betts Machine Co. has produced. The machines which the Betts Machine Co. now has on order will be completed in the Wilmington plant. The Betts tools have been sold in New York by Manning, Maxwell & Moore, Inc., and in Philadelphia by both Manning, Maxwell & Moore, Inc., and the Sherritt & Stoer Co. The Betts Machine Co. was incorporated in 1879 and was formerly conducted by A. and E. Betts. Alfred Betts was president until 1894. Several changes have taken place in the officiary since that time due to deaths. At present William Betts is president. Charles H. Stoer and M. A. Sherritt organzed the Sherritt & Stoer Co. in Philadelphia about three years ago and have built up a large machine-tool business, being sole agents in that territory for several well-known lines.

Pig Iron Differentials and Extras on Steel Products

The new classification of extras on various finished steel products as announced by the sub-committee on steel distribution of the American Iron and Steel Institute, and published in THE IRON AGE of Nov. 1, will be reprinted in pamphlet form, as will also the statement of E. H. Gary, chairman of the committee on steel and steel products of the American Iron and Steel Institute, of differentials on the various grades of pig iron published in to-day's issue of THE IRON AGE. This pamphlet will be sent to any subscriber so requesting.

In the article published last week one slight error occurred. On rounds and squares 6⅝ to 7¼ in., the extra is 0.625c. instead of 0.025, as published.

Bolt and Nut Manufacturers Meeting

PITTSBURGH, Nov. 7 (*By Wire*).—A meeting of nut, bolt and rivet manufacturers will be held in the Waldorf-Astoria, New York, Wednesday, Nov. 21, to consider the question of whether there shall be a reduction made in prices on nuts, bolts and rivets. Some manufacturers state they are still paying high prices for raw materials and cannot see their way clear to reduce prices on nuts, bolts and rivets until the high-priced raw material has been worked off.

National Tube Co. Issues New Card

PITTSBURGH, Nov. 7 (*By Wire*).—The National Tube Co. has issued new discount cards on tubular products bearing date of Nov. 6 and showing advance over former prices of $8 per ton. This includes black and galvanized steel pipe, oil country goods, line pipe and all other tubular products.

The total assessed value of Minnesota iron mines has been fixed by the State Tax Commission at $295,353,692, an increase of $18,021,697 over the 1916 valuation, which compares with a valuation of only $194,428,928 in 1907, when the State Tax Commission was organized. The mineral assessment will produce a revenue for State purposes for the year of $1,500,396. The average tax rate in the mineral districts, for all purposes, State, county, school and municipal, for 1917 is estimated to aggregate 35 mills. On that basis, the iron ore properties will pay total taxes for all purposes in Minnesota of approximately $10,337,379 for the year, or $4,500,000 more than the estimated income derived from railroad gross earnings taxation in Minnesota for the same period.

THE MANGANESE PROBLEM

New Work of the Bureau of Mines—Steel Industry's Co-operation Vital

WASHINGTON, Nov. 5.—Because of the increasing difficulty in obtaining imported manganese and the vital importance of manganese for the production of the steel needed in the manufacture of war material, the U. S. Bureau of Mines is making a thorough investigation of the possibilities of relief through a more extensive use of domestic ores, according to an announcement made by Director Manning. These investigations have been assigned to the Lake Superior station recently established at Minneapolis. Although the bureau realizes the importance of taking up the iron-ore concentration problems at this station as soon as possible, yet such work is obviously to be classed as a peace problem relating to conservation. The manganese investigation is strictly a war problem dealing with increased production.

The Lake Superior region contains large reserves of manganiferous iron ores and can mine and ship much larger amounts if metallurgical practice can be so modified as to make ores in better demand. For many years our steel makers have relied on imported manganese alloys and ores. The imported ores are suitable for making 80 per cent ferromanganese, which is needed in greater quantities because of a larger proportion of our steel being made by the open-hearth process.

With the low ocean freight rates that prevailed generally during the last 10 or 20 years, it was well-nigh impossible for producers of domestic manganese ore to compete with imported ore. There was little incentive for the exploration and development of manganese ore bodies and their mining was carried on without system. With the outbreak of the war in Europe in 1914 the manganese industry of the world faced new conditions. Consequently, producers in the United States face an unprecedented demand.

To Investigate Manganiferous Iron Ores

Until last year this demand had little effect on production because of the difficulty of interesting capital in an industry that might die with the ending of the war. A clearer conception of the causes of high manganese prices and a belief in the likelihood of these existing for some time after the war has partly removed that tendency. Manganese ore of high grade, suitable for making 80 per cent alloy, is very scarce in the United States, but manganiferous iron ores are much more abundant. Such ores have not been in demand by the steel industry and it is essential to investigate carefully by extensive research the possibilities involved in their use. It is this work that the Bureau of Mines desires to carry out. The sooner the facts can be determined the more valuable they will be.

The bureau realizes that much information has been accumulated by various Federal and State bureaus, technical societies, private operators and individuals. Duplication of present effort and of any reliable results must be avoided. For this reason the bureau hopes to work in co-operation with all agencies interested, with producers and consumers of manganese ore and alloys and with individuals. Indeed, such co-operation is essential in order to serve the country well in the effective conduct of the war. A proper co-ordination of all data now available and of the data obtained in attacking these problems will be of tremendous assistance. Proper credit for such co-operation and assistance will be gladly given. Suggestions and constructive criticism will be greatly appreciated.

The bureau plans to assemble and tabulate information concerning the character and amount of known domestic ores; the current practice in mining and concentration; and the present methods of manufacturing manganese alloys and of using them in steel. When compiled this material should afford a starting point for various original researches.

Problems to Be Studied

The possibility of concentrating various types of ores will be studied by detailed tests and experiments; fundamental thermochemical data relating to manganese and its compounds will be determined and the equilibria of certain fundamental reactions between iron and manganese compounds will be studied. Also, much attention will be given to the development of possible substitutes for manganese in steel making; to the possibility of using more extensively alloys that are not used in what is now considered standard practice, such as alloys containing between 20 and 80 per cent manganese, and alloys containing manganese and other constituents, and to the possibility of increasing the manganese content of basic pig iron in order to lessen the amount of manganese alloy added at the end of a heat, part of this being left as residual manganese in the bath metal. Another problem that will be studied in the light of the results already obtained will be the production of manganese alloys in the electric furnace in localities where power is cheap. During the past summer the bureau has been carrying on a series of experiments in Pittsburgh on the production of alloys in the electric furnace from slags high in manganese.

Much of the work relating to present practice, also certain researches, must necessarily be conducted in the field at mines, concentrating plants, blast furnaces and steel works. In the laboratories of the Lake Superior station, which is situated at and co-operates with the University of Minnesota at Minneapolis, Minn., concentration tests of ores will be made and fundamental laboratory data will be collected. Arrangements are now in progress for co-operative work on other problems at laboratories throughout the country that are equipped to do work of the desired character.

The persons actively engaged in these manganese investigations will comprise the staff of the Bureau of Mines attached to the Lake Superior station, the staff of the Minnesota School of Mines Experiment Station and those members of the Bureau of Mines who may be particularly qualified for certain phases of the work. In order to make this work of the most practical value it is planned to organize a number of advisory committees composed of mine and furnace operators.

Shipyard Strike Ended

SEATTLE, Nov. 5.—After a strike of more than a month in the various shipyards of Portland, Ore., a settlement has been reached—the employees have returned to work, and the ship-construction work has been resumed on a larger scale than ever before. Every effort will be made to rush construction, and make up for the waste of time during the strike. Eleven steel steamers are nearing completion in Portland, four in the yards of the Northwest Steel Co., three at the Columbia River Shipbuilding Co.'s plant, and four on the ways of the Albina Engine & Machine Works. Most of these are 8800-ton carriers. If the strike had not occurred, several of them would have been completed, and machinery partially installed. The shipbuilding concerns in Portland have enough contracts on hand to keep the plants operating to capacity for the next two years. Other yards will be opened, for which negotiations are now under way, additional contracts are pending, and the shipbuilding industry shows extreme activity.

Shipyards in Sattle are likewise getting back to their former high state of efficiency prior to the strike, and work on the large number of vessels under construction is being rushed as much as possible.

A strike of the boilermakers in Vancouver, B. C., which has been in force for two weeks, has been called off by the union, and the men have returned to work. About 700 men were affected.

The Downey Shipbuilding Corporation, Mariners' Harbor, Staten Island, N. Y., has had plans prepared for the erection of 300 houses for employees at its new shipbuilding works, formerly the plant of Milliken Brothers, Inc., structural iron and steel.

BUY TOOLS FOR GUN WORK

Government Arsenals and Plants in Market

New Buying Also for Manufacture of Airplane Engines—Simplex Closes and General Vehicle May Buy This Week

Buying of machine tools for the production of big guns for the American Army in France is proceeding on a tremendous scale. Requirements of the Watertown Arsenal, Watertown, Mass., will aggregate several million dollars in value. Purchases will be made soon for the Watervliet Arsenal, Watervliet, N. Y. The new machine shop of the Navy Department at Washington, D. C., must also be provided with a large quantity of equipment. The Dodge automobile plant in Detroit will be devoted to the manufacture of recoil mechanisms for guns and additional buildings will be erected. It is reported that the contract taken by Dodge Bros. aggregates between $20,000,000 and $30,000,000. A large steel company is reported to have plans almost completed for a gun forging plant to cost several million dollars, which will be erected in the Middle West. The Stone & Webster Engineering Corporation, Boston, will close soon for 46 cranes for the Watertown Arsenal.

Needs of the shipbuilding companies are an important factor in present machinery demand. The Fore River Shipbuilding Corporation is still buying. It closed last week for 31 traveling cranes with the Niles-Bement-Pond Co. The Newport News Dry Dock & Shipbuilding Co., Newport News, Va.; the New York Shipbuilding Corporation, Camden, N. J., and the Union Iron Works, San Francisco, Cal., are all large buyers in various markets.

Merchant shipbuilding plants are also buying steadily. The Emergency Fleet Corporation has increased the contract of the American International Shipbuilding Corporation and will do likewise with the Submarine Boat Corporation. Each of these plants will build 150 or more merchant ships during 1918. The American International Shipbuilding Corporation is in the market for about 35 to 40 machines for a fabricating plant at its Hog Island yard. It also requires seven 10-ton traveling cranes and 46 3-ton jib cranes and an equal number of 3-ton mono-rail hoists.

The Simplex Automobile Co., New Brunswick, N. J., is finally going ahead with its plans for building airplane engines for the Government, and has bought about $300,000 worth of machine-tool equipment. The General Vehicle Co., Long Island City, N. Y., is expected to come into the market this week, but its requirements will not be as large as originally planned. Its list issued several weeks ago contained about 900 tools.

There is considerable miscellaneous buying in Eastern markets. E. I. Du Pont de Nemours & Co., Wilmington, Del., will put up a large powder plant, probably in Virginia, and will require equipment for a machine shop. This company has bought 20 presses for its plant at Pompton Lakes, N. J. The Scovill Mfg. Co., Waterbury, Conn., is buying for a fuse contract. One of its orders was for 300 hand screw machines. The Himoff Machine Co., Astoria, L. I., is buying for gun mount work. The Wasson Piston Ring Co., New Brunswick, N. J., is buying for a factory in England. M. J. Gourland, 120 Broadway, New York, has placed orders for automobile factories in France. The American Machine & Foundry Co., Brooklyn; the Brennan Motors Mfg. Co., Syracuse, N. Y., and the Bridgeford Machine Tool Works, Rochester, N. Y., are in the market for a few tools each.

The Baldwin Locomotive Works, Philadelphia, is buying for munitions work and also for export to Russia. A list was issued a few months ago for complete equipment of a locomotive shop in Russia to be built for the Russian Government, and apparently this project has been revived. The Jeanesville works of the Worthington Pump & Machinery Corporation, Hazelton, Pa., placed additional orders last week. The buying of the North American Motors Corporation, Pottstown, Pa., is said to have aggregated about $90,000. This concern will make 6-in. shells. The Landis Tool Co., Waynesboro, Pa., has bought a number of milling machines and lathes for equipping a new addition.

The Union Pacific Railroad Co. is buying for a shop at Pocatello, Idaho. Railroad buying in general is practically negligible.

In the Chicago market a large list has been received from the Four Lakes Ordnance Co., recently formed at Madison, Wis., to manufacture 5-in. guns. The Edward Valve & Mfg. Co. has bought close to $130,000 worth of machine-tool equipment in Chicago for Government work. This company has sublet a small contract to the Chamberlain Machine Works, Waterloo, Iowa. The Cambria Steel Co., Philadelphia, has been looking for tools in Chicago which it could not find in the East. The Miehle Printing Press Co., Chicago, has issued an inquiry.

The principal inquiry in the Cleveland market in the past week was from the Davis Sewing Machine Co. Dayton, Ohio, for about 40 machine tools for shell work.

It develops that the tools recently found in New York export warehouses, which will be taken over by the Government as needed, have a market value of about $10,000,000. A few of these tools will be shipped to the plant of the Simplex Automobile Co. for airplane engine work.

Plans of the Machine Tool Section of the War Industries Board are rapidly nearing completion. The needs of the Government for at least the next six months have been carefully approximated. Various plans are being worked out to speed up production of much-needed tools. Machine-tool builders have been asked to concentrate on the tools which are in greatest demand and curtail production of those which are not

so vital for the war industries. Less confusion in Government buying will be noted as soon as the central purchasing plan, now being worked out, is put into operation. Buying for all of the Government departments will pass through one office in Washington and competition between departments will be obviated.

Deliveries are getting further off, even for the most important Government work. Those who come into the market now with Class A1 priority certificates find that there are so many ahead of them that they must accept deliveries of two and three months or longer. The Simplex Automobile Co., which bought heavily last week, had priority number 88, but only in a few cases did it succeed in getting anything near prompt deliveries. A machine tool builder who is interested in a new ordnance plant said he would ask the Government for *double* A1 priority, a classification which does not yet exist, but his remark illustrates the futility of buyers expecting prompt deliveries even with priority certificates. To relieve the shortage of machine tools more stringent regulations on exports will be adopted. Even for the allied countries orders will be carefully investigated before licenses are granted. Dealers in those countries will undoubtedly find it difficult, if not impossible, to purchase tools for stock, and must show that the tools are needed for immediate use in war industries.

New York

NEW YORK, Nov. 6.

Buying of machine tools for war industries has been resumed on a large scale in the New York market during the past week after a slight lull. The Watertown Arsenal, Watertown, Mass., is one of the largest buyers. A complete list of the arsenal's requirements was not sent to the trade, but from the size of the individual orders placed it is apparent that the purchases will run into several millions of dollars as a great deal of the equipment is of heavy type for a new forge shop, rough machining shop and erecting shop. A single order for one type of tool is said to have totaled about $200,000. The Stone & Webster Engineering Corporation, Boston, which is building the shops, opened bids on Oct. 31 for 46 electric traveling cranes of from 10-ton to 65-ton capacity. There were about 10 bidders, and the lowest bid totaled several hundred thousand dollars. Deliveries of these cranes, as quoted in the bids, averaged from two to ten months. The cranes are wanted by April 1, 1918. The Watervliet Arsenal, Watervliet, N. Y., is making large additions to its gun-making plant and will buy equipment soon.

The Fore River Shipbuilding Corporation continues to place orders for machine tools for its machine shop in Buffalo, and has also bought, through the Aberthaw Construction Co., Boston, 31 traveling cranes from the Niles-Bement-Pond Co. Several locomotive cranes have been purchased.

After much delay the Simplex Automobile Co., New Brunswick, N. J., is going ahead with its plans to make Hispano-Suiza airplane engines for the United States Government and a few days ago placed orders for machine tools aggregating $300,000 or more. Some of the tools found in export warehouses in New York by the Government, as mentioned in THE IRON AGE last week, were taken for the Simplex plant. It is reported that the Simplex contract calls for 4000 motors. The General Vehicle Co., Long Island City, N. Y., is also about to buy and its orders are expected this week. It is said that this company will make 1000 Gnome motors, which is considerably less than the number originally figured upon when the General Vehicle Co. machine-tool list was issued several weeks ago.

The Scovill Mfg. Co., Waterbury, Conn., is buying on a large scale for a Government contract for fuses. An order was placed for 300 Foster screw machines and other tools will be required.

The Union Pacific Railroad Co. is placing orders for equipment for a shop at Pocatello, Idaho. Two gantry cranes have been bought and a number of tools. Two traveling cranes, one of 15-ton and another of 25-ton capacity, will be required.

Twenty presses have been bought by E. I. Du Pont de Nemours & Co., for the cartridge department at their Pompton Lakes, N. J., plant. The Brennan Motors Mfg. Co., Syracuse, N. Y., is buying a few tools for motor work. The Bridgeford Machine Tool Works, Rochester, N. Y., has been inquiring for several tools. The Himoff Machine Co., Astoria, L. I., is buying both new and second-hand equipment for making gun mounts for the Navy Department. The Wasson Piston Ring Co., New Brunswick, N. J., is placing orders for tools for a new plant, to be built in England. M. J. Gourland, 120 Broadway, New York, is buying tools for shipment in several months to automobile factories in France for replacement. The American Machine & Foundry Co., Brooklyn, has been trying to obtain prompt delivery on a number of tools needed for Government work.

Basil Bancroft, American representative of the Whitehead Aircrafts, Ltd., Richmond, Surrey, England, has been making inquiries of the trade as to the possibility of making shipments of tools to England. No list of the requirements of the Whitehead factory has as yet been issued.

A company in the East which has been figuring on a large contract with the Government for making recoil mechanisms for guns has abandoned its plan. It had inquired for about $500,000 worth of machine-tool equipment. It is reported that the Government will place the contract with a company recently formed by leading manufacturers of Detroit and the Dodge Bros. automobile plant will be utilized for this work.

It develops that the machine tools in export warehouses, which have been commandeered by order of the War Industries Board, totaled about $10,000,000 in value. Many of these tools were consigned to Sweden and some of them had been in storage for two and a half years. They will be left in the warehouses, but the Government has a complete record of them and will take them out as needed for urgent requirements.

The Submarine Boat Corporation's orders for nine locomotive cranes has been awarded to the Ohio Locomotive Crane Co. The Terry Steam Turbine Co. has bought one locomotive crane for its plant at Hartford, Conn., to which additions have been built for turbine work.

Stephen Ransom, New York, operating a works at 401 West Street for marine repairs, machine work, etc., has purchased property at 408-9-10 West Street for the construction of a new three-story boiler shop.

The Stoddard Union Co., New York, has been incorporated with a capital of $100,000 to manufacture cast steel pipe and pipe fittings. A. Hild, E. O. Aspein and F. B. Potterton, 18 Cliff Street, are the incorporators.

The Gerald G. Freeman Corporation, New York, has been incorporated with a capital of $100,000 to manufacture tools and hardware. H. S. White, T. J. Mahoney and Gerald G. Freeman, 216 West Eighty-ninth Street, are the incorporators.

The Standard Aircraft Corporation, New York, has been incorporated with a capital of $5,000,000 to manufacture aeroplanes. C. H. Day, H. B. Mingle and D. L. Meehan, Jr., 36 West Eighty-eighth Street, are the incorporators.

The Burroughs-Baldwin Co., New York, has been incorporated with a capital of $20,000 to manufacture hardware, cutlery, etc. C. R. Frazer, W. C. Burroughs and D. W. Baldwin, 87 Warren Street, are the incorporators.

The Williams Cabble Excelsior Wire Mfg. Co., 88 Ainslie Street, Brooklyn, has had plans prepared for alterations and improvements in its plant to cost about $16,000.

The Dunlop Wire Wheel Corporation of America, New York, has changed its name to the Ajax Wire Wheel Corporation of America.

The Darling Metal Goods Mfg. Co., New York, has been incorporated with a capital of $10,000 to manufacture metal specialties. R. S. Darling, B. E. Storm and J. E. Watson, 30 Church Street, are the incorporators.

The Grant Hammond Arms Co., New York, has been incorporated in Delaware with a capital of $1,000,000 to manufacture firearms. Arthur W. Britton, Samuel B. Howard and George V. Reilly, all of New York, are the incorporators.

The New York Signal Co., New York, has been incorporated with a capital of $12,000 to manufacture signal apparatus for automobiles. F. J. Benitoa, C. J. and J. R. Avellanal, 111 West Sixty-ninth Street, are the incorporators.

The Peerless Watchmen's Clock Co., New York, has been incorporated with a capital of $75,000 to manufacture special clocks. H. T. Stetson and R. L. Kritzler, 1081 Union Avenue, are the incorporators.

The Kings County Iron Foundry Co., North Thirteenth and Berry streets, Brooklyn, manufacturer of sash weights and other specialties, has been incorporated with a capital of $200,000. T. E. Hodgskin, C. S. Woodman and J. Friedman, 20 Nassau Street, New York, are the incorporators.

The Anco Mfg. Co., New York, has been incorporated with a capital of $250,000 to manufacture automobiles and motor trucks. The incorporators are H. Hartman, D. S. Leiberman and B. H. Resnick, 54 Cathedral Parkway.

Jacobson & Feldherr, Inc., New York, has been incorporated with a capital of $10,000 to manufacture hardware and automobile supplies. D. Lieberman, E. Feldherr and M. Jacobson, 1519 Madison Avenue, are the incorporators.

The Globe Auto Radiator Mfg. Co., Brooklyn, has been incorporated with a capital of $5,000 to manufacture automobile radiators. A. and B. Greenblatt, 1766 Union Street, are the principal incorporators.

Davidson & Schwab, Inc., 126 West Forty-sixth Street, New York, manufacturer of jewelry, has increased its capital from $50,000 to $500,000.

The Otter Mfg. Co., New York, has been incorporated with a capital of $100,000 to manufacture automobile supplies. L. May and S. and M. M. Otter, 243 West Seventeenth Street, are the incorporators.

The Associated Steel Corporation, New York, has been incorporated with a capital of $50,000. R. T. Kahl, A. M. Carbade and M. F. Walser, 309 West Eighty-sixth Street, are the incorporators.

The Tidewater Shipwrights, Inc., New York, has been incorporated with a capital of $10,000. The incorporators are M. P. Wheeler, W. Brown and L. W. Davidson, 18 Christopher Street.

The Kansas City Machine & Supply Co., New York, has been incorporated with a capital of $50,000 to manufacture motion picture machines. J. Robert Rubin, H. T. Edwards, J. H. Halberg and A. D. Flinton, New York, are the incorporators.

The McCoy Iron Works, Seaman Street, Perth Amboy, N. J., has commenced the construction of a new one-story plant about 100 x 400 ft., on Mortimer, near St. Vincent Street, Utica, N. Y., for the manufacture of steel and iron products. Considerable electrically operated equipment will be installed. M. A. McCoy will be local manager.

The Universal Air Motor System, Inc., Newburgh, N. Y., has been incorporated with a capital of $50,000 to manufacture air motors, etc. J. and J. Graziano, and W. W. Babcock, Spring Valley, N. Y., are the incorporators.

The New Era Double Tire Co., 261 West Onondaga Street, Syracuse, N. Y., manufacturer of automobile tires, is contemplating increasing the capacity of its present plant.

The Globe Malleable Iron & Steel Co., 101 Greenway Avenue, Syracuse, has acquired property about 980 x 1000 ft., on Teall Avenue, adjoining its present works, to be used for future extensions. The company has no immediate plans for building. W. C. Lipe is president, and H. H. Elmer, treasurer and general manager.

The Warsaw-Wilkinson Co., Highland Avenue, Warsaw, N. Y., manufacturer of agricultural implements, has increased its capital from $100,000 to $200,000.

The Bridgeford Machine Tool Works, Winton Road, Rochester, N. Y., has awarded a contract for the erection of an addition to cost about $50,000. A. W. Ingle is president. Crowell, Lundoff & Little, Museum Building, Cleveland, are the contractors.

The Farmers Machine & Chemical Co., Rochester, N. Y., has been incorporated with a capital of $100,000 to manufacture machinery, etc. J. N. Marshall, W. S. McKinney and S. G. H. Covell are the incorporators.

The Monarch Blower Co., Troy, N. Y., manufacturer of blowers, has been acquired by the Climax Smoke Preventor Co., Boston. The new owners contemplate increasing the capacity of the plant. B. L. Ames is general manager.

The Transmission Ball Bearing Co., 1050 Military Road, Buffalo, manufacturer of ball bearings, etc., has acquired about seven acres on Military Road for the erection of a new plant.

The De Vogel Machine & Welding Co., Paterson, N. J., has been incorporated with a capital of $25,000 to manufacture tools and other products. John and Richard De Vogel, and Robert T. Hamilton, Paterson, are the incorporators.

The Atlas Welding Co., 146 Irving Street, Rahway, N. J., has been incorporated with a capital of $50,000 to manufacture acetylene cutting and welding apparatus. Walter W. Todenwarth, Roselle; John Grouss and Clarence E. Pryor, Elizabeth, are the incorporators.

The Samuel L. Moore & Sons Corporation, Elizabeth, N. J., announces the acquisition of its plant by the Moore Shipbuilding Co., a subsidiary of the Bethlehem Shipbuilding Corporation. The Liebig Mfg. Co. has also been acquired and will be used as a shipbuilding plant in conjunction with the Moore works.

The National Auto Accessories Co., South Orange, N. J., has been incorporated with a capital of $50,000 to manufacture automobile accessories. Jerome C. Beck and Roy Choen, South Orange, are the incorporators.

Reinhold Schumann, Inc., East Orange, N. J., has been incorporated with a capital of $50,000 to manufacture surgical instruments. The incorporators are Gordon Grand, Charles O. Geyer and Harry H. Picking, East Orange.

The Improved Rubber Co., Bayonne, N. J., has been incorporated with a capital of $100,000 to manufacture rubber goods. A. A. DeBonneville, Bayonne, and A. S. Perry, Branford, Conn., are the principal incorporators.

The A. W. Wheaton Brass Works, 157 New Jersey Railroad Avenue, Newark, N. J., specializing in the manufacture of builders' hardware, will erect a new one-story brass foundry, about 33 x 50 ft.

A one-story power plant, about 46 x 90 ft., will be erected by the United Color & Pigment Co., Newark, on Evergreen Avenue, near the Pennsylvania Railroad.

The E. J. Kerns Mfg. Co., Newark, has been incorporated with a capital of $50,000 to manufacture aeroplanes. Francis J. Kerns, Newark; Edward J. Kerns, Worcester, Mass.; and James F. Kelly, East Orange, are the incorporators.

The Weston Electrical Instrument Co., Weston Avenue, Newark, manufacturer of electrical measuring instruments, has increased its capital from $500,000 to $1,000,000.

The Pulsometer Steam Pump Co., 485 South Twenty-first Street, Irvington, Newark, manufacturer of pumps, will erect a one-story addition.

The Avery Mfg. Co., 119 Griffith Street, Jersey City, has been organized to manufacture folding machines. Howard F. Avery, Riverside Drive and Eighty-fifth Street, New York, heads the company.

The Atlas Steel Casting Co., Buffalo, is building an addition, 40 x 96 ft., to its foundry at Elmwood Avenue and the Erie Railroad.

The American Radiator Co., Buffalo, is completing drawings for a one-story addition, 120 x 200 ft., to its foundry at Elmwood Avenue and the New York Central Railroad Belt Line.

The O'Neil Iron Works, Inc., Buffalo, has been incorporated with a capital stock of $400,000. Lawrence W. and William D. O'Neil and John M. Hull are the directors.

The Empire Engineering Co., 1042 Marine Bank Building, Buffalo, has completed plans for a power house, 50 x 85 ft., which it will erect at the foot of Michigan Street.

The Volz-Guild Co., Buffalo, has been incorporated with a capital stock of $50,000, to manufacture steel and iron products and railroad specialties. For the present its products will be manufactured by contract and later a plant will be equipped. George Volz, Rufus C. Guild and William H. Means are the directors. Offices are being established in the Ellicott Square Building.

The Beaver Board Companies, Buffalo, has plans for a four-story reinforced concrete addition, 40 x 80 ft., to plant at Beaver Road, Ontario Street and the New York Central Railroad. William F. MacGlashan is president.

The Vulcan Steam Forging Co., Buffalo, is building a power house at Rano Street and the Lackawanna Railroad.

The Kellogg Structural Steel Co., Buffalo, is building an addition, 55 x 150 ft., to its fabricating plant at Stone Street and the New York Central Railroad.

The United States Lens Co., Geneva, N. Y., is taking bids on revised plans for a one-story addition to its factory, 65 x 180 ft. C. E. Wilson is president.

The Union Carbide & Carbon Corporation of Niagara Falls, capitalized at $15,000,000, has been incorporated to supersede the Union Carbide Co., and continue the operation of the plant and business at Union Road and the New York Central Railroad Belt Line and the Niagara Falls Junction railroads. The directors are C. K. G. Billings, Charles A. Coffin, New York, Myron T. Herrick, Cleveland, and Nicholas Brady.

B. T. Converse, United States Government engineer, is preparing plans for a one-story ordnance factory, 200 x 300 ft., at the Watervliet Arsenal. W. W. Gibson is commandant.

Philadelphia

PHILADELPHIA, Nov. 5.

The American International Shipbuilding Corporation has issued inquiries for cranes and machines for the equipment of a plate and angle shop at its Hog Island shipyard. Bids will close on Nov. 6 for seven 10-ton traveling cranes, 70-ft. span, and 45 3-ton jib cranes with 45 3-ton electric monorail hoists. Ten are of the bracket type and 35 of the mast type. About 35 or 40 machines will be required for fabricating work, including punches, shears, bending rolls, shapers, planers, radial drills, etc. Nearby deliveries are asked for, and it is known that a number of concerns will be unable to quote because their output for several months ahead is already preempted on priority orders.

Cramp & Co., Denckla Building, Philadelphia, are making

inquiries for supplies and equipment for the $1,000,000 machine shop which the Navy Department will build at Washington. The machine-tool equipment of this shop will total many millions of dollars. Bids for construction of the building closed on Nov. 5.

E. I. Du Pont de Nemours & Co., Wilmington, Del., will construct another large powder plant at the behest of the United States Government. It is reported that it will be located somewhere in Virginia. The company is inquiring for eight locomotive cranes with buckets for excavating and handling material and it is understood will soon issue an inquiry for considerable machine-shop equipment. It has also been reported, though not confirmed, that the Du Pont Company will build a powder plant in France for the United States Government.

The Baldwin Locomotive Works, Philadelphia, is buying machine tools for munitions work and has also closed on a number of tools for export to Russia. A list was issued a few months ago for a complete equipment for a locomotive shop to be built in Russia for the Russian Government, and it is said that this project has now been revived and will be carried out.

The Jeanesville works of the Worthington Pump & Machinery Corporation at Hazleton, Pa., continues to buy for munitions work and last week closed orders amounting to $30,000 to $40,000. Several other large machine-tool orders have been placed within the past few weeks.

The New York Shipbuilding Corporation, Camden, N. J., has been buying throughout the past week. Its orders in the aggregate are very large, but will not approximate those placed by the Fore River Shipbuilding Corporation, Quincy, Mass., which is also to build destroyers. An unofficial estimate is that the buying of the New York Shipbuilding Corporation may reach $1,000,000 or more. So far, the William Cramp & Sons Ship & Engine Building Co., Philadelphia, has bought comparatively little. The Newport News Dry Dock & Shipbuilding Co., Newport News, Va., has come into the market and its purchases may also reach about $1,000,000. This company will build about 20 destroyers.

The North American Motors Corporation, Pottstown, Pa., has closed for equipment for 6-in. shell work. Its orders are said to have aggregated about $90,000.

The Landis Tool Co., Waynesboro, Pa., as bought a number of tools, mostly milling machines and lathes, for an addition to its plant.

It is reported in the trade that the Budd Mfg. Co., Philadelphia, now making wire wheels, may take another contract soon and will be in the market, in that event, for additional machine-tool equipment.

The Chesapeake Iron Works, Baltimore, Md., which has recently begun the building of electric traveling cranes, has taken on a considerable number of large orders, and will increase the capacity of its plant by the addition of an erecting shop, one story, 40 x 210 ft., costing about $150,000. This expansion will presumably include the purchase of some new equipment.

The Haines, Jones & Cadbury Co., Philadelphia, brass goods manufacturer, has purchased several new machine tools.

The International Auto Parts Co., Philadelphia, has been incorporated with a capital of $50,000 to manufacture automobile parts. Philip Belasco, 1806 North Eighth Street, is treasurer.

The Allen Iron & Steel Co., Philadelphia, operating machine repair shops at Third and Venango streets, will build a one-story addition, about 35 x 84 ft.

The Bitumo Enamel Co., Gloucester City, N. J., has been incorporated with a capital of $100,000 to manufacture enamel ware. Hugh V. Ramsay, Elmer J. Shinn and Frank Breckenridge, Gloucester City, and Norman Burn, Camden, are the incorporators.

The Verilite Metals Co., Philadelphia, has been incorporated with a capital of $1,000,000 to manufacture metal and aluminum products. F. R. Hansell, Philadelphia, and S. C. Seymour, Camden, N. J., are the incorporators.

A power house will be built by Winfield S. Barnes & Co., 1614 Cherry Street, at their new plant to be erected in the Frankford section at a cost of about $75,000.

William B. Chambers, Philadelphia, will build a one-story machine shop, 32 x 32 ft., at Seventy-second and Yocum streets.

The Clinton Shipbuilding & Repair Co., Philadelphia, has been incorporated with a capital of $50,000. F. J. Bradley is treasurer.

The Harrison Safety Boiler Works, Seventeenth Street and Allegheny Avenue, Philadelphia, will erect a small addition to its foundry.

The National Auto Top Co., Philadelphia, has acquired property on Princeton Avenue, Trenton, N. J., for the establishment of a new plant.

The Weatherly Foundry & Machine Co., Hazelton, Pa., is planning for the erection of a new electric power plant.

The Badenhausen Co., Philadelphia, which will supply many boilers for the merchant fleet now being built by the Emergency Fleet Corporation, is making extensions and improvements at all of its plants. About $300,000 is being spent for additions and new equipment. At its works at Bound Brook, N. J., known as the Bound Brook Engine & Mfg. Co., 18 triple expansion marine engines will be built for merchant ships. Machine-tool equipment has recently been purchased for that shop. The shops at Norristown and Bridgeport, Pa., are being enlarged and an entirely new plant is being built at Cornwells, Pa., on a 73-acre site. A new boiler shop, 200 x 275 ft., is the first unit of the new Cornwells plant.

Baltimore

BALTIMORE, Nov. 5.

The Bartlett-Hayward Co., Scott and McHenry streets, Baltimore, will build a new one-story plant, 160 x 380 ft., at Gunpowder and Hamburg streets, to cost about $79,500. Morrow Brothers, 1201 Fidelity Building, have the contract.

The Baltimore Enamel & Novelty Co., Westport, Md., has been incorporated with $1,500,000 capital stock by Henry A. Brehm, Arthur P. Claridge and Harold B. Little to manufacture enamel ware.

The Poole Engineering & Machine Co., Woodberry, Md., will build a two-story office building, 32 x 48 ft., at Railroad and Woodberry avenues, at a cost of $4,300.

A permit has been granted to the Porcelain Enamel & Mfg. Co., Baltimore, to construct a plant, 120 x 319 ft., at Ridgely and Bayard streets at a cost of $40,000. P. O. Keilholtz, 1602 Continental Building, is the architect.

The Crown Cork & Seal Co., 1511 Guilford Avenue, Baltimore, will build an addition to its power house at Highlandtown, Md.

The Shawinigan Electro Products Co., Lexington Street Building, Baltimore, has increased its capital stock from $500,000 to $750,000.

The Universal Aircraft Construction Co., Wilmington, Del., has been incorporated with a capital of $1,000,000 to manufacture airplanes. George G. Steigler and E. E. Wright, Wilmington, are the incorporators.

The Bedford Can Co., Bedford, Va., has increased its capital from $50,000 to $100,000.

The Economy Electric Co., Norfolk, Va., has been incorporated with a capital of $50,000 to manufacture electrical supplies. Charles A. and E. R. Page, Norfolk, are the principal incorporators.

Chicago

CHICAGO, Nov. 5.

The war demand for machine tools is approaching full flood in this section, with the problem of finding them to sell growing more acute, especially with regard to large tools. Interest the past week has been largely centered in the equipment required for the manufacture of 5-in. guns. A large list of such tools has been issued by the Four Lakes Ordnance Co., recently incorporated at Madison, Wis., by officials of the Steinle Turret Machine Co. of that city.

Not much is heard of new shell orders, but a steadily growing number of manufacturers are taking on various forms of Government work such as guns, mounts and their parts, forgings for ships, etc. The Edward Valve & Mfg. Co., which has large orders for fittings and 3-in. shells, has bought close to $130,000 worth of equipment. To permit the fulfilment of orders for products in its own line, it has sublet its shell contract to the Chamberlain Machine Works, Waterloo, Iowa.

Big planers and boring mills continue in conspicuous demand, one large dealer stating that the extent to which orders for these machines, either new or second-hand, have to be turned down is disheartening. They simply cannot be had for any kind of near delivery. Under such circumstances even priority orders cannot be promptly filled.

The Cambria Steel Co., Philadelphia, has been looking in this market for machines which it could not find in the East. Several tools have been purchased here for delivery to an automobile company which is to locate in Buffalo. A Waukegon, Wis., company has been an active buyer. A local firm which has inquiry out is the Miehle Printing Press Co., Chicago.

The Krasberg Mfg. Co., Chicago, is to enlarge its facilities for the manufacture of tools, jigs and fixtures.

The Union Special Machine Co., Chicago, plans to build an eight-story factory to increase its output of sewing machines, these being in great demand for the manufacture of garments for the army and navy.

Practically all factory extensions and new shops now reported are related directly or indirectly to war needs which is in compliance with Government request.

The Standard Spiral Pipe Works, Chicago, which has contracts for reinforced pipe, is equipping a forge shop and in addition to forging pipe couplings may take on a Government contract for ship forgings.

It has been announced that the size of the Holt Mfg. Co., Peoria, Ill., which is committed to supplying the Government with tractors and shells, will be tripled in size, so that eventually 1200 machinists will be employed. It is estimated that the improvements will cost about $500,000 and be completed by Jan. 1. A Government training camp will be established near the plant for instructing army men in the manangement of the so-called "tanks."

The Motors Appliances Co. will establish a plant in East Moline, Ill., for the manufacture of the Benson automobile signal device and other accessories and has purchased the former plant of the Fuller-Lee Disc Co. G. L. Rowe, East Moline, is secretary.

The Dirigible Auto Light Co., St. Joseph, Mo., has been incorporated with a capital stock of $25,000 for the manufacture of devices for focusing, adjusting and turning headlights on automobiles, locomotives, interurban cars, etc. Dr. U. G. Crandell, Dr. E. H. Bullock and John P. Strong are the incorporators.

The Avery Co., Peoria, Ill., has purchased the plant of the Davis Mfg. Co., Milwaukee, Wis. The latter company has supplied the Avery Co. with gasoline motors for tractors.

The U. & J. Carburetor Co., Chicago, has been incorporated in Delaware with a capital of $250,000 to manufacture carburetors. Frank A. Urwan, J. W. Johnson and George E. Brannan, all of Chicago, are the incorporators.

Catalogs Wanted

The H. Mueller Mfg. Co., Decatur, Ill., desires a catalog library covering lathes, drilling machines, automatics, etc., and metal-working machines generally.

Milwaukee

MILWAUKEE, Nov. 5.

A feature in the metal-working industry in this section is the unprecedented activity in the drop-forge business. A number of new projects have been established in Wisconsin the past six months, others are in process of completion, and existing forge-shops are making extensive additions. Several of these are identified with railroad forgings, while others are producing a varied line of material for Government war requirements.

The demand for machine-tools, especially milling machines, continues at a high ebb. October business was by far the largest that local builders have ever known. Several new shop extensions which will be available about Dec. 1 or Jan. 1 and furnish some relief from the pressure upon existing facilities. While local shops could use many more skilled and unskilled men, the requirements are fairly well taken care of for the present.

Because of the close co-operation between the machine-tool industry and the Government, manufacturers experience little difficulty in obtaining sufficient shipping facilities, which are lacking in the more private lines of business.

The Four Lakes Ordnance Co., Madison, Wis., organized by interests owning the Steinle Turret Machine Co., Madison, to manufacture naval ordnance for the Government, has awarded the general contract for the erection of its new plant to the Austin Co., Cleveland. It will be of steel, brick and reinforced concrete, 150 x 500 ft., and is to be completed by Jan. 1. G. A. Steinle is in general charge.

The Milwaukee Forge & Machine Co., 224 Lake Street, Milwaukee, has purchased a 5-acre site at Oklahoma Avenue, Manitoba Street, and the Chicago & Northwestern Railroad tracks, and will spend $100,000 in the construction and equipment of a new plant. The first units will be a forge shop, 75 x 150 ft., 50 ft. high, and a one-story machine shop, 65 x 100 ft. The officers are: President, George P. Pillar; vice-president and treasurer, John Eckert; secretary, P. J. Ramstack.

The United States Switch Co., Eau Claire, Wis., recently organized with $1,750,000 capital, and now operating in the former plant of the Eau Claire Mfg. Co., is preparing to erect a drop forge shop addition, 60 x 130 ft. Bids will be taken about Dec. 1. T. C. Hadley is general manager.

The Otto Biefeld Co., Watertown, Wis., expects to be ready for bids Dec. 1 for the erection of a foundry and machine-shop addition, estimated to cost $40,000. Max Biefeld is secretary.

The Northern Boiler & Structural Works, Appleton, Wis., will spend between $30,000 and $40,000 in the erection and equipment of a one-story shop addition, 100 x 150 ft. Bids probably will be taken late in November.

The Arneson Foundry Co., South and Exchange Streets, Kenosha, Wis., is reported to be considering the erection of an addition to its plant. The company manufactures brass and iron castings, and specializes in heavy brass work.

W. H. Stewart, Delavan, Wis., will erect a machine-shop, farm implement and automobile warehouse, 70 x 100 ft., costing about $15,000.

J. H. Boggess, 21 North Union Street, Fond du Lac, Wis., has organized the Boggess Mfg. Co. and leased the Haas Building, Second and Macy Streets, which will be equipped to manufacture a sheet metal mop wringer.

The Titan Truck & Tractor Co., 843-849 Thirtieth Street, Milwaukee, recently incorporated with a capital stock of $100,000, has changed its corporate style to the Titan Truck Co., having abandoned its original plan of building tractors, at least for the present. Joseph C. Millman is president and general manager.

B. Wiesniewski, of John Wiesniewski & Son, 904-906 Kinnickinnic Avenue, Milwaukee, machinists, has organized the Motor Specialties Co. of Milwaukee, with a capital stock of $5,000, to manufacture automobile bodies, accessories, supplies, etc.

The Record Needle & Mfg. Co., 135 Second Street, Milwaukee, has been incorporated with a capital stock of $75,000 to manufacture talking machine and phonograph needles and later sewing machine and other textile needles. A factory will be equipped at once. The officers are: President, George F. Ruez; vice-president, Samuel W. Goldsmith; secretary, Harry A. Goldsmith.

The Kant-Mis Spark Plug Co., Green Bay, Wis., has been incorporated with a capital stock of $10,000 to manufacture spark plugs and other gas engine and automobile devices and accessories. The incorporators are William C. Haslem, Bearl E. Calburn and Jack Gilleaume.

The Gillette Rubber Co., Eau Claire, Wis., which recently completed its new plant, will add a boiler and transformer house, 65 x 81 ft., 60 ft. high, with a 175-ft. concrete stack, 15 ft. in diameter. The installation will include two 315-hp. Sterling boilers; hydraulic pumps; open switchboard and overhead coal bunkers of 650 tons capacity, with automatic stokers. R. B. Gillette is vice-president and general manager.

The Allen-Bradley Co., 495 Clinton Street, Milwaukee, manufacturer of electric controlling devices, rheostats, etc., has increased its capital stock from $136,000 to $168,000 to accommodate its growing business. Harry L. Bradley is vice-president and general manager.

The Ajax Forge Co., Superior, Wis., started operations in its new plant Nov. 1, which represents an investment of about $200,000. The forge shop is 120 x 200 ft., and the blacksmith shop 50 x 80 ft. Much of the production will go to the Great Northern Railway, it is stated. C. O. Hunt is general superintendent.

The Stegeman Motor Car Co., 606 Linus Street, Milwaukee, manufacturer of 6-cylinder, worm-drive motor trucks exclusively, is reorganizing its official personnel following the resignation of Oscar Stegeman as president and general manager. The controlling interest now is represented by Arthur Davidson, of the Harley-Davidson Motor Co., motorcycle manufacturer, Milwaukee. The Stegeman plant has been doubled in size during the last five months.

J. Frederick Palmer, 60-64 Third Street, Milwaukee, manufacturer of tools and dies, has incorporated under the name of the J. Frederick Palmer Mfg. Co., with a capital stock of $25,000. The business will be enlarged to manufacture machine tools as soon as facilities can be provided. N. C. Woodin and Herbert P. Manger are also incorporators.

The Turner Mfg. Co., Port Washington, Wis., manufacturer of gas engines, tractors and farm machinery, has increased its capital stock from $150,000 to $250,000. L. M. Turner is vice-president and general manager.

Detroit

DETROIT, Nov. 5.

Large orders for munitions have caused a rush of inquiries to machine tool jobbers, which are expected to result in good business within a few weeks.

Dodge Bros., Detroit, have a Government contract for between $20,000,000 and $30,000,000 worth of munitions,

which will probably be increased. Work has been started on a munition plant on the Lynch road, east of Mt. Elliott Avenue, Detroit. It is reported that the building will be ready for occupancy next spring as construction materials have been guaranteed by the Government.

The Packard Motor Car Co., Detroit, is erecting a large building in the same neighborhood for the manufacture of materials for the Government, and a third plant for another company is in prospect.

It is reported that a contract involving $100,000,000 has been promised an organization of leading Detroit business men and financiers. At present the organization is being perfected and definite announcement of the plans are being withheld.

The local labor situation has been affected by the scarcity of skilled men. Machinists are drawing high wages and it is impossible to secure enough to run all plants to capacity. The coal situation has not improved, and large companies are facing a shutdown unless the situation is relieved. Transportation difficulties have lessened, but raw materials are still extremely hard to obtain.

The old plant of the Bay City Box & Lumber Co., Bay City, Mich., has been purchased by a newly organized company, in which Bay City, Detroit and Toronto capital is interested, to manufacture airplane parts for the Government. Additions are planned so that later complete airplanes may be manufactured. Capt. E. L. Janney, Canadian army aviator, announced the formation of the company.

The East Fulton Hardware, Heating & Plumbing Co., Grand Rapids, Mich., has been organized with a capital of $20,000. The stockholders are Harry VanderVeen, Jennie Grougan and Cornelius VanHouten.

The Triangle Truck Co., St. Johns, Mich., has resumed work on its new plant which will be pushed to completion.

The Fuller & Sons Mfg. Co., Kalamazoo, Mich., maker of automobile parts, is installing machinery and equipment in its new factory, which is nearly completed. The addition of two buildings will more than double the floor space.

Cleveland

CLEVELAND, NOV. 5.

The market is somewhat quieter than it has been owing to the absence of round lot buying, but steady demand exists for small lots of tools and single machines. Practically all business being placed is for Government work. With slow deliveries and high prices buyers generally are only purchasing machinery that they cannot get along without. With the exception of an inquiry from the Davis Sewing Machine Co., Dayton, Ohio, for about 40 machines for shell work, no large list came out the past week. A let-up is noted in the demand from rubber companies, some of which announce that they do not expect to buy any more equipment this year. Considerable business has been coming from this source recently.

The G. H. Scott Machine Co., Cleveland, has commenced the erection of a new one-story plant, 60 x 166 ft., at West 114th Street and Locust Avenue, which will about double its present capacity.

A. P. Schraner, Cleveland, will erect a new two-story pattern works, 60 x 107 ft., at 3338 Payne Avenue.

The Toledo Plate & Window Glass Co., Toledo, Ohio, will erect a plant on St. Clair Avenue between East Thirtieth and Thirty-third Streets, Cleveland, which will include finishing works, warehouse and office building. Walker & Weeks are the architects.

The Grabler Mfg. Co., Cleveland, which will build a new three-story foundry, 47 x 130 ft., has awarded the general contract to the Sam W. Emerson Co., 1900 Euclid Avenue.

The Warner & Swasey Co., Cleveland, has placed a contract for the erection of a two-story reinforced concrete factory, 71 x 100 ft.

The Davis Sewing Machine Co., Dayton, Ohio, has an inquiry out for about 40 machine tools, including five milling and nine drilling machines, four boring mills, five turret lathes, sixteen miscellaneous machines, including two plain grinding machines, a double acting toggle press, punch and shearing machine, bolt riveter, engine lathe and two 25-ton bulldozers.

The H. L. Hurst Mfg. Co., Canton, Ohio, maker of spraying machines, has increased its capital stock from $100,000 to $150,000. It will soon move from Canton to Greenwich, Ohio.

The Benoist Aeroplane Co., Canton, Ohio, is equipping a temporary building and announces that it will build a new plant next spring.

The Champion Spark Plug Co., Toledo, has purchased the properties of the F. Bissell Co. and the City Foundry, adjoining its plant. The buildings are being remodeled and will be used as machine shop, steel drawing department, and warehouse. It has also purchased 4 acres of land nearby for further expansions.

The Niles Forge & Machine Shop, Niles, Ohio, has broken ground for a new machine shop, 40 x 80 ft.

Indianapolis

INDIANAPOLIS, NOV. 3.

The Indianapolis Engineering Co., Indianapolis, has been incorporated with $50,000 capital stock to manufacture machinery. The directors are Arthur J. Gibbons, William Brandt and Raymond W. Beckman.

The Kokomo Rubber Co., Kokomo, Ind., has increased its capital stock from $200,000 to $1,000,000.

The United States Traction Wheel Co., Kokomo, Ind., has been incorporated with $100,000 capital stock to manufacture wheels for tractors. The directors are Alton G. Seiberling, Harry F. Tate and David McCosker.

The Searle Mfg. Co., Anderson, Ind., has been incorporated with $10,000 capital stock to manufacture files and other tools. The directors are Frank F., Samuel H. and C. E. Searle.

The R. W. G. Foundry Co., Anderson, Ind., has been incorporated with $9,000 capital stock to manufacture gray iron castings. The directors are Myron G. Reynolds, John C. Westerfield and Jacob C. Groble.

The Benham-White Co., Crothersville, Ind., has been incorporated with $17,000 capital stock to manufacture woodenware. The directors are Clyde W. Keach, Harlan B. White and Alex. W. Benham.

The Alpha Electric & Mfg. Co., Warsaw, Ind., has been incorporated with $50,000 capital stock to manufacture mechanical and electrical devices. The directors are Walter H. Stanley, Angus C. McDonald, George W. Polk, John William Scott and Bertram Shane.

The Gary Steel Safety Can-Opener Co., Gary, Ind., has been incorporated with $40,000 capital stock to manufacture kitchen utensils. The directors are Stewart P. Peabody, W. D. Oakley and M. L. McDade.

Negotiations are about to be closed whereby the Wagner Axle Co., Anderson, Ind., will acquire the De Tamble motor plant of Anderson. It is reported that the company has a contract to supply axles for Government vehicles.

Cincinnati

CINCINNATI, NOV. 5.

The report of the Cincinnati Building Commissioner for the month of October shows a decided falling off in building operations, as compared with October, 1916. The total for the first 10 months of this year, however, is more than $600,000 in excess of that for the first 10 months of 1916. This is due in a large measure to the increased number of permits for manufacturing buildings, some of which have been completed and are now occupied, while others are under construction. The plant of the American Tool Works Co., built this year, is now occupied. The Carlton Machine Tool Co. has finished the installation of its equipment in a new building on Spring Grove Avenue, and the Champion Tool Works Co. expects to move into its new plant at Winton Place soon after Jan. 1. At Oakley additions have been made to the plants of the Cincinnati-Bickford Tool Co., Cincinnati Planer Co., Cincinnati Milling Machine Co., Modern Foundry Co. and the Cincinnati Frog & Switch Co.

Inquiry for machine tools is still very good, with the larger lathes, boring mills and milling machines leading. Although inquiries from manufacturers who have no Government contracts is on the increase it has been found difficult to take on all the business offered. A conservative estimate is that Government orders, either directly or indirectly, take up fully 80 per cent of the capacity of local machine tool plants.

The Cisco Machine Tool Co., Cincinnati, has just finished a one-story brick and steel addition to its plant, 30 x 120 ft. A permit has been taken out for another extension, 33 x 110 ft., and also for an additional story to the main plant, 63 x 110 ft. The company is rushed with work and will equip the new additions as soon as possible.

The Ott Grinder Co., Indianapolis, Ind., is inquiring in this market for a 36-in. to 42-in. x 14 ft. planer, either new or second-hand.

The Buckeye Iron & Brass Works, Dayton, Ohio, has increased its capital stock from $75,000 to $200,000 and will increase the capacity of its plant. The company makes a specialty of cotton oil mill machinery.

The Dayton Aluminum & Mfg. Co., Dayton, Ohio, has been

incorporated with $10,000 capital stock by Leo A. Stotter and others. The company's plans have not as yet been given out.

The Randle Machinery Co., Cincinnati, is contemplating an addition to its plant on Spring Grove Avenue.

The D. Gruen Sons & Co., Cincinnati, has increased its capital stock from $500,000 to $600,000. No confirmation has been obtained of the report that its watch-making plant on Walnut Hills will be enlarged.

The J. C. Callery Engineering Co., Columbus, Ohio, has increased its capital stock from $125,000 to $350,000.

The Buckeye Steel Castings Co., Columbus, Ohio, has recently completed an addition to its administrative building that provides for a dining room to serve its 125 office employees.

The Blue Valley Creamery Co., Chicago, has purchased the plant of the Ohio Dairy Co., Columbus, Ohio, and has plans for the erection of a building to cost $50,000 for which refrigerating equipment will be required.

It is currently reported that the Carman Mfg. Co., Columbus, Ohio, has purchased the sheet metal plant of the John A. Bell Co., Dresden, Ohio, and will add equipment for the manufacture of roofing specialties.

The Central Electric Producing Co., Athens, Ohio, has completed an addition to its electric producing plant and expects to install further equipment.

The Banner Machine Co., Columbiana, Ohio, has finished the construction of a new one-story brick machine shop, 24 x 1500 ft., with an engine boiler room, 45 x 75 ft., adjoining. A new foundry, 24 x 75 ft., has also been completed. Equipment is being installed in both buildings.

The Central South

LOUISVILLE, Nov. 5.

Machinery and tools are becoming more difficult to obtain, especially for the manufacture of farm implements. The coal shortage continues. Skilled labor is not up to the demand, though common labor is becoming more plentiful.

Fire on Nov. 3 destroyed the plant of the Owensboro Ice Co., including the boiler room, with a loss of $25,000 to $30,000.

The Grapevine Coal Co., Madisonville, Ky., is asking for prices of two geared hoisting engines to lift a load of 8000 lb. 130 ft.

The Powells Non-Elevating Harvester Co., Alamo, Tenn., has been incorporated with a capital stock of $100,000 to manufacture farming implements. The incorporators are D. H. Powell, Jr., J. H. Agnew, H. E. Hardison and others.

The W. G. Simmons Co., Memphis, Tenn., is in the market for a 1 to 2-ton second-hand alternating current electric driven hoist, 220-volt, 60-cycle, and for a 100-hp. portable boiler in good condition.

The Domestic Ridgley Light & Ice Co., Ridgley, Tenn., has been incorporated with a capital stock of $10,000 by G. S. Riley, J. T. Foster, G. F. Richardson and others to establish a light and ice plant.

St. Louis

ST. LOUIS, Nov. 5.

The St. Louis Chamber of Commerce, St. Louis, has taken initial steps for the organization and establishment of a $1,000,000 shipbuilding corporation to be devoted chiefly to the construction of barges, tugboats, etc., but which will also be equipped to build war vessels of light draft and other boats. The plans follow the recent development in the possibilities of ore and coal transportation on the Mississippi River and the availability of locations for the construction of ships.

The Kansas City Light & Power Co., Kansas City, Mo., is preparing plans for a new power house about 1½ miles down the river which will have an ultimate capacity of 250,000 kw., and has completed plans for the installation of 40,000 kw. The equipment includes two 20,000-kw. General Electric turbines, two Worthington condensers, six Babcock & Wilcox boilers, six Sanford-Riley 16 retort underfeed stokers, six low-pressure Green fuel economizers and minor equipment.

The Mazda Electric Mfg. Co., St. Louis, has been incorporated with a capital stock of $20,000 by J. M. McKerna, D. W. Hutchinson and others, to manufacture electric devices.

The Truck, Tractor & Mfg. Co., St. Louis, has been incorporated with a capital stock of $25,000 by Isidor M. Jacobs, Kansas City, Mo.; Norris B. Gregg, Jr., and others of St. Louis, to manufacture motors, trucks, tractors, etc.

The Dirigible Auto Light Co., St. Joseph, Mo., has been incorporated with a capital stock of $25,000 to manufacture lighting and signal devices. The stockholders are C. G. Crandall, Eugene H. Bullock and Joseph L. McDonald.

The Rosa Gin Co., Rosa, Ark., incorporated with a capital stock of $175,000, is in the market for about $14,500 worth of equipment. J. C. Spann is president.

The East Point Gin Co., East Point, La., J. C. Marston manager, whose gin was recently burned with a loss of $25,000 on equipment will be rebuilt.

Junkin Bros., Vidalia, La., will re-equip a gin recently burned requiring about $8,000 worth of machinery.

The Planters Gin Co., Vian, Okla., will rebuild its burned cotton gin, and is in the market for about $10,000 worth of machinery.

Charleston, Miss., J. M. O'Neal commissioner, will install alternators and other equipment in its electric light plant, opening bids Nov. 20 for oil engines, pumps, and other machinery.

The Lawton Gas & Electric Co., Lawton, Okla., has been incorporated with a capital stock of $300,000 by John C. Keys, J. M. Young and A. H. Keys and will equip an electric light and power plant.

The Dixie Engineering Co., Enid, Okla., will equip a plant for the manufacture of feed mills and other machinery.

The Tropic Ice Machine Co., Oklahoma City, Okla., has been incorporated with a capital stock of $100,000 by E. E. Gainer and H. C. Kee, Oklahoma City, and E. J. Green, Enid, Okla., to manufacture ice making and refrigerating machinery.

The Modern Refining Co., Blackwell, Okla., incorporated with a capital of $250,000, J. W. Squires, engineer, Hotel Denton, Blackwell, will equip a pipe line and install a 1200-bbl. pumping station.

Gulfport, Miss., will install equipment for a garbage incinerator at a cost of about $50,000. The mayor is in charge.

The Universal Signal Co., St. Louis, has been incorporated with a capital stock of $27,000 by George A. Czibulka, A. C. Wirth and others, to manufacture automobile signals.

Waurika, Okla., will install about $20,000 worth of waterworks plant equipment. W. H. Divers, mayor.

The Portland Lead & Zinc Co., Miami, Okla., Edward Nix manager, is receiving bids for four 100-hp. steam boilers, one 200-hp. Corliss engine, 18-in. crushers and rolls, one 200-hp. gas engine and other machinery.

The White-Blakeslee Mfg. Co., Woodlawn, Ala., manufacturer of gasoline engines and veneer machinery, has been purchased by D. B. Dimock, president American Casting Co., Birmingham, and will be operated as a branch plant under the name of the American-Blakeslee Mfg. Co.

Texas

AUSTIN, Nov. 3.

The machinery and tool trades in this section and Mexico show increased activity. An unusual number of industrial plants are in course of construction and being planned. Conditions, in Mexico continue to improve and large orders are being placed for mining machinery and other mechanical equipment.

The Lampasas Light & Power Co., Lampasas, will install additional machinery and equipment.

The Keith Lumber Co., Voith, plans to build one or more additional hardwood lumber mills upon the Neches River to utilize about 3,000,000,000 ft. of timber that it owns near Voth.

The La Bianca Sugar Co., recently incorporated under the laws of Delaware with a capital stock of $500,000, plans to build a sugar mill near Donna in addition to the two mills it has purchased. It also has under consideration the construction of a sugar refinery at some point in the lower Rio Grande valley. J. C. McDowell, Pittsburgh, Pa., is president.

The Texas Wheel & Body Co., Dallas, has been incorporated with a capital stock of $10,000 to manufacture wheels and bodies for vehicles.

The Jefferson Ice & Light Co., Jefferson, plans to install a new electric motor and other equipment in its plant.

B. B. Stevens, Cooksville, will build an electric light and power plant.

Announcement is made by the Sinclair-Gulf Oil Corporation that it will immediately begin the construction of its refinery at Houston and the laying of a pipe line from the Oklahoma fields to the site of the proposed new plant. The total cost, it is stated, will be $11,000,000.

The City Ice & Fuel Co., San Antonio, has been incorporated with a capital stock of $50,000 and will build an ice factory. J. P. Wilhelm is a stockholder.

California

SAN FRANCISCO, Oct. 30.

The increasing difficulty in securing delivery on marine engines and parts from the East and the scarcity of skilled labor has led to a steady demand for machine tools and a number of jobbing houses are installing equipment for making parts. Machine tools for manufacturing nuts and bolts are also in demand. An acute scarcity of large lathes is noted, which cannot be had on less than eight months' delivery. Small lathes are in oversupply. Government work continues to absorb the attention of the larger shops, largely to the exclusion of private customers.

The Moore & Scott Iron Works, Oakland, will erect a one-story steel and wood machine shop at the foot of Adeline Street to cost $65,000.

The Turbine Muffler Mfg. Co., Carson, Nev., has been incorporated in San Francisco with a capital stock of $50,000 to manufacture automobile parts. The directors are R. C. Savage, J. G. Ellis, William Muller, Joseph Smythe and P. B. Ellis of Carson City.

The Dalton Iron Works, Goldfield, Nev., has been incorporated with a capital stock of $500,000 by H. V. Morehouse, Augustus Tilden and Marjorie Tilden.

The Skandia-Pacific Oil Engine Co., Oakland, has completed a machine shop, 75 x 175 ft. and will install automatic tools and machinery to double its present capacity.

The Byron Jackson Iron Works, San Francisco, is equipping a new pump factory at Berkeley, Cal., which will increase its capacity about 50 per cent.

The United States Aircraft Corporation, San Francisco, has bought the plant of the Christopherson Aircraft Co., Redwood City, Cal., and will double the capacity.

L. C. Wills, formerly of the C. A. Green Co., ship chandlers, Tampa, Fla., has bought the interests of O. S. and B. P. Weston in the Marine Equipment Co., Los Angeles, of which he becomes president. The company will enlarge its boat building plant.

The Scovel Iron Stores Co., San Francisco, has increased its capital stock from $100,000 to $250,000.

A. J. Woolsey, Oakland, has leased 25 acres on the water front and, it is understood, a shipbuilding plant will be erected.

The Cannonball Motor Co., Texico, N. M., recently incorporated, announces plans for the erection of a factory to manufacture automobiles, farm tractors, trucks and parts.

The Pacific Northwest

SEATTLE, WASH., Oct. 30.

The Boeing Aeroplane Co., Seattle, has contracts from the Navy Department valued at $575,000. It will make improvements including a two-story machine shop, 84 x 88 ft., and office building.

Oregon Box & Manufacturing Co., Portland, Ore., plan erection of a sawmill, costing $5,000; main building to be 40 x 200 ft.

An agreement has recently been reached with the striking shipbuilders in Astoria, Ore., whereby all the men have returned to work, and every shipbuilding plant in the city is operating to capacity.

The Thurston County Dairy Products Association of Olympia, Wash., will erect a 40 x 140 ft. one-story dairy plant at Camp Lewis; structure will cost $10,000 and machinery to be installed will cost $5,000 additional.

The St. Paul & Tacoma Lumber Co., Tacoma, Wash., will erect a sawmill on the tideflats, to furnish shipyard timbers. Plant will cost $80,000.

The Clyde Casting Co., Seattle, whose plant was recently destroyed by fire, will rebuild to have a capacity 30 per cent greater than old plant, and will turn out 6000 lb. of casting per day.

The Pioneer Paper Co., Seattle, has been incorporated with a capital of $75,000 by H. N. Richmond, L. L. Beberage and J. P. Reynolds.

The Wonder Pump & Engine Co., Standard Bank Building, Vancouver, B. C., has been organized with $25,000 capital.

The Grant Smith-Guthrie-McDougall Shipbuilding Co., Portland, Ore., contemplate the construction of a plant, adjoining its St. Johns shipyard, for the equipment of vessels constructed in its yards.

The North Bend Iron Works, North Bend, Ore., is erecting a building to house its ironworking plant. Some new equipment will be added.

The Skinner & Eddy Shipbuilding Corporation, Seattle, is completing plans for extensions which include a foundry, 60 x 150 ft., adjoining the third machine shop now under construction; new shipway, power house and punch shop equipped with six machines. When completed the improvements will cost $1,000,000 and the plant will represent an expenditure of more than $4,000,000.

Puget Sound Machinery Depot, Seattle, has purchased land on which it will erect a plant to cost $1,000,000. It manufactures boilers, boiler parts, shafting and patterns for ship machinery, and has contracts on hand to keep the plant operating for two years.

Canada

TORONTO, Ont., Nov. 5.

The Dominion Steel Products Co., Brantford, Ont., has secured a contract for the construction of heavy machinery for about 100 merchant ships being built throughout the United States, which will involve the extension of its plant. Land has been acquired and new equipment will be purchased.

The Alloy Steel Works, Ltd., Toronto, has been incorporated with a capital stock of $2,000,000 by Reginald H. Parmenter, 85 Bay Street; Arthur J. Thomson, Samuel D. Fowler and others, to manufacture iron, steel, tools, machinery, implements, etc.

The Gould Rotary Sewing Machines, Ltd., Toronto, has been incorporated with a capital stock of $350,000 by Frank Regan, 72 Queen Street West; Edward Murphy, Glen Sullivan and others, to manufacture sewing machines, tools, parts, accessories, etc.

The National Index Card Co., Ltd., Toronto, has been incorporated with a capital stock of $50,000 by Joseph H. Saunders, 53 Waverly Road; Harold J. King, 60 Neville Park Boulevard; James F. Osborne and others, to manufacture filing cabinets, office equipment, furniture, etc.

The Heating Specialty Co., Ltd., Toronto, has been incorporated with a capital stock of $50,000 by James Parrish, William A. Ross, Harry W. Page, 12 Richmond Street East, and others, to manufacture stoves, grates, furnaces, boilers, gas and electric heaters, etc.

The Railway & Power Engineering Corporation, Ltd., Toronto, has been incorporated with a capital stock of $50,000 by Theodore Malm, 55 Kingswood Road; Gerard Ruel, 127 Isabella Street; Frederick C. Allen and others, to manufacture machinery, tools, etc.

The Montreal Shipbuilders, Ltd., Montreal, has been incorporated with a capital stock of $300,000 by Errol M. Macdougall, Sadi C. Demers, Leslie G. Bell and others, to build drydocks, vessels, boilers, etc.

H. W. Petrie, Lister Building, Hamilton, Ont., is in the market for 5 and 10-hp. water motors.

S. E. Landry, Vancouver, B. C., is arranging for the establishment of a shipbuilding plant at Prince Rupert, B. C., which will be a branch of the Eastern Canadian Co., at present constructing vessels for the British Government.

Bienville, Que., C. Lessard, 493½ St. Valier Street, engineer, will soon call for bids for turbine pumps for its waterworks plant.

The Water Commission, Sault Ste. Marie, Ont., will build a pump house and install equipment to cost $15,000. Van Every is manager of the commission.

The Town Council, Strathroy, Ont., is calling for tenders for the construction of a pump house and is in the market for a turbine pump. Kerry & Chace, Confederation Life Building, Toronto, are the engineers.

The Gray Marine Motor Co., Bridgewater, N. S., is arranging for the erection of a plant to manufacture engines, boilers, machinery, etc.

The Comeau Shipbuilding Co., Ltd., Comeauville, N. S., proposes to build a shipbuilding plant to cost $100,000. E. L. Comeau is secretary-treasurer.

James Wilson & Sons, St. Andrews Street, Fergus, Ont., will build a sawmill at a cost of $50,000 and will require machinery and equipment.

The Canadian Steel Foundries, 120 St. James Street, Montreal, will build a one-story frame factory to cost $6,000.

The Nova Scotia Steel & Coal Co., Ltd., New Glasgow, N. S., will build additions to its plant, make repairs and install equipment to cost $4,000,000. F. H. Crockard is general manager.

The Acadian Shipbuilding Co., Ltd., Saulnierville, N. S., will build a shipbuilding plant to cost about $75,000. Denis D'Entremont, Meteghan River, is secretary-treasurer.

The Dussault Co., Levis, Que., has completed plans and will start work at an early date on the erection of a machine shop at St. Romauld, Que., to cost $50,000. M. J. Et. Dussault, Wolfe Street, Levis, is president.

Prospects for Machine-Tool Exports

(*Continued from page* 1117)

the freight rates, which will necessarily be high from America.

"They have also commenced to form various combinations for the sale of their tools, not only in Belgium but in other countries, and are prepared for a very active and extensive campaign for the Belgian market. After the war they will specialize a good deal more than they have done in the past, and they will, therefore, be in a position to compete very much more favorably than they have done heretofore.

"The Swedish manufacturers, I do not think, will bother to any extent the American manufacturers, as before the war they did not make a very great variety of machine tools, and most of these were of the cheaper class.

Prospects for After-War Trade

"There are two more items, to my mind, that enter into the prospects for the exporting of American tools to Belgium after the war; one being the question on the part of the American manufacturers as to whether the Belgian manufacturers will be able to pay for their goods, and the other on the side of the Belgian manufacturers as to whether the American manufacturers will be able to obtain anything like reasonable freight rates for the shipping of their goods from America to Belgium.

"Dealing with the first item, I think I have already explained earlier that certain Belgian manufacturers have already put up the necessary cash for payment of their goods, and it may interest you gentlemen to know that all the gold which was held at the National Bank in Brussels has been saved, as well as the gold in a good many other banks, and this is now deposited in the Bank of England in London, so that the Germans did not obtain any great amount of gold when they overran Belgium. This will, therefore, again be put in circulation, and it remains to be seen as to whether it is enough to make the Belgians' credit as good as ever.

"Another point in regard to the question of finance is that a lot of the large Belgian firms have sister firms operating either in France or other countries, and they will no doubt help to restore their plants in Belgium. I know for a fact that one firm in France has already set aside the sum of three million francs for the re-equipment of their plant in Belgium.

"Again, the Belgians are also a commercial race as well as industrial, and owing to their own country being so small they had to seek investments outside for their money, and they own the controlling interests, or very large ones, in various railroads and trolley lines in South America and the Far East. They also have their colony in the Congo, which is a very rich and valuable one to them, and the companies operating there have made large profits during the war.

"I learn on good authority that should credits be necessary to the Belgian manufacturers after the war plans are already afoot and likely to be consummated at any time by which the American bankers will give their correspondents in Belgium credits such as they did before the war, and the Belgian bankers in turn will give certain first-class responsible Belgian firms all the credit they require, so that it will become practically a cash against bill-of-lading proposition in New York for the American manufacturers for these firms. There will still remain certain Belgian manufacturers who will not be able to benefit by any of the foregoing advantages, and who will expect to receive facilities of payment for their machines from the American manufacturers, which in most cases will be the manufacturers' agents in Belgium. American manufacturers must therefore be prepared to assist their agents immediately after the war, in certain cases, by extending them this credit, and if necessary obtain help from their banks until conditions again settle down to normal.

"I do not think that any agent will have the necessary funds at his disposal to take care of the huge orders which they will receive just prior to peace and for several months after.

Shipping Problem a Serious Factor

"The shipping problem, however, is one that is up to the American manufacturer and I think should seriously be considered. Before the war the freight rate from England to Belgium was about $1.25 to $1.50 per gross ton, and from America to Belgium about $2.50 per gross ton, and the difference was practically negligible on the cost of the machines. Just compare these figures, gentlemen, with the freight rates of to-day. After the war if you do not find some means of combating the freight rates, I am afraid it will be very difficult for you to compete seriously against the English manufacturers, as each European nation will probably control its own shipping for a certain period after peace has been declared. You will therefore not be able to depend on British steamers to carry your goods as they did in the past until conditions again become normal. I do not doubt, though, that you manufacturers will be able to solve this problem just as successfully as you have solved others which have arisen from time to time. It is needless to say that the obvious solution of this uncertainty is for you Americans to have your own merchant marine operating on the same economic basis as that of other countries, thereby controlling your own freight rates.

"Tools of all descriptions will be in great demand after the war, and the Belgians will of necessity have to purchase more labor-saving machinery than they have done in the past, as labor will be scarce in this country as in all others after the war, but there are a certain class of tools which are possibly in more demand in the Belgian market than any other country and to which the American manufacturer has not yet devoted enough attention. I refer to heavy railroad tools. There were no less than 19 railroad shops in Belgium before the war which were producing locomotives for all parts of the world, and most of the tools required for the production of these machines were supplied by Germany, who made very costly and intricate tools which were not at all well received by the workmen. The others were supplied mostly from England also; some were manufactured in Belgium, but these were not of a very modern design. Some of the railroad tools required in Belgium are of a special nature as compared with the tools used in this country. For example, in Belgium for freight car wheels cast steel centers are used with forged steel flanges shrunk on to these, and not cast-iron wheels as are used in this country. You will, therefore, see that the tools must be made to perform more operations than here and also be of a heavier construction to work on the steel material. I would strongly draw your attention to this fact, gentlemen, as boring machines, axle lathes, slotting machines, wheel-turning lathes, etc., for this heavy type of work will be in very great demand.

"A certain number of new firms will naturally spring up in Belgium after the war for the manufacture of machine tools, but I do not think you need give them any great consideration, as they will not be in shape to compete very seriously for some time until they have their own shops equipped and working, and before this time comes most of the orders for the re-equipping of shops will have been placed.

Appointing of Belgian Agents

"Regarding the appointing of agents in Belgium, I would like to offer one or two suggestions. Certain manufacturers think of sending over their own representatives and being directly represented in that country, and not using established agencies, which, of course, is a good idea where the volume of business is sufficient. I would, however, warn these gentlemen not to send over, as certain firms have done in the past, highly trained men who cannot speak the French language, as Belgian manufacturers have not the time to spend in receiving them and having their views interpreted for them by a third party. Of course, Belgian manufacturers always feel honored by a visit of any officials of American manufacturers who are represented by Belgian firms. Should you decide to intrust

your agency to a firm operating in France, be sure that they will establish themselves in Belgium, as it does not follow that a firm working successfully in France are the best people to represent you in Belgium. Also you cannot succeed in Belgium without being established there. Except for the same language being spoken in the two countries their customs andd ways of doing business are entirely different. Close co-operation will be needed between the American manufacturer and his agent. Fortunately this feeling was developed by most of the large firms before the war. You should all heed the old motto, 'United we stand, divided we fall.'

"To my mind the best agents for Belgium, or any other country, are those who specialize and devote all their time and energy in the country where they have the agency, just the same as American tool manufacturers have confined themselves and specialized in their branches of tools, which has made them so successful and enabled them to bring out the most efficient machines.

"In conclusion, I would like to state that there should be a very rosy future for American machine tools in Belgium after the war, as I read a report just recently published in which the Belgian Government estimates that $400,000,000 worth of tools, machinery and raw materials have been taken out of that country by the Germans. American tools will be looked upon with a good deal of favor by the Belgians, as they will always appreciate and feel very warmly disposed toward you, not only on account of the very good tools you manufacture, but also due to the very excellent and liberal manner in which you have contributed to their relief and kept that poor nation from starving."

South American Conditions

South American conditions and prospects were discussed by G. E. Briggs, commercial attache National City Bank, New York, in part as follows:

"As markets for machine tools, the South American countries present different aspects. Some are more highly industrially developed than others, and give promise of still further progress along this line, and therefore offer much more promise than certain other countries, which can never, in any sense of the word, become industrial.

"The Argentine, for example, is a purely cattle and agricultural country. Raw materials for a metal-working industry, generally speaking, do not exist in the country, and in the few cases where mines have been found they are so far from the coast as to render uneconomical their exploitation. There is a considerable importation of machine tools, however, into this country, for use in the Government and railroad shops, and in the small industries that exist.

"The Government maintains shops in connection with its marine and Department of Public Works, and is occasionally in the market for machine tools. Purchases are made almost exclusively from local importers who carry a stock of machinery and are in a position to make immediate delivery. It is their custom to call for competitive bids from these importers. It is necessary, therefore, to approach the Government by first selling one of these importing houses.

English Capitalists Own Railroads

"Seventy-five per cent of the railroad mileage of the Argentine is owned by English capital, 14 per cent by the State and 11 per cent by French companies. The so-called English railroads purchase all their supplies through their London offices, and it is only in very exceptional cases that purchases are made in the Argentine. The French railroads purchase most of their supplies in Paris, it is true, but obtain a much larger proportion of their requirements in the Argentine than do the English roads. The State railroads purchase from local importers, on competitive bids, as do the other departments of the Government.

"The metal-working industries are permitted to exist through the protection of the Argentine tariff. The principal products are bolts, nuts, screws, wire nails, brass and iron beds and springs. In addition to the establishments which constitute these industries there are many other machine shops engaged almost exclusively in repair business and the manufacture of repair parts.

"It is generally estimated that prior to the outbreak of the war 75 per cent of the machine tools imported, exclusive of those for the use of the English railroads, were of German manufacture. The German manufacturer, through giving the utmost consideration to the requirements of the market, had succeeded in practically displacing the English machine from the market. The German manufacturer exported to that market a medium-priced machine, of medium quality, admirably suited to the needs of the Argentine industry. Cost of equipment is the chief consideration in the estimation of the Argentine industrial. As I have stated, the establishments, with but few exceptions, are small, and do rough work which does not require the use of a high-class machine.

"As an example of the manner in which the Germans have adapted their machines to the varied uses of the small industrial I might mention the fact that in almost every case the German lathe is manufactured with a deep gap in the bed, and is in this way able to work an 80-cm. diameter, whereas a lathe of the same size, without the gap, would admit a diameter with only 30 cm. This is typical of many adaptations that the Germans have made. The construction of the German machines, furthermore, is made as simple as possible. The Argentine is a poor mechanic, and the intricate precision machine is liable to suffer at his hands.

American Tools in Railroad Shops

"The majority of the American tools in the Argentine are in the shops of the English railroads and have been purchased by the London offices of those railroads from the English offices of the American manufacturers. The most careful mechanical work is done in these shops, and the necessity of having exact high-production machines is realized. Only a few American machines are in the Government shops, and still fewer in the smaller industries.

"Although the Argentine does not present as attractive a potential market for American machine tools as do certain other South American countries, the possible business is of considerable importance. There has been a shortage of certain types of machines in the market during the last three years, and importers have sent many orders to the United States. The few machines that have been received have been, generally spaking, sold to good advantage in spite of the higher price. Had more attention been given to those orders the superior value of American tools might have been demonstrated to industrials, in general, in the Argentine, and, with the continued interest of American tool builders in that market a large share of the business could have been retained. In general, it may be stated that the Argentine demands a medium-priced and medium-quality machine.

Brazilian Products More Varied

"The products of the Brazilian industry are more varied than are those of the Argentine. Even a few locomotives have been manufactured in the railroad shops. As a rule, however, the work is limited to locomotive and roming stock parts, in general, and to the manufacture of certain small lines in private industry. English and French capitalists are also prominent in railway ownership in Brazil, but a much larger proportion of the requirements of the roads is filled in the country.

"English and American machine tools have always been the standard of the market in Brazil, but during the few years immediately preceding the outbreak of the European War, German firms encroached to a considerable extent on this business. A special advantage presented by the Brazilian market in the eyes of the North American builder is the recognition of the superior merits of the American machine, and the willingness to pay the extra price.

"A still more favorable market exists in Chile. The principal users of machine tools are the Government,

and when I mention the Government I include also the railroads, which are all state owned, and the mines. The Government shops are largely equipped with American machine tools at the present time, and as an item of added interest I might mention the fact that a great establishment is now being built there by an American concern, to construct locomotives for the State Roads. The Chilian Government and Administration of Railroads usually buy their supplies through houses in Chile. Occasionally, however, at a time like the present, when they are encountering the greatest of difficulty in obtaining supplies, they send a commission to an European or to the American market. Shortly before I left Chile a purchasing agent of the State Roads came to the United States to buy supplies of all kinds. It was said at that time that this man would undoubtedly be high up in the administration of the railroads upon his return, and it is to be hoped that his experience in the States will incline him favorably toward American goods. Shortly thereafter a commission of five or six young men came from Chile to the United States to study the American railroad system. They intend to spend two years in this country, and it is expected that they will be the ones to dictate the Chilian railroad policy of the future. With these favorable influences the Chilian Government should be a very good customer for American machine tools.

Copper Mining Interests Big Buyers

"The American copper mining interests have invested in the neighborhood of $150,000,000 in Chile. Their machine tool requirements are entirely filled in the United States. In the case of these companies, however, the purchases are usually made by their head offices direct from the manufacturers in this country.

"I would also like to bring to your attention the fact that Chile may be an industrial country in the future. The time may come when the world, seeking economies in manufacture, will incline toward establishing manufacturing plants as near as possible to the sources of production of raw material. Chile, one of the world's greatest copper producers, and, furthermore, rich in minerals of all other kinds, would, under these conditions be one of the selected fields of industrial activity.

Plan for Capturing the Trade

"I would suggest the following plan of sales organization as the best adapted to the requirements of machine tool builders: The co-operation of a number of non-competitive firms in establishing a representative in South America to work through an importer in each market appointed the exclusive agent for that territory. These houses will carry stock and attend to the orders for the small industrials and shops and others who buy stock in the market. The representative will travel from one market to another, co-operating with the agents and seeing that the attention of the agent to this line is not allowed to flag, and dedicate himself especially to the larger business, acquainting his principals with the opportunity to sell large buyers, who make their purchases in other markets. Such an organization snould be built up at the present time in order that the foundation may be well laid and the American business house may be in a position to meet the keenest competition that the world has ever seen on as near an even footing with his competitors as possible."

Builders Hear Mr. Merryweather

At the closing session of the annual convention of the machine tool builders, they listened to an address by G. E. Merryweather, who was recently appointed head of the Machine Tool Section of the War Industries Board. Mr. Merryweather's remarks were not given out for publication, but they had to do in a general way with the progress of his work in conserving machine tools for war purposes, stimulating increased production, priority matters, commandeering and other subjects associated with Government purchasing.

Resolutions of condolence were reported by special committees on the death of Albert S. Smith, president, Smith & Mills Co., Cincinnati, and Paul Kendig, formerly connected with the Seneca Falls Mfg. Co., Seneca Falls, N. Y.

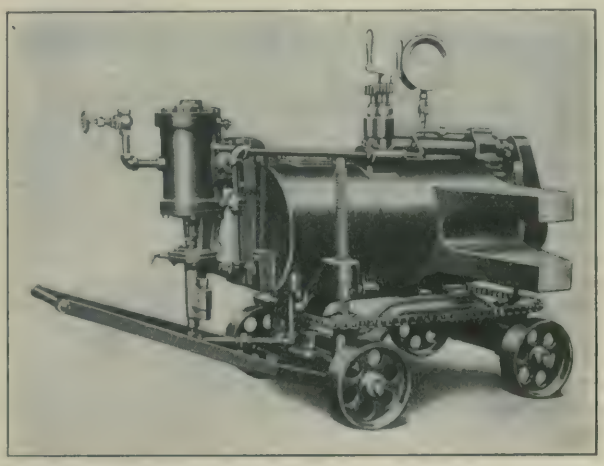
Present officers of the association were re-elected for the coming year as follows:

President, J. B. Doan, the American Tool Works Co., Cincinnati; first vice-president, D. M. Wright, the Henry & Wright Mfg. Co., Hartford, Conn.; second vice-president, August H. Tuechter, the Cincinnati Bickford Tool Co., Cincinnati; treasurer, A. E. Newton, Reed-Prentice Co., Worcester, Mass.; secretary, Charles L. Taylor, the Taylor & Fenn Co., Hartford, Conn.; general manager, Charles E. Hildreth, Whitcomb-Blaisdell Machine Tool Co., Worcester, Mass.

Portable Crankpin Forcing Press

A new type of portable press for forcing crankpins into locomotive and engine wheels and for miscellaneous shop and field work has been placed on the market by the Watson-Stillman Co., 190 Fulton Street, New York. A pump driven by an air engine is substituted for the hand pump formerly employed. This change aside from reducing the number of men required by one, also, it is stated, increases the speed of operation approximately 300 per cent.

A steel cylinder with heavy cast forks on the side that support tierods forms the main portion of the press. The reservoir is mounted at the rear of the press and the ram operates from the front of the cylinder casting. The pressure for operating the ram is supplied by a power-driven pump operated by compressed air. When it is desired to operate the pump, a connection is made through a rubber hose or other flexible tube between the compressed air line in the shop and the pump engine in the same way that pneumatic tools are connected up. The operating valves are located so that the man in charge can operate the press as well as direct the work of the crew. The whole unit is carried on screws that are mounted on a flat wheel truck and by turning one of the screws the center line of the ram can be raised or lowered to coincide with that of the pin. Two tierods and an abutment beam are used in connection with the press, the distance between the former being adjustable in the forks on the cylinder so that the rods may be passed between the spokes of a wheel or any other convenient opening in the work.



An Engine Supplied from the Shop Compressed Air Line Is Employed to Drive the Hydraulic Pump in a New Portable Crankpin Forcing Press, thus Eliminating the Hand Pump Operator Formerly Required

The ram is returned by a small hydraulic cylinder mounted on the top of the press, the piston of which is connected to a lug on the end of the ram. A geared screw stem valve is provided to control all the movements of the ram. The presses, which are built in capacities ranging up to 300 tons, are equipped with a gage which indicates the pressure required to sink the pin. This arrangement, it is emphasized, makes the detection of a loose fit which might cause a serious accident an easy matter.

Skilled Men Drafted for War Duty

(*Continued from page* 1118)

3. Man with brothers or sisters incompetent to support themselves, dependent on daily labor for support.
4. County or municipal officer.
5. Firemen or policemen.
6. Necessary artificers or workmen in arsenals, armories and navy yards.
7. Necessary custom house clerk.
8. Persons necessary in transmission of mails.
9. Necessary employees in service of United States.
10. Highly specialized administrative experts.
11. Technical or mechanical experts in industrial enterprise.
12. Highly specialized agricultural expert in agricultural bureau of State or Nation.
13. Assistant or associate manager of necessary industrial enterprise.
14. Assistant or associate manager of necessary agricultural enterprise.

CLASS IV.

1. Married man with wife (and) or children (or widower with children) dependent on daily labor for support and no other reasonably adequate support available.
2. Mariners in sea service or merchants or citizens in United States.
3. Heads of necessary industrial enterprises.
4. Heads of necessary agricultural enterprises.

CLASS V.

1. Officers of States or the United States.
2. Regularly or duly ordained ministers.
3 Students of divinity.
4. Persons in military or naval service.
5. Aliens.
6. Alien enemies.
7. Persons morally unfit.
8. Persons physically, permanently, or mentally unfit.
9. Licensed pilots.

Method of Procedure

It is the intent of the War Department to call all the men of Class I before any are called from Class II and to exhaust each class in turn before proceeding with the next class. Although no data are available indicating the number of men that will be included within each of the five groups, it is believed that the second contingent will be obtained before Classes I and II are exhausted. If this proves to be the case, no workmen in arsenals, armories and navy yards, technical or mechanical experts in industrial enterprises, highly specialized administrative experts or assistant or associate managers of necessary industrial enterprises will be taken.

It is understood that the new classification will not operate to prevent exemptions from the call for such reasons as were recognized in connection with the first draft, but obviously it will greatly reduce the number of exemptions for the reason that practically all classes entitled to be relieved from the obligation of service under the original regulations are so grouped in the new classification that they will not be summoned on the next call. Thus no married men with dependent wives or children will be called until Class IV is reached and it is quite possible that the second and even the third contingent for the national army may be selected before the first three classes are exhausted.

The labor situation as affected by the next draft is likely to be improved to some extent by legislation which the War Department will seek at the coming session of Congress. The selective draft law made no provision for the registration of young men coming of age after the date of the first call and such persons cannot now be legally registered or forced into the service. Congress will be asked to pass a measure, probably in the form of a joint resolution, requiring all young men to register as soon as they become of age throughout the period of the war and thus the registration lists will be steadily augmented to a very substantial extent. The average number of skilled workmen among these very young men will probably be less than among the older men and as the registration recruits will take their places automatically in their respective classes, the prospect for the drafting of skilled labor will proportionately decrease.

W. L. C.

Rating Rolling Mill Motors

In discussing the paper on electric power in steel plants presented before the American Iron and Steel Institute at Cincinnati, Oct. 26, by S. S. Wales, electrical engineer, Carnegie Steel Co., Pittsburgh, some views of the requirements to be met by rolling mill motors were given by K. A. Pauly, power and mining engineering department, General Electric Co., Schenectady, N. Y., in part as follows:

Compounding the roll motor, as agreed to by Mr. Wales, in no way relieves the mill or motor of the mechanical shocks. When the ingot hits the rolls, the roll motors slow down until the combined work delivered by the motor armatures in slowing down and the torque developed by these motors is sufficient to carry the steel through the rolls. The stored energy in the armature acts instantly and delivers the initial blow, whether the motor is shunt or compound wound.

Compounding reduces the overloads on the electrical equipment, but does so at the expense of production as it slows down the rolls while the piece is being rolled. We must appreciate that rolling mill conditions are extremely severe, and if the equipment is designed to withstand the overloads and mechanical vibrations incident to rolling, there will be no need for compounding the roll motors.

Rolling mill motors should be rated by their continuous capacities, which is a measure of their ability to produce tonnage, and by their maximum overload capacity, which is a measure of their ability to withstand the high momentary overloads of the individual passes. No rolling mill equipment is properly defined without the specification of these capacities. Altogether too much emphasis has been placed on the maximum capacity, and any such rating for these motors which includes only the maximum horsepower without a time or speed qualification is not only contrary to the recommendations of the American Institute of Electrical Engineers but extremely misleading and flexible, and no purchaser is safe in assuming that specifying the maximum horsepower at any given speed, or series of speeds, alone protects him against obtaining an equipment inadequate to meet his requirements.

For this reason we have always insisted on giving, for various speeds, the continuous ratings of our reversing mill equipments, together with their maximum capacities and emergency overload capacities to take care of unusual peak loads. It is very gratifying to us to find that most of the engineers of the larger steel companies appreciate the importance of doing this and in purchasing their equipments insist on curves giving the continuous as well as the maximum load capacities.

War Service Committee of the Fabricating Trade

Representing the steel fabricating interests and appointed by the Bridge Builders and Structural Society and the similar organization operating in the West, the following war service committee has been appointed to collaborate with the advisory commission of the Council of National Defense: John Sterling Deans, Phoenix Iron Works, chairman, and Lewis D. Rights, Lewis F. Shoemaker & Co., secretary; Thomas Earle, Bethlehem Steel Co.; H. A. Fitch, president Kansas City Structural Co.; J. F. Kimbrough, president Indiana Bridge Co.; C. D. Marshall, McClintic-Marshall Co., and H. A. Wagner, president Wisconsin Bridge Co. This committee constitutes one of the war service committees which are being rapidly brought into being to take the places of the various raw material subcommittees of the advisory commission of the Council of National Defense, which subcommittees are to go out of existence because of the ruling against committees of sellers being substantially a part of a board placing orders.

The Russian Government, represented in Seattle by A. Pevzoff, who has opened permanent headquarters at 327 Railway Exchange Bldg., Seattle, has leased a tract of 35 acres near Georgetown, Wash., which will be used for assembling and storage yards for 1500 locomotives and 30,000 box cars, for use in rehabilitating the Trans-Siberian and Russian Railway systems.

Widening Fields for Malleable Iron

(*Continued from page* 1121)

iron. He has truly said that steel will never entirely replace malleable iron for a multitude of articles and it might further be said that many competent engineers are of the opinion that in numerous instances substitutions of steel for malleable have been made that were not justified and that as malleable iron becomes more thoroughly understood and appreciated, it will eventually find its proper place wherever such substitutions have occurred. In time, of course, scientific design will take the place of guess work in the determination of these matters and when that day comes, malleable will be in far more general use than it is to-day.

"The scope of Mr. Pope's paper being so essentially broad, it was, of course, impracticable for him to discuss in detail the multi-various uses of this product, hence it may not be inappropriate to refer more in detail and yet briefly to one of the particular uses of malleable iron which he mentioned. I refer to the automobile, the development of which has opened a very broad field for all kinds of steel and iron. In this great industry, the most brillant engineering talent has been developed, so that while malleable iron is very largely used in motor car construction, it is probably more intelligently and scientifically employed in this field than in any other, due, of course, to the exact science which the building of automobiles has already attained. Some one has probably said ere this 'Where is there much malleable iron used on an automobile?' The question might be answered by asking where it is not used? The wheels, whether wood or metal, have malleable hubs; the steering gear, transmission, rear axle, springs, body, lamps, wind shield, magneto and self starter are generally supplied with malleable iron parts, not to mention the thousand and one accessories, such as license brackets, wrenches and tools innumerable. May it not be profitable to consider for a moment why malleable iron is so largely used in this industry? We will find that among the reasons are its general adaptability and great strength in proportion to area, easy machining qualities and, last but not least, intelligent and scientific designs. In the most popular car made in the country to-day, there are about 100 parts made of malleable iron while in the higher priced cars there are about the same number.

Importance of Inspection

"Mr. Pope has spoken of the importance of inspection and too much stress cannot be laid on this point. Here again most industries can learn something from the automobile manufacturer. Practically all the large motor companies not only employ a corps of competent inspectors but they have established chemical and physical laboratories where scientific study is given to the characteristics of all materials used in the construction of the car. It is not unusual now for a foundry to have a defective casting returned accompanied by a chemical analysis of the product and an opinion concerning the methods employed by the foundry. While some of these opinions may not harmonize with the views of the foundryman, the practice has a tendency to keep him alert and if other lines would take as much pains to relate cause and effect, there would be less of arbitrary and more of intelligent and discriminating decision in the selection of metals for various designs.

Research Work

"Mr. Pope has also touched on the research work which has been carried on for a number of years by malleable iron manufacturers with a view to improvement in processes and product. Probably no other branch of the metal working industry has been more active in this respect, so that to-day practices are standardized and modernized until many of the old uncertainties and difficulties are eliminated entirely. A start has also been made toward providing reliable literature for students who wish to know something of the process of making malleable castings. Our colleges and technical schools have had almost nothing heretofore of a satisfactory nature along this line while all branches of the steel industry are liberally provided with text books and literature of a comprehensive and reliable character. It is therefore a reasonably safe prediction that malleable iron will continue to find an ever increasing and expanding field of usefulness and in the not distant future its proponents fully expect to see it replace steel in many places where the latter has been improperly substituted for malleable."

Handling Coal with Portable Truck Loader

Loading bituminous coal at the rate 1 ton per minute with an automatic wagon and truck loader has enabled the American Optical Co., Southbridge, Mass., to reduce the cost of handling this material over 50 per cent. Labor shortage made it necessary for the company to find some means of loading coal from a ground storage pile other than hand shoveling. The coal arrives in carload lots and is dumped from the



The Use of a Motor-Driven Truck Loader Enables the Motor Truck Shown to Be Loaded with Bituminous Coal in Approximately 5 Min., and Has Reduced the Cost of Handling About Half

trestle to the ground storage pile shown. From here it is transported a considerable distance to the power house by motor trucks, which necessitates a second transfer of the fuel before it reaches the boilers.

To do this work a motor-driven wagon and truck loader built by the Link-Belt Co., Chicago, was purchased. This machine enables the motor truck illustrated to be loaded in approximately 5 min. for transportation to the power house. On arriving there the coal is dumped and fed to mechanical stokers. As such a short space of time is required to load the truck, it is kept in service practically all the time. One man operates the machine, and measured by the saving in time the cost of handling has been cut practically in two.

Installations of Greaves-Etchells Electric Furnaces

The Electric Furnace Construction Co. of Philadelphia announces the sale of the following Greaves-Etchells furnaces:

The American Radiator Co., Buffalo, will install another 6-ton furnace in addition to one of the same capacity ordered in September.

The Stoddard Union Co., Lockport, N. Y., will install a 1-ton furnace.

The Primos Chemical Co., Primos, Pa., will install one special furnace for making ferroalloys.

The installation of these three furnaces brings the total of this type operating or contracted for in the United States to eight.

A 2-ton furnace has also been sold to T. Waddell & Sons, New Zealand.

Electric Furnaces for Non-Ferrous Work

(*Continued from page* 1123)

Regarding savings, the statement is made that with coke costing $4 and crucibles 4c. per number there is a saving made by using electricity at ¾c. per kw. hr., which is practically what they pay. In addition the labor of carrying the coke and ashes is eliminated, together with the space for their storage.

There is one more or less serious drawback to the Baily furnace in that it is very sluggish. It takes something like 15 min. before it begins to respond to a change in power input—while as a matter of fact there is not much change in temperature for an hour. At the Lumen Bearing Co. the last heat of the day is made on practically the stored heat of the furnace. In fact, it took 49 hr. to cool the furnace from 2580 deg. to 965 deg. Fahr. This sluggishness means that if the furnace is brought to too high a temperature in the morning at the beginning of the day's melt, the metal is apt to be burned and much time lost before the proper temperature can be obtained. On the other hand, however, it is of advantage in keeping a hot furnace overnight.

In connection with the other three furnaces in use, the Rennerfelt, Snyder and Hoskins, it can be said that they are of the indirect arc, direct arc and resistance types respectively. They have been fully described many times.

The Hoskins furnace is sold mainly for work of an experimental nature as called for in the laboratory and testing room, or when it is desired to melt a small batch of metal occasionally. The manufacturers do not recommend it for commercial purposes.

The Snyder and Rennerfelt Furnaces

The only installation of Snyder furnaces handling non-ferrous metals of which the writer is aware is that of the Chicago Bearing Metal Co. There are two furnaces installed there rated at 400 kw. each taking approximately 750 kva. single-phase, 60-cycle current directly from a 12,000-volt line. The secondary line voltage is 220, with an operating voltage from 120 to 160 volts, depending upon conditions. The power factor is in the neighborhood of 60 per cent.

The furnaces have a capacity of about 2000 lb. of metal per heat and average power consumption is not over 300 kw. hr. per ton. They operate 24 hr. per day, Sundays excepted, and handle a heavily loaded bronze such as is used for car and locomotive bearings. The composition of the metal is approximately 75 per cent copper and the rest lead, tin and miscellaneous impurities in that order of importance, the lead running about 15 per cent. The metal is poured at approximately 2100 deg. Fahr., and while the metal loss is fairly high, mostly lead and some copper, they save about $12,000 net per month by doing away with the crucibles, since these two furnaces replace 40 to 50 coke and oil-fired furnaces. The high metal loss follows naturally from the use of a direct arc furnace, since it is bound to produce a superheated top layer in the bath.

There is also a saving made in increased production with smaller floor space.

The Rennerfelt furnace is in operation at the Gerline Brass Foundry Co., Kalamazoo, Mich., 1/3-ton capacity, and at the Philadelphia Mint, one of 200 lb. capacity, while two more of one-ton capacity each will soon be in operation at the Chicago Bearing Metal Co.'s plant. These furnaces are all designed for two-phase, three-wire operation.

The furnace at the Philadelphia Mint has only been in operation for a short time, so that full data is not available as yet. It handles penny stock and cupro-nickel. The penny stock is composed of 95 per cent. copper, the other 5 per cent being made up of zinc and tin. The cupro-nickel is composed of 75 per cent copper and 25 per cent nickel. Three heats are made per day, pouring the penny stock at approximately 1950 deg. Fahr. and the cupro-nickel at about 2500 deg. Fahr. French and Italian coins have been handled, composed of almost pure nickel, the lining standing up very well, although the melt was at a high temperature. A ganister bottom with silica brick lining is used.

This furnace should give a very good account of itself in handling alloys of this nature.

The furnace at the Gerline Brass Foundry has been handling red brass, enamel tank (½ red and ½ yellow brass with not over 22 per cent zinc content), and Monel metal, but not much success was attained with yellow brass ingots. Yellow brass borings could not be worked at all. This was only to be expected, since neither the direct or indirect arc type of furnace is suited for handling alloys containing metals which volatilize at comparatively low temperatures, unless some method is provided for overcoming the superheated top layer.

Some trouble was experienced with the lining giving out on the Monel metal heats, which might be attributed to lack of skill in operation rather than against the lining itself—in that the metal was melted to a very high temperature (around 3000 deg. Fahr.) in order to pour intricate castings and the furnace was over-powered. This would seem to be borne out by the fact that nickel was successfully melted at the Philadelphia Mint in the same lining.

Out of four heats making Monel metal the average of the actual melting time was 3 hr. and 48 min., with a consumption of approximately 1300 kw. hr. per ton. The average charge was 549 lb. with an average electrode consumption of 5 lb. per ton.

The result of seven heats making enamel tank castings under fair operating conditions showed an average metal loss of 3½ per cent, with an average of actual melting time of 1 hr. and 48 min. The average consumption was 537 kw. hr. per ton, while the electrode consumption was 2.8 lb. per ton. The average charge was 580 lb.

Ten heats were selected from those making red brass castings as representing fair working conditions. The results show the average charge to be 532 lb. with an average of actual melting time of 1 hr. and 14 min. The average kilowatt-hour consumption was 437 kw. hr. per ton with an electrode consumption of 2.8 lb. per ton.

It will be noted that the kilowatt hours required for making red brass castings are less than those for enamel tank, which shows that experimental figures cannot be relied on for commercial practice.

This resume covers fairly completely what has been and is being done, as far as the writer has knowledge, toward the development of an electric furnace for use in non-ferrous metallurgy. The results recorded as to performances are not as full as the writer would have liked to obtain, but it was extremely difficult to obtain them, due to the lack of keeping accurate records. It is to be hoped that the importance of so doing in order to improve the general practice of to-day, will be fully realized.

From all indications it is fair to assume that the electric furnace will soon be established on a firm commercial basis as a heating medium in this field.

J. C. Agnew, chief engineer of the mining properties of the Midvale Steel & Ordnance Co., has completed preliminary exploration work on the ore property recently acquired by the company in Wayne County, Mo., and a force of about 250 men, it is announced, will be withdrawn Dec. 1 from the Mahoning mine at Hibbing, Minn., and placed in active mining operations in the Wayne County field. Drilling which has been done has decided the best locations for taking out ore. Another organization which has undertaken the development of ore bodies in Missouri in Butler County has been formed as the American Coke & Chemical Co., with Studebaker interests and National Enameling & Stamping Co. interests as well as the Granite City Steel Works owners. This latter concern will expend about $125,000 in preliminary development and also has in view the reduction of iron ore and the making of metallurgical coke from Southern Illinois coal.

Hamilton & Hansell, agents for the Rennerfelt electric furnace, have removed from 17 Battery Place to 13 Park Row, New York.

THE IRON AGE

New York, November 15, 1917

ESTABLISHED 1855 VOL. 100 : No. 20

Handling the Refuse of a Foundry

Conservation of Labor Secured at Chisholm-Moore Plant by Installing an Elevator and Trestle for Dump Body Truck

THE conservation of labor in these days of high wages and scarcity of workmen is of more importance to plant managers than ever before, and the special application of modern equipment often proves a great aid in saving labor and consequently in cutting down operating costs. A new method of handling old sand, cores, cinders, etc., in a malleable iron foundry by which the cost of removing refuse has been materially reduced, was recently adopted by the Chisholm-Moore Mfg. Co., Cleveland.

Formerly workmen hauled the refuse from the foundry up an incline in wheelbarrows and dumped it into railroad cars. As the foundry produces about four cars of this refuse a week, the labor cost of wheeling it to the cars was not a small item. To eliminate this hand hauling in wheel barrows from the foundry floor and up the incline to cars, a 3-ton elevator was installed on one side of the plant adjoining the railroad siding and a platform covered trestle was erected over the railroad track. Refuse is now gathered up in an electric storage battery truck with a dump body, taken up the elevator and onto the trestle and dumped into hopper cars beneath. The trestle is built of steel and is 22 ft. 8 in. in height. Near the center is a platform connected with the building and elevator entrance, this platform being large enough to permit a truck to turn and run in either direction on the trestle. Each end of the trestle is somewhat longer than the length of a car so that there is ample room for spotting cars on the siding beneath.

A guide track for the truck is provided by 3 x 4-in. angles laid on the trestle, these being 2 ft. apart and coming to a point at the platform end so that the truck guides itself over either section of the trestle. Openings are provided in the trestle platform beneath the guide rails through which the refuse is dumped into a sheet-steel hopper under each end of the trestle. The hopper is 20 x 48 in. at the top and tapers down to 20 in. square at the bottom. It is movable and extends down to just above the top of the car beneath, being attached to a standard hoist carrier that runs on an I-beam track under the truck runway. Only the two outside wheels of the carrier are used, the inside ones having been removed. The hopper is also hinged so that it can be lifted up lengthways out of the way when a box car is run under the track beneath.



Foundry Refuse Is Collected by a Dump Body Storage Battery Truck Which Is Brought Up on an Elevator to the Trestle and Dumped Into the Cars Beneath. The wheelbarrows on top of the car show the old way of handling spent sand, cores, cinders, etc.

The dump body of the truck is 59 in. long, 36 in. wide and 23 in. high. This body is removable, and in its place can be substituted a wooden platform for use in han-



A 4000-Lb. Dump Body Truck in Addition to Collecting Refuse Is Also Employed for Handling Small Castings and New Sand, While by Removing the Dump Body and Substituting a Platform It Becomes a General Utility Conveyor Around the Plant

dling large castings and other material. By adapting the truck for various uses it becomes a general utility conveyor around the plant in addition to handling castings and new sand, and is kept in almost constant use. The dump-body truck is found very convenient in handling small castings. When used for this purpose the end gate is lowered, the castings are shoveled into the hopper from the end, and the whole load is dumped after reaching its destination.

The truck is a standard four-wheel steer type, built by the Elwell-Parker Electric Co., Cleveland, with the hopper body as added equipment. It has a single reduction worm drive. The wheelbase is 67¼ in., and the wheels have solid rubber tires. The truck has a capacity of 4000 lb. The hopper is balanced on rockers on each side, so that its dumping requires no energy on the part of the operator further than overcoming the friction of the mechanism.

Steel Distribution Committee

The steel distribution committee of the American Iron and Steel Institute, which acts as intermediary between the Government and the steel manufacturers in the allotment of Government requirements of steel, is now constituted as follows: J. A. Farrell, United States Steel Corporation, chairman; J. B. Bonner, Carnegie Steel Co., vice-chairman; E. A. S. Clarke, president Lackawanna Steel Co.; J. A. Topping, chairman Republic Iron & Steel Co.; F. J. Hall, vice-president Central Iron & Steel Co., Harrisburg, Pa.; H. F. Holloway, Jones & Laughlin Steel Co.; J. Ogden Hoffman, Brier Hill Steel Co. Mr. Holloway is New York representative of his company but has been for several months also in charge of the Washington office. Mr. Hoffman represents his company at Philadelphia, but of late has been giving special attention to its Washington business.

Two of the six blast furnaces of the Youngstown Sheet & Tube Co. are idle. One of the Hubbard furnaces has been blown out for relining and repairs. One of the Youngstown stacks has been banked for lack of coke. Unless the coke supply soon improves it is probable another Youngstown stack will have to be banked.

AMERICAN MERCHANT MARINE

National Foreign Trade Council Submits Important Report

WASHINGTON, Nov. 12.—In a report and resolution submitted to the United States Shipping Board to-day, the National Foreign Trade Council addresses itself to the question of the national policy necessary to render permanent the rehabilitation of the American Merchant Marine which it regards as about to be practically accomplished through the execution of the present construction and requisition program of the Shipping Board. The report was prepared by the council's committee on Merchant Marine, and is signed by James A. Farrell, chairman of the council and president of the U. S. Steel Corporation, and P. A. S. Franklin, president of the International Mercantile Marine Company. Edward N. Hurley, chairman of the Shipping Board, is a member of the council.

The resolution of the council submitting this report to the Shipping Board declares "that the removal of all inequalities and injustices from the American navigation system, enabling American shipping to maintain itself upon an equitably competitive basis with other nations, with due regard to American standards of living and compensation, is absolutely essential to the permanency of the forthcoming rehabilitation of the American merchant marine," and strongly urges "all who are interested in insuring the permanent restoration of the American flag to the recognized place it formerly held in the carrying trade of the world, generously to co-operate with the United States Shipping Board for the purpose of securing the necessary revision and amendment of the navigation laws in time to render effective service in the operation of the new American fleet."

The committee points out that the experience of Great Britain has proved that less than 60 per cent of British foreign trade is carried in British bottoms.

"If the carriage of 60 per cent of American foreign trade in American ships," says the committee, "would render the United States reasonably free from the necessity of employing a foreign merchant marine for its carrying trade, the program of the Shipping Board and Emergency Fleet Corporation at present under execution would accomplish the desired result." The committee expressed the conviction that, "whenever the war ends, the restoration of peace will find the United States equipped, or in process of rapid equipment, with a merchant fleet calculated to carry pretty close to the proportion of our own foreign trade that British experience has shown to be normal for the nation with the greatest merchant marine afloat."

"The question, when peace comes, will be of operation rather than of provision of more ships. * * * When the Government comes to sell or charter the vessels of its merchant fleet to private organizations there will be the opportunity to arrange conferences in the different trades, which will establish rates in harmony with costs of operation and at levels which will encourage the growth of American trade with all markets, fair to both shipper and ship owner; control tonnage, insuring a sufficient supply for all requirements; and in general effect and maintain a standardization of conditions that will make for the successful operation of the rehabilitated American merchant marine. At the same time sufficient supervision of foreign bottoms may be maintained through control of clearance and by other means to prevent undue advantage to foreign ships with regard to American commerce."

The United States Metal Refining Co., which has a large plant at Chrome, N. J., has purchased a tract of about 120 acres on Tuffts Neck, Carteret, N. J., from the International Nickel Co. It is estimated that the value of land is about $1,200,000. The new site will probably be used ultimately for a plant for the metal refining company, which is cramped for lack of room to expand in its present location.

FIXED IRON AND STEEL PRICES

Views of Consumers on Agreements Between Government and Makers

A canvass of views of consumers of iron and steel on the fixed-price policy instituted by the Government brings out a general reply that too little experience has yet been had by the average user to make any lasting comment, let alone drawing conclusions as to the effect. This comes partly out of the custom of buyers to enter a market for tonnage purchases at relatively long periods and hence numbers of THE IRON AGE readers have not, as the phrase goes, tested the market. Some of the opinions and some of the incidents may, however, be here recorded, and they have a relation to the suggested abrogation of contracts likely to be considered in the Pomerene price-fixing bill, scheduled to come up for consideration at the next session of Congress. Quotations from replies are as follows:

A steel casting company: The Government fixed price policy will be of great benefit in the organization of the country for war, for the reason that prices had absolutely run wild and were being made with no regard whatever to production costs, the high prices maintaining being largely the result of competitive buying for future unknown requirements. The prices fixed must show a fair profit to all manufacturers engaged, and with a graduated apportionment of the steel production in the United States to purposes requiring this steel for the prosecution of the war they will more speedily accomplish the national end than any other policy that could be adopted. It naturally will work many hardships, but all those combined will not approximate the benefit derived by the country as a whole. In our own company orders or inquiries for non-war purposes are receiving no consideration, for the war needs are so stupendous that they will tax the resources of the entire steel production in the United States.

A selling agent for various steel makers' products: As we see it the prices are not such as to warrant increased production, and are a distinct hardship on those of us who are not self-sustaining throughout.

An iron, steel and fuel broker: We are really somewhat surprised that such a radical change in the mode of doing business in this industry is accompanied with as little confusion as has been the case. One of the particularly good results has been to put the purchasing agent in a more secure position. The condition that is at present causing the most confusion both to the small mills and the small consumers is what is the position of a warehouse. The larger producers refuse to quote on their product for mill shipment, but do take on business through their own warehouse or through closely allied warehouses not at 2.90c., 3c. and 3.25c. per lb., but at 4.50c., 5c. and 7c. per lb. This procedure is considered by the smaller mills more or less of a subterfuge. They feel that their interests have not been particularly looked after or themselves consulted in arriving at the fixed prices but face the penalty of being considered slackers or at least unpatriotic if they do not observe the conditions laid out for them.

A maker of cold-rolled strip steel: We had hoped that the Government would not find it necessary to try to fix prices for other than the war business. Conditions, however, were so unusual that it was no doubt warranted in taking a very unusual step. Either price-fixing should have been pursued far enough to affect the products that are bought by the people or it should not have been adopted; but that will not prevent me from doing everything in my power to uphold the hands of and co-operate in every way with the Government in its action.

A maker of electrical machinery: It seems quite generally a condition that all manufacturers have good stocks and are covered for replenishments under existing contracts at almost the highest prices, which will carry them over into next year. Therefore, there are not many buyers, and the steel industry, having their order books loaded with such business, are kept busy without booking any new contracts at Government prices. I realize that as time passes and old contracts are cleared up, we can all have more definite views on the question of how the Government's fixed price policy is working.

A machine tool manufacturer: The whole subject is too young yet and serious to bear our signature. We do not mind giving you a few of our experiences, however. Take it on the matter of coke (and we had some 15 cars ordered on a contract at "price prevailing at time of shipment"). When the Government set the price, the coke people refused to bill at $6, and therefore they are shipping us coke at $15. For self-protection, for future use, we ordered some 15 cars of coke at a price of $15. As we understand matters, contracts are to stand; therefore, we are out $9 a ton until we finish the contract.

The only way that we can buy steel is to pick it up of a jobber, and as the Government has not set the price with the jobber, we have not found any difference on the price of steel.

As for pig iron, we had contracts running up to, say, $42, and yet the Government put the "stop" price in at $33. Now we are having some iron come at $30, therefore we are making $3 a ton. When we get to using the $40 iron we shall be losing $7 a ton. Of course, as far as the matter of abrogation of contracts is concerned, the user will get the best of it in general as most of the low price stuff is already delivered. We think the pig iron people are handling this matter in the most patriotic manner, and we have had iron offered to us for delivery into next year at Government prices. As for steel and coke, we cannot say as much.

We might mention that a few days ago we placed an order for some machinery spindle steel and they held us up to some 10c. a pound, while according to the new Government price, it ought to be down to 6c. or 7c. a pound at the most. This was an order placed direct with the mill, and yet, we are not getting the advantage of the new price. We have not yet mentioned that we are making machine tools for the Government, but if matters do not adjust themselves shortly we shall have to do so, and perhaps resort to a priority demand.

A maker of heating and ventilating equipment: The fixing of a maximum price for iron and steel by the Government is a good thing. It will operate to prevent speculation and over-buying and thus stabilize the market.

A maker of bar iron: My observation is that in some lines there has been some increase in buying, but generally domestic purchases of finished materials have largely decreased, and this, it seems to me, will remain until old contracts are cleared up.

A maker of bolts and nuts: We are in entire accord with the idea that no one should make an undue profit under present conditions. Every one should do something in the way of making a sacrifice. Some of us can make a sacrifice by enlisting and going to the front; others by selling their product at materially lower prices than the natural law of supply and demand would indicate. Hence, where manufacturers or producers are not willing, voluntarily to make what seems to us fair and reasonable prices, it is necessary for the Government to step in and arrange for price fixing. As an economic proposition, this is a difficult and frequently unwise thing to do, but we are confronted with abnormal conditions and must conform to them.

A maker of washers: Any move, whether by the Government or brought about by market conditions generally, which involves radical price changes, has a bad effect on business at any time. Of course, in these abnormal times business adjusts itself to these changes without any apparent serious results. Price fixing by the Government is a blessing because it gets us nearer the ground floor to which all of us will have to get when the proper time comes. As to the abrogation of contracts I hope that our legislators will have the good sense to let well enough alone. Very few will be seriously hurt by conditions as they are. Surely it is difficult enough for the manufacturers to get a contract to hold water when conditions are not favorable, and I do not consider that these tendencies need the Government's approval, by making it a party to it.

A maker of wire cloth: We do not object to the Government's fixing fair and reasonable prices for its purchases of steel products for its own use and that of our allies. We do object to their obliging us to adopt these prices for all other business, as this eliminates what should govern prices—supply and demand.

A maker of horse shoes, etc.: The establishment of fixed prices by the Government will have a good effect. It will more or less influence the trade in specifying for their immediate wants; they have failed to do recently, owing to the uncertainty of what was to be done. We have made no changes in our prices, nor do we contemplate making any, due to the fact that the only advances made were those due to increased cost, and in considering this we hardly covered ourselves.

Speeding Up Shipbuilding Program

Charles A. Piez, President Link-Belt Co., Takes Active Charge and Bureaucratic Methods Are to Be Abandoned—Conscription of Labor May Come

WASHINGTON, Nov. 13.—The Emergency Fleet Corporation of the United States Shipping Board has again undergone a radical reorganization as a result of which Admiral Capps, its general manager, though retaining the title of the office, has been displaced so far as responsible duties are concerned by Charles A. Piez, president of the Link-Belt Co. of Chicago, who, a fortnight ago, was induced to come to Washington to assist Chairman Hurley of the Shipping Board in his efforts to speed up the shipbuilding program. Mr. Piez is an engineer of wide experience and is already securing results through the slashing of red tape and the substitution of up-to-date business methods for the complicated and bureaucratic systems of the Navy Department under which the Fleet Corporation has been operated since the resignation of General Goethals.

The appointment of Mr. Piez as the active executive of the Fleet Corporation was but the first step in its reorganization. Several naval officers who heretofore have been assisting Admiral Capps have been relieved from this duty, and their places have been taken by engineers of broad business experience. Charles Day of Philadelphia, a mechanical engineer who has supervised much important construction work, has been assigned to the direction of the three big Government owned shipyards in which fabricated steel ships are to be built. Mr. Day was retained by the Shipping Board several weeks ago to make a study of the shipbuilding plants of Great Britain and is now in England with the American War Commission for that purpose. James Heyworth, a Chicago contractor, who has a comprehensive knowledge of the lumber industry, has been placed in charge of wooden shipbuilding and will devote himself to hastening this feature of the board's program which of late has been lagging in very discouraging fashion. A. J. Mason of Chicago, another well known engineer, has been placed in charge of the inspection division of the Fleet Corporation, and will organize a staff whose duty it will be not only to see that all contract work is executed in first-class manner, but also to keep the Shipping Board fully advised as to progress in all departments in order that no feature of the work may fall behind. Mr. Mason will institute a system of progress reports which will keep the board informed from week to week of the exact status of every ship in process of construction.

Change Was Expected

The latest upheaval in the Shipping Board has been foreshadowed for some time. While Admiral Capps' accomplishments have at all times been fully recognized, the most experienced observers here familiar with Navy Department methods have, from the outset, felt that the placing at the head of the Emergency Fleet Corporation of a naval constructor imbued with the traditions of the Navy Department was a serious mistake. The systems employed in the department were instituted many years ago and are in no way adapted to expeditious work. In the matter of designing, drafting specifications, and in other technical details of shipbuilding, the Naval Bureau of Construction and Repair is believed to be equal, if not superior, to that of any European Government, not excepting Great Britain; but its circumlocution methods have been such as to preclude a genuine speeding up of the Shipping Board's building program, and Chairman Hurley and his associates were some time ago reluctantly forced to the conclusion that a sweeping change must be made. A committee of experienced engineers and business men was, therefore, appointed to make a thorough examination of the organization and methods of the Fleet Corporation and to recommend such changes as seemed desirable. This committee was headed by Mr. Piez and included Mr. Mason, Mr. Day and Frank Kirby, a well known New York engineer.

New Men and Methods Needed

The report of the special committee, which was received by the board a few days ago, left no doubt in the minds of Chairman Hurley and his associates that new men and new methods must be immediately employed to save the situation. The board found that in place of a harmonious feeling between shipbuilders and the officials of the Fleet Corporation a spirit of antagonism had developed between the contractors and the members of Admiral Capps' staff, and that builders were being hampered and retarded in their efforts by the bureaucratic routine prescribed by the manager of the Fleet Corporation, which made it impossible to secure information promptly or to keep in touch with the corporation's plans. Many complaints were made, it is said, by contractors that their plans and specifications were changed from time to time and that their work was held up for considerable periods pending changes which might easily have been promptly authorized.

The special committee recommended the substitution of up-to-date business methods and modern engineering practice for the system employed by the Fleet Corporation, and especially that the Washington headquarters be brought into close co-operation with the men who are building the big emergency fleet. The raw-material situation was also dwelt upon by the special committee, which found that the lumber contractors, and especially those who have agreed to deliver Southern white pine, are heavily in arrears. There are now 310 wooden ships building for the Fleet Corporation, and as a result of the reorganization Douglas fir will be substituted for pine and distributed to the Atlantic and Pacific seaports under priority orders by special trains that will be given the right of way over all other traffic. It is not known whether the special committee expressed a definite opinion concerning the wisdom of the original determination to build wooden ships, but it has been decided that no more contracts for such vessels shall be let.

Hurley's Stirring Address

Chairman Hurley of the Shipping Board has spent a strenuous fortnight in the effort to expedite the Shipping Board's program. He recently summoned to Washington responsible representatives of the shipyards embraced in the Atlantic Coast Shipbuilders Association, and at an extended conference with them delivered a stirring address, in part as follows:

> This meeting has been called for the single purpose of establishing a new goal for our expectations. Between now and March 1 this country will turn out approximately 1,000,000 tons of ships, deadweight. In the whole of 1916 we turned out little over 750,000. Thus we will achieve in four months far more than we achieved previously in 12 months. Conservatively stated, we have quadrupled our output. The new goal of our expectations is 10 times the production of 1916.
>
> We can't achieve this goal by ordinary methods, by normal energy, or average initiative. This is an extraordinary period in the country's history. We are confronted with an abnormal task and must apply abnormal methods. Every ounce of our energy and initiative must be directed toward the achievement of the greatest task ever imposed upon a nation in war.
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> The Government alone, no matter how willing and anxious to do its part, cannot bring the production of ships to the maximum capacity of the country. The shipyards alone, no matter how willing, can't do it. The labor of the country, no matter how intelligent, skillful and patriotic, can't do it. Working together, determined to forget everything but the national welfare, we can achieve the goal we have now set for ourselves.

In any great enterprise of this kind there are always obstacles to be overcome. The biggest and best industrial concern in the world, if suddenly asked to multiply its output by 10, would have to strain every nerve to accomplish the task. it would have to build new plants, find additional foremen, new labor, new machinery, and adopt new methods. If there were no obstacles to be overcome, however, there would be no special credit in the achievement.

I want to take this opportunity to pay a tribute to the patriotism of labor. The shipyard owners probably do not understand the obstacles which the patriotic labor of the country have had to overcome. Labor probably does not understand the obstacles which the shipyard owners have had to overcome. It is so that we may all understand each other better, pull together, and speed up that Admiral Capps and I called this meeting. Incidentally it may give all of you a knowledge of the difficulties which we must overcome here at our own end.

We are going to build 6,000,000 deadweight tons of ships in 1918. I say we are going to do it, rather than that we are going to try to do it, because I know that anything America sets out to do she does. As a fighting Nation, we have a clean record for victory. We've got the men, we've got the money, and we've got a cause that is right.

We want the labor representatives here to tell us the best way to speed up and augment the labor supply. We want the shipyard representatives to tell us what will facilitate the work of production in order that we may reach the goal which we have set for ourselves. It is my hope that to-day will establish a milestone in the progress of America in the war against the German government.

The young Americans in the trenches are offering the supreme sacrifice of their lives for the honor of their country. Their safety and their success depend on us. Much less is required of us, but I am confident that everything we have to give will be given in the same spirit of unselfishness.

Five Recommendations

Following the conference the representatives of the shipbuilders submitted five recommendations, designed to expedite the work of building the enormous fleet projected by the board, as follows:

Adjustment and standardization of shipyard wages on the Atlantic coast, with the co-operation of labor representatives and the moral suasion of the Government.

Distribution among all the shipyards of the visible supply of labor, so there shall be no surplus in one plant and shortage in another.

Arrangement for priority in delivery of materials in a systematic way, which will keep each yard supplied with the material it needs first.

Co-ordination and co-operation of the Navy Department and the United States Shipping Board with the builders.

An equitable policy for the adjustment of unfinished contracts.

Chairman Hurley and his associates were very favorably impressed with these recommendations, and it is probable that they will be incorporated in the Shipping Board's general policy. Concerning the suggestion that an equitable policy for the adjustment of unfinished contracts be adopted, it is explained that this relates to an appeal received from a number of yards in which are being constructed vessels contracted for by private parties but commandeered under an order of the board issued some time ago. The contractors claim that the ships cannot be completed for the contract prices and are petitioning for special allowances to meet the increased cost of production. The commandeered vessels aggregate over one million tons and were contracted for at a time when labor and materials were much cheaper than to-day, some of the orders having been placed early in 1916. The majority of the yards in which these vessels are building are located on the Atlantic coast, and the builders point out that the Government has approved large advances in labor and material costs which have been incurred by yards building war ships on the cost-plus-profit basis. In this way, it is contended, the Government has itself created the condition now complained of. It is probable that the board will meet this situation by increasing the contract prices of vessels where it can be clearly shown that the greater cost is due to bona fide increased expenditures by the contractors.

Complaints Submitted

Complaints were made to the Shipping Board officials by the representatives of several yards that certain shipbuilders are bidding against each other for the services of high class superintendents and that this practice is having a very demoralizing effect. In one case cited, a Pacific coast yard offered a superintendent $50,000 to leave a rival. The British Government, in the Defense of the Realm Act, forbids such practices and it is probable that Congress will be appealed to to enact a similar prohibition.

Labor Situation Discouraging

While the conference of the shipbuilders has served to stimulate them to greater activity and the reorganization of the Fleet Corporation will have an excellent effect, very discouraging reports have reached the Shipping Board within the past two or three days concerning the labor situation. While the United States Shipbuilding Labor Adjustment Board recently announced a uniform minimum wage scale for the Pacific coast shipbuilding yards, providing an increase of 10 to 30 per cent over the old scale, representatives of union labor promptly gave to the press statements declaring that "there won't be many ships built under this scale." M. J. Maguire, representing the Metal Trades Craftsmen of the San Francisco Bay district, is quoted as declaring that "the entire shipbuilding crafts of the Pacific coast will appeal to Wilson against the decision." The adjustment board points out that 75,000 men are necessary on the Pacific coast alone to carry out the Government's program and that on this basis there is a shortage of 30,000 to meet which the Department of Labor will be urged to extend the Federal employment service in California, Oregon and Washington to supplement the union bureaus which are now unable to supply skilled workmen. In promulgating the new scale the board made the following statement:

The shipbuilding labor adjustment board is a war board. The owners of the shipyards are, for the duration of the war, merely agents of the Government. Employers and employees must realize the war has changed their relation to each other. The Government is insistent that ships it requires must be built and be built promptly. It is equally insistent that standards of living must be preserved.

The national program requires an increase in the output of ships from 750,000 tons turned out in 1915, to 6,000,000 tons in 1918. This necessitates introduction, wherever possible, of the two or three shift systems. Immediate steps to bring about this change must be taken by shipyard owners. The board urges representatives of organized labor and employers concerned to work out in co-operation with agents of the Government plans for the more rapid training of skilled workers in the different crafts.

The board did not feel justified in forcing on the taxpayers of the country, who henceforth must pay for the ships built, the higher wage that the consideration of merely local aspects of the situation might have warranted. It urges employers and employees to accept the decision in the spirit of loyal co-operation and do their utmost to help the Government win the war by turning out the ships so urgently required.

The minimum scale for the Pacific coast was fixed by the board as follows:

Journeymen machinists, molders, blacksmiths, anglesmiths, pipe fitters, boilermakers, shipfitters, pressmen, angle and frame setters, riveters, chippers and caulkers, acetylene workers and electrical workers, $5.25 per day; painters and plate hangers, $5; sheet-metal workers, coppersmiths and flange turners, $6; heaters, foundry carpenters, furnace men and punch and shear men, $4.50; pattern makers, $6.50; planer men, counter sinkers, drillers and reamers and holders, $4.20; machinist specialist, $4; rivet heaters, $3.15, and laborers, $3.25. Helpers are divided into two classes, as follows: Machinists, pipe fitters, sheet-metal workers, ship fitters, electrical workers, molders and helpers, $3.60; blacksmiths, coppersmiths, slab, plate hangers, hook tenders, flange fire and machine helpers and casting cleaners, $3.90. In yards where wooden ships are being constructed the minimum rate for caulkers is fixed at $6.50; shipwrights, joiners, boat builders and mill men, $6, and laborers and helpers, $3.25.

The scales of rates are retroactive, and in the Puget Sound district go back to Aug. 1. The board directed that they should be in effect on or before Monday, Nov. 12, and all back pay must be paid within two weeks thereafter. An 8 hr. day is fixed for the San

Francisco and Portland districts, while working conditions in the Puget Sound district are to be determined by agreements between employers and employees.

The labor conditions prevailing in the shipyards are duplicated in several other important industries, notably in the mining of coal, a product upon which every branch of war activity rests. In certain coal mining districts, according to reports received here, the men refuse to work more than 6 hrs. daily, and in some cases they insist upon laying off three days a week. Higher wages, it is said, simply make conditions worse, tempting the men to cut down their hours of labor and increasing drunkenness to a marked extent. Many operators in order to prevent a decrease in production, have met the most unreasonable demands of their men, and in the case of an important anthracite property it is said that the company advanced to the local union the dues of a large number of its men to prevent a hold-up of the work. In one district, by general consent, the companies are regularly paying the union dues of their men and deducting the amounts from their wages.

Coal Miners Are Defiant

Threats made by the fuel administrator, Dr. Garfield, that unless the coal miners in the southwestern districts go to work the Government will use the full powers conferred upon it by law to secure maximum coal production have been met by defiant statements by representatives of the miners' unions to the effect that the Government will prove unable to force the men to work. Representatives of the coal miners who have been in conference with Dr. Garfield during the past week have refused to agree to the insertion in a new wage contract of a provision penalizing strikes and lockouts and, after a secret meeting held here, left for their homes declaring that a general convention of Southwestern miners would be called to meet in Kansas City to discuss the situation.

Ordered to Return to Work

Since the departure of these labor leaders, Dr. Garfield has been advised that Alex Howatt, an official of the United Mine Workers of America, has ordered the striking miners in the Kansas district back to work pending the action of the Kansas City convention, but no details have yet been received as to the extent to which mining operations have been resumed. No less than 60 mines have been idle in Kansas, while the miners in Oklahoma, Arkansas and Missouri are threatening to strike unless they are given immediate wage increases. Dr. Garfield declares that no contracts granting wage advances will be approved by the Government unless the proposed penalty clause is inserted, and he states further that he will not apply to the Southwest the recent raise of 45 cents per ton in coal prices, which was designed to absorb wage increases, until the miners come to terms. In an official statement issued here Dr. Garfield says that the automatic penalty clause must not be made the occasion for oppression, either on the side of the operators or the men, but that "if honest differences arise, they must be threshed out by the representatives without disturbing the operation of the mines."

Indignation Expressed

Administration officials express great indignation at the course pursued by the labor leaders in certain districts, which has heavily handicapped the prosecution of the war. One high Government official, of whom it is said that his "responsibilities require him to see that several million men in certain industries shall remain steadily at work," is quoted as follows:

I cannot see any certain method of securing steady labor on indispensable war work except by the conscription of workingmen.

The right to strike is incompatible with the duty of the American army in France. The soldiers are under iron military discipline. They cannot strike, but must do as their country requires, even if it takes their lives.

These soldiers cannot be sure of victory unless they are sure of supplies. They cannot be sure of supplies unless there are ships to carry the supplies.

When men here in this country insist upon the right to hold up the building of ships or the manufacture or transportation of necessary war supplies they strike a blow at the American army in France. They not only stand in the way of American victory, but they imperil the lives of our soldiers.

I know the workingmen do this unwittingly, and therefore I do not suggest any harsh measures, but I submit that the present conditions cannot be tolerated long.

What would we think if it were suggested that every one of Gen. Pershing's boys should have the right to quit at any time he pleased, and to combine with other soldiers to strike unless Pershing would grant any concession they might demand?

We would call that anarchy. Something like that occurred in Russia, and Russia immediately broke down.

Yet, logically, the men at the front have just as much right to quit as the man at the rear. Both classes are in duty bound to defend the country, one by fighting and the other by working. One class keeps at the front only as long as the other class works to keep it there. A retreat would be no worse than a breakdown of supplies. One would mean the other.

The President is asking labor to enlist voluntarily for the period of the war. The great majority of workers are already voluntarily enlisted and faithfully serving in the ranks of toil.

But what about the slackers? We can't get them into the ranks of labor by appeals to their patriotism any more than we can get them to volunteer for service in the army.

Yet they must do their bit, if justice is to be done to the men who are faithful. We don't want a system that will punish faithful workers by increasing their hours and at the same time permit slackers to escape work altogether.

In short, as I see it, everybody, sooner or later, must be conscripted for the work he is best fitted to do. If this be done soon, the war will be won soon; if late, the war will be prolonged.

Let us take a hint from the enemy, who always tries to do that which is necessary for success, whether it is pleasant or not. The enemy has industrial conscription in force.

Hence, every man and woman in Germany is really a part of the great army that is dealing such tremendous blows to Russia and Italy.

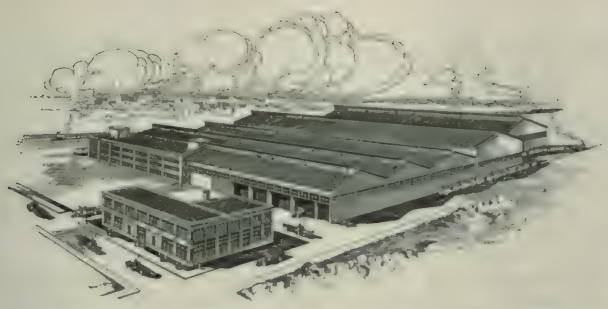
The German nation is fighting, and not merely the German army. It is up to the whole American nation to form a fighting unit, not leaving the burden to the army alone. From the men in the trenches to the men in the mines of Arizona or the timber camps of Oregon, there should be a perfect chain of active and alert soldiers of America, handling every link of the vast and complicated mechanism which America must develop to defeat Germany.

Conscription Proposed

The labor shortage in the leading industries so necessary to the vigorous prosecution of the war has induced certain officials of the Department of Justice to give some consideration to the possibility that it may be necessary to provide by law, by conscription or otherwise, for workmen to keep the mines, shipyards and munition factories going. The administration would be very reluctant to take such a step, and even discussion of the matter at this time is deprecated by the President's advisers. It is suggested in this connection that the situation may be somewhat relieved by a plan which the War Department is now working out which will provide for exemption from military service of a considerable number of men already registered and likely to be called in the next draft who are specially skilled in the industries upon which the war must depend. W. L. C.

The Westinghouse Electric & Mfg. Co., East Pittsburgh, has nearly completed the building of a new foundry at Cleveland, in which hand grenades for the Government will be made. The new foundry will be about 160 x 260 ft., and equipped with two 15-ton air furnaces. All the contracts for the buildings and equipment were placed some time ago.

The Stanley Club, of the Stanley Works, New Britain, Conn., has started the publication of a biweekly newspaper, the *Stanley Worker*, in order to keep in touch with employees of the company who have enlisted in the army. An interesting feature of the little paper is the correspondence corner, in which letters from soldiers are published.



OPEN WAREHOUSE AT DETROIT

Joseph T. Ryerson & Son Begin Operations at Fourth Unit of Warehousing Service

JOSEPH T. RYERSON & SON, Chicago, have now in operation their new warehouse at 470 Euclid Avenue, East, Detroit, the fourth unit in their chain of plants designed to give country-wide service to consumers of steel and steel products. The stock carried in Detroit will comprise the variety of materials and commodities carried at the other warehousing centers of the company, although it has been especially studied with a view of serving also the requirements of the automobile, auto truck and auto part industries. The list of material carried is a formidable one.

Close attention was given to the location of the new plant, and as a result the site on Euclid Avenue is central to the manufacturing districts of Detroit. City deliveries will be made by motor trucks, while out-of-town shipments are facilitated by connections with the Michigan Central and Grand Trunk Railroads.

The main building is 350 x 325 ft., with a three-story building 54 x 142 ft. The main building consists of a series of five bays, two being 50 ft. wide each and three being 75 ft. wide each, the approximate length of the bays being 350 ft., with cranes in each running east and west. The Michigan Central switch traverses the bays at the extreme west end and the Grand Trunk switch at the extreme east end. All buildings are of steel construction and concrete flooring is provided throughout the entire warehouse.

The offices of the plant are in a separate L-shaped building of steel and concrete construction, thus providing good light and ventilation. The main building is 40 x 75 ft., with a wing 30 x 45 ft.; part of the building being two stories. The general plan of the office is in line with the general plan of the corporation's other offices, being one large room with private offices partitioned off to a height of 8 ft. In this building are located locker rooms and lavatories for the office help and locker rooms and lavatories for the warehouse employees. The firm has installed a restaurant for the use of both office and warehouse employees. Careful supervision is given to the welfare of all employees, the purpose being to create the proper working conditions and environments. Rest rooms and reading rooms are provided, sanitary conditions are studied and attention is given to placing employees in the departments or lines of work for which their qualifications best equip them.

The new plant contains complete and modern equipment for the warehousing and handling of all materials. Great attention has been given to the crane equipment and all details of handling. The team loading bay in Span A is equipped with two traveling cranes of 2-ton capacity each; Span B is equipped with one 5-ton and Spans C, D and E are equipped with one 10-ton crane each, arranged with two 5-ton hoists. The transverse travel is provided for by industrial tracks running through the plant, equipped with ball-bearing trucks and operated with storage battery motor-driven electric trucks. All tools in the plant are so located relative to the industrial track that material can be handled direct from unloading skids, either by hand or crane, to cars placed on the tracks. The plant is equipped with automatic dial scales, having three stationary platform scales of 5-ton capacity each, one portable 3-ton capacity and a 5-ton mill type scale.

The sheet shear located in Span B is of the gate type, with a capacity of shearing 3/16 in. thick by 120 in. wide at one stroke. The plate shear located in Span C is the gate type of shear and has a capacity of shearing 1¼ in. thick by 72 in. wide, with one stroke and shearing and cutting accurately to size. A feature of this equipment is the power-driven roller table, carrying the plate to the shear. The material is handled through the shear on an arrangement of gooseneck rollers. This arrangement permits of handling plates from the extremely wide to very narrow widths and access is provided for the operators, permitting them to work in and about the shear.



Friction saw in new Detroit steel warehouse. Has capacity for cutting structural sections up to and including 24-in., 100-lb. beams.

The friction saw located in Span D is the Ryerson friction saw, type 3, direct motor-driven. The blade of the saw is mounted direct on the armature shaft of the motor, which is capable of 100 per cent overload. The forward and back movements of the saw carriage are controlled by electric motor and arranged with oil checks which prevent overloading. The saw has a capacity for cutting all structural sections up to and including 24-in. 100-lb. beams. The periphery speed of the saw is 25,000 ft. per min. The angle shear located in Span E has a capacity of shearing angles up to and including 6 in. x 6 in. x 1¼ in., and bars of corresponding size.

The betterment department of the company studies all methods of operation. It seeks to improve on systems in use and devise new schemes to promote both efficiency of operation and the safety and welfare of employees. The firm has in use a carefully worked out bonus system in the operating departments of all plants. The betterment department plans the time allotments on which this system is based.

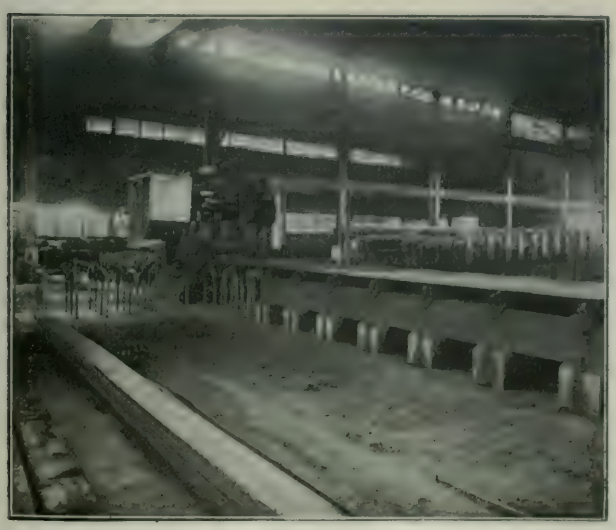


Plate shear and power driven roller table in new Detroit plant of Joseph T. Ryerson & Son. Capacity of shear is 1¼ in. thick and 72 in. wide.

The Corrigan, McKinney New Steel Plant

Works Including Open-Hearth Furnaces, Mills for Producing Sheet Bars, Billets and Slabs—Blast Furnaces and Coke Oven Plant

THE completion of the steel plant of Corrigan, McKinney & Co. in Cleveland this past summer marked an important epoch in the steel-making industry of that city and northern Ohio. For several years, under the name of the River Furnace Co., the firm had been operating two blast furnaces in Cleveland, the first of which was blown in in 1910. Having ownership in large and important Lake Superior ore properties, it was decided to erect a steel plant to convert a portion of its ore into semi-finished steel and to make a corresponding increase in its blast furnace output. On March 13, 1913, it commenced the erection of the steel works and the first steel was poured Jan. 20, 1916, and the mills were placed in operation a few months later.

The steel plant is designed to roll blooms, billets, slabs and sheet bars, there being no finishing mills. On the completion of the open-hearth plant, the erection of four additional open-hearth furnaces was started. Provision for them had been made in the original plans and they were completed this year. A gas producer plant was built in connection with the open-hearth furnaces, but after the steel works were well under way it was decided to build a by-product coke oven plant, and this was placed in operation in the past year. Both of the new blast furnaces were completed last year, one being blown on May 13 and the second Dec. 30.

The open-hearth plant has twelve furnaces, of a rated capacity of 75 tons each, and it is equipped with a hot metal mixer of 1000 tons capacity. There are twenty-four soaking pits, each accommodating six ingots. The steel plant contains a 40-in. reversing blooming mill, driven by a twin-tandem compound engine, and a 21-in. four-stand and an 18-in. six-stand continuous sheet bar and billet mill, both driven by one motor. All products are rolled from the initial heat of the unit. The steel plant has an annual capacity of 500,000 tons of ingots and the same tonnage of rolled products. The coke oven plant includes 204 Koppers by-product ovens, with an annual capacity of 750,000 tons, and a by-product plant.

An important feature of the plant is a power house which supplies electrical power for practically the entire plant except the blooming mill. The entire plant was arranged and equipped throughout with a view of reducing to a minimum the amount of hand labor required in its operation.

The blast furnace plant consists of the two old furnaces, each 83 ft. in height by 20 ft. 3 in., and the two new stacks, each 90 ft. in height by 22 ft. The old furnaces are of the vertical elevator type, steam driven and hand filled. The new furnaces have electric skips, and McKee distributors and steam driven bell operating mechanism. The daily capacity of the old furnaces is 350 tons each and that of the new stacks 500 tons each, making an annual output of approximately 625,000 tons, somewhat more than one-half of which is consumed in the steel plant.

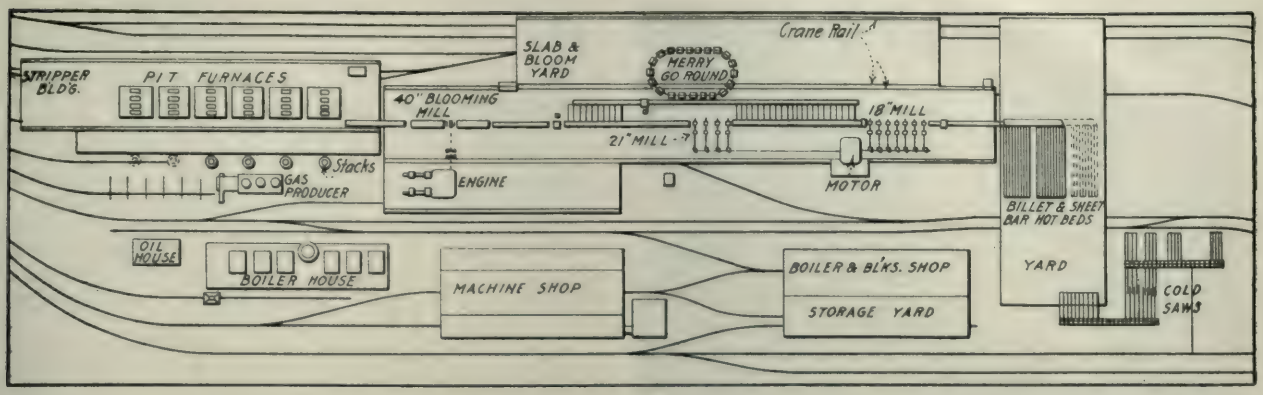
The plant is located along the Cuyahoga River. The blast furnaces are on the west side of the river, the two new furnaces adjoining the old stacks, and the power plant is near the blast furnaces. The steel works and coke ovens are on the east side of the river and the pumping station between the river and the Ohio Canal, which parallels the river. Ore from the Lake Superior district mines is brought up the river to the dock adjoining the blast furnaces and is handled with three Hulett unloaders, each of 10 tons capacity, and two Brownhoist ore bridges having 10-ton buckets. The river is spanned by a private rolling lift bridge of the Scherzer type and having a single track and foot walk. Molten metal is conveyed over this bridge from the blast furnaces to the open hearth plant on a standard gage track. Practically all other tracks throughout the plant and yard used for hauling ingots, scrap, slag, etc., are of standard gage. The plant adjoins the Baltimore & Ohio and Wheeling & Lake Erie railroads, and is also served by the River Terminal Railway Co., a subsidiary to the Corrigan-McKinney interests.

The entire plant was designed and built under the direction of H. T. Harrison, general manager Corrigan, McKinney & Co., who was chief engineer of that firm when the plant was erected. Changing the name of the River Furnace Co., the plant is now operated as the River Furnaces, Corrigan, McKinney & Co., agents.

Hot metal is brought from the blast furnaces to the mixer building in 50-ton Pollock ladle cars drawn



The Top Roll of the 40-In. Reversing-Blooming Mill Is Balanced by Constant Pressure Furnished by an Independent Accumulator. The spindle from the engine to the pinion is a steel casting 21 in. in diameter and 7 ft. long



Blooms After Being Cropped Are Transferred Either to the 21-In. Mill for Rerolling or to the Drop and Runout Table Leading to the Merry-Go-Round Which Delivers Them to the Slab and Bloom Yard

by a yard locomotive. The mixer, instead of adjoining the open hearth plant, is located in a building about 200 ft. distant, and the delivery side of the mixer is on a line with the charging side of the open hearth building which is on the same level or 16 ft. 6 in. above the yard level. The hot metal mixer is of 1000 tons capacity and of the cylindrical type. This was supplied by the Pennsylvania Engineering Co.

The hot metal is weighed on a 150-ton Fairbanks scale on the ground floor in the mixer building. The ladle is lifted by a 75-ton Morgan crane and is poured through an opening in the roof of the mixer, being tilted by a 25-ton auxiliary. The crane has a span of 72 ft. 6 in. and the height of the crane runway from the yard level is 67 ft.

The mixer is electrically operated by two 75-hp. motors connected in series and either motor is of sufficient capacity to operate the mixer in case of an accident to the other. These motors can be disconnected from the mixer both electrically and mechanically. The receiving spout cover is operated by hoisting mechanism driven by a 5½-hp. motor manually controlled, arranged for dynamic breaking in the lowering direction.

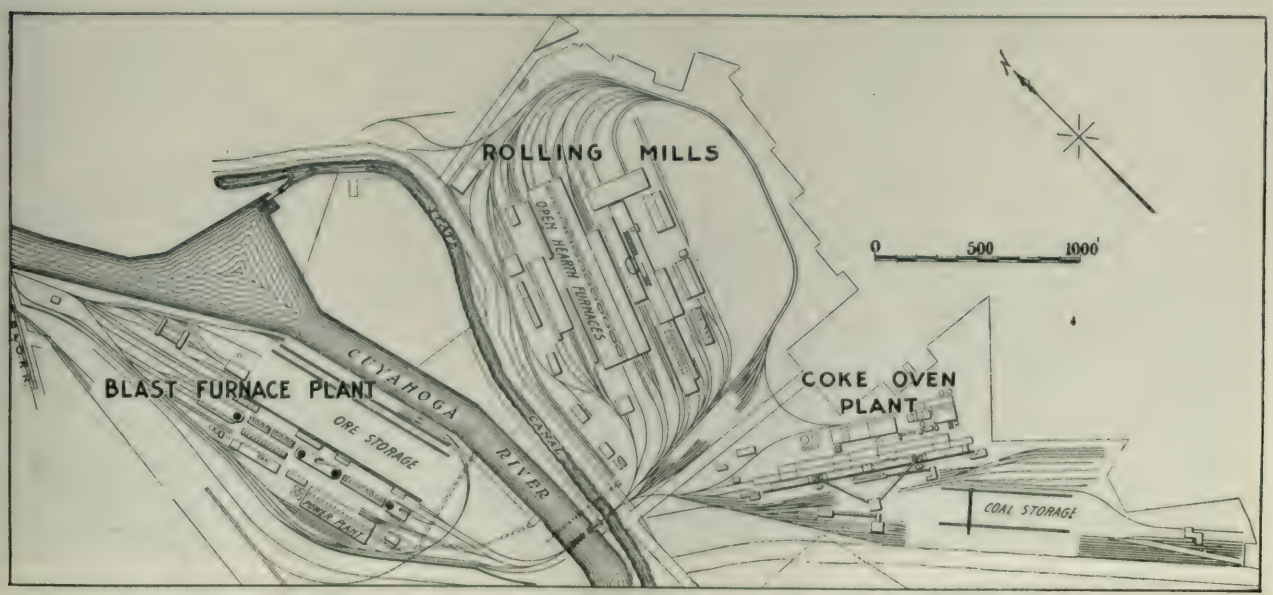
From the mixer the metal is poured into 50-ton ladles similar to those used in bringing the metal from the blast furnace to the mixer. The ladle stands on the weighing scale while being filled, the metal thus being weighed also when it leaves the mixer. A Baldwin-Westinghouse electric trolley locomotive hauls the hot metal ladle cars to the open hearth plant on a standard gage track.

The open hearth plant occupies a modern mill type of building 1000 ft. long and 141 ft. 6 in. wide. The charging side is 86 ft. wide from center to center of the columns and the pouring side is 65 ft. 6 in. wide. The furnaces are 68 ft. 6 in. in length and 18 ft. in width over all. The eight first built have hearths 36 ft. long and the others have hearths 42 ft. long. The width of the hearth in all of the furnaces is 15 ft. The checker work in the chambers is of a standard type made of 10½ x 4½ in. blocks. Knox type of water cooled doors and frames are provided and the charging doors are 36 in. high and 42 in. wide and have 36 x 36 in. openings.

The regenerators located back of the furnaces are of a standard type with separate valves for gas and air. The gas valves are Dyblie valves and the air valves are of the standard mushroom type. The regenerator chambers are 25 ft. long. The air chamber is 13 ft. 10 in. wide and the gas chamber 8 ft. 5 in. wide.

Waste heat boilers are installed in connection with the furnaces. Steam at 180 lb. pressure is developed, some used in the gas producer plant for blowing, and the remainder is utilized for driving the blooming mill. The boilers are of the water tube type of 375 hp. rating, built by the Babcock & Wilcox Co. The waste heat is by-passed around each furnace stack through a flue 4 ft. 6 in. wide and 5 ft. 6 in. high. The flues pass under the furnaces to the gas producer house where the boilers are located. Each flue is provided with a hand operated damper for shutting off the direct flow of gases to the furnace stack. The furnace stacks are 5 ft. in diameter and 160 ft. high. The boilers are operated under mechanical draft provided by a turbine driven fan and an overhead connection delivers the spent gases into the furnace stack.

There are two 75-ton Morgan ladle cranes with 15-ton auxiliaries for charging the furnaces. The cranes have a span of 79 ft. 6 in., and ride on single Lorain T rails of 175 lb. section. A 7½-ton monorail Pawling & Harnischfeger trolley is provided in the open hearth department for expediting repair work, as on the traveling cranes. For charging scrap, ore and other material there are two 4-ton low type Morgan charging ma-



Molten Pig Iron Is Conveyed to the Steel Plant Over a Lift Bridge Spanning the Cuyahoga River



The 18-In. Mill from the Delivery Side Showing Runout, Flying Shear and Shear Delivery Table Having a Hinged Section for Delivering the Product Either in Sheet Bars to the Sheet Bar Piling Rolls or in Billets to the Hot Bed.

chines. Charging boxes of pressed steel with cast steel ends, 6 ft. 9 in. long, 2 ft. 3 in. wide and 8 in. deep inside measure, are used.

Ore and limestone, dumped from a trestle track into six 2-carload-capacity steel bins, are discharged from these bins through gated bottoms into the charging boxes. These, already on cars, are hauled to the charging floor by a yard locomotive. The scrap yard is served by two 10-ton, 75-ft.-span Morgan cranes equipped with E. C. & M. magnets.

The pouring side of the open hearth plant is served by three 150-ton Morgan ladle cranes with a 59-ft. span and having 25-ton auxiliaries. There are three pouring platforms each 205 ft. in length and accommodating two heats. The metal from the smaller furnaces is poured into 90-ton ladles and that from the larger into 105-ton ladles of the Treadwell manufacture. The ingots are cast in 20 x 22 in., 22 x 22 in., and 22 x 28 in. sizes and are poured on three mold buggies. The ingot mold yard at the side of the pouring bay is served by a 10-ton crane.

Pollock pots of about 200 cu. ft. capacity take the slag. At the dump, scrap steel is recovered by means of a magnet loading crane. The skull breaker crane has a 110-ft. per minute hoist. It has a 75-ft. span and its runway is 60 ft. above the yard level. A lower crane has a grab bucket for handling the scrap and slag.

Three of the open hearth furnaces are fired with producer gas and nine with coke oven gas and tar. Four batteries of producers were installed for the eight original furnaces, with five producers in each battery. Coal is unloaded in the producer building from the yard level into hoppers under the track, and a conveyor carries it to the crusher which distributes it into buckets which operate automatically. As the bucket is loaded it settles down on a lever which trips a switch to the motor and this automatically closes the gate on the discharge end of the crusher. The motor raises the bucket and dumps it into a 600-ton hopper above the producer building, one empty bucket being carried down while the filled bucket is being elevated. From the main overhead hopper a larry car distributes the coal to hoppers over each producer.

Adjoining the stock yard is a calcining plant. This includes dolomite bins and a crane which serves two 10-ton cupolas for calcining the dolomite, an 8-ft. dry and an 8-ft. wet grinding pan, and a jaw crusher. The dolomite, after being calcined, goes to the dry crusher which has a grate bottom and is then carried by a bucket conveyor to a bin overhead. From this bin it is carried by a larry bucket to the open hearth plant.

The soaking pits are located in a steel frame building, 350 ft. long and 73 ft. 6 in. wide. Ingots are here stripped on a 150-ton Morgan screw stripper. The 24 soaking pits are arranged in six rows, and each pit accommodates six 20 x 22 in. ingots. Though ordinarily using coke oven gas, they may be changed over to producer gas in a few minutes. The covers are hydraulically operated. A Dyblie type of reversing valve is used on the regenerating system, one for each of the six rows of furnaces. These valves are water cooled and hydraulically operated. Two 10-ton vertical ram soaking pit cranes, with a 5-ton auxiliary for handling covers, serve also for general repair work and a 7½-ton monorail trolley runs over the stripper and soaking pit cranes.

The mill building which houses the blooming mill



The 21-In. Mill from the Platform Back of the Electric Shear Showing Also the Skew and Transfer, and at the Left the Approach Table to the Electric Shear. At the extreme left is the merry-go-round, and just outside the building on this side the bloom and slab yard

and two continuous mills is 697 ft. long and 80 ft. wide, and is served by a 50-ton crane with a 10-ton auxiliary having approximately a 30-ft. lift, and a 25-ton crane with a 5-ton auxiliary, both cranes serving the three mills.

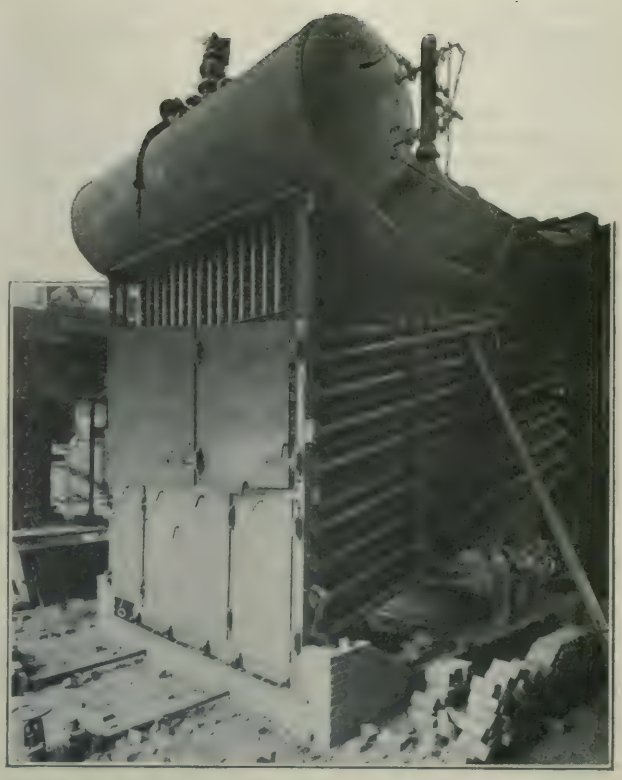
In usual practice a 20 x 22-in. ingot is reduced in the blooming mill to 4 x 4-in. billets up to 14 x 14-in. blooms, or slabs 12 x 2 in. up to 26 x 8 in. The standard 20 x 22-in. ingot is reduced to a 4 x 4-in. billet in twenty-three passes. Large slabs are rolled from 22 x 28-in. ingots and large round bars for shells from 23 x 23-in. ingots.

After cropping, the pieces are delivered by the shear run-out table to a skew and a rail type of transfer table which delivers them to an approach table to an electric shear. On this they are sheared into commercial billets, slabs and blooms of various lengths. From the shear they are conveyed on drop and run-out tables 50 ft. long driven by a 45 hp. motor. An electrically controlled kickoff pushes them off upon cars which are hooked together in a continuous train on an oval track designated as the "merry-go-round." On this track they are hauled outside the building to the bloom and slab yard. There are 21 of these cars 10 ft. long, and they are electrically propelled by a 100-hp. motor, being moved ahead one car length as a car is loaded. The cars are propelled by a dog and their movement is automatically controlled. All that is required of an operator is to start the motor, which moves the cars the required distance and spots them, the dog then returning to its original position where it stops. The bloom and slab yard is served by a 25-ton and a 15-ton crane for loading standard railroad cars.

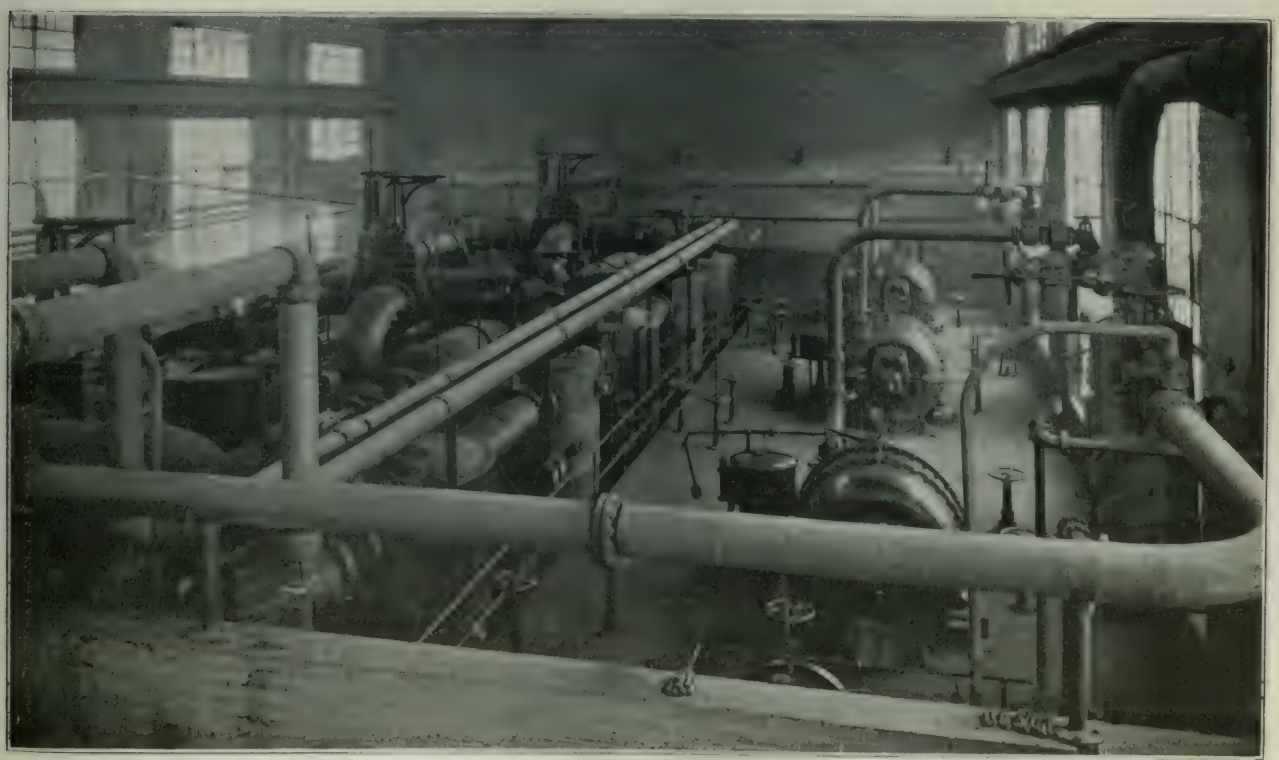
The blooming mill is a standard 40-in. reversing mill built by the United Engineering & Foundry Co. The width of the top roll is 30-in. and the length of the roll between housings is 86 in. The top roll is balanced by constant pressure furnished by an independent accumulator. The screw-down gears are operated by a 100-hp. motor. The mill housings and pinion housing are steel castings, the former weighing 55 tons each. The leading spindle from the engine to the pinions is a steel casting 21 in. in diameter and 7 ft. long. The spur pinions have smooth machine cut teeth that run in oil. All mill table gears are steel castings with machine cut teeth and run in oil.

The blooming mill approach table is 70 ft. long and has 33 rollers 16 in. in diameter and is driven by a 50 hp. motor. The ingot buggy that delivers the ingot to the table is driven by a 43-hp. mine type motor. The front and rear mill tables are each 40 ft. long and contain nineteen rollers on each side. These are 18 in. in diameter except the two feed rollers which are ¾ in. and ¼ in. larger. The feed rollers and the two rollers adjoining these on each side are solid forgings. The remainder of the rollers are cast steel. The front and rear mill tables are each driven by two 100-hp. motors connected permanently in series. The manipulator is of the Kennedy type.

The shear approach table is 70 ft. long, contains 26 rollers 16 in. in diameter and is driven by a 50 hp.



One of the 375-Hp. Waste-Heat Boilers Before It Was Bricked Up. These boilers are located between the gas producers and operate on forced draft. Waste gases are by-passed around the furnace stacks through flues provided with hand operated dampers



The By-Product Plant Showing at the Right the Turbo Exhausters That Are Used Instead of Blowers for Drawing the Gas from the Ovens and Forcing It Through the Apparatus. The tar extractors, reheaters and saturators are shown at the left

motor. The ingot chariot, blooming mill tables and the hydraulic and electric shears were built by the United Engineering & Foundry Co.

The run-out table from the hydraulic shear is 80 ft. long, driven by a 40-hp. motor. The transfer table is 30 ft. wide and 60 ft. long, with power supplied from a 40-hp. motor. The drop and run-out table back of the electric shear is 50 ft. long, each part of the table being driven by a 40-hp. motor. The kickoff is also operated by a 40-hp. motor. The electrically operated shear is 8 x 36 in. in capacity and is driven by a 150-hp. wound rotor induction motor. This shear is equipped with an electric trip and an electrically operated gage and stop, the gage and stop being operated by a 5½-hp. motor.

The hot saw is so located that the table which feeds the electric shear also feeds this saw. This is accomplished by driving the table in the opposite direction. The hot saw, which is used for sawing alloy steel, is 54 in. in diameter and is belted to a 250-hp. cage wound induction motor. Feed is obtained by hydraulic pressure. The saw table is driven by a 60-hp. motor.

The blooming mill is driven by a 46 x 76 x 60-in. Mesta twin-tandem compound single lever control reversing engine, with a rated capacity of 35,000 hp. It has a barometric condenser with an independent steam-driven air pump. The engine is a duplicate of one installed in the plant of the Youngstown Sheet & Tube Co. It is operated on a steam pressure of 200 lb., the greater part of the steam being supplied by the waste heat boilers connected with the open-hearth furnaces.

The blooming mill boiler plant consists of six 825-hp. Stirling boilers, three of which are fired with coke oven gas, two with coal and one with coke breeze, the last three being spare boilers. The coke breeze boiler is equipped with a special Coxe stoker and the remainder with Green chain grate stokers, the gas fired boilers being arranged for substituting coal for fuel. The blooming mill engine room and the electric sub-station which occupies the same building are served by a 60-ton crane with a 10-ton auxiliary.

Continuous Sheet Bar and Billet Mills

Blooms that are to be rerolled in the 18-in. and 21-in. continuous sheet bar and billet mill, instead of being transferred to the electric shear referred to, after leaving the hydraulic shear run-out table go to the approach table to the 21-in. mill. This table is 60 ft. in length and is driven by a 50-hp. motor. The 21-in. mill consists of four stands of rolls and this mill as well as the 18-in. mill are standard Morgan 2-high mills.



The Main Generators in the Power House Are Equipped with Air Washers. Two of these are 25,000 cu. ft. per min. units and the other has capacity for 15,000 cu. ft. of air per minute

The 21-in. mill relieves the blooming mill of rolling small sections when crowded to capacity and thus permits an increase in output. For example, it would require 23 passes to roll a 4 x 4-in. billet in the blooming mill, but the number of passes is reduced to 15 and the steel is delivered in the form of 6 x 7-in. blooms to the 21 in. mill, which then produces the 4 x 4-in billet.

The 21-in. mill delivers to a skew connecting table 145 ft. long, driven by a 50-hp. motor. From this table, if no further reduction is necessary, the product is transferred across a standard rail type of cooling bed 135 ft. long and 30 ft. wide, driven by a 37½-hp. motor, to a shear table 140 ft. long driven by a 45-hp. motor, this table returning the product to the electrically driven shear and finally to the bloom and slab yard.

The 18-in. continuous mill is an 8 stand mill consisting of six stands of the standard type of Morgan



Billets Are Delivered to a Double Hot Bed in the Sheet Bar and Billet Yard, Which Is Served by a 15-Ton Crane with a 120-Ft. Span

mills, and two 16-in. vertical edging rolls. One of these rolls precedes the 18-in. stand and the other is between the second and third stand of the 18-in. mill. Directly in front of the 18-in. mill is a mechanically operated preliminary trip shear which is provided for emergency purposes to prevent trouble in case of bad ends which can be conveniently clipped off before the piece enters the rolls. The 18-in. mill is used for rolling sheet bars and billets. Sheet bars are rolled to any foot weight and in widths of 8, 10 and 12 in. The mill is provided with duplicate sets of housings, one set for billets and the other set for sheet bars. The housings are lifted in and out of the mill by means of the overhead crane. The 16-in. vertical edging rolls are used to control the width on sheet bars, the pieces not being passed through these rolls in making billets. Billets produced on the 18-in. mill range in sizes from 1½ x 1½ to 3 x 3 in. inclusive. Sheet bars are rolled down to ¼ in. in thickness. When producing the thin sizes the pieces are passed through the six stands of rolls, but fewer stands are used in making thicker sizes.

Sheet bars and billets rolled on the 18-in. mill are sheared, usually in 30 ft. lengths, on a Morgan flying shear having an approach and delivery table 30 ft. long. This table is driven through a shaft and gears from the mill drive. Change gears are provided for regulating the speed of the delivery table to correspond with the speed of the mill stand from which the sections are being delivered. The delivery table from the flying shear is hinged so that when rolling sheet bars the back end of this table is raised to a higher elevation to deliver the product into Morgan sheet bar piling rolls, operated by a 30 hp. motor, which deliver it into a piling rack under the crane in the sheet bar and billet yard.

When billets are being rolled, the piling rolls are lifted up and moved out of the way by means of the crane, and the hinged section of the flying shear delivery table is dropped to the elevation of a skew piling table and the billets pass to a standard Morgan double hot bed, 90 ft. long and 60 ft. wide, in the sheet bar and billet yard. The skew piling table is 65 ft. long and is driven by a 75-hp. motor with special windings. The hot bed has a disappearing stop between its two sections, driven by a 5½ hp. motor, straight edges and transfer jacks. The straight edges and two dogs that carry the product off the hot bed are each driven by two 50 hp. motors. The steel drops from the hot bed into a receiving rack on a scale.

The sheet bar and billet yard equipment includes two 54-in. Ryerson cold saws each driven by a 45-hp. three-phase induction motor, the saws being located on an armature shaft extension. The saw feed is driven by an induction motor. The saws are located near the end of the yard and are served by the yard crane. This yard is also provided with a Mesta scrap shear of the alligator type having a capacity for cutting 6 x 6-in. cold steel and driven by a 75-hp. induction motor. The sheet bar and billet yard are served by a 15-ton single-trolley double-hoist Morgan crane of 120 ft. span.

The 21 in. mill rolls are 23 to 22½ in. in diameter by 48 in. between bearings and have necks 14 in. in diameter by 17½ in. long. The housings are steel castings. The 18 in. mill rolls for billets are 18.45 in. in diameter and for sheet bars 18.50 to 17.92 in. in diameter. The billet rolls are 27 in. long and the sheet bar rolls 20 in. long. The necks are 12 in. in diameter by 15 in. long.

The two continuous mills are driven by a 5750-hp., wound rotor General Electric motor taking 6600 volt three-phase twenty-five cycle current and having a full load speed of 92½ r.p.m. The motor is connected to the line shafts of the mills by two breakable spindles, one on each side of the motor. The master controller is located remote from the motor on a pulpit convenient for vision of the mills. The line shafts extend parallel to the mill stands, the 21 in. mill shaft running south from the motor a distance of approximately 120 ft. to the last-stand bevel gear reduction, and continuing on for the reduction of the other three stands. On the 18 in. mill end the shaft runs north approximately 20 ft. to the first stand reduction for that mill and continues on for the other five stand reductions. The main driving shafts are steel forgings, being 15 in. in diameter for the 21 in. mill and 15¼ in. for the 18 in. mill.



The Main Power Plant Showing the Low-Pressure Turbine Equipped with a Multi-Port Flow Valve as the First of the Three Turbine Units. In the foreground are the exciters and in the rear are blowing engines

The Main Power Plant

The main power plant, which is located near the blast furnaces, supplies power for practically the entire plant except the blooming mill. It serves the blast furnaces, open hearth plant, continuous mills, pumping station and coke oven plant. It also furnishes the air supply and the filtered water for the entire plant for steam purposes, including that for the waste heat boilers, and service water for the Nos. 3 and 4 blast furnaces, the water for the two new blast furnaces being supplied from the old blast furnace power plant. It occupies a structural steel frame building 76 ft. wide, 408 ft long and 127 ft. high. The walls are of paving brick and the roof is of reinforced concrete.

The water supply reaches the plant from the river through a reinforced concrete tunnel 123 ft. long and 6 ft. square. The discharge is through another tunnel of the same dimensions as the intake tunnel. Water is pumped into a stand pipe 125 ft. high and 21 ft. in diameter. The discharge from the pumps to the stand pipe is through a pipe running up through the inside to the top of the stand pipe, thus maintaining a constant head on the pumps. The general service pumps comprise two De Laval turbine driven centrifugal pumps,

each having a capacity of 5000 gal. per minute against a 142 ft. head, and two motor driven centrifugal pumps of the same capacity. Two revolving screens at the intake approximately 6 ft. wide on 27-ft. centers, with ⅜ in. mesh screens intercept suspended matter in the water. These screens were supplied by the Chain Belt Co. and were described in THE IRON AGE, May 11, 1916.

The filtration plant consists of a We-Fu-Go intermittent system with a capacity of 74 gal. per hour. There are four wooden settling tanks 19 ft. 6 in. high and 30 ft. inside diameter, on reinforced concrete foundations; two rectangular filtering beds approximately 22 ft. long and 7 ft. wide and one concrete clear well of the same dimensions.

The boiler plant consists of fifteen 823-hp. Stirling water-tube boilers. The boilers are placed 22 ft. above the yard level, so that cars may run under the stokers. Babcock & Wilcox superheaters rated for 125 and 150 deg. Fahr. above saturation at 250 lb. pressure are provided. The boilers are also equipped with Diamond soot blowers, seven revolving units for each boiler. General Electric indicating steam flow meters are also installed.

Ten of the boilers are equipped for burning waste gas from the blast furnaces and five have Green automatic chain grate stokers. The stoker fired boilers are equipped with Richardson automatic scales under the coal chutes in front of the boilers. Each is also equipped with an Ellison draft gage. The steel breeching, 360 ft. long and 10 ft. square, connects to two brick lined and grouted steel stacks, 275 ft. high and 15 ft. in diameter. A main steam line 8 in. in diameter leads down from each boiler to a main steam header which increases from 8 to 14 in. in diameter.

Coal for the power house is dumped from cars into a 50-ton hopper located outside of the station. An elevator carries the fuel into a crusher of 50 tons per hour capacity. Then it is elevated and distributed into coal hoppers, two hoppers to each boiler, an endless canvas belt being employed. The coal handling plant was installed by the Stephens-Adamson Co. The ashes are dumped from hoppers directly into railroad cars on a track which runs under the stokers.

The boiler plant has two 10,000-hp. Cochrane metering feed water heaters and two feed pumps of 1000 gal. per minute of the DeLaval turbine driven centrifugal type and two Epping Carpenter duplex pumps, each having a capacity of 500 gal. per minute.

The blowing engines for the blast furnaces consist of three horizontal cross compound non-condensing Mesta engines each of about 3000 hp. capacity rated to deliver 60,000 cu. ft. of air per minute at 100 r.p.m. These engines are normally run at 75 r.p.m. with a delivery of 45,000 cu. ft. of air per minute. Two engines supply the air for two blast furnaces, the third engine being a spare installation. The other two blast furnaces are blown from engines located in the old power house. The blowing engines and steam driven auxiliaries exhaust into one 24 in. common exhaust header. This is protected against exterior pressure by a Cochrane multi-port back pressure valve. Richardson-Phenix oil filters are used for the lubricating oil.

The electric power units comprise three 2500 kw. mixed pressure Curtis steam turbines driving 2500-kw. alternating current 25-cycle 6600-volt generators. Each unit is provided with a Westinghouse surface condenser. The circulating pumps are turbine driven, and the pump capacity is 16,000 gal. per minute. The condensers also have turbine driven condensate and air pumps There is one 1000 kw. Westinghouse synchronous motor 250 volt direct current motor generator set and a 1500 kw. motor generator set, the latter largely for cranes.

Each main generator is equipped with an air washer made by the Spray Engineering Co., Boston. The washers are, of course, to keep dust out of the ventilating air and incidentally give a cool supply. One of the washers has a capacity of 15,000 cu. ft. and the other two each have a capacity of 25,000 cu. ft. per minute. They are located on a mezzanine floor in the power plant.

An underground conduit system is used for carrying the power cables across the river, a tunnel approximately 60 ft. below the yard level and 500 ft. in length and 7 ft. in diameter, of brick construction was built. Power is transmitted to the steel plant by a trunk system of cables to a sub-station located at the steel plant, distribution for the individual departments being made from this main sub-station to three other sub-stations. The filtered water supply is carried under the river from the main power house through a line in the tunnel that carries the transmission lines.

The Coke Oven Plant

The coke oven plant consists of 204 Koppers 12½-ton ovens arranged in a straight line in four batteries of 51 ovens each. The surplus gas supplies the open hearth plant, soaking pits and blooming mill boiler house. Electricity for operating the coke plant comes from the main power house and steam from the blooming mill boiler house. Steam is carried in an 8-in. and 12-in. overhead supply line for supplying three turbo exhausters, a steam driven booster, an engine that drives the pumps, and a branch line carries steam to the benzol plant. In the by-product plant tar and sulphate of ammonia are recovered and in the benzol plant toluol, xyol, solvent naphtha and naphthalene.

On an 18 hour coking time the plant will carbonize 3500 tons of coal and produce 2400 tons of coke. The coal storage space is 200 ft. wide and 700 ft. long and is served by a Brownhoist coal handling bridge. The coal handling plant has a capacity for handling 500 tons of coal per hour. It includes three duplex track hoppers equipped with duplex shaking feeders, two Bradford breakers, four Pennsylvania hammer mills, four mixing bins and two coal larry bins of 1800 tons capacity each.

Atlas make of quenching cars, propelled by a General Electric locomotive are used. The coke is quenched with water supplied from the primary coolers of the recovery plant. This water is pumped to a 20,000 gal. tank over each of the two quenching stations.

The by-product plant occupies a building 75 x 396 ft. in size and consists of three complete units, two of which are of sufficient capacity to take care of all the gas from the ovens. General Electric turbo-exhausters are employed for drawing the gas from the ovens and forcing it through the apparatus. The surplus gas is moved at 5 lb. pressure at the booster outlet. Tar from the by-product plant is delivered to the open hearth furnaces in a 4 in. line, to which is connected an Auldrich triplex single acting plunger pump.

Metal Trades to Hold a Win-the-War Meeting

A "Win-the-War" meeting is to be held by the Boston branch of the National Metal Trades Association at the City Club, Boston, Friday, Nov. 16. The program provides for an afternoon conference at 3 p.m. and a dinner at 6 p.m. with the following program:

For the afternoon: Walter Drew, counsel, National Erectors Association, "The Experience of British Industries in the War and Its Lesson to Us." Clarence E. Whitney, Whitney Mfg. Co., Hartford, Conn., "The Hartford Plan for Co-operative Employment Control." David S. Earll, employment manager, New Process Gear Corporation, Syracuse, N. Y., "Our Experience with the Employment of Women."

For the dinner: Walter Gordon Merritt, counsel, American Anti-Boycott Association; Col. Tracy C. Dickson, commanding officer, Watertown Arsenal, Watertown, Mass., and James J. Storrow, fuel administrator for New England. A representative of the National Council of Defense is also expected to speak.

The Durbin Automatic Train Pipe Conductor Co. has acquired a site in East St. Louis, Ill., where it will equip a plant at a cost of about $150,000, the first of a series of units to be built in different parts of the United States for the manufacture of flexible pipe joints and an automatic train pipe conductor. The site occupies three and one-half acres and will ultimately be covered by the plant of the company, which has offices in the Pontiac Building in St. Louis. It will include malleable castings in its general output.

Motor-Driven Vertical Pickling Machine

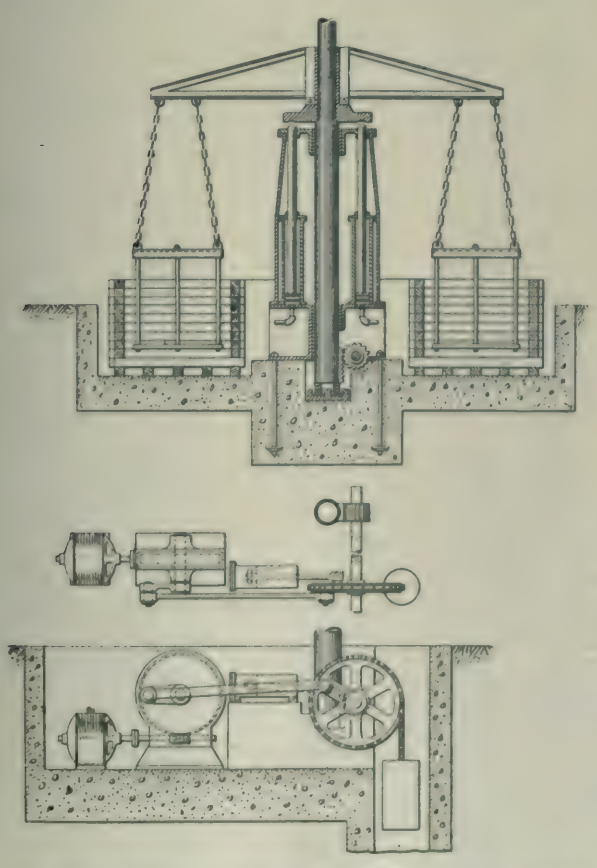
As a substitute for the steam-driven machines used for pickling white and black sheets in tin and in some sheet mills, A. E. Maskrey of the Carnahan Tin Plate & Sheet Co., Canton, Ohio, has patented a motor-driven balanced vertical machine. The pickling movement is the same as in the steam-driven machines generally employed, with the added advantage that it is possible to run the motor-driven machine faster, if that should be found desirable. In addition to the motor operation for the pickling movement a compressed air arrangement is employed for use when changing from one tank to the other.

The machine consists of a vertical ram with four arms, from which are suspended the crates carrying the material to be pickled. An A-frame is fastened to the sub-base and together with it supports and guides the ram of the machine. The operating mechanism consists of a controller for the motor and a two-way valve for regulating the supply of air used in changing from tank to tank. These are situated at a convenient location near the machine, and the motor and the moving parts are placed at a sufficient distance from the ram to eliminate danger of trouble from water, while at the same time enabling them to be inspected and repaired easily.

The motor is connected to a worm reduction gearbox which enables the speed of the pickling machine to be varied within the ordinary limits. A crank is attached to the wormwheel shaft and transmits power through a connecting rod to the oscillating balance wheel, the power being transmitted from there by a shaft to a pinion meshing with a rack on the bottom of the ram.

When changing from one tank to another, compressed air is admitted to two vertical cylinders inclosed in the A-frame. This raises the arms and the suspended crates, etc., above the level of the tanks, annular ball bearings on bottom of the sleeve which slides on the upper part of the ram, making the turning a comparatively easy matter. When the work is being shifted from one tank to another, the ram remains stationary. If no other source of air is available, a single-air compressor is attached to the oscillating balance wheel by a connecting rod and operates on the downward stroke of the ram.

A weight suspended from the balance wheel takes care of the weight of the ram, the arms, the crates and the material to be pickled, which, it is pointed out, eliminates the operating cost of the unbalanced steam-driven machine. The thrust of the pinion on the bottom of the ram is taken by a long split bearing and the guide bearing on the top of the A-frame is of the same type. Both of these bearings can be readily renewed when they become worn.



An Electric Motor Transmitting Power Through Several Sets of Gears and a Crank Arrangement Raises and Lowers Material in the Pickling Tanks while Compressed Air Is Employed for Lifting when the Work Is Being Changed from One Tank to Another

Midvale Steel Companies Merged with Dinkey as President

Alva C. Dinkey, who has been president of the Midvale Steel Co., has been elected president of the Midvale Steel & Ordnance Co., succeeding William E. Corey, who has been made chairman of the executive board. It is announced that the Midvale Steel Co., Worth Brothers Co., at Coatesville, and the Wilmington Steel Co., Wilmington, subsidiaries of the Midvale Steel & Ordnance Co., have been merged and that hereafter the Midvale Steel & Ordnance Co. will be the operating concern. The other companies will lose their identity. The Midvale Steel Co. will be known as the Nicetown works, the Worth Brothers Co. as the Coatesville works and the Wilmington Steel Co. as the Wilmington works. The Cambria Steel Co., Johnstown, Pa., the largest unit in the Midvale group, will maintain its name and organization because a part of the stock is still in the hands of the public and also because an old lease of the property from the Cambria Iron Co. provides that the name Cambria is to be retained for 999 years. The new officers of the Midvale Steel & Ordnance Co. are as follows: W. E. Corey, chairman of the board; A. C. Dinkey, president; William B. Dickson, vice-president; Edwin E. Slick, vice-president in charge of operations; John C. Neale, vice-president in charge of sales; H. S. Black, assistant to president; D. B. Gehl, treasurer; Robert Brewster, secretary; Marshall Lapham, controller; James M. Milliken, auditor; Joseph Hill and L. K. Krause, assistant treasurers; T. B. Bustis and W. A. Martin, assistant secretaries; S. C. Yeates, purchasing and H. C. Crawford, traffic manager. Ambrose Monell, having accepted a position in the United States Army, resigned as a director of the company.

Brass Companies Consolidate

The Connecticut Brass Corporation, West Chesire, Conn., and the Pilling Brass Co., Waterbury, Conn., have been merged into one company, to be known as the Connecticut Brass & Mfg. Corporation, with capital stock of $600,000 8 per cent first preferred stock, $400,000 8 per cent second preferred and $2,000,000 common stock of $10 par value. The two companies have a combined smelting capacity of 2,500,000 lb. of finished brass annually.

The Dominion Iron & Steel Co., Sydney, N. S., posted notices at its plant on Nov. 1, reading as follows: "Effective Nov. 1, 1917, a general increase averaging 10 per cent will be granted to employees of the steel plant. The rate for common labor will be 24 cents per hour." This is the fifth increase granted by the company since the beginning of 1916, given at approximately six-month intervals, and it brings the total increases since January, 1916, up to 53 per cent. Since January, 1916, the increase in the rate of the ordinary labor has totaled 71 per cent.

The Syracuse Smelting Works, Brooklyn, N. Y., wishes it known that one Anthony George, recently convicted and sentenced to a term of three years in the Federal prison at Atlanta, is not the Anthony George of the Syracuse company who enlisted in the cavalry immediately upon the entrance of the United States into the war and is now in camp at Fort Riley, Kan.

Large Increase in Machinery Exports

All Records Broken in September Despite Embargo Policy of the Government—Value of Iron and Steel Products Much Higher

WASHINGTON, Nov. 12.—The exports of manufactures of iron and steel in September made an astonishing record in view of recent tendencies attributable to the embargo maintained by the War Trade Board. While the shipments of tonnage commodities were below the average of the past six months, the exports of machinery broke all records and the exports of iron and steel by values reached a total which has been exceeded but three times in the history of the industry. While higher prices are to some extent responsible for the surprising record made in September, the detailed figures showing quantities of highly manufactured articles make it clear that actual increases in exportations have helped materially to swell the total.

Total exports of iron and steel in September gained 20 per cent over August, the figures having been exceeded only in January, March and June of the present year, the last-named month holding the record. Shipments of tonnage iron and steel declined 24 per cent from the level of September, 1916, and while they exceeded the figures for July of this year by a large margin, they showed a loss compared with August when a notable upward tendency developed. Exports of machinery surpassed the high water mark reached last June by a fraction of 1 per cent and gained 37 per cent over September of 1916. Shipments of machine tools, which have been declining irregularly during the past year, closely approximated the substantial total of September, 1916.

The record for the nine months ended Sept. 30 shows gains all along the line, except in machine tools. Total imports of iron and steel by values increased 50 per cent over the same period of 1916, which was 140 per cent above the level of 1915. In tonnage commodities the nine months showed a gain of 4 per cent over 1916, machinery rose 21 per cent and machine tools declined 3.3 per cent.

The value of all shipments of iron and steel products in September was $107,665,824 as compared with $90,895,592 for the same month of 1916 and $119,141,836 for June of this year, which is still the record total. For the nine months of 1917 the total was $911,438,464 as compared with $619,853,667 for the corresponding period of 1916, and $251,220,008 in 1915. Exports of machinery in September were valued at $27,947,134 as against $20,508,455 for the same month a year ago. The largest previous monthly exports of machinery were made in June of this year, when the total was $27,946,036. For the nine months, the total was $203,727,900 as compared with $168,570,287 for the same period of 1916. Shipments of metal-working machinery aggregated $7,891,349 as against $7,901,328 in the same month of 1916. For the seven months of 1917 the exports totaled $61,055,803 as against $63,218,202 for the corresponding period of 1916. Details of the exports of machinery in September, 1916 and

Imports of Iron and Steel

	September		Nine Months	
	1916 Gross Tons	1917 Gross Tons	1916 Gross Tons	1917 Gross Tons
Ferromanganese	9,787	3,402	58,474	38,875
Ferrosilicon	550	920	5,071	7,807
All other pig iron	5,394	3,926	34,251	16,675
Scrap	6,340	5,437	47,772	167,226
Bar iron	953	192	6,745	2,097
Structural iron and steel	13	1,311	1,081	4,056
Steel billets without alloys	163	2,620	8,298	28,525
All other steel billets	4,055	1,138	11,474	6,046
Steel rails	862	905	24,438	6,400
Sheets and plates	94	142	1,311	1,334
Tin and terne plate	51	.....	826	124
Tin scrap	.....	a608	.....	a6,102
Wire rods	295	203	3,284	516
Totals	28,557	20,804	203,025	285,783

a Not separately enumerated prior to July 1, 1917.

Exports of Machinery

	September		Nine Months	
	1916	1917	1916	1917
Adding machines	$83,617	$197,264	$1,040,486	$1,688,667
Air-compressing machinery	119,173	139,968	632,733	788,425
Brewers' machinery	404	1,803	11,729	96,899
Cash registers	83,154	49,497	1,254,263	668,322
Parts of	5,176	3,353	108,886	60,753
Concrete mixers	.....	a24,062	.....	a47,906
Cotton gins	12,438	4,726	73,704	69,155
Cream separators	24,087	31,883	370,449	467,976
Elevators and elevator machinery	245,650	270,588	1,374,419	1,671,392
Electric locomotives	18,831	33,081	395,873	353,372
Gas engines, stationary	25,765	84,811	274,494	663,965
Gasoline engines	909,458	2,598,347	12,165,657	17,881,778
Kerosene engines	.....	a256,541	.....	a662,946
Steam engines	759,379	4,873,008	8,278,243	22,924,606
All other engines	471,654	101,809	3,926,284	3,068,784
Parts of	1,548,693	.....	7,859,717	b9,287,245
Boilers	.....	a362,334	.....	a868,978
Boiler tubes	.....	a566,415	.....	a1,605,792
All other parts of engines	.....	a1,502,040	.....	a4,136,999
Excavating machinery	.....	a94,726	.....	a179,778
Milling machinery, flour and grist	109,434	124,317	1,807,979	645,671
Laundry machinery, power	29,118	25,784	241,532	319,835
All other	51,998	26,293	198,459	201,561
Lawn mowers	11,463	21,816	182,182	166,563
Metal-working machinery (including metal-working tools)	7,901,328	.....	63,218,202	b44,604,259
Lathes	.....	a2,371,629	.....	a5,552,631
Other machine tools	.....	a1,006,481	.....	a2,561,601
Sharpening and grinding machines	.....	a765,492	.....	a1,614,204
All other metal-working machinery	.....	a3,022,107	.....	a6,723,118
Meters, gas and water	18,768	725,640	289,839	1,048,991
Mining machinery, oil well	102,700	124,282	1,542,320	1,015,341
All other	680,240	876,196	4,949,977	8,182,779
Paper mill machinery	81,028	197,978	607,013	1,480,669
Printing presses	170,002	174,807	1,430,045	1,309,079
Pumps and pumping machinery	549,121	599,479	4,072,779	4,576,773
Refrigerating and ice-making machinery	60,676	59,662	544,615	835,144
Road-making machinery	.....	a39,486	.....	a91,655
Sewing machines	465,424	857,449	4,209,705	5,925,642
Shoe machinery	119,721	176,512	786,171	1,187,715
Sugar-mill machinery	1,173,993	659,132	4,202,165	5,195,582
Textile machinery	220,618	358,415	2,609,985	2,540,256
Typesetting machines	85,630	52,861	878,181	831,532
Typewriting machines	905,932	493,106	8,243,380	7,199,310
Windmills	46,779	115,219	808,577	830,750
Wood-working machinery, saw-mill	30,637	29,868	321,352	441,032
All other	68,450	101,280	677,183	813,174
All other machinery and parts of	3,317,911	3,746,597	28,981,718	30,739,295
Totals	$20,508,455	$27,947,134	$168,570,287	$203,727,900

a Not separately enumerated prior to July 1, 1917.
b Six months ending June 30, 1917.

Exports of Iron and Steel

	September		Nine Months	
	1916, Gross Tons	1917, Gross Tons	1916, Gross Tons	1917, Gross Tons
Pig iron	64,122	.....	302,504	b377,094
Ferromanganese	.....	a57	.....	a1,139
Ferrosilicon	.....	a1,116	.....	a4,329
All other pig iron	.....	a43,114	.....	a133,207
Scrap	36,519	1,459	158,352	136,243
Bar iron	6,948	3,099	59,193	39,561
Wire rods	10,793	15,893	118,377	115,574
Steel bars	64,169	47,577	588,753	470,778
Billets, ingots and blooms, n.e.s.	163,104	148,932	1,051,669	1,478,640
Bolts and nuts	2,565	2,317	21,916	205,152
Hoops and bands	4,556	5,079	34,146	41,695
Horseshoes	837	3,304	7,043	6,417
Cut nails	877	604	3,672	3,020
Wire nails	15,369	9,777	114,710	74,221
Wood screws	.....	a276	.....	a856
All other nails, including tacks	1,686	1,543	7,764	14,566
Cast-iron pipes and fittings	7,558	7,289	49,931	55,182
Wrought pipes and fittings	17,724	12,592	111,238	98,177
Radiators and cast-iron house heating boilers	226	407	1,858	4,424
Railroad spikes	1,579	2,605	20,140	15,413
Steel rails	86,676	34,387	391,449	372,979
Galvanized iron sheets and plates	7,652	7,064	62,775	65,034
All other iron sheets and plates	2,869	4,927	34,305	44,302
Steel plates	24,385	42,487	196,494	397,980
Steel sheets	9,677	11,264	77,787	104,892
Ship and tank plates, punched and shaped	.....	a3,916	.....	a6,960
Structural iron and steel	29,336	21,156	211,869	222,468
Tin and terne plates	18,769	11,596	179,126	128,056
Barb wire	42,404	28,989	341,919	138,904
All other wire	23,363	16,589	211,566	a146,647
Totals	643,763	489,415	4,358,189	4,525,871

a Not separately enumerated prior to July 1, 1917.
b Six months ending June 30, 1917.

1917, and for the two nine months' periods are given in the accompanying table.

Exports of iron and steel for which quantities are given aggregated 489,415 gross tons in September, 1917, as compared with 643,763 for September of 1916, when the high record in this class of shipments was scored. For the nine months ended September, 1917, these shipments aggregated 4,525,871 as against 4,358,189 for the same period of 1916. The accompanying table shows the exports for September and for the nine months ended September, 1917, as compared with 1916.

The imports of September show a decline as compared with those of 1916, decreases being noted in receipts of ferromanganese, and other pig iron, scrap and steel billets. W. L. C.

German Supply of Iron and Manganese Ores

The iron and manganese ore situation in Germany is outlined as follows in the London *Ironmonger* as gleaned from German papers: Interruptions of imports have produced a shortage of certain grades of ore, but it is claimed that there are sufficient supplies of the principal kinds. There is a shortage of high-grade manganese ores and the manganese supply office cannot meet all requirements. According to the report of the Siegen District Ironstone Association the output, owing to the shortage of labor, has not shown the hoped-for increase in recent months. Manganiferous ore from Hesse and Nassau is coming into greater use but it does not entirely fill up the breach. There is plenty of phosphoric minette ore from Lorraine, Luxemburg and the occupied districts. Stocks of Swedish ores are sufficient and there have been no interruptions worth mentioning in their importation. Pig-iron production has been maintained at a height corresponding to the ore supply. An export of 70,000 to 80,000 tons is possible in phosphoric kinds; quality pig iron, on the other hand, only suffices to meet the home demand and is scarce.

The Seneca Electric Furnace Corporation, Albany, N. Y., has filed notice of change in its company name to the Ludlum Electric Furnace Corporation.

Skilled Workmen Needed

The Army Air Service needs more skilled workmen behind the lines abroad. These men will be recruited continuously, beginning immediately, until March 31. A. J. Baldwin, president of the Associated Business Papers, Inc., New York, has appointed a special committee which is co-operating with the War Department in obtaining enlistments. The air fighters need the backing of skilled men to keep every airplane ready for instant and constant service, and six men are needed on land to keep one airplane in the air, to bring up supplies, ammunition, food, clothing, to construct and maintain airdromes and to make repairs. Picked men who are being enrolled from various classes of skilled workers will be given special training and there is a chance for them to become non-commissioned officers. Among the skilled workers badly needed are mechanicians, engine repair men, electricians, machinists, blacksmiths, metal workers, automobile engine testers, welders, molders, propeller testers and tool makers. All interested are requested to address Edgar Z. Steever, Major Signal Corps, War Department, Washington.

Youngstown Sheet & Tube Co.'s Safety Rule Book

A new edition of the book of rules and instructions has been recently issued by the Youngstown Sheet & Tube Co., Youngstown, Ohio. General rules applying to all of the departments are set forth, followed by others having particular bearing upon the different departments of the plant. Each of these sets of rules are subdivided where necessary to take care of the different sections in any one department of the works. Rules for emergency work and instructions for resuscitation are given, the latter being supplemented by a list of the places where different pieces of emergency apparatus are stored. Mention is made of the relief association that is maintained by the employees for their benefit.

Puddlers' Wages Advanced

Wages of puddlers employed in bar iron mills in the Central West that sign the Amalgamated scale will receive $13.80 per gross ton for boiling for November and December, an increase of 50c. per ton over the rate for September and October, which was $13.30. Finishers receive an advance of about 4 per cent. The rate of $13.80 per ton for puddling is much the highest ever paid in the history of the bar iron industry. This rate of $13.80 per gross ton for boiling will also be paid by A. M. Byers & Co., having large puddling mills at Girard, and also by the Youngstown Sheet & Tube Co., which has puddling furnaces at Youngstown, Ohio. However, neither of these concerns signed the Amalgamated scale, but always pay that rate or higher.

Opposed to Negro Labor

MILWAUKEE, WIS., Nov. 5.—As the result of the influx of negro labor from the southern states, which in recent weeks has assumed large proportions, the Milwaukee County Council of Defense, co-operating with employers, will make an organized effort to discourage further importation of such labor, for the reason that investigation shows that there is plenty of labor in Milwaukee, but a readjustment is required.

Francis S. Peabody of Chicago has been appointed by Secretary of the Interior Lane as assistant to the Director of the Bureau of Mines in enforcing the provisions of the act regulating the manufacture, sale, storage and use of explosives. Mr. Peabody is a prominent coal operator and is chairman of the committee on coal production of the Council of National Defense. The new law provides for a maximum fine of $5,000 and imprisonment for one year for the unauthorized possession of explosives.

Phases of the Acid Open-Hearth Process*

Proper Condition of Bath—Influence of Lime — Temperature, Dead Melting and Role of Deoxidizers—Ingots Large End Up

BY DR. F. ROGERS

PERSISTENT mystery and some ignorance continually enshroud steel-making, especially by the acid open-hearth and crucible processes. Many of the views and suggestions in this paper will have a direct or indirect bearing upon steel-making by all the six usual processes. Attention has been centered upon the acid open-hearth process, partly because for a number of years acid open-hearth steel has remained in this country a standard of reference for quality among structural steels, and because the metallurgy of this process offers a convenient starting point for the study of all the steel-melting processes.

In all the oxidizing processes it is essential at the end to deoxidize the metal by some means. The prime and inadmissible effect of neglect to do so is blowholes in the ingot. There is also considerable evidence which suggests, but as yet does not prove beyond doubt that, besides the oxygen in some form and hydrogen and nitrogen, further gas, including oxygen, remains in combination or solution in the steel to its detriment.

Two principal methods are in use which contribute to secure the desired end. The first is the bringing of the bath to proper condition toward the end of the melting process; this factor assumes exceptional importance in the acid open-hearth process. The second is the use of deoxidizers.

Proper Condition of the Bath

The term "condition" is often abused in its application to steel-melting, being used in a vague and mysterious manner, frequently to cloak ignorance. It is true that it is not yet possible to keep the working under the continuous control of instantaneous precise measurements, but there is every reason why this fundamentally important condition should be as fully understood as possible. What is meant by the condition of the bath is properly its temperature, the composition (particularly the carbon and oxygen contents) of the metal, and the composition (particularly the iron oxide content) of the slag.

There are many considerations involved in judging the condition during working. After the adjustment of the carbon content is well in hand, the deoxidation of the metal should occupy first place. The diminution of oxygen in the metal is indicated by the appearance of the sample and by the quieting down of the reaction, in conjunction with the carbon content of the metal, the composition of the original charge and slag so far as known and the temperature.

Dead melting means the minimizing of oxygen in the metal at this stage. The influence of temperature in dead melting is usually misunderstood. The reaction between iron oxide and carbon in the bath proceeds further in the direction of minimizing the total iron oxide present, as the temperature is raised. On the other hand, the rate of oxidation of the bath by the furnace atmosphere increases with the temperature. In practice, however, under ordinary conditions, the author has found that the balance is strongly in favor of the higher temperature. No satisfactory figure for the temperature can be given, since the means of measurement hitherto available are always open to an error of 20 to 30 deg. C., and this amount is sufficient to make the difference between good dead melting and bad.

Fig. 1, with its legend, illustrates this point. It has already been mentioned that it is important to minimize the small amount of oxygen which remains in the metal. The foregoing remarks, however, would apply equally well if we were merely contemplating the minimizing of oxygen in the slag, but in some of the following remarks this would not apply, and it may therefore be taken that the author considers oxygen as being present in the bath (and in the solid steel) in small amounts as dissolved iron oxide.

The bearing of these views, however, is less clear unless it be realized that he considers that when dead melting is achieved, there is an appropriate equilibrium involving the retention of an amount of iron oxide in solution, in the molten metal, which is quite a definite amount in relation to the other factors involved (temperature, carbon principally, in presence of iron, silica principally). The equilibrium here referred to is not a stationary condition, but the reaction still continues, in passing through this condition.

The Influence of Lime

The influence of lime (if present) in this equilibrium, should be mentioned for the sake of completeness. Its addition causes in effect the displacement of some iron oxide, although the entire slag remains an approximately homogeneous solution, which reacts with carbon in the metal, thus lessening the total iron oxide in the system. The effect is slightly increased because the distribution of iron oxide between slag and metal will upon well-understood physical and chemical grounds be proportioned to the total iron oxide present—that is, the addition of lime does not merely lessen the iron oxide in the slag, but also lessens the iron oxide in the metal correspondingly. The diagram represents this:

Effect of Adding Lime

$FeO - SiO_2$	Slag	$\begin{matrix} CaO \\ FeO \end{matrix} \Big\} - SiO_2$
$\frac{FeO}{C}$	Metal	$\frac{FeO}{C}$
Before adding lime		After adding lime.

It is evident from this explanation of the action of lime that when, as often happens, the nature of the charge and other conditions are such that the early addition of lime is not essential, it is sufficient to add lime at a late stage, in approaching the dead melted condition. The above-described reaction then occurs, and a satisfactory dead-melted condition is attained in from 20 to 60 min., according to various other circumstances.

Dead melting is a relative expression, and it is important to inquire what happens if this condition be over-stepped in any way. At this stage the reaction may be comparatively slight—for example, a drop of 0.01 per cent carbon in ¼ hr.—or rapid—a drop of three to five times as much—yet with satisfactory results. Reference to Fig. 1 will show what may happen next: We may in the extreme case have the rate of production of iron oxide by furnace atmospheric oxidation greater than the rate of its decomposition by carbon, and the carbon being low, the metal becomes increasingly charged with iron oxide. It is probable that the solubility of iron oxide in the metal increases slightly as the temperature rises and as the carbon decreases beyond some very low figure. It is further probable that the solubility of each of the gases decreases continuously with rise of temperature from the melting point, but drops suddenly in solidifying.

Reference to Fig. 2 will now show in a simple form one of the principal features extracted from Fig. 1, namely, the curve of excess oxygen present—the oxygen in the bath as a whole which is in excess of what can be removed by the reaction with carbon.

We can now see the several conflicting factors which enter into the proper deoxidation at this stage—the chances of underdoing it on the one hand, and leaving

*From a paper presented at the annual meeting of the Iron and Steel Institute, London, England, Sept. 20, 1917.

the steel considerably oxidized, though not markedly wild which is the commonest error, or, on the other hand, overdoing it and producing wild steel, which is not in all circumstances fully cured by the use of deoxidizers. Thus, for example, it is useless to make a rigid practice, as the author has known to have been done, of running the carbon down to 0.07-0.09 per cent in all casts, with practically no reference to condition in other respects, and then to imagine that this is dead melting because a lot of pigging-back was done. At 0.09 per cent carbon the bath is usually underdone, because a relatively high temperature is required to dead-melt at this carbon.

Incidentally, a relatively slight excess of temperature would, under these circumstances, lead to wildness; but with care in approaching 0.09 per cent carbon there is no difficulty in obtaining a good dead-melted condition at this carbon if necessary.

Another extreme instance is the attempt to catch the carbon at say 0.45 per cent carbon, including obtaining three or four successive samples in ½ to 1½ hr., all analyzing 0.45 per cent carbon. This can be done, and sometimes is approximately, but it is not to be imagined that this is properly dead-melting. The bath has in such a case been held quiescent by its coldness, and the diagrams show that, under these circumstances, its oxygen content is higher than it should be before going on with the additions. Incidentally, a relatively great excess of temperature, and even a first addition of lime, need not in this instance do worse than cause the fall of the carbon to 0.25 to 0.30 per cent in 1 to 1½ hr. and produce a good dead-melted bath.

The diagrams here presented must be only of a qualitative nature. They have, however, been derived from a great variety of experiments arranged to test the various points at issue. It will be seen, for example, that a consequence of Fig. 1, as of some of the above-expressed conclusions, would be, that if the temperature of the bath could be promptly raised while keeping the other conditions (especially oxidation and carbon addition) as stationary as possible, an underdone cast could be dead-melted or a dead-melted cast made wild. This is not, however, very well illustrated in the acid furnace, owing to the relative slowness of the heating, but the action is evidently exactly what should be made fullest possible use of, as mentioned in the foregoing instances.

On the other hand, it is possible to study this action in the reverse way—that is, by prompt cooling of the bath. The means by which the author achieved this was the addition of fairly massive scrap steel of similar class to the bath. If this be done when an ideal dead-melted condition has been obtained, then as soon as the scrap addition is melted and mixed in, the bath shows the usual signs of coldness.

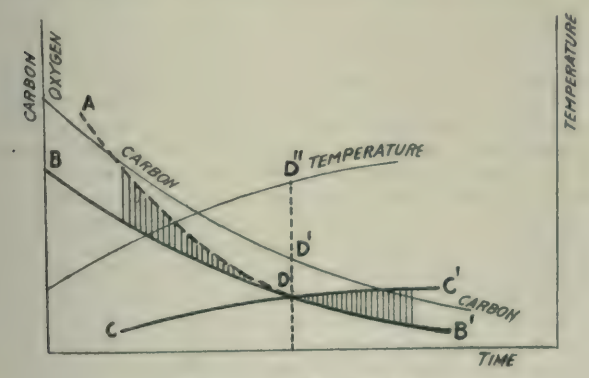


Fig. 1.—Dead Melting

Curve "Carbon" shows the bath carbon content (C) in relation to the time (t). Curve "Temperature" shows the corresponding temperatures. Curve BB' shows the oxygen (O) taking part in the reaction FeO + C = Fe + CO; the equation of the curve is $O = -\frac{16\,dC}{12\,dt}$. Curve CC' shows the oxygen entering the slag from the atmosphere. CC' and BB' intersect at D. Curve AD shows the total oxygen present in the bath previous to D. The curve AD frequently meets BB' elsewhere than at D.

The part of the ordinate intersected between BB' and ADC' represents the oxygen in the bath in excess of that taking part in the reaction FeO + C = Fe + CO. These intercepts are plotted separately in Fig. 2.

The ideal consists in dead melting to "condition D," that is:

Oxygen D, all in course of removal by reaction FeO + C; *Carbon D'*; *Temperature D''*

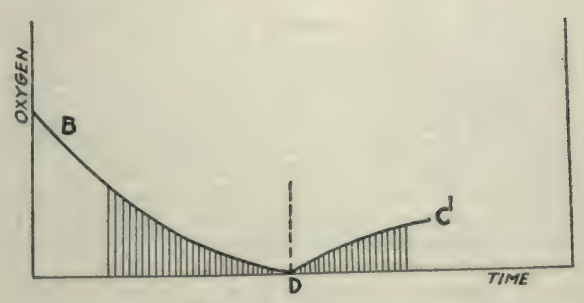


Fig. 2.—Dead Melting

The ordinates are oxygen in excess of that taking part in the reaction FeO + C = Fe + CO, as obtained from, and explained under Fig. 1

Adding Scrap to Correct Wildness

Again, if a good dead-melted condition be exceeded, and by pushing the temperature too high in relation to the other conditions, a somewhat wild bath is obtained, the addition of the correct amount of scrap restores a perfect dead-melted condition. The author is not advocating the indiscriminate addition of scrap for the control of condition in dead melting; to do so might cause more mischief than it would remove. Further, he does not make a sweeping claim of novelty in adding scrap (or anything else) to the bath, which has often been done by others, especially in the final additions; but he is not aware that it has been used in exactly the way above described in the study of the essential condition of the bath. It is one of the most valuable methods of study and it has assisted him in arriving at a decision as regards several of the more obscure features of the subject.

In the attempt to end the oxidizing stage satisfactorily, it is from the practical point of view necessary not only to minimize the oxygen present in the system, but also to do so with the carbon content within reasonable limits of a desired figure—which varies considerably with the circumstances. The nature of the running equilibrium has been indicated, and it is therefore evident that some careful choice must be exercised in regard to the controllable excesses which may occur. In this respect we have to notice chiefly temperature, carbon and iron oxide. The influence of temperature has already been discussed. The important point as regards carbon and iron oxide is to choose correctly the carbon content at which to cease oreing, so that in view of all the particular circumstances then prevailing (approximate ore content of the bath, the relative keenness of working of the furnace, the general nature and volume of the slag, etc.) dead melting will be achieved at a convenient carbon content.

Deoxidizers, and Temperature Effect

What is the advantage of such great care in deoxidizing the bath by dead melting when deoxidizing additions are afterward to be used? The author has found by wide and careful experiments that no one deoxidizer will alone thoroughly deoxidize steel, and that when two or more deoxidizers are used, each has an effect, and the combined effect is greater than if one of them be omitted. The fact that carbon alone is not sufficient to deoxidize steel demonstrates the truth of this conclusion.

Manganese dissolves in the metal in some form and produces manganese oxide, which unites with avidity with silicates, but which is at most slightly soluble in the metal. A part of the manganese also unites with sulphur, producing an insoluble sulphide. The action of silicon resembles that of manganese—it is partly dissolved in some form and produces insoluble silica, whose assimilation by the silicates and basic oxides is not so ready as the combination of MnO with the silicates. Aluminum enters only to a very slight extent into the metal, and produces an oxide which frees itself fairly readily from the metal, but which does not readily associate itself with the other non-metallic matters. Despite the presence of some manganese in solution in the molten metal, a certain amount of FeO

and CO still remain dissolved and even unacted upon by manganese.

The deoxidizers are more efficacious, the higher the temperature of the metal at the time of their addition. The effect of higher temperature and time in giving the entangled products greater opportunities to float to the top is generally recognized. The casting conditions which have to be met are, however, usually permitted to dictate the temperature control as the end of the process is approached. Throughout, the process is admittedly full of such compromises, but the present is a plea for ideals accompanied by suggestions as to how to attain them, and even in the last-mentioned stage, the author much prefers to see the attempt made to get the maximum deoxidation as stated, followed by temperature control, or even by modification in the details of casting to obtain the required ingots.

The Casting Stage and the Defects

Approaching the casting stage metallurgical generalizations are not so readily applicable to the whole field. Much good steel is more or less ruined in the pit in casting. Three of the principal types of original defects in steel are rokes, non-metallic inclusions, and pipe. Rokes which do not contain silicious matter may arise in mechanical ways in worked steel, but more generally they arise from blowholes in the ingot. The means which have been outlined for minimizing oxygen are the prime means for obviating rokes arising from blowholes. Blowholes usually local in the ingot (that is, not related to the general anatomy of the ingot) can also arise through wrong design of ingot, bad surface or facing of mold, etc. Non-metallic inclusions arise in various ways:

Entangled slag and silicates or MnS in suspension in the bath and carried over to the ingot.

Silicates formed *in situ* in the ingot by a continuance of the deoxidizing action and aided by oxidation of the steel by air during its passage into the mold.

MnS formed *in situ* by continuance of the action of manganese in the ingot during solidification.

Fluxed refractory fittings, especially runner bricks.

The influence of high temperature and time in lessening the first has already been noted. As regards the second and third, there is a slight advantage in hot steel; the fourth is a strong argument for avoiding bottom running if possible.

Steel made on the lines indicated will have the greatest tendency to piping, but it is always possible to minimize this tendency systematically. Refractory lined heads and ingots wide end uppermost are the simplest and most direct methods.

The full advantages of casting ingots wide end up are, for the greater range of ordinary work, best obtained from a mold standing on a loose bottom plate, preferably with a well for sizes over 3 tons or so, containing a loose but fairly massive piece of scrap plate for the stream to strike upon first. If this loose piece be adopted, it is essential that every loose piece absolutely should be identified afterward for each ingot, since sometimes I have known this plate, if too light, to be washed up into the ingot and cause trouble.

New York State Safety Congress

The Second Industrial Safety Congress of New York State will be held at Syracuse, N. Y., on Dec. 3, 4, 5 and 6, under the auspices of the State Industrial Commission. The program calls for the discussion of set topics at the morning sessions, with round table discussions in the afternoons. The evenings will be given over to illustrated talks. Some of the topics to be considered are "Safety from an Economic Standpoint as Well as a Humanitarian Proposition," "What Part Does Labor Play in the Safety Movement?" "Disciplining Careless Workmen—How the Employer Feels About It and How the Employee Feels," and "Safety Committees, Their Scope and Benefit." The headquarters of the congress will be at the Hotel Onondaga and the safety exhibit in connection with the congress will be held there. The sessions of the congress will be at the First Baptist Church, where they were held last year.

Suggestions for Conserving Coal

WASHINGTON, Nov. 13.—A series of suggestions addressed to owners and managers of power plants for the economical use of coal has been prepared by the committee on coal conservation of the Chamber of Commerce of the United States, which is working in conjunction with the Council of National Defense. The cost of coal for the generation of power, the committee points out, has in many instances not had the same consideration as other costs because coal has been cheap and abundant, so that cheap coal and cheap labor sometimes made it apparently economical in dollars and cents to install and operate an inefficient plant. Coal and labor are now expensive and conditions make it imperative for every owner or manager of a power plant to examine into the cost of the power his establishment uses, the economy with which it is generated and applied and the increase in efficiency that is possible.

Most users of coal can join in promoting efficiency of coal. Railways have made real progress in firing locomotives; they can often go farther. Gas workers can generally effect further saving by using careful technical direction. Manufacturing plants of every degree can show great results in the aggregate.

The Bureau of Mines, on behalf of the Federal Government, has gathered a great deal of information about the use of coal and has expert advice to give regarding means of economy. Several publications, in which the Bureau of Mines has embodied the results of its experiments and made practical suggestions based upon expert observations and conclusions of its staff and other engineers, are now available and a list can be obtained by application to Director Van H. Manning.

Bethlehem Steel Corporation Need Not Show Books

Justice Goff, in New York, Nov. 9, denied the application of the General Investment Co. for an inspection of the books of the Bethlehem Steel Corporation, in which the petitioner owns 100 shares of common stock. It was alleged that the Bethlehem company had illegally paid bonuses amounting to $8,000,000 to officials and employees of the concern. It was alleged that of this amount Eugene G. Grace, its president, received $1,000,000.

The proceeding before Justice Goff brought out the statement by counsel for the Bethlehem Steel Corporation that Clarence H. Venner, banker, who has figured as plaintiff in many actions against corporations, was the head of the General Investment Co., and had brought the action merely as a "fishing expedition."

The defendant's attorney said that Mr. Venner bought 100 shares of Bethlehem stock, a small proportion of the entire outstanding issue of common stock. After heckling Charles M. Schwab, chairman of the Bethlehem board of directors, at the last annual meeting, he voted the 100 shares against the granting of the bonuses. The number of shares voted in favor of the bonus plan numbered 238,398. It was argued for the Bethlehem company that no favoritism in the distribution of bonuses is shown to persons holding stock, but the bonuses are given for good service, the man on the scrap heap and the man in charge of submarine construction for the Government sharing with heads of departments and salesmen, who have earned a bonus.

Counsel for the General Investment Co. denied that Mr. Venner was connected with it.

The Barrett Co. has acquired the plant of the All-Roofing Co. at East St. Louis, Ill., and will enlarge the plant and make it the central manufacturing plant for the central west of the company. The company which it has acquired is capitalized at $100,000 and has on hand contracts for the Government aggregating approximately $1,000,000. Vice-President Thomas M. Rianhard and W. D. Harris of New York City acted for the Barrett Co. in closing the deal.

LIBERTY BOND CAMPAIGN

Interesting Details of Successful Efforts of a Youngstown Company

During the week ending Oct. 24 the Youngstown Sheet & Tube Co. conducted in its works at Youngstown, Ohio, a campaign for the sale of Liberty bonds to employees which was so phenomenally successful as to arouse general interest in the methods used. Some of the ideas will probably be adopted by other companies in later campaigns.

During the period mentioned 8,893 employees became subscribers to the second Liberty loan, taking an aggregate of $1,064,300 worth of bonds. In addition to this the company subscribed for $2,750,000 worth of the issue, making a total of $3,814,300 taken by the corporation and its employees. This remarkable result was in addition to subscriptions to the first Liberty loan on the part of the company and employees amounting to $3,875,000, and the purchase of short-term certificates by the company in the interim to the amount of $4,000,000, which bring the total amount of Government securities absorbed by this institution and its employees to date up to $11,689,300.

Subscriptions to the first Liberty loan by its employees, having totaled $610,000, the company decided to increase this amount on the second loan if it was at all possible. That this could be done seemed doubtful, since about half of the installments on the first purchases were still unpaid. The fact that of the 13,500 employees fully 60 per cent are of foreign birth, and many of them from enemy countries, was also expected to add to the difficulty of increasing the subscriptions. Nevertheless, the officials decided to make the effort and a campaign was carefully planned with the idea of bringing the total up to $1,000,000.

Subscribing Made Easy

The first step was to provide an easy method by which the employees could pay for the bonds out of their earnings, which were about to be increased by a 10 per cent advance in wages, and this was given much thought by the officials. It was finally decided to use the same plan as in the case of the first loan, but to add to new subscriptions the unpaid balance on the old, deducting from earnings of the subscribers 10 per cent of the total amount each month. This gave subscribers to the loan the opportunity to pay for a part of the first subscription during 15 months, instead of 10. A clause was also inserted in the agreement by which the company agreed to complete subscriptions up to $100 and turn over the bonds to heirs in case of the subscriber's death before the term of payment had been completed. This provision was also made to apply to $100 on all subscriptions of larger amount. It was also provided that subscribers could withdraw their subscriptions at any time, or in case of sickness, have the time of payment extended.

When this plan was finally formulated, posters and booklets in seven different languages were printed and distributed to all the employees in the works. These languages were English, Slavish, Hungarian, Polish, Italian, Rumanian and Greek, from which fact the cosmopolitan nature of the group can be judged.

Superintendents Organized

Next an organization was formed among the superintendents in the works, and they were instructed to select committees, including their foremen and the more progressive workmen of foreign birth in their departments. When this had been done all these men, about 350 in number, were called together at the time day and night shifts were changing, and addresses made to them by officials of the company and a speaker brought in from outside.

In the meantime 10,000 Liberty loan buttons had been secured, and these, with subscription blanks, were placed in packages and distributed among the workers, each being given a button and blanks for every man in the department which he was to cover, different workers being selected for day and night turns. The campaign had been arranged to begin in the middle of the week, so that the day and night shifts, which alternate weekly, could both be reached.

The work was under the general direction of C. S. Robinson, vice-president; W. C. Reilly, general superintendent, and E. T. McCleary, assistant general superintendent. The details were handled under direction of R. M. Welch, special agent, and the campaign was conducted through the Industrial Relations Department, which had instructions to complete the canvass in seven days.

Even with this elaborate organization it was impossible to see every man in the plant, but nearly all were seen and solicited to invest their savings in the Liberty loan. The campaign as conducted under this organization involved considerable expense, and extra accounting is involved, but the result eminently justified this.

Wise Expenditure

The officials of the Youngstown Sheet & Tube Co. believe the expenditure of time and money to have been fully justified, not only on patriotic grounds, but also because the purchase of bonds results in closer relations between the company and its employees, and offers them an opportunity for saving their earnings such as could be found in no other way. Of all the bonds taken, only about $13,000 worth were fully paid for in cash. The greater portion of the remaining amount will prove to be actual saving by the employees during the period of payment. The company will, of course, purchase the bonds and hold them until they are paid for, but will deliver to all subscribers to the first loan the bonds then taken as soon as the aggregate deducted from earnings is sufficient to pay for that amount. These bonds will be of the 4 per cent denomination in all cases where the subscribers so desire.

Speaking of the extraordinary inducements offered by his company to its employees subscribing for Liberty bonds, President J. A. Campbell said:

"We were inspired chiefly by the desire to see our employees express their patriotism and aid the Government at a time when every citizen should keenly feel his obligations in that direction.

"Nevertheless, this large subscription to the bond issues will prove immensely to the advantage of our people and will be well worth the labor and expense involved. Our employees have been encouraged to save some of their large earnings against the time when it may be impossible for the industry to maintain these earnings at their present rate, and they will thus get permanent benefit from the prosperity they are now enjoying. High wages benefit no one if they are spent unnecessarily, and the best citizen for himself and for everyone else is the one who makes a serious effort to provide a competence for his family.

"This campaign has accomplished for some of our employees what could not have been done by either our regular relief fund or our housing propositions. It has given them a motive and an opportunity for saving while they can do so, and at the same time it has made them better citizens and better workmen.

"I naturally feel proud of the record that has been made in our plant, and congratulate our employees and those who were in active charge of the campaign."

Soot Blowers for Army Cantonment in France

The boilers installed in connection with the heating and refrigerating systems in the first American cantonment in France will be equipped with soot blowers made by the Diamond Power Specialty Co., Detroit. The units, a large number of which will be installed, are of the front-end type, in which the entire mechanism is attached to the door and swings out with it when the door is opened. In this way the boiler ends are readily accessible for inspection or repairs, and is also possible to get at the blower easily. The blower proper consists of a revolving arm which is moved by a wheel on the outside of the boiler and discharges jets of steam in a path parallel to the tube walls.

Enlarged Activities of Bureau of Mines

Popular Report Telling Story of Iron to Be Issued—Special Investigations as to Safety, Corrosion and Slag

WASHINGTON, Nov. 13.—An interesting summary of the metallurgical work of the Bureau of Mines during the past year and a comprehensive forecast of greatly enlarged activities of special importance to the iron and steel trade during the coming year are the salient features of the forthcoming annual report of the director. With a prospect for materially increased appropriations for this particular branch of the Bureau's work, it is believed that its usefulness to the industry will be very greatly increased.

As a general basis for public understanding of the iron industry, and to serve in answering many of the questions coming to the bureau from all sides regarding the fundamentals of the industry as a whole, a popular report entitled "The Story of Iron" has been practically completed and will be published in the near future. The report aims to cover the general history and evolution of the iron industry. The work is both historical and technical and notes the progressive steps and methods in the development of iron manufacture with special reference to the United States; it also cites various noteworthy discoveries improvements, and processes.

Investigation of Safety in the Industry

In conformity with the bureau's general policy of promoting safety and welfare in the industries which it touches, it has been making a study of accidents at iron and steel plants with a view to determining the principal causes of such accidents and to developing equipment and practice to lessen them.

The investigation of accidents and of safety devices at blast furnace plants has been finished. It has necessitated much travel—all districts of the country, with the exception of the Colorado district, having been visited at least once—many interviews with men managing, operating, and working at the various blast furnace plants, the compiling of considerable information on operating and constructional features, the study of hundreds of accidents, and the observation of furnace methods and practice. The result of this investigation is represented in four reports, two of which (Safe Practice at Blast Furnaces and Asphyxiation from Blast-Furnace Gas) have already been published. The third report treats in detail of Blast-Furnace Breakouts, Explosions, and Slips and will be published at an early date. The fourth report, which will appear later, represents the findings of an investigation undertaken in co-operation with the Pennsylvania Department of Labor and Industry on the hazards at furnace plants in that state. This report embraces an analysis of the accident risk and suggests methods and means of prevention. The report takes up the entire field of accidents about blast furnaces and every type of accident is illustrated by the description of an actual occurrence, together with the discussion of the means best calculated to prevent it.

Co-operation of Public Health Service

To aid in improving hygienic conditions, a plan was formulated for the investigation of the health of workers in the steel and metallurgical plants of the Pittsburgh district. Seven of the largest and most representative steel plants, employing approximately 35,000 men, were visited. A general survey of each p'ant was first made and data were collected on such subjects as the sanitary condition of the plants as a whole, the character of the work performed by the employees, the amount required, and the conditions under which it was performed as far as each of these might affect the health of steel workers. A detailed study was then made of each condition observed that might injuriously affect the employees' health, with a view to devising ways and means by which these health hazards could be eliminated or minimized. A report has been prepared for publication and will appear at an early date.

Corrosion Investigations

The corrosion of metals is receiving constantly increasing attention in the metallurgical world on the part of both the manufacturer and the user. "For a time," says the report, "we were inclined to believe that modern conditions of service and the demand for production by present-day methods made short life inevitable. Fortunately scattered examples of long-lived products, and the activities of certain investigators and producers showed that improvement in material was within the bounds of probability. Such improvement has been marked within recent years, and it seems likely that we have by no means reached the limit of advancement in quality. Again, the better understanding of the underlying causes of corrosion is opening new avenues of attack for solution of the problem.

"That the rusting of iron and steel is one of our serious economic and conservation problems is now generally admitted. If we assume an average life of steel of 33 years, the depreciation charge of 3 per cent represents in this country a yearly loss of 1,000,000 tons of product, valued at $30,000,000 to $40,000,000 for the crude or semifinished material alone, exclusive of correlated fabricating costs. The inevitable rusting of steel may be justly claimed to be the bulwark of the zinc industry, as 60 per cent of the metallic zinc used in this country is for galvanizing iron and steel articles, representing an annual outlay of $20,000,000 in an endeavor to protect metals from inevitable decay. Enormous amounts of paint are used in a like endeavor. About 5,000,000 tons of coal is needed in the production of steel to replace the annual waste and 1,000,000 more for the zinc that is annually lost.

Nature of Corrosion of Metals

"The mechanism of corrosion is of extreme importance as underlying any investigation of the problem. Its study involves research of an electrochemical and metallographic nature. This phase of the problem has of late years received the minor share of attention, partly because the commercial interests are primarily concerned with tests that will prove superiority for their particular products and partly because the electrolytic theory of corrosion has been rather generally accepted, and in consequence most investigators have assumed that the scientific aspects of the problem were largely solved.

"The electrolytic theory of corrosion is based on simple and well-understood principles; their application to corrosion phenomena involves modifications of detail only. * * * * One does not have to go far into the study of the corrosion problem to be forced to the conclusion that many of the actual facts observed in service tests are not satisfactorily accounted for by the usual interpretation of the electrolytic theory. For example, iron of highest purity should be most immune from rusting, and such rusting should be even in distribution, with absence of pitting. And yet pure iron does rust, and it does pit as severely as do impure products, especially in some service, as in water pipes.

"The work of the Bureau of Mines during the past year has been devoted to the study of the surface influences, particularly of the influence of rust once formed on the progress of further rusting. The findings have received the general approval of authorities on corrosion as explaining many of the hitherto seemingly anomalous observations, and especially the differences observed in the corrosion of pipe as compared with that of iron exposed to the weather, and the more pronounced

pitting common to iron pipe. In brief, the investigation has shown that rust once formed is a factor in the progress of rusting at least equal in effect to those factors universally recognized and is more important than many factors that are subject to dispute because of being attended with detrimental effects of considerable magnitude. It has been found that there is a reversal of polarity according as the rust is wet or dried.

"Some interesting work has been done during the past year in the detection of steel scrap in wrought-iron pipe of supposedly genuine character. Methods for such detection have been devised and will be described in a forthcoming report, so that the information may be used by consumers of pipe.

Slag Investigations

"On account of the growth and expansion of the iron and steel industry and of the industries which depend upon an abundant supply of iron and steel, there arose at the beginning of the last century an urgent need for greater economy and output in the operation of the blast furnace. The raw materials for the manufacture of iron must needs remain iron ore and coal; and with the exhaustion of the higher grade ores the industry is becoming confronted with the problem of profitably working leaner ores or ores that present unusual operating difficulties.

"In their preliminary survey of the field the metallurgists of the bureau chose as problems demanding scientific investigation the fluidity of blast-furnace slags and its relation to their chemical composition, and the mechanism and physical chemistry of the desulphurization process—two problems intimately associated with the realization of fuel economy and the production of high-grade pig iron.

The first phase of these investigations, the fluidity of blast-furnace slags, has for many years been the subject of much speculation and theoretical deduction by operating men and scientists. Prior to the present investigations there have been no reliable conclusions drawn because of the utter lack of experimental data relating to the problem.

Since the beginning of the investigation in November, 1915, the problem of slag viscosity has been successfully solved, so far as the method, apparatus and technique of measurement are concerned, by the development of the Feild high-temperature viscosimeter. By means of this apparatus the viscosity of slags is accurately measured up to a temperature of 2900 deg. Fahr., which is approximately 900 deg. higher than had been reached by previous investigations. The viscosity temperature relations of numerous typical commercial slags have already been investigated, and similar measurements of synthetic slags are under way to show the effect of the different constituents, particularly of magnesia, alumina, titanium oxide, manganese oxide and sulphur. As soon as these investigations are completed the study of the desulphurization of pig iron and its relation to the viscosity and composition of slags is to be undertaken.

Numerous slag samples have been collected from blast-furnace plants throughout the country, and these are being investigated with a view to applying the laboratory results to operating practice. The results of further research will be published from time to time as the experimental measurements accumulate.

It is earnestly hoped that the investigations designed to promote efficiency in the iron and steel industry, of which the present study of slags is the beginning, may be carried to their logical conclusion, and that the necessary funds and equipment may be made available for their continuance. W. L. C.

The Wagner Electric Mfg. Co., St. Louis, on Nov. 15 opened a sales office at 116 Auburn Avenue, Atlanta, Ga., in charge of Charles M. Welch, formerly Indianapolis branch office manager.

The Globe Iron Co., Jackson, Ohio, blew out its blast furnace last week for relining and repairs.

LABOR AND THE NATION'S WORK

Checks by Organized Labor Told by President of National Founders' Association

Since the United States declared war there have been called nearly 2000 strikes, according to William H. Barr, president National Founders' Association, in his annual address before the association at the Hotel Astor, New York, Nov. 14. If we understood all conditions accompanying these demands, he said, we would know that our Government, after only six months of hostilities, is sanctifying an industrial status of disastrous socialism similar to that from which England emerged only with a supreme effort, after two years.

Among the unfortunate examples of academic industrial theories reacting on manufacturers he mentioned an agreement between the Secretary of War and the American Federation of Labor entered into some months ago, an agreement afterward approved by the Secretary of the Navy as applied to shipbuilding and other naval construction. This agreement in substance is that any manufacturer accepting certain war contracts should be governed by union hours, wages and conditions at the time nominally in existence in his particular locality.

Very recently adroit union leaders, by intimidation or deceit, enlisted the co-operation of ranking Federal officers to the extent of inserting a unionization clause in contracts with steel corporations, an attempted embarrassment to the industry and a skillfully conceived plan which ultimately contemplates forcing every manufacturer to accept the entire labor union program.

Eight-Hour Day an Economic Waste

We recognize, he continued, that national emergency measures are now necessary, but "I disapprove the growing tendency toward waste, indicated by the Government in its drastic continuance of effort to impose the 8-hr. day. Some conditions of labor make the 8-hr. day advisable, but by far the greater number of occupations do not need such restrictions. Why then this Federal insistence of reduction in working hours when every nerve should be strained to support our fighting men? Do they battle at the front on an 8-hr. schedule? Does the Chief Executive encompass all his duties in 8 hr.? Can the farmer, without whose support the war cannot be won, increase the products of the soil by reducing his workday to 8 hr.? In wartime, particularly, the 8-hr. day is a luxury which must yield to the demands of national necessity. The conservation and development of America's manufacturing facilities must be equal to the demands of war."

Scheme to Unionize All Industry

One of the newer problems is presented in the U. S. Public Service Reserve, a division of the Department of Labor. The report of the Reserve is to register all persons available for emergency service by having the individual sign an application containing his address and answers to a variety of occupational questions. As a substitute for the existing distribution of labor by union representatives in the Public Service Reserve why not urge the creation of a non-partisan, absolutely impartial committee, divorced from the Department of Labor and free from antagonisms, who could handle necessary enrollment most equitably for all concerned and effect a reserve force both available and mobile to some degree?

Every effort should be made through this plan or some other to check the added unrest which will inevitably follow the present persistent effort of the Reserve staff to suggest temporary change of occupation without definite opportunity, to the steady, loyal, dependable workmen now in your shops.

The Automatic Sprinkler Co., Youngstown, Ohio, has bought some property adjacent to its plant, on which it proposes to build an addition to cost about $50,000.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

Owned by the United Publishers Corporation, 243 West 39th Street, New York. H. M. Swetland, *Pres.* Chas. G. Phillips, *Vice-Pres.* W. H. Taylor, *Treas.* A. C. Pearson, *Secy.*

BRANCH OFFICES—Chicago: Otis Bldg. Pittsburgh: Park Bldg. Boston: Equitable Bldg. Philadelphia: Real Estate Trust Bldg. Cleveland: Guardian Bldg. Cincinnati: Mercantile Library Bldg. San Francisco: 320 Market Street.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

Labor Union Foes

If Great Britain had suffered one-eighth as many industrial disputes in the last two years as my colleagues and myself have personally observed during the two months we have been in this country we should long ago have been forced to conclude a disgraceful peace with the Germans.

So spoke H. W. Garrod, a member of the mission of the British Ministry of Munitions now visiting in the United States, in addressing the Brooklyn Central Labor Union last week. Mr. Garrod would not have been far from the truth if he had added that judging from the attitude of organized labor shown in various strike outbreaks and in reported utterances of union leaders, there is a labor element in the United States that could even view with indifference the conclusion of a disgraceful peace between the United States and Germany.

The response of American Federation of Labor delegates to President Wilson's speech at Buffalo seemed enthusiastic enough and the counsel of some labor leaders to their followers sounds fair enough, but there is much that is disquieting in current labor developments. There has been a solemn enough compact between Samuel Gompers and others on the one side and the American public on the other side as represented in various Washington conferences, to the end that no changes in labor conditions, particularly as to open or closed shop, shall be forced under stress of war; but in actual practice the attitude of many representatives of organized labor has been far from keeping the faith President Wilson has repeatedly expressed in these promises.

The strike on shipyard construction work in New Jersey this week, to compel an erecting company to unionize its operations and abandon its long-standing open-shop policy, under threat of holding up the Government's shipbuilding program, is nothing less than traitorous. But it is exactly matched by the spirit of the strikers who are throttling shipyard work on the Pacific Coast, and that shown in repeated attempts to force the closed shop upon metal-working concerns having contracts with the Government. It is true that in some of the strikes of which much has been printed the workers have acted directly contrary to orders given by union officers. But the spirit of many leaders has been far from whole-hearted support of the pledges given the President. Witness this from the address of James O'Connell, president of the metal trades department of the American Federation of Labor, before the convention of the Boilermakers' Union at Kansas City. The extract is from the report of this address given in the *Boilermakers' Journal* for October:

> In our country, we took advantage of the situation as we found it abroad, and before war was declared by the United States we saw to it that organized labor was going to get proper recognition and that conditions of employment and standards of living would not be interfered with, would not be lowered. * * * Nothing can take place, nothing can be done, unless we are consulted and practically give our consent to it. * * *
>
> And so you are meeting now, my friends, and you will be expected before this convention adjourns to make a declaration as to what the position of the Brotherhood of Boilermakers, Iron Ship Builders and Helpers of America is, so that the world may know. It is not a mere question of being behind President Wilson. That is a sort of catchy expression, a catch phrase, sounds nice. The question is, are you behind yourself? If you are, you will say so before you leave here.

There is no misunderstanding the brand of loyalty thus described and the Kansas City audience of boilermakers could have had no doubt of the extent to which they might expect to discount public assurances by their leaders that all would stand behind the President. Such utterances and the tactics in line with them which have been all too large a factor in current labor news suggest a day of reckoning for men who are thinking of everything but their country's welfare in the gravest crisis in its history. Or is there ahead a fearful reckoning for the whole country as the result of such disloyalty as exists in the ranks of organized labor?

The various departments of the Government at Washington, having come to a realization of the necessity of co-operating with the business men of the country, are honestly endeavoring to do so, and with much better results than in the days when public men persistently sought to gain popular approval by antagonizing all corporations. Many important problems are being slowly but surely worked out. That there is, however, some of the old red tape left is shown by the slowness in paying bills.

Indeed, recent reports indicate more than the usual amount of procrastination. Considerable speeding up of payments is in order.

Less Pig Iron But More Steel

The monthly statistics of coke and anthracite pig iron collected by THE IRON AGE show a production in the first ten months of this year of 32,097,271 tons, against 32,549,894 tons in the same period of 1916, a decrease of 452,623 tons, or 1.4 per cent. The decrease is insignificant, but the curtailment in production this year is very important, for the reason that there is a largely increased blast furnace capacity available, if it could be operated. At least a dozen entirely new furnaces have been completed, at various dates, and these should have yielded a very considerable increase in production. In addition, a number of furnaces that had been transferred to the abandoned list have been resuscitated. The blast furnace list of THE IRON AGE contained about 390 stacks, active or potentially active, at the beginning of 1916, while now it contains 413, making a net increase of 23, either new stacks or stacks restored to the possibilities. During the first ten months of last year there was an average of 317 furnaces in blast, while this year the number in blast has increased from 311 on Jan. 1 to 355 on Nov. 1; but the larger number of stacks has produced a smaller tonnage of iron.

The average output per furnace has decreased very materially, and that decrease has been due almost entirely to insufficient supply of coke. The particularly distressing feature with respect to coke is that it was not necessary for the beehive ovens to increase their output, in order to provide coke for the greater number of blast furnaces prepared to consume it. If they had merely produced as much coke this year as they did last year the by-product ovens would have taken care of the increased requirements, with something to spare. The statistics of the Connellsville *Courier* indicate that the output of the Connellsville and lower Connellsville region has been running 17 per cent below that of last year, equivalent to a decrease of 3,600,000 tons in a year, or more than enough to make 3,000,000 tons of pig iron. The decrease is due in chief part to there being less coal mined in the Connellsville district for coking purposes, though some of the decrease is attributable to the transfer of the coking operation from beehive ovens to by-product ovens completed meanwhile. The attendant curtailment of beehive coke production was dictated by necessity rather than choice, in all probability. The steel interests which have put by-product ovens in operation and have fed them with their Connellsville coal would have found a good market for beehive coke if they had been in position to feed their by-product plants with other coal, at a reasonable cost and continue the manufacture of beehive coke.

More than a month ago the Washington authorities issued a priority order upon the railroads, in favor of a full car supply to the Connellsville region, but thus far no improvement has been noticeable in the situation. The general wage advance of Oct. 1 has been followed by another advance, effective Nov. 10, and that is still to be tried out. Wage rates now average three times those of 1894, when the *Courier* estimated the average market price of the entire year's production at $1 a ton. Now we have wages tripled and the price sextupled.

The American Iron and Steel Institute has begun the monthly publication of statistics of steel ingot production. The figures, given in more detail on another page, may be summarized as follows, the production of works which in 1916 produced 88.14 per cent of the total:

	Monthly Output, 1912 Gross tons
First six months	3,150,137
Third quarter	3,011,530
October	3,351,935
Ten months	3,128,735

The apparent gain in production in October is somewhat illusory, as the month had 27 working days, or one and one-third days more than the average of the preceding nine months. This makes an increase of 5.2 per cent in the working time, with an increase of 8 per cent in the tonnage, comparing October with the nine months preceding. Compared with the daily output in the three preceding months, October makes a slightly better showing, with a gain of about 6 per cent. The institute estimated the total ingot output for the current year at 42,600,000 tons, against last year's output of 40,401,917 tons, the estimate for this year being on the assumption that production by the 11.86 per cent not reporting was in the same proportion as in 1916.

The increase in ingot production this year, concurrent with a decrease in pig-iron production, is decidedly interesting. There has evidently been a decrease in the consumption of pig iron by the iron foundries. Last year the ingot production exceeded the total production of coke and anthracite pig iron by about 6 per cent. This year it has been exceeding it by 10.6 per cent. This would indicate for the whole of this year a pig-iron production 1,700,000 tons less than the amount that would be produced to maintain the same ratio of pig-iron production to ingot production as existed last year. This deficiency probably means in part less pig iron consumed in making ingots, with correspondingly greater consumption of scrap, in part a decrease in pig-iron consumption outside the manufacture of ingots and also to some extent a reduction in the amount of pig iron in stock at the beginning of the year.

As late as August of this year, notwithstanding the great demand of our own shipbuilding industry for ship plates and the urgent need of their conservation, Japan received 57 per cent of the month's exports of plates, or 28,591 tons out of a total of 49,801 tons sent out of the country. For the nine months ended Sept. 30, 1917, Japan took 49 per cent of the total export shipments of plates. It is noteworthy, also, that of the total August exports of 74,937 tons of plates and sheets, Japan received 41 per cent, while of the total of these products for the nine months ended Sept. 30,

Japan took 36 per cent. The building up of the Japanese merchant marine in contrast with American lethargy in this paramount matter, even in the face of the wholesale destruction of ocean vessels in the first two years of the war, is one of the chapters in recent history which this country must always contemplate with anything but pride.

Forward Look in Machine Tools

What is to become of our large production of machine tools after war demands have ceased? The question has been asked many times in the past three years and was raised again at the recent convention of the National Machine Tool Builders' Association by President J. B. Doan. The answer seems to have been given by those who spoke at the meeting on prospects for export trade after the war. If half they said on post-war conditions in Russia, France, Belgium, Spain and South America proves right, it is evident that there will be a market for American machine tools in all the industrial countries of the world in the reconstruction period.

Russia's annual imports of machine tools before the war were approximately $5,000,000, of which three-fourths came from Germany. As a matter of self-preservation Russia must become a greater manufacturing nation then ever. The only way in which she can recoup her losses is by using her raw materials and labor in manufacturing. France through the war has developed into a greater industrial nation with plans for further expansion. Belgium has been stripped of machine tools by the Germans. For the rehabilitation of manufacturing plants she must purchase thousands of tools, and a considerable part of this business will logically come to the United States. Spain is rapidly expanding in manufacturing through the exigencies of war; and even South American countries, though principally engaged in agriculture, cattle raising and mining, are bound to become larger users of machine tools.

The point that received emphasis in every one of the five addresses at the New York convention was that the business would not come for the mere asking, but that American machine tools builders must organize and plan their post-war selling campaigns now. A pertinent suggestion made by G. E. Briggs of the National City Bank, New York, who has had extensive experience in South America, was that our machine tools builders in non-competitive lines associate in forming export selling organizations, appoint agents in leading distributing centers of South America and employ their own expert salesmen and service men to travel the continent and demonstrate the superiority of the machines.

The Western Screw & Lock Nut Co., maker of screw machine products and lock nuts, has changed its name to the Drake Lock-Nut Co. Offices will be maintained at the old location, 342 Mills Building, San Francisco.

The Hydraulic Pressed Steel Co., Cleveland, will enlarge its plant by the erection of an addition 80 x 625 ft. The general contract has been placed with the Westinghouse-Church-Kerr Co.

CORRESPONDENCE

Abrogation of Contracts

To the Editor:—We are astounded at any proposition suggesting the repudiation of contracts. Is it possible that America proposes to pattern after Germany, and consider a contract a scrap of paper to be destroyed at its pleasure?

For a period extending over more than two years, with prices steadily going up, the mills have fulfilled their obligations in the face of rising costs. For a long period past, all prospective buyers have been warned that they would be expected to take the tonnages contracted for. Further, for more than six months, the hand writing on the wall has called for caution in making purchases, and to buy no more than the business required. Under these circumstances, anyone who placed large contracts for material at high prices did so from purely speculative motives, hoping that rising prices would enable them to make a handsome profit, or, in case of a decline, that they could some how sneak out of them. If there is to be any integrity in business, certainly a contract should be lived up to. Many of the mills buying raw material, cover for their requirements of raw material as they make sales, and to any of these, a repudiation of contract would mean a direct loss. We cannot see how cancellation of contracts at higher prices will help the situation, and it certainly won't help business honor.

There is no doubt in our mind that the mill will give preference to orders at high prices, rather than any which the public may be able to place at Government prices. Of course, all patriotic concerns will give preference to any Government work, regardless of price. We believe that the public consumer, unable to get a priority certificate, will be a long time getting his material, unless he is willing to pay a reasonable price for it. We are fearful that the Government prices now ruling will be such as to shut down many of the smaller mills, thus curtailing output, when production should be at its maximum. Would it not have been better to have made a price which would have enabled the smaller fellows to run their mills on a small profit, and then take the excess profit made by the larger manufacturer through taxation?

Philadelphia. LEWIS F. SHOEMAKER.

Manganese in Ordnance Steel

To the Editor: The note by Prof. Henry M. Howe, in your issue of Nov. 2 on "Manganese in Ordnance Steel," is interesting, as it is a departure from the vogue and arguments made in this country generally up to this time.

It is well known on the other side that steel of the kind Professor Howe cautions against using will not give results that compare with good carbon steel. The use of the term "low manganese steel" is new, also, and yet it expresses exactly the quality of such metal. The best Continental steel-making practice never gave manganese the place of carbon at all. Bessemer steel was never regarded there as equal to metal in which the carbon and iron and other constituents were brought to the proper proportions in the well-established methods of refining.

The linings for guns and like uses of steel have long been known in Europe to require the best carbon steel; and if manganese was present at all it was in very small degree and in the condition which its presence in small amounts in the ore caused. The same is true of iron and steel used there to make motor cylinders and all parts that must endure heavy strains and shocks, especially when subjected to extreme variations of heat and cold.

So far as the writer has observed, these details have not yet been taken up by makers of ordnance and motors in this country, but they will be, no doubt, before long. G.

New York, Nov. 12, 1917.

WILL DO THEIR BIT

Automobile Manufacturers Co-operating with the War Board

As the result of conferences between the War Industries Board and representatives of the automobile industry of the United States, a committee of automobile manufacturers will make its headquarters in Washington and co-operate with the war board in all matters affecting the relations between the Government and automobile makers. This committee is headed by Hugh Chalmers, chairman of the board of the Chalmers Motor Co., Detroit, and the other two members are John R. Lee of the Ford Motor Co., Detroit, and A. W. Copeland of the Detroit Gear & Machine Co., Detroit, who represents the Motor and Accessory Manufacturers' Association. Mr. Chalmers was appointed by the National Automobile Chamber of Commerce.

The War Industries Board decided to curtail the production of passenger automobiles on the ground that they are non-essential in the prosecution of the war. As reported in a Washington dispatch to THE IRON AGE last week, the automobile manufacturers opposed the cut and suggested that if curtailment of production must be brought about, the industry, itself, be permitted to do the cutting. Production of cars can continue so long as the automobile industry can show itself capable of making all needed munitions at the same time. Unconfirmed reports are that the committee above referred to will have an opportunity as soon as it gets started at work in Washington to divide about $100,000,000 worth of munition contracts among those automobile plants which are equipped to handle such work with a minimum of readjustment of organization and equipment.

It is decided that production of passenger automobiles will be curtailed, possibly from 30 to 50 per cent. Output of passenger automobiles this year to date has been running at the rate of about 1,500,000 per year and production of trucks at the rate of about 200,000 this year, compared with 92,000 in 1916, this gain being due very largely to orders for army purposes. Manufacturers of passenger automobiles, anticipating the decreased demand for their products, which has now become a serious factor, have been making plans for, or are already engaged on other work. The Packard Motor Car Co., the Ford Motor Co., Dodge Bros., the Lincoln Motors Co., the Simplex Automobile Co., the Hall-Scott Motor Co., the Fageol Motor Co., the Pierce-Arrow Motor Car Co., the Locomobile Co. and the Nordyke-Marmon Co. are all engaged on war contracts, and in some instances have already curtailed motor car manufacturing. Dodge Bros. are the only manufacturers who have announced plans for munition making, but under the new plan others will be heard from in this connection in the near future. Dodge Bros. have taken a $30,000,000 contract for gun recoil mechanisms and will erect a plant costing $1,500,000 in Detroit, besides utilizing a part of their present plant and equipment.

New Installations of Heroult Electric Furnaces

Licenses for the installation of the following Heroult electric furnaces have been issued by the U. S. Steel Corporation:

The Bethlehem Steel Co., South Bethlehem, Pa., will install one 3-ton furnace for making steel castings. This company already has a 6-ton furnace making ingots of special steels.

The Illinois Steel Co. will install one 25-ton furnace at its South works, South Chicago, Ill., supplementing the two 25-ton and two 15-ton furnaces, now operating.

The installation of these two furnaces will bring the total, operating or contracted for, in the United States and Canada to 146.

The Standard Steel Products Co., New York, has leased offices at 42 Broadway for local headquarters.

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STEEL FOR AEROPLANES

Use of Air Hardening and Stainless Steels—Other Important Factors

DR. W. H. HATFIELD recently discussed the subject of steel for aeronautical work in a paper before the English Aeronautical Society. An abstract follows, as given by the *Journal* of the Society of Chemical Industry.

Dr. Hatfield emphasized the importance of using high-class material and of employing scientific methods in works practice. Accurate heat treatment based on the thermal phenomena associated with each steel is essential and this necessitates in works practice the use of satisfactory and properly standardized pyrometers. The best types of furnaces, efficiently constructed and worked, are also required if homogeneous results are to be anticipated in the final product.

Though it has often been pointed out that the term factor of safety is misleading, yet its erroneous use continues. A true factor of safety should be the ratio between the stress which may be safely applied indefinitely under the actual working conditions to the stress actually employed. The actual values of this factor employed in modern design have been arrived at largely by the method of trial. Better results might be obtained and fewer mysterious failures result if the various contingencies to be allowed for were carefully examined and the factor placed on a more definite basis.

Elastic Limit and Maximum Stress

Among these contingencies is low elastic limit as compared with maximum stress. The difficulty of measuring the true elastic limit militates against this fundamentally important figure being determined, as frequently as it should be. Our ignorance as regards the properties of steels below the yield point is considerable, while of the properties between the yield and the breaking stress it is still greater. Variation of temperature, too, has a marked influence upon the physical properties of steel and the influence of the ranges of temperature to which the parts have to be submitted in practice should be carefully studied.

Corrosion might be carefully and profitably considered, particularly as regards seaplanes. Other items which require attention are the internal stresses left after forging and probably also after heat treatment, and non-uniformity of material, especially as regards conditions produced by unskillful methods of manufacture and heat treatment. Inclusions of slag, exaggerated sulphide inclusions, defects caused by unsatisfactory treatment in the forge and last but not least hardening cracks are also extremely important.

Parts Subjected to Shock

Parts not subjected to shock should be produced from material having a high elastic limit with just sufficient ductility to insure non-brittleness, whereas for parts subjected to severe shock toughness is the more important feature. The division between these two classes of stresses is not very sharp and in many cases a compromise would appear to have been made between two types of material. All the parts under consideration are of relatively small section and lend themselves to very careful heat treatment.

Material for Pistons

There is such wide divergence of opinion as to the best material for pistons that cast iron, steel and even aluminum alloys are all in use at the present time. The author records having had definite indication that pistonheads have spent a considerable time in service above the critical point, 730 deg. C. Generally speaking, the fluctuations of temperature during a cycle of operations take place too rapidly for such changes materially to affect the temperature of the piston or cylinder walls, except just at the skin of the material. The possibility of attainment of extremely high local temperatures at the skin depends largely on the thermal conductivity and specific heat of the material, high values in these tending to reduce the fluctuation in temperature.

For many steels the yield point is not a definite value. If yield point is to be taken as a guide to the value of true elastic limit and if elastic limit is to be taken as the basis of design, then this quantity must have much more attention than it usually receives.

The use of impact tests of the Izod and Charpy type is not justified in view of the anomalous results obtained in practice. The torsion test is of particular interest to aero engineers since any shaft which transmits power suffers torsion and the natural way of testing the strength of such a shaft or of the material of which it is made should be by torsion.

Importance of Air Hardening Steels

In discussing the properties of a number of typical steels used in aero work the author described air-hardening steels as extremely important and predicted that when they are more completely understood, they will be used to a much greater extent than at present. An air-hardening steel heated to temperatures of 800 to 850 deg. C. and allowed to cool in air will have great hardness, whereas the hardness introduced by the same treatment in an ordinary carbon or even a high tensile steel is in no way comparable. It is the presence of a high percentage of nickel, as well as chromium, that induces the specific property. Such steel on air hardening from 800 to 850 deg. C. gives 100 tons per sq. in. maximum stress and upward, accompanied by an elongation in the neighborhood of 10 per cent. Such results should be extremely valuable to engineers designing aircraft parts.

Stainless steel, a low carbon steel with 11 to 15 per cent of chromium, is air hardening and has the property of successfully resisting the ordinary corrosive action of the weather, the change from wet to dry atmospheric conditions, organic acids, oxidizing influences and sea water. It should, therefore, have a large application to seaplane work. At present it is used for aero valves and would appear to be a possible material for stream-line wires.

A considerable tonnage of sheet steel is employed in aero work, as for manufacturing clips, etc. The steel used for such purposes has usually a low tensile strength, about 28 to 30 tons. A higher class of sheet steel is being used containing nickel, which gives approximately 35 tons tensile strength per sq. in., with a considerably higher yield point than the mild steel. A drawback to this latter steel is that there is some difficulty in working it.

Steel Ingot Production in October

The American Iron and Steel Institute reports as below the production of steel ingots in the United States in October and in the first ten months of the year. The figures are the totals of the outputs of 29 companies which made 88.14 per cent of the steel ingots produced in the previous year, and are in gross tons:

	Total First Six Months.	Third Quarter, July-Sept.	Total First Nine Months.	October.	Total First Ten Months.
Open hearth..	13 681,483	6,599,048	20,280,531	2,475,754	22,756,285
Bessemer.	5,164,139	2,411,108	7,575,247	870,494	8,445,741
Other ...	55,198	24,435	79,633	5,687	85,320
Total..	18,900,820	9,034,591	27,935,411	3,351,935	31,287,346

It will be seen that October output, at 3,351,935 gross tons, was considerably larger than the average of 3,011,530 tons for the preceding three months. It is to be noted, however, that there were 27 working days in October, as against an average of 25.5 working days for the first nine months of the year. The Iron and Steel Institute, on the basis of its figures, estimates the production of ingots in the country for 1917 at 42,600,000 tons.

The Evertite Locknut Corporation, New York, has changed its company name to the Evertite Nut Corporation.

INVESTIGATION OF ACCIDENTS

Important Facts Disclosed by the Bureau of Labor Statistics

WASHINGTON, Nov. 13.—In a report upon accidents and accident prevention in machine building, which has just been completed by the Bureau of Labor Statistics, an innovation in the preparation of statistics of this character is introduced to show the seriousness of accidents as well as their frequency. For this purpose, new data are introduced under the title of "severity rates." The result is a collection of illuminating figures which show not only the number of accidents occurring in plant or industry or per thousand of employees, but also the extent to which the working forces employed have been actually incapacitated by injuries incident to their occupations.

The meaning of the term "severity rates" may be best expressed by an example: Assume that a plant employing 1000 300-day workers during the course of a year had 200 accidents, and that the total time lost by the men injured was 5000 working-days; the accident frequency rate for the year would be 200 per 1000 workers; the "severity" rate would be 5000 days lost per 1000 workers, or, more conveniently expressed, an average of five days per individual worker.

To make such computations, it is necessary, of course, to express fatal and permanent injuries, as well as temporary disabilities, in terms of workdays lost. This is done by valuing a fatal injury (assuming the employees killed of an average age of 30) as equivalent to the loss of 30 years' work time—9000 days. Other injuries—such as loss of hand or foot—are credited with lower time losses, in proportion to their probable effect upon earning capacity—2196 days for a hand, 1845 days for a foot, etc. This method of evaluating permanent injury in terms of time loss, although based upon somewhat rough estimates, is by no means arbitrary.

More Accurate Measure

Severity rates, thus computed, constitute a very much more accurate measure of accident hazard than do the older frequency rates. A striking example may be cited: The machine-building industry, in one year, had an accident frequency rate of 118 per 1000 300-day workers. This was, as it happened, actually higher than the accident frequency in a large steel plant in one year, the rate there being 114.5 cases per 1000 workers. But even a casual acquaintance with the two industries would indicate that the steel plant represented the more hazardous employment, inasmuch as its accidents are, on the whole, of a more serious character than those occurring in machine building. This was evident when severity rates were computed according to the method described, the steel plant having a severity rate of 21.2 days lost per full-time or 300-day worker, as against only 5.6 days lost per worker in machine building. In this case the severity rate is clearly more valuable than the frequency rate in indicating the relative hazards of the two industries.

The investigation here summarized was based upon statistics covering 1912, that year being chosen because of the completeness of the figures obtainable. As it was obviously impossible to cover all the plants engaged in the industry, the inquiry was limited to 194 typical establishments which worked 347,109,000 man hours, which is equivalent to 115,703 full-time or 300-day workers.

Accident Rates, by Departments

Classifying the combined plants by departmental divisions, boiler shops and yard labor show by far the greatest hazards. Boiler shops have a frequency rate of 224.1 per 1000 workers and a severity rate fo 26.7 days lost per worker, while yard labor has a frequency rate of 221.1 and a severity rate of no less than 29 days lost. These rates are, roughly, as high as those in the iron and steel industry, which is recognized as inherently a much more hazardous industry than machine building. The high rates of the boiler shops are, primarily, the result of insecure trestles and scaffolding. For the excessive rates in the yard department, responsibility rests upon the general neglect of safety precautions in the transportation work of many plants.

Effect of Safety Systems

A striking method of showing the effect of a good safety system in accident prevention is to compare the accident rates in plants having, with those in plants not having, well organized systems. This was done for three important groups of plants. In every case the plants not having a good safety organization show accident frequency rates three or four times as high as those having a well-developed system.

Important Causes of Accident

The analysis of accident causes, together with the determination of occupational rates, is at present the most important practical subject to be considered in accident studies. A careful study of accident causes was made in selected groups of machine-building plants.

For the industry as a whole "falling objects" stands out as the most frequent cause of accidents, the frequency rate for five machine-building plants from 1907 to 1912 being 14.44 cases per 1000 300-day workers, and for four machine-building plants, 1910 to 1913, 14.35 cases per 1000 300-day workers. As measured by severity, "cranes and hoists" assume first place, the severity rate being 2.26 days lost per 300-day worker in the group of five plants, 1907 to 1912, and 1.22 days lost per 300-day worker in the group of four plants, 1910 to 1913. In foundries "hot metal" appears as the accident cause with most serious effects, the severity rate being 2.82 days lost per worker out of a total of 7.41 days lost for all foundry causes.

Methods of Accident Prevention

Experience has everywhere shown that the most effective work for the prevention of accidents must come from a proper safety organization within the plant itself. Such an organization involves some form of a safety committee system, with representatives of both employer and employees working together to develop the best safety methods, not only in the field of mechanical safeguards, but also in the education of the employees in the observance of proper precautions and the maintenance of the safety spirit. It is important to note, in this connection, that the existence of compensation laws in most of the States now furnishes an economic incentive for accident reduction, which was so often absent under the old liability system.

The plant safety organization, however, does not itself do away with the need of mechanical safeguards. It is rather an assurance that the proper safeguards will be adopted and will be properly used. For practically all of the dangers attending the use of the machinery and processes in machine building, excellent safeguards have been devised and are in use in certain plants.

W. L. C.

Large Decrease in Steel Corporation Orders

Unfilled orders on the books of the United States Steel Corporation on Oct. 31 were 9,009,675 tons, a decrease of 823,802 tons from the report for September when the total orders on Sept. 30 were 9,833,477 tons. This is the sixth successive monthly decline and is the largest of any. The following table gives the unfilled tonnage of the United States Steel Corporation at the close of each month since January, 1914:

	1917	1916	1915	1914
January	11,474,054	7,922,767	4,248,571	4,613,680
February	11,576,697	8,568,966	4,345,371	5,026,440
March	11,711,644	9,331,001	4,255,749	4,653,825
April	12,183,083	9,829,551	4,162,244	4,277,068
May	11,886,591	9,937,798	4,264,598	3,998,160
June	11,383,287	9,640,458	4,678,196	4,032,857
July	10,844,164	9,593,592	4,928,540	4,158,589
August	10,407,049	9,660,357	4,908,445	4,213,331
September	9,833,477	9,522,584	5,317,618	2,787,667
October	9,009,675	10,015,260	6,165,452	3,461,097
November		11,058,542	7,189,489	3,324,592
December		11,547,286	7,806,220	3,836,643

Iron and Steel Markets

JOBBERS' PRICES FIXED

Narrowing Steel Uses to War Needs

Plates to Go to Japan—Pig-Iron Activity Continues, Particularly for Steel Making Irons

The adjustment of the steel trade to the new regime in prices and to an increasing diversion of mill products from accustomed channels of consumption is proceeding with less friction than had been expected. The difficulties of the mills growing out of the lack of co-ordination at Washington are still painfully apparent, and in the past week the industry in the Central West, particularly at Youngstown, has lost pig-iron and steel output from coal and coke shortage. Car troubles have also increased, and the outlook for winter operations, as to cars, fuel and labor, is not encouraging.

Working continuously, the manufacturers' committee appointed to bring all prices in line with those already fixed, has brought out a new list, including forging steel, bar iron, boiler tubes, nuts and bolts, boat spikes, electric and automobile sheets, wire rope and pipe skelp, and further announcements are to be made covering screws, railroad spikes and track supplies and a variety of collateral products. Sheet and tin-plate extras are about ready, and there is yet to come a revision of crucible-steel products.

An important feature of the week's new prices is the adoption of a warehouse or jobbing spread of 1c. per pound on sales of plates, shapes, bars, and blue annealed sheets, and 1¼c. per pound on black and galvanized sheets and cold-rolled steel. Though larger than the normal jobber's profit, these amounts are considered fair, taking account of the reduced amount of mill product that will be handled by jobbers under the new conditions. There is no expectation of readjustment of jobbers' contracts with mills, based on higher prices than those now made, the steel companies having for over two years refused any guarantees against declines.

In a few secondary products, as nuts and bolts, the new prices will mean in some cases a revision of contracts. There has been more or less friction, moreover, over the pleas made by various manufacturing consumers of rolling-mill products for a revision of contract prices. But as long as demand exceeds supply no such readjustments are in sight.

As the Government program of steel requirements develops, the steel-consuming trade in various lines is feeling the first cleavage between essential and non-essential industries. As priority rulings multiply, the disturbance from steel scarcity in certain minor lines increases, and it becomes clearer that the list of affected businesses will grow.

Little finished steel is being sold for general commercial needs, most mills being sold for three to six months ahead. But very considerable shipments are still being made on contracts at lower prices than those lately fixed.

The Government's requirements are now counted on to be 100 per cent of ship plate output, after due allowance of plates for war and food industries and railroad upkeep. Many plate users must resort to universal plates and a larger use of rivets.

The total of cars bought for use abroad has now reached 35,000. Besides the 30,000 for Russia, closed late last week, are 4975 for our expeditionary force in France. Italy wants 3000 to 5000 cars.

Japan is negotiating for 15,000 to 30,000 tons of American standard section rails.

Government work continues to monopolize the fabricating steel industry. The business booked in October appreciably exceeded that of September.

Japan is to have an early release for export of the large shipments of plates lately made from mills to Pacific coast warehouses. Orders for about 70,000 tons of plates for the first 25 vessels of the American International Shipbuilding Corporation have been given out at Washington. The Government has also ordered in eastern Pennsylvania 15,000 tons of plates for early shipment to Italy.

Activity in pig iron keeps up and a fair sized tonnage has gone on the books for delivery in the first half of 1918, all at the Government prices and differentials. Philadelphia again shows the largest transaction in basic iron—one steel company buying 45,000 tons for the first quarter of 1918. The Steel Corporation is in the market for 10,000 tons of basic iron for its Pencoyd, Pa., works and this will be the first purchase in years for this plant. In Ohio 6000 tons of basic is sought for shipment to Maryland. In Chicago the demand for basic and malleable pig irons is the feature and there is good inquiry also for standard Bessemer.

Pittsburgh

PITTSBURGH, PA., Nov. 13 (*By Wire*)

The one important thing that has been accomplished by the Government naming of prices on raw materials, such as ore, coke and coal, scrap iron and finished steel, is that the practice of exacting heavy premiums in prices for prompt delivery has been entirely eliminated. This had become an abuse in the trade and there is general relief over the fact that it has been wiped out. The new buying of pig iron, semi-finished and finished steel products since the Government prices came out by consumers other than the Government has been relatively light. Probably 75 per cent or more of the new business has been on direct or indirect Government

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Nov. 14, 1917.	Nov. 7, 1917.	Oct. 17, 1917.	Nov. 15, 1916.
No. 2 X, Philadelphia...	$34.25	$34.25	$34.25	$25.00
No. 2, Valley furnace...	33.00	33.00	33.00	25.00
No. 2 Southern, Cin'ti...	35.90	35.90	35.90	22.90
No. 2, Birmingham, Ala.	33.00	33.00	33.00	20.00
No. 2, furnace, Chicago**	33.00	33.00	33.00	26.00
Basic, del'd, eastern Pa.	33.75	33.75	33.75	26.00
Basic, Valley furnace....	33.00	33.00	33.00	25.00
Bessemer, Pittsburgh....	37.25	37.25	37.25	29.95
Malleable Bess., Ch'go**	33.50	33.50	....	26.00
Gray forge, Pittsburgh..	32.75	32.75	32.75	25.95
L. S. charcoal, Chicago..	37.50	37.50	....	25.75
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	....	....	....	$38.00
O.-h. rails, heavy, at mill	....	....	....	40.00
Bess. billets, Pittsburgh.	*$47.50	*$47.50	*$47.50	52.50
O.-h. billets, Pittsburgh.	*47.50	*47.50	*47.50	52.50
O.-h. sheet bars, P'gh...	*51.00	*51.00	*51.00	52.50
Forging billets, base, Pgh.	*60.00	....	....	76.50
O.-h. billets, Phila.....	....	....	....	55.00
Wire rods, Pittsburgh....	57.00	57.00	*57.00	65.00
Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	*3.685	4.685	4.25	2.659
Iron bars, Pittsburgh...	*3.50	....	....	2.85
Iron bars, Chicago.....	4.50	4.50	4.50	2.65
Steel bars, Pittsburgh...	2.90	2.90	†*2.90	2.75
Steel bars, New York...	3.095	3.095	...	2.919
Tank plates, Pittsburgh.	†*3.25	†*3.25	†*3.25	4.25
Tank plates, New York..	...	...	...	4.419
Beams, etc., Pittsburgh..	3.00	3.00	†*3.00	2.80
Beams, etc., New York..	3.195	3.195	†*3.195	2.969
Skelp, grooved steel, P'gh	*2.90	*2.90	*2.90	2.70
Skelp, sheared steel, P'gh	*3.25	*3.25	*3.25	2.80
Steel hoops, Pittsburgh..	3.50	...	...	3.10

*Agreed prices. †As yet only a few sales made.

**The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Nov. 14, 1917. Cents.	Nov. 7, 1917. Cents.	Oct. 17, 1917. Cents.	Nov. 15, 1916. Cents.
Sheets, black, No. 28, P'gh	5.00	5.00	...	3.65
Sheets, galv., No. 28, P'gh	6.25	6.25	...	5.25
Wire nails, Pittsburgh..	3.50	...	...	2.85
Cut nails, Pittsburgh....	...	...	...	2.80
Fence wire, base, P'gh..	*3.25	...	...	2.80
Barb wire, galv., P'gh...	*4.35	...	...	3.70
Old Materials, Per Gross Ton:				
Iron rails, Chicago.....	$35.00	$35.00	$36.00	$25.00
Iron rails, Philadelphia.	38.00	38.00	38.00	23.00
Carwheels, Chicago.....	27.75	27.00	26.00	16.50
Carwheels, Philadelphia..	29.00	29.00	29.00	18.00
Heavy steel scrap, P'gh.	29.00	30.00	27.00	21.00
Heavy steel scrap, Phila.	26.00	25.00	25.00	19.50
Heavy steel scrap, Ch'go.	28.00	28.00	25.00	20.50
No. 1 cast, Pittsburgh...	26.00	27.00	27.00	17.00
No. 1 cast, Philadelphia.	30.00	28.00	28.00	18.00
No. 1 cast, Ch'go (net ton)	22.50	21.00	20.00	15.50
No. 1 RR. wrot, Phila..	35.00	35.00	35.00	23.50
No. 1 RR. wrot, Ch'go (net)	31.00	31.00	29.50	21.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	$6.00	$6.00	†*$6.00	$7.50
Furnace coke, future....	6.00	6.00	†*6.00	3.75
Foundry coke, prompt....	7.00	6.00	...	7.00
Foundry coke, future.....	7.00	6.00	...	5.00
Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York..	23.50	23.50	23.50	32.50
Electrolytic copper, N. Y.	23.50	23.50	23.50	32.50
Spelter, St. Louis.....	7.75	7.62½	8.00	11.25
Spelter, New York.....	8.00	7.87½	8.25	11.50
Lead, St. Louis.....	6.37½	6.12½	6.87½	6.90
Lead, New York.....	6.50	6.25	7.00	7.00
Tin, New York.....	73.00	68.00	61.00	44.12½
Antimony (Asiatic), N. Y.	13.75	14.00	15.00	13.00
Tin plate, 100-lb. box, P'gh.	$7.75	$7.75	....	$6.00

order. This has priority in rolling and shipment and orders for ordinary customers are pushed aside until the Government business has been filled. None of the mills has any material to speak of for delivery this year, so that general customers have not participated very largely in the lower prices named by the Government. On pig iron, billets and bars and finished steel, contracts were in force when the Government prices came out that have not been completed and will not be for some months. Many of these were at much higher prices than the Government named in the different raw and finished steel products. The most serious obstacle that confronts the steel trade now is the demoralized railroad situation that will no doubt get worse as soon as real winter weather starts. The movement of traffic is abnormally slow and the strict regulations that govern shipments make it impossible to move freight with any degree of satisfaction. The railroads are simply up against it, not having the motive power, cars or labor to move the enormous traffic that is being offered. It is the consensus of opinion that the Government should quickly take some action to relieve and improve the present railroad situation, which is by far the worst ever known. A shortage of coal and coke in the Pittsburgh and Youngstown districts is seriously restricting output of pig iron and finished steel. Some seven or eight blast furnaces in Youngstown are banked for lack of coke and others will have to bank unless the supply of coke improves. The steel business is being carried on to-day under the most trying conditions it has ever known. Shortage of labor, cars, coal and coke is contributing to make the situation as regards output and shipments about as bad as it could possibly be. No important price announcement came out during the week but the new discounts on steel and iron boiler tubes are looked for at any time.

Pig Iron.—There is a veritable famine in the local market in the supply of Bessemer and basic pig iron and where iron is to come from to supply the needs of local consumers over the winter months is a good deal of a problem. It is suggested that both Bessemer and basic iron will have to be secured at other iron manufacturing centers, aside from Pittsburgh and the valleys, to meet the demand. Local steel companies are scouring the market everywhere trying to find Bessemer and basic iron, but without success. The N. & G. Taylor Co. wants 5000 tons of basic for its open-hearth steel plant at Cumberland, Md., the National Tube Co., 5000 tons of basic, the Jones & Laughlin Steel Co. has been a heavy buyer of Bessemer and basic and is in the market for more and other smaller steel companies are actively seeking iron but are not finding it. If it were not for the maximum Government prices that now control pig iron, there would be a runaway market that would carry prices to an unheard of level. The Pennsylvania railroad has an inquiry out for 2500 tons of low silicon car wheel iron, 7600 tons of high silicon foundry iron and 1750 tons of high manganese iron. This inquiry is likely to be closed within a few days. The Youngstown Sheet & Tube Co. has four or five furnaces banked for lack of coal to operate its by-product coke ovens. The Carnegie Steel Co. has three or four furnaces banked in the Youngstown district and other stacks there will have to be banked shortly unless coke supply soon gets larger. The Republic Iron & Steel Co. and Brier Hill Steel Co. are running short of iron and have inquiries in the market for Bessemer and basic. A local interest has bought 7000 to 8000 tons of malleable Bessemer iron for making car wheels at the fixed price of $33.50 valley furnace. Fairly heavy sales of No. 2 foundry iron are being made right along at the regular price of $33 valley furnace.

We quote as follows: Basic pig iron, $33; Bessemer, $36.30; gray forge, $32; No. 2 foundry, $33; No. 3 foundry, $32.50, and malleable Bessemer, $33.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being 95c. per ton.

Ferroalloys.—The manufacturers of Bessemer ferrosilicon and silvery iron have adopted and are now quoting the scale of prices adopted for these two products by the general committee of the American

Iron and Steel Institute and the War Industries Board, and later approved by the President. At present there are only two or three sellers of Bessemer ferrosilicon and silvery iron. The Globe Iron Co.'s blast furnace at Jackson, Ohio, is idle for relining and repairs and is out of the market. The Star Furnace Co. and the Jackson Iron & Steel Co., both at Jackson, Ohio, are sold up for some time ahead, the Ashland Iron & Mining Co., Ashland, Ky., has quit making ferroalloys, and the only really active seller for early delivery is the Bessie Furnace Co., at New Straightville, Ohio. New inquiry for ferromanganese is fairly active, and prices on 80 per cent domestic range from $250 to $260 per gross ton, delivered. We quote 18 to 22 per cent spiegeleisen at $60 to $65, and 50 per cent ferrosilicon for prompt shipment at $150 to $160 per ton. On contracts prices range from $140 and higher, depending on the quantity. Some large consumers of 50 per cent ferrosilicon have covered their needs over all of next year.

We now quote 9 per cent Bessemer ferrosilicon at $54, 10 per cent $55, 11 per cent $58.30, 12 per cent $61.60, 13 per cent $64.90, 14 per cent $68.20, 15 per cent $71.50, and 16 per cent $75. We quote 6 per cent silvery iron $40, 7 per cent $42, 8 per cent $44.50, 9 per cent $47, 10 per cent $50, 11 per cent $53, and 12 per cent $56. These new prices on Bessemer ferrosilicon show reductions over former prices, ranging from $35 to over $60 per ton. On silvery iron the new prices show reductions over former prices of $35 to $40 per ton. All the above prices are f.o.b. makers furnace, Jackson or New Straightville, Ohio, these furnaces having a uniform freight rate of $2 per gross ton, for delivery in the Pittsburgh district.

Billets and Sheet Bars.—There is some inquiry for billets and sheet bars, but so far none of the steel mills seems to have any steel to spare for prompt delivery at the Government price of $47.50 for billets and $51 for sheet bars. Dealers say they are having inquiries for billets and sheet bars for prompt delivery and intending buyers are willing to pay a commission to dealers if they can obtain steel for them at Government prices. The steel mills are covered by contracts made some time ago for billets and sheet bars and are making good deliveries. It is stated that some large tin plate mills have covered their needs of sheet bars over first half of 1918 at the regular price of $51, Pittsburgh or Youngstown mill. We quote 4 x 4 in. soft Bessemer and open-hearth billets at $47.50 and sheet bars at $51, maker's mills, Pittsburgh or Youngstown.

Structural Material.—The amount of new work outside of Government needs is very small. The McClintic-Marshall Co. has taken about 400 tons for a new steel building for the Donner Steel Co. at Buffalo. Nearly all new jobs being placed are either direct or indirect Government, details of which are not given out. The Fort Pitt Bridge Works have taken 680 tons for a new machine shop for the Wellman-Seaver-Morgan Co., Akron, Ohio. We quote beams and channels up to 15 in. at 3c. at mill.

Plates.—In addition to the contract for 30,000 cars for Russia, noted last week, the Italian Government is in the market for 3000 to 9000 high side four-wheel steel gondola cars, and this order may possibly be given out this week. We are advised that more plates are available right along for fairly prompt shipment at the fixed price of 3.25c., but the larger mills are sold up for months ahead on plates for Government and other works, mostly the former, and are paying little attention to the 3.25c. price. We quote ¼-in. and heavier sheared plates at 3.25c. at mill, Pittsburgh.

Steel Rails.—As yet no announcement has come out of any changes in prices on standard sections or light rails, and very little new business is being placed. Nominal prices on standard section and light rails are given on page 1217.

Sheets.—All the sheet mills adopted at once the new Government prices that came out on Monday, Nov. 5. Last week the district sales managers for the American Sheet & Tin Plate Co. were here for a three-day session, during which conditions in the sheet and tin plate trade and general business matters were fully discussed. The American Sheet & Tin Plate Co. has apportioned to its district sales managers its output of sheets, and very shortly the district sales managers will take contracts from manufacturers only for sheets at the Government prices for delivery over first half of 1918, with the exception that contracts for galvanized sheets will be for first quarter of next year only. The policy of this company as regards sales to jobbers has not yet been determined, but will likely be announced within a short time. Some sheet mills report a larger demand, and some fair sized orders for different grades of sheets have been placed at the new Government prices for delivery this year. It is probable also that contracts have been for delivery in first quarter and first half of next year to manufacturing consumers. It is not believed that the Government price on sheets, as now in effect, will be changed on Jan. 1, as they are conceded by manufacturers and consumers alike to be eminently fair, with the exception that some makers of galvanized sheets who are not self-contained feel that the price of 6.25c. on No. 28 gage is too low. We quote blue annealed sheets, No. 10 gage, 4.25c.; No. 28 Bessemer black, 5c.; No. 29 galvanized, 6.25c.; No. 28 tin mill black plate, 5c., in carloads, f.o.b. Pittsburgh, rolled from Bessemer or open-hearth stock. Prices on sheets are given in detail on page 1217.

Tin Plate.—The American Sheet & Tin Plate Co. has apportioned to its district sales managers in various cities its output of tin plate for first half of 1918, and within a short time will accept contracts from its customers for delivery over the first half of 1918 at the Government price of $7.75 per base box, Bessemer or open-hearth stock. Some tin plate mills have not yet started to sell tin plate for first half of 1918 delivery, as they have not yet been advised how much steel will be given to be used in the manufacture of tin plate, and they are unable to estimate what their output will be for the first half of next year. It is understood that contracts for sheet bars from tin mills that buy steel in the open market have been practically made on the basis of $51, and should this price be raised or lowered, the tin mills are to abide by any change in price of tin bars that may be made. The output of tin plate in the first half of next year at least will be relatively small, as manufacturers will concentrate their entire resources with a view of producing a maximum output of tin plate for the packing of perishable foods. In order to more fully conserve the output of tin plate for packing perishable foods, the food administration board has issued an order forbidding the canning of dry beans and peas without a special Government permit. The Government holds that these two products can be marketed to a large measure without being canned. The Government has also made some stringent license rules in regard to exports on tin plate and has ruled that tin plate leaving this country must be used only to contribute to the military or vital needs of the nations at war against Germany. Preference will be given in all cases where it is proven that the tin plate is to be used to contribute to the production or transportation of foodstuffs for the United States and her Allies. We quote coke plate at $7.75 per base box, f.o.b. Pittsburgh, for Bessemer or open-hearth stock. Effective Wednesday, Nov. 7, some slight reduction in prices on certain sizes of terne plate were made, these changes in prices to apply only on new orders booked from Nov. 7 or after. The new prices now in effect on terne plate are given in detail on page 1217.

Boiler Tubes.—Makers of iron and steel boiler tubes formulated new discounts which were sent to the general committee on iron and steel products of the American Iron and Steel Institute and they were then forwarded to Washington for Government approval. The prices as agreed upon will be found elsewhere in this issue. Recently the sub-committee on tubular products of the American Iron and Steel Institute placed some large orders with the mills for iron and steel tubes for use in the boilers being built for the Emergency Fleet Corporation's ships.

Railroad Spikes and Track Bolts.—As yet, manufacturers of track bolts have made no change in their price quoted for some time and railroads are naming

6.50c. to 7c. in carload lots, while to the small trade, 8c. at mill is being quoted. Prices on standard size railroad spikes are slightly lower, but demand for track bolts, also railroad spikes, is quiet. Prices on track bolts and railroad spikes are given in detail on page 1217.

Nuts and Bolts.—Nearly all the new business being placed in nuts and bolts is for Government work, the commercial demand for some time being very light. Discounts just announced are given on page 1217.

Rivets.—Most of the new business being placed in rivets is on direct or indirect Government orders, the new demand from domestic consumers having been dull for some time.

Wire Products.—All the makers of wire products have agreed on standard prices, based on $3.25 on plain wire per 100 lb., f.o.b., Pittsburgh, announced by the Government on Monday, Nov. 5. Some mills believe that the price of $3.50 on wire nails is unduly low. Taking basic iron at $33 and Bessemer at $36.30, Pittsburgh, it is figured out that the rods alone will cost close to $60 per ton, and in addition there is an extra cost of drawing into wire, cutting the nails, furnishing the kegs, which cost 15c. to 18c. each, heading and other incidentals. Some manufacturers believe the price of nails should have been fixed at $4 to allow a fair margin of profit. However, all the manufacturers have adopted the $3.50 price, but would much prefer to sell plain wire at $3.25, as there is more profit in it than in nails at $3.50 per keg. There is also more profit on some other grades of wire than in making nails at $3.50 and it is probable some manufacturers may materially decrease their output of wire nails. The new demand for wire and wire nails is reported better and the export demand, which comes from practically all foreign countries, is reported heavy. Sales of wire nails have been made lately for export that realized $5 and even $5 10, base, per keg, f.o.b., New York. Existing contracts on wire and wire nails are not to be disturbed by the new prices. The prices now in effect on wire and wire nails are given in detail on page 1217.

Wire Rods.—Local makers report quite a heavy domestic and export demand, but are pretty well sold up for the remainder of this year and have very few rods to spare. Small manufacturers of wire and wire nails, who buy rods in the open market, will hardly be able to realize a profit with rods at $51 and costs of labor and incidentals at present high rates. We note a sale of 300 tons of soft open hearth rods at $57, Pittsburgh, for this year's delivery. We now quote No. 5 common basic or Bessemer rods at $57; chain rods, $65; screw, rivet and bolt rods and other rods of that character, $65, all these prices being f.o.b. Pittsburgh. Prices on rods are given in detail on page 1217.

Hoops and Bands.—Manufacturers are now quoting the steel bar price on bands, which is 2.90c. and a differential of 60c. in favor of steel hoops, making the price of the latter 3.50c. None of the mills has very much tonnage in either hoops or bands for this year, having contracts at higher prices which will take some months to clean up. We quote steel bands at 2.90c., extras as per the steel bar card and steel hoops 3.50c. f.o.b. mills, Pittsburgh.

Iron and Steel Bars.—Sales of both iron and steel bars are confined mostly to small lots for shipment prior to Jan. 1. Some large consumers covered several months ago for first quarter and in some cases for first half of 1918 at higher prices than are in effect on steel bars, and specifications against these contracts are fair. Iron bar makers have not yet adjusted their prices to put them more in line with the 2.90c. price on steel bars, but may do so in a short time. Large quantities of steel bars are being used in recent Government orders for cars and also for other Government work and will take absolute priority in shipments. The price on steel bars is good only until Jan. 1, but it is not believed it will be revised at that date. We quote steel bars at 2.90c., refined iron bars at 4c. to 4.25c. in carloads, f.o.b. mills, Pittsburgh.

Shafting.—It is understood that some fairly large orders for shafting have been placed in the last week at the new Government price of 17 per cent off list, which makes the basing price 4.15c. at mill. Other contracts placed some time ago on which the price was left open have also been adjusted to the new basis. The demand for shafting from the automobile trade is dull, but from screw stock machine people is heavy. The Government is also a large buyer of shafting, both on direct and indirect orders. We quote cold rolled shafting at 17 per cent off list, f.o.b., Pittsburgh.

Cold Rolled Strip Steel.—Manufacturers of cold rolled strip steel continue 7c per pound in carloads and larger lots, f.o.b. Pittsburgh, and on contracts for delivery within 60 to 90 days. Terms are 30 days, less 2 per cent off for cash in 10 days when sold in quantities of 300 pounds or more.

Wrought Pipe.—All makers of steel pipe have adopted new cards based on the Government discount, which puts ¾ in. to 3 in. black pipe at 51 per cent, galvanized at 37½ per cent, an extra discount of 1 point, 5 and 2½ per cent being made to the large jobbing trade. Manufacturers of iron pipe have sent out new cards under date of Nov. 7, reaffirming former discounts in effect for some months. New discounts have also been adopted on line pipe. Oil country goods have also been revised in prices to a basis somewhat higher than quoted for some time by the National Tube Co. and lower than quoted by other mills. The Government has been a fairly heavy buyer of steel pipe recently, its orders having been divided among the mills based on capacity. One maker has taken an order for 14,000 tons of 3 in. steel pipe to be used for trench mortars. This will be a very high grade pipe, made from the best quality of skelp. Present discounts on black and galvanized iron and steel pipe being quoted by the mills are given on page 1217.

Coke.—The announcement by the Government last week of the price of $7 on 72 hr. foundry coke and $7.30 per net ton of 2000 lb. on crushed coke has done much to clear up the unsatisfactory condition that has existed in the coke trade since the Government made a price of $6 on furnace coke on Sept. 24 last. This price of $6 on furnace coke was also reaffirmed by the Fuel Administration Board and sets at rest any doubt as to whether this price would remain in force and also the absurd report that was printed that the $6 furnace coke was not legal. Since the new prices went into effect, the underhanded methods employed by some small coke operators to get higher than $6 for furnace and foundry coke have largely disappeared and it is hoped will very soon be only a memory. The resolution by the Fuel Administration approved the above named maximum prices and also provides that brokers are not to get a commission. The unexpected announcement of the Frick Coke Co. of a heavy advance in wages for coke mine and coke oven labor was a very great surprise to the trade. The company made a 10 per cent advance on Oct. 1 and in a little over a month has made another still heavier advance. We are advised that some contracts for furnace coke for first half of next year have been made at $6 per net ton at oven, but prior to Sept. 24 contracts were made between several leading producers of high grade furnace coke and blast furnace operators at $9 per net ton at oven, effective from Jan. 1 to June 30, 1918. The coke producers who made these contracts are shipping coke to the same consumers over the remainder of this year at $6 per ton at oven. We now quote furnace coke at $6, 72 hr. foundry coke at $7 and crushed coke over 1 in. size $7.30, all in tons of 2000 pounds at oven. The *Connellsville Courier* gives the output of coke in the Upper and Lower Connellsville regions for the week ending Nov. 3 as 332,423 tons, an increase over the previous week of 26,443 tons.

Old Material.—The new Government maximum prices of $30 per gross ton, delivered at consuming points on heavy melting steel, $20 on borings and turnings, and $35 on No. 1 railroad wrought scrap are not being maintained at any of the consuming points outside of Pittsburgh, and in fact in this district are from $1 to $2 per ton lower than named by the Government. Just now prices for scrap are higher in the Pittsburgh district than at any other consuming point.

None of the local dealers will sell material for delivery in Cleveland, Chicago, Buffalo, Philadelphia, or other leading consuming points, and pay the freight to these points, preferring to do what business they can in the Pittsburgh district where they can realize higher prices. Just now heavy melting steel is about $29, borings and turnings $18, No. 1 railroad wrought scrap $33 to $34, delivered in the Pittsburgh district. Prices at other consuming points on these materials are considerably lower. It is almost impossible to-day for dealers to do any scrap business owing to the rigid railroad restrictions. The railroads still demand permits from dealers and consumers, and will not furnish any open cars unless the party to whom the scrap is consigned will furnish the number of the war order for which the material is intended. It is not likely there will be much scrap business done in this district until after the first of the year, as consumers seem to be pretty well covered. Dealers are now quoting for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$29.00 to $30.00
No. 1 foundry cast	25.00 to 26.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	30.00 to 31.00
Hydraulic compressed sheet scrap	21.00 to 22.00
Bundled sheet scrap, sides and ends, f.o.b. consumer's mill, Pittsburgh district	20.00 to 21.00
Bundled sheet stamping scrap	18.00 to 19.00
No. 1 railroad malleable stock	22.00 to 23.00
Railroad grate bars	15.00 to 16.00
Low phosphorus melting stock	37.00 to 38.00
Iron car axles	40.00 to 41.00
Steel car axles	40.00 to 41.00
Locomotive axles, steel	47.00 to 48.00
No. 1 busheling scrap	21.00 to 22.00
Machine-shop turnings	18.00 to 20.00
Cast-iron wheels	28.00 to 30.00
Rolled steel wheels	32.00 to 33.00
*Sheet bar crop ends	32.00 to 33.00
Cast-iron borings	18.00 to 20.00
No. 1 railroad wrought scrap	33.00 to 35.00
Heavy steel axle turnings	21.00 to 22.00
Heavy breakable cast scrap	21.00 to 22.00

*Shipping point.

The Stalnaker Steel Co., dealers in iron and steel scrap of all kinds, has located its offices in rooms 1124-1126 Farmers' Bank Bldg., Pittsburgh, these being the rooms formerly occupied by the Ohio Iron & Metal Co., which has discontinued its Pittsburgh offices for the present. The Stalnaker Steel Co. has been organized with a capital of $250,000, of which $160,000 has been paid in. The officers are H. D. Stalnaker, president and treasurer; H. G. Stalnaker, vice-president, and F. S. Easterly, secretary. Mr. Easterly was formerly assistant purchasing agent of the Westinghouse Electric & Mfg. Co. The Stalnaker Steel Co. also maintains offices in the Citizens' Building, Cleveland.

Chicago

CHICAGO, Nov. 12.

In summing up his view of the situation, a prominent official of an independent steel company remarked that the industry is getting down to a sane and decent way of doing business, and his words carried with them satisfaction and relief. Another characterized the manner in which the mills had fallen in line with the spirit of the times as wonderful, at the same time deploring that there were those who would abrogate contracts. If, at a later day, prices should be revised upward, he asked, how would these same consumers feel about the cancellation of their contracts which called for material at the lower levels? The view of not a few consumers that their contract prices are subject to revision has caused worry and considerable friction. Meanwhile, specifications are good, and agreed prices are working in all directions where new orders can be filled. In limited quantity, plates are selling at 3.25c., and structural shapes at 3c. High carbon bars show more or less irregularity, sales having been made all the way from 2.90c. to 4c., Chicago. Bar iron is at sea. There is plenty of inquiry for all kinds of steel products, and the end of the year will bring a large volume of buying. It is reported that independent wire mills have announced their intention of dropping their quotations from the $4 base for nails to $3.50, the quotation of the leading interest. The Government named $3.25 for plain fence wire, not mentioning nails. Shell steel is being actively placed, and bars for gun forgings are sought by the Government. The sheet mills are selling at the agreed prices, and the largest local producer is taking business so fast that it expects to be filled up for the first quarter by the end of this month. While selling, it is making no contracts. A reduction in bolt and nut prices is confidently looked for. Pig iron is active for 1918 delivery at agreed prices. The makers of cast-iron pipe have advanced their quotations $5 per ton. Old material is quiet.

Pig Iron.—Buying for the first half of 1918 is active in all grades of iron, the demand for malleable and basic being especially notable. There is considerable inquiry for standard Bessemer, which is quoted at $36.30, furnace. It goes without saying that all the prices quoted are in accordance with the base of $33, furnace, for No. 2 foundry. For the silvery grades there is fair inquiry for both this year and 1918, with but very little to be had for delivery this year. The principal distributor of Northern iron reports that production is less retarded than it was a few weeks ago, although the coke supply is not what it should be because of inequalities in the coal that is being delivered at the ovens. Among the inquiries is one for 1000 tons from the Chain Belt Co., Milwaukee. Indicative of the extent to which Southern iron is being sold is the fact that the agent of one producer in the past week has placed between 5000 and 6000 tons, all for 1918 delivery. The company in question is offering, for 1918, 1.75 to 2.25 per cent silicon iron at $33, f.o.b. cars, furnace; 2.25 to 2.75 silicon at $33.50; 2.75 to 3.25 silicon at $34.50; silicon, 3.25 and over silicon at agreed prices for high silicon. One brand of the company's production, with manganese guaranteed at 0.75 and production, with manganese guaranteed at 0.75 and over, is offered at an advance of 50c. per ton, and 1 per cent and over at an advance of $1. The company states that it has nothing to offer for delivery in the rest of this year. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 2 to 5	$37.50
Lake Superior charcoal, Nos. 6 and Scotch	40.00
Northern coke foundry, No. 1	33.50
Northern coke foundry, No. 2	33.00
Northern coke foundry, No. 3	32.50
Northern high-phosphorus foundry	33.00
Southern coke No. 1 foundry and 1 soft	38.50
Southern coke No. 2 foundry	37.00
Malleable Bessemer	33.50
Basic	33.00
Low-phosphorus (copper free)	53.00
Silvery, 7 per cent	44.54

Ferroalloys.—The purchase of 400 tons of 80 per cent ferromanganese at $250, with other sales, establishes the market at that level, for delivery this year or in the early part of next. Some 10 to 12 per cent electrolytic ferrosilicon is being offered at about $85 per gross ton, f.o.b. cars, Tonawanda, N. Y, For this product, made in the electric furnace, the claim is made that its phosphorus and sulphur content is less than half that of ordinary Bessemer ferrosilicon. Standard 50 per cent ferrosilicon is offered over the first half of 1918, with a few carloads for November and December, at $150 per ton for 1918 and $163 for this year. Freight is allowed to points east of the Mississippi River.

Plates.—Except for Government purposes, the leading interest is taking no business and the leading independent none, except where it can work in an occasional small tonnage. Eastern producers, however, are taking some plate business at the official price of 3.25c. Flanged plates, taking the usual extras, are also being sold on the basis of the Government price. The Government is steadily increasing the volume of plates it will require the mills to furnish, many orders coming both directly and indirectly from the Emergency Fleet Corporation. The jobbers have not changed their quota-

tion for plates out of stock, but a lower price is looked for.

For material out of warehouse, the quotation is 7c.

Structural Material.—Shapes in a small way are fairly active, the prices being based on the Government base of 3c. As in plates, Government agencies have been active buyers, the usual allotments of shapes being about one-third that of plates. The Western Pacific has placed 1500 cars, and it is reported that about 4900 cars of various types have been distributed among the makers by the Government for its railway in France. Three structural lettings are announced, as follows:

Two 130 ft. and one 140 ft. truss spans for Morrison County, Minn., 159 tons. To International Bridge Co., Evansville, Ind.

Sioux City Terminal Railway Co., deck plate girder bridge across Floyd River at Sioux City, Iowa, 109 tons. To Franklin Bros. Bridge & Construction Co., Minneapolis, Minn.

Holt Mfg. Co., buildings at Peoria, Ill., 600 tons. To A. Lucas & Sons, Peoria.

For material out of warehouse the quotation is 5c.

Bars.—A Government inquiry, at hand to-day, is for about 1200 tons of steel bars required in making gun forgings, the mills being requested to state if they can make delivery without interfering with other Government requirements. Should there be a conflict, the mills are requested to give notice, after which the Priority Board will be expected to make some readjustment. Shell steel is being placed more freely by the Government. Some high carbon bars, rolled from discarded shell steel, are occasionally sold at 2.90c. Uncertainty exists with regard to both rail carbon steel bars and bar iron, no official prices having been fixed as yet for these products, but recommendations have been made to the Iron and Steel Institute in the case of bar iron, and there also has been some talk as to similar adjustment of rail carbon bars and rerolling rails. Although some makers of rail carbon bars quote 4c., Chicago, and higher, in a nominal market, sales have been made at 3.50c., Chicago. Nominally, iron bars are unchanged at 4.50c., Chicago. Jobbers' quotations are unchanged.

We quote warehouse prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c.; reinforcing bars, 4.50c. base, with 5c. extra for twisting sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Sheets.—The sheet mills are filling up rapidly with orders for first quarter delivery, and a prominent local producer expects to be out of the market by the end of the month, as at the present rate its capacity will then have been reached. All of the business is being taken at the recently announced Government levels—5c. for black sheets, 4.25c. for No. 10 blue annealed, and 6.25c. for No. 28 galvanized, all Pittsburgh base, and subject to a freight rate of 21.5c. per 100 lb. The producer referred to is making no contracts, and will ship in the first quarter only those orders which are specified at the present time. The buyer is expected to pay the Government tax of 3 per cent on the freight rate. A little export business is being done to neutral countries, or to commercial consumers in the allied countries, in which cases the Government base does not apply. Jobbers are expected to announce revised prices in the near future.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 8c.; No. 28 black, 8.50c.; and No. 28 galvanized, 9.50c.

Wire Products.—The leading interest is quoting $3.50, Pittsburgh, for nails (the base); plain fence wire, $3.25 (named by agreement); painted barb wire, $3.65; galvanized barb wire, $4.35; polished staples, $3.65, and galvanized staples, $4.35. The independents have been quoting on the basis of $4 for nails, but a circular received in this city announced that they are in accord with the new prices. The prices named are to jobbers, per 100 lb.

Cast-Iron Pipe.—Quotations were advanced to-day $5 per ton, the makers having decided that their recent reduction of $15 per ton was too radical. It is intimated that when they last reduced their prices they expected to get Southern pig iron cheaper than has proved to be the case. Wooster, Ohio, is asking alternate bids for 8000 ft. of pipe, wood, steel or cast iron. If 12-in. pipe is taken, about 370 tons will be wanted, and if 16-in. about 575 tons. The 600 tons wanted by Kansas City, Mo., was placed with the United States Cast Iron Pipe & Foundry Co.

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., $58.50; 6 in. and larger, $55.50, with $1 extra for class A water pipe and gas pipe.

Rails and Track Supplies.—Specifications are active, but little new business is being done. Spikes have been taken at 4.50c. to 5c., Pittsburgh.

Standard railroad spikes, 4.50c. to 5c., base; small spikes, 4.75c. to 5.50c., base; track bolts with square nuts, 5.50c. to 6c., all in carloads, Chicago; tie plates, $70 to $90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base (nominal); open hearth, $40 (nominal); light rails, 25 to 45 lb., $70; 16 to 20 lb., $71; 12 lb., $72; 8 lb., $73; angle bars, 3.25c., base.

Old Material.—The leading interests had supplemented its purchases of heavy melting and shoveling steel, taking about 15,000 tons in all, for which it paid $29 per ton, regardless of grade. The result has been to reduce, if not wipe out, the usual differential between the two. Other consumers have done very little, all waiting for the market to crystallize following the recent price fixing in which a few items were named. While No. 1 railroad wrought was fixed at $35 by agreement, this was for a gross ton, while it usually is sold per net ton, the equivalent being $31.25. Yet the railroads are receiving and consumers have been willing to pay more than $31.25. The American Board of Scrap Iron Dealers has sent out letters asking the dealers to adjust their operations to the agreed prices. Meanwhile there is much uncertainty as to where the market stands, also a feeling that the mills would like to buy. It is felt that rail carbon bars will be revised downward—in fact they must be to enable them to compete with mild steel bar and iron bars when the latter take their destined place—consequently a revision of rerolling rails will be in order. The railroad lists are few and light. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton
Old iron rails	$35.00 to $36.00
Relaying rails	50.00 to 55.00
Old carwheels	27.75 to 28.75
Old steel rails, rerolling	35.00 to 36.00
Old steel rails, less than 3 ft.	33.50 to 34.50
Heavy melting steel scrap	28.00 to 29.00
Frogs, switches and guards, cut apart	28.00 to 29.00
Shoveling steel	27.00 to 28.00
Steel axle turnings	20.00 to 21.00

	Per Net Ton
Iron angles and splice bars	$34.00 to $35.00
Iron arch bars and transoms	35.00 to 36.00
Steel angle bars	26.00 to 27.00
Iron car axles	42.00 to 43.00
Steel car axles	40.00 to 41.00
No. 1 railroad wrought	31.00 to 32.00
No. 2 railroad wrought	28.00 to 29.00
Cut forge	28.00 to 29.00
Pipes and flues	18.75 to 19.75
No. 1 busheling	22.00 to 23.00
No. 2 busheling	15.50 to 16.00
Steel knuckles and couplers	29.00 to 30.00
Coil springs	36.50 to 37.50
No. 1 boilers, cut to sheets and rings	18.50 to 19.50
Boiler punchings	31.00 to 32.00
Locomotive tires, smooth	32.00 to 33.00
Machine-shop turnings	16.00 to 17.00
Cast borings	15.75 to 16.50
No. 1 cast scrap	22.50 to 23.00
Stove plate and light cast scrap	17.50 to 18.00
Grate bars	16.00 to 17.00
Brake shoes	17.50 to 18.00
Railroad malleable	26.00 to 27.00
Agricultural malleable	22.00 to 23.00
Country mixed scrap	16.50 to 17.00

Bolts and Nuts.—The demand is more active than heretofore, and under ordinary circumstances an advance might be looked for, but there was a feeling in the trade that, in keeping with the trend in other products, lower prices were not unlikely to come as they have. For prices and freight rates, see finished iron and steel, f.o.b. Pittsburgh, page 1217.

Mr. Rowe Very Ill

PITTSBURGH, Nov. 14. (*By Wire*).—Wallace H. Rowe, president of the Pittsburgh Steel Co., Union Arcade Building, Pittsburgh, is lying seriously ill at his home in the East End in this city from a complication of diseases.

Cleveland

CLEVELAND, Nov. 13.

Iron Ore.—Believing that the greatest efficiency can be obtained from the joint control of the Lake fleet, most of the vessel owners have placed the operation of their boats in the hands of an executive committee which is also given full authority to co-operate with the Government and Allied industries. This committee will direct the shipments of bulk freight including ore, coal and grain. This action has been taken by the Lake Carriers' Association and members holding 85 per cent of the total tonnage have placed their boats under the direction of the committee which is composed of Harry Coulby, Pittsburgh Steamship Co.; John S. Ashley, M. A. Hanna & Co.; H. S. Wilkinson, Great Lakes Steamship Co.; C. D. Dyer, Shenango Steamship Co., and Charles L. Hutchinson, Pioneer Steamship Co. The demands of the grain trade are heavy and many vessels scheduled for ore have been diverted to that trade during the past week. Ore shippers and vessel men are doing all they can to increase grain shipments to the maximum, and the former are releasing boats under charter, so that they may be used for carrying grain. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, $5.95; old range non-Bessemer, $5.20; Mesaba-Bessemer, $5.70; Mesaba non-Bessemer, $5.05.

Pig Iron.—The demand for foundry iron is fairly active, having been stimulated somewhat by the recent announcement of the differentials. The call is largely for first-half contracts, but there is considerable inquiry for small lots for prompt shipment. Malleable iron is also in fair demand. Most furnaces are well sold up and are booking as few orders as possible. Very little iron is available for this year's delivery. The melt is heavy and foundries are crowding furnaces for shipments, some being unable to get iron on their contracts as fast as needed. In steel making iron, there is an inquiry from a Maryland plant for 6000 tons of basic for delivery 1500 tons per month starting with December. There is some demand for small lots of silvery iron, but the supply is not plentiful. Some contracts for 8 per cent silvery iron contain the clause that if that iron is not available, 9 to 10 per cent iron is to be shipped in its place. The Southern iron market is inactive. We quote delivered Cleveland, as follows:

Bessemer	$37.25
Basic	33.30
Northern No. 2 foundry	33.30
Southern No. 2 foundry	37.00
Gray forge	32.30
Ohio silvery, 8 per cent silicon	46.12
Standard low phos., Valley furnace	50.00

Coke.—There is a heavy volume of inquiry for foundry coke, but selling agents have none to offer. Doubt is expressed that the new Government price of $7 for foundry coke will help the situation much, as it is claimed that producers are still filled with orders taken at much higher prices before the Government regulation of prices went into effect. The demand is largely for spot coke and the situation has become so serious that at least one foundry, crowded with rush work for the Government, has been compelled to partially shut down because of the lack of coke.

Bolts, Nuts and Rivets.—The demand for bolts and nuts is light, both in new orders and in specifications on contracts. In view of the possible reduction in prices jobbers have been reducing stocks and have not been placing orders on contracts. Inquiries for about 10,000 tons of rivets from Eastern shipyards are pending, but the placing of the orders is being held up pending a possible reduction of prices.

Finished Iron and Steel.—The demand for steel for Government work continues very heavy. A large share of the manufacturing plants in this territory are now devoting 50 per cent or more of their capacity directly or indirectly to Government work, and the portions of their plants used for these purposes are increasing every day. The market is rapidly reaching such a condition that steel will be available only for Government work and for uses in the manufacturing necessities. Most orders now are Government priority orders, these being placed with the mills that are the usual source of supply for the customer. Orders were placed with a Cleveland mill during the week for 30,000 to 40,000 tons of billets for shells, slabs for making plates for the Emergency Fleet, and sheet bars, some of the latter being placed on priority orders for making tin plate to be used in the manufacture of food containers. There is still considerable inquiry for contracts for steel bars, plates and structural material for the first quarter and first half, but mills are taking on no contracts. Some inquiry has also come out for sheet bar contracts for the first quarter. The demand for plates is fairly active, but mills having high-priced contracts report that some consumers are not sending in specifications on these contracts. Prices quoted by Cleveland mills are unchanged, ranging from a maximum of 6c., Pittsburgh, down to the Government price. An Eastern mill is still quoting universal plates at 3.25c. at mill for early delivery in this territory. The volume of sheet business has been stimulated by the fixing of Government prices, a great deal of business having been booked during the week. Mills are now well sold up for the remainder of the year. Mill orders are being booked at Government prices. There is some irregularity in warehouse prices on sheets, and these are quoted down to 6c. for No. 28 black, 5.25c. for No. 10 blue annealed and 7.25c. for No. 28 galvanized. Hard steel bars continue to ease off and are now quoted around 3.50c. One mill that has been selling deformed bars rolled from shell discard at 2.90c. since the establishment of the Government price is now asking a 25c. extra. The bar iron market is very quiet and the price is nominally about 4.25c., Pittsburgh, but a round lot inquiry would doubtless bring out a considerably lower price. Warehouse prices are unchanged at 4.50c. for steel bars and 7c. for plates and 5c. for structural material.

Old Material.—The scrap market is extremely dull. Mills are still well supplied with material and are keeping out of the market. The only inquiry from a large consumer is from an Ohio mill that is offering $27 for heavy melting steel, but apparently is unable to secure any material at that price. Dealers are trying to force up the price on this grade to consumers to the $30 maximum price fixed by the Government, and are asking this price from consumers, and around $29 from dealers. The latter, however, are offering around $27.50 for heavy steel scrap to cover short sales. We quote f.o.b. Cleveland as follows:

	Per Gross Ton	
Steel rails	$26.00 to	$27.00
Steel rails, rerolling	36.00 to	37.00
Steel rails, under 3 ft.	30.00 to	31.00
Iron rails	35.00 to	36.00
Steel car axles	45.00 to	46.00
Heavy melting steel	27.50 to	28.50
Carwheels	26.50 to	27.50
Relaying rails, 50 lb. and over	50.00 to	60.00
Agricultural malleable	22.00 to	23.00
Railroad malleable	27.00 to	28.00
Steel axle turnings	21.00 to	22.00
Light bundled sheet scrap	20.00 to	20.50
Per Net Ton		
Iron car axles	$44.00 to	$45.00
Cast borings	16.75 to	17.25
Iron and steel turnings and drillings	16.00 to	16.75
No. 1 busheling	22.00 to	23.00
No. 1 railroad wrought	30.00 to	31.00
No. 1 cast	23.00 to	23.50
Railroad grate bars	16.00 to	17.00
Stove plate	16.00 to	17.00

Cincinnati

CINCINNATI, Nov. 13—(*By Wire*).

Pig Iron.—The Ohio silvery irons are in excellent demand, but for prompt shipment little business can be transacted, as two furnaces in Southern Ohio are out for repairs. However, a number of contracts have been made for 8 per cent iron to be shipped in the first half at $44.50 furnace. The inquiry for high silicon iron has been better than at any time during the last half of the present year. An Illinois company is included in a large list of smaller melters as wanting 1000 tons of high silicon iron for first half shipment. Prompt shipment of silvery iron is impossible, except on contracts already existing. In the South, foundry iron for prompt shipment is scarce and sales are confined to odd carload lots that the furnaces

can spare. Notwithstanding reports to the contrary, there is considerable iron in the South that can be had for first half shipment, but there is no energetic move on the part of the furnaces or warrant iron holders to dispose of this iron. Southern iron is now selling strictly on the Government's analysis of 1.75 to 2.25 per cent silicon for No. 2 foundry, and the usual advances for an iron higher in silicon are being made. Recent sales include two to Indiana melters of 500 tons each and 800 tons to a Northern Ohio melter, all for first half shipment. Southern Ohio producers are able to take on only a limited tonnage of foundry iron for shipment either this year or in the first half of next year. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, prices as follows:

Southern coke, No. 2 foundry and 2 soft	$35.90
Southern Ohio coke, No. 2	34.26
Basic, Northern	34.26

(By Mail)

Finished Material.—The nearby mills are now quoting No. 10 blue annealed sheets at 4.18½c.; No. 28 black 5.18½c. and No. 28 galvanized at 6.43½c., all f.o.b. cars Cincinnati or Newport, Ky. These quotations are only on carload lots and very little business has been transacted so far on the new basis. The local jobbers have not yet fixed a new schedule and sold a number of small lots of sheets at the old prices up until Saturday. The warehouse price on structural shapes remains at 5.15c.; steel bars, 4.65c.; twisted steel bars, 4.70c.; flat bars 2 x 1 in. and heavier and also rounds 3 in. in dia. and over, 5c., and plates 7c. Considerable interest is taken in the warehouse quotation on wire nails. Some jobbers sold last week wire nails at $4 per keg base but the general quotation to-day is 4.20c., which is 30c. above the ruling price two weeks ago.

Coke.—The recent rearrangement of prices of $6 per net ton at oven on furnace coke and $7 for foundry coke will doubtless help to clear the situation to some extent. The new prices on foundry coke may tend to increase the output in different districts, but no quick change may be expected unless the labor situation improves, which is a matter of considerable uncertainty at the present time. Inquiries are still coming in for both furnace and foundry coke, but foundry users are more insistent than furnace coke consumers, as many of them are operating on very short supplies. The Connellsville district seems to be the only one where any coke can be bought and sales from that territory are confined mostly to carload lots. Shipments on old foundry contracts are only reasonably good and frequent complaints are made. Wise County, Pocahontas and New River operators are not now offering any coke for any delivery.

Old Material.—The market is stagnant and the new price arrangement has brought out no business. It has also not had any effect on previous prices, but a rearrangement is expected to be made on No. 1 wrought and on borings and turnings. As a whole, quotations are firmer and as soon as buying commences it is apt to grow in volume at an unexpected rate, because it is stated that many users of scrap will soon run short.

The following are dealers' prices, f.o.b. cars, southern Ohio and Cincinnati:

Per Gross Ton

Bundled sheet scrap	$17.50 to $18.00
Old iron rails	32.00 to 32.50
Relaying rails, 50 lb. and up	44.00 to 44.50
Rerolling steel rails	33.00 to 33.50
Heavy melting steel scrap	25.00 to 25.50
Steel rails for melting	24.50 to 25.00
Old carwheels	25.00 to 25.50

Per Net Ton

No. 1 railroad wrought	$28.50 to $29.00
Cast borings	13.00 to 13.50
Steel turnings	13.00 to 13.50
Railroad cast	18.50 to 19.00
No. 1 machinery cast	24.00 to 24.50
Burnt scrap	13.00 to 13.50
Iron axles	40.00 to 40.50
Locomotive tires (smooth inside)	33.50 to 34.00
Pipes and flues	15.50 to 16.00
Malleable cast	19.00 to 19.50
Railroad tank and sheet	14.00 to 14.50

Birmingham

BIRMINGHAM, ALA., Nov. 12—*(By Mail)*.

Pig Iron.—Iron makers of the Birmingham district in all likelihood will abandon the old nomenclatures of No. 1 and No. 2 foundry for the sale of iron, selling iron instead on the basis of analysis. Foundrymen of the district declare this will probably be the first effect of fixing of differential rates by agreement of the committee of the American Iron and Steel Institute and manufacturers. The differential rates were received in Birmingham last week by iron makers, and while in some respects they are not satisfactory, the producers assert they are doubtless necessary, and they are perfectly willing to abide by them. The differential rates already are being quoted in this market, and preparations for changing the basis of selling iron from the No. 1 and No. 2 basis to that of analyses of makes are under way. The basic price of $33 per gross ton, f.o.b. cars furnace has been in effect in this market for some weeks. J. W. McQueen, vice-president of the Sloss-Sheffield Steel & Iron Co., declared that he had not had opportunity to analyze the differentials suggested by Judge Gary's committee. "However," he said, "we will accept them, although I believe it will be necessary to change the nomenclature, and sell iron on a basis of analysis." Other iron makers, expressed themselves in similar vein, and declared they would conform to the differential rates at once. In the selling end of the iron market in the Birmingham district this week there was little of interest. Very little iron was sold, and makers were occupied mainly with old contracts.

San Francisco

SAN FRANCISCO, Nov. 6.

The announcement that the ship men probably would not accept the finding of the United States Shipbuilding Labor Adjustment Board on the scale of wages for shipbuilders added another element to the uncertainty of the market, and caused considerable uneasiness. The board has been in continuous session here for the past two weeks and it was expected that a working agreement which would be permanent would be reached. The decision arrived at is so unsatisfactory to the workers that another walk out in the near future is predicted. In other respects the market is, as one steel man put it, "Governmental," and is practically unchanged from the conditions which prevailed two weeks ago. Another reduction in the price of sheets and bars is announced by the jobbers, but it is believed that the bottom has now been reached, as the jobbers are not inclined to reduce their stocks further. At present prices some of them are selling both sheets and bars at a loss. This market is bound to strengthen as soon as the railroad freight conditions improve and the Government embargo of export to Japan is modified.

Bars.—The condition of the market on bars has not changed. The price has remained the same whenever a price was tentatively quoted, and the recession which some predicted has not yet materialized in mill quotations. The feeling that bars would go lower has, however, resulted in another reduction in some cases of the jobbers' price, 6c. being generally quoted. It is not expected that this figure will be long maintained.

Structural Materials.—Structural materials are very quiet, although there is considerable demand, judging from the inquiries received. A. B. Fletcher, chief engineer for the State Highway Commission, is trying to have Judge R. S. Lovett release the railroad embargo on open cars, so that sand and gravel may be hauled for road building. If this material could be obtained freely the commission stands ready to give orders for a considerable amount of structural material for the building of bridges. The Mare Island Navy Yard is building nine large structures, the structural material in which was bought for the East and is being fabricated at local shops.

Plates.—The market for plates is unchanged, but it is predicted that prices will probably go lower. As

soon as the old contracts are completed the Government price will prevail, and this means a material reduction. However, as the Government demand is large and expected to increase, private consumers may not receive much advantage. The Government demand is 60 per cent and more of many of the mills now, so the local dealers argue that, with the increased Governmental need there will be little or nothing for the general public, once the present stock is consumed.

Sheets.—The general condition of the market on sheets keeps pace with that on plates. Among the jobbers, however, there has been a further reduction. For No. 28 gage a quotation of 10.50c. was made to-day. Blue annealed sheets are also showing weakness among the jobbers.

Wrought Pipe.—Representatives of large manufacturers of tubular goods find it difficult to promise delivery of wrought pipe under 16 or 18 months. They are taking orders for small pipe on a 20-week delivery basis. Like all other materials in the iron and steel trade, Government orders are taking precedence, and the fact that a contract for 70 new ships has just been made convinces the local representatives and jobbers alike that wrought pipe will be scarcer on this coast.

Cast Iron Pipe.—Very little business is offered for cast iron pipe. Many cities are in need for large supplies for their water distribution, but at the present prices they cannot afford to buy. The city of Hollywood, in the southern part of this State, for instance, recently voted $3,000,000 to extend its water mains. Between the time the ordinance was passed authorizing the bond election and the voting on the matter the price of cast iron pipe advanced so much that the city could not with the amount allowed buy enough pipe to fulfill the letter of the law. A second election to increase the bond issue is mentioned, but the proposition is not meeting a hearty response. There are other municipalities which are in need of pipe, but they are holding off in hope of a slump. The general opinion here is that an advance in price rather than a recession is more likely to come with the new year. However, cities must have pipe sooner or later.

Pig Iron.—The market on pig iron is settling down to prices based upon the Government War Board agreement with the American Iron and Steel Institute. No. 2 foundry is being quoted at about $34 and No. 1 at about $36. There is much more inquiry than business, but it is expected that buyers of pig will be in the market for considerable quantities in the near future. Ferromanganese is temporarily down, but increased prices are expected during the winter on account of the difficulty of getting the ore.

Old Material.—The market for scrap is well supplied with material and prices are steady. The scrap men have got together on the question of price and a steadier market in old materials is expected to result.

Buffalo

BUFFALO, Nov. 12.

Pig Iron.—Inquiry is heavy and coming from all directions, both for early shipment and for first half and third quarter delivery next year; but finding very little available tonnage for early shipment in the Buffalo district, furnace companies being out of the market for 1917 shipment. One furnace interest has sold an aggregate of 2500 tons of foundry grades, some of it being No. 1 foundry at $34.50 and some of it No. 2 X, at $33.50, furnace; a portion was for prompt shipment from the stack at Troy, which has been obliged this week to go out of blast on account of inability to secure coke, and will probably remain out for two or three weeks. Nearly all producers are making sales for 1918 shipment, but are not urging buyers to place orders, merely quoting on inquiries presented and favoring old line customers, it being very difficult for melters who have not bought from regular sources of supply to get their requirements filled. The Government scale of prices and grade classification controls quotations for contracts for third quarter delivery as well as for first half. The coke situation continues to be very troublesome, the shortage both for furnaces and foundries being severely felt. Furnaces are idle in the Buffalo district and foundries face shut-downs through lack of fuel. Shortage of labor at ovens and at the mines is the principal cause of the trouble. The pressure on furnaces for shipment on contract iron is extremely heavy and with a limited production furnacemen are trying to prorate equitably the tonnage produced to the best of their ability. Practically all requisitions for shipment are covered by Government order numbers, showing that the tonnage is going directly or indirectly into Government use. Three of the furnaces of the district are out of blast—one for relining and two for lack of coke. The price schedule is the same as for a week ago, f.o.b. furnace, Buffalo, as follows:

No. 1 foundry	$34.50
No. 2 X	33.50
No. 3 foundry	32.50
Gray forge	32.00
Malleable	33.50
Basic	33.00
Lake Superior charcoal, f.o.b. Buffalo	39.75

Finished Iron and Steel.—A number of inquiries, ranging from 100 to several hundred tons each, are appearing in the market, for structural material for replacement of stocks for fabricators. So far as known, the inquiries have not found placement on mill books, because of the desire of the mills to conserve their output for the production of orders already on the books and to supply government demands. It is reported a contract has just been awarded for 12,000 tons of shipbuilding material for shipment to Canada, delivery to commence in October, 1918, and to be forwarded at the rate of 1000 tons per month.

Old Material.—The week has shown good demand for heavy melting steel, machine shop turnings and cast-iron borings, although there have been no large sales of any grade. Heavy melting steel is selling at $29 to $30, which is about $1 per ton higher than quoted for the week previous, the Government price for that commodity as announced being about that much higher than the ruling price in this market a week ago. No. 1 railroad wrought is now held at $34 to $35; machine shop turnings at $18 to $18.50, and cast-iron borings at $19 to $20. The Government price established on the four commodities mentioned above has not affected the prices on other grades of scrap; but it has had a restraining effect on speculation by dealers, as in order to make any profit the speculative dealer must buy at a price under the price fixed by the Government. Labor shortage, lack of cars and general transportation conditions are still interfering with prompt deliveries on out-of-town contract obligations, but the local consuming market is absorbing a large percentage of the scrap materials now originating here. We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$29.00 to $30.00
Low phosphorus	36.00 to 38.00
No. 1 railroad wroughth	34.00 to 35.00
No. 1 railroad and machinery cast	27.00 to 28.00
Iron axles	45.00
Steel axles	45.00
Carwheels	30.00 to 31.00
Railroad malleable	28.00 to 29.00
Machine shop turnings	18.00 to 18.50
Heavy axle turnings	25.00 to 26.00
Clean cast borings	19.00 to 20.00
Iron rails	37.00 to 38.00
Locomotive grate bars	20.00 to 21.00
Stove plate	20.00 to 21.00
Wrought pipe	26.00 to 27.00
No. 1 busheling scrap	25.00 to 26.00
No. 2 busheling scrap	17.00 to 18.00
Bundled sheet stamping scrap	19.00 to 20.00

British Steel Market

Advance in Maximum Pig-Iron Prices Expected —Tin Plates Higher and Firmer

(*By Cable*)

LONDON, ENGLAND, Nov. 14.

The pig-iron market is strong and an official general advance of fully 10s. is expected owing to the advance in coke. American semi-finished steel is nominal. Steel bars have sold to India at £35, c.i.f., early shipment. Ferromanganese is unsettled. Canada has paid $290,

c.i.f., for forward shipment. Tin plates are firmer at 30s. 9d., allowing for an advance of 10s. We quote as follows:

Tin plates, coke, 14 x 20; 112 sheets, 108 lb., f.o.b. Wales 30s. 9d.
Ferromanganese, £45 nominal.
Ferrosilicon, 50 per cent, c.i.f., £35 upward.
On other products control prices are as quoted in THE IRON AGE of July 19, p. 171.

Price of Coal Advanced—Tin-Plate Output Larger—The Ferromanganese Position

(*By Mail*)

LONDON, Oct. 23.—The stringent conditions may become still more accentuated with the ever increasing demand for war purposes. While steel production is apparently still short of current needs, the use of this material is being more and more restricted in some trade branches and exports are being kept down. This also probably accounts for the fact that the allocation of supplies of ferrochrome is now under Government control, while users have been requested for particulars of their stocks, contracts, etc.

A new feature of influence in the general situation is the recent advance of 2s. 6d. a ton in the cost of coal which points to an increase in the cost of pig-iron production and a revision of the maxima. This would involve a similar procedure in allied products, unless it be found possible to bring about adjustments in the various branches without disturbing the present maxima, as suggested by some who do not relish a general revision. The consumer must expect, however, to pay more for his supplies. Under this influence the demand for pig iron, after a short-lived lull, is on the increase but makers are disinclined to book orders except subject to an official change. The tone is strong, even in forge iron, due to increased demand. Consumers of Cleveland foundry grades are comfortably situated, the supply here being ample, although deliveries are retarded by car scarcity.

Ferrosilicon Prices

It is understood that the maximum price of blast-furnace ferrosilicon is £10. 10s. for 9 per cent, and £12 for the 12 per cent grade, net f.o.t., but this requires official confirmation. The position of hematite is intensely stringent but nominally unchanged. Demand is heavy but allocations are kept down. A new blast furnace has been put on basic iron by the Stanton Ironworks Co. in Derbyshire, which, before the war, had nine furnaces on foundry iron but, owing to the shortage of basic iron for steelmaking, allocated at the request of the Government two furnaces in the last six month for this purpose, so that three are now operating.

Little semi-finished steel is to be had for ordinary trade needs, although output is at a high rate. Supplementary allocations representing about 1000 tons a week were recently made to the Welsh tin-plate mills. Government needs, of course, make the continuation of stringent conditions inevitable. Official prices of sheet bars and billets are unchanged. The reluctance of British consumers to pay the full terms asked, until a week or so ago, for American wire rods has induced concessions and small sales have ensued at £28 to £27 c.i.f. Liverpool for shipment this quarter with further offers now at £26.

Finished iron and steel is strong, probable higher costs of raw materials tending to add to the reticence in booking new orders, in view of the intense accumulation of orders. War work is given primary attention and there is very little scope for mercantile business, in spite of constant efforts toward plant extensions. Within the next few months productive capacity should be developed further but there is no prospect of a revival of merchant business. It is reported that John Brown & Co., intend to erect a steel plant at their Trent Ironworks and may transfer other steel operations thither from Sheffield.

Electric Furnace in Cleveland District

The recent introduction of the electric furnace in the Cleveland district deserves notice. Under the basic process, steel of the highest quality can be made from the phosphoretic Cleveland ore. The steel is said to be purer chemically than that secured by the acid process. By the use of the electric furnace high quality carbon steels can be produced which, as regards purity, are almost equal to best Swedish charcoal steels.

As cabled, the allotments of steel bars to the tin-plate mills were increased by about 7½ per cent and the mills' output since Oct. 15 has been about 37 per cent of normal, the increase representing roughly 20,000 boxes a week, chiefly intended to facilitate the covering of Allied requirements. The market is very firm, makers not being eager to contract further, pending a settlement of the wage question through Government action. The men insist on an increase in their war bonus to 100 per cent on the basis of which makers would expect the official maximum to be raised by at least 1s. 6d. per basis box. The increase in the cost of coal is another argument for price revision.

Revision of Ferromanganese Price

Ferromanganese is extremely quiet, and somewhat unsettled because a revision of the home trade price is now under consideration. The fixed price for the home trade for a long time has been £25, which is considered now unduly low. Until a decision has been reached, sales to the home trade have been practically suspended. There is virtually no change in export business except that rather easier terms are being entertained round about $350 for shipment to American North Atlantic ports. The market is chiefly nominal with the quotation to continental ports about £80 f.o.b. for loose.

Philadelphia

PHILADELPHIA, Nov. 13.

Between 50,000 and 60,000 tons of basic iron have been sold in this market during the past week, 45,000 tons of which were taken by an Eastern plate mill at the $33 price at furnace. A bridge company which is usually supplied by its own furnaces came into the market for 8000 to 10,000 tons of basic, but received only a part of this quantity. This iron was wanted for prompt delivery to relieve a serious shortage. Announcement of fixed prices for old material has been followed by a better demand and prices have strengthened. Heavy melting steel was sold here a few days ago at $27, delivered in the Philadelphia district. No. 1 railroad wrought, fixed at $35, will probably be hard to get at that price. The fixing of prices for warehouses is covered fully in another column of this issue.

Coke.—A New York coke company has been quietly selling for next year in this district, and another seller is about to do likewise. Coke for prompt delivery is not to be had, however, though some relief is promised through the efforts of the authorities at Washington in giving priority of shipment to coke until such time as the present serious shortage is overcome. The Fuel Administration has fixed the price of 72-hr. foundry coke at $7, ovens. Blast furnace coke was fixed by the President at $6.

Pig Iron.—An Eastern plate mill came into the market last week for its first quarter requirements of pig iron, taking about 45,000 tons of basic, most of which was sold by one company. The price was $33, at furnace. Other sales of basic and of a few thousand tons of phosphorus were made during the week. A bridge company came into the market for 8000 to 10,000 tons of prompt basic to meet urgent requirements due to troubles at its own furnace. A Philadelphia company is in the market for 6000 tons of basic for first quarter. The inquiry for next year is active and involves a considerable tonnage, while for prompt delivery a large quantity of iron could be sold if it were available. Foundry iron is being sold mostly in small lots, from a carload to 500 tons, some of which is for this year and some for next. One Eastern Pennsylvania furnace has sold about 20,000 tons of foundry iron in the past three weeks, mostly in small lots. The question of commissions for brokers has not been settled by Government edict, as on coal and coke, so brokers are charging their usual commissions, about 2½ per cent on foundry iron and 1 per cent on basic iron, in addition to the price of the iron,

the commissions being charged as "service." Brokers and merchants are also able to make some profit through the differentials permitted, but not specifically fixed, on variations of silicon, manganese, phosphorus and sulphur. We quote the following standard grades at furnace, the freight to destination to be added:

Eastern Penna. No. 1 X	$34.50
Eastern Penna. No. 2 X	33.50
Eastern Penna. No. 2 foundry	33.00
Virginia No. 2 X	33.50
Virginia No. 2 foundry	33.00
Basic	33.00
Gray forge	32.00
Bessemer	36.30
Standard low phosphorus	53.00
Low phosphorus (copper bearing)	50.00

Ferroalloys.—Although reports of price fixing of ferromanganese have been in the air for some weeks, it is now regarded by producers as improbable that the Government will find it necessary to do so. Unofficially, it is said that when the price of ferromanganese was about $350 per ton the makers received a strong intimation from Washington that unless this was substantially reduced, the Government would establish a control price. A few large producers have gradually worked the quotation down to $250, and even this has been shaded at least to $249. Consumers have not shown a disposition to contract for next year, but makers believe they will do so as soon as they become convinced that price fixing is not in prospect. Spiegeleisen has weakened and the market is now quoted at $65 to $70, furnace, but the inside price could probably be obtained only on desirable orders. The prices quoted apply for any delivery.

Billets.—Makers of re-rolling billets find it more profitable to use any surplus, after deliveries are made on old contracts, in their own mills. Under present conditions, it is doubtful whether there will be any billets offered for sale in this market for some time to come. The $47.50 price is not attractive to makers, and they will not sell as long as they can make more profit by conversion into finished material. Forging billets, mostly in small lots, have been sold at prices varying from $75 to $97.50 per ton, the higher quotation applying on special quality.

Sheets.—Fixing of prices was followed by a fairly large number of orders, mostly under 500 tons, for delivery over the remainder of this year. An eastern Pennsylvania mill has accepted orders from regular customers for blue annealed sheets for the first quarter of next year.

Structural Material.—Opinions differ among representatives of mills rolling structural shapes as to the quantities which will be available for general building construction. The extreme view on one hand is that there will be a decided scarcity, and on the other hand that there will be sufficient after Government requirements are satisfied to take care of such building as is likely to be considered necessary during the war. Only one mill in this district is prepared to take contracts, at the Government price, with definite dates of delivery, and of course this mill alone could not take care of anything approaching normal demand. Other shape mills are either loaded up with Government work at the present time, or see so much of this work coming to them in the near future that they are not willing to commit themselves. The Government has changed the plans for the new machine shop at the Washington Navy Yard to concrete construction. The McClintic-Marshall Co. received an order for about 1800 tons for a plate and angle shop at the Hog Island shipyard of the American International Shipbuilding Corporation.

Plates.—Orders for about 70,000 tons of plates have been divided among several mills by the Emergency Fleet Corporation for the first 25 ships to be constructed by the American International Shipbuilding Corporation at Hog Island. Mills have also received orders for plates for submarine destroyers. Offerings of plates for prompt delivery are a little freer. Such plates are extra rollings and are sold, in most instances, only to regular customers. An eastern Pennsylvania mill, though selling plates this way, refuses to contract ahead. It seems beyond question that there will be a great shortage of plates next year for ordinary commercial purposes. Many inquiries are being turned down. Reports from Washington indicate that a limited tonnage of plates, possibly 150,000 tons, will soon be released for shipment to Japan. Probably plates already in storehouses on the Pacific Coast will be the first released. Shipment of plates for Japan to the coast on domestic bills of lading has been stopped. Only those shipments for which cargo space has been reserved will be carried by railroads. The Government has ordered 15,000 tons of ship plates for shipyards in Italy from an eastern Pennsylvania mill. The Baldwin Locomotive Works and the American Locomotive Co. will each build 750 locomotives for Russia. A large car order for Italy is also pending.

Old Material.—A better inquiry for iron and steel scrap followed the announcement of fixed prices by the Government. About 1000 tons of No. 1 heavy melting steel was sold last week for delivery at Coatesville, Pa., at $27. Some dealers are asking up to $29, the fixed maximum being $30 at consuming port. Machine shop turnings and cast borings have not as yet been materially affected by the fixed price of $20 per gross ton. Rolling mill turnings have been selling at $18 to $20 and cast borings at $20 to $22. Dealers say that cast borings adapted for special purposes, as for chemical plants, will continue to take an extra of about $2 per ton above the maximum price, or $22. No. 1 railroad wrought was fixed at $35, though recent sales in this district have ranged from $38 to $43. Some dealers say that No. 1 wrought will be scarce at $35 and consumers may be forced to take yard wrought, which is now quoted at $30 to $32.50 delivered, with predictions that it will go higher. There is a good demand for No. 1 wrought at the fixed prices, but no sales are reported. A good demand from carwheel makers, who are short of charcoal pig iron, for old carwheels has stiffened the price about $1 per ton. Low phosphorus scrap, No. 1 cast, grate bars and stove plate are higher. Railroad malleable is lower. The large dealers in this market assert their determination to adhere absolutely to the Government recommendations, but a little confusion has resulted from the attitude of the small merchants, who have in some instances insisted on the full maximum price for their material. In some quarters, it is believed that the fixing of prices will have the effect of diverting business away from the dealer and broker and that mills will be more apt to buy direct from large producers. Efforts are being made by dealers to induce producers to accept the new conditions and facilitate the normal movement of scrap. The inspection bureau of the American Board of Scrap Iron Dealers is now in working order in the office of Secretary C. A. Barnes, Widener Building, Philadelphia. Purchasing agents are being asked to co-operate in reducing car rejections to a minimum. The committee on iron and steel scrap of the American Iron and Steel Institute will now take up priority matters with Washington. Confusion has resulted from the order of Judge Lovett of the War Industries Board for the use of all open freight cars for coal, coke, ores, etc. Scrap iron was excluded, though it is held to be just as important to blast furnaces and steel mills as coal or coke, Scrap dealers have had difficulty in shipping to blast furnaces, which directly have no Government orders, but which are shipping pig iron to war plants. Shippers are now required by the railroads to make affidavit that scrap is intended for war work before a permit is granted. We quote for delivery at consuming points in this district the following prices:

No. 1 heavy melting steel	$26.00 to $28.00
Steel rails, rerolling	38.00 to 40.00
Low phosphorus heavy melting	36.00 to 40.00
Old iron rails	38.00 to 40.00
Old carwheels	30.00 to 33.00
No. 1 railroad wrought	35.00
No. 1 forge fire	22.00 to 23.00
Bundled sheets	22.00 to 23.00
No. 2 busheling	15.00 to 16.00
Steel turnings (for blast furnace use)	15.00 to 16.00
Machine shop turnings (for rolling mill use)	18.00 to 20.00
Cast borings (for blast furnace use)	15.00 to 16.00
Cast borings (clean)	20.00
No. 1 cast	30.00 to 32.00
Grate bars	21.50 to 22.50
Stove plate	20.00 to 23.00
Railroad malleable	30.00 to 32.00
Wrought iron and soft steel pipes and tubes (new specifications)	30.00 to 32.50

Iron and Steel Bars.—By request of the Government makers of bar iron have recommended a fixed price for their product, and the result is announced in another column as 3.50c. Many in the bar iron trade believed this commodity might escape Government regulation. Price fixing of bar iron was foreshadowed, however, by the announcement of a Government price of $35 on No. 1 wrought scrap. Upon this basis, bar iron producers could not expect to continue getting 4.50c. to 5c., the prices which have been ruling.

St. Louis

ST. LOUIS, Nov. 12.

Pig Iron.—The announcement of the differential prices on the various grades and classes of pig iron brought no difficulties into this market which had not already existed and the furnace representatives generally accept the figures given out as being as fair as could be expected under the circumstances. The problems now confronting them are more in the way of getting metal than a matter of price, for inquiries continue to flow into the market in heavy aggregates, but very few sales are being made, in comparison with the total asked for. Probably 5000 tons was sold during the week in lots ranging from carloads up to 1000 tons, with deliveries extending through the first half of the coming year. There is, as yet, no disposition to take business beyond that period. The inquiries still pending and for the present with little hope of execution include 20,000 tons of basic, 1000 to 2000 tons of malleable, 2000 tons of No. 2 foundry and a large number of lesser quantities aggregating probably 20,000 tons.

Old Material.—While conditions in the scrap market are somewhat improved, there is still considerable uncertainty while dealers and consumers are adjusting themselves to the fixed prices announced by the Government and figuring the prices to be placed on scrap not specifically covered by the schedule. In consequence quotations are not to be made at present as definitely the market, but rather as an estimate of values which may be revised when the Government figures are more completely digested. We quote dealers' prices, f.o.b., customers' works, St. Louis industrial district, as follows:

	Per Gross Ton	
Old iron rails	$36.00 to	$37.00
Old steel rails, re-rolling	36.00 to	36.50
Old steel rails, less than 3 feet	37.00 to	37.50
Relaying rails, standard section, subject to inspection	60.00 to	75.00
Old carwheels	28.00 to	28.50
No. 1 railroad heavy melting steel scrap	27.50 to	28.00
Heavy shoveling steel	25.50 to	26.00
Ordinary shoveling steel	24.00 to	24.50
Frogs, switches and guards cut apart	27.50 to	28.00
Ordinary bundled sheet scrap	18.00 to	18.50
Heavy axle and tire turnings	18.00 to	18.50
	Per Net Ton	
Iron angle bars	$34.50 to	$35.00
Steel angle bars	27.00 to	27.50
Iron car axles	43.00 to	43.50
Steel car axles	41.00 to	41.50
Wrought arch bars and transoms	42.00 to	42.50
No. 1 railroad wrought	30.00 to	31.00
No. 2 railroad wrought	28.00 to	28.50
Railroad springs	30.00 to	31.00
Steel couplers and knuckles	28.50 to	29.00
Locomotive tires, 42 in. and over, smooth inside	30.00 to	31.00
No. 1 dealers' forge	21.00 to	21.50
Cast iron borings	16.50 to	17.00
No. 1 busheling	23.00 to	23.50
No. 1 boilers, cut to sheets and rings	18.50 to	19.00
No. 1 railroad cast scrap	20.50 to	21.00
Stove plate and light cast scrap	17.00 to	17.50
Railroad malleable	25.50 to	26.00
Agricultural malleable	21.00 to	21.50
Pipes and flues	21.00 to	21.50
Heavy railroad sheet and tank scrap	18.50 to	19.00
Railroad grate bars	18.00 to	18.50
Machine shop turnings	16.50 to	17.00
Country mixed scrap	17.50 to	18.00
Uncut mixed railroad scrap	20.00 to	20.50

New York

NEW YORK, Nov. 14.

Pig Iron.—Sellers of Alabama irons who have endeavored to dispose of their product in New York and New England territory during the past week on the basis of $33, Birmingham, for No. 2 foundry have found themselves up against a stone wall for the reason that buyers were unwilling to contract on that basis plus the high freight rates which must be paid. Effective Nov. 25, the rail and water rate from Birmingham to interior New England points will be advanced to $6.40, while the rate to New York will be advanced to $5.75. The rates to New England points are now variable, being $6 to Boston, $5 to Pawtucket and $5.25 to Springfield, while the present rail and water rate to New York is $4.25. These high rates are not, however, very important for the simple reason that there are no boats available for carrying pig iron and the all rail rate, which is not to be changed, so far as know, continues, it being $6.15 to New York, while to New England it is $6.40 and to Philadelphia, $5.20. Alabama irons are unable to compete with Northern irons at this rate and their only hope is that the supply of Northern iron will be exhausted and that melters will be compelled to place their orders for the Southern product. During the past week, there has been very fair buying of Virginia irons, including 6000 tons for next half delivery, foundry grades, from one furnace company. Of eastern Pennsylvania irons the buying has been largely for small lots, all at Government prices. For early delivery we quote as follows, tidewater, the Virginia price having been advanced to correspond with the recent advance of 52c. in freight from the gateway to the North, all Eastern shipments:

No. 1 X	$35.25
No. 2 X	34.25
No. 2 Plain	33.75
No. 2 Southern (rail and water)	37.25
No. 2 Southern (all rail)	39.15
No. 2 X Virginia	37.00 to 37.25

Ferroalloys.—The domestic ferromanganese market is a little more active with sales in the last week aggregating 1200 to 1500 tons, mostly in small lots. The majority of this went at $250, furnace, and was largely for next year's delivery. Italy has taken 200 tons for prompt shipment and has been receiving considerable ferromanganese in recent months from this country. Offerings to pay $225 to $240 have not been successful and the market is quoted at $250 for all positions. Spiegeleisen, 20 per cent, has also been active. Besides the large sale noted a week ago, at least 5000 or 6000 tons has been sold this last week, all for next year's delivery except 400 to 500 for November to January shipment. These sales were made at about $60 to $65, furnace, which is the quotation for next year's delivery with earlier material commanding about $70, furnace. Ferrosilicon, 50 per cent, is in active demand for 1918 delivery with inquiries aggregating about 1500 tons before the market. Producers are quoting $150 for next year, but it is understood that this alloy has been sold recently as low as $140. For this year, $175 is asked.

Finished Iron and Steel.—Little buying on domestic account is noted. Settlement among manufacturers of forms of steel not covered by the fixed prices already announced appears to proceed slowly, some producers resisting the reductions as being altogether too great. Jobbers' prices, partly in preparation for the revision, have been lowered to the levels maintained recently by the larger warehouses. The 30,000 cars for Russia were finally closed late last week and the distribution has been made for 4975 cars for the United States expeditionary force in France. Italy is in the market for 3000 to 5000 cars. Japan is sounding the market for 15,000 to 30,000 tons of rails, on part of which early delivery could probably be obtained. A contract for 900 tons for a 15-story hotel on Seventy-third Street, east of Amsterdam Avenue, New York, to the Hinkle Iron Co., for the Hotel Hamilton Corporation stands conspicuous in a section of the country in which little building work has been done for some time. The hangars for Langley Field, 3500 tons, are about closed; it is understood that Lewis F. Shoemaker & Co. will provide 750 tons of the work. Awards have been made for 220 steel derrick towers for the Hog Island shipyard development and the American Bridge Co. will provide 75 of them, requiring 2100 tons. John Eichleay, Jr., Co. has also one of the contracts. Other new work includes 3100 tons for the Anaconda Copper Mining Co. to the American Bridge Co. and 200 tons for four bridges for the Long Island Railroad to the Bethlehem Steel Bridge Corporation. Bids were taken on Nov. 12 on 200 tons for a storehouse and 200 tons for a foundry

addition for the Washington Navy Yard. What business is done appears now to be going at the fixed prices, but we note higher prices for export, as, for example, 300 tons of plates at 5.75c., Pittsburgh, to go into storage to be exported on obtaining license. We quote mill shipments of steel bars at 3.095c., New York; shapes, 3.195c.; plates, 3.445c., and bar iron at 4.695c. to 4.945c., New York. Out of store we quote iron and steel bars at 4.75c., New York, shapes 5c. and plates 8c., with a possibility that 7c. in plates may be done.

Old Material.—Following the action of the Government in naming quotations on heavy melting steel, borings, turnings and No. 1 railroad wrought, there has been very little activity. While no one is paying more than Government prices—and this applies to dealers who sold short some time ago at higher prices than those named by the Government—the Government quotations are being shaded and prices remain as for several weeks past. We quote prices of brokers as follows to New York producers and dealers, per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$24.00 to $24.50
Old steel rails (short lengths) or equivalent heavy steel scrap	24.00 to 25.00
Relaying rails	45.00 to 50.00
Rerolling rails	33.00 to 34.00
Iron and steel car axles	41.00 to 42.00
No. 1 railroad wrought	32.00 to 33.00
Wrought-iron track scrap	27.00 to 28.00
No. 1 yard wrought long	27.00 to 28.00
Light iron	7.00 to 8.00
Cast borings (clean)	16.00 to 17.00
Machine-shop turnings	14.00 to 15.00
Mixed borings and turnings	13.00 to 14.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long	25.00 to 26.00

Dealers in New York City and Brooklyn are quoting as follows to local foundries, per gross ton, but for delivery to cupola platforms of Brooklyn foundries, about $3 more is quoted:

No. 1 machinery cast	$25.00 to $26.00
No. 1 heavy cast (column, building materials, etc.)	21.00 to 22.00
No. 2 cast (radiators, cast boilers, etc.)	21.00 to 22.00
Stove plate	19.00 to 20.00
Locomotive grate bars	16.00 to 17.00
Malleable cast (railroad)	27.00 to 28.00
Old carwheels	27.00 to 28.00

Cast Iron Pipe.—On 812 tons of 4-in. pipe and 1200 tons of 6-in. pipe for the Government, bids were submitted last Saturday as follows: Lynchburg Foundry Co., $109,687; National Pipe & Foundry Co., $111,711; Central Foundry Co., $112,875; R. D. Wood & Co., $113,287; United States Cast Iron Pipe & Foundry Co., $115,968; Stokes & Ivy, $117,956. The award has not yet been announced but will undoubtedly be made to the Lynchburg company. Considering that this is Government business, the bids are not very low. On ordinary business, New York quotations are still $56.50 on 6-in. and heavier and $59.50 on 4-in.

Plans of the Pittsburgh Export Co.

PITTSBURGH, Nov. 14.—(*By Wire*).—Associated with A. H. Dillon, formerly assistant general sales manager of the Youngstown Sheet & Tube Co., who resigned to become president of the Pittsburgh Export Co., will be Charles J. Graham, president of the Graham Nut Co.; J. Rogers Flannery, president of the Flannery Bolt Co.; E. J. Lanahan, president of Fort Pitt Malleable Iron Co., and J. M. Hansen, president of Standard Steel Car Co., all of Pittsburgh. The company will engage in a general iron, steel and machinery domestic and export business. At present, it is buying steel for 50 merchant vessels building for the Emergency Fleet Corporation. This work is being handled by Mr. Dillon, who will be in charge of the Pittsburgh office.

The Nordberg Mfg. Co., Milwaukee, a large manufacturer of steam, gas and oil engines and machinery, has installed a complete hospital and infirmary in connection with its main works at Oklahoma Avenue and Chicago Road, Milwaukee. The building is of the bungalow type and located between the foundry and machine shop, and is equipped with all modern surgical appliances.

IRON AND INDUSTRIAL STOCKS

Unfavorable War News Responsible for Further Recessions

NEW YORK, Nov. 14.

Following the sharp declines of week before last, which were generally attributed to short selling, there was further recession last week, forcing many stocks to the lowest level in years. This latest slump is attributed almost entirely to the unfavorable war news, especially that relating to Russia and Italy, which indicated that the war might be continued indefinitely. Transactions in the week of United States Steel common amounted to 1,400,000 shares ranging from 95⅞ to 88¾, and recording a net loss of 3⅛ points. Other shares were equally active and weak and in some cases the lowest from the high points of the year were as high as 75 points. Friday and Saturday there was a pretty general rally and the week ended with a somewhat better feeling.

Developments in the bond market were like those in the stock market and declines of two and three points were common as the result of the week's transactions.

Among the very few industrial stocks that recorded gains were the American Car & Foundry Co., ¼ point and the Midvale Steel Co., ⅜. Among the stocks which recorded losses were the following: American Locomotive pref., 2; Baldwin Locomotive com., ⅝; Bethlehem Steel com., 1; Bethlehem Steel class B, ⅝; Bethlehem Steel pref., ¾; Colorado Fuel & Iron, 1½; Crucible Steel com., 3½; Gulf States Steel, 5; National Acme, ½; Pressed Steel Car com., 1; Pressed Steel Car pref., 8¼; Republic Iron & Steel com., 1⅞; Republic Iron & Steel pref., 2½; Superior Steel, 2¾; United States Steel com., 3⅛; United States Steel pref., 3; Westinghouse Electric & Mfg. Co., 1⅞.

The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal. com.	16 - 18⅜	Int. Har. of N. J. com	103¾-106
Allis-Chal. pf.	71 - 76	Int. Har. Corp. com.	52 - 55
Am. Can com.	29½- 35¼	Lacka. Steel	68 - 73½
Am. Can pf.	92⅞- 93	Lake Sup. Corp.	10½- 11¾
Am. Car & Fdry. com.	59 - 63½	Midvale Steel	39⅞- 44¼
Am. Car & Fdry. pf.	104	Nat.-Acme.	26½- 26¾
Am. Loco. com.	49 - 52½	Nat. En. & Stm. com.	32¾- 37
Am. Loco. pf.	94½	Nat. En. & Stm. pf.	95
Am. Radia. com.	270½-280	N. Y. Air Brake.	98⅛-106
Am. Ship com.	88 - 89	Nova Scotia St.	72 - 74¼
Am. Steel Fdries.	51 - 54¾	Pitts. Steel pf.	94
Bald. Loco. com.	49¼ - 56¾	Pressed St. com.	49¾ - 55
Beth. Steel com.	74 - 82½	Ry. St. Spr. com.	36½ - 40
Beth. St., class B.	72½- 82½	Republic com	65¼ - 73½
Beth. Steel pf.	89 - 90	Republic pf.	94 - 95
Cent. Fdry. com.	26 - 27	Sloss com.	33½- 37
Cent. Fdry. pf.	36 - 39	Superior Steel	30¼ - 33½
Char. Iron com.	6⅞- 7¼	Transue-Wms.	37½ - 39
Chic. Pneu. Tool.	43 - 46	Un. Al. St. 1st pf.	36¼ - 37
Colo. Fuel	29¾ - 33½	U. S. Pipe com.	10⅝ - 13¾
Cruc. Steel com.	49½ - 56¾	U. S. Pipe pf.	48 - 48½
Crucible St. pf.	85	U. S. Steel com.	88⅜ - 95⅞
Deere & Co. pf.	98 - 99½	U. S. Steel pf.	108¾-109¼
Gen. Electric	122⅛-130	Va. I. C. & Coke	50
Gt. No. Ore. Ctf.	22¾ - 25¼	Warwick	8⅝
Gulf States Steel.	77 - 81½	West. Electric	36 - 39½
Gulf S. St. 1st pf.	101½		

Industrial Finances

The Pittsburgh Steel Co., Union Arcade Building, Pittsburgh, has issued a statement showing sales for three months ended Sept. 30, 1917, as $10,979,461.42, an increase over the same period in 1916 of $4,605,258. Net profits for the three months ended Sept. 30 were $2,048,844.92, after setting aside $1,385,239.75 for estimated war profits and income tax. In other words, the gross profits of the Pittsburgh Steel Co., for the three months ended Sept. 30, 1917, were $3,434,084.67.

The Savage Arms Corporation reports total earnings of $845,829 for the quarter ended Sept. 30, compared with $462,105 for the previous quarter and $2,031,858 for the three months ended March 31 last. The balance available for dividends on the common stock was $564,486. For the nine months ending with September the company earned the equivalent of $25.40 a share on the junior shares.

Sales of the Pittsburgh Steel Co. for the quarter

ended Sept. 30, 1917, amounted to $10,979,461, an increase of $4,605,258 over the same period of last year. Net profits, after setting aside $1,385,239 for estimated war profits and income taxes, amounted to $2,048,844, a decrease of $164,208.

A committee has been formed to take charge of the financial affairs of ex-Governor Eugene Foss of Massachusetts. The committee will take over his securities and the business affairs, including stock of the Sturtevant Blower Co. and the Mead, Morrison Co. Recent weakness of the market is given as the reason for Mr. Foss's embarrassment. The Sturtevant Blower Co. is in splendid condition, and has no obligations outside of current bills, and has two years of work on hand. It is understood that the ex-governor's liabilities are about $10,000 and that the $17,000,000 of assets have shrunk to about $13,000,000. The Mead, Morrison Co. is also in fine condition.

Gross sales of the Pittsburgh Rolls Corporation, of Pittsburgh, which took over the Seaman-Sleeth Company properties some months ago, for the four months ended Sept. 30, amounted to $479,476, and net sales to $441,661. After deducting all selling expenses and administrative costs, including income and excess profits taxes, there remained a net profit of $97,818. Adding "another income" brought the gross income for the four months up to $112,618. Bond interest, normal sinking fund charges and preferred stock dividends call for $10,000 a month.

Crucible Steel Co. of America Annual Report

The annual report of the Crucible Steel Co. of America, Pittsburgh, for the year ended Aug. 31, 1917, has been issued. A statement showing the disposition of the net profits for the year is as follows:

Net profits for the year accounted for as below	$12,282,357 86
Cash dividends on preferred stock (30¼ %)..	$7,562,500 00
Increase in current assets.....	1,316,123 25
Reduction of coal land purchase notes.....	286,000 00
Invested in additional property.....	1,614,174 87
Increase in investments and construction advances to associated companies.....	4,092,820 07
	$15,194,757 23
Deduct:	
Increase in reserve funds.....	2,912,399 37
	$12,282,357 86

Herbert Dupuy, chairman of the executive committee, said in part:

The Crucible Steel Co. was among the very first to place its large manufacturing facilities at the disposal of the Government to be put to such use as might best suit national needs. It has always furnished a great deal of material to and for our own Government, so that when the crisis came it was in the best position to offer prompt assistance. To show the extent of what we are doing, one of our plants alone, the Atha Works, at Harrison, N. J., is to-day supplying directly to the United States Government about 83 per cent of its entire output, in addition to 15 per cent to Government contractors, so that practically the entire output of that large plant goes directly to the assistance of the United States to cover its present war needs.

In our report of last year we expressed the difficulty then confronted of finding the high grade of materials required to make crucibles, in which such a large part of our steel is made. The same trouble continues this year as faced us then. No new clays, yet discovered, produce a crucible as durable as that made from clay mined in Germany. We have experimented with a hundred or more domestic varieties, taken from the four corners of the United States, but have yet to find one which will give the results which were obtained before the war in the use of foreign clays. Besides this, American clays are several times higher in cost than was the German product formerly used. Owing to the poor heat-resisting qualities of the material and its high cost, the crucible steel products of your company, being by far the largest value of its output, now cost such high figures to produce that it is difficult to secure for them a remunerative figure from the public.

For a number of years your board of directors has been endeavoring to devise a comprehensive plan, under which a direct relation might be established between the earnings of the company, and the compensation paid to those of its employees charged directly or indirectly with the responsibility of managing its affairs, the prime object of this being to recompense faithful employees who have been in the service of the company during at least two years. Based upon these considerations a plan has been evolved through which the loyalty and efficiency of the company's employees are recognized and through its scope their best efforts in the service of the company will be developed. Your board considers this to be one of its most far-sighted and profitable investments in the interest of the efficiency of the company and one which is bound to reflect favorable results.

Many of the improvements referred to in our report of last year are still unfinished, owing to the difficulty in securing raw material of every kind in connection with all new construction and installation, and men to do the work.

ATHA WORKS.—During the year, in order to assist the Government in securing additional munitions of war, contracts have been made covering large additions to this plant, including additional buildings for open hearth and electric furnaces, a large forge shop, new hammer-house and a modern warehouse, all of which, together with the machinery to be installed in them, will entail an expenditure of between $2,000,000 and $3,000,000.

CRESCENT WORKS.—The new office building and laboratory under construction at the time of the writing of the last report has now been completed and is a great convenience for the use of our employees and experts.

PARK WORKS.—One of the most important improvements now under way in any of your plants is the one referred to in our last report, where a new open hearth building was contracted for in which to install four 50-ton open hearth furnaces and two 6-ton electric furnaces. It will probably be late in the spring of 1918 before these improvements are completed.

SINGER-NIMICK WORKS.—The construction referred to in our last report, covering the centralization of the boiler-units in this plant, is still unfinished and will hardly be completed before the coming year.

SYRACUSE CRUCIBLE STEEL CO.—This addition to the Crucible Steel Co.'s producing mills has been connected with one of our other plants in Syracuse and is now in successful operation, mills and furnaces recently having been installed in several of its buildings, in order to increase output.

SANDERSON WORKS.—The important addition to this plant, referred to in our 1916 report, has been finished and the plant is now running successfully, turning out the highest grades of drill-rods and drawn wire and steel.

PITTSBURGH CRUCIBLE STEEL CO., MIDLAND, PA.—The addition to the open hearth department of this plant has not yet been completed, but it is hoped that before Christmas its two large open hearth furnaces, which have been added, will be in successful operation. The heat treating building now under construction is expected to be finished and the machinery installed in it complete by the spring of 1918.

Midvale Earnings

Midvale Steel & Ordnance Co. has issued its report covering operations for the quarter ended Sept. 30, 1917. Earnings for the period, compared with the two preceding quarters of 1917, were as follows:

	Quarter Ended		
	Sept. 30, '17	June 30, '17	Mar. 31, '17
Net earnings	$18,045,082	$18,966,135	$15,859,738
Res. for Federal taxes..	7,817,964	8,132,591	6,189,027
Interest charges	805,685	816,521	814,456
Depreciation charges ..	1,382,148	1,758,233	1,800,864
Net profit	*$8,039,285	$8,258,790	$7,055,391

*Equivalent to $4.02 a share earned on $100,000,000 capital stock ($50 par value) in the three months period, or at annual rate of $16.08 a share.

Dividends

The Crucible Steel Co. of America, quarterly, 1¾ per cent on the preferred, payable Dec. 20.

The Dominion Steel Corporation, quarterly, 1¼ per cent, payable Jan. 1.

The Harbison Walker Refractories Co., quarterly, 1½ per cent on the common, payable Dec. 1.

The National Acme Co., quarterly, 75c. per share, payable Dec. 1.

The Niles-Bement-Pond Co., quarterly, 3 per cent on the common, payable Dec. 20, and 1½ per cent on the preferred, payable Nov. 20.

The Pratt & Whitney Co., quarterly, 1½ per cent on the preferred, payable Nov. 20.

The United States Cast Iron Pipe & Foundry Co., quarterly, 1¼ per cent on the preferred, payable Dec. 14.

The Scovill Mfg. Co., monthly, 5 per cent, payable Nov. 15.

The Pittsburgh Steel Co., quarterly, 1¾ per cent on the preferred, payable Dec. 1.

Metal Markets

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
Nov.	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
7	23.50	23.50	71.00	6.50	6.37½	7.87½	7.62½
8	23.50	23.50	70.00	6.50	6.37½	7.87½	7.62½
9	23.50	23.50	70.00	6.50	6.37½	7.75	7.50
10	23.50	23.50	....	6.50	6.37½	7.75	7.50
12	23.50	23.50	71.00	6.50	6.37½	7.87½	7.62½
13	23.50	23.50	73.00	6.50	6.37½	8.00	7.75

NEW YORK, Nov. 14, 1917.

The markets continue inactive. The copper situation remains indefinite, with prices nominal. Tin is scarce and has sold at the highest price in its history. Lead is dull, but firm. Spelter has a better tone and is firmer. Antimony is inactive and lower.

New York

Copper.—In the absence of any definite confirmation of sales to large buyers of either Lake or electrolytic copper for early delivery at the Government or any other price, we continue to quote the fixed price of 23.50c. as nominal. The position of the seller and buyer of small lots continues unsettled, but a little business is being done at above the fixed price. An interesting report is to the effect that refined copper is being delivered for early consumption at 23.50c. to consumers having Government work but not provided with copper by contract. As bearing on the general situation, copper exports to Oct. 1, this year, 370,843 tons, exceed the exports of 360,229 tons in all of 1914.

Tin.—Spot Straits tin sold yesterday at the highest price in its history. A 5-ton lot went at 73.50c. New York, and later a 5-ton lot was offered at 73c., which we quote as the market. Yesterday also the Government, being unable to buy 15 to 25 tons for its Washington Navy Yard needs, requisitioned what it desired from the 250 tons on an incoming steamer, the Mahopah, consigned to various dealers and already sold. No price settlement was announced. The present scarcity is due to the tightness of the permit situation limiting all shipments to stipulated consumers only. Banca and Chinese tin are also extremely scarce. Efforts of the Tin Committee to make some agreement at Washington have not so far relieved the situation, but a solution is announced. In general the market is quiet, buyers awaiting developments and abstaining from the market so far as possible. Arrivals up to Nov. 12 inclusive were 830 tons, with 4100 tons reported afloat. The London market yesterday was £274 per ton for spot Straits, an advance of £13 10s. in the week.

Lead.—The market has quieted down since the strength and activity displayed recently, with buying now in small volume. The leading producer again advanced its price on Wednesday, Nov. 7, from 6c. to 6.25c., New York, which it continues to quote. The outside market stands at 6.50c., New York, or 6.37½c., St. Louis, at which a few sales have been recorded. The situation is strong as a whole and has only one weak point. A few sellers who did not participate in the large market of the last few weeks are now reported as offering some metal at concessions. Most sellers are comfortably filled with orders.

Spelter.—The market has a little better tone this week and is firmer. Sales of small lots have been made from 7.50c. to 7.87½c., St. Louis, in the last week, but they have not been large. The lower prices have about disappeared and the market for prime Western for early delivery is quoted at 7.75c., St. Louis, or 8c., New York. The firmer tone is induced by the belief that Government purchasing on a considerable scale is near at hand. This will involve not only special grades, but also large amounts of prime Western for rods. Important meetings between the War Industries Board and the spelter producers are now being held. Price fixing is likely to be a result of these deliberations. If reports are true that the Government is ordering or has ordered 33,000,000 shells of 3-in. size it will involve 33,000,000 lb. of spelter for brass cases for these shells.

Antimony.—There is better demand and the market is lower. Chinese and Japanese grades are quoted at 13.75c. to 14c. per lb., New York, duty paid.

Aluminum.—The market is inactive with No. 1 virgin metal, 98 to 99 per cent pure, available at 36c. to 38c. per lb., New York.

Old Metals.—The market is practically unchanged. Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible (nominal)	23.50
Copper, heavy and wire (nominal)	23.50
Copper light and bottoms	21.00 to 21.50
Brass, heavy	18.00 to 18.25
Brass, light	12.00 to 12.50
Heavy machine composition	24.00 to 24.75
No. 1 yellow rod brass turnings	15.00 to 16.00
No. 1 red brass or composition turnings	19.00 to 19.50
Lead, heavy	5.50
Lead, tea	4.25
Zinc	6.25

Chicago

Nov. 12.—Old lots of copper amounting to a considerable tonnage have changed hands, the buying, in most cases being necessitated by dire need, and the sellers, in many cases, being over-stocked manufacturers. In antimony, no price at all is obtainable, pending Government action having in view the assurance of its supply. Lead has been active and both the leading interest and the independent producers have advanced their quotations. Tin is quoted to-day at 71.50c., but has been higher, and with the soaring prices there has been considerable activity. Spelter is a trifle higher, but with almost nothing doing. We quote as follows: Casting, Lake and electrolytic copper, 28c. to 30c.; tin, carloads, 71.50c.; small lots, 73.50c.; lead, 6.25c. to 6.50c.; spelter, 7.75c.; sheet zinc, 19c.; antimony, prices withdrawn. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 21c.; copper clips, 20c.; copper bottoms, 19c.; red brass, 19c.; yellow brass, 14.50c.; lead pipe, 4.50c.; zinc, 5c.; pewter, No. 1, 35c.; tinfoil, 42c.; block tin, 47c.

St. Louis

Nov. 12.—In the non-ferrous metals market there has been improvement in some of the weaker items and an addition of strength to those which were strong at the last report. In less than carload lots the quotations to-day were: Lead, 7c.; spelter, 8.50c.; tin, 76c.; copper, nominal, 27.50c.; Asiatic antimony, 18c. In carload lots: Lead, 6.50c. to 6.75c.; spelter, 8c.

In the Joplin district there was continued weakness in zinc ore, though the top basis price was held at $72.50 per ton for 60 per cent metal, with a higher figure for premium ores. The average price, however, was considerably below this figure, and the second-grade ores, which brought $60 per ton the week before, were set back to $57.50 per ton. The average for the week for the district was $61 per ton. In calamine there was also weakness and the basis price for 40 per cent ore was $32 to $35 per ton, with the average for the week for the district at $34 per ton. Lead ore advanced and was sold $10 per ton higher than the week before, though the advance came rather late in the week. The average for the week for the district was $70 per ton. Inability to get cars to handle ore is having a bad effect on the situation and is holding down sales and shipments. Buyers are threatening to retire from the market unless the car situation is improved. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 10c.; heavy yellow brass, 14c.; heavy red brass and light copper, 19.50c.; heavy copper and copper wire, 20c.; lead, 5.50c.; tea lead, 5c.; zinc, 5c.; pewter, 25c.; tinfoil, 42c.

Pointing out that 71 per cent of the gas produced in West Virginia is transported to points outside the state to the disadvantage of West Virginia manufacturers, a resolution has been unanimously adopted by the Wheeling Council, calling upon the State Public Service Commission and other official bodies to take whatever action may be necessary to insure an adequate supply of fuel for West Virginia industries.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

(Some of these quotations are nominal, showing prices which prevailed when last sales were made. Published as a matter of record.)

Freight rates from Pittsburgh on iron and steel articles, aside from wrought iron and steel pipe in carloads, per 100 lb. New York 19.5c.; Philadelphia 18.5c.; Boston 21.5c.; Buffalo 11.6c.; Cleveland 13.5c.; Cincinnati 18.5c.; Indianapolis 20c.; Chicago 21.5c.; St. Louis 27c.; Kansas City 47c.; minimum carload 36,000 lb.; St. Paul 35.5c.; minimum carload 36,000 lb.; Denver 79c.; minimum carload 36,000 lb.; Omaha 47c.; minimum carload 36,000 lb.; New Orleans 30.7c.; Birmingham 46c.; Pacific Coast 75c.; minimum carload 80,000 lb. To the Pacific Coast, the rate on steel bars and structural steel is 90c.; minimum carload 40,000 lb. and 85c.; minimum carload 50,000 lb. On wrought iron and steel pipe, the rate from Pittsburgh to Kansas City is 40c. per 100 lb., minimum carload 46,000 lb.; to Omaha 40c., minimum carload 46,000 lb.; to St. Paul 35.5c., minimum carload 46,000 lb.; Denver 79c., minimum carload 46,000 lb. *A 3 per cent transportation tax now applies.*

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in., angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 3c.

Wire Products

Wire nails, $3.50 base per keg; galvanized, 1-in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1-in., $2.50. Bright basic wire, $3.35 per 100 lb.; annealed fence wire, nos. 6 to 9, $3.25; galvanized wire, $3.95; galvanized barb wire, and fence staples, $4.35; painted barb wire, $3.65; polished fence staples, $3.85; cement-coated nails, $3.40 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 47 per cent off list for carload lots, 46 per cent for 1000-rod lots, and 45 per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large rivets.....$4.65 base
7.15 in. x 6 in. smaller and shorter rivets. 45-10 per cent off list
Machine bolts h.p. nuts, ⅝ in. x 4 in.
Smaller and shorter, rolled threads...50-10-5 per cent off list
Cut threads.....50-5 per cent off list
Larger and longer sizes.....40-10 per cent off list
Machine bolts, c.p.c. and t nuts, ⅝ in. x 4 in.
Smaller and shorter.....40-10 per cent off list
Larger and longer.....35-5 per cent off list
Carriage bolts, ⅝ in. x 5 in.
Smaller and shorter, rolled threads.....50-5 per cent off list
Cut threads.....40-10-5 per cent off list
Larger and longer sizes.....40 per cent off list
Lag bolts.....50-10 per cent off list
Plow bolts, Nos. 1, 2, 3.....50 per cent off list
Hot pressed nuts, sq., blank.....2.50c. per lb. off list
Hot pressed nuts, hex., blank.....2.30c. per lb. off list
Hot pressed nuts, sq., tapped.....2.30c. per lb. off list
Hot pressed nuts, hex., tapped.....2.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank....2.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped....2.00c. per lb. off list
Semi-finished hex. nuts
⅝ in. and larger.....60-10-10 per cent off list
9/16 in. and smaller.....70-5 per cent off list
Stove bolts.....70-10 per cent off list
Stove bolts.....2½ per cent extra for bulk
Tire bolts.....50-10-5 per cent off list

The above discounts are from present lists now in effect. All prices carry standard extras.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $57; chain rods, $65; screw, rivet and bolt rods, and other rods of that character, $65; high carbon rods, made from open hearth steel, $80 to $85 and special high carbon ized steel rods with carbons running from 0.40 to 0.60, $90 to $100; above 0.60 carbon, $100 to $110. All these prices are f.o.b. mill, Pittsburgh.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $5 to $5.50; ¾ in., 7/16 in. and ½ in., $7.00 base. Boat spikes, $5.25 per 100 lb., f.o.b. Pittsburgh. Track bolts with square nuts, 7c. to 7.50c. to railroads, and 8c. to 8.50c. in small lots for fairly prompt shipment.

Terne Plate

Effective Nov. 7, prices on all sizes of terne plates are as follows: 8-lb. coating, 200 lb., $15 per package; 8-lb. coating, I. C., $15.30; 12-lb. coating, I.C., $16.75; 15-lb. coating, I. C., $17.75; 20-lb., coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.90c. for delivery late this year, and 4.50c. to 5c. from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c., railroad test bars, 5.25c. in carload and larger lots f.o.b. mill.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card, as announced Nov. 5 by the Government on steel pipe, those on iron pipe being the same as quoted for some time:

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	44	17½	⅛ and ¼	23	+4
½	48	33½	⅜	24	+3
¾ to 3	51	37½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	44	31½	1¼	18	3
2½ to 6	47	34½	1½	25	11
7 to 12	44	30½	2	26	12
13 and 14	34½	..	2½ to 6	28	15
15	32	..	7 to 12	25	12

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	40	22½	⅛, ¼ and ⅜	22	5
½	45	32½	½	27	14
¾ to 1½	49	36½	¾ to 1½	33	18
2 to 3	50	37½			

Lap Weld, extra strong, plain ends

2	42	30½	1¼	19	4
2½ to 4	45	33½	½	25	11
4½ to 6	44	32½	2	27	14
7 to 8	40	26½	2½ to 4	29	17
9 to 12	35	21½	4½ to 6	28	16
			7 to 8	20	8
			9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots f.o.b. Pittsburgh, announced Nov. 12, as agreed upon by manufacturers and the Government:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.	34	3½ to 4½ in.	12½
2½ to 3¼ in.	24	3 to 3¼ in. plus	5
2¼ in.	17½	2½ to 2¾ in. plus	7½
1¾ to 2 in.	13	2 to 2¼ in. plus	22½
		1¾ to 1⅞ in. plus	35

Standard Commercial Seamless—Cold Drawn or Hot Rolled

	per net ton		per net ton
1 in.	$340	1¾ in.	$220
1¼ in.	280	2 to 2½ in.	190
1⅜ in.	270	2¾ to 3¾ in.	180
1½ in.	220	4 in.	200
		4½ to 5 in.	220

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net or 2 per cent discount in 10 days.

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer	Cents per lb.
Nos. 3 to 8	4.20
Nos. 9 and 10	4.25
Nos. 11 and 12	4.30
Nos. 13 and 14	4.35
Nos. 15 and 16	4.45
Box Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21	4.80
Nos. 22 and 24	4.85
Nos. 25 and 26	4.90
No. 27	4.95
No. 28	5.00
No. 29	5.05
No. 30	5.15
Galvanized Black Sheet Gage—Bessemer	
Nos. 10 and 11	5.25
Nos. 12 and 14	5.35
Nos. 15 and 16	5.50
Nos. 17 to 21	5.65
Nos. 22 and 24	5.80
Nos. 25 and 26	5.95
No. 27	6.10
No. 28	6.25
No. 29	6.50
No. 30	6.75
Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16	4.80
Nos. 17 to 21	4.85
Nos. 22 to 24	4.90
Nos. 25 and 27	4.95
No. 28	5.00
No. 29	5.05
No. 30	5.05
Nos. 30½ and 31	5.10

PITTSBURGH FAVORED

Such Is Opinion of Examiner in Regard to Railroad Rates—Revision Expected

WASHINGTON, Nov. 13.—In a report to the Interstate Commerce Commission on the complaint of the Pollak Steel Co., Cincinnati, against the Baltimore & Ohio and other railroads, Attorney Examiner Charles F. Gerry recommends a finding by the commission that the railroads in their rates on iron and steel articles from Cincinnati and Chicago to Atlantic ports unduly discriminate in favor of Pittsburgh and other steel producing points, the rates from which are made in relation to those from Pittsburgh to Boston, New York, and Philadelphia. He further recommends that the commission issue an alternative order requiring the railroads to either raise the rates from Pittsburgh, Youngstown, Cleveland, Lorain, Zanesville and Middletown, Ohio, or reduce the rates from Cincinnati and Chicago and points taking rates related to the charges from the points of origin mentioned to the destinations set forth.

This report follows the general line laid down by the commission in its report in the Eastern Export Iron and Steel Case, 43 I. C. C., 5. As a result of that decision, the export rates on steel were brought up to the level of the domestic. At the time the carriers, to enable them to take advantage of the commission's decision, undertook the revision of export rates on iron and steel, so that those from Cincinnati and Chicago bore a definite relation to those from Pittsburgh, Youngstown, Cleveland and other points taking specific cents per 100 pounds over the Pittsburgh rates.

While the roads were engaged in this revision, the commission allowed a big increase in class rates in Central Freight Association territory, the group lying between the Mississippi River on the west, the Buffalo-Pittsburgh line on the east, the Ohio River on the south and the north shore of Lake Erie on the north. Still later, it allowed an increase in class rates for the whole eastern territory, to be placed on top of the one in Central Freight Association. The higher rates went into effect on September 20 and earlier dates.

Examiner Gerry now recommends either bringing the Chicago and Cincinnati domestic rates down to the basis used in making such rates from Pittsburgh, or bringing the Pittsburgh rates up to the basis on which these from Chicago and Cincinnati are founded.

The Cincinnati and Chicago domestic rates are on the basis of the New York-Chicago percentage scale. In that scale the rates from Chicago to New York are 100 per cent. Cincinnati is an 87 per cent point, that is, it takes rates to New York, as a typical point, 87 per cent of those from Chicago. Pittsburgh is a 60 per cent point, but when the Lackawanna Steel Co. got into the market, it was given rates from Buffalo the same as the rate from Erie to Philadelphia. Then Pittsburgh steel interests insisted upon having the same rates as Buffalo. The result was a scale of iron and steel rates from Pittsburgh to the east that was only 57.5 per cent of the Chicago-New York rates. Thereupon the Ohio points other than Cincinnati, demanded and received concessions by arbitraries of two cents from the valleys and three cents from Cleveland, over Pittsburgh.

When the railroads asked permission to bring their export rates up to the level of the domestic, the Pollak company objected unless it was given export rates related to the export rates from Pittsburgh on the same percentage that the Pittsburgh rates were related to the New York-Chicago export rate. It won its contention.

Now the domestic fabric must be adjusted, if the commission follows Examiner Gerry's recommendation, as it is taken for granted it will. Inasmuch as the railroads are fighting, in other cases, to have the commodity rates on other articles brought up to the level of the New York-Chicago scale, it is taken for granted they will raise the Pittsburgh and related rates.

Shippers in Chicago, western Pennsylvania, Ohio and West Virginia intervened in the case, asking to have their rates adjusted. The complainants and interveners are largely manufacturers and fabricators of iron and steel products such as roofing and metal sheets, ingots, sheet bars, sheet iron, corrugated iron, wire and wire products, sheet steel and tin plate, wrought pipe, horse shoes, mule shoes, bridge and structural steel. The interveners are the Andrews Steel Co., Newport Rolling Mill Co., Globe Iron Roofing & Corrugating Co., Cincinnati Horse Shoe Mfg. Co., Edwards Mfg. Co., Cincinnati Chamber of Commerce, Cincinnati Merchants Exchange, Ironton-Ashland Manufacturers' Association, and Whitaker-Glessner Co.

Extras on Semi-Finished Materials

The following standard classification of extras on semi-finished steel has been promulgated by the subcommittee on steel distribution of the American Iron and Steel Institute, the extras to be added to the base price (per gross ton) of rerolling billets, slabs and sheet bars:

Extras for Carbon

Up to and including 0.25 per cent carbon, base.
0.26 to 0.60 per cent carbon, $1 per gross ton.
Over 0.60 per cent carbon, $2 per gross ton.
Where range of carbons is specified extra is to be based upon the mean of such carbons.

Extras for Size and Cutting

For cutting small billets, $0.50 per gross ton.
Slabs 16 sq. in. in area and larger, base.
On sheet bars and billets under 3⅞ in. for random lengths down to 15 ft., no extra is to be charged, but regular charge of 50c. per ton is to be made for such bars and billets cut to exact lengths.

Prices and extras apply only to material of standard specifications; customary extras for special phosphorus, manganese, silicon, sulphur, etc., to apply.

Plan Blast Furnace and Coke Plants

The St. Louis Coke & Chemical Co., a subsidiary of the American Coke & Chemical Co., Chicago, announced at St. Louis Nov. 8 its decision to build a plant at or near East St. Louis, Ill., to make metallurgical coke from Illinois coal by the Roberts by-product coke oven process. The first named company is incorporated with a capital stock of $15,000,000 in Illinois, with George T. Buckingham as president, and the parent company has been organized with Clement Studebaker, South Bend, Ind., president; George T. Buckingham, Chicago, vice-president; Scott Brown, secretary and treasurer; Arthur Roberts, chairman of the executive committee; together with George W. Niedringhaus, of the National Enameling & Stamping Co., W. G. Bierd, president of the Chicago & Alton Railroad and others on the board of directors. A number of sites have been placed under option and as soon as a definite selection has been made, a plant will be equipped, the first unit requiring about 12 to 15 months to build.

The plans of the company are said to include the building of blast furnaces for the delivery of hot metal to the iron and steel plants situated on the East side at St. Louis in suburban towns. As by-products, toluol, xyol, benzoin, solvent naptha as well as gas, tar and ammonia products, will be included in the output of the new coking plant. The blast furnace plans include three stacks of 500 tons each daily capacity. L. E. Fischer is to be engineer in charge.

The Tidewater Coal Exchange has been formally approved by the United States Fuel Administration and an order has been issued requiring all transshippers of coal at New York, Philadelphia, Baltimore and Hampton Roads to make shipments through this Exchange. The Exchange was organized some time ago and practically all shippers to these points have been handling and making shipments through it, a few shippers remaining outside, which interfered with the successful operation of the Exchange, in that 100 per cent efficiency could not be obtained unless all shippers were members.

Contracting for Millions of Shells

Some Orders Distributed and Others Will be Later—Canadian Plants Not to be Utilized if Work Can be Done in the United States

WASHINGTON, Nov. 13.—Arrangements have been completed with the assistance of the War Industries Board for the placing of contracts by the Ordnance Bureau of the War Department for approximately 6,500,000 6-in. shells. The placing of these contracts was a very difficult task inasmuch as it threatens to test the extreme capacity of American manufacturers. As a matter of fact, it is said, the contracts could not have been placed so quickly and so efficiently had it not been for the services of the War Industries Board and the co-operation of the American Iron and Steel Institute. The orders were distributed according to the advice of the Subcommittee on Production of the institute.

To make this number of shells, which correspond in size with the standard shell which is being used by the French on the western front, will require over 487,500 tons of steel. The problem first confronted by the Ordnance Bureau was to distribute the order for this steel. Naturally the order took priority over all others held on the books of the steel mills. Each mill was requested to supply the amount which it was capable of furnishing under normal conditions, but in distributing the proportions some consideration was given to the business the mill already had on hand. It is said that practically all the large steel mills of the country participated in the orders.

Contracts for Forgings.

The Ordnance Bureau within a very short time will be ready to distribute contracts among the forgers of the country to forge the metal for the shells. Orders for the forgings will be distributed in the same manner in which the orders for the steel itself have been distributed. Later the orders for the finished shells will be allotted among the machine manufacturers. In the placing of all these contracts, however, the Ordnance Bureau takes into consideration the amount of work and its nature that each plant has on hand.

The Government has heretofore placed contracts for 5,000,000 6-in. shells, in the manufacture of which more than 375,000 tons of steel are being used. In placing the additional contracts the Ordnance Department was advised by the War Industries Board to take into consideration the fact that the mills and plants already had some contracts and urged that the distribution of the new orders be made in a manner to supplement and not to crowd the prior contracts.

Keep Details Secret.

The 6-in. shells are the type which the Government has decided to hurry out first. They are not exactly 6-in. calibers, but approximate that size, being close equivalents in millimeters calibrated to the French standard. The exact identity is not desired to be proclaimed by the officials because much publicity regarding ordnance work and contracts is frowned upon by the Administration. As a matter of fact, the military authorities have done all in their power to keep secret the fact that contracts were going out and positively refuse to permit to become known the names of the firms engaged in the work. It is sufficient, they say, to know that all the firms capable of doing the work will be drafted into taking contracts. It is no longer a matter of the firm seeking the contract, but of the contract seeking the firm.

Following the orders for the 6-in. shells which have now gone out, the department intends to take up immediately the question of letting contracts for 3-in. shells, of which it is understood about 33,000,000 will be ordered. In the production of these shells at least 247,500 tons of steel will be used. Negotiations for the placing of these orders are now under way. Following the distribution of this work the Ordnance Bureau, it is said, will proceed to make up schedules for larger shells, 8 to 12 in. in diameter. Probably more than 390,000 tons of steel in addition will be needed for these.

A Gigantic Task

This gives but a general idea of the enormous amount of the work which is being distributed among American plants. The task of distributing the orders for the steel itself was a monumental one, inasmuch as it was necessary to place the business equably and then to file priority orders against many of the plants. In most cases, it is understood, the steel men voluntarily gave priority to the ordnance contracts.

Practically all of the machine manufacturers of the country as well as the forgers will participate in the work. The report has already been circulated, though without the confirmation of the Department, that the New York Air Brake Co. will make about 1,000,000 of the 6-in. shells and that the American Car & Foundry Co. will make another million. Many of the automobile plants are seeking contracts to make shells and will, before the year is out, replace a part of their plant facilities with equipment for this ordnance work. The Priorities Committee has already taken action which is calculated to curtail the production of passenger automobiles in the United States, and the plants will be used to make shells and other ordnance supplies.

Work for the Machinery Plants

How rapidly the machine plants can be changed over, or even prevailed upon to make the shells and ordnance supplies needed, is a problem. It is believed that some of them will hesitate, and therefore it is being urged upon the Department to make use of the established munition plants in Canada. The Canadian plants have been making ordnance supplies for England, but England is now nearly equipped to make all of her own munitions. The Canadian plants have developed to considerable proportions, and now that the English contracts are being withdrawn, they are ready to take on contracts for the United States. One report states that the Imperial Munitions Board of Canada has been negotiating with the United States for contracts to make between six and seven and a half million shells for delivery during the first seven months of 1918. The United States, however, will not make use of this offer unless it is found impossible to locate sufficient plants in the United States to undertake the work.

As a matter of fact, many munition plants which have been developed in the United States on foreign orders since the outbreak of the war in Europe are now prepared to take on contracts for the United States, and in that regard are in a similar position to that of the Canadians. The domestic plants will be given work first, and for the present, it is understood, there will be no necessity of calling upon outsiders for assistance in making the shells. W. L. C.

Large Heroult Electric Steel Furnaces Operating

The largest electric steel plant in the world is now in operation at the South Works of the Illinois Steel Co., South Chicago, Ill. One of the two 25-ton Heroult electric furnaces was started on Friday, Nov. 9, with the other one following at once. It has been decided to install another 25-ton in this plant immediately. The two 15-ton furnaces there have been operating for some time. The last one erected made steel for the first time in June, 1916. When all are operating at this plant, there will be three 25-ton and two 15-ton Heroult furnaces.

PERSONAL

Major Benedict Crowell, Cleveland, who was appointed Assistant Secretary of War last week, is well known in the iron ore trade, with which he has been associated for several years in a professional capacity as chemist. As a member of the firm of Crowell & Murray, chemists, Cleveland, he has done a great deal of ore analysis work for firms mining and selling Lake Superior ores. He was born in Cleveland in 1869 and was graduated from Yale in 1891. Returning to Cleveland on the completion of his college course, he became chemist for the Otis Steel Co. in that city. He left that company to engage in business for himself as a chemist and later also took up mining engineering in connection with his other work. He has also for some time been an important figure in the building contracting field in Cleveland as president of the Crowell-Lundoff-Little Co., contractor. With Mr. Murray he is joint author of the well-known volume, "The Iron Ores of Lake Superior." The new Assistant Secretary, who is an officer of the Engineer Reserve Corps, will take over this branch of war preparation and, in addition to relieving Secretary Baker of much of the detail work that has arisen in connection with the great task of providing arms and ammunition for the United States military forces, will co-operate with General Crozier, chief of the Ordnance Bureau, in the work of concentrating American manufacturing industries upon production of heavy ordnance and field artillery of all kinds. Major Crowell will also co-operate with the Quartermaster's Department in systematizing the agencies, Governmental and private, through which the army in field and in camp is being supplied. Immediately after the formation of the National Council of Defense he went to Washington, and became associated with the work of the General Munitions Board, especially in connection with steel production.



Photo by Edmondson

MAJOR BENEDICT CROWELL,
Assistant Secretary of War

J. Leonard Replogle, director of steel supply for the United States and allied governments, was called from Washington in the past week to Johnstown, Pa., by the death of his father, Rev. R. Z. Replogle.

W. Karl Hilbrich assumed the position as purchasing agent of the Erie Malleable Iron Co., Erie, Pa., Nov. 1.

C. R. Murphy, Green Bay, Wis., has been elected secretary of the Lawson Aircraft Corporation, Green Bay, which is manufacturing airplanes for the Government. Mr. Murphy succeeds C. I. Smith, who resigned because of the pressure of other interests.

Richard Garlick, treasurer of the Youngstown Sheet & Tube Co., Youngstown, Ohio, has returned to his duties after an extended vacation, spent mostly at watering places in the East. Mr. Garlick's health has been greatly benefited by his long rest.

Robert J. Mullaly has been named assistant superintendent of the McDonald, Ohio, bar mill plant of the Carnegie Steel Co., under construction. W. U. Dennison is superintendent of the McDonald plant.

Alvin Whitehead has joined the office force of Clarke & Harrison, dealers in machinery and equipment, 149 Broadway, New York. For the past two years and a half he was connected with the machinery department of Gaston, Williams & Wigmore, Inc.

Jay C. McLauchlan, of Pickands, Mather & Co., Cleveland, has been appointed assistant to J. Leonard Replogle, who has charge of iron and steel matters for the War Industries Board. Mr. McLauchlan will give particular attention to the supply of pig iron.

W. F. Morris has been made general traffic manager of the Crucible Steel Co. of America, Pittsburgh, a newly created position. He will have entire charge of traffic matters of the company, also of the Pittsburgh Crucible Steel Co., a subsidiary, and other interests.

Carl Barth, consulting engineer, Philadelphia, is to address the Philadelphia section of the American Society of Mechanical Engineers on Feb. 26, 1918, on "Supplement to Taylor's 'Art of Cutting Metals'." Recent developments in material specifications is to be discussed on March 26 by Dr. S. W. Stratton, director U. S. Bureau of Standards and developments in the treating of corrosion problems on April 23 by Dr. Allerton S. Cushman, major Ordnance Department, U. S. R.

C. B. Young has been appointed manager of the Western Gas Construction Co., Fort Wayne, Ind., builder of water, coal and oil gas apparatus. On account of ill health, O. N. Guldlin, founder of the company, will retire from the active management, but will be retained in a consulting capacity. Thomas W. Stone will continue with the company as chief engineer.

Henry S. Sherman, vice-president and treasurer of the Standard Car Wheel Co., and D. S. Blossom, vice-president of the William Bingham Co., Cleveland, have volunteered to serve as executives with the American Red Cross in France, and will leave shortly for that country, where they expect to remain until the close of the war.

E. H. Whitlock, consulting engineer, Cleveland, and director of the Wellman-Seaver-Morgan Co., that city, who has been in the Government service several months, is now in the Ordnance Department at Washington with the rank of major.

J. E. Thropp, Jr., has been appointed superintendent of the blast furnaces of the American Rolling Mill Co. at Columbus, Ohio.

Warren S. Blauvelt, Steere Engineering Co., Detroit, has been appointed to act on the staff of the United States Fuel Administration on all matters pertaining to coke.

H. Norman Brooke & F. H. Brooke, Sheffield, England, have acquired the exclusive right to manufacture and sell Maccallum Metal-Kase brick in Great Britain. The firm is a large manufacturer of silica and magnesite brick at its Cleveland Works (Cleveland Magnesite & Refractory Co., England), and is associated with Benj. F. Talbot, managing director of the Cargo Fleet Iron Works and inventor of the Talbot process for making steel.

Dudley R. Kennedy, formerly assistant to J. A. Campbell, president of the Youngstown Sheet & Tube Co., Youngstown, Ohio, has resigned to accept a responsible position with the American International Shipbuilding Corporation of Philadelphia, a subsidiary of the American International Corporation. Mr. Kennedy will have charge of the industrial relations work

of the Philadelphia company. For some years he was in charge of the claims department of the Youngstown Sheet & Tube Co., and resigned to assume charge of the industrial relations work of the B. F. Goodrich Co. at Akron, where he remained several years. Nine months ago he returned to the Youngstown Sheet & Tube Co., with the title of assistant to the president, acting as a representative of President James A. Campbell at the plant and supervising the company's extensive housing projects.

James H. McKee, superintendent forge department, Pittsburgh Screw & Bolt Co., has been called to Washington by the Government to give his services in the gas masks investigation.

H. E. Lewis, formerly assistant to the president, Bethlehem Steel Co., has been elected a vice-president of the company. H. S. Snyder, vice-president Bethlehem Steel Co. and its steel and shipbuilding subsidiaries, has been placed in charge of the finances of the corporation and all subsidiaries. E. B. Hill, formerly treasurer Fore River Shipbuilding Corporation, Quincy, Mass., was elected treasurer.

Roy B. Woolley, formerly sales and advertising manager of the Standard Electric Stove Co., Toledo, Ohio, and late of the American ambulance field service at the Verdun front in France, has served his enlistment and has returned to the United States. He is now with the Society for Electrical Development, New York, as an executive in its advertising department.

Charles F. Hall, structural and mechanical engineer, has joined the staff of the Booth-Hall Co., 565 West Washington Street, Chicago, manufacturer of electric steel furnaces, in the capacity of production manager. To accept this position Mr. Hall has left Armour & Co., Chicago, where he held the position of structural engineer, and was in full charge of engineering work in the construction department.

A. H. Dillon, for about 12 years in the sales department of the Youngstown Sheet & Tube Co., and for six or seven years assistant sales manager, has tendered his resignation. He is to engage in a general brokerage business in steel, machinery and similar products, maintaining offices in Youngstown, Pittsburgh and New York.

Clarence M. Woolley, for many years president of the American Radiator Co., has been appointed member of the War Trades Board by President Wilson at the request of Secretary Redfield. He is to administer supervision over imports.

Charles H. Carter of the Philadelphia office of the Midvale Steel & Ordnance Co. is now representing the company in Washington, where an office has been established.

W. C. Webster, who has been secretary and general manager and director of the Nichols Copper Co., 25 Broad Street, New York, for several years, has resigned. He expects to take a rest before assuming further duties.

With a view to increasing the efficiency of the transportation systems of the country and especially for the purpose of reducing car shortage the Council of National Defense has issued a bulletin addressed to the several State councils of defense urging shippers in all lines to conform to a code of rules drafted by the American Railway Association for the use of freight cars. The bulletin says there is still a shortage of freight cars and the demand will increase with the movement of fall crops, including grain and cotton, unless every shipper and consignee co-operates to relieve the strain.

The Hanging Rock Iron Co., Hanging Rock, Ohio, has placed orders for a movable car dumper and an ore handling bridge. The former will be erected by the Wellman-Seaver-Morgan Co., Cleveland, and the latter by the Brown Hoisting Machinery Co., Cleveland.

PLATES FOR JAPAN

Shipment of Product Under Contract Will Probably Be Permitted

WASHINGTON, Nov. 13.—A recommendation has gone to the War Trade Board to grant permits to the Japanese to export those ship plates which have been made in the United States under contracts with the American mills existing at the time the President imposed an embargo upon such steel. The board will announce its decision in this regard within the next few days, probably before the end of the current week.

The recommendation to grant these permits originated with the Shipping Board. This board negotiated with Count Ishii and his colleagues when the Japanese mission was in the United States recently for some of the Japanese ships to be used in the Atlantic trade. Japan has consented upon condition that Japanese shipbuilders be allowed to ship plates which have been made in the United States under contract but which have been tied up in American warehouses because of the embargo. The agreement contemplates the sending of at least 12 Japanese vessels to the Atlantic to aid in relieving the heavy freight congestion on shipments to Europe.

When the President placed his embargo upon the exportation of ship plates the American mills had upon their books many contracts with the Japanese. It has been learned from some of the Washington representatives of the steel producers that the mills filled the then existing contracts but refused to take on any new orders from the Japanese. Since then the War Industries Board has seen to it that the American mills have been filled with contracts for account of our own Government. The Shipping Board has itself taken on contracts for ship plates nearly equal to the full capacity of the mills.

The plates made for Japanese account were stored in American warehouses because of the inability of the owners to obtain export permits. A large percentage of these plates, it is said, has been shipped to the Pacific ports awaiting the raising of the embargo. It is learned upon authority that the War Trade Board has knowledge of only a certain proportion of the Japanese plates being shipped to Pacific ports, although, it is said, all of these plates are now stored in American warehouses.

The Japanese found it difficult to ship to the Pacific ports because the railroads, acting upon suggestions of the Government, refused to accept on export bills of lading ship plates which were embargoed. The Japanese, it is said, have sought to overcome this by shipping their plates to the Pacific coast upon domestic bills of lading, hoping thus to save time when the United States finally consented to lift the embargo. Inasmuch as the strict embargo of plates was issued by the President on Aug. 2 last, there has been sufficient time for the Japanese to secure delivery of most of the plates for which they had already contracted and to move these to the ports upon domestic bills.

W. L. C.

Only Two Bids

Only two American manufacturers submitted bids for 336,000 5-in. projectiles, representing a contract of about $4,000,000. One was the Bethlehem Steel Co. and the other the Ingersoll-Rand Co.

The officials of the War Industries Board announce that before any change is made in the order issued by the Priority Committee in regard to the delivery of chrome alloy steel to the manufacturers of passenger automobiles the board will await the recommendations of a special committee representing the automobile industry which has just been organized to devise a method of applying the proposed embargo with the least possible injury to the manufacturers.

Further Prices in the Fixed Price Program

Maximum Figures Trade is Asked to Adopt— Boiler Tubes, Bolts and Nuts, Bar Iron, Wire Products, Sheets and Warehouse Business

The following statement was made late on Nov. 13 by E. H. Gary, chairman of the Committee on Steel and Steel Products of the American Iron and Steel Institute:

In announcing under date of Nov. 5, 1917, an agreement made by the War Industries Board with the principal steel industries of the United States, fixing maximum prices on certain steel articles, namely, sheets, pipe, cold rolled steel, scrap, wire and tin plate, the Board, with the approval of the President, made the following statement:

In connection with the above, the iron and steel manufacturers have agreed promptly to adjust the maximum prices of all iron and steel products other than those on which prices have been agreed upon. It is expected that this will be done promptly and consistently in line with the basic, intermediate and finished products. for which definite maximum prices have been established.

The General Committee on Steel and Steel Products of the American Iron and Steel Institute has received from a sub-committee a report based on information received from representative manufacturers of various other lines of steel and steel products, and from such report and other data available, the General Committee has reached a conclusion as to fair and reasonable prices for such products in line with the basic, intermediate and finished products for which definite maximum prices have been established and now recommends to the industry that the prices below stated be adopted as maximum prices, to take effect immediately, to apply to the requirements of the United States Government, to the war requirements of the Allies and for domestic consumption within the United States.

The committee expresses the hope that there will be no hesitancy in accepting this recommendation.

Iron Bars

Base sizes, per 100 lb.....$3.50

Usual and customary extras for size, quantity, etc., and established custom as regards delivery point to govern.

Wire Products

Wire nails, base, per 100 lb., f.o.b. Pittsburgh.....$3.50

Painted barb wire, base, per 100 lb., f.o.b. Pittsburgh... 3.65

Usual trade differentials as to sizes and quantity to govern.

Boat Spikes

Base sizes, per 100 lb., f.o.b. Pittsburgh.....$5.25

Usual trade differentials as to sizes and quantity to govern.

Automobile Sheet Prices—Based on No. 22 Gage

Other gages at usual differentials.

	Primes only. Per 100 lb.	Primes when seconds up to 15 per cent are taken. Per 100 lb.	Seconds arising.
Automobile body stock	$5.95	$5.85	*See Note
Automobile body stock, deep stamping	6.20	6.10	
Automobile body stock, extra deep stamping	6.45	6.35	
Hood, flat fender, door and apron, or splash guard stock	6.05	5.95	
Crown fender, cowl and radiator casing, deep stamping	6.30	6.20	
Crown fender, cowl and radiator casing, extra deep stamping	6.55	6.45	

Automobile Sheet Extras for Extreme Widths:

Nos. 17 and 18 over 36 in. to 44 in., 10c. per 100 lb.
Nos. 19 to 21 over 36 in. to 44 in., 30c. per 100 lb.
Nos. 22 to 24 over 36 in. to 40 in., 40c. per 100 lb.
Nos. 22 to 24 over 40 in. to 44 in., 80c. per 100 lb.

Black sheet extras to apply on narrow widths.

Oiling, 10c. per 100 lb.
Patent leveling, 25c. per 100 lb.
Resquaring, 5 per cent of gage price after quality, finish and size extras have been added.

*10 per cent less than the invoice Pittsburgh price for corresponding primes.

Electrical Sheets

Guaranteed as to electrical efficiency. Manufactured under various trade names and guaranteed to meet the established standard of the grades under the trade names given below.

Armature grade, base sizes, No. 28 gage.....$6.00
U. S. electric, base sizes, No. 28 gage..... 6.50
Dynamo, base sizes, No. 28 gage..... 8.00
Apollo special, base sizes, No. 28 gage..... 8.50

Black sheet extras to apply to special sizes.

Forging Steel

Base price per gross ton, f.o.b. Pittsburgh $60

Subject to the following extras:

Large size forging bloom extras.	12,000 lb. and under each.	Over 12,000 lb. each.
Up to but not including 10 x 10 in.	Base	$7
10 x 10 in. up to but not including 16 x 16 in.	$2	9
16 x 16 in. up to but not including 20 x 20 in.	4	11
20 x 20 in. up to and including 24 x 24 in.	6	13

For slabs, use the above extras for equivalent sectional area; and for slabs of greater equivalent area than 24 x 24 in., use the above extras for 24 x 24 in. blooms.

Usual carbon differentials and other extras as provided in the billet schedule to be added in addition to the above extras for forging quality, as follows:

	Extra for carbon.
Up to and including 0.25 per cent carbon	Base
0.26 to 0.60 per cent carbon	$1 per ton extra
Over 0.60 per cent carbon	2 per ton extra

All the above extras will apply to all material sold for forging purposes. They also apply to either basic open hearth or Bessemer steel.

For forging into car axles only, blooms under 10 x 10 in. will carry an extra of $5 per ton over base price of re-rolling billets(i. e., $47.50 per gross ton), to which will be added usual extras for carbon, as above.

Lapweld Steel Boiler Tubes

3½ to 4½ in. tubes, 34 per cent off list.
2½ to 3¼ in. tubes, 24 per cent off list.
2¼ in. tubes, 17½ per cent off list.
1¾ to 2 in. tubes, 13 per cent off list.

Above prices for carload lots f.o.b. Pittsburgh.

Charcoal Iron Boiler Tubes

3½ to 4½ in. tubes, 12½ per cent off list.
3 to 3¼ in. tubes, list plus 5 per cent.
2½ to 2¾ in. tubes, list plus 7½ per cent.
2 to 2¼ in. tubes, list plus 22½ per cent.
1¾ to 1⅞ in. tubes, list plus 35 per cent.

Above prices for carload lots f.o.b. Pittsburgh.

Standard Commercial Seamless Boiler Tubes

Cold Drawn or Hot Rolled.

1 in. .....$340 per net ton
1¼ in. ..... 280 per net ton
1⅜ in. .....270 per net ton
1½ in. ..... 220 per net nto
1¾ in. ..... 220 per net ton
2 to 2½ in. ..... 190 per net ton
2¾ to 3¾ in. ..... 180 per net ton
4 in. ..... 200 per net ton
4½ to 5 in. ..... 220 per net ton

Above prices for carload lots f.o.b. Pittsburgh.

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Special Skelp for Boiler Tubes, Etc.

Base sizes, f.o.b. Pittsburgh, per 100 lb.....$3.40
Other sizes, f.o.b. Pittsburgh, per 100 lb..... 3.55

Round Billets for Seamless Steel Tubes

Base sizes, f.o.b. Pittsburgh, per 100 lb.....$3.25

Bolts, Nuts and Rivets

Large rivets .....$4.65 Base
7/16 x 6 in. smaller and shorter rivets..45-10 per cent off list
Machine bolts, h.p. nuts, ⅝ x 4 in.:
Smaller and shorter, rolled threads....50-10-5 per cent off list
Cut threads .....50-5 per cent off list
Larger and longer sizes .....40-10 per cent off list
Machine bolts, c.p.c. & t. nuts, ⅝ x 4 in.:
Smaller and shorter .....40-10 per cent off list
Larger and longer .....35-5 per cent off list
Carriage bolts, ⅝ x 6 in.:
Smaller and shorter, rolled threads.....50-5 per cent off list
Cut threads .....40-10-5 per cent off list
Larger and longer sizes.....40 per cent off list
Lag bolts .....50-10 per cent off list
Plow bolts, Nos. 1, 2, 3.....50 per cent off list
Hot pressed nuts, square blank.....2.50c. per lb. off list
Hot pressed nuts, hexagon, blank.....2.30c. per lb. off list
Hot pressed nuts, square, tapped.....2.30c. per lb. off list
Hot pressed nuts, hexagon, tapped.....2.10c. per lb. off list
C. p. c. & t. square and hexagon nuts, blank, 2.25c. per lb. off list
C. p. c. & t. square and hexagon nuts, tapped, 2.00c. per lb. off list
Semi-finished hexagon nuts:
⅝ in. and larger .....60-10-10 per cent off list
9/16 in. and smaller.....70-5 per cent off list
Stove bolts .....70-10 per cent off list
Stove bolts .....2½ per cent extra for bulk
Tire bolts .....50-10-5 per cent off list

The above discounts are from present lists now in effect.
All prices carry standard extras.

Warehouse Trade

Prices From Stock on Heavy Iron and Steel Products.

The following differentials to apply on the official maximum mill prices f.o.b. Pittsburgh, plus carload rate of freight from Pittsburgh to warehouse point:

Bars, structurals, plates, blue annealed, No. 16 and heavier, billets, $1 per 100 lb.

One pass cold rolled sheets, No. 18 and lighter; galvanized sheets, $1.25 per 100 lb.

Cold rolled shafting, 25 points, which is $1.25 per 100 lb. on base sizes.

In addition to the foregoing, maximum prices were recommended for standard commercial wire rope. These are obtainable in printed form in a leaflet of four pages. Prices cover various grades and six geographical groups, and give discounts for the consumer, dealer and agents and United States Government.

Differentials on tin plate and sheets, while substantially ready for publication, are not yet available.

Pittsburgh Foundrymen's Association

The monthly meeting of the Pittsburgh Foundrymen's Association will be held in that city in the Fort Pitt Hotel on Monday evening, Nov. 19. Action will be taken on the death of Frank H. Zimmers, who served the association as its secretary since its organization more than 21 years ago. B. D. Fuller of the Westinghouse Electric & Mfg. Co. of Cleveland, elected president of the American Foundrymen's Association at its recent Boston meeting, will be the speaker. Bayard Phillips of Wm. J. Brant has been appointed acting secretary of the association.

The Government is preparing to take comprehensive and drastic action for the apprehension and punishment of all persons engaged in plots to destroy factories, bridges, etc., with the use of explosives. Authority for the prosecution of a vigorous crusade against this class of offenders is found in a war measure passed by the last Congress which is now being put into effect by the Bureau of Mines which is charged with its enforcement. The law also gives the bureau full jurisdiction over the manufacture and distribution of explosives for all purposes and Francis S. Peabody, of Chicago, a well-known coal operator, familiar with the use of explosives, has been appointed as assistant to the Director of the Bureau of Mines.

Regulation of Exports of Tin Plate

WASHINGTON, Nov. 13.—The War Trade Board upon the recommendation of its bureau of imports and of the committee on the conservation of tin plate has made two additional rulings affecting the exportation of tin plate, which are set forth below in paragraphs (3) and (4), respectively, in the following list of such rulings, which is complete to date, and includes in paragraphs (1) and (2) the rulings promulgated on Oct. 24, 1917:

(1) That no licenses will be granted for the exportation of tin plate for use for any other purpose than as food containers, except on satisfactory evidence that the plate will be used in such a way as to contribute to the military needs of the nations at war with Germany and her allies.

(2) That as to application for license to export tin plate to be used as food containers, preference will be given to those cases in which satisfactory evidence is presented that the food to be packed will be for the use of the nations at war with Germany and her allies.

(3) That no licenses will be granted for the exportation of articles (other than tin plate) containing tin, except on satisfactory evidence that the goods will be used in such a way as to contribute to the military and other vital needs of the nations at war with Germany and her allies. Preference will be given to those cases in which satisfactory evidence is presented that the goods will be used in such a way as to contribute to the production or transportation of foodstuffs for the use of the nations at war with Germany and her allies.

(4) That no licenses for the exportation of tin plate will be granted, except to the manufacturers of the plate or to others who, either at the time of making application or before shipment out of the country, present satisfactory evidence that they have purchased the plate from a manufacturer on firm order from a purchaser abroad. This rule applies to pending as well as to future applications.

Carbon Steel Co. Affairs

The annual meeting of stockholders of the Carbon Steel Co. was held in its general offices, Pittsburgh, on Monday, Nov. 12. About 44,000 shares out of a total of 50,000 were represented at the meeting, either in person or by proxy. Because there had been controversy recently in regard to payment of bonuses to officers of the company, it was expected that the meeting might result in a contest for control, but this did not develop, with the exception that several new directors were elected. The following board of directors was unanimously elected: Charles McKnight, Raymond S. Baldwin, Walter H. Baker, H. T. Pierpont, W. D. Uptegraff, John Worthington and Woodward Babcock. A committee was appointed to fix the salary of the president and approve the payment of bonuses to other officials. A vote of confidence in and thanks to the management of the company was unanimously adopted. At a meeting of the new directors held after the general meeting of stockholders all former officials were re-elected as follows: Charles McKnight, president; D. R. Wilson, vice-president and treasurer; C. F. Blue, Jr., vice-president and general sales agent, and W. W. Noble, secretary. On Thursday, Nov. 15, the company paid a regular quarterly dividend of 1½ per cent and an extra of 2½ per cent on the common stock, declared some time ago.

Estimated Tin Plate Production

The Tin Plate Conservation Committee estimates for 1918 that the hot mill production will be 38,700,000 base boxes, and of coke tin plate 36,450,000 base boxes. During the first eight months of 1917 shipments for food containers for domestic use were 12,750,350 boxes of tin plate, and to Canada for the same purpose 587,372 boxes. Some idea of the enormous output of tin plate can be gathered from the fact that total shipments from the mills for the first eight months of this year, foreign and domestic, totaled 22,843,799 boxes. In addition to this, there were orders placed amounting to 15,619,760 boxes.

Buys More Land

The Solvay Process Co., Detroit, has purchased 1300 ft. of waterfront property on Zug Island, near Detroit, at $500,000. A large expansion of the plant is said to be contemplated.

MOBILIZATION OF LABOR

Lessons to Be Obtained from the Experience of Great Britain

A conference of employers of metal working plants and those building machinery, engines, boilers, motor trucks, airplanes and ships and railroad equipment and supplies was held at the headquarters of the Merchants' Association, Woolworth Building, New York, Nov. 13, to learn the experience of Great Britain in labor matters through a special mission of the British Ministry of Munitions. This mission, which has been touring the largest industrial cities of the country, is composed of Sir Stephenson Kent, member of the Council of the Ministry and director general of the labor supply department; H. W. Garrod, deputy assistant secretary of labor regulation department; G. H. Baillie, chief technical dilution officer of the labor supply department, and Capt. Cyril Asquith, director of the artificers' allocation of the labor supply department.

Sir Stephenson Kent reviewed briefly the so-called Treasury agreement between employers and employees, fixed in the munitions of war act, by which profits are limited and wage rates fixed. He then described briefly the workings of the law, in substance as follows:

To take care of the increased cost of living, an investigation is made every four months and the extra pay awarded is made up to the employer by the Government, so that the extra represents merely the increased requirement growing out of living cost and due to the special conditions. In the matter of the agreement, the workmen waive all regular practices such as control of output and the like and in return the pledge was made to restore the pre-war conditions, a very difficult proposal, the speaker mentioned parenthetically. The maximum penalty to which anyone is liable for attempting, as by inciting to strike, to interfere with the war needs, is penal servitude for life.

How Man Power Is Conserved

Mr. Kent emphasized especially the need of conserving man power with just as thorough an organization at home as at the front, if we are to win the war. He intimated that Great Britain has not yet arrived at the maximum expenditure of munitions. No non-essential industry, broadly speaking, exists which uses material or men required for the manufacture of war articles. To meet the enticement or auctioneering of labor between industries, there are two regulations of the defense of the realm act; one of these provides that any employer who has attempted to entice workmen is liable to prosecution with a severe penalty, and the other is that the Minister of Munitions may lay an embargo on a firm which is not making the full satisfactory employment of skilled men, for example.

Meeting Skilled Labor Scarcity

Mr. Baillie told of the two schemes for meeting the scarcity of skilled labor, one by the dilution with unskilled labor and the other by the substitution of women. The unskilled men are put on the relatively easy jobs and promoted as may be possible. He mentioned as an example that in a steel works in Wales, there were no operatives for new furnaces and there was no available supply of men. Accordingly the works employed 67 women, but these were not put on the furnaces, but replaced laborers, such as those used in loading and unloading jobs, handling bricks, breaking limestone and the like and the unskilled men were then put on simpler jobs in connection with the furnaces and gradually developed so that the new furnaces could be manned. Skilled workers in the non-essential trades were also utilized. Watch makers were put at manufacturing gages; plumbers were instructed in lead burning for explosive manufacture; carpenters were employed in shipyards and textile mill mechanics were put at doing the final work on munitions.

In the matter of substitution, he told how the women had been trained so that some were equal to making snap gages in the tool room, the women hardening and grinding the work to 0.005 in. and a skilled man putting on the finishing touches. In introducing women, it was agreed that they should get the same day rate as skilled workmen and the same piece work rate, when they substituted for such workers, but on semi-skilled or unskilled work a minimum wage was established about two-thirds of the wage of unskilled male labor.

1,000,000 Women Now Engaged on Munitions

The women as a class who went into munitions work, he said, averaged somewhat above those who had been regularly employed in factories previous to the war, such as those in textile mills. They have done far more than expected and over 1,000,000 women are now engaged in munition work. In a 5-in. shell plant only 6 per cent of the hands are men and in a 6-in. shell plant there is one skilled man to 50 women, and this is one of the best plants measured in terms of output. About 80 per cent of the employees in shell and fuse shops are women. Screw gages are made entirely by women. Of a plant making explosives, and employing 15,000, 11,000 are women. In a trinitrotoluol plant 80 per cent of the employees are women and in a picric acid plant about 40 per cent. In plants for filling shells, fuses and gaines the percentage is 90. The percentage in shell plants ranges from 90 per cent downward, the smaller number naturally being in the plants making the larger shells.

Training Schools for Women

Training schools have been equipped, one group comprising schools attached to the technical colleges and the other accommodated in factories which have been taken over for instruction purposes and which do actual munition work. With specialized training, operatives are produced in six to eight weeks time. The women are trained for specific jobs for which help is asked. Some makers of machines arrange to send to the purchaser one or two women operatives with the machines sold.

Mr. Baillie emphasized particularly the change of attitude toward the employment of women shown by manufacturers. There is no hesitation now, but instead a preference compared with that shown toward the old and army-unfit men now available. The shortage of labor came suddenly to England and he suggested that in the United States we are no better off in respect to skilled workmen and in a few months we will experience the same sudden shortage.

It was brought out in the discussion that the women obtained were largely those not previously in industry, such as shop girls, domestics and the like. The minimum ages for women are 18 and 16 years; best results seem to lie with the ages of 25 to 27 and while there is no upper limit, none over 35 years are taken into the training schools.

Accidents have decreased with the employment of workmen, though some of them are even operating overhead cranes. Women are employed in shipbuilding yards, punching light plates, and doing hydraulic riveting, but more on ships of war than on merchant ships. They have also done the intricate electric wiring work of the man-of-war.

Hours of Labor

The hours of labor are exactly those existing before the war. They vary from 52 to 54 hr. per week, with one and one-quarter time for the first two hours and one and a half time for more than two hours overtime. The only legislation in this respect passed puts the maximum for workmen at 60 hr. per week. In the early period of the war when there was such a tremendous need for munitions, men sometimes worked 100 hr. per week over long periods, four to six months, indeed, but by that time output began to drop rapidly. Now there is practically a stop to Sunday work. The average overtime amounts to four to five hours. Generally there are now only two shifts in most plants, but in explosive manufacture three shifts.

Entertained by New York Engineers

The special mission was given a luncheon on Nov. 13 by the Editorial Conference of the New York business journals and in the evening a dinner was tendered by

the United Engineering Society at Delmonico's. The formal program was opened by Charles F. Rand, president United Engineering Society, Col. J. J. Carty, American Telephone & Telegraph Co., presided as toastmaster, and Gano Dunn spoke for the assembled engineers.

Sir Stephenson Kent emphasized that the present is no war of armies but a clash of nations and indeed a clash of industries. Talking in the strain which he followed in the morning's meeting, reviewed in the foregoing, he explained that there had been no strike for increase of pay since the agreement under the munitions of war act, which incidentally covers war bonuses to compensate for the increased cost of living. He also remarked that no one had been sent to penal servitude for life, the penalty for instituting a strike calculated to interfere with the productio nof war materials. There has been no trouble on the front through want of a continuity of supply. No automobiles had been manufactured for private users in over 18 months. No building construction can be entered upon without a license where the cost is $2,500 or more.

He described briefly the war munitions volunteer movement under which 200,000 skilled men, the total so far, leave themselves at the disposal of the Government so they may be shifted to different kinds of work and to different plants. He felt confident that as a result of the Italian situation undoubtedly a large number of these volunteers have been called to the intensive production of guns for Italy.

Japan's Large Share in Steel Plate Exports

Steel plate exports in 1917 have been large and Japan's share has been very considerable. The following table gives Government figures in gross tons:

	Total Plate Exports	Plates and Sheets to Japan
First quarter, 1917	106,737	52,789
Second quarter, 1917	162,657	94,208
Third quarter, 1917	128,556	.....*
July	36,268	18,902†
August	49,801	28,591†
September	42,487	.....*
Total to Oct. 1, 1917	397,950	194,490
Fiscal year, 1915	123,914	12,436
Fiscal year, 1916	271,280	62,575
Fiscal year, 1917	421,397	203,179
Calendar year, 1913	223,814	7,250
Calendar year, 1914	111,552	3,275
Calendar year, 1915	222,472	37,119
Calendar year, 1916	276,034	80,458

*September distribution by countries not yet given.
†These two figures represent plate exports only and do not include steel sheets.

In THE IRON AGE of Aug. 9, 1917, attention was called not only to the large steel plate exports but also to Japan's share. It will be seen that, up to Oct. 1, these exports continued of large proportions and that Japan's share as late as August was still about 50 per cent of the total. Further facts concerning Japanese plate shipments are given elsewhere in this issue under Washington correspondence.

It is interesting to note that, for July, for the first time, the official data give separate figures for the destination of steel plates.

Wages of Sheet and Tin Plate Workers Advanced

The bi-monthly examination held Nov. 10 at Youngstown, Ohio, gives sheet workers 10½ per cent increase on a 5.25c. card; and tinplate workers 10 per cent increase on prices based on average sales of tinplate at $8.35 a box of 100 pounds. Wages of sheet workers are 96 per cent above the base fixed in the wage scale of the Amalgamated Association of Iron, Steel and Tin Workers and those of tinplate workers are 95 cents above the base. This increase will mean $2.50 a day more for rollers in the sheet mills averaging $25 a day. Puddlers' wages established for November and December at $11.80 a ton are a record in the history of the trade for this class of skilled workers.

COUNTRY-WIDE ADVANCE

Plan of Railroads Will Be Vigorously Resisted by the Shippers

WASHINGTON, Nov. 13.—The Western railroads have joined the Eastern roads in an application for higher freight rates and it is believed that the Southern roads will soon ask to be included, thus bringing before the Interstate Commerce Commission definitely the issue of allowing increases to the railroads of the entire country "to cover higher labor, material and supply costs." The application of the Western roads is for a general increase of an unspecified amount and will be heard by the Commission on Dec. 17, when it will be made a part of the pending 15 per cent case.

When the Commission ruled upon the application of the railroads for a 15 per cent advance last June, it granted certain minor increases to the Western carriers, but these roads, in their petition just filed, declare they are prepared to show that their net earnings have dwindled steadily since the early summer although gross revenues have been larger and the claim, therefore, is made that "to maintain efficient service required for the war and to make necessary improvements, part of the burden of the heavier operating costs must be passed on to the shippers."

The action of the Western roads and that anticipated on the part of the Southern carriers has alarmed the representatives here of certain large shippers' associations and as a result it is probable that the combined 15 per cent rate case will be sharply contested by these interests. The shippers' associations were disposed not to resist moderate increases if limited by the Commission to the carriers in Eastern territory, but are not prepared for a country-wide advance of 15 per cent. The representatives of the shippers' associations are also greatly incensed at the action of Comptroller of the Currency Williams in giving out an official statement expressing the opinion that the leading railroad systems of the country, in order to maintain reasonable market values of their securities, should be granted an advance in freight rates. However well meant this announcement was, it could hardly fail to arouse the antagonism of the organized shippers and it is now being vigorously denounced as an unfair attempt to prejudice the case in the minds of the members of the Interstate Commerce Commission. Clifford Thorne, representing large Western shippers of livestock and grain and so-called independent oil refiners, has made public a letter to Comptroller Williams, challenging his assertions and defying him to appear before the Commission.

Locomotive Orders

There were only 65 locomotives estimated as ordered in September with 647 in October bringing the total for the year to Nov. 1 to 5463 of which 3528 were ordered in the first half. The U. S. War Department has placed orders, since the middle of July, for no less than 2014 locomotives, a large number of which have already been built and shipped. Of this the Baldwin Locomotive Works received orders for 1834; the American Locomotive Co., 150 and the Vulcan Iron Works 30. The Chicago, Milwaukee and St. Paul has ordered 10 electric locomotives from the Westinghouse Electric & Mfg. Co. and 7 from the General Electric Co. The Egyptian State Railways has ordered 70 ten-wheel locomotives from the Baldwin Locomotive Works. The Chilean State Railways is inquiring for 20 locomotives, while inquiries have appeared from the Missouri, Kansas & Texas, the Atlanta & West Point and the Wheeling & Lake Erie.

Six sheet mills at the plant of the Mahoning Valley Steel Co. at Niles, Ohio, are now in operation, with prospects of getting the other two mills of this newly built works, in commission shortly. Jacob Waddell, formerly sales manager for the Brier Hill Steel Co., is the president and general manager.

MAY SEIZE COKE PLANTS

Fuel Administration Exasperated by Attitude of Mine Operators

WASHINGTON, Nov. 13.—Exasperated over the failure or refusal of coke producers in certain districts to observe the schedule of prices recently promulgated by the Government, officials of the Fuel Administration are preparing to take vigorous measures to compel manufacturers and dealers to observe strictly the scale authorized by Dr. Garfield. The power of the Fuel Administrator for the control of this situation is without limit and intimations have been made in several communications sent out from headquarters during the past week that the Government is prepared to invoke the extreme provisions of the Lever act and to seize plants and stocks of coke, if such measures are necessary to bring producers and dealers into line. Dr. Garfield is reluctant to take over any branch of the fuel industry as the Government is not equipped to operate it and probably would not be able to do so at full capacity, but he is determined to stop profiteering and he will not hesitate to invoke the law if necessary. It is the best opinion here that should the Government be forced to seize a plant or two, the results would be salutary and that it would not be necessary to take over any considerable number of ovens.

The following orders relative to prices for coke have been issued by the United States Fuel Administration:

"In each case the price shall be understood as the price per ton of 2000 lb., f.o.b. cars at the plant where coke is manufactured.

"All the maximum prices mentioned herein shall apply to car lots sold to consumers or to dealers for wagon delivery; any commissions paid to selling agencies or margins allowed to jobbers shall be paid by the vendors and shall not be added to the prices established hereby.

"In all cases where wagon deliveries are made, either by the coke producer or by dealers, a reasonable charge for such handling and delivery may be made. Such charge shall be subject to approval of the State fuel administrator.

"The maximum prices for coke made in ovens without by-product recovery east of the Mississippi River shall be as follows:

Blast furnace coke	$6.00 per ton
Foundry coke, 72-hour selected	7.00 per ton
Crushed coke, over 1-in. size	7.30 per ton

"The maximum prices for various grades of beehive coke made in districts other than those described heretofore shall bear the same ratio to the established price of the coal from which the coke is made as the average contract prices of the same grades of coke had to the average contract prices of coal during the years 1912 and 1913."

Plans for diverting a part of the tremendous coal traffic from the overworked railroad system of the country to inland and coastwise waterways are under consideration by the United States Fuel Administration. It is expected that a material saving in cars and motive power can be effected by utilizing water transportation for coal supplies wherever possible.

Major-General William S. Black, Chief of Engineers of the Army, in charge of river and harbor improvement work, is co-operating with the Fuel Administration in the water transportation plans. General Black has submitted to L. A. Snead, in charge of fuel supplies and distribution for the Fuel Administration, the results of an investigation into the terminal facilities and equipment available for the transportation of coal by water. The investigation showed clearly that a large saving in railroad transportation can be effected by utilizing all of the water transport facilities.

The shipment of coal from eastern fields to New England is one of the most striking instances of the opportunity for saving. At present large quantities of coal are shipped from Pennsylvania and West Virginia fields direct to New England points by rail. Facilities are available whereby practically all of this coal could be sent by a much shorter rail haul to tidewater at Baltimore, Philadelphia and New York, and thence by barge to New England ports. The longer rail haul keeps the coal in a much-needed car for a week or more, while the shorter haul could be made in about one-half of that time.

A detailed report is in course of preparation on all cases where long rail routes are being used in preference to available water routes, and the Fuel Administration will undertake to see that shippers take full advantage of water transportation wherever possible.

W. L. C.

Railroad Car Purchases

Practically 35,000 cars for use abroad have been closed since last week's issue and Italy is in the market for 3000 to 5000 cars.

The 30,000 cars for Russia were finally closed on Nov. 9 and in that connection it develops that 2500 of them are to be built by a new company, the Pacific Car & Foundry Co., with which William Pigott, vice-president Pacific Coast Steel Co. and identified with the Seattle Car & Foundry Co., is connected. The remainder of the cars were placed as follows: 10,000 cars to the American Car & Foundry Co., 10,000 cars to the Standard Steel Car Co. and 7500 to the Pressed Steel Car Co.

As already stated in these columns, the additional cars for the American expeditionary force in France were placed with eleven companies. The total, 4975, was distributed as follows: Box cars, 400 to the St. Louis Car Co., 400 to the Central Locomotive & Car Works, 450 to the Mt. Vernon Car & Mfg. Co., 500 to the American Car & Foundry Co. and 500 to the Pullman Co., a total of 2250. To the Standard Steel Car Co. were awarded 725 high-side gondolas; 1000 low-side gondolas were divided equally between the Cambria Steel Co. and the Pressed Steel Car Co. The American Car & Foundry Co. is to build 125 tank cars and the General American Tank Car Corporation an equal number. The Haskell & Barker Car Co. will build 250 refrigerator cars and the Southern Car Co., High Point, N. C., will build 500 flat cars.

Fuel Shortage Causes Trouble

YOUNGSTOWN, OHIO, Nov. 12.—The Bessemer steel mill of the Republic Iron & Steel Co. is idle this week, to give the finishing mills of the Brown-Bonnell works an opportunity to catch up. The finishing mills of the Republic here were shut down Tuesday, Oct. 30, because of a scarcity of fuel. The departments did not resume until Monday, Nov. 12, so that considerable steel accumulated with the steady operation of the Bessemer mill.

The Youngstown Sheet & Tube Co. is relining one of its Hubbard stacks. The other furnace was banked for some days because of a fuel shortage. The by-product coke works of this same company has been handicapped severely within the past two weeks because a supply of coal sufficient to keep the ovens operating to capacity was lacking.

The Carnegie Steel Co. reports all of its Bessemer furnaces at the Ohio Works here in operation. The Niles furnace is still out of blast. With the completion of the coal pulverizing plant, the McDonald bar mills will be put in partial commission. Two bar mills are reported to be in readiness.

The first delivery on the Canadian Government railway car order recently placed with the Canadian Car & Foundry Co., Montreal, will be made within the next two weeks. Some delay was caused through the inability of the car company to obtain steel for this business, but both the Nova Scotia Steel Co. and the Steel Company of Canada are now making regular deliveries, and within the next month the company will be turning out 50 cars a day.

Book Reviews

Hendricks' Commercial Register of the United States.—Pages, 2225, 7½ x 10 in. Published by the S. E. Hendricks Co., Inc., 2 West Thirteenth Street, New York. Price $10.

The twenty-sixth edition of this book contains as the distinctive feature an alphabetical section containing in one list the name, trade description and address of every company that appears in the main portion of the book. In addition to complete lists of producers, manufacturers, dealers and consumers of the products used by the iron and steel, mechanical, hardware, engineering, railroad, architectural, electrical, quarrying, contracting and kindred industries, a list of trade names, brands, etc., covering 212 pages, is included. This list, which was published last year for the first time, is a ready means of reference for purchasing agents and prospective buyers seeking for products that have distinctive names. The trade names which have formerly appeared in parenthesis after the manufacturer's name under the different classifications in the main portion of the book are still retained. The index to the trade classifications occupies 151 pages and covers over 50,000 trade references, an increase over the previous edition of approximately 5000 classifications.

Blast Furnace Construction in America. By J. E. Johnson, Jr. Pages xi + 415, 6 x 9 in.; illustrations, 247. Published by McGraw-Hill Book Co., New York, and for sale by THE IRON AGE Book Department. Price $4.00.

There are far too few American books relating to the metallurgy of iron or steel written by men actually in contact with the processes which they describe. Robert Forsythe's book "The Blast Furnace and the Manufacture of Pig Iron" is almost the only one relating to this important subject and this covers a somewhat different field from Mr. Johnson's book. It is fortunate that a man of Mr. Johnson's experience has had both the opportunity and the inclination to put in published form the results of his observation and study.

The book on the whole is an excellent one, clearly written and well illustrated, but it disappoints in the meager attention paid to several important parts of a furnace plant. The material in the book is taken from a series of articles which the author contributed to *Metallurgical and Chemical Engineering* and a second volume is to follow, containing the remainder of the series. For this reason occasional reference is made to data not contained in this volume.

The earlier chapters deal with handling the raw materials for the furnace including ore, coke and limestone and charging and distributing them in the furnace itself. The description of ore bridges, car dumpers, skips and other charging appliances is adequate and covers the field well. The advantage of each is carefully and clearly discussed. In the chapter on "Filling" too much space is devoted to the double bell top, both the simple and modified types as used on small furnaces, but the standard double bell top, for large furnaces and its vital proportions, is not reviewed. Much space is given to rotating and other types of distributors and these are well treated. This chapter would lead a novice to believe that either some type of ring bell or mechanical top was in universal use. No mention is made of inside distributors of the Killeen, MacDonald or Slick Type.

The economical use of the top gas is an important matter in a large plant and this is inadequately treated, both under boilers and stoves. None of the newer automatic burners of the Bradshaw or Turbeck type is mentioned. The boiler settings shown are standard trade cuts of coal-fired boilers which are not adapted to blast furnace gas. In a new edition the entire chapter on boilers should be rewritten. The chapter on cleaning the gas is largely a copy of papers by Forbes and Diehl on this subject; the gas analysis in this chapter does not agree with that in an earlier one.

Blowing engines of all types are well described to some length. Unfortunately, the author's experience apparently has not covered turbo blowers and these excellent and desirable blowing units are handled very unsympathetically. Their characteristics are such that they will probably eventually displace reciprocating machines entirely and a more careful analysis of their good traits is warranted. There would appear to be sufficient available data to disprove the old figure of 63 cu. ft. per pound of coke which is given in this chapter. Dry blast is described in much detail and the power and economical phases of the subject treated extensively.

A chapter is devoted to "Stoves" and most of the usual type are illustrated. Much of the space devoted to the obsolete cast iron stoves could have been used advantageously in treating some of the most recent advances in construction.

The construction of the furnace stack with reasons for the types adopted is described, and handling the slag and iron is treated in a full and satisfactory way. The addition of actual data on runner design would be helpful. A chapter is devoted to auxiliaries and plant arrangement and the general plans of several typical plants are given.

The book is a good one and while perhaps too dogmatically written, it is one which engineers and draftsmen in the blast furnace industry will find of great value.

S. M. MARSHALL.

Robert H. Treman, deputy governor of the Federal Reserve Bank of New York, has published a booklet entitled "Trade Acceptances." A trade acceptance is defined as "a time draft or bill of exchange drawn by the seller of merchandise on the buyer, for the purchase price of the goods, and accepted by the buyer, payable on a certain date, at a certain place designated on its face." The booklet sets forth how the use of acceptances will do more to increase American financial efficiency than almost any other element. It will permit a more economical distribution of merchandise and food products, through obtaining low rates of interest as trade acceptances can be rediscounted at a lower rate than any other form of mercantile paper. Experts have estimated that from two to three times the present volume of business under the prevailing "open book accounts" system can be done safely and conservatively on the same capital by the use of trade acceptances.

A report on the deterioration in the heating value of coal during storage, covering a five-year period, has just been issued by the Bureau of Mines, Department of the Interior, as Bulletin 136. The tests show that the amount of deterioration has commonly been overestimated. Except for the subbituminous Wyoming coal, no loss was observed in outdoor weathering greater than 1.2 per cent in the first year, or 2.1 per cent in two years. The bulletin, of which the authors are Horace C. Porter and F. K. Ovitz, may be obtained free of charge by addressing the director of the Bureau of Mines, Washington.

Poor's Intermediate Manual of Railroads is issued. It gives revised statements of the more important companies, issued for the new fiscal period in accordance with the requirements of the Interstate Commerce Commission. Bond statements, income accounts and balance sheets have been revised to the latest date. The work contains 1200 pages of text. It is the only book of the kind issued to date. It should be found very useful by brokers and financial institutions. Price $7.50 a copy. Issued by Poor's Manual Co., New York.

"New York of To-day," by Henry Collins Brown, is a very attractive little volume of interest to people throughout the country as well as to New Yorkers. It contains an immense amount of information entertainingly written and also has numerous illustrations. It is sold for $1.50, cloth, and $2, flexible leather, by the Old Colony Press, 15 East Fortieth Street, New York.

Electric Furnace in Norway's Iron Industry*

Present Stage of Electric Pig Iron—Progress in Electric Steel—Economy in Remelting Scrap in the Electric or Open-Hearth

BY HAAKON STYRI

At the end of the sixteenth and the beginning of the seventeenth century, Norway had a comparatively well-established iron industry, which, after a declining period in the hard years of war following 1800, again revived and flourished until the middle of the last century. Eighteen iron works were in operation and many prominent families made fortunes at that time. It is probable that from the same period originated the name "Norway Iron" for high-quality wrought iron. A constant decline in the iron industry followed until, at the end of the century, only one charcoal furnace at Naes was in operation utilizing its product for crucible steel.

A turning in the tide seemed to come with the steel-casting industry. An acid open-hearth, heated with generator gas, was built at Kristiania Staalverk, and a Tropenas converter with cupola outfit at Strömmen Staalverk. A third plant made a good profit by welding together plate scrap to billets, which were rolled and forged.

Pig Iron from Electric Energy

The application of electric energy in iron and steel-making gave a new impulse to the iron works, supported probably by the competition between owners of water falls who wanted to find some use for their power. The Jössingfjord Mfg. Co., in 1909, built an induction furnace of the Hiorth type. More interest centered in the electric production of pig iron, after the promising reports from the operation of the "Electrometall" shaft furnace at Domnarfvet and Trollhättan. The Electrometallurgical Committee, appointed by the Norwegian Government in 1907, reported favorably on the prospects, and with nation-wide support.

The Hardanger Jernverk, was formed at Tysaa. The type of furnace adopted here was the Electrometall but with modifications in design which, after the few experiments in Trollhättan, were considered necessary when coke was used for reduction. One furnace was built and put in operation in 1911 and another built before results from the first were obtained. The operation was not successful. The charge had a strong tendency to hang, caused partly by the narrow neck, and partly as later investigations have indicated by the limestone which fell into powder when burned and by the precipitation of carbon in the briquettes, causing many of these which were of a loose structure to burst.

This does not prove that coke cannot be used in the Electrometall furnace and it is said that in later tests in one of the larger new furnaces in Sweden, where coke alone was used for reduction, satisfactory results were obtained. Some recently published reports, however, indicate that reduction with coke was tried in the Helfenstein furnace in Domnarfvet, where the energy consumed was 2600 to 2700 kw.-hr., and the coke consumed 310 to 330 kg. per ton of pig. From the same source, we are informed that a Helfenstein furnace is in course of construction somewhere in Norway. Time will tell whether or not sufficient tests have been made to justify this new construction.

The Tinfos Furnace

Before the Hardanger Jernverk started operation, experiments were made from Jan. 1, 1910, at Notodden, with the 500 kw. furnace of the Bie-Lorentzen and Tinfos Paper-Fabric. After quite successful trials with coke as reduction material, the Tinfos Jernverk was formed, which built three 1200-kw. furnaces of the single-phase type, with bottom electrode, rectangular chamber, and two charging stacks.

Work started in 1912. In the beginning many difficulties had to be overcome, partly on account of poor electrodes and bad castings for water-cooled collars. Many furnace details had to be changed and the correct way of mixing and charging the material at hand had to be found. Most careful attention had to be paid to the physical properties of the coke. The product at first varied considerably in quality but now the furnaces operate very regularly. White and grey pig iron of high quality can be produced at will, competing with charcoal iron. It is of interest to note that most of the manganese in the ore is reduced. From data published, the energy consumed per ton is 2700 kw.-hr. for white pig and 3000 kw-hr. for grey pig, with 44 per cent iron in the ore.

The Tinfos Jernverk has had a very successful period since the war started, and particularly since the demand for high-grade pig increased. It was practically the only domestic plant which could furnish a small part of the pig iron that was formerly imported from Sweden, Germany and England and has thus materially helped in keeping the mechanical industries of Norway going. A Tinfos furnace has also been built at Ulefos, using phosphoric ore from the Faehn deposits. Foundry iron is produced, which is remelted in a Rennerfelt furnace and then run into stove castings.

Progress in Electric Steel

None of these plants has, until now, tried to convert the electric pig iron into steel; but electric steel making in the country has developed along the same lines as in other countries where electric furnaces have been adopted.

The most important company melting and refining scrap for tool steel and steel castings is the Stavanger-Staalverk, at Stavanger, Norway, which started in 1913. The scrap is melted in an open-hearth furnace and refined in a 5-ton Roechling-Rodenhauser single-phase induction furnace. This plant has gradually improved its product and now has a very good reputation for hammered bars and steel castings. The plant has been very prosperous during the last two years, and recently increased its invested capital to $1,000,000, in order to allow installation of more electric furnaces, a bar mill and electric annealing furnaces. It is also said to have discontinued the operation of its open-hearth for melting down the scrap, on account of the present prohibitive prices of coal.

A number of other small electric-furnace installations have been formed on account of the wartime profits in steel castings and special steels. A small Roechling-Rodenhauser furnace at Eureka, Christiania, makes acid-resisting steel; at Hamar, Hougsund, and Drammen, cast steel is made in Rennerfelt furnaces, and at Kongsberg and Naes tool steel is made in the same type of furnace.

The Rennerfelt and Heroult Furnaces

Most of the electric furnaces built in Norway are of the Rennerfelt type. The reason for this is that it is difficult to get material from countries other than Sweden, and the furnace is very well adapted to the remelting of scrap, for cast steel in small quantities. There is very little in the feature claimed as specific to this furnace, that the arrangement of electrodes serves to throw the arc against the bath. Anyone will find that an arc will play against the molten charge when, with single or polyphase current, the electrodes are placed at an angle to the charge. The arc will follow the path of least resistance, that is, where the gases are hottest between the electrode-ends and the bath. When starting to melt down cold scrap, the arc is not more steady than it is, for instance, in a 3-phase Heroult furnace, because of the cooling of the air from the

*From a paper presented at the thirty-second annual meeting of the American Electrochemical Society, Pittsburgh, Oct. 4, 1917. The author is metallurgist, Hussey Binns Steel Co., Charlerol, Pa.

charge with the consequently unsteady air currents. The lining is very much exposed to radiant heat and the uneven heating of it has been the result of faulty shape of the furnace body, which has been improved in recent designs, approximating the well-known Stassano furnace.

The Heroult furnace is not, at present, in use in Norway for steel making, but it will probably be seriously considered by a new larger company. The excellent shape of the furnace body, which facilitates repair, and the simple arrangement of electrodes are of great advantage. Many details in the furnaces built by the United States Steel Corporation could certainly be improved upon. There ought to be sufficient room under the electrodes for mechanical charging, an essential point in the economy of operation. In a larger plant the electrodes should be arranged on the side, to allow a continuous charging platform for a battery of furnaces. Attention should also be given to the possibility of the freezing of the water in cold weather. All pipes, therefore, should be easy to drain. The device for lifting the doors and the manner of tightening them should be improved.

Much of the successful operation of the furnace depends on the kind of scrap that is used. To avoid losing time in melting, the complete charge should go into the furnace from the start, and it is very important that the melter pay attention to his lining when charging, as he can protect or cut the lining according to the way different material is placed.

Graphite Electrodes in Large Furnaces

In larger furnaces, from 16 to 20 tons, graphite electrodes are probably better than carbon electrodes because it is difficult to handle the large sized carbon electrodes, particularly when they break off in the furnace during operation. Besides, if private information is correct, they are more economical in use, at least when applied on molten charge.

The refining facilities in the Heroult furnace are very good. There is no difficulty in getting an oxidizing slag. The reducing action of the electrodes will not overbalance the oxidizing influence of the incoming air, which effect can be increased by roll scale and ore. When making high-carbon steel, in particular, it is of advantage to dephosphorize at the lowest possible temperature, in order to enable the greater part of the carbon to remain. In the preliminary testing, the manganese content will indicate the amount of phosphorus, when the content of both in the material charged is known. For desulphurization the furnace is ideal, because the slag can so easily be kept reducing by throwing in coke or coal, and, if necessary, ferrosilicon, whereas the temperature of the slag can be kept high.

A common disadvantage in the arc furnaces is that so much smoke is developed, which, in some places, has even resulted in strikes by the workmen. This fault is not shared by the induction furnace.

Where furnace installations are contemplated, the choice of furnace type will to a greater extent depend more upon the cost of installation and royalty than upon the kind of work that is to be done and the ease of operation. It is well to remember, in this connection, that the first and principal Heroult patents have now expired.

Present Conditions

In late years in Norway there has been a great desire to get iron and steel works which could produce shapes, plates, and other commercial steel in order that the country might be more independent of imports. During the present war this need has been bitterly felt, as it is extremely difficult to get commercial steel from the belligerent countries, which formerly furnished it all. Many private corporations have investigated the possibilities of starting a modern steel plant and much capital was expected to back the plans if they could be satisfactorily worked out, but the present soaring prices of all new construction has put a stop to further important development. Another reason for little progress in the plans was the difficulty in working the different local interests together into a national interest and the intervening of the Government has not improved the conditions.

It is of importance, however, that Government interest in the development has been created. The immediate result of this is that, as a strictly war measure, a premium on the production has been granted to Kristiania Spikerverk for building a second open-hearth furnace and a small bar mill and the extra funds necessary to build a new cupola and Tropenas converter has been voted to Strömmen Staalverk. It is rather discouraging for people interested in the electric iron industry in Norway to find that the Government considers it more opportune, economically, to support open-hearth and Tropenas converting and not electric steel melting when private interests find it best to work along the latter line; but the reason is probably that in the present emergency it is easier to get building material for open-hearth furnaces and converters, and wood and charcoal can be substituted for coal and coke.

Conditions are not promising for the production of steel on a larger scale in Norway. The operation of a coke blast furnace would demand the import of lump ore from Sweden, Spain or North Africa, besides the fuel from England and the same would to a less extent hold true for a large scale production of electric pig iron. For the conversion of pig iron to steel there would be little difference in the cost whether this was done in the open-hearth or electric furnace. The freight on some or all material used would increase the final cost considerably. The conditions are no better, when we remember that Norway and England are the only iron-producing countries which have no duty on imported iron.

Remelting Scrap in Electric or Open-Hearth

Better economical success could apparently, at least before the war, be expected for a company remelting scrap in electric furnaces, as the scrap was considerably lower in price than pig. The basic open-hearth would certainly melt the scrap somewhat cheaper than the electric furnace, but when the capacity of the latter is increased it is probable that the steel from an electric furnace using cold scrap would not cost more than $1 to $2 per ton more than the open-hearth steel, when the same quantity is produced, and the better quality of the electric steel would balance the difference. Increasing coal prices would improve the prospects for the electric-furnace melting. The difficulty would be to get the scrap.

The total annual import of steel into Norway is about 200,000 tons, from which 12 to 15 per cent is returned as scrap. The scrap from all parts of the country would therefore not amount to more than 30,000 tons and most of this is already disposed of by the plants in operation. A large company must, therefore, depend entirely on the supply of scrap from neighboring countries, with additional freight expense and at prices in competition with the foreign buyers.

The prospects can, of course, change. It is possible that concentrate can be used direct in an electric reduction furnace, at least where little attempt is made to utilize carbon monoxide in the reduction of the ore, by using the gas instead for heating pig-iron mixers, where the main decarbonizing could be done, for melting of scrap, and for heating of by-product coke ovens. The gas from the coke ovens could be sold to the city. The steel product could be finished in an induction or arc furnace.

Another method is now on trial, basing the operation on the direct use of low-grade ore by the Edwin-Westberg-Gröndal process. Interested Norwegians and Swedes have secured $150,000 for the purpose of testing the method on a commercial scale. The low-grade ore is crushed according to the structure and is treated in the furnace with reducing gases which are heated outside in a high-tension arc furnace, similar to the one used for the manufacture of saltpeter. The reduced iron is afterwards separated magnetically from the rock and the iron powder melted in an electric furnace.

The successful iron and steel works in Norway have based their production on high quality of product. The manufacture of structural steel is not and probably will not be tried in the near future on account of the competition from foreign countries. What Norwegians want and look forward to is the time when the country can again furnish iron and steel which comes up to the old standard of Norway iron.

Machinery Markets and News of the Works

EXPORTS BEING CUT DOWN

Partial Embargo in Effect on Many Tools

Large Demand in All Sections of the Country for Equipment to Manufacture Guns and Shells

A tightening of the restrictions on exportation of machine tools is noted. Manufacturers of tools which are in greatest demand for war industries, such as milling machines, grinding machines, lathes, 24 in. and larger, etc., have received letters within the past week from the Exports Administrative Board that licenses will not be granted hereafter for the exportation of such tools to the Northern neutral countries of Europe. Requests for licenses to export even to our Allies are being given close scrutiny.

Machinery demand in Eastern markets continues active, though there is not as large a number of new inquiries as have been noted in recent weeks. The Watertown Arsenal is still buying heavily and the Watervliet Arsenal will soon need a large quantity of equipment for a new cannon shop. The International Fuse & Arms Corporation, Bloomfield, N. J., has received a shell contract. The Bridgeford Machine Tool Works, Rochester, N. Y., is buying for an addition to cost $50,000 for making large tools. The Standard Ordnance Co. continues to buy for a munitions plant in Hamilton, Ohio. The Pacific Coast Shipbuilding Co., San Francisco, has bought equipment for a plate and angle shop.

A 250-ton gantry crane will be purchased by the Government for the Sandy Hook Proving Ground. The Champion Engineering Co., Kenton, Ohio, has sold four 5-ton cranes to the Fore River Shipbuilding Corporation.

There is an unusually large demand for cranes and hoists from shipyards and manufacturers in the Philadelphia district. The Baldwin Locomotive Works has issued the largest inquiry, calling for bids on 20 cranes, ranging in capacity from 20 to 150 tons. This concern is also buying other locomotive shop equipment, for use both in this country and in Russia, where it will erect a locomotive shop for the Russian Government. The William Cramp & Sons Ship & Engine Building Co. is in the market for six cranes, from 5 to 25 tons capacity. The Eastern Steel Co., Pottsville, Pa., wants a 25-ton crane and the Standard Steel Works Co. will buy cranes for its gun-machining shop at Burnham, Pa. The Newport News Shipbuilding & Dry Dock Co., Newport News, Va., is inquiring for a large number of electric hoists for new destroyer shops. The New York Shipbuilding Corporation, Camden, N. J., has placed an order with the Pawling & Harnischfeger Co., Milwaukee, Wis., for six cranes for its new destroyer shops. The American International Shipbuilding Corporation is expected to close this week for seven 10-ton shop cranes and 45 3-ton jib cranes and the same number of 3-ton mono-rail hoists. The Sun Shipbuilding Co., Philadelphia, has bought two locomotive cranes for its shipyard at Chester, Pa. The United States Government will require a large number of locomotive cranes for terminals on the Atlantic seaboard, which are to be built at a total cost of $18,000,000.

The Worthington Pump & Machinery Corporation, Hazelton, Pa., has just issued another large inquiry for equipment to manufacture 75-mm. shells. The Bartlett & Hayward Co., Baltimore, Md., has placed large additional orders and will buy more for munitions work. With what is to come, this company's purchases will aggregate several hundred thousands of dollars. The Midvale Steel Co. is reported to be searching for large planers and other equipment for its ordnance plant. The Pennsylvania Railroad Co. is buying more tools for shipment to the American railroad in France. The Hess-Bright Mfg. Co. has placed another large order for grinding machines, which will make its grinding-machine equipment one of the largest in the country. The Pusey & Jones Co. is making important additions at its Wilmington, Del., shipyard, and is expected to enter the market for new equipment. The Chester Shipbuilding Co. has not yet closed on a large number of machines, for which bids were received some time ago. The American International Shipbuilding Corporation will buy a large number of pneumatic tools. The Tacony Ordnance Corporation is buying for a tool room at its new gun-forging plant at Tacony, Pa.

Large purchases for the Rock Island Arsenal are the feature of the Chicago machinery market. These orders will aggregate at least $1,000,000. Machine-tool dealers have been asked to furnish lists of tools for immediate shipment to motor truck manufacturers, who are in urgent need of new equipment. Demand for war work is on the upward trend in the Chicago territory and is expected soon to approximate the enormous demand which has prevailed for some months in the East. The Twin City Forge & Foundry Co., Stillwater, Minn., has obtained a $3,000,000 contract for 6 in. shells.

Dodge Bros., Detroit, who have a contract for recoil mechanisms for guns approximating $30,000,000, have issued an inquiry for 60 planers, according to information from the Cleveland machinery market. Presumably other equipment will be inquired for soon. The Osgood Mfg. Co., Marion, Ohio, is inquiring in Cleveland for 75 lathes for shell work. A Cleveland company wants 100 screw machines, 24 grinders and some other tools for shell work, and another Cleveland company is inquiring for 10 21-in. lathes. Still another inquiry is for 60 to 70 machines, including lathes, grinding, milling and drilling machines. A Cleveland builder has received an order for 22 turret lathes from the Rock Island Arsenal. The Salisbury Wheel & Mfg. Co., Jamestown, N. Y., has bought 23 turret lathes for machining gun carriage hubs. The Interstate Motor Co., Muncie, Ind., wants 15 or 30 turret lathes for similar work. The Lincoln Motors Co., Detroit, has

bought additional equipment, including lathes and radial drills, for airplane engine work. The Wellman-Seaver-Morgan Co., Cleveland, has been awarded a contract for the manufacture of condensers, uptakes and stacks for submarine destroyers, and an addition will be built at its Akron, Ohio, works. Some standard lathes and drilling machines will be installed, but most of the machinery will be of a special character. The same company has taken another contract for steering engines for destroyers, and work on these is under way at the Akron plant. The two contracts, it is reported, will aggregate $5,000,000. Cleveland crane builders are bidding on three 350-ton hammer-head fitting-out cranes for navy yards. The cranes will be the largest of this type ever built and the cost will approximate $2,000,000. The American Clay Machinery Co., Bucyrus, Ohio, will equip a new unit for the manufacture of 6-in. shells. It placed an order last week for 50 21-in. lathes and is expected to buy other equipment. The Elyria Machine Co., Elyria, Ohio, which also has a Government order for shells, bought 20 lathes of 21 and 25 in.

The New England machine tool market is being combed for tools for the Watertown Arsenal and the new shops of the Fore River Shipbuilding Corporation. The Osgood Bradley Co., Worcester, Mass., is buying heavily for a gun-carriage contract.

Michigan automobile manufacturers have pledged their support of the Government program of utilizing motor plants for war work. The Ford Motor Co., Detroit, has taken a contract for 5000 Liberty motors.

New York

NEW YORK, Nov. 13.

New Government contracts for shells and projectiles have been awarded to manufacturers in the East, resulting in demand for new machine-tool equipment, but for the most part these orders have gone to companies whose plants are already pretty well equipped because of former munitions work. The International Arms & Fuse Corporation, Bloomfield, N. J., has received a large contract for 75-mm. shells for use in French guns and will probably be in the market for additional equipment.

Nearly all dealers in this market report that new inquiry was lighter during the past week than for some months. Miscellaneous inquiry for civilian work has fallen off almost to nothing. This may be due to the difficulty of obtaining satisfactory deliveries or the high prices, or a combination of the two. Sellers are showing little interest in inquiries except for Government work, as they claim it is useless to load their order books up with commercial orders when there can be nothing definite as to delivery. Of smaller tools there is a good supply. Small lathes have become almost a drug on the market.

The Watervliet Arsenal will build a new cannon shop, 200 x 300 ft., for which equipment is to be purchased soon. The Bridgeford Machine Tool Works, Rochester, N. Y., is building a $50,000 addition for the manufacture of large machine tools and is purchasing equipment. The Staten Island Shipbuilding Co., Port Richmond, N. Y., will purchase equipment for a machine shop. The Government is seeking a shaper, milling machine and an engine lathe for the submarine base at New London, Conn. The Bausch & Lomb Optical Co., Rochester, N. Y., is buying tools for making gun sights and periscopes. The Standard Ordnance Co., 115 Broadway, New York, continues to buy for a munitions plant in Hamilton, Ohio. This company is affiliated with the Mosler Safe Co.

The Pacific Coast Shipbuilding Co., San Francisco, has bought about 25 machines for a plate and angle shop. The Fore River Shipbuilding Corporation, through the Aberthaw Construction Co., Boston, has placed an order for four 5-ton cranes with the Champion Engineering Co., Kenton, Ohio. This makes 62 new cranes which have been bought for the Fore River destroyer shops, in addition to several second-hand cranes. The Staten Island Proving Ground will purchase a 250-ton Gantry crane. A tentative inquiry, which has just been issued, will be followed with specifications soon.

The De La Vergne Machine Works, with plant at the foot of East 138th Street, New York, has been sold to the William Cramp & Sons Ship & Engine Building Co., Philadelphia, which will use it for the manufacture of oil engines and refrigerating machinery for war vessels. The De La Vergne company is capitalized at $1,500,000 and its annual output has had a value of $1,200,000 to $2,000,000. New equipment will soon be purchased.

The Simplex Automobile Co., New Brunswick, N. J., has awarded to Westinghouse, Church, Kerr & Co., New York, the contract for a large extension to its aluminum foundry.

The Central Railroad of New Jersey has awarded to Westinghouse, Church, Kerr & Co., New York, the contract for a boiler plant at its railroad coaling station at Communipaw, N. J.

The American Can Co., 120 Broadway, New York, has taken bids for the erection of three additions to its plant near Elizabeth Avenue, Newark, N. J. The structures will comprise a one-story forge shop, 60 x 70 ft.; three-story, reinforced-concrete manufacturing plant, about 40 x 240 ft.; and two-story office building. N. M. Loney is engineer.

The Toch Screw Machine Products Corporation, Eighth Street, Long Island City, N. Y., has purchased property, about 75 x 100 ft., adjoining its plant, which, it is said, will be used for extensions.

The Bario Metal Corporation, New York, has been incorporated with a capital of $90,000 to manufacture electrical furnaces. N. Herbschleb, P. Demiles and H. Jenkins, 31 Park Row, are the incorporators.

The Universal Shell Fuse Co., New York, has been incorporated with a capital of $10,000 to manufacture fuses. The incorporators are L. F. Sniffin, W. J. Powell and F. K. Welton, 49 Wall Street.

The Bemis Brothers Bag Co., St. Louis, manufacturer of package containers, is having plans prepared for the construction of a new plant on Fifty-second Street, from First to Second avenues, Brooklyn, N. Y. It will be two and three stories, of reinforced-concrete, about 85 x 700 ft., and is estimated to cost $300,000. G. W. Wadleigh is engineer. Local offices are at 61 Broadway.

The Colman Machinery & Tool Co., New York, has been incorporated with a capital of $10,000 to manufacture tools and machinery. F. B. Knowlton, W. Metkiff and J. Gill, 154 Nassau Street, are the incorporators.

The Reading Chassis & Motor Corporation, New York, has been incorporated with a capital of $100,000, to manufacture automobile parts. C. W. Bliss, S. S. Shears and E. Cahn, 233 Broadway, New York, are the incorporators.

The Himoff Machine Co., 50 Church Street, New York, has increased its capital from $100,000 to $250,000.

The L. M. F. Engineering Co., Fourth Avenue and Tenth Street, College Point, L. I., manufacturer of airplanes, etc., has had plans prepared for a new one-story plant, about 100 x 170 ft., to cost $150,000.

The Eureka Specialty Mfg. Co., New York, has been incorporated with a capital of $100,000 to manufacture automobile accessories. E. M. Carlson, W. H. David and M. W. Richard, 674 Academy Street, are the incorporators.

The Morse Dry Dock & Repair Co., foot of Fifty-sixth Street, Brooklyn, is considering the erection of a one-story addition, about 90 x 200 ft., to cost $20,000.

The W. F. Meyers Machine Co., Inc., Hamilton Street, Long Island City, N. Y., manufacturer of diamond saws and stone-cutting machinery, will build a two-story addition, about 15 x 34 ft.

Richard Kramer, Classon Point, L. I., and associates have incorporated the Fidelity Tire & Rubber Co., Jersey City, N. J., to manufacture automobile tires, etc. James L. Meltzer and F. O. Sheehan, both of New York, are also interested in the company.

Burdick & Son, Hamilton and Mosher streets, Albany, N. Y., operating a sheet metal works, have had plans prepared for a four-story addition to cost about $50,000.

The Vecchio Mfg. Co., Albany, has been incorporated with a capital of $10,000 to manufacture electrical machinery. L. Vecchio, J. A. Pabula and F. Mondello, are the incorporators.

The Simmons Machine Co., Broadway, Albany, has had plans prepared for a one-story extension, 120 x 120 ft., to cost about $20,000.

The Gifford-Wood Co., Hudson, N. Y., manufacturer of ice and coal handling machinery, has had plans prepared for an addition, about 75 x 150 ft., to cost $30,000.

The North Atlantic Shipping Corporation, Pearl River, N. Y., has been incorporated in Delaware with a capital of $100,000 to operate a shipbuilding plant. Arthur R. Oakley,

Pearl River; Cornelius E. Cole, Hackensack, N. J.; and Paul E. Britsch, New York, are the incorporators.

The American Emblem Co., Columbia Street, Utica, N. Y., will erect a new two-story factory, about 40 x 50 ft., on Genessee Street, New Hartford, N. Y., to cost about $15,000.

The R. G. Packard Co., Twenty-eighth Street, Bayonne, N. J., has commenced dredging work on its property on the Raritan River, Perth Amboy, N. J., which will be used, it is said, as a site for shipbuilding works. It recently acquired about 40 acres of land, adjoining its present holdings.

The Samuel L. Moore & Sons Corporation, Front Street, Elizabeth, N. J., iron founder, has conveyed to the Moore Shipbuilding Co., a subsidiary of the Bethlehem Shipbuilding Co., 69 acres of land at Roosevelt, formerly used by the Canda Car Co. It is reported that the site will be used for a new shipbuilding plant.

The Standard Aero Corporation, Elizabeth, has awarded a contract for the erection of a new two-story plant, 50 x 550 ft., and two-story office building, 60 x 140 ft., at Linden, to cost about $250,000.

The Schoellner & Horbach Mfg. Co., Newark, has been incorporated with a capital of $125,000 to manufacture jewelry. Karl A. Horbach, J. W. Schoellner and Joseph P. Rowley are the incorporators.

John Regner, Newark, will erect a new one-story welding shop at 68-72 Gotthart Street.

The Saylor Tool Works, Newark, has been incorporated with a capital of $50,000 to manufacture tools. The incorporators are Harry M. Saylor, 328 Washington Street; Frank W. Bird and Charles E. Patterson, Newark.

The Newark Bay Shipyard, Newark, has been organized to operate shipbuilding works at Port Newark Terminal. H. R. Sutphen, 5 Nassau Street, New York, heads the company.

The Irvington Mfg. Co., Coit Street, Irvington, N. J., manufacturer of tools, will erect a one-story brick addition to cost about $8,000.

Catalogs Wanted

Elmer P. Morris, iron and brass founder, 126 Liberty Street, recently lost a valuable collection of catalogs in a fire and asks manufacturers to send duplicate catalogs with discount sheets for export trade.

Buffalo

BUFFALO, Nov. 12.

The Fore River Shipbuilding Corporation, Quincy, Mass., a subsidiary of the Bethlehem Shipbuilding Corporation, has filed plans for the construction of a one-story machine shop at the site of its new turbine plant, Vulcan Street, Buffalo.

The Miller-Ulrich Machine & Tool Works, Buffalo, has been incorporated with a capital of $20,000 to manufacture tools, etc. F. and A. Miller and C. Ulrich, Buffalo, are the incorporators.

The Machinery Products Co., Buffalo, has been incorporated with a capital of $15,000 to manufacture machinery specialties. The incorporators are C. Pond, F. H. Fowler and J. A. Carmon, all of Buffalo.

The Dyneto Electric Corporation, Syracuse, N. Y., manufacturer of electric apparatus, has acquired a four-story building, 75 x 100 ft., on Park Street, for an extension to its works.

The Illinois Platinum Corporation, Eddyville, N. Y., has been incorporated with a capital of $17,500 to manufacture platinum specialties. A. D. Ranstead, E. P. Bellows and G. V. Reilly, 65 Cedar Street, New York, are the incorporators.

The Rochester Tire Co., Rochester, N. Y., has been incorporated with a capital of $500,000 to manufacture automobile tires. The incorporators are Earl H. Crowder, Buffalo; Henry J. Crowder, New York; and Ernest W. Ewell, Lancaster, Pa.

The Perfecto Traffic Corporation, Rochester, has been incorporated with a capital of $60,000 to manufacture motors, trucks, etc. The incorporators are W. B. Hopkins, H. D. Hutcheson and F. E. Olmsted, all of Rochester.

The Fayette & Porter Mfg. Co., Oswego, N. Y., has been incorporated with a capital of $25,000 to manufacture plumbers' supplies. G. E. Porter, H. S. Lavere and G. B. Fayette are the incorporators.

The Ferguson Steel & Iron Co., Buffalo, is building a power house, 30 x 130 x 30 ft., at Bailey Avenue and the New York Central Railroad.

An addition to the laboratory of the Rensselaer Polytechnic Institute, Troy, N. Y., is to be erected at a cost of $100,000.

The O'Neil Iron Works, Inc., Buffalo, recently incorporated with a capitalization of $500,000, has purchased the Lake Erie Boiler Works at Perry and Chicago streets, Buffalo, which it will immediately equip for the manufacture of sugar mill machinery. The foundry connected with the plant, which has been shut down for several years, will be put in operation at once. It is expected about 700 men will be employed within a short time. The officers are Laurence W. O'Neil, president; William D. O'Neil, vice-president, and John F. O'Neil, chairman of the board of directors, all of whom formerly owned the Fulton Iron Works, St. Louis, which was recently sold. The company expects to commence work on Government orders as soon as the remodeling of the plant is completed.

The Henry Cheney Hammer Corporation, Little Falls, N. Y., has been incorporated with a capital stock of $100,000 J. E. Hemstreet, K. E. Morgan and D. J. Williams are the directors.

The Erie Railroad Co., Frederick D. Underwood, president, has let contract for additions and repairs to its East Buffalo shops. A Robbins coal handling plant will be installed.

The Hornespeed Propelling Co., Buffalo, recently incorporated with a capital stock of $1,000,000, has completed plans for the erection of a factory for the manufacture of marine propellers, ventilators and other specialties.

The Stewart Motor Corporation, manufacturer of motor trucks, is building an addition, 51 x 110 ft., to its plant at East Delavan Avenue and the New York Central Railroad Belt Line.

The Chamber of Commerce, Batavia, N. Y., has negotiated with a Canadian steel company to take over the plant of the Worden Co. on Evans Street to manufacture shells for the United States Government, for which the Canadian company holds a contract. The plant is to be enlarged at once and operations will begin Jan. 1.

The Cutler Desk Co., Buffalo, will build an addition, 50 x 152 ft., to its plant at Churchill Street and the New York Central Railroad.

The Garoga Electric Power Co., Garoga, N. Y., has been incorporated with a capital stock of $200,000 by J. T. Norton, W. A. Dunne and G. C. LeCompte, Troy, N. Y.

The Buffalo Forge Co., Buffalo, is building a $25,000 addition to its plant at Broadway and Mortimer Street.

The Fero Engineering Co., Rochester, has been incorporated with a capital stock of $57,500 to manufacture motor trucks, trailers and engines. The incorporators are H. D Hutcheson, Rosewood Terrace; W. S. Strowger, 11 Lamberton Park, Rochester, and G. S. Garlock, Phelps, N. Y.

New England

BOSTON, Nov. 12.

Every metal working plant in New England is fast rounding into a volume of output greater than ever attained. The pressure of war business is being felt particularly by machine tool makers who are receiving a flood of orders from all sections of the country. Locally, the Government plants are the large buyers, but it is difficult to ascertain the amount of business they are placing as the old-fashioned method of putting out large lists and waiting for bids seems to have been mostly abandoned in favor of direct buying of machines as fast as a maker can give a delivery date that, to some degree, fits the requirements of the plant equipment program. The Fore River Works and the Watertown Arsenal are combing the market for machines and it is understood have only begun on the lists they will ultimately order. Large orders are being placed for equipment for gun and aviation plants in France and work for these is being pushed as fast as possible.

The attitude of labor, as shown by the strikes at Watertown, Fore River and Squantum, is causing some uneasiness and there is a great interest in the final outcome. Private corporations and the smaller shops will find it difficult to retain their present working forces if much greater concessions are given to the men employed in munition and shipbuilding work. As pointed out in the recent report of the Government committee on housing, the city of Bridgeport will need 10,000 more men by Jan. 1 and the working forces in New Haven, Waterbury and Hartford must be greatly increased. Unless the Government finds an effective solution for the labor problem of this section, most manufacturers expect to find their output lessened by labor shortage or labor troubles.

The Connecticut Brass & Mfg. Corporation, a new organization to be capitalized at $11,000,000, will take over the Connecticut Brass Corporation, West Cheshire, Conn., and the Pilling Brass Co., Waterbury, Conn. The combined output of the two plants will be 2,000,000 lb. per month. The West Cheshire plant has been in operation for 60 years and the Pilling business was started in 1907.

The Scovill Mfg. Co., Waterbury, Conn., is reported to be preparing to erect another large addition as a result of further Government orders.

The Marine Engineering Co., Boston, has been incorporated with authorized capital stock of $40,000 by Frank G. Crowley, Winthrop; Fred W. Brigham, Quincy, and Walter Kilvert, Lynn.

The Antrim Safety Lock Co., Worcester, Mass., has been incorporated with authorized capital stock of $30,000. Raymond B. Fletcher, Shrewsbury, is president and Robert W. Jameson, Hancock, N. H., treasurer.

The foundry of the Wyman-Gordon Co., Worcester, was damaged by first Oct. 30, with a loss of about $2,500.

The Bernitz Method Co., Boston, has been incorporated with authorized capital stock of $10,000. The incorporators are Ernest Bernitz, South Boston; Oscar Nygard, Mattapan, and Obert Sletten, Cambridge.

The Spencer Wire Co., Worcester, has begun the erection of a two-story addition, 51 x 60 ft.

The Gile Marine Engine Co., 50 Foster Street, Somerville, Mass., has awarded a contract for a one-story machine shop, 60 x 100 ft.

The General Electric Co., West Everett, Mass., has awarded a contract for an addition to its foundry, 42 x 210 ft., one story. It has also placed an order for 1000 tons of steel for plant extensions at West Lynn, Mass.

The Simplex Tool Co., Woonsocket, R. I., has moved into a new factory on Worrall Street. The capacity of the plant will be tripled in the new quarters.

Charles A. Jackson, Inc., Boston, has been incorporated with authorized capital of $10,000 to manufacture machinery and electrical appliances. Charles A. Jackson, Newton, is treasurer.

The Trimont Mfg. Co., Boston, has awarded a contract for a two-story addition, 45 x 85 ft.

The Osgood Bradley Car Works, Worcester, Mass., has secured a contract for 9900 gun carriages and will erect new buildings and rearrange some of the existing ones in order to carry out the contract which involves approximately $7,000,000. It is buying a large equipment of machine tools.

The Pratt & Whitney Co., Hartford, Conn., now has 3300 employees at work and is steadily enlarging its working force. It is rushed with orders for machinery for the production of arms and ammunition and is not taking orders for machines for other purposes. All departments are working until 9 p. m. three nights a week.

The plant of the Maxim Munitions Co., Derby, Conn., at which there has been a strike for some weeks, has been closed, throwing 350 out of employment. The United States Cartridge Co., which took over the plant after the strike started, refuses to state whether the closing is to be permanent.

The American Brass Co., Waterbury, Conn., has awarded a contract for an addition, 42 x 51 ft., to a building on Washington Street.

The Pratt & Cady Co., Hartford, Conn., has awarded a contract for an addition, 35 x 100 ft., three stories.

The Standard Brass Co., New London, Conn., is to build an addition, 65 x 76 ft., and a boiler house, 29 x 42 ft.

After reorganization, the John Davenport Co., founder, Stamford, Conn., recently acquired by A. B. Venesch and Morris C. Rosenbaum of A. B. Venesch & Co., bankers, New York, expects to expend $500,000 in extensions and equipment and to double its working force.

The Colt Patent Fire Arms Mfg. Co., Hartford, Conn., has taken out permits to build a one-story testing department, 50 x 252 ft., and a one-story storehouse, 70 x 162 ft.

The Marlin-Rockwell Corporation, New Haven, Conn., is to remodel part of the Mayo radiator plant, which it owns, for the manufacture of rapid-fire guns. It will continue to devote one-half of the plant to the manufacture of radiators.

The Coin Controlled Clock Co., Bridgeport, Conn., has been incorporated in Delaware with capital of $1,000,000 to manufacture a special coin-controlled clock. E. F. Bennett, E. E. Fish and L. C. Sayles, Bridgeport, are the incorporators.

Philadelphia

PHILADELPHIA, Nov. 13.

Buying for Government work continues on a large scale in this market, though the past week has brought out fewer new inquiries. The Worthington Pump & Machinery Corporation, Hazelton, Pa., has been awarded a contract for 75 mm. shells for French guns, in addition to a Government shell contract received some weeks ago, and is in the market again for a large quantity of equipment. The Bartlett & Hayward Co., Baltimore, which has large Government contracts, purchased additional equipment last week and will be in the market for more. With what is to come, the total purchases of this company will aggregate several hundred thousand dollars. The Midvale Steel Co. is reported to be searching for large planers and other equipment for its gun shop.

The Baldwin Locomotive Works, which is erecting a large erecting shop, is in the market for more than $500,000 worth of cranes, and is also buying other locomotive shop equipment. A party of Baldwin men have left for Russia to take charge of locomotive building in that country and machines are also being bought for their use. The crane requirements for the new Baldwin shop are as follows:

Four 100-ton, two 50-ton trolleys.
Four 150-ton, two 75-ton trolleys.
Two 70-ton, two 35-ton trolleys.
Two 50-ton, two 25-ton trolleys.
Eight 20-ton, two 10-ton trolleys.
All are to be of the same span, 74 ft. 8 in.

The William Cramp & Sons Ship & Engine Building Co., Philadelphia, is in the market for two 25-ton cranes, 55 ft. 7½ in. span; two 15-ton cranes, same span, and two 5-ton, 26 ft. span. The Eastern Steel Co., Pottsville, Pa., wants a 25-ton crane for its structural shop and the Standard Steel Works Co. will buy several cranes for its gun machining shop at Burnham, Pa. The New York Shipbuilding Corporation has bought six small cranes from the Pawling & Harnischfeger Co., Milwaukee. The American International Shipbuilding Corporation, Hog Island, is expected to close this week for seven 10-ton traveling cranes and 45 3-ton jib cranes and mono-rail hoists. The Newport News Shipbuilding & Dry Dock Co., Newport News, Va., is in the market for a large number of electric hoists for new destroyer shops. It will also buy other equipment. The Sun Shipbuilding Co., Philadelphia, has bought two locomotive cranes for its shipyard at Chester, Pa.

The William Cramp & Sons Ship & Engine Building Co. is expected to come into the market shortly for more equipment for destroyer work and also for adding to the equipment of a plant in New York it has bought for the manufacture of oil engines. It is expected that the Chester Shipbuilding Co., Philadelphia, will soon do considerable additional buying.

The Pennsylvania Railroad Co. is again buying tools for shipment to France for the railroad work under way there for the United States Government. The Baltimore & Ohio Railroad, it is reported, will soon issue a list of tools required for replacement in its shops. The Tacony Ordnance Corporation is buying equipment for a tool room at its new gun-forging plant. The Hess-Bright Mfg. Co., Philadelphia, has bought more grinding machines for ball-bearing work. The Pusey & Jones Co., Philadelphia, is making important additions at its Wilmington, Del., shipyard and is expected to buy more equipment. The American International Shipbuilding Corporation will close soon for a large number of pneumatic tools for shipbuilding.

The Edgewater Steel Co., Edgewater Station, Oakmont P. O., Pa., which recently issued a large list of tools required for machining big guns, has let a contract to the Austin Co., Cleveland, for the construction of a factory extension to cost about $100,000.

The United States Government will establish three terminal stations on the Atlantic seaboard, one near Norfolk, Va., one near Baltimore and the third on the Raritan River, New Jersey. The cost will approximate $18,000,000. A large number of locomotive cranes will be required.

The Tioga Steel Co., Philadelphia, has taken bids for the erection of a one-story addition, about 100 x 106 ft., comprising a second story to the present building.

The Philadelphia & Reading Railroad, Philadelphia, has taken bids for the erection of a one and two-story machine shop and engine house at Tulip and Emerald streets.

A new one-story power plant, about 35 x 100 ft., is planned by the Hulton Dyeing & Finishing Co., Philadelphia, at its works at Frankford Junction.

Haines, Jones & Cadbury, Ridge Avenue, Philadelphia, manufacturers of plumbers' supplies, steam fittings, etc., have taken bids for additions to their plant at Twelfth and Spring Garden streets.

The Dunbar Automobile Body Co., Thirty-seventh and Filbert streets, Philadelphia, manufacturer of automobile bodies, parts, etc., is having plans prepared for improvements at its plant.

The Innes Grain Shocker Co., Philadelphia, has been incorporated in Delaware with capital of $30,000 to manufacture agricultural implements. F. R. Hansell, Philadelphia; J. V. Pimm and S. C. Seymour, Camden, N. J., are the incorporators.

The Bernstein Mfg. Co., Allegheny Avenue, Philadelphia,

manufacturer of metal beds, bed springs, iron and steel shapes, etc., has awarded a contract for the erection of a two-story addition to its foundry, about 47 x 90 ft.

J. McCaffrey, 1624 South Eighteenth Street, Philadelphia, will make improvements to his foundry at 2318 Washington Avenue, to cost about $2,500.

The new plant of the Zee-Zee Rubber Mfg. Co., Trenton, N. J., to be erected at Yardville is estimated to cost about $500,000 for buildings and machinery and will consist of two two-story structures, 50 x 160 ft., and 40 x 125 ft., respectively; one-story mill building, 50 x 200 ft.; and one-story factory, 50 x 200 ft. The plant will be equipped for a daily output of about 900 completed automobile tires and 5000 inner tubes.

The Delion Tire & Rubber Co., Trenton, N. J., will make extensions and improvements in its plant to cost about $18,000.

The Rush Motor Co., Camden, N. J., has been incorporated with a capital of $100,000 to manufacture automobiles. Elmer Johnson, Jacob Liffman and Nathan Raidemann, Camden, are the incorporators.

The New York Shipbuilding Corporation, Camden, N. J., will build a one-story addition to its machine shop, 134 x 140 ft., and an addition to its forge shop.

The Mountain Glass Machine Co., Port Allegheny, Pa., has been incorporated with a capital of $20 000 to manufacture glass-making machinery. H. R. Hilton is the principal incorporator.

The Sheldon Axle & Spring Co., Conyngham Avenue, Wilkes-Barre, Pa., manufacturer of axles and springs, is considering the construction of a two-story extension, about 60 x 200 ft.

The Adder Machine Co., Wilkes-Barre, Pa., manufacturer of adding machines, is planning for the erection of a one-story brick addition, 46 x 52 ft.

O. H. Shenk, Ridgeway, Pa., will establish a plant for rebuilding used automobiles at the coach factory of Ralph Rosenburg, Rohrerstown, recently acquired.

The Stanley J. Flagg Co., Stowe, Pa., manufacturer of pipes and tubing, has taken bids for the erection of a one-story addition, 23 x 120 ft., to its No. 5 building.

The Donaldson Iron Co., Broad Street, Emaus, Pa., manufacturer of pipes and tubing, is planning for the erection of a new one-story molding plant.

The Pennsylvania Bronze Foundry Co., Seventh and Camp streets, Harrisburg, Pa., has disposed of its present plant to the Atlantic Refining Co. The company is planning for the erection of a new one-story foundry on property at Seventh and Emerald streets, with total area of 158 x 245 ft.

The Armstrong Cork Co., Pittsburgh, Pa., has acquired a tract of land extending from Liberty Street to Jackson Street, Lancaster, Pa., in the vicinity of its present works and is said to be planning for the erection of extensions.

The Johnstown Traction Co., Johnstown, Pa., is building a new one-story car repair works, 54 x 170 ft., at Coppersdale, to cost about $10,000.

The Garrison Motorcycle Co., Wilkes-Barre, Pa., has been incorporated in Delaware with capital of $10,000 to manufacture motorcycles. The incorporators are Winifred D. Garrison, Wilkes-Barre; Russell Garrison, Dorrancetown, Pa.; and H. S. Tawrowski, Trucksville, Pa.

Baltimore

BALTIMORE, Nov. 12

The Cecilton Electric Light & Power Co., Cecilton, Md., has been incorporated with $2,500 capital stock to generate electric current. The incorporators are William H. Anderson, Enoch S. Short, William Luthringer, William H. Brown and R. Markley Black.

Plans are being made by the Atlantic Coast Line, Wilmington, N. C., to rebuild the engine repair shops recently destroyed.

H. A. Tuggle, Keysville, Va., is seeking prices on machine shop equipment.

The American Steel & Bottlers' Supply Mfg. Co., South Boston, Va., has been organized with $750,000 capital to manufacture bottle washing machines. R. S. Barbour is president.

The Guardian Motors Co., Detroit, Mich., has acquired property on the Elizabeth River, Norfolk, Va., and contemplates the erection of a reinforced-concrete plant, 100 x 500 ft. for the manufacture of automobiles. Temporary works, 50 x 100 ft., will be erected immediately.

The Newport News Shipbuilding & Dry Dock Co., Newport News, Va., has commenced the erection of several additions to its plant which includes six new shipways, shops and construction buildings, as well as an office building to cost about $100,000. The company is said to have approved an appropriation of about $6,000,000 for extensions.

Fire, Nov. 2, destroyed the automobile and carriage manufacturing plant of Cahill & Co., Second and French streets, Wilmington, Del., with loss estimated at about $200,000.

Chicago

CHICAGO, Nov. 12.

The Rock Island Arsenal, Colonel Burr commandant, is actively purchasing tools, the value of which is between $2,000,000 and $3,000,000. These tools are required for gun carriage and recoil equipment to be made at Rock Island under the supervision of French officers for 75 mm. French guns. French patterns and blueprints loaned by that government will be used, the work being done in a separate shop which will not interfere with the regular production of the Arsenal. Only the carriages and recoil mechanism are to be made at Rock Island, the guns presumably being made elsewhere in this country. Many orders have been placed, with far more to come. Among the tools specified are 24 planing machines, 24 24-in. lathes, 20 No. 4 vertical milling machines and 13 4-ft. radial drilling machines. There are a large number of miscellaneous tools as well, including lathes and milling machines. A large order for turret lathes has been placed and some crank shapers have been purchased.

A feature of the lathes is that most of them are to have long beds and to be equipped with metric screws for manufacturing metric sizes. Standard tools have so long been sold in Continental Europe that this requirement imposes no hardship on the builders. They have been long prepared to furnish metric screws, or transposing gears which will accomplish the same result. Two Chicago companies now have contracts for the delivery of guns or their parts made to metric measurements, the designs of the guns being French. Though nothing official is stated on the subject a natural deduction is that ordnance made at Rock Island is to be in accordance with French design, presumably permitting interchangeability of parts, and the use of French shells.

The Military Truck Production Section of the Quartermaster's Department, United States Army, Christian Girl, director, is asking machine-tool dealers to report as to the kind and number of tools they have available for shipment, including those they can locate outside of their warerooms, in this way, it is supposed, to aid manufacturers who have taken truck contracts and find it difficult to obtain the necessary equipment. The information requested is no small matter inasmuch as descriptions of the tools, their condition, maker, geographical location, etc., is wanted.

Great as the war demand now is, it is still on the upward trend and sellers see times ahead which will closely approximate those which have prevailed in the East. They find some consolation in the fact that the operations of the Priority Board will relieve them to a considerable extent by directing where deliveries shall be made. Without this assistance their task would be almost hopeless and of a most distracting sort.

It is reported from Washington that Dodge Bros., Detroit, have taken a $30,000,000 contract for munitions and will build a new plant to handle it, which concerns local sellers chiefly because of the inroads that will be made on factory stocks and deliveries. It may also be pointed out that the Eastern demand has already made it a struggle for Western munitions plants to obtain tools.

The Hotpoint Electric Heating Co., Ogden Avenue and Twenty-second Street, Chicago, is contemplating the erection of a factory to cost $250,000, the site for which has not been disclosed. The headquarters of the company are in San Francisco, Cal.

George C. Nimmons & Co., architects, 122 South Michigan Avenue, Chicago, will soon award contracts for the construction of an eight-story reinforced-concrete factory, 100 x 100 ft., at Kinzie and Franklin streets, for the Union Special Machine Co., 300 West Kinzie Street.

Plans have been drawn for a one-story machine shop, 60 x 180 ft., in Maywood, Ill., for the Universal Engineering Co., maker of kerosene motors, 700 West Twenty-second Street, Chicago. The new shop will be of mill construction and cost about $15,000.

Frank D. Chase, industrial engineer, 122 South Michigan Avenue, Chicago, has awarded contracts for a one-story factory, 85 x 200 ft., in Hammond, Ind., for the Keith Railway Equipment Co., Chicago.

The American Wire Fabrics Co., 208 South La Salle Street, Chicago, is having plans prepared for a plant comprising several buildings to be built at Blue Island, Ill., at a cost of about $200,000.

The Challenge Spark Plug Co., Joliet, Ill., has been incorporated with a capital stock of $20,000 by William Heggie, C. L. E. Mueller and C. McNaughton.

The Holt Mfg. Co., Peoria, Ill., whose plans for enlargement have been referred to heretofore, has let the contract for buildings which will cover about 200,000 sq. ft. Contracts for the foundry and other buildings are yet to be awarded.

George H. Atwood, president Twin City Forge & Foundry Co., Stillwater, Minn., announces that his company has been awarded a contract for $3,000,000 worth of 6-in. shells, which will be made in its new plant.

The Murray Iron Works Co., Burlington, Iowa, has begun work on a three-story addition, 77 x 105 ft.

The Zenith Furnace Co., Duluth, Minn., will build a fireproof machine shop and storage building to cost $50,000.

The Bradford Supply Co., Robinson, Ill., will build a one-story machine shop, 40 x 60 ft.

The Great Western Smelting Co., Forty-first Street, Chicago, will build a new one-story machine shop, 100 x 100 ft., at Whiting, Ind.

The Keystone Steel & Wire Co., South Bartonville, Ill., has commenced the erection of a two-story addition, 120 x 150 ft., to cost about $35,000.

The Apex Electric Mfg. Co., Fifty-ninth Street, Chicago, manufacturer of electrical specialties, will build a one-story addition, about 25 x 50 ft.

The Ice Making Refrigerator Co., Chicago, has been incorporated in Delaware with a capital of $1,500,000 to manufacture refrigerating machinery. Fred W. Wolf, V. A. Johnson and G. W. Friend, Chicago, are the incorporators.

The Z-K Airship Co., Chicago, has been incorporated in Delaware with capital of $5,000,000 to manufacture airplanes. The incorporators are Israel Ziperstein and Michael J. Steffers, Chicago.

The Liberty Lock Mfg. Co., Chicago, has been incorporated in Delaware with a capital of $20,000, to manufacture locks. Joseph Jordan, Samuel E. Briscoe and Charles J. Evans, Chicago, are the incorporators.

Milwaukee

MILWAUKEE, Nov. 12.

Pressure upon machine-tool manufacturers, particularly those specializing in milling machines, continues to grow stronger and shops find themselves getting further behind on deliveries. An enormous number of tools is urgently needed by Government contractors and orders continue to come almost exclusively from such sources. Additional capacity is now being provided by almost every tool builder in this section. The labor situation is growing worse with respect to an increasing shortage of skilled and unskilled men. It is likely that the free employment bureaus operated by the Industrial Commission of Wisconsin will be federalized for the purposes of the present emergency. The Milwaukee office last month reported 3651 calls for help, and was able to fill 2659 positions. A year ago the orders for help numbered only 1222. Industries in the smaller communities are having a hard time, as local housing accommodations are wholly inadequate for even the present working forces and in the face of an urgent need for additional workmen, few can be induced to take positions unless assured of a place to sleep and eat. This is becoming one of the most serious phases of the labor situation.

The Eagle Mfg. Co., Appleton, Wis., manufacturer of gasoline engines, ensilage cutters and other farm machinery, has increased its capital stock from $200,000 to $500,000 to enlarge its works and to further develop its farm tractor manufacturing business. The present plant will practically be doubled in size. Frank Saiberlich is president and general manager.

The Arneson Foundry Co., Kenosha, Wis., maker of brass and iron castings, is having plans prepared by White, White & White, architects, Kenosha, for enlargements and improvements to the plant.

The Menasha Wire & Mfg. Co., Menasha, Wis., has been organized by local interests to manufacture screens and other devices and supplies for paper and pulp mills. Plans are being prepared for a plant estimated to cost $30,000, including equipment. Ten wire-weaving looms will be installed.

The Klemish Co., Kewaunee, Wis., manufacturer of gasoline engines and operating a general machine-shop has disposed of its business to August Knoller, DePere, Wis., who took possession Nov. 1.

The American Grinder Mfg. Co., Milwaukee, manufacturer of tool grinders, has awarded the general contract to the Coddington Engineering Co., North Milwaukee, for the erection of a two-story shop addition, 85 x 121 ft., to cost $35,000, at Twenty-second and Sycamore streets. L. E. Bertane is vice-president and secretary.

The Topp-Stewart Tractor Co., Clintonville, Wis., which is completing work on the erection of its new plant, contemplates the construction of a hydro-electric power plant near that city. Plans have not yet been prepared but the project will mature during the winter. A. H. Mayhew is secretary.

The Superior Iron Works, Superior, Wis., has work well under way on a new brick foundry, 65 x 100 ft., at Grand Avenue and Third Street, which is being erected around the frame casting shop built 20 years ago. The capacity will be trebled.

A. J. Schutte, architect, 412 Camp Building, Milwaukee, has plans in progress for a motor truck manufacturing plant, 50 x 150 ft., two stories and part basement, to be built in North Milwaukee. The equipmetn will include a 3-ton crane. The name of the builder and occupant cannot be divulged at present.

The Denmark Condensed Milk Co., Denmark, Wis., will take bids soon for the construction and equipment of a new power plant, 40 x 60 ft.

The Cruiser Motor Car Co., Madison, Wis., will award contracts this week for the erection of the first unit of its new automobile manufacturing plant, 70 x 263 ft., at Second and Johnson streets. Completion will be specified at 90 days, so that operations may begin about Feb. 15. W. D. Curtis is president.

The Davis Mfg. Co., West Allis, Milwaukee, manufacturer of gasoline motive power units, is completing work on additions to its machine shops and foundries, the estimated cost of which is in excess of $200,000. The Davis company recently passed into the control of the Avery Co., Peoria, Ill., but it is stated that the present officers will continue in charge. Frank M. Davis is president; John T. Thompson, vice-president and superintendent, and George W. Kliegal, secretary and treasurer.

Detroit

DETROIT, Nov. 12

Prospective conversion of the motor car industry equipment to the manufacture of war materials, as now planned under Government supervision, makes necessary vast changes in the machinery and tool facilities of Detroit's most prominent industry. Dodge Bros. and the Lincoln Motors Co. factories are rapidly nearing the stage when machinery can be installed for the manufacture of war materials. Other industries throughout the State are closing large contracts with the Government for war materials. H. C. Cornelius of the Wolverine Brass Works, Grand Rapids, has obtained a contract for $400,000 worth of brass airplane parts. Representatives of Michigan industries having invested capital of $750,000,000 met in Detroit Saturday and completed plans for increasing production in all lines to aid the Government. They pledged their organizations to make their plants available for any work that may be required of them. The Ford Motor Co., Detroit, has closed a contract to manufacture 5000 Liberty motors. The plant is now carrying approximately $40,000,000 worth of Government work in addition to its regular production.

To meet the heavy demands from automobile manufacturers, the Michigan Copper & Brass Rolling Mills, Detroit, is building an addition to its plant, which will complete a unit of 160 x 1000 ft. in floor space. The new building is of brick and steel construction and will be completed about Dec. 15. It will then be possible to bring the production of the company up to 1,000,000 lb. of thin brass and copper per month. A laboratory is being added for extensive research work in testing and chemical analysis. In the interests of its employees the company is establishing a doctor's office and emergency hospital, a welfare department and lunch room. A plan of landscape gardening to beautify the surrounding grounds is also being worked out.

Cleveland

CLEVELAND, Nov. 13.

New inquiry for machine tools for Government work is extremely heavy and several round lot orders were placed the past week. The demand is largely for machinery for shell and gun-carriage work. The placing of some orders for which large inquiries are pending is contingent upon the securing of Government contracts, but it is expected that in most cases these will be forthcoming provided the required machinery can be purchased for the deliveries wanted. Little information is available regarding the requirements of Dodge Bros., Detroit, for recoil mechanism for guns, although this firm has an inquiry out for 60 planers. The Osgood Mfg. Co., Marion, Ohio, is inquiring for about 75 lathes for shell work and a Cleveland company has an inquiry out for 100 screw machines, 24 grinders and equipment for shell work. Two other local inquiries are for 10 21-in. lathes, and 60 to 70 machines, including lathes, grinding, milling and drilling machines. The Government purchased considerable equipment the past week for the Rock Island Arsenal, 22 turret lathes going to a Cleveland maker. The Salisbury Wheel & Mfg.

Co., Jamestown, N. Y., has placed an order with the same company for 23 turret lathes for machining gun carriage hubs and an inquiry is pending from the Interstate Motor Co., Muncie, Ind., for 15 or 30 turret lathes for similar work. The Lincoln Motors Co., Detroit, has bought some additional equipment, including lathes and radial drills. There is a heavy demand for drilling machines for work on airplane motors and motor trucks. The call for locomotive cranes for shipyards continues heavy.

Some Cleveland crane builders are preparing to bid on three 350-ton hammer-head cranes to be installed in the navy yards at Norfolk, New York and Philadelphia. Bids will be opened by the Bureau of Yards and Docks, Nov. 19, and the contract price is expected to exceed $2,000,000. The cranes will be the largest of this type ever built. The largest now in use are in European shipyards and have a capacity of 300 tons.

The Wellman-Seaver-Morgan Co., Cleveland, will shortly begin the erection of a plant in connection with its Akron, Ohio, works for the manufacture of condensers, uptakes and stacks for submarine destroyers. It has received orders for this equipment for 100 destroyers now being built by the William Cramp & Sons Ship & Engine Building Co., the New York Shipbuilding Corporation and the Newport News Shipbuilding & Dry Dock Co. The building will be of steel frame, 130 x 400 ft., and will be erected by the George A. Fuller Co. Contracts have also been placed for the equipment. Some standard lathes and drilling machines will be installed, but most of the machinery will be of a special character. It is planned to have the building ready for operation in about 60 days. The Wellman-Seaver-Morgan Co. has also taken an order for steering engines for destroyers, and work on these is under way at its present Akron plant. It is understood that both orders will aggregate close to $5,000,000. Other work includes a charging machine for the projectile plant at Charlestown, W. Va., a similar machine and two open-hearth furnaces for the Watertown Arsenal and a 75-ton hammer-head crane for the Cramp shipyards, Philadelphia.

The American Clay Machinery Co., Bucyrus, Ohio, has taken a Government order for 500,000 6-in. shells and will equip a new unit for their manufacture. It placed orders the past week for 50 21-in. lathes and is expected to buy additional machinery, including grinders and tool room equipment. It is stated that the company has under consideration the location of its new shell plant in an unoccupied factory in Mansfield, Ohio.

The Elyria Machine Co., Elyria, Ohio, has taken a Government order for shells, and the past week placed orders for 20 lathes in 21 and 25-in. sizes. Its plant will be enlarged by the erection of a steel and glass building, 60 x 200 ft.

The Parish & Bingham Co., Cleveland, will enlarge its plant by the erection of a one-story steel structure, 50 x 265 ft., for storage purposes, and a two-story building, 50 x 200 ft., of reinforced concrete, the first floor of which will be used for storage and the second floor as a tool room. The one-story building will be equipped with a 5-ton electric traveling crane. The general contract has been awarded to the W. I. Thompson & Sons Co., Cleveland.

The Balkwill Manganese Crossing Co., Cleveland, has been incorporated by Stephen Balkwill, mechanical engineer of the Cleveland Frog & Crossing Co., E. D. Rogers, T. B. Cagwin and others to place on the market a new type of railroad crossing which is designed to eliminate breakage in the bottom flangeway. The steel castings used in these crossings will consist of several small pieces bolted together instead of the usual practice of using one or two large castings. The company will issue licenses to crossing manufacturers and may later build a plant.

The Biggs-Watterson Co., machinery dealer, Cleveland, will shortly move from its present offices in the Guardian Building to 1235-37 West Ninth Street, where in addition to its offices it will maintain a storeroom for the display of both new and second-hand machinery.

The Kanter Stamping & Mfg. Co., Cleveland, has been incorporated with a capital stock of $200,000 by L. J. Kanter, A. E. Bernstein and others.

The Paragon Machine Tool & Mfg. Co., Cleveland, has been incorporated with a capital stock of $10,000 by F. W. Treadway, Norton McGiffin, E. G. Rushforth and others.

The Cleveland Precision Tool Co., Cleveland, has been incorporated with a capital stock of $10,000 by Robert T. Snell, Harry H. Hawk and others.

The Willys-Overland Co. will erect an addition to its plant at Elyria, Ohio, at an estimated cost of $69,000.

The Lakewood-Galion Co., Galion, Ohio, has been incorporated with a capital stock of $100,000 by interests associated with the Lakewood Engineering Co., Cleveland. The latter company recently acquired the plant of the Galion Dynamic Motor Truck Co., in which it will manufacture its line of electric trucks and tractors and storage battery and trolley locomotives. The general offices of the Galion company will be located in Cleveland in connection with those of the Lakewood Engineering Co.

The Williams Foundry & Machine Co., Akron, Ohio, has placed the contract for the erection of a foundry to cost $75,000 to Clemmer & Johnson, Akron.

The Sidney Tool Co., Sidney, Ohio, has awarded the contract for the erection of a machine shop, 50 x 150 ft.

The Springfield Metallic Casket Co., Springfield, Ohio, is building a three-story addition, 80 x 190 ft., to cost about $20,000.

Indianapolis

INDIANAPOLIS, Nov. 11.

Edward Shirkie, Terre Haute, Ind., has purchased the interests of B. Frank and Ross W. Crawford in the Crawford-McCrimmon foundry and machine shops, Brazil, Ind., who have retired. C. W. Crawford, president and founder of firm, has also retired but will continue to hold an interest in the company.

The Barger Truck Co., Indianapolis, has been incorporated with $50,000 capital stock to manufacture four-wheel drive automobile trucks. The directors are Henry W. and O. Barger and Walter Brewer.

The Continental File Corporation, Anderson, Ind., has increased its capital stock from $25,000 to $100,000.

Cincinnati

CINCINNATI, Nov. 12.

Manufacturers of engineering specialties report business better than at any time heretofore. Government work practically takes up the entire capacity of plants. Orders from large lumber companies on the Pacific coast are being filled, but the volume is too great to make prompt shipments. The inability to get copper as needed is also causing some concern.

Machine tool builders are unable to quote on many inquiries now pouring in, as the matter of making shipments on time is frequently impossible. Export inquiries continue good, but in most instances shipments cannot be made on machines already completed on old contracts, as they are needed in this country by the Government. Instead of actually commandeering the machines the Government has refused export certificates in many cases. Dealers in machine tools, both new and second-hand, have lately received Government blanks to be filled out, showing not only the machines owned by them, but also all those on which they may have options, giving a brief description of each machine. Second-hand lathes from 16 in. up are hard to obtain, while boring mills are still scarcer.

The New Wapakoneta Wheel Co., Wapakoneta, Ohio, is reported to be considering enlarging its plant. Details are not yet available.

The foundry operated by William Hilland, Greensburg, Ind., has been sold to R. C. Dock, Chicago Heights, Ill. The capacity of the plant will be increased.

The National Oxygen Co., Cincinnati, A. J. Chinn, president, has removed its plant from 3240 Spring Grove Avenue to Winton Place.

The Champion Tool Works Co., V. A. Kreusberg, president, is now fitting up its new plant at Winton Place, which it expects to have in full operation soon after Jan. 1.

The Modern Foundry Co., Cincinnati, is installing equipment in an addition, 60 x 150 ft., to its foundry in Oakley suburb.

The Dayton Engineering Laboratories Co., Dayton, Ohio, has received contract for 20,000 ignition systems for airplanes. It is now operating on an 8-hr. basis to conform with Government regulations. Considerable extra equipment has recently been installed.

It is reported, but not officially confirmed, that the Domestic Engineering Co., Dayton, is having plans prepared for an addition to its plant.

The Dayton Screw Co., Dayton, W. M. Anderson, president, is increasing the capacity of its plant.

The Thomas & Armstrong Co., London, Ohio, is considering the erection of a new plant on a 2-acre site near its factory, in which will be installed equipment to more than double its present capacity. The company makes a specialty of sheet metal roofing, downspouts, etc., and also manufactures tank and farm silos.

The Monarch Machine Tool Co., Sidney, Ohio, is installing machinery in an addition to its plant that will greatly increase its present output.

The Urbana Tool & Mfg. Co., Urbana, Ohio, is moving

equipment into its new plant. It makes a specialty of dies, tools and special machine work.

The Central South

LOUISVILLE, Nov. 12.

An increased number of inquiries for equipment for garages has been noted the past week, with second-hand machines in good demand. Small wood-working plants are in the market for some replacements, and a call for ice machinery for cold storage plants is developing. New oil refineries are also contemplated. A somewhat better distribution of coal is noted.

The Wood-Mosaic Co., hardwood timber manufacturer, New Albany, Ind., has purchased a veneer plant at Huntington, W. Va., and is figuring on additional machinery to increase the capacity.

The W. P. Brown & Sons Lumber Co., Louisville, operating saw mills at Brasfield, Ark., Perth, and other points, has purchased 18,000 acres of additional timber at Brasfield and is planning the installation of an additional band mill, another resaw and log handling equipment.

The Kentucky Lithographic Stone Co., Louisville, operating a quarry at Brandenburg, Ky., will shortly be in the market for a small second-hand locomotive for hauling stone.

The John G. Duncan Co., 308 West Jackson Avenue, Knoxville, Tenn., wants jobbers' prices on prompt delivery of a 25 to 40-hp. locomotive boiler on wheels, together with a 4-in. suction steam pump with 3-in. discharge.

F. B. Moodie, president North American Fluorspar & Lead Co., Smithland, Ky., wants prices on a separating and grinding plant to be installed in a mill to cost $100,000.

The John G. Duncan Co., Knoxville, Tenn., is in the market for a second-hand steam shovel of 1¼ yards capacity, No. 20 Marion, or Bucyrus, for immediate delivery.

The Kentucky Wagon Mfg. Co., Louisville, is erecting a brick addition to its plant to take care of Government orders, and will shortly be in the market for some new equipment.

The Parkersburg Machine Co., Parkersburg, W. Va., has awarded a contract for the erection of a two-story addition to its machine shop, about 40 x 60 ft.

St. Louis

ST. LOUIS, Nov. 12.

The U. S. Auto Lock Mfg. Co., St. Louis, has been incorporated with a capital stock of $15,000 to manufacture automobile locks and other metal specialties. The stockholders are William Henckler, John C. Farrell and Clarence Graham.

The Choctaw Portland Cement Co., Hartshorne, Okla., will increase its capital from $750,000 to $1,250,000 to increase its capacity.

The Knobel Gin Co., Knobel, Ark., R. V. Harper, H. Whitaker and James L. Smith interested, is reported in the market for about $10,000 worth of cotton ginning machinery.

The Churchill Compress Co., Clarksdale, Miss., will enlarge its plant and add machinery to increase its capacity about 100 per cent.

F. S. Evans and Will Davis, owners of a cotton gin burned at Greenwood, Miss., are reported in the market for about $7,500 worth of new machinery.

The Nicholls Pump & Well Co., Stuttgart, Ark., has been incorporated with a capital stock of $50,000 by J. P. Nicholls, H. C. Duckett and H. C. Hollis to establish a machine shop and foundry.

The Tropic Ice Machine Co., Oklahoma City, Okla., E. J. Green president, is in the market for a 12-in. pipe machine and an 18-in. x 12-ft. lathe.

The Delta Mining Co., Kennedy Building, Tulsa, Okla., W. E. Templeman, president, is in the market for boilers, concentrating mill equipment, engines and other machinery.

Kansas City, Mo., will install a garbage incinerator to cost about $130,000.

The Fire and Water Board, Kansas City, will build an additional pumping station to cost about $500,000.

Okmulgee, Okla., will issue $385,000 in bonds for additional waterworks equipment. R. H. Jenness, commissioner of finance, is in charge.

J. D. Johnson, 420 Johnson Street, Little Rock, Ark., is reported in the market for concrete-mixing machinery, hoisting machinery and other equipment.

C. M. Huber, Crystal Springs, Miss., is in the market for machinery for the manufacture of fertilizer from acid phosphate, cotton seed meal, etc.

The Perfection Mattress & Spring Co., Birmingham, Ala., is planning to equip a section of its works for the manufacture of wire clothes hangers.

Texas

AUSTIN, Nov. 10.

The machinery and tool trades continue active with the demand for irrigation equipment larger than ever before known. A renewal of disturbances in different parts of Mexico is causing a curtailment of orders from that country.

The Fabrica de Automovilles, Monterey, Mexico, has been incorporated with a capital stock of 600,000 pesos which is equivalent to about $300,000 gold. It is having plans prepared for a plant to manufacture automobiles.

The Beaumont Iron Works, Beaumont, will soon install additional machinery and other equipment, including electric transformers.

H. Hagedorn and associates, Waco, have incorporated the Guaranteed Vulcanizing Co. and will install equipment for general automobile repair work.

The Oil Machine & Mfg. Co., Fort Worth, has been incorporated with a capital stock of $50,000 to manufacture certain lines of machinery. J. W. Carter is a stockholder.

California

LOS ANGELES, Nov. 6.

George L. Craig, Craig Shipbuilding Co., Long Beach, Cal., is planning for the construction of new shipbuilding works near the municipal pier, San Diego, estimated to cost about $500,000.

The Perfection Machine & Tool Works, 1568 East Twenty-second Street, Los Angeles, has been organized to operate a machine shop and tool works. G. O. Hix and Henry Garbe head the company.

The Moreland Truck Co., Los Angeles, manufacturer of motor trucks, will build a one-story addition, 40 x 100 ft., to its foundry at its new plant now in course of construction at Burbank.

The D. & B. Pump & Supply Co., 2625 Humboldt Street, Los Angeles, manufacturer of pumps, etc., has increased its capital from $70,000 to $250,000.

The Ventura Mfg. Co., Ventura, manufacturer of agricultural implements, is considering the removal of its works to a new site with increased capacity. Property near Torrance is now being selected for the new plant.

The Tractor-Train Co., 1346 Wall Street, Los Angeles, has been organized to operate a machine shop and tractor manufacturing plant. Frank E. Eckhart, 501 South Kingsley Drive, heads the company.

James Guitar, Calexico, is planning for the erection of a new cotton gin of about 100 hp. for initial operations.

The Central Machinery Mfg. Co., Los Angeles, will erect a new one-story building, 40 x 125 ft., on San Pedro Street, near Sixteenth Street.

The Cain-Housman Mfg. Co., 5217 Moneta Avenue, Los Angeles, has been organized to manufacture gas radiators, etc. W. H. Cain and W. B. Housman head the company

The Pacific Northwest

SEATTLE, WASH., Nov. 6.

The final settlement of labor disputes in the shipbuilding industry of this section is expected to be followed by heavy demands for marine engines and parts as well as for machinery and machine tools for making marine specialties. Some extensions to machine shops are under way and many are planned. Notwithstanding the season the demand for machinery from lumber mills keeps up.

Thomas Bilyeu and associates, Portland, have plans completed for a foundry and machine shop, 90 x 110 ft., to be erected at Astoria. Negotiations are under way for a lease on the Astoria water front on which to erect a ship repair and marine machinery manufacturing plant.

The Puget Sound Traction, Light & Power Co., Seattle, will erect a coal pulverizing plant at its Western Avenue power station to cost $80,000.

A. H. Cox & Co., Seattle, who handle lumber mill machinery and supplies, have secured space on Eyers Dock on which heavy machinery will be carried, and has doubled the capacity of its store space on First Avenue, South.

The Martinolich Shipbuilding Co., Seattle, has been incorporated by John Martinolich and C. E. Papst, and will construct a plant at Quartermaster Harbor for building wooden steamships for Norwegian interests. It is stated that contracts for four vessels have been taken.

The National Steel Construction Co., 425 Frontenac Street, Seattle, will construct a boat building shed, 60 x 288 ft., to cost $5,000.

George Mockley, 3901 Ninth Avenue, South, Seattle, is having plans prepared for a frame foundry, 60 x 80 ft., to cost $3,000, exclusive of machinery and equipment.

The Puget Sound Spar Co., Seattle, has purchased a 5-acre tract across Lake Washington, on which a plant will be erected for the manufacture of spars, booms and masts. O. B. Hollis, manager, states that enough orders have been booked to keep the plant in operation for a year with two shifts of men.

W. H. Jewett, Gardiner, Ore.; whose sawmill was destroyed by fire a year ago, plans to immediately construct a new mill to have a daily capacity of 70,000 ft.

The Astoria Marine Iron Works, Astoria, Ore., has been incorporated and plans the establishment of a machine shop and foundry, 90 x 110 ft., for the manufacture of ship machinery and steel fittings and to repair vessels.

The Star Machinery Co., Seattle, manufacturer of rebuilt machinery and saw and shingle mill equipment, contemplates the construction of a two-story concrete addition, 120 x 148 ft., to its plant at 1731 First Avenue, South, to be used as a machine shop and sales room.

The Elliott Bay Shipbuilding Co., Seattle, plans the construction of a shipbuilding shed, 280 x 320 ft., providing five shipways and costing $35,000. This will immediately be followed by the erection of an office building, foundry, plate shed and machine shops, to cost $135,000.

The Burbank Machinery Co., Seattle, will change its name to the Pacific Derrick & Hoist Co.

The Seattle Can Company, Seattle, will remodel an acquired building at Georgetown into a can and box manufacturing plant. Considerable new equipment will be installed.

The Pacific Construction & Engineering Co., 2719 Whatcom Avenue, Seattle, contemplates extensions to its plant to increase the capacity more than 25 per cent. A 90-ft. addition will be built and equipped with new machinery. It manufactures heavy forgings for shipbuilding and engine plants. Robert C. Monteagle is president.

Libby, McNeil & Libby, Seattle, have let a contract for a two-story machine shop, 40 x 70 ft., to cost $5,000.

The Baker White Pine Lumber Co., Baker, Ore., contemplates the construction of a sawmill to cost $175,000 and to have a daily capacity of 160,000 ft.

Canada

TORONTO, ONT., Nov. 12.

The Canadian Allis-Chalmers Co., Ltd., King and Simcoe streets, Toronto, is making additions and repairs to its shipbuilding plant at Bridgeburg, Ont., and installing new machinery.

The Essex Tractor Co., Essex, Ont., will build a concrete and brick factory to cost $10,000.

The Bawden Machine Co., 163 Sterling Road, Toronto, has commenced work on the erection of an addition to cost $5,000.

The United Rubber Mfg. & Reclaiming Co., 495 Yonge Street, Toronto, is making arrangements for the erection of a factory at Whitby, Ont., to cost $15,000. The Jackson-Lewis Co., Bell Telephone Building, Toronto, is the architect.

Lethbridge, Alta., proposes to install power plant equipment to cost $65,000. W. A. Stephens is clerk.

Isaac Stewart and Leon Cook, Georgetown, Ont., are preparing plans for a factory for the manufacture of needles, etc., to cost $10,000.

The Russell Motor Car Co., Ltd., King and Duncan streets, Toronto, is in the market for vertical boring mills, 50 to 60 in. swing; horizontal boring mills, 3 to 6 in. boring bar; hobbing machine, for cutting worm wheels 42 in. in diameter, and 60 in., Brown & Sharpe spur gear cutter.

The Canadian General Electric Co., Toronto, has taken a contract through the Imperial Munitions Board, Ottawa, to build four ocean steamships of 3500 tons each. The hulls will be constructed at the Bridgeburg, Ont., plant of the company and the engines, boilers and accessories will be built at the Davenport works in Toronto.

The forging plant of the Cluff Brothers Ammunition Co., 26 Atlantic Avenue, Toronto, was totally destroyed by fire Nov. 3, with a loss of $200,000. The fire also caused considerable damage to the buildings of the Ontario Wing Engine and Pump Co. R. J. Cluff, head of the Cluff company, states that the plant will be rebuilt immediately at a cost of $20,000. New machinery will be required. This is the second fire to visit the works of the Cluff company within a year.

The Nash Motor Sales, Ltd., Toronto, has been incorporated with a capital stock of $200,000 by Henry Horsman, Frederick B. Edmunds, 1758 Dundas Street; William H. McDonald and others to manufacture automobiles, motorcycles, engines, motors, etc.

The Lee Puncture-Proof Tire Co. of Canada, Ltd., Montreal, has been incorporated with a capital stock of $50,000 by Albert A. Garthwaite, Conshohocken, Pa.; John M. Dettra Morristown, Pa.; William P. McFeat and others of Montreal to manufacture tires and other rubber goods.

The Transparent Rubber Goods Co., Ltd., Toronto, has been incorporated with a capital stock of $40,000 by Willis B. Sturrup, 6 Adelaide Street, East; Thomas S. H. Giles, 249½ St. Helen Avenue; John S. Duggan and others to manufacture rubber goods.

Safe on Sea, Ltd., Montreal, has been incorporated with a capital stock of $1,000,000 by Rene Chenevert, Leopold Barry, both of Montreal; Dennis McA. Coughlin, Westmount, Que., and others to manufacture life-saving devices, rubber goods, etc.

The Davis-Durkin Corporation of Canada, Ltd., Trenton, Ont., has been incorporated with a capital stock of $100,000 by Gordon D. Oulster, William Brown, John G. McHattie and others, all of Ottawa, to manufacture explosives, tools, shells, etc.

The George C. Brymer Co., Ltd., Toronto, has been incorporated with a capital stock of $40,000 by George C. Brymer, 115 King Street, East; Percy G. A. Webster, Charles B Nasmith and others to manufacture jewelry, clocks, watches chains, etc.

Catalogs Wanted

A. J. Papineau, architect, P. O. Box 1896, Winnipeg, desires catalogs and information on building material, equipment and power apparatus for an abattoir and cold storage plant.

Government Purchases

WASHINGTON, Nov. 12.

Bids will be received by the Bureau of Yards and Docks, Navy Department, Washington, until Nov. 26 under specification 2666 for furnishing at Norfolk, Philadelphia and New York dry dock cranes. Also, sealed proposals, indorsed proposals for fitting-out cranes will be received until Nov. 19 for three electrically-operated fitting-out cranes of 350 gross tons capacity at the Norfolk, New York and League Island navy yards. Drawings and specification No. 2587 may be obtained on application to the bureau or to the commandants of the navy yards named.

Bids were received at the Bureau of Supplies and Accounts, Navy Department, Washington, on Nov. 2 for furnishing materials and supplies for the naval service as follows:

Schedule 2014½; class 1. Boring and turning mill—Bid 58, $12,465. Alternate—Bid 39, $13,300; 58, $11,280.

Schedule 2086½; ordnance, class 61. South Charleston, W. Va.—Two 54-in. triple-geared variable-speed heavy-duty boring and turning lathes—Bid 58, $23,810; 26, $18,200; 35, $15,252.

Names of the bidders and the numbers by which they are designated in the above list follow:

Bid 26, Houston, Stanwood & Gamble Co., Cincinnati; 39. Kemp Machinery Co., 223 North Calvert Street, Baltimore: 35, I. H. Johnson, Jr. & Co., Inc., Philadelphia; 58, Niles-Bement-Pond Co., New York.

The Bureau of Census, Department of Commerce, has published a report on the 1914 census of manufactures, giving figures on the American machinery production, including machine tools and other metal working machinery. Machine tools were the largest, according to value of product, and Ohio was the leading state in the production of this class of machinery, with products constituting more than one-fourth of the total reported for all states combined. Rhode Island ranked second, Connecticut third and Massachusetts fourth. In the manufacture of metal-working machinery other than machine tools Pennsylvania was the leading state in the value of output, New York ranking second, Ohio third and Connecticut fourth. The four states combined contributed nearly three-fourths of the total value of products.

W. W. Lindsay & Co., Harrison Building, Philadelphia, have incorporated their business of steel construction, open-hearth and heating furnaces, steel plate work, etc., and will in the future be known as W. W. Lindsay & Co., Inc.

THE IRON AGE

New York, November 22, 1917

ESTABLISHED 1855 VOL. 100: No. 21

Concentrating for Real War Work

Bureau of Manufacturing Industries to Be Organized —Non-essential Manufacturing Will Be Reduced, but Action Will Not Be Taken with Ruthless Hand

FAR-REACHING plans for the concentration of the manufacturing resources of the entire country upon war work and the production of the necessaries of life have been launched at Washington during the past week by the War Industries Board in conjunction with the Division of Imports of the War Trade Board, involving the drastic restriction or complete elimination of non-essential industries and the conversion of their facilities, where possible, to war work or work for the general public welfare. This project, foreshadowed some time ago when the Priority Officer of the War Industries Board cut off the supply of chrome steel from the manufacturers of pleasure automobiles, is one of the most comprehensive yet undertaken by the Government, and notwithstanding the announced policy to proceed with this work along conservative lines with a view to minimizing the disturbance of established industries, there can be no doubt the results in many cases will not only be revolutionary but disastrous. On the other hand, the concentration of every possible resource upon the giant task of winning the war will prove most helpful to those industries engaged in the manufacture of munitions, the building of ships and other lines of activity contributing substantially to the general welfare.

The first formal action looking to the perfecting of an organization to handle this important and delicate work was taken by the War Industries Board on Nov. 16 when it was decided to create a Bureau of Manufacturing Resources, the head of which will be a direct subordinate of the Board and at all times in touch with that body. Simultaneously the War Trade Board announced the appointment of Clarence M. Woolley as a representative of the Department of Commerce on the board charged with the special duty of supervising all imports of foreign merchandise with a view to restricting the use of shipping and other transportation facilities to war materials and other necessaries. The work of the Bureau of Manufacturing Resources and the Division of Imports of the War Trade Board will be closely co-ordinated and will be under the general supervision of the Council of National Defense.

Classifying All Industries

The first step to be taken by the Bureau of Manufacturing Resources will be the classification of all the industries of the United States by output with respect to their usefulness in the conduct of the war. Essential industries will be grouped in the preferred class and will be entitled to receive the most favorable treatment at the hands of the Government. The non-essential industries will be subdivided and classified according to the demands they make upon the resources of the country with respect to supplies of raw material, labor requirements and transportation. Lines of manufacture like the production of pleasure automobiles, which use large quantities of special alloy steel and fuel, employ great numbers of highly skilled mechanics and require a large amount of rolling stock to move their products, will be marked down for early attention. Next in order will come industries which, while not utilizing material that could be turned to war purposes, nevertheless employ much skilled labor and have heavy requirements in the way of transportation facilities. Other classes using less fuel, labor and freighting facilities will follow in order, while at the foot of the list will be many small enterprises producing non-essentials or pure luxuries, but the requirements of which in the form of fuel, materials, labor, transportation, etc., are negligible.

Methods of Procedure

When the classification of non-essential industries is completed, it will be reviewed from the point of view of the practicability of changing over existing establishments for the production either of war material or of so-called necessaries of life. As a simple illustration of what it is hoped to accomplish in this direction through the work of the Bureau, the plants of the manufacturers of pleasure automobiles and the manufacturing jewelers may be cited. Many automobile factories have already been given large contracts for the production of Liberty motors, airplanes and their various adjuncts and shells of small calibers. The wide distribution of these plants and their highly specialized organizations will undoubtedly make it practicable for the Government to secure enormous quantities of necessary material therefrom, while at the same time keeping the majority of these concerns going on a reasonably profitable basis. Certain manufacturing jewelers, anticipating that they will ultimately be classified as producers of non-essentials, have already offered suggestions to the War Industries Board concerning the utilization of their plants in the manufacture of fuses and brass parts of small caliber shells. It is obvious, of course, that there are many industries destined to be included in the category of non-essentials that cannot be made to contribute to the Nation's stock of war material, but it is probable that there are very few that cannot be changed over for the production of useful material of some kind and thus made to supplement the output of existing industries now heavily taxed by the current demand.

In this connection the Bureau of Manufacturing Resources will adopt for its guidance the broad principle that consumption and production should be bal-

anced in all industries. This will be borne in mind in all the attempts made to change over the plants of non-essential industries for the production of useful material. Every effort will be made in directing such remodeling to increase the production only of goods in which there is a shortage; otherwise the efforts of the Bureau would merely result in the piling up of surplus merchandise of no more immediate value than mere luxuries.

No Cause for Alarm

Intimations concerning the plans of the War Industries Board with respect to non-essential industries, which have appeared in the daily press, have started a flood of letters and telegrams to Washington from owners and managers of plants engaged in producing articles likely to come under the ban, anxiously inquiring concerning the purposes of the Bureau of Manufacturing Resources, and in many of these communications there is an earnest protest against the publication by Government authority of any category of non-essentials. It is pointed out that the publication of such a list would spell the ruin of many establishments. Credit would be withdrawn, organizations of experts and of skilled labor would go to pieces overnight, raw material supplies would be cut off and dealers and consumers would probably turn their attention to other goods. It can be stated on the authority of Director Gifford of the Council of National Defense that the Government has at no time contemplated the publication of any list of non-essential industries and that while the classification of the Bureau of Manufacturing Resources must necessarily be made in a systematic manner, its conclusions will be treated as strictly confidential. While the work will necessarily be of the most delicate character, it is the hope of the officials who are planning the organization of the Bureau to keep its deliberations as to any particular industry entirely secret at least until plans have been perfected for changing over plants for the manufacture of other profitable products.

Many inquiries have also been received here as to whether hearings will be granted to the representatives of industries likely to be included in the non-essential class. Plans for the work of the new Bureau have not progressed far enough to enable the officials to answer this question categorically, but it can be stated that it is the present intention of the officials to permit the representatives of such industries to present fully either orally or in writing all the facts concerning their material supply, fuel requirements, labor, transportation, use of product, etc., as may be necessary for a clear understanding of each separate problem. No hasty action will be taken, and as in nearly all cases a careful study will have to be made of each industry that it is proposed to divert to some other line of work, there will be little danger that hardship will result from hurried decisions or inconsiderate action.

Question of Authority

In some of the inquiries now reaching Washington, it is contended that the Government is without specific authority to make the proposed classification of industries and the officials are requested to point out the particular statute under which the Bureau of Manufacturing Resources is to be organized. A high official in commenting upon these inquiries pointed out to the correspondent of THE IRON AGE the fallacy upon which they are based.

"It is not a question," said he, "of statutory authority to organize the proposed bureau and if the manufacturers who are raising this issue understood the purpose of the bureau, they would not urge the contention that there is no law for its creation. As a matter of fact, the chief function of the bureau will be to provide relief for such industries as are classified as non-essential and the entire staff of the bureau will be devoted to reducing to a minimum the hardships incident to the necessary concentration of the country's resources upon the vigorous prosecution of the war.

"No one at all familiar with recent legislation will be apt to raise any question as to the power of the Government to take steps discriminating against industries of no value for war purposes and which do not contribute greatly to the public welfare. The Lever food, feed and fuel bill gives the President, through his delegated agents, full authority to regulate the distribution of coal, coke, petroleum, etc., and the Fuel Administrator can thus cut off absolutely supplies from non-essential manufacturing plants. The Priority Officer of the War Industries Board is also clothed with full authority to embargo any material in his discretion and to deny the use of transportation facilities to producers whose output may be included in the non-essential class. The Government's absolute control of transportation alone gives it all the power necessary to carry out the plans of the Bureau of Manufacturing Resources and it is doubtful if it will be necessary to ask Congress for supplemental legislation of any kind. This does not mean that the power of the Government will be ruthlessly exercised, for every effort will be made to avoid hardship."

In this connection the attention of Judge Lovett, Priority Officer of the War Industries Board and its temporary chairman, was called to a widely published statement that the Council of National Defense will speedily formulate a list of non-essential industries and that the first step to be taken by the Government will be the denial of transportation privileges to all products included in the category. Judge Lovett promptly discredited these publications.

Transportation of Non-Essentials

"While the situation may change," said he, "I am not at this time contemplating any further action with respect to transportation of non-essentials. Priority Order No. 2 with regard to open top cars went as far as it seemed wise to go in dealing with that problem by restricting the transportation of non-essentials. Conditions, however, will be constantly observed. Whether the coal shortage requires restriction of the coal supply of non-essential industries is a question for the Fuel Administrator, Dr. Garfield, to determine; and if any priority orders become necessary in the furtherance of his policy in that regard, they will be made only upon his request.

"As to the War Industries Board, apart from my action under the Priority Act with respect to transportation, I may say that the industries of the country would seem to be justified in assuming from the action of the board in the matter of copper and steel prices and its record generally to date, that it is the desire and policy of the board carefully and liberally to conserve the interest and welfare of industries. I feel safe in saying that the board will take no action designed to eliminate any non-essential industry without reasonable notice and an opportunity to be heard."

Dr. Garfield's Statement

Supplementing Judge Lovett's statement, Dr. Garfield, the Fuel Administrator, says that if voluntary economy on the part of industrial and domestic consumers, added to the increased coal production of 1917, which will exceed 1916 by more than 50,000,000 tons, "does not provide fuel enough for the war and to keep the people warm, there will come a time when some limitation will have to be imposed upon manufacturers of non-war products."

"In such an event," he continues, "the business world may feel sure that all the bearings of such limitations will be given thorough consideration and that the necessary coal will be obtained with the least possible interference with industry. Arbitrary limitation is a last resort and to be avoided, if possible. In many cases, industrial concerns have already begun a voluntary curtailment of their use of coal. Such efforts will receive the fullest support and encouragement of the fuel administration, including technical advice on the use of fuel. The important point for every one to remember is that if coal is now consumed in the old 'peace-time' way, the supply will fall 50,000,000 tons short of necessary requirements in spite of the large increase in production.

"As I have stated before, the fuel administration is determined that sufficient coal for the war, for public utilities and for domestic consumers shall be provided. The way to prevent those losses incident upon limitation of industry is for every consumer of coal to cut off unnecessary consumption with an iron hand, and to start on this intensive course of conservation without a moment's delay."

Electrical Advertising

Action collateral with that of the proposed bureau of manufacturing resources was taken during the past week by Fuel Administrator Garfield with respect to electrical advertising signs. This order provides that hereafter "no corporation, association, partnership, or person engaged in whole or in part, in the business of furnishing electricity for illuminating or power purposes, and no corporation, association, partnership, or person maintaining a plant for the purpose of supplying for its own use electricity for illuminating or power purposes, shall use any coal for the purpose of generating, producing, or supplying electricity, or supply or use electricity generated or produced, in whole or in part, by the consumption of coal, for the purpose of providing, maintaining, lighting, or operating, before the hour of 7.45 p. m., or after the hour of 11 p. m., electrically illuminated or display advertisements, notices, announcements, signs, designation of the location of an office or place of business or of the nature of any business, electric searchlights, or (external) illumination or ornamentation of any building, except in the interior of buildings, and except as in special cases hereinafter further or otherwise provided or limited." The limitations referred to exempt electric signs affixed to the street fronts of buildings over the street entrances thereof or over the street entrances of stores, shops, or other places of business therein, or extending therefrom over the sidewalks, for the purpose of announcing the name or business of a retail shop or store, or the name and location of a theater or other place of amusement or of a hall or other place of public assembly, together with the name of the play or other entertainment given therein, or of the purpose of any public assembly to be held therein. It is also provided that the order in question shall not apply to "porch lights upon houses or hotels or at the entrances to buildings occupied or open for ingress or egress during the nighttime, or to lights upon private driveways, walks, or in the grounds of any hotel, manufacturing establishment, or residence, or upon the platform of railroad stations, approaches thereto, or in railroad yards or grounds, or to lights to mark the location of fire escapes or exits; or to lights for any similar purposes when authorized by any State fuel administrator of the State within which such lights are located."

Foreign Sources of Supply

Although the work of the Division of Imports of the War Trade Board with reference to the elimination of non-essential industries will affect only those lines of enterprises in which foreign materials are employed in whole or in part, it will be of vital importance to those dependent in any way upon foreign sources of supply. Within a comparatively short time it is probable that every kind of foreign merchandise will require an import license to permit it to be brought into this country, just as at the present time export licenses are required to send abroad certain kinds of iron and steel and other commodities. Mr. Woolley, who will have charge of this work, has had a broad business training, having served for many years as president of the American Radiator Co. and can be relied upon to take an experienced business man's view of all the problems he is called upon to consider. In addition to working with the Bureau of Manufacturing Resources, Mr. Woolley will be in close touch with the Shipping Board and it is expected that a system will be worked out under which the leading steamship lines of the world entering American ports will require prospective shippers to produce licenses for the entrance of their goods into the United States before receiving them for transportation. The Government has ample authority to enforce such an arrangement, as it can require steamship companies to return to the port of shipment all goods excluded from the United States in the same manner as is now required with respect to undesirable immigrants. Such a regulation would, of course, have a salutary effect upon steamship lines that otherwise might be disposed to ignore the requirements of the War Trade Board.

W. L. C.

Marked Betterment in Fabricated Business

A marked increase in the amount of business which was done in October is shown by the records of the Bridge Builders and Structural Society, as collected by George E. Gifford, 50 Church St., New York, its secretary. The percentage figure of the capacity of the bridge and structural shops of the country put under contract in October was 61.5, which is also the average of the first five months of this year. The volume corresponds to about 111,000 tons. Thus over twice as much business was done in October as in September, when the total reported was about 52,000 tons, but it is believed that October figures include some Government work not reported in September. To a very large extent the business has represented Government demands or demands for shipbuilding purposes growing out of the war conditions.

So far this year about 943,000 tons of bridge and building work have been closed. For the totals of 1913 and 1914 to be reached it will only be necessary for contracting to be done at the rate of 38 per cent for November and December. The amount of business done in 1915 and 1916, however, was nearly 50 per cent more than in the years 1913 or 1914.

Trumbull Steel Co. Additions

The Trumbull Steel Co., Warren, Ohio, expects to place its open-hearth plant in operation about Jan. 15. Five 100-ton furnaces are being built, the first of which will be ready to start about that date. Two additional furnaces will be built later. The mill equipment, which will not be ready for operation until some time after the open-hearth furnaces are started, will include a 36-in., two high blooming mill supplied by the United Engineering & Foundry Co., and six stands of 18-in. Morgan continuous sheet bar and billet mill. A 21-in. stand will be installed later. Practically the entire plant will be electrically driven. The company plans to place its hot strip mill in operation about Dec. 15.

L. E. Fisher, vice-president and chief engineer of the St. Louis Coke & Chemical Co., a subsidiary of the American Coke & Chemical Co., Chicago, has announced that the site in East St. Louis, Ill., for the plant recently announced as planned, has been selected and will probably be formally transferred within the next two weeks.

The Ore Bridge Spans 147 Ft., Has a Length of 207 Ft., and Is Equipped with a 10-Ton Brownhoist Ore Bucket. Ore is unloaded between the tracks just outside the concrete retaining wall at the bins. This wall supports the rail on which the shear leg of the bridge travels



Yard and Bins for Large Ore Storage

Plant at Republic Iron & Steel Co.'s New Blast Furnace Facilitates Handling Ore, Coke and Limestone—Car Unloading Trestle at Bins

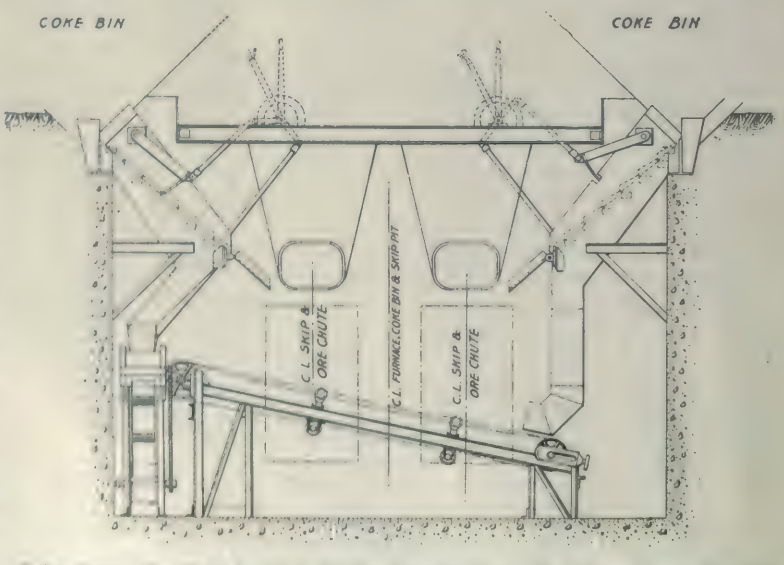
EFFICIENT utilization of limited ore-storage space adjoining the new Haselton blast furnace, recently put in operation by the Republic Iron & Steel Co., Youngstown, Ohio, and facility in the handling of ore, coke and limestone at the skip hoist were features sought in the design and construction of the bins and ore-yard plant supplying this furnace. Reinforced concrete was used extensively in the superstructure in place of steel due to scarcity of the latter and the side plates of the bins were increased in thickness and used as suspension members, thereby making unnecessary the use of independent bolt supports.

Nineteen bins were erected; 15 for ore, limestone and miscellaneous materials, one double bin for coke, one for scrap iron, and two to provide coal to yard locomotives. This part of the plant, together with a three-track trestle approximately 337 ft. long, one ore transfer car and two scale cars, was furnished by Arthur G. McKee & Co., contracting engineers, Cleveland. The transfer and scale cars are the McKee patented standard types and are electrically driven. The capacity of the scale car is 120 cu. ft. and that of the transfer car 50 tons.

Space for the ore yard was limited on one side by the trestle at the furnace and on the other side by adjoining Pennsylvania tracks. For this reason a retaining wall was built the whole length of the trestle system. This wall is heavily reinforced, and at the bottom has a large spread foot. Another retaining wall was built along the Pennsylvania Railroad's right of way. Ore for the yard is dumped under the outside track of the trestle between the counterforts as illustrated and is handled by a grab bucket, being picked up just outside the outer rail and delivered by the bridge to the ore pile. It will be noted that the shear leg of the ore bridge runs on top of the trestle just above the retaining wall.

One track of the trestle is over the coke, coal and scrap bins, the second track is over the ore and stone bins, and the third track, the trestle of which was extended approximately 271 ft., is parallel to the first two, but supported on the counterforts of the ore-yard retaining wall and arranged for unloading ore from railroad cars. The tracks are all of standard gage. All bents are spaced 16-ft. 1-in. centers, and all track stringers are made of Bethlehem 26-in. I-beams, 90 lb. per foot. These stringers are provided with suitable cross-bracing made of 7/16-in. plate, 22 in. wide, and 3 x 3 x 7/16-in. flange angles. They support 85-lb. American standard rails, secured by means of rolled steel clips.

An ore-bridge rail is secured to the top of the ore-yard retaining wall by means of ties, some of which extend a sufficient distance on each side of



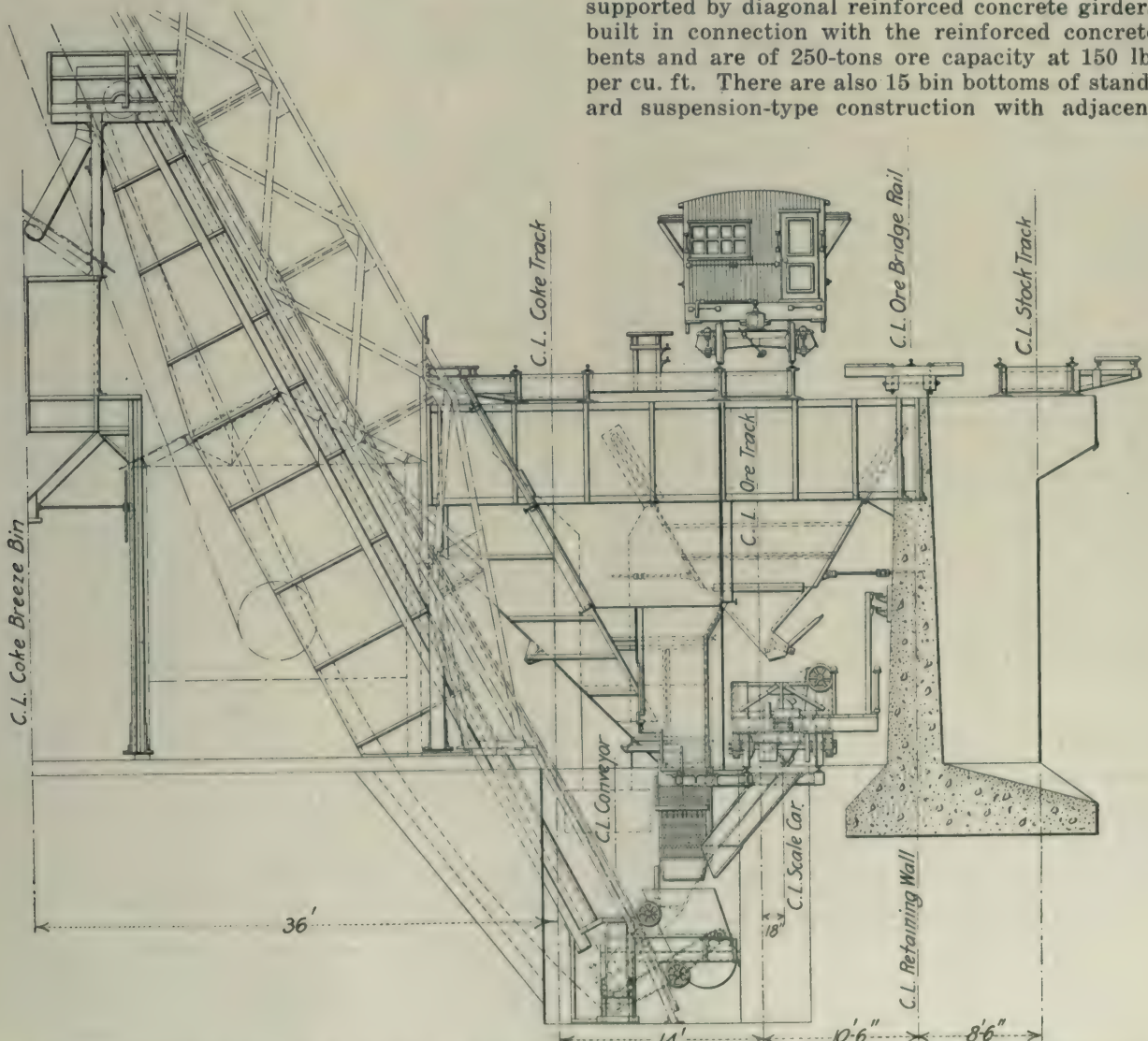
Coke from the Double Bin Is Discharged Into the Skip Hoist Buckets Over Sets of Cascade Coke Screens. Breeze is transferred by the auxiliary conveyor and lifted by a main conveyor to a coke-breeze bin

The Conspicuous Bay in the Center of the Illustration Contains the Scrap-Iron Bin. Adjoining this are the two locomotive coaling bins. The scrap bin is approximately 10 ft. long and has capacity for approximately 200 tons of scrap. Each coal bin has capacity for 40 tons of coal



this track to form the supports for the walkways adjacent to this rail. A walkway was built on the outside of both the ore unloading track and the coke trestle, complete with hand-rail and intermediate bar, and another was built between the ore track and the coke track. This walkway is somewhat higher than the railroad tracks and is to carry two transfer car conductors, consisting of 25-lb. rails extending the entire length of the three-track part of this trestle. All walkways have steel supports and 2-in. plank flooring.

The ore and limestone bins are shown in an accompanying reproduced photograph. These are supported by diagonal reinforced concrete girders built in connection with the reinforced concrete bents and are of 250-tons ore capacity at 150 lb. per cu. ft. There are also 15 bin bottoms of standard suspension-type construction with adjacent



The Trestle Supports the Coke and Ore Tracks and the Stock Track from Which Ore Is Unloaded. The method of Supporting the ore bins is shown, as is also the conveyor delivering coke breeze to the coke breeze bin

hand-operated gates. Two ore bins on one side of and next to the coke bin are provided with partitions dividing them in two parts at right angles to the trestle, these partitions extending to the bottom of the track stringers. Over the ore bins are provided 15-in. 33-lb. channels, for the support of grids to prevent large pieces of ore from falling into the bins.

Opposite No. 5 blast furnace was erected one double coke bin of 300-ton capacity. This discharges over a set of McKee patented Cascade coke screens and chutes with gates for shutting off the flow of coke. The chutes deliver the coke directly to the skip cars in the skip pit. These coke bins are made of 5/16-in. steel plates throughout, except adjacent to the discharge openings of the bins, where they are reinforced by ⅜-in. wearing plates.

The coke breeze removed by the coke screens falls through chutes into coke breeze conveyors at the bottom of the skip pit. These conveyors deliver the breeze to an elevator, which, in turn, discharges its contents to a coke breeze bin situated over a track adjacent to the cast house wall. The coke breeze elevator is constructed of Leviathan belting and malleable buckets, and is provided with suitable motors and starting boxes. The casing of the elevator is constructed of plates and angles and is designed to admit of the customary sag of the return side of the elevator belt.

There is in the fifth bay of the trestle, adjoining the first ore bin, one scrap-iron bin, designed to receive scrap from cars placed on the coke track. This bin is about 10 ft. long and has a capacity of approximately 200 tons of scrap iron, figured at 350 lb. per cu. ft. This scrap bin is shown in an illustration. It has its bottom plate protected by 75-ft. rails placed on 5-in. centers and running in the direction of the slope of the bottom of the bin. Two locomotive coaling bins are located opposite the two ore bins adjoining the scrap bin. These bins are made of 5/16-in. plates and have a capacity of approximately 40 tons each. To prevent dropping of materials from the ore track on the operator of the scale car when opposite the coke bin a ¼-in. deck plate was erected under the track stringers for the entire length of the coke bin and extending from the side of the coke bin to the retaining wall. There is also a similar deck plate over the scale-car track opposite the scrap-iron bin.



Fifteen Ore Bins, Each of 250 Tons Capacity, Are Supported by Diagonal Reinforced Concrete Girders Spanning the Reinforced Concrete Bents

Manganese Imports Fall Off in September

Manganese ore imports in September were only 36,755 gross tons, or next to the lowest for any month so far this year. April with only 27,023 tons was the minimum. To Oct. 1, 1917, however, the total of 494,633 tons exceeds any previous record and compares with 469,222 tons to Oct. 1, 1916. The monthly average to Oct. 1, 1917, is 54,959 tons per month, which means a production of about 20,000 tons of 80 per cent ferromanganese each month.

The recently remodeled furnace of the Southeastern Iron Co. at Goshen, Va., which went into blast Oct. 8, began the manufacture of ferromanganese Nov. 9. Its production will be about 75 tons a day.

Court Decisions on Labor Questions

An unusual array of important decisions is presented by the Bureau of Labor Statistics of the U. S. Department of Labor in its annual compilation of court decisions on labor questions, just published as Bulletin No. 224. A number of the decisions of the Supreme Court of the United States, handed down since December, 1916, are included in this bulletin, but for the most part the decisions were made in the calendar year 1916.

Most notable among the Supreme Court decisions, on account of the circumstances attending the enactment of the law construed by it, is the decision sustaining the constitutionality of the Adamson 8-hour law for trainmen in interstate commerce, and declaring at the same time the right of Congress to compulsorily arbitrate disputes between the railroads and their employees for the benefit of the public.

The first broad decisions ultimately deciding the constitutionality of workmen's compensation laws are also noted in this volume. Another important decision by the Supreme Court was that sustaining the Oregon 10-hour day for factory employees without regard to sex or age—a marked reversal of position from the action of the same court in 1905 in holding the 10-hour law of New York applicable to bakeries unconstitutional.

Of hardly less interest than these decisions of the Supreme Court is the action of the court of last resort of the State of Massachusetts in declaring unconstitutional an act of that State which undertook to limit the issue of injunctions in labor disputes, declaring that injunctions should issue only when property rights are affected, and that labor is not property. The court took the view that this attitude excludes from the protection of the law those who had no other property than their right to work, and held that such a deprivation could not be effected by statute.

The Commonwealth Steel Co., Granite City, Ill., and St. Louis, has announced, effective Dec. 1, an increase of wages amounting to 5 per cent. Another increase will be given March 1. This has been decided upon in lieu of a special fund for pensions which will probably be created later. After Nov. 30 employees getting 34c. per hour or less will be increased 1½c. per hour. From 35c. to 49c. per hour, the increase will be 2c. per hour and above 50c. per hour the increase will be 2½c. per hour. Piece work employees will be given a straight 5 per cent increase.

BRAZILIAN IRON ORE

Recent Action Against Germans Improves the Prospect

Financial interests which have been connected with the plans for the exploitation of the extensive and high-grade iron ore deposits in the central part of Brazil, and at the present time are engaged in continuing investigations and concluding negotiations, are watching with a good deal of interest the developments of the war situation in Brazil.

The availability and importance of these Brazilian deposits were first recognized by Dr. C. R. Van Hise, president of the University of Wisconsin, about six years ago, at the time of the Copenhagen meeting of the International Geological Congress. Dr. Van Hise was at that time engaged in editing the Iron Resources of North and South America, for the main thesis of the convention, The Iron Ore Reserves of the World. He was so impressed with the data relating to the Brazilian deposits that he personally assumed the expense of sending an associate to Brazil to investigate and confirm the facts set forth in the reports, official and otherwise.

As a result of these activities, some large British financial interests secured extensive holdings in Brazil, also a group including some very important British and American interests acquired in the field approximately 5,000,000,000 tons of iron ore and undertook a general reconnaissance of the district. At the same time another American-British syndicate, represented by John Hays Hammond, purchased about 2,000,000,000 tons of ore, and various other syndicates, including a French syndicate and a German-Brazilian syndicate, obtained control of large deposits. The aggregate reserves secured by these syndicates are enormous, but by no means include the total available ore in the district.

Negotiations for the financing of one of these projects were definitely under way when the European war broke out. Another negotiation, in which German concerns were supposed to be actively interested, was also planned. An investigation of transportation conditions was made under the direction of James J. Hill, the railroad authority, and Sir Ernest Casell, of London, and a general report was made. Freight rates according to this report could be made which would enable the high grade ore to be shipped to England profitably. It was proposed to extend the railroad which followed the course of the Doce River from Victoria port to the iron district and establish an ore steamship line to England. The capital involved in this transportation scheme was placed at $50,000,000. The port of Victoria lies north of Rio de Janeiro. Another plan contemplated the construction of railroad lines to either Rio de Janeiro or some adjacent port, the distance being about the same as to Victoria, but the grade not so good. The advantage, however, of the Rio Janeiro terminus was the distribution of return cargoes of coal and other products.

All of these negotiations were suspended at the beginning of the war, but the geologic investigations of the district have been continued and in general the matter is being held in hand. Negotiations have been continued with the Brazilian Government and with the State of Minas Geraes, to insure the minimum export taxes and to secure the co-operation of these governments in the exploitation of the iron. One party in the Brazilian Government is very much in favor of having iron smelted in Brazil, but this is not considered practical on account of lack of fuel. It is probable that an operation on a small scale might be advisable, particularly if a British-Brazilian or American-Brazilian steamship service were created which would provide delivery of coal in Brazil at a low figure. This would probably result in a steel and iron industry for local needs and to supply some of the other South American markets.

The Brazilian governmental and financial interests are looking toward electrical smelting of iron ore and are giving this subject consideration at this time.

The activity of certain German interests in the district, in earlier negotiations, was a factor in the situation which delayed the realization of the project. The recent action of the Brazilian Government in canceling the German-owned concessions and confiscating the German property generally throughout the Republic, will probably clear the situation. At any rate, British-American projects are more likely to be looked upon favorably by the Brazilian Government now than before the war.

This Brazilian ore, a specular hematite, runs from 68 per cent to 70 per cent in iron and low in phosphorus, and billions of tons can be mined above the surface. The deposits lie on a plateau, 3000 to 5000 ft. high, in a district which is healthful and on which there is abundant water power and favorable labor conditions.

The Brazilian manganese deposits lie to the south of the iron district generally, and realization of these deposits can be carried on extensively with the establishing of iron operations.

Pittsburgh-Cleveland Electrical Engineers to Meet in Canton

A joint meeting of the Pittsburgh and the Cleveland district sections of the Association of Iron and Steel Electrical Engineers will be held at the Hotel Courtlandt, Canton, Ohio, on Saturday, Nov. 24. While at Canton, the engineers will make a trip to the plant of the United Alloy Steel Corporation in that city. This plant has a 12,000-hp. reversing motor, driving a plate mill. The plant also contains a 60-cycle 4200-hp. motor having a frame of over 27-ft. in diameter, standing over 17-ft. above the floor. Its full-load speed is 93 r.p.m., and its maximum rated torque is approximately equivalent to that of 12,000-hp. at synchronous speed. The 1100 and 800-hp. adjustable-speed alternating-current sets, installed in 1913 on the company's merchant mills, were the first adjustable-speed alternating-current motor equipments installed in this country. Also the company's Lamberton mill is an interesting application. It is 2-high with the rolls moving from the upper to the lower position and vice versa, eliminating the necessity of tilting and lifting tables that would be necessary in a 3-high mill, and at the same time using a motor rotating in one direction only. This is the only mill of this type in this country. The plant also contains a 15-ton, 60-cycle Heroult electric furnace.

The delegates will also go to Massillon, five miles west of Canton, to inspect the steel plant of the Massillon Steel Co. This was the first steel plant to carry out every mechanical operation by electricity. It has nine 50-ton open-hearth furnaces, a 34-in. reversing blooming mill, and a 28-in. bar mill. The reversing mill is equipped with an 8000-hp. motor. This is the first reversing motor installed on a blooming mill in this country.

In the evening a paper on "Central Station Power" will be read by W. M. Hornlein, and another paper entitled "Electric Furnaces," by J. G. Donovan. Pittsburgh delegates will leave that city from the Pennsylvania station on Saturday morning at 8 o'clock.

On Wednesday, Nov. 7, the main building of the plant of the American Sintering Co., at Youngstown, Ohio, was destroyed by fire caused by an explosion, the loss being estimated at $30,000. The plant was treating about 10,000 tons monthly of blast furnace ore dust. The company has contracted with the Stone & Webster Engineering Corporation for the rebuilding of its plant, is employing large forces of men clearing away the ruins, and expects to resume operations again early in December.

The Great Northern Railway Co., F. A. Bushnell purchasing agent, St. Paul, Minn., is in the market for ore spouts, pocket doors, hoisting machines, shafting, bearings, etc., for an ore dock of 160 pockets at Allouez, Wis.

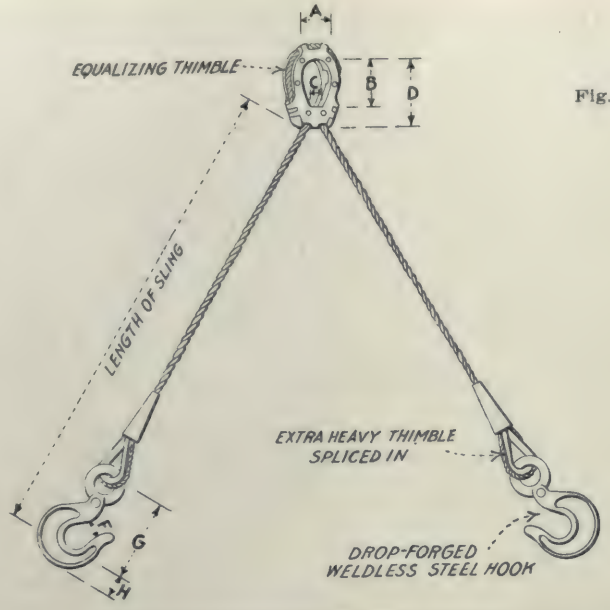


Fig. 2—Dimensions and Safe Loads of Two-Rope Bridle Slings Shown

DIAM. SLING	SAFE LOADS		HOOK				EQUALIZING THIMBLES			
	WHEN USED VERTICAL	WHEN USED 60° ANGLE	SIZE	F	G	H	A	B	C	D
½"	3	2.5	2.5	1½"	5 7/16	1 9/16	3/8	5½	1¼"	7/8
5/8	4.5	4	3.0	1 5/8	6 5/16	1 3/4	3/8	5 3/4	1 3/8	8 3/8
3/4	6.25	5.5	4.0	1 3/8	7½	2	3/8	5 3/8	1 3/8	8 3/8
7/8	9	8	5.0	2 1/8	8 7/8	2 5/16	5/4	8	1¼	10⅛
1"	11.5	10	6.5	2 1/16	9½	2 9/16	5/4	8	1¼	10¼
1⅛	14	12	7.5	2 9/16	10 5/16	2 3/4	5/4	7 3/8	1½	10½
1¼	17	14.5	9.0	3	11 1/16	3	5/4	7 3/8	1½	10½
1⅜	20	17	11.0	3 3/16	12 7/16	3 1/8	6	9 3/4	1 3/4	13
1½	23	20	12.5	3 3/4	13 3/8	3½	6	9 3/4	1 3/4	13
1⅝	25	22	15.0	4½	15½	4	9	14	2	17 3/8
1¾	29	25	17.5	5	18	4 3/4	9 3/8	15	2½	19½

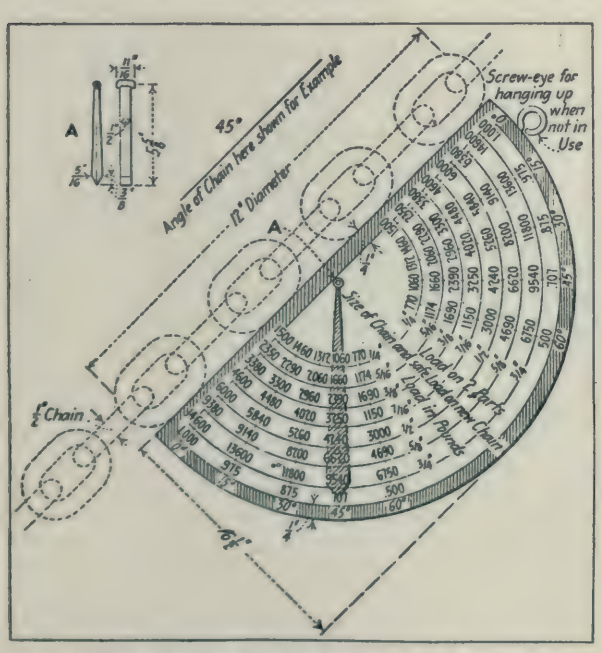


Fig. 1—Safe-Load Gage for Chain and Rope Slings

Safe Loads of Crane Chains and Slings

In a paper devoted to the solution of foundry transportation and conveying problems, read by Robert E. Newcomb, of the Deane Works, Worthington Pump & Machinery Corporation, Holyoke, Mass., at the convention of the American Foundrymen's Association, Boston, Sept. 28, 1917, notes were presented on methods of improving crane service. Among other things attention was called to the importance of regular inspection of cranes, chains and cables. The chart, Fig. 4, was presented as illustrating the practice of the Deane Works in this respect. Sling chains of suitable strength should always be used and the author called attention to several methods of insuring this practice.

The Safe-load gage, Fig. 1, devised by F. W. Salmon, is one of the devices recommended in the paper. The gage is a frame of light seasoned wood, about 1 ft. long and ¾ in. thick. The use of the gage is shown clearly in the illustration and no further explanation is necessary. At the Deane Works each sling is marked with its capacity.

The data on safe loads of steel rope slings given by the author were contributed by John A. Roebling's Sons Co. Figs. 2, 3 and 5, respectively, show the conditions under which the tables are to be used.

A point is made that sometimes a frequent and just

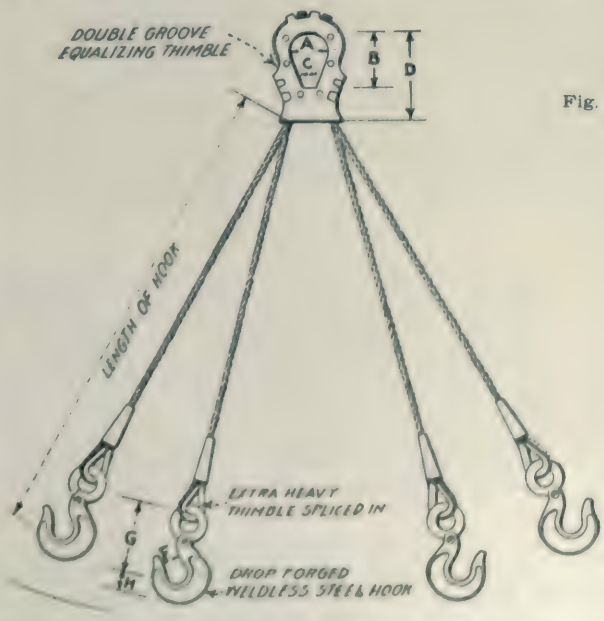


Fig. 3—Dimensions and Safe Loads of Bridle Slings with Four Hooks

DIAM. SLING	SAFE LOAD IN TONS		THIMBLE				HOOK			
	WHEN USED 60° ANGLE	WHEN USED 45° ANGLE	A	B	C	D	SIZE	F	G	H
½"	5	4.25	5/4	7/4"	2"	11/4"	2.5	1½"	5 7/16	1 9/16
5/8	8	6.5	5/4	7½	1 15/16	11 3/8	3.0	1 5/8	6 5/16	1 3/4
3/4	11	9	5/4	7½	1 15/16	11 7/8	4.0	1 3/8	7½	2
7/8	16	12.5	6½	8 3/4	2 3/8	14¼	5.0	2 1/8	8 7/16	2 5/16
1	20	16	6½	8 3/4	2 3/8	14¼	6.5	2 1/16	9½"	2 9/16
1⅛	24	20	8	11¼	2 5/8	17 3/4	7.5	2 9/16	10 5/16	2 3/4
1¼	29	24	8	11¼	2 5/8	17 3/4	9.0	3	11 1/16	3
1⅜	34	28	9	12	3½	19	11.0	3 3/16	12 7/16	3 1/8
1½	40	32	9	12	3½	19	12.5	3 3/4	13 3/8	3½
1⅝	44	35	10	13	4 3/8	20½	15.0	4½	15½	4
1¾	50	41	10	13	4 3/8	20½	17.5	5	18	4 3/4

WORTHINGTON PUMP AND MACHINERY CORPORATION
DEANE STEAM PUMP PLANT
CRANE INSPECTION REPORT

Make & Capacity of Crane NORTHERN 10 TON MACH. NO.425 DATE 6-14-17..

INSTRUCTIONS TO INSPECTOR. Any dangerous condition shall be indicated by underscoring the report in red and inspector will definitely state whether he considers it necessary to shut down crane immediately or whether it be permitted to operate. He shall follow all repairs vigorously until the machine is right.

ELECTRICAL EQUIPMENT Commutator or

	Collector Rings	Air Gap	Brushes	Grounds
Main hoisting motor	SMOOTH	1 - 32"	O.K.	NONE
Auxiliary " "	SMOOTH	1 - 32"	O.K.	NONE
Trolley travel "	SMOOTH	1 - 32"	O.K.	NONE
Bridge " "	SMOOTH	1 - 32"	O.K.	NONE

	Resistance grids	Contacts	Lost Motion
Main hoisting controller	O.K.	O.K.	SLIGHT
Auxiliary " "	O.K.	BURNED	CONSIDERABLE
Trolley travel "	O.K.	BURNED	CONSIDERABLE
Bridge " "	O.K.	O.K.	SLIGHT

LUBRICATION AND MECHANICAL CONDITION

Motor bearings, Main O.K. Auxiliary O.K. Trolley O.K. Bridge O.K.
Drum " Main SLACK Auxiliary O.K.
Gearing WORN BUT O.K. FOR PRESENT Hooks IN GOOD CONDITION
Hoisting cable or chain, Main GOOD Auxiliary O.K. BUT SOMEWHAT WORN

SAFETY APPLIANCES

Automatic Stop, Main TESTED AND FOUND O.K. Auxiliary TESTED AND FOUND O.K.
Drum brake, Main TESTED AND FOUND O.K. Auxiliary TESTED AND FOUND O.K.
Solenoid brake, Main TESTED AND FOUND O.K. Auxiliary TESTED AND FOUND O.K.
Trolley travel brake NONE Bridge travel brake TESTED AND FOUND O.K.
Runway stops BOLTS TIGHT AND O.K.

SUGGESTIONS:- OPERATOR SHOULD KEEP HIS CRANE CLEANER? USE OIL MORE GENEROUSLY ON DRUM BEARING AND LESS ON OUTSIDE. A NEW PINION ORDERED FOR THE MAIN HOIST? A NEW CABLE FOR THE AUXILIARY HOIST AND CONTROLLER. CONTRACTS FOR AUXILIARY HOIST AND TROLLEY REPLACED SATURDAY AFTERNOON.

(Signed) HENRY F. JONES
Inspector.

Fig. 4—Crane Inspections at the Deane Works of the Worthington Pump and Machinery Corporation Are Reported on This Form

Allied Machinery Co. Changes

The Allied Machinery Co. of America, New York, has announced the retirement from its board of directors of Samuel McRoberts, who had been its chairman since the acquirement of the company by the American International Corporation. Mr. McRoberts accepted an important position with the United States Government which necessitated his resignation. In 1911 he organized, with others, the Allied Machinery Co. of America for the purpose of introducing American machine tools into Europe. A beginning was made in France and a large part of the company's business his since been with that country. He is succeeded as chairman of the board of directors by R. P. Tinsley, vice-president of the American International Corporation. Prior to March of this year the active management of the corporation was in the hands of R. B. Sheridan, as president. In March Mr. Sheridan sailed for Europe to make a study of conditions in France. In recognition of his services along that line he was made vice-president of the American International Corporation, and has now returned to this country to take up the active duties of that position with especial reference to the rehabilitation work which he studied while in Europe. Upon his return to this country Mr. Sheridan retired from the presidency of the Allied Machinery Co. of America. He will continue as a member of the executive committee and will be succeeded as president by J. W. Hook, formerly active vice-president in charge of the company's affairs during Mr. Sheridan's absence in Europe. The company's affairs in Europe will continue to be in charge of C. E. Carpenter, who is president of the Allied Machinery Co. of France.

The Allied Machinery Co. of America is now carrying machine tools in its stores in Paris, Lyons, Turin, Petrograd, Moscow, Zurich and Barcelona. Through an interest recently acquired in Benson Bros., Ltd., of Sydney, Australia, larger stocks of machine tools will be carried at Melbourne and Sydney and sales offices established in Adelaide, Brisbane and Wellington. Plans are under way for the extension of the company's activities to other parts of the world.

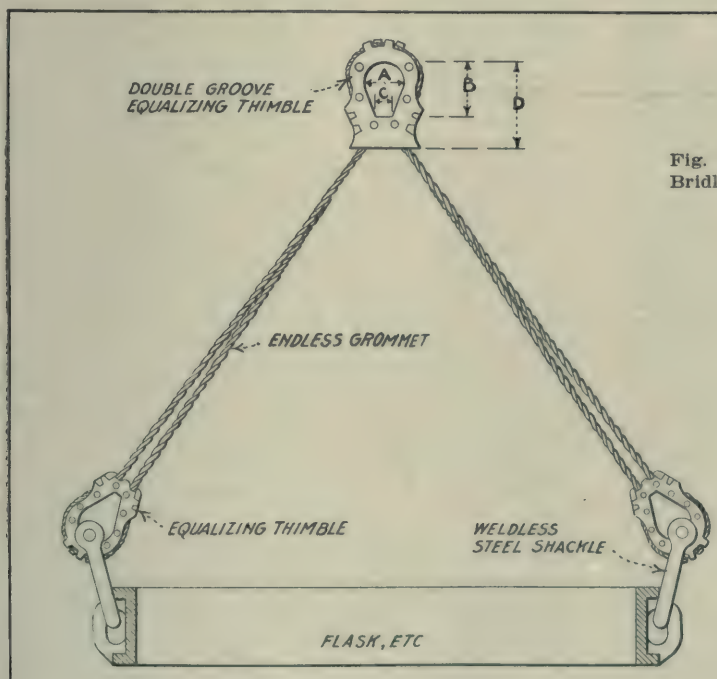


Fig. 5—Dimensions and Safe Loads of Bridle Slings with Equalizing Thimble and Shackle Connections

DIAM. SLING	SAFE LOAD IN TONS OF 2000 LB. WHEN USED VERTICAL	WHEN USED 60° ANGLE	WHEN USED 45° ANGLE	THIMBLE A	B	C	D
½"	6	5	4	5¼"	7¼"	2"	11¼
⅝	10	8.5	7	5¼	7½	1 1/16	11⅞
¾	14	12	10	5¼	7½	1 5/16	11⅞
⅞	20	17	14	6½	8¾	2⅜	14¼
1	26	22.5	18	6½	8¾	2⅜	14¼
1⅛	32	28	23	8	11¼	2 5/8	17¾
1¼	38	33	27	8	11¼	2 5/8	17¾
1⅜	45	39	32	9	12	3½	19
1½	51	44	36	9	12	3½	19
1⅝	57	49	40	10	13	4⅜	20½
1¾	65	56	46	10	13	4⅜	20½

criticism by molders is inadequate and poor crane service. This may be improved by use of standard signals and suitable instruction to crane operators. The author illustrated the signals used at the Deane Works.

Recovering Tin from Old Cans

A new method of recovering the tin on old cans and tin scrap is being experimented with by the United States Bureau of Mines at its station at Seattle, Wash. A small electric furnace has been installed and operation begun on the volatilization of the tin from such material. An extensive series of experiments will be carried out.

The Mahoning Foundry Co., Punxsutawney, Pa., has changed its name to Mahoning Foundry & Machine Co.

The Asbestos Auto Hood & Capsule Container Co., Detroit, recently incorporated, is negotiating for property at Wilmington, Del., as a site for a new plant for the manufacture of compressed asbestos automobile hoods and bodies, and capsule containers for high explosives. The proposed works will occupy about ten acres and give employment to 1000 men. Robert T. Beyer, Charles Milligan and Henry H. Valentine, all of Detroit, head the company.

REAL PROBLEM IS LABOR

Judge Gary Says Steel Mills Will Do Their Part in the War

"Yes, we shall have a merchant marine," said Judge E. H. Gary in an interview published in the New York *Tribune* Nov. 19, as reported by Theo. M. Knappen. Then he went on to tell about the two new shipbuilding companies the Corporation is starting, the Federal, which is now building its plant on the Hackensack Meadows, and the unnamed corporation, which will build ships on Mobile Bay, where there has been acquired a great tract of land. The latter is an offshoot of the Tennessee Coal, Iron & Railroad Co., which is erecting a new plate mill at Birmingham, chiefly for the purpose of meeting the requirements of the Mobile yards for shipbuilding material. Quite independently of the plans of the United States Shipping Board, the Steel Corporation had decided to build 50 ships, varying in size from 9600 tons up to 18,000 tons.

Is it possible for the corporation to engage in shipbuilding on a large scale itself and not interfere with the demands made upon it for steel by the innumerable other yards?" asked Mr. Knappen.

"We shall take care of all the requirements of the other builders without delay," was the answer. "The steel mills of America are equal to the task of building 6,000,000 tons of shipping in a year.

"The real problem in that connection is that of labor. The labor outlook is precarious. Considering the small amount of tonnage American yards have been putting out, it seems almost impossible to build 6,000,000 tons next year. But I have great faith in Chairman Hurley of the Shipping Board. He is getting a great executive staff around him. Charles Piez, whom he has summoned from Chicago, to become vice-president of the board, is a great executive, energetic, competent and successful, and will be of great assistance to Mr. Hurley. I am not personally acquainted with Mr. Heyworth, who has been put in charge of hastening the construction of wooden ships, but I hear very favorable reports of him.

"We are continuously adding to our plants and equipment, not only to promote shipbuilding, but to contribute in many ways to the successful prosecution of the war. The new Liberty plate mill at Homestead was rushed to completion in six months, and is now turning out the plates for the ships the Federal Shipbuilding Corporation is building. It has a capacity of 150,000 tons a year.

"A short time ago Mr. Baruch came to me and said that the Government was greatly in need of increased forging capacity. This is a kind of work we had not been doing. We began work on forging plants the next day. We are greatly increasing our electric steel capacity, one plant being built at Gary and another at Carnegie.

"We are extending our structural steel capacity at Birmingham and are increasing our production at other places. Our production of coke is being greatly increased, not only for the coke, but also for such important by-products of great military value as benzol and toluol. To expedite the movement of our products we are building many freight cars. Some are being built for us, and we are erecting a car shop at Birmingham, where we are also putting up a fine new structural steel plant. We are doing things in every department.

"It may surprise the people to know that we are spending about $12,000,000 a month for extensions, almost all for war purposes."

The Bureau of Yards and Docks, Washington, D. C., has awarded a contract for the construction of a new five-story machine shop at the Washington navy yard to cost $936,000. The Industrial Engineering Co., 30 Church Street, New York, is the contractor. The department has also awarded a contract for the construction of a new six-story gun plant at the local yards to cost $1,048,000. The structure will be reinforced concrete, 162 x 502 ft. The Warren, Moore Co., Philadelphia, is the building contractor.

FALSE REPORTS CIRCULATED

Reports Concerning Policy in Handling Alien Property Cause Trouble

WASHINGTON, Nov. 20.—Erroneous reports widely published during the past week concerning the plans of the alien property custodian for the execution of the trading with the enemy act have caused ill-founded alarm and have resulted in many unnecessary transfers of property, the cancellation of employment contracts, and the withdrawal of large amounts of capital from business and of money from the banks and postal savings funds. In a number of cases important manufacturing concerns have found their organizations demoralized and have been obliged to make comprehensive readjustments. Many of the published statements concerning this matter are so misleading as to induce the Committee on Public Information to suggest that they have originated in a deliberate plan to disturb and injure American business interests and not in a mere mistake.

The statement most calculated to mislead and cause uneasiness is to the effect that the fact as to whether anyone is an enemy or the ally of an enemy under the terms of the trading with the enemy act recently passed by Congress is determined by nationality or citizenship This is not the fact. The principal test of enemy character under the act of Congress is one of residence or place of business or business connections, rather than nationality or citizenship. A subject of Germany or of any of Germany's allies residing in this country, even though he has made no declaration of his intention to become a citizen, is permitted to continue in trade and commerce and in the possession and control of his property while he remains in the United States and obeys its laws, and he is not regarded as an enemy nor placed in that category by the trading with the enemy act.

The broad purpose of Congress, as expressed in the trading with the enemy act, is, first, to preserve enemy-owned property situated in the United States from loss, and, secondly, to prevent every use of it which may be hostile or detrimental to the United States.

Commerce cannot, of course, be carried on between residents of countries that are at war. In the absence of a general law for the protection of money and property in the United States belonging to those who are under legal disability, there might without the special action of Congress have been very considerable property loss and deterioration. The property of every person under legal disability is in every civilized country protected by the appointment of trustees or conservators whose duty it is to administer and care for the property while the disability exists.

This is the duty of the alien-property custodian. He is charged by law with the duty of protecting the property of all owners who are under legal disability to act for themselves while a state of war continues.

The trading with the enemy act authorizes in certain cases a license to permit enemy-owned business to be carried on. Where such license is not applied for or is not granted, the alien-property custodian is directed to exercise in regard to enemy-owned property the well-defined authority of a common-law trustee. Thus the probable waste and loss of a great deal of valuable property and property rights which could not, while the war continues, be conserved by the enemy owner is avoided, and a trustee appointed and paid by the United States is charged with the duty of protecting and caring for such property until the end of the war. This is his function. There is, of course, no thought of the confiscation or dissipation of the property thus held in trust.

The Codd Tank & Specialty Co., 402 West Camden Street, Baltimore, Md., is desirous of getting in touch with a malleable iron foundry in a position to manufacture a pipe union. This has a bronze seat in the main portion of the union and another in the nut. In connection with the manufacture of the union machine shop facilities are required.

Tool Holders and Expanding Mandrel

Two tool holders and a swinging expansion mandrel, all of which are intended to facilitate the production of projectiles, have been designed by Herman P. Louden, Sr., Lebanon, Pa. The holders are intended for diamond point and round nose tools respectively, and in the case of both marked increases in the rate of production are said to have been secured aside from the savings effected in the amount of tool steel required in comparison with large forged tools as well as enabling short pieces of scrap to be utilized.

The diamond point tool holder is intended for use on lathes, boring mills and planing or shaping machines, the holder being parallel on the bottom with the head rest. One end of the tool has an excessive lip for roughing, while the other is flatter and is designed for taking finishing cuts and cutting a standard V. It is possible to swivel the tool to the right or left, which enables right or left-hand threads to be cut with the same holder, and graduations are provided to facilitate setting. Another use of the tool is where a radius produced by a form attachment has to be followed. The round tool holder is particularly adapted to the turning out of various forms of projectiles and in one case the production of the 3.3-in. size was increased from 40 to 275 shells per day. Another advantage claimed for this arrangement of holders is that the shape selected for the class of work to be done can be kept true without grinding into the sides of the stock, which causes a waste of expensive steel as well as eliminating the expense of forging to shape and the dead stock required for a large forged tool.

The swinging expansion mandrel can be used for all classes of hollow work, although it was designed particularly for shell finishing. It can be arranged for either a friction or an automatic grip drive. In the former case the operator sets up the nut provided to pull up the jaws, while in the latter case the nut is left with the jaws a little slack, thus, it is pointed out, giving a mandrel that the mere turning of the work will make it grip fast while by turning the work in the opposite direction the piece can be readily released. The strain on the work as the cut is being taken is automatically compensated for by the rocking motion of the jaws.

The advantages claimed for the swinging arrangement are the elimination of energy consumed in lifting the mandrel in and out of the machine and the time required for loosening the tailstock and sliding it back whenever a shell has to be taken from the machine. This mandrel is provided with trunions with the mandrel telescoping through the driving medium. As the end of the mandrel is its own center, and rests in a funnel-shaped hardened bushing, it is pointed out that a larger friction surface is provided as well as effecting

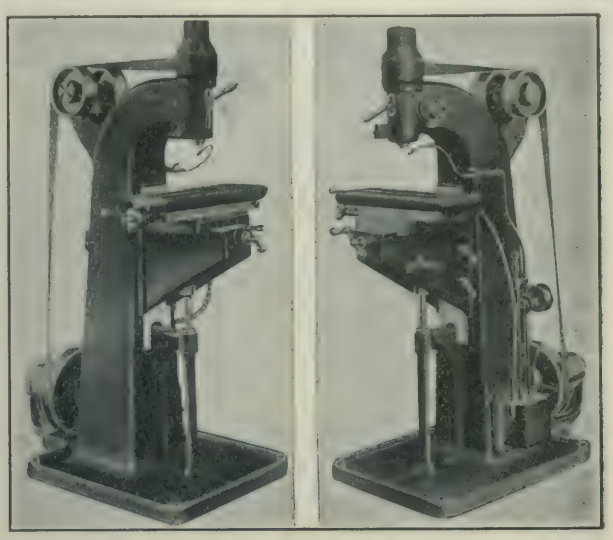


The Production of Shells Is Facilitated by Two Recently Developed Tool Holders and an Expanding Mandrel Which Can Be Swung Out of the Line of Centers for Ready Removal of the Work

the elimination of chatter and the saving in the cost of one center wearing and breaking off. The shells, it is emphasized, can be easily placed in and removed from the machine, thus eliminating sprained wrists due to constant lifting of the shells, while the production is also increased.

Light Vertical Spindle Milling Machine

High cutter speeds and ability to enable light profiling work to be handled characterize the new vertical spindle milling machine that has been brought out by the Taylor & Fenn Co., Hartford, Conn. The machine was designed for light work, cross and longitudinal movements of 6 and 11 in. respectively being



The Unit System of Construction Is Employed in a Recently Developed Light Vertical Spindle Milling Machine That Can Be Adapted for Profiling

provided, while the knee has a vertical adjustment of 9½ in. One of the uses to which the machine can be put is the manufacture of light interchangeable parts. The unit system of construction has been followed, the individual parts being assembled in groups. This arrangement is relied upon to give accuracy in conjunction with the finishing of the rotating parts by grinding and the scraping of the sliding surfaces.

The tool steel spindle, which has a hole 13/32 in. in diameter extending through it, is mounted in a steel sleeve in the head. A clamp ring and handle on the front of the head provides for the locking of the spindle and the sleeve in which it is mounted has a vertical movement of 2 in. controlled by a hand lever on the side of the head. Positive stops are provided for regulating the depth of the cut that is taken. The use of a four-step cone pulley and a friction countershaft having two forward speeds and one in the opposite direction provides for eight spindle speeds ranging from 246 to 4000 r.p.m.

The table, which measures 9 x 21 in. over all, has a working surface of 6 x 18 in. and is provided with ⅝-in. T-slots. The longitudinal and cross movements of the table are regulated by adjustable stops and by adjusting the knee and the spindle in its sleeve it is possible to secure a maximum distance of 11½ in. between the end of the spindle and the table top.

The machine is equipped with double row self-aligning ball bearings throughout, occupies a floor space of 30 x 50 in. and weighs 1050 lb. The equipment regularly furnished with the machine includes a gear-driven pump with tank and piping for supplying cutting lubricant to the work, an endless belt for transmitting power from the cone pulley to the spindle and a two-speed friction countershaft, the diameters of the pulleys being 8 and 10 in., respectively.

When changes now being made by the new interests in the Pittsburgh Rolls Corporation are complete the company will have a monthly capacity of 2000 tons of chilled and sand iron rolls. The plant at Pittsburgh is now running at the rate of 1300 tons monthly, as compared with an average for the 10 months ended Oct. 31 last of 1102 tons, and an average for 1916 of 1048 tons. The corporation is now working on orders for Italy, Japan and Australia, some of which will be delivered late this year and some early in 1918.

Foundrymen and Nation's Labor Problems

Feature of Meeting of National Founders' Association—The Farmer on Labor Questions—Enlarged Influence of Industrial Conference Board

AUTOCRACY of labor in interposing restrictions on production and in attempting to change existing employer-employee relations was easily the main subject of the twenty-first annual convention of the National Founders' Association held at the Hotel Astor, New York, Nov. 14 and 15. The views of the meeting took definite form in a telegram to the President of the United States, here reproduced. Contributions to the subject were made in addresses reported below, including one from a prominent farmer which shows a reversal of opinion on labor legislation by the agriculturists. The case of the railroads in meeting today's needs was explained by a nationally known railroad president and the broadening influence of the National Industrial Conference Board, the body organized to lay before Congress and the public facts concerning our industrial labor situation, was told by the chairman of the board's executive committee. A feature of the work of the National Founders' Association, brought out at the meeting, is the study being made to introduce mechanical appliances in the foundry, partly to overcome the labor shortage, but largely to bring about an engineering study of foundry problems not as yet much of a factor in the manufacturing side of castings production. The work has been in charge of the association's committee on foundry methods and for purposes of education on this topic a remarkable series of motion pictures were shown of actual work in several different foundries.

Three sessions were held as usual. On Wednesday morning were delivered the reports of officers. Leading points of President William H. Barr's address were given in last week's issue. Extracts of the reports of the commissioner and secretary are to be found in the subjoined account of the meeting. The sessions of Wednesday afternoon and Thursday morning were reserved for the special addresses and a banquet was held on Wednesday evening, at which motion pictures in color, many of them war scenes, were shown.

Labor Troubles in the War Period

George F. Monaghan, Detroit, general counsel for the association, delivered a stirring address. His subject was "Federal Control and Industrial Legislation." He referred to the enlarged authority which has been granted to the President in these war times, declaring that we are to-day living under a condition of State socialism with the President holding arbitrary power. He traced the growth of Federal control away from the old doctrine of State's rights. The first marked indication of the new order of things was the appointment in 1887 of the Interstate Commerce Commission with jurisdiction over the railroads of the country. Gradually, he said, the powers of this commission have broadened, and its history furnishes an example of increasing public sentiment in favor of centralization of authority in the Federal Government. He declared that Federal control of the drastic form now in effect was necessary to the successful prosecution of the war.

Referring to labor disputes during the war, Mr. Monaghan quoted the statement made some months ago by Samuel Gompers, president of the American Federation of Labor, that the question of closed or open shop would not be in controversy during the war. Mr. Monaghan said that the union men had not adhered to this declaration, however, but have found the war an opportunity to advance their own interests regardless of the effect upon the welfare of the country. He likened the union men who refuses to work with the man who throws down his gun and refuses to fight. The latter would be considered a traitor or a deserter and the laboring man who goes on strike, under present war conditions, should suffer the same penalty, in his opinion. All labor, he said, is as much a part of the war as the man who fights in the trenches. He hoped that no backward step would be taken by the Government in insisting upon a full performance of the promise made by Mr. Gompers.

"If the Government can draft men to fight; if the Government can commandeer shops and factories; if it can deflect orders from one manufacturer to another for war needs; if it can suspend the ordinary peacetime safeguards of property—if it can do all these things, and it can and is doing them," said Mr. Monaghan, "it can force men to work." He suggested that the Government should say to these men, "Strike if you will, but as surely as you do you will be drafted for service in the trenches." He advocated a law that would force men to fight who refuse to work.

Mr. Monaghan said also that the business man is unpatriotic who will not work for the Government because his profits are not what they ought to be. He made a plea for unalloyed support of the Government in its war program, and said this was no time to indulge in idle criticism of the Administration, but if good ground for criticism exists an appeal should be made directly to Congress.

The 8-Hour Law in Government Work

W. H. Van Dervoort, president National Metal Trades Association, talked on labor troubles during the past year. He said that his association had had as many as 80 strikes at one time to contend with, and that there had been 200 strikes at the plants of members in the past three years. Without the help of the association, he said, 90 per cent of these strikes would have been won by the workmen. To-day, Mr. Van Dervoort said, fully 90 per cent of the capacity of members' factories are on oGvernment work. He discussed the difficulties encountered because of the restrictions of the 8 hr. law, and said it was a problem how to handle the various factors that arise in connection with work under this law.

The piece-work question had proved a stumbling block, but had now been straightened out. Factories are privileged to keep running as many hours as the men are willing to work, but for all time over 8 hr. the employer must pay time and a half. If the same method of figuring were used on piece work it would require an endless amount of bookkeeping, so that compensation has been averaged in this way: If the men are receiving 10c. per piece on the basis of an 8-hr. day, and then their hours are increased to 10 the same result is arrived at, with less bookkeeping, by paying them a straight 11c. for each piece throughout the entire 10-hr. day. It has been decided that if an employee makes more in this way in 10 hr. than he would in 8 hr. on the hourly basis of pay the employer is within the law. If, however, the employee makes less on piece work than he would on the hourly basis of pay the employer must make up to him his loss.

Mr. Van Dervoort recommended that all employers on Government work keep an individual time record on each workman, as this record will settle disputes. It has been ruled that an employee cannot work 8½ hr. for five days in the week and 5 hr. on Saturday and receive only straight time for his labor. He must be paid for each half-hour overtime on five days of the week, and straight time for the 5 hr. on Saturday.

Agitators Masquerade as Government Agents

He cautioned foundrymen to be on guard against callers who represent themselves as agents of the Council of National Defense or other Government boards. He said that all such accredited agents have proper credentials and that men not possessing such credentials should not be admitted to offices or plants. He ended by telling how he had settled a threatened strike

at the plant of the Root & Van Dervoort Engineering Co., East Moline, Ill., by calling the men together in mass meeting after union men had been working for days to unionize the plant and call a strike. He told his employees plainly that any man who joined the union would be discharged; then he dwelt upon the fairness with which his company had treated the men and by force of argument persuaded them it was not to their interest to join the unions. The next day the labor agitators were driven off by the men themselves, and there has been no further talk of strike at the Root & Van Dervoort plant.

Walter E. Drew, counsel for the National Erectors' Association, followed Mr. Van Dervoort and explained the legal aspects of the Government 8-hr. law. He told in detail of a case in which a foundry was informed that a particular casting could be made without coming under the restrictions of the 8-hr. day. Subsequently organized labor had succeeded in having the Washington decision reversed. The foundry was regularly working on a 9-hr. day and the result was that the company, in spite of the parts being intended ultimately for Government work, was forced to refuse to contract. He emphasized particularly that labor union publications are playing up the special influence which the organization appears to have on at least certain branches of the Government and felt that protest ought not to be left to the single manufacturer, but should come from such an association as the National Founders' Association.

A Labor Bid for Public Esteem

Mr. Drew called attention to the claim for patriotic attitude made by organized labor in calling off unlawful strikes, thus getting widespread publicity for an act which had really been taken by the same group that subsequently called the strike off. He emphasized that something needs to be done for the silent 90 per cent of wage earners seeking to remain at work. He said that the Lackawanna Bridge Co., in connection with the development of the large shipbuilding activities at Newark, is getting plenty of men after repeated attempts to bring about strikes, and in violation of Mr. Gompers' promise. So well had the Lackawanna company been able to get labor that it was now ahead of schedule and has all the men it needs. The so-called patriotic order coming from the convention of the American Federation of Labor at Buffalo seems to have some influence on the men, though the organization claimed to have no control over the building trades.

He felt that the National Founders' Association could well congratulate itself on the selection of Charles Piez for the vice-presidency of the shipping board. A vast amount of praise also was due both President Barr of the National Founders' Association and President Van Dervoort of the National Metal Trades Association, and he believed that considerable influence for betterment of employer-employee relations had already been exercised or exerted by the National Industrial Conference Board.

Farmers' Lesson in Industrial Relations

The address on the farmers' interest in industrial relations was made by O. L. Martin, former secretary of agriculture of Vermont and lecturer of the Vermont State Grange. It was in part as follows:

The farmer has always been sympathetic with the workers in their efforts for just treatment, but the farmer is equally opposed to arrogance and injustice, whether from the worker or the capitalist. We have watched the growth of organized labor, at first with curiosity, then with a certain amount of sympathy and lately with apprehension and distrust. We have helped organized labor to win legislative battles. We have given help in many ways. But to-day we are countin up the result. We find that we have helped dig a pit for the farmers, and that the sympathy which we extended to the unions had better be saved for ourselves.

The farmers' alliance with labor led to the grantino of certain immunities and privileges to labor, which to my mind are undemocratic and unjust. We should all stand equal before the law. But labor was put above the law. True, you will say that the farmers were included in this preference and immunity. But the man who does not violate the law, nor intends to violate it, wants no immunity. The farmer lives within the law. He seeks no exemption from its terms. He did wrong in helping others to secure special privileges and exemptions. He realizes that now, unless I am mistaken.

The farmer to-day sees his mistakes and he has paid for those mistakes. The farmers' natural alliance is with industry.

The National Industrial Conference Board

L. A. Osborne, vice-president Westinghouse Electric & Mfg. Co., New York, spoke on the National Industrial Conference Board, in place of the executive secretary of the board, Magnus W. Alexander, taken suddenly ill. While the purposes of the Conference Board have been outlined from time to time in these columns, it was em-

National Founders' Association Telegraphs to President Wilson on Autocracy of Labor

The President, White House, Washington, D. C.:

The National Founders' Association, composed of nearly six hundred manufacturers operating iron and steel foundries, and employing scores of thousands of workmen, in annual convention assembled, unanimously pledges to you and our country the unswerving loyalty of its members and the resources of its industrial plants.

To gain that measure of efficiency requisite for the proper equipment of our army and navy, we stand squarely on the platform that the processes of labor shall not be interfered with and trust employees throughout the various industries of the nation may quickly be brought to a realization of the fact that autocracy of labor is fully as disturbing to the welfare of mankind as is the autocracy of government.

With full and complete support of their employees the manufacturers of our country will back the boys in the trenches to the limit without thought of emolument, but they will be powerless unless the present autocratic demands of some branches of labor for purely selfish advantage are dissipated.

We are unqualifiedly in accord with the declaration of the Council of National Defense that industrial and labor conditions as existing prior to the war should continue for the duration of the war. Any action to the contrary, whether of industry shirking its duty or labor interposing restrictions of production and attempting to change existing conditions, should be regarded as treason and punished as such.

We realize that there must be absolutely loyal co-operation between employer and employee until this war is won; that patriotism must be unsullied and uninfluenced by personal gains and selfish consideration; that the mutual pledges of representatives of the workingmen and directors of industries must be kept inviolate until a righteous peace is re-established on the earth.

THE NATIONAL FOUNDERS' ASSOCIATION.

phasized at the meeting that the board was never intended to secure immediate and quick action, but was for thoughtful study of industrial economic problems and the dissemination of the information obtained through various channels to the public. The board was doing well when we entered upon the war, and many looked to the board for expressions of opinion on the special problems growing out of the war. As a result the board has been reorganized to take care of emergency matters.

The Ante-War Status of Labor

Some mention was made of how the board was approached by the Council of National Defense and an executive committee appointed as an advisory committee. The board has continued its studies, such as those of social insurance, hours of labor, financial matters and taxation laws. How the advisory committee met in Washington over considerable periods and appeared several times before congressional committees in regard to the income tax measure was told, but meanwhile the Council of National Defense began to show concern over labor matters. These columns have noted at length how the board put forward its plan that during the period of the war the conditions and relations between employer and employee should remain as they were prior to the war. The attitude in Washington for a while was that things will right themselves, but in August the serious nature of the situation began to be realized. Then it was that the board was invited to provide a plan and a meeting was called of as many State and national associations as possible, when the statement mentioned was adopted. As yet, however, the Council of National Defense has taken no action on the recommendation, as it seems impossible as yet to get all labor organizations to take similar action. Since the publication of the statement in Washington 68 to 70 State, national and local associations have endorsed it, Mr. Osborne said.

The present status of the board is that by resolution of these conventions, the board is allowed to speak for for industry collectively, but Mr. Osborne mentioned that this is not likely to be done, unless quick action is necessary. One point is that the things which industry asks to be done must not be delegated too generally, but that the industrial heads themselves must take an active interest. It is yet necessary to inaugurate an intensive campaign of public education and as the spokesman of industry, the industry itself must support the board generously, if it is to be successful.

Betterment in Railroad Operation

How economies may be obtained in railroad operation at a time when railroads have difficulty in financing extensions and additional equipment was told in an informal address by L. F. Loree, president Delaware & Hudson Railroad Co. He mentioned that there were cases of railroads which had been inadvisably built in sections where they could not be economically operated and others which had passed their period of usefulness owing to changes and developments in the territory served. He regarded it likely that 30,000 to 40,000 miles of track under such conditions might well come up and be relaid in places where railroad facilities are especially needed. There is barely a road, he added, in which one or more branches could not under present special conditions be taken up.

Track structure, he continued, will not show great deterioration for 18 months, and in a general way equipment is in fairly good condition. Some locomotives there are indeed idle ready for use. Passenger equipment is more than ample. The average passenger car will accommodate 60 persons, but in actual use about 11. There are less excursion trains and some trains have been discontinued. Freight movement is not specially good, he admitted. One trouble is that too often unnecessary delays occur in yards. In case of the Kansas City Southern some time ago it was found that 70 hr. was lost in the six yards through which some freight had to pass and by special attention to yard conditions the delay was reduced to 19 hr. In the last six months such delays have been cut in half on the Delaware & Hudson Railroad, and in this he expected that the railroads of the country are going to show marked economy. Freight cars as a whole are in good physical condition.

Mr. Loree paid his respects to the commission form of government of railroads. He asserted briefly that while the railroads represent one-third of the productive activities of the country, they are now facing bankruptcy and that the commission after a generation of opportunity has either got to put the railroads on their feet or "you have got to get rid of the commission." The railroads, he said, are no longer under indictment. But they have no credit and to maintain themselves have to pay promptly for material and wages.

Shippers' Part in Ameliorating Transportation

Recent betterment in results are as much as anything due, he said, to the co-operation of shippers. Railroad men are gratified by the help given them by shippers. One trouble has been the small amount of units and the need of quicker loading and unloading. He urged shippers not to over-order the number of cars required, nor file duplicate orders for empty cars. The average time of loading cars is two days, and counting 200,000 cars, 100,000 cars would be saved if the loading time could be reduced to one day. Further economies would also be made by loading to 10 per cent above capacity or to utilize fully the cubic contents of a car where possible.

He dwelt on the reconsigning of cars, developing out of the practice to start a car before the buyer has actually been obtained. The result is that at each division terminal the car is consigned to some one or another representative of the original shipper, as the car proceeds toward the point of the expected customer. Though an attempt had been made to allow for a charge on such practices, the Interstate Commerce Commission refused to make the grant. He urged also that shippers should not try to use roundabout routes to overcome an embargo. He specially advised the use of automobile trucks for short hauls, as the railroads do not make money on short hauls, but prefer to confine their business to long hauls.

The Winona Foundry School

What may be mentioned as the revival of the Winona foundry school at Indianapolis was described by William M. Taylor, Indianapolis. He told how some years ago the association had established the school, but now it was a vocational school of the Indianapolis public school system. About Oct. 1 it began taking off heats. The National Metal Trades Association members in that city have a contract with the school board for the establishment of a machine shop, the manufacturers to be permitted to dictate the curriculum. After a two years' course the boys are taken into their shops at a minimum of 20c. per hour. The foundry is used to give the boys getting the machine shop training an insight into foundry work, but a similar contract is expected to be put through with the foundrymen of the city in connection with the school foundry. The school is not as commonly known a manual training school. The boys work 30 hr. a week in the foundry and then they get instructions in other subjects, such as civics, mathematics, etc. The serious problem is to get boys who can be induced to take up the work.

Labor Saving in the Foundry

A remarkable series of motion pictures of labor-saving appliances in the foundry was shown under the direction of the committee on foundry methods, of which J. J. Wilson, Cadillac Motor Car Co., is chairman. These were shown particularly to indicate possibilities of machine work in the average jobbing foundry, and to induce a greater degree of engineering study in the foundry than is now generally the case. President Barr contended that too often 50 per cent greater output could be obtained with a given force if the same skill was applied to the producing department as is to the selling department. This was the first showing of the pictures. They are intended for the widest possible use. For example, local foundrymen's associations will be given an opportunity to secure the pictures, as will foundry foremen associations. They covered practices in plants like the King Sewing Machine Co., Buffalo;

the Cadillac Motor Car Co., the foundries for the Buick Motor Car Co., the stove foundry of the McClary Mfg. Co., London, Ont., and the Lumen Bearing Co., Buffalo.

Commissioner McClintock's Report

In his report as commissioner of the association, A. E. McClintock pointed out that an analysis of the causes of strikes involving members in the past season shows the refusal of the employer to concede union control to be the main point of contention. The wage question as a strike issue, he said, has been unimportant, as the law of supply and demand for labor has taken care of that.

He described the situation at Hamilton, Ohio, "combatting one of the most vicious strikes in its history." An association member there is working on extremely urgent and important Government work, he said, to the extent of 80 per cent of capacity. "It is one of three plants in this country capable of producing this equipment. It has operated open shop for many years. The wages and hours were better than the union scale for that district. The equipment and shop conditions will compare most favorably with those in any shop in this country.

"After weeks of the most vigorous organizing effort but 22 out of a total of 126 molders could be induced to join the union. Their men were not interested in the union, as their pay was better than the scale set for union shops. The union officials then decided to have a union molder disobey shop rules to any extent necessary to bring about his discharge. This was done, and the local union promptly voted the shop on strike. By resort to violence and rioting, molders were prevented from continuing at work. The local police officers refused to act in maintaining law and order. The Governor, on being appealed to, stated he was powerless to act, as the State National Guard had been taken into the Federal Service. This condition continued for four months, when the foundry was placed under the protection of the Federal Court through the issuance of a permanent injunction against the molders' union."

The International Molders' Union has, he said, an average paid membership of 44,000. The United States census for 1910 gives the number of male molders and coremakers in the United States as 137,262. Including Canada, a conservative estimate, he figured, would place the total number at present at 150,000. The union, therefore, embraces about 30 per cent of the total number. In the year union dues have increased from 40c. to 60c. per member per week. In five years 48 new local unions have been organized and 63 discontinued.

Secretary Taylor's Report

The report of Secretary J. M. Taylor showed that 56 concerns had been admitted to membership and 22 lost by resignation. Nearly all the resignations were due to financial reasons, changes in management and concerns going out of business. The average number of employees reported showed a gain over the previous year of about 10 per cent.

Mr. Taylor told at length of specific indications of the value of the association's publication, *The Review*, which later in the meeting it was voted should be called "The Open Shop," provided the change in name met the approval of the National Metal Trades Association, which jointly with the founders' association publishes the periodical.

Officers Elected

William H. Barr, Lumen Bearing Co., Buffalo, was re-elected president. Samuel L. Moore, vice-president and general manager, Moore Bros. Co., Elizabeth, N. J., was elected vice-president. J. M. Taylor was re-elected secretary and A. E. McClintock was reappointed commissioner by the administrative council after the close of the convention. The district committees elected are as follows:

FIRST DISTRICT: F. C. Fromm, Manufacturers' Foundry Co., Waterbury, Conn.; A. E. Newton, Reed-Prentice Co., Worcester, Mass.; Enoch Shenton, Wm. Highton & Sons Co., Nashua, N. H.; C. C. Chesney, Pittsfield Works, General Electric Co., Pittsfield, Mass.; C. H. Tholl, General Fire Extinguisher Co., Providence.

SECOND DISTRICT: D. W. Sowers, Sowers Mfg. Co., Buffalo; H. P. Macdonald, Snead & Co. Iron Works, Jersey City; James H. Caldwell, Ludlow Valve Mfg. Co., Troy, N. Y.; A. S. Blagden, American Malleables Co., Lancaster, N. Y.; Louis P. Willsea, Willsea Works, Rochester, N. Y.

THIRD DISTRICT: Ely Griswold, Griswold Mfg. Co., Erie, Pa.; Wm. S. Hallowell, Harrison Safety Boiler Works, Philadelphia; C. S. Koch, Fort Pitt Steel Casting Co., McKeesport, Pa.; J. Turner Moore, Reading Steel Casting Co., Reading, Pa.; John E. Thropp, John E. Thropp's Sons Co., Trenton, N. J.

FOURTH DISTRICT: Geo. O. Rockwood, Rockwood Mfg. Co., Indianapolis; Charles F. Seelbach, Forest City Foundry & Mfg. Co., Cleveland; Samuel Blackburn, John B. Morris Foundry Co., Cincinnati; E. R. Frost, National Machinery Co., Tiffin, Ohio; James Inglis, American Blower Co., Detroit.

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Duties of Director of Steel Supply

The following statement, which supplements the recent announcement in these columns, is authorized by the Council of National Defense:

"Under and subject to the raw-materials division of the War Industries Board of the Council of National Defense, J. L. Replogle, vice-president American Vanadium Co., will act as director of steel supply and will have charge of the distribution and be responsible for the prompt and proper execution of all orders for iron and steel, other than ordnance, for the United States and allied Governments.

"Mr. Replogle will receive weekly reports from the iron and steel producers showing the tonnage of iron and steel of the various classifications on order for the United States and allied Governments, as well as domestic and foreign orders for general purposes. He will also keep informed as to mill capacities and mill production, and in cases of retarded output secure reasons therefor, and in conjunction with the manufacturers and the War Industries Board make every proper effort to remove obstacles which prevent maximum output of war necessities.

"Mr. Replogle will at all times work in close harmony with the various departments of the Government, which will give him as much preliminary information as possible in order that material can be placed to the best advantage of all concerned and with due consideration with respect to giving mills the best operating conditions to permit maximum output at minimum cost so far as the Government necessities will allow.

"Mr. Replogle will have all necessary steel statistical records to which the authorized representatives of the various Government departments will have access."

The German Electric Steel Co. of Berlin, which was founded in 1916 with a capital of 5,000 marks, increased soon afterward to 250,000 marks, now intends to increase its capital further to 2,000,000 marks, according to the London *Ironmonger*. It is reported that one-half of the shares have been taken by the town of Frankenberg, near Chemnitz, where a new plant is to be built and to which the headquarters of the company are to be transferred. The steel plant will be moved from Berlin to Frankenberg.

The Hedason Mfg. Co., maker of screw machine products, has removed from its former location at 28 Whitney Avenue, New Haven, Conn., to 1041 State Street.

Unable to Spend All Money Voted

War Preparations Proceed Rather Slowly—Secretary McAdoo Makes Statement—Board of Excess Profits Advisers Selected to Help Administer War Revenue Act

WASHINGTON, Nov. 20.—The submission to the Secretary of the Treasury during the past few days of the estimates of the several executive departments of expenditures to be made during the remainder of the current fiscal year has resulted in the disquieting disclosure that war preparations have proceeded at so slow a pace since July 1 that the War Department has been able to disburse but 50 per cent of the appropriations allotted to the four months' period ending Oct. 31. Other departments, also, are behind their estimates by very large sums, and as a result Secretary McAdoo concludes that the country may be able to get through the present fiscal year by raising not more than $10,000,000,000 additional by the issue of bonds, war savings certificates and Treasury certificates of indebtedness. Further taxation, effective during the current year, may be avoided, but, as Congress at the coming session must provide both appropriations and revenues for the fiscal year beginning July 1, next, it is more than probable that a new revenue measure will be framed during the winter or spring designed to produce approximately $2,000,000,000.

In giving this important news to the public, Secretary McAdoo, in an address before the Investment Bankers' Association in Baltimore during the past week, endeavored to draw an optimistic deduction from the very serious facts, emphasizing the conclusion that the financial resources of the country would not be strained in the immediate future to provide the funds necessary for the prosecution of the war until next July. He was very careful, however, not to pledge the Treasury Department to refrain from recommending to Congress further taxation during the present fiscal year, and he significantly omitted any reference whatever to the requirements of next year, which Congress must take up for immediate consideration. The Secretary said in part:

Secretary McAdoo's Statement

During the past few days the various departments of the Government have submitted to me their estimates of expenditures during the current fiscal year. On the basis of these estimates, I am confident that, allowing for a liberal balance in the general fund at the close of the fiscal year, not more than $10,000,000,000 remains to be raised by the issue of bonds, war savings certificates and Treasury certificates of indebtedness.

This is not regarded by the Treasury Department as a task which will in any way strain the capacity or resources of the United States. The splendid success of the second Liberty loan shows that the people are fully determined to support the war and are prepared to make such sacrifices of luxuries, pleasures, comforts and conveniences as may be necessary.

The estimates of the various departments include appropriations already made and proposed supplemental estimates to be submitted at the forthcoming session of Congress. Though the estimated ordinary expenditures (excluding advances to the Allies) for the year average about a billion a month, the ordinary expenditures for the four-month period ended Oct. 31 have been only $1,296,000,000, or at the rate of $324,000,000 a month. For instance, the expenditures for the War Department for the four-month period have been 50 per cent less than was estimated by that department for that period. It may be confidently expected, therefore, that the actual expenditures for the balance of the fiscal year ending June 30, 1918, will not at the most exceed the estimates.

The actual credits to the Allies have averaged $500,000,000 per month, or within the estimates of the Secretary of the Treasury, and the actual cash disbursements against the credits so established have fallen below the estimates. Of the expenditures made for the account of the United States, as well as those for the account of the Allies, a very great preponderance is for purchases in the United States, so that the operations involve merely a shift of credits and have not been a strain on the financial resources of the country. Not only is this true, but every precaution is being taken, by wise restrictions upon the shipment of gold, accompanied by careful study of the course of international trade, to husband the resources of the country.

The Statement Explained

Secretary McAdoo's frank statement to the effect that "the expenditures for the War Department for the four-month period have been 50 per cent less than was estimated by that department for that period" carries with it a revelation of great importance. The language employed is susceptible of three interpretations, but the correct one is easily distinguished. Either the War Department overestimated the cost of the material it planned to purchase or its estimates covered twice as much material as it has proved necessary to buy, or its deliveries have been so delayed that payments have consumed but one-half the current allotments of funds. It is no secret here that the last explanation is the correct one. It should be said, however, that this involves no disparagement of the ability of the department officials in contracting for the colossal quantities of material ordered since the United States became involved in the war, for there have been no precedents or criteria to guide them, while at every hand obstacles, some of them almost insurmountable, have been met with all the resourcefulness at command.

In the Ordnance Bureau in particular it has been necessary to overcome a situation due to the refusal of Congress to provide funds for the equipment of private plants to co-operate with the arsenals, and it has proven a gigantic task to fit up steel works, forging plants, and machine shops in a dozen different districts to help in the great work of producing guns, carriages and shells. That this work of equipment, while breaking all records, has progressed less rapidly than was hoped for, is no reflection upon the efficiency of the bureau.

Wooden Ship Building

It will not be surprising to those who have followed developments in the Shipping Board to learn that its appropriations will be drawn upon much more slowly than was anticipated and that the sums provided at the last session of Congress will not only meet all the drafts to be made during the current fiscal year, but, together with the authorizations heretofore provided, will carry the program through the greater part of next summer. The development of the wooden ship program has proved a great disappointment and it is probable that the average period of construction of this type of vessel will materially exceed that of the fabricated steel ships. The original idea that large numbers of these ships could be built in from four to eight months was long ago abandoned and the recent announcement that the Emergency Fleet Corporation has decided to substitute Douglas fir from Oregon for Southern white pine in the construction of these vessels indicates that little substantial progress has been made upon the ships the keels of which have thus far been laid.

The new naval program, including the 160 additional destroyers for which appropriation was made at the last session, is progressing at a normal rate of speed and in some respects shows increased rapidity as compared with peace times. The stupendous tonnage involved, however, has not only tested the existing facilities for naval construction, but has made necessary large yard extensions and increased equipment requiring much time as well as money, and it is not surprising, therefore, that a very large proportion of the allotment for the first four months of the current year is still on hand.

The Aviation Program

A similar situation exists as to the aviation program for which Congress appropriated approximately $700,000,000. A great deal of essential preliminary

work has been done in developing this program and the establishments which are to build the projected airplanes are rapidly getting into shape for quantity production. Up to the present time, however, the output of Liberty motors, which are to be largely used by the American aviation corps, has been inconsiderable, while the construction of the planes themselves has made little better progress. Experienced engineers have foreseen all the obstacles encountered and are neither disappointed nor discouraged at the progress made, but, of course, the net result is that the money appropriated by Congress has not been spent and is still in the Treasury.

The slow progress made in the war preparations and the comparatively light drafts on the appropriations granted by Congress will result in a very rigid examination of all estimates received by the Appropriations Committees of the two houses at the coming session. Conservative members of both houses pointed out last summer that the amounts being so readily voted to meet the estimates of the departments could not possibly be spent during the fiscal year ending June 30, 1918, and suggested that smaller sums be allotted coupled with authorizations to make contracts covering the full estimates. The administration officials, however, urged so strongly the immediate appropriation of the full sums desired that Congress was carried completely off its feet and bills carrying fabulous amounts were rushed through without the slightest consideration. The passage of the aviation bill carrying $664,000,000 through a single house in an hour or two and without any real discussion was typical of much of this procedure.

War Revenue Problems

Quite irrespective of whether, in view of Secretary McAdoo's disclosures, it will be regarded as necessary to enact additional revenue legislation during the coming winter, it is expected that a measure will soon be introduced amending the war revenue act in certain important particulars and especially as to the provision imposing the so-called war excess profits tax. The only escape from this necessity would be possible by the promulgation of regulations not only construing but actually amending the law so as to avoid the illogical consequences of blunders made in the drafting of this feature of the act. The Internal Revenue Bureau has already given serious consideration to the practicability of putting certain strained constructions upon several provisions and the question as to whether this is practicable will probably be decided at an early date, as the result of the deliberations of the Board of Excess Profits Advisers just appointed by the Secretary of the Treasury to assist the department in administering the war revenue act. These advisers are:

Representative Cordell Hull, a member of the House Committee on Ways and Means.

T. S. Adams, economist, of Yale University.

Wallace D. Simmons, president Simmons Hardware Co., St. Louis and Philadelphia.

J. E. Sterrett of Price, Waterhouse & Co., accountants, New York.

S. R. Bertron of Bertron, Griscom & Co., bankers, New York.

E. T. Meredith, editor *Successful Farming*, Des Moines, Iowa.

T. W. McCullough, editor *Omaha Bee*, Omaha, Neb.

Stewart W. Cramer of the National Council of Cotton Manufacturers, Charlotte, N. C.

Henry Walters, chairman of the board, Atlantic Coast Line and Louisville & Nashville Railways.

In announcing the appointment of these advisers, Secretary McAdoo emphasizes the established policy of the department "to co-operate intelligently with the public and business in the administration of the tax laws" and says that "in the important work these men have been called upon to do there must be constructive co-operation between the department and the taxpayers of the country in the proper collection of the full amount of all revenue authorized by Congress, which is absolutely necessary to winning the great war in which the nation is engaged." Referring to the manner in which business men from the beginning of the war have shown their desire to help, Secretary McAdoo cites the action of the Chamber of Commerce of the United States in recommending that a large part of the war expenditures be obtained from taxes on excess profits and incomes. "This evidence of the readiness of business to do its full share in the support of the Government's war policies," says the Secretary, "has been recognized by the administration and every effort will be made to have this great burden, advocated by those who will bear the greater part of it, fall with as little hardship as possible consistent with a just and thorough administration of the law."

Preparing for Gigantic Task

The Internal Revenue Bureau thoroughly understands Secretary McAdoo's policy. In planning for the gigantic task of collecting the war revenue, a new organization has been effected, additional divisions have been created, and preparations made for a large increase in personnel. Every official, it is declared, will be required to so conduct his own work as to clearly reflect the department's policy.

In connection with the appointment of the Board of Excess Profits Advisers, Secretary McAdoo makes it plain that their work will not be limited to construing the law, but they will assist taxpayers in calculating their obligations to the Government under the various provisions of the war revenue act. "The Government is fortunate," says the Secretary, "to obtain as advisers men of such broad vision and experience, who are patriotically interested in seeing that the money so vitally needed for war purposes is collected with the least inconvenience to the public and to business generally. The law presents problems of construction and interpretation that are of vital importance. The policy of the department will be to continue to keep in close touch with the taxpayers, so as to secure the most reliable and complete information before promulgating administrative regulations. The recognized standing and ability of these advisers are an assurance that the problems will be solved in the light of the best available constructive knowledge and experience.

Program of Information

"In addition to the action of the department in availing itself of the services of these advisers, plans are being formulated for a program of information for the taxpaying public. It is essential that every taxpayer shall know how to compute the amount of the taxes he must pay and the time, place and method provided for its payment. The department recognizes that information of this kind will be indispensable because the law puts upon the taxpayer the responsibility for making the returns by which his tax is measured.

"Steps are being taken to bring the tax-gathering machinery of the Government into closer relationship with the taxpaying public. An office known as the Division of Taxpayers' Co-operation has been created in the Internal Revenue Bureau. Under the direction of this office a nation-wide plan of co-operation with taxpayers is being developed. Through the organization that will carry out this plan essential information will be conveyed in the most direct manner to each taxpayer.

"The department recognizes also the desirability of relieving the public of any uncertainties as to the interpretation and administration of the law. Hasty action must be avoided and due consideration must be given to actual conditions and facts, so that the department's rulings shall not disturb sound and desirable trade practices. It is essential, however, that the work shall proceed intelligently and expeditiously."

It is very doubtful that the Board of Advisers will be able to correct by regulation some of the blunders made in the drafting of the excess profits tax law. It has been found, for example, that a large number of small concerns having profits aggregating but a few thousand dollars per annum, which were intended to be practically exempt from taxation, will be called upon to pay a very large percentage of their net earnings because, through an oversight, the first and lowest "bracket" of the excess profits schedule will not apply to them and they become liable under a bracket which does not include the $3,000 exemption. It is understood that a provision covering this point has already been drafted and will be offered as an amendment to the revenue act as soon as Congress meets.

W. L. C.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

Owned by the United Publishers Corporation, 243 West 39th Street, New York. H. M. Swetland, *Pres.* Chas. G. Phillips, *Vice-Pres.* W. H. Taylor, *Treas.* A. C. Pearson, *Secy.*

BRANCH OFFICES—Chicago: Otis Bldg. Pittsburgh: Park Bldg. Boston: Equitable Bldg. Philadelphia: Real Estate Trust Bldg. Cleveland: Guardian Bldg. Cincinnati: Mercantile Library Bldg. San Francisco: 320 Market Street.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

The War's Economic Changes

In view of the extensive program of the United States at the present time in the regulation and control of industries by the Government, the experience of Great Britain in this direction is extremely interesting. The London *Economist*, in describing present conditions, says that while it is recognized that a great and increasing amount of state control is necessary so long as the war lasts and afterward while the immense dislocation of the world is being straightened out, "we are all most heartily sick of it." The *Economist* expresses the opinion that the war has done more to make all classes hate the very idea of state socialism than could have been achieved in the past if all the newspapers, books and speeches delivered had been concentrated on this one purpose. It then shows how a committee is collectively much less intelligent than its individual members. It is asserted that experiences in Great Britain with state controlled railroads, ships, coal mines, engineering works, food, drink and newspapers causes an intense longing for the day when the defense of the realm act will pass out of existence; yet it is admitted that there cannot be a return to the old free, untrammeled individualism. "We can no longer conduct business each man for himself, each industry for itself on the principle of the devil take the hindmost," says this London authority, which adds that co-operation has shown what might be achieved by co-operation under voluntary organization; for, inefficient as industries under government control have been and are, the wastage before the war under the old free competitive system has been demonstrated. With methods developed to the greater degree of efficiency that now exists, it is clear that if the present waste still caused by friction between management and labor, between producer and distributor can be eliminated or minimized, short hours of work will be fully compatible with high pay and prices lower than they now are.

As to conditions in this country, it is doubtful if state socialism as such has made progress; but it certainly is true that people are not as easily alarmed as they once were about certain tendencies being classified as socialistic, whether they be in the line of increased Government authority or in allowing greater power to corporations to co-operate. One thing is certain: that conditions after the war will be far different from those before the war or those now existing. The value of co-operation on the part of railroads and great industries is appreciated more than ever in this country and the follow of insisting on unlimited competition will never prevail again.

The tendencies of the times are illustrated in the declaration of Mr. Vanderlip before the Interstate Commerce Commission at Washington last week at the hearing on the proposed increase in freight rates. He expressed the opinion that increased rates would simply be a poultice for existing ills and suggested the possibility of a radical change fashioned after the plan of the Federal Reserve system with representatives of labor and the Interstate Commerce Commission on the central governing board which could decide when combinations could be formed and when increases should be granted in traffic as well as in wages. He expressed the fear that unless the present system of regulation without allowing combinations of railroads is abandoned, Government ownership will be urged as the only remedy for the serious railroad problems in this country. This surely is a long step away from individualistic operation of industry, but the proposal does not shock the country and it with other plans will receive serious consideration.

Mr. Vanderlip, like all thinking men who are in contact with the railroads and all the great industries of the country, is seeking such light as present conditions afford, and the war period is certain to bring experience in large measure to assist in laying the foundations for better systems.

Workmen and Performance

There is reason to suspect that the claim that workmen are not putting forth their best effort is being made altogether too sweepingly. The glaring instances, of I. W. W.'s, of coal miners who object to being fined if they do not work five eight-hour days a week, and others, are probably magnified when it comes to considering totals or averages. Many individual instances of "labor shortage" are in reality evidence that men are working. While there are floating idlers in all the large cities, the "odd-job" man in the hamlet is hard to find,

doubtless because he now has a steady job. The sum total of work done is very large.

In some directions that is an improvement in the amount of work done. Many employers testify to the steadier labor of men through their having purchased Liberty bonds on the installment system. Men who hitherto made no effort to save money have been given an incentive and are putting in more regular hours. Instead of the first loan acting as a drag upon the second, many employers found their forces subscribing much more freely to the second. The educational work done in the first campaign, the tendency toward thrift inculcated, bore good fruit when the second campaign was started.

It is well to recall now that the restriction in immigration, which in the spring of 1915 was already used as the basis for predicting a labor shortage, has now extended over a period of more than three years. The net increase in population due to the passenger movement, aliens and citizens, has been as follows, in fiscal years and in July and August of this year:

1913	754,205	1916	137,138
1914	687,065	1917	217,907
1915	117,237	July-August	—12,378

The fiscal year 1913 was a good year industrially, while the next was a bad one. The two together can be taken, therefore, as involving a normal average influx for average times, whereas we have since had good times. The 1913-4 average increase in population due to passenger movement was about 720,000 a year or 60,000 a month. In three years and two months additional we should have had an increase of 2,280,000 in our population, according to the previous rate, whereas there was an increase of only 472,282 in the three fiscal years, with an efflux of 12,378 last July and August, making a net increase of about 460,000, or a deficiency of 1,820,000 from the expected.

All things considered, therefore, it is probably safe to conclude that on an average the amount of work being done per man at the present time is large. There are glaring and unfortunate cases of exceptions, which should be rectified, but the chief difficulty is that the number of men is not great enough in proportion to the amount of work that should be done.

More Transportation or Less Freight

The condition on the railroads is such that an early decision is imperative whether greater transportation facilities shall be provided or less freight shall be required to be moved. The railroads have been handling a record volume of freight, yet have not been able to meet the demands upon them, and congestion has so increased in recent weeks that a remedy must be found, particularly as the first blasts of winter will effect their usual slowing down in railroad operations.

The subject is being discussed by the laity, who suffer from embargoes, car shortage, and slow movement of freight. In the opinions expressed as to what should be done there is seen the fruit of the railroads' campaign in recent years, that they should be enabled to purchase more rolling stock, and there is quite a discussion as to the means that should be provided. While the discussion centers upon an advance in freight rates, there are two proposals, one that rates should be advanced to such an extent as to enable the railroads to make purchases out of earnings, the other that rates should merely be so increased as to insure earnings prospects sufficient to invite capital to invest in railroad securities.

Railroad managers are themselves not a unit on this subject, some taking the interesting stand that they ought not to seek to float new securities when the Government is engaged in borrowing such huge sums while others claim that now is the time to put the railroads in such condition that now and in future they will be able to borrow money.

As opposed to the proposition that the capacity of the railroads should be increased to meet the demands, there is the plan for discontinuing unessential industrial operations, so that less freight would be seeking movement and also much man power would be released. The various departments at Washington having direct and indirect interest in this matter are now seriously considering the compilation of what will be known as a list of unessentials. Last week the railroads submitted a list of about 500 commodities, the movement of which might be considered unessential to the prosecution of the war, and this list is now being studied. The dispatch from Washington that a list has already been adopted, but is kept secret for the time being to avoid unsettlement to industry, does not seem to be well founded, more authoritative advices being that no list will be finally adopted until the parties in interest have been given an opportunity to present their respective cases. Actual restriction, however, has begun, with the priority order dated Oct. 27, prohibiting the use of open-top cars in the transportation of materials to be used in road making and repair, building places of amusement, and making passenger vehicles and furniture. The question is only how far restriction shall go.

The question has its psychological as well as its material aspect. It was frankly admitted that one of the considerations leading to the fuel administrator's order as to the curtailment in electrical illumination was the sentimental influence that would be exerted, by giving the public another illustration of the sweeping character of the country's devotion to the work of prosecuting war. Meatless and wheatless days have likewise their psychological function. Curtailment of industry by cutting out unessentials is not necessarily in the same category. It would not make its separate appeal to each of the individuals in the masses. On the one hand men would be thrown out of jobs in factories doing unessential work, and certainly no desirable sentimental appeal would be involved in that. It would produce scarcity of the commodities marked unessential and abstention from buying them would come from pecuniary, not sentimental, reasons. The publication of a list of industrial operations decided upon as unessential would exert an unsettling influence upon business. On the whole, the psychological influence would be unfavorable, and the matter must be considered only from its material side, whether the cutting out of unessentials will increase the supply of labor and of transportation sufficient to make it pay as a national operation.

The other proposition, to increase railroad facilities, has its own difficulties, greater than seems generally to be realized. It is admitted that there is enough main line track. Increasing railroad facilities involves one or more of the following: More cars, more locomotives, more yard and siding facilities.

There is no scarcity of cars as cars, the difficulty being with their movement, and the question in railroad circles is whether it is more motive power or greater yard and siding facilities that is needed to produce a heavier freight movement. It is not feasible at this time to build large numbers of standard steel construction cars, for the plates at least are not available, being required to push the shipbuilding program to the utmost. Composite cars could be built, using wood in conjunction with structural shapes, but that is to be considered only as a last resort, because such cars would be of far less than full value after the war.

As to yards and sidings, the difficulty there is not so much material as it is labor. The railroads have not even been able to maintain their permanent way of late, and nearly all is already well below the respective standards. At best, additional yard and siding capacity could only be brought into being slowly.

A remedy frequently suggested is that the Government retard its locomotive program for the railroad in France. Doubt is expressed whether the "U. S. A." locomotives are needed as rapidly as they are being built. The total of standard-gage locomotives on order for the Government is 980, all for the railroad in France and all of the one type, 80-ton consolidation. On July 18, 150 were ordered each from the Baldwin Locomotive Works and the American Locomotive Co. In August, 380 additional were ordered from Baldwin and in October 300 more. The first Baldwin locomotive was completed Aug. 11, in 20 working days, work then proceeding at the rate of four per day. Apart from these locomotives there were ordered 1,004 60-cm. gage locomotives from Baldwin, chiefly gasoline, and 30 saddle tank locomotives from the Vulcan Iron Works, making a grand total of 2014 locomotives, standard and narrow gage, steam and gasoline, ordered by the Government, of which only the 980 80-ton standard gage need be considered as a locomotive-building proposition.

The country's capacity in standard locomotives is estimated by a competent railroad manager at 5500 a year, which under pressure and with standardized designs might easily become 20 a day. The orders of the United States Government, therefore, are not employing anything like half the locomotive building capacity. Large orders for our Allies are being filled, while orders for 1500 locomotives for Russia were tentatively placed recently, the actual inception of work awaiting settlement of details the importance of which can readily be imagined. The advantage to ourselves of furnishing locomotives to Russia, if they will be used for prosecuting the war, cannot be overestimated. The inconvenience of curtailing some of our unessential industrial activities cannot be weighed against the burden that would be thrown upon our shoulders by a collapse of the defensive on the eastern front.

Thus between cutting down the volume of freight offered for transport and increasing the facilities of the railroads no decision can be lightly reached. The most efficient co-operation between all parties in interest, Government departments, railroad managers and industries, is imperative to develop the best plan. Nor is that the whole matter. While the existing railroad equipment has done well, it could do still better. There is need for at least two things more—a still more complete unification of the railroads as one system and a larger performance of labor. In the latter connection a partial or complete suspension under Federal war authority of various State laws regarding hours of labor, size of train crews, etc., is believed by practical men to be imperative.

FORD WILL HELP

Standardization of Vessels Will Hasten the Building Program

WASHINGTON, Nov. 20.—An important step in the reorganization of the Shipping Board has just been taken looking to a reduction in the number of types of ships to be built and the thorough standardization of vessels, materials and equipment. Charles Piez, vice-president of the Emergency Fleet Corporation, who is now in full charge of the shipbuilding operations, has appointed Henry Ford, the automobile manufacturer, a special assistant to devise standardizing methods with a view to hastening quantity production. This important innovation may halt construction in certain shipyards for a short time, but it is believed that ultimately it will greatly increase the output and will place the entire shipbuilding program on an up-to-date basis in line with modern engineering methods.

One of the first discoveries made by Mr. Ford, who arrived in Washington during the past week to take up the duties of his new office, was that the fleet corporation is now attempting to build eight different types of vessels, and that these represent a cut of 13 types in the original Denman-Goethals program, which contemplated no less than 21 models differing in size, lines, material, motive power, speed, equipment, etc. The present program includes three types of steel ships to be built in private yards, three types of the fabricated ships to be built in Government controlled yards and two types of wooden ships. The important differences between these eight types necessarily involve a great variety of materials, power units and equipment, and as a result a multiplicity of details which has contributed not a little to the slowing down of the building program.

It is Mr. Ford's idea that all the steel ships should be reduced to a single type designed to carry a maximum amount of cargo at a rate of speed that will outrun the submarines. He believes these vessels should have a cargo capacity of about 8000 tons, should be about 500 feet in length and should have a speed of not less than 16 knots. Such a model, it will be noted, is larger than any of the steel ships thus far designed except a small number of 9000-ton vessels, which the fleet corporation has planned to build in one of the Government controlled shipyards.

It is Mr. Ford's plan, as soon as a standard type of ship has been decided upon, to secure quantity production in the same manner in which Liberty motors are now being turned out. A large number of blue prints and specifications will be provided and orders for standardized materials, including plates, shapes, power units, equipment, etc., will be placed wherever possible, a special effort being made, however, to induce manufacturers to undertake the production of a single specialty in order to develop accuracy and quantity output to the maximum.

Thomas A. Edison is an enthusiastic supporter of Mr. Ford's plans and with Mr. Ford has recently gone

over the entire project with Chairman Hurley of the shipping board. Mr. Edison believes that if any time is lost now as the result of revising the designing of the cargo carriers it will be more than offset by the speed with which standardized vessels can be built. On this point Mr. Ford talks with the utmost confidence.

"The differences in methods and plans of construction now to be found in the different shipyards," he says, "ought to be wiped out, and all of them run at top speed and in the same way. To accomplish this every available factory in every part of the country ought to be called into action. Each factory should be asked to make only that part of a ship for which it is equipped, or for which it can be most readily equipped. The shipyards themselves ought to be merely assembling plants. By this method we would make use of all that is best in the present speedy operation of those motor car plants which devote themselves to assembling."

The fleet corporation is experiencing no difficulty in securing supplies of steel for the vessels contracted for. Reports reaching headquarters here indicate that all the mills furnishing this material are up to their schedules and in some cases ahead of them. It has been practicable to organize this branch of the work in a very satisfactory manner and there will be no delays on this score.

Strike Conditions at Boston

The strikers on structural work on various Government jobs in the Boston district refused to heed the orders of the international presidents of their unions to return to work, following the decision to that effect made at the Buffalo meeting of the American Federation of Labor. Late in the week, following the announcement that Stanley King of the War Department and Admiral Harris of the Navy Department were to come to Boston the first of this week to confer with them, the men were ordered back to work on all the jobs except that of the destroyer plant at Squantum, for which the contract is held by the Aberthaw Construction Co. There is no conflict except over the enforcement of closed shop rules. Colonel Dickson, commandant of the Watertown Arsenal, announced on Monday that there was temporarily no strike at the Arsenal. The situation is temporary because the leaders of two of the unions have made demands that the non-union workers employed during the strike be laid off. Following orders of the War Department, these men are being retained on the job and all other competent men applying for work are being taken on, as the demand for workers is greater than the unions can supply. The carpenters on the Watertown job have not returned to work and have announced that they will not do so until after the conference with Mr. King. The strike is affecting the work at Squantum but slightly, as the contractors have had little difficulty in filling the men's places.

Iron-Ore Imports Falling Off

Iron-ore imports have been considerably less in 1917 than at any time during the war, though in 1916 they were larger than in some pre-war periods. To Sept. 1, 1917, they were 613,529 gross tons as compared with 919,856 tons to Sept. 1, 1916, and 797,845 tons to Sept. 1, 1915. More detailed figures in gross tons follow:

	Total	Per Month
Eight months ended Aug. 31, 1917	613,529	76,691
Fiscal year ended June 30, 1917	1,149,958	95,829
Fiscal year ended June 30, 1916	1,425,717	118,809
Fiscal year ended June 30, 1915	1,196,077	99,673
Calendar year, 1914	1,350,588	112,549

It thus appears that the 1916 imports were unusually large under war conditions. Of the 1917 imports more ore has come from Spain than at any time during the war. Of the total to Sept. 1, this year, 133,906 tons was from Spain, or four times the amount in the same period in 1915. Imports from Cuba have correspondingly lessened.

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Electric Steel Furnaces in Great Britain

In Great Britain 131 electric steel melting furnaces are now operating or under construction or represented by application for permit, according to the London *Ironmonger* of Oct. 20. They are distributed as follows:

Heroult	48	Stassano	4
Greaves Etchells	33	Stobie	3
Electro-Metals	27	Induction	2
Rennerfelt	7	Girod	1
Snyder	6		

Of the total 70 are in Sheffield. This probably makes the largest number of such furnaces in any one center in the world.

Coal-Supply Situation Is Critical

Fuel Administrator Announces Policy to Be Pursued to Conserve Fuel—Believed Agreement with Miners Will Be Reached

WASHINGTON, Nov. 20.—A critical situation with respect to the coal supply has developed as the result of the discovery that a huge shortage of approximately 50,000,000 tons now exists due to the enormous increase in consumption by the war industries and the railroads during the past nine months. For several weeks the office of the Fuel Administrator has insisted that the coal supply was ample, pointing to the fact that production during the calendar year to date is at least 50,000,000 tons in advance of last year. It now appears, however, that the consumption of coal has exceeded that of the corresponding period of 1916 by more than 100,000,000 tons, leaving an enormous net shortage. All the power possessed by the Government will be invoked to increase production and regulate distribution with a view to keeping the war industries going at top speed, and the Fuel Administrator and the Attorney-General have already taken steps to prevent any form of profiteering in the handling of the nation's coal supply.

The entire increase in coal consumption, according to Dr. Garfield, is due to the necessities of the war. Munition plants, running 24 hours a day at full capacity with continuous demands from the Government for increased production, are using from one-third to one-half more coal than they were a year ago. The Bethlehem Steel Co., for example, is said to require an increased coal supply of approximately 250,000 tons per month, or 3,000,000 tons a year. In 1916 the Federal Government purchased 2,000,000 tons of coal, but for the current calendar year the demand for fuel for the actual fighting forces of the army and navy will result in the consumption of at least 8,000,000 tons. There has also been a huge increase in the demands of public utility plants, particularly in the industrial sections of the country, and the increase on this account is figured at not less than 35 per cent. In the main, however, this is due to increased power furnished to munitions plants and other war industries.

Dr. Garfield's Policy

"To close up the gap of 50,000,000 tons between the production and the consumption of coal," says Dr. Garfield, "the Fuel Administration will take steps to increase production, facilitate transportation and enforce the most economical use of the available coal supply. The Fuel Administration is determined that war industries, public utilities and domestic consumers shall be supplied. To this end the co-operation of every coal user in the country will be necessary. The Fuel Administration will use all of its authority to prevent the waste of fuel or the unnecessary use of fuel. Domestic consumers will be urged to conserve their supplies.

"Wherever the unnecessary use of coal in industry threatens to embarrass war industry the Fuel Administration will see that the war needs are filled. All activities which are unnecessary to the maintenance of military or economic efficiency will have to give way by curtailment of their supply to the necessities of the war, and this must be accomplished without undue curtailment of the domestic supply. This policy is expected to relieve not only the demands for coal, but a part of the tremendous pressure on the transportation facilities of the country."

Many Complaints Received

A flood of complaints from all parts of the country has reached the Fuel Administration during the week describing the alleged hoarding of coal by munitions plants and other lines of industry, and protesting against the refusal of dealers to sell coal and coke at prices fixed by the Government. At the request of Dr. Garfield, Attorney-General Gregory has notified all United States District Attorneys to take immediate steps to inform themselves as to conditions in their districts and to use the utmost vigilance and energy in detecting and prosecuting operators, jobbers and others discovered in profiteering practices. A number of special attorneys have been detailed to assist in this work and the Attorney-General states that every effort will be made to enforce full compliance with the price rulings as they have been determined by the President and the Fuel Administration.

Producers of coke seeking to alter the prices fixed by the Fuel Administration must establish that their cost of production justifies the changes asked for. In this connection Dr. Garfield has issued the following regulation:

"If a change in the price of coke is desired, the applicant should first procure the Federal Trade Commission's uniform cost sheets. These should be filled out for the calendar year of 1916 as a whole and for 1917 month by month to the date of application. The cost sheets may be secured from either the Federal Trade Commission or the Fuel Administration."

Alleged Hoarding

Accompanying several complaints received by the Fuel Administrator concerning the alleged hoarding of coal by munitions plants have been photographs of large coal piles which, on their face, appear to be strong evidence in support of the charges. In all of the cases investigated, however, the fact has developed that the coal piles shown in the photographs, although containing large quantities of coal, represent but a few days' supply for very large establishments consuming great quantities of fuel. In no case has the Fuel Administrator been satisfied that there was improper hoarding of coal by any manufacturing concern.

On the other hand, it has been made clear that a critical situation exists among the munitions manufacturers in several important districts. Charles H. Ten Weeges, State Fuel Administrator for Delaware, has called Dr. Garfield's attention to the condition in the Wilmington district, where a large number of munitions plants are located. Many of these plants draw heavily upon the power and lighting facilities of Wilmington and neighboring towns, while others provide their own power. For some time past these power plants have been on a hand-to-mouth basis and the Fuel Administration has now promised to take steps to assure an adequate supply of fuel in order that there may be no slowing down of the war industries.

State fuel administrators have been instructed by the United States Fuel Administrator that they have complete authority in their respective States to enforce the proper distribution of the coal supply at proper prices.

Coal dealers are prohibited from selling coal at a price "subject to revision" by an order just issued by the Fuel Administrator. Heretofore the Administration has allowed all producers to sell their coal at prices fixed by the Government with a stipulation in the selling agreement that the price might be revised if the Government should change the published rates. This practice has resulted in much confusion, as certain dealers have refused to make readjustments and some consumers have objected to paying additional amounts after receiving their coal.

B. G. Hinckley of Boston, Mass., has been named to assist L. A. Snead of the apportionment and distribution section of the United States Fuel Administration in all matters relating to coal and coke for New England. With the closing of navigation on the Great Lakes, the Fuel Administration will arrange to have special shipments of coal made to New England.

It is now believed that a working agreement will be reached between the Fuel Administrator and the

miners' organizations that will include a mutually satisfactory automatic penalty clause designed to prevent strikes, lockouts and other disturbances calculated to interrupt coal production. On Nov. 26 Dr. Garfield will confer here with the representatives of the miners in Illinois and other coal fields with a view to reaching an agreement to continue through the period of the war, subject to revision only after a stated period and by mutual consent. Several other miners' organizations in the Southwest have tentatively agreed to accept the penalty clause and it now seems probable that a similar arrangement will be effected covering practically the entire bituminous field.

The operators in the Pennsylvania anthracite field, after a conference in this city during the past week, have agreed to wage increases ranging from 15 to 44 per cent on condition that the advances are absorbed in higher coal prices allowed by the Fuel Administrator. Immediately after reaching this agreement, a committee of operators and miners called on Dr. Garfield and requested that the anthracite prices be raised to meet the increases. Dr. Garfield promised to give the matter his immediate attention, but stated that he would make a very careful investigation before rendering a decision. The operators estimate that the wage increase would add about 45 cents a ton to anthracite prices and give the miners about $40,000,000 additional pay annually, imposing a corresponding burden upon the consumers. Up to the present time Dr. Garfield has given no indication as to what he will do in this matter and, although the operators point to the fact that when bituminous producers and miners recently fixed a new wage scale he promptly increased coal prices to absorb the raise, the fact is recalled that bituminous prices had been cut sharply but a short time before by the Government's fixing all rates, while the controlled price of anthracite is substantially at the same level as before the passage of the Lever act. Anthracite miners are now working under a contract made last April, which supplemented a four-year agreement signed in May, 1916. W. L. C.

War Advisory Committee of Chemists

Because of the great amount of war work being done by the Bureau of Mines, Secretary of the Interior Lane has the following well known chemists to act as an advisory board to the bureau: Dr. Wm. H. Nichols, General Chemical Co., New York, chairman; Prof. H. P. Talbot, head of the chemical department of Massachusetts Institute of Technology, Boston; William Hoskins, consulting chemist, Chicago, Prof. H. P. Venable, head of the chemistry department, North Carolina University, Chapel Hill, N. C.; E. C. Franklin, professor of chemistry, Leland Stanford University, Stanford, Cal., and Dr. Charles L. Parsons, chief chemist of the Bureau of Mines. The board will discuss and advise upon gas warfare research, the minerals especially needed for munitions, and the recently enacted law for the regulation of explosives.

Crucible Steel Co. of America

At the organization meeting of the board of directors of the Crucible Steel Co. of America held at Pittsburgh, Nov. 19, the following officers were re-elected for the ensuing year: Herbert DuPuy, chairman of the board; O. H. Wharton, president; H. A. Brown, J. W. Dougherty, Geo. W. Sargent, John A. Sutton and Geo. A. Turville, vice-presidents; Geo. A. Turville, secretary and treasurer; H. F. Kress, J. M. McComb and A. A. H. Niebaum, assistant treasurers; H. F. Kress and E. W. Reed, assistant secretaries; N. W. Nolen, comptroller; G. A. M. King, auditor; H. L. Gellinger, assistant auditor.

The Elyria Machine Co., engineers and machinists, Elyria, Ohio, is erecting a new steel building, 200 x 300 ft. and will make a new addition to its plant. The company has purchased recently about 70 lathes and miscellaneous shell equipment at a cost of about $200,000, suitable for 155 M-M shells. This machinery was bought from leading machinery houses in Cleveland.

Bureau of Iron and Steel Scrap in Operation

The American Board of Scrap Iron Dealers has begun the operation of its Bureau of Iron and Steel Scrap in the office of the secretary, C. A. Barnes, Widener Building, Philadelphia. The bureau has the cooperation of the American Iron and Steel Institute, the American Railway Association and the National and Eastern Bar Iron institutes. A letter has been sent to all steel mills by the American Iron and Steel Institute asking for their co-operation in carrying out the purposes of the bureau, which are to effect quick disposition of all rejected cars and to prevent congestion of cars and otherwise facilitate the rapid movement of scrap. The following letter has been sent by the bureau to purchasing departments:

This bureau is a neutral agency and has been established for the purpose of co-operating with the shipper, carrier and consumer of iron and steel scrap, in the interest of the Government.

The necessity for this Bureau was brought about by the serious transportation conditions, as pointed out by the American Railway Association, who would have found it necessary to issue most drastic orders had not the buyers and sellers themselves offered a remedy.

PURPOSE—Its main purpose to assist in reducing the number of cars under load with iron and steel scrap:

FIRST—To effect quick disposition of all rejected cars.

SECOND—By reducing the number of rejections.

THIRD—To prevent congestion or assist in the disposition of cars in a congested district.

The bureau will not enter into any questions regarding price or contracts, or otherwise interfere in the relations between buyer and seller.

OPERATION—For the purpose of facilitating the operation of the bureau, will you please have blanks printed conforming to the enclosed sample rejection sheet, which should be used in quadruplicate. The day upon which a car of scrap is rejected please mail one notice to this bureau (1); one to the shipper (2); one to the railroad agent making delivery (3); keeping one for your own file (4).

The establishment of this bureau does not relieve the shipper or the consignee from making every possible effort to quickly dispose of the car by agreement, but should they fail to do this within 48 hours, the bureau will take such action as is necessary in the circumstances.

The cost of the operation of this bureau is at present being advanced by the American Board of Scrap Iron Dealers and a punitive charge of $25.00 will be made against the shipper of every rejected car, which has to be disposed of through this bureau. In cases where dispute arises as to specification, the bureau will send an experienced inspector, who will be an employee of this bureau upon whose report the chief of the bureau will make his determination.

We, therefore, ask the heartiest co-operation of all the parties interested and ask you to treat with this bureau as an absolutely neutral agency. While the office of the Chief of the Bureau will be located in Philadelphia, we hope shortly to announce subsidiary offices or representatives in the various important consuming centers of the United States.

If there are at the present time any rejected cars at your plant, please send this bureau full information at once.

Very truly yours,

THE BUREAU OF IRON AND STEEL SCRAP.

P.S.: If you prefer, the bureau will have rejection slips printed and forwarded to you at cost and would ask you to indicate the probable number you will require.

First Call for Women

What is reported to be the first call for women for mechanical war work made by the Government was issued at the Portsmouth Navy Yard, Nov. 17. Women will be used in the assembly room of the electrical shop and more than 200 applications were filed for the 100 positions open. The women will work on an 8-hour basis at a flat rate of $1.68 a day minimum and $2.72 a day maximum, with double time for overtime.

The strike of the molders in the various foundries at Bradford, Pa., was adjusted last week, the men having been given an advance of 25 cents per day up to Jan. 1, and after that date, 50 cents per day. The men were receiving $4.50 per day for 9-hours, and demanded $5 per day. A compromise was reached by which the men will receive $4.75 per day until Jan. 1, and $5 per day thereafter. The men have returned to work.

Iron and Steel Markets

MILL HANDICAPS INCREASE

New Business Chiefly for Government

Further Activity in Pig Iron—Lake Ore Movement May Reach 62,000,000 Tons

The steel industry is making harder work than ever of its effort to meet war conditions, with an increasing handicap from fuel scarcity and transportation failures, and the limitation of output due to the conflicting purposes of those in authority from whom steelmakers now take their orders. Bankings of blast furnaces from coke shortages keep up, and at Youngstown steel output at some plants has been cut nearly 50 per cent.

It is two months since price fixing began, and the market results are scarcely appreciable apart from some progress in the pig-iron trade, which has shown itself more amenable to control than the finished-material lines.

Dislocations in rolling-mill operation are more marked. While these have been commonly laid to irregular gas coal and coke supply, there is increasing evidence of the shifting of consumption, and in some lines its reduction, and the embargoes on exports have left some mills with occasional gaps which selling forces are trying to fill.

A feature of the week has been the wide and prompt acceptance by the warehouses of prices which represent drops of $10 to $20 per ton in many products, and as much as $50 per ton in sheets and $70 in plates. Being on a Pittsburgh basis, the new jobbing schedules carry considerable freight additions for a very large part of the tonnage involved.

While a good amount of finished steel for use on Government contracts is sold currently, little business is coming out for rolled material for other purposes. Plate inquiries include one for 20,000 tons of 3/16-in. plates cut in 30-in. squares, for the Government. Plate prices quoted by certain mills able to make early shipment continue higher than the Government basis, but are approaching it, one Central Western mill now quoting 5c. as against 6c. recently.

On the Government's orders for 1,500,000 tons of shell steel now being allotted, shipments are to be completed by June 15. Half the amount will be for 6-in. shells alone. There are yet to come large requisitions for Great Britain and France.

Labor supply has improved in spots, but the problem will be made more serious by the second draft. It is plain that dilution of skilled labor must begin soon, particularly under the urgent call of the Government for thousands of mechanics for service in France. At Pittsburgh as high as $3.85 is offered for common labor on a 10-hour day.

The flow of structural steel orders related to the war program is swelling so fast that a meeting of fabricators is to be held in Pittsburgh on Tuesday. A very large part of the 111,000 tons of bridge and building work put under contract in October, representing 61.5 per cent of capacity, was directly and indirectly for the Government. A later item is the placing with a Canadian fabricator, because it has a good working staff, of 50,000 tons of ship work as part of a total of 45,000 tons monthly for ten months to be delivered at Philadelphia.

New price fixing includes a 3c. basis for light rails 25 lb. and heavier. The new basis of 3.50c. for bar iron is a mill price and not f.o.b. Pittsburgh as with steel bars. Its maintenance alongside 2.90c. for steel is problematical.

Sheets have sold more freely to the general trade than any other finished product since official prices came in. The mills are well filled for this year and some good sales have been made for the first quarter. The Government is placing orders for 20,000 tons, largely blue annealed.

Philadelphia has led again in pig-iron buying, a total of 25,000 tons of basic iron being taken by several steel companies. The Steel Corporation has bought 8000 tons of basic iron in that market in the past fortnight. At Cleveland a 5000-ton sale of basic is reported and the buyer seeks 10,000 tons additional for the second quarter of next year. At Pittsburgh steel companies whose blast furnace output is curtailed by lack of coke are trying to buy iron but with little success.

There was fear in October that enough Lake Superior ore would not be brought down to carry the industry through to the arrival of new ore in the season of 1918. But the November movement has been greater than usual and it is now believed the season's total will come close to 62,000,000 tons, as against 64,734,000 tons moved by water last year.

In the scrap market competition has given lower prices than those of the Government for various materials, but there is a scarcity of No. 1 railroad wrought. By various evasions, as by charging a high price for forms of scrap not under control, the Government maximum on railroad wrought has been exceeded. This is likely to bring about the fixing of prices on all scrap. A more stringent requirement of permits for shipping scrap is in preparation by the railroads.

Pig tin made a new high record at 77c. this week, due to the limiting of British permits to actual consumers and the scramble of the small trade for the little available stock.

Pittsburgh

PITTSBURGH, Nov. 20—(*By Wire*).

The fuel situation in the Youngstown, Ohio, district this week is not any better than it was last week, and if any change has taken place it is worse. On Tuesday afternoon the Youngstown Sheet & Tube Co. had two Hubbard and one Youngstown blast furnaces idle, also its two new steel bar mills, other smaller finishing departments, and 102 out of 204 of its by-product coke ovens. The Republic Iron & Steel Co. has been able so far to keep its five Hazelton blast furnaces going, with no stock coke ahead, its Hannah furnace being out for relining and repairs. Its Bessemer steel plant has been off nearly

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Nov. 21, 1917.	Nov. 14, 1917.	Oct. 24, 1917.	Nov. 22, 1916.
No. 2 X, Philadelphia...	$34.25	$34.25	$34.25	$25.50
No. 2, Valley furnace...	33.00	33.00	33.00	26.00
No. 2 Southern, Cin'ti...	35.90	35.90	35.90	23.90
No. 2, Birminhgam, Ala.	33.00	33.00	33.00	21.00
No. 2, furnace, Chicago**	33.00	33.00	33.00	27.00
Basic, del'd, eastern Pa.	33.75	33.75	33.75	26.00
Basic, Valley furnace....	33.00	33.00	33.00	25.50
Bessemer, Pittsburgh ...	37.25	37.25	37.25	30.95
Malleable Bess., Ch'go**.	33.50	33.50	33.00	27.00
Gray forge, Pittsburgh..	32.75	32.75	32.75	26.95
L. S. charcoal, Chicago..	37.50	37.50	35.50	26.75

Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	...	...	...	$38.00
O.-h. rails, heavy, at mill	...	...	...	40.00
Bess. billets, Pittsburgh.	$47.50	$47.50	$47.50	52.50
O.-h. billets, Pittsburgh.	47.50	47.50	47.50	52.50
O.-h. sheet bars, P'gh...	*51.00	51.00	51.00	52.50
Forging billets, base, P'gh	60.00	60.00	....	78.00
O.-h. billets, Phila.....	....	....	....	55.00
Wire rods, Pittsburgh...	57.00	57.00	57.00	65.00

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	*3.685	3.685	4.25	2.659
Iron bars, Pittsburgh....	*3.50	3.50	...	2.90
Iron bars, Chicago.....	*3.50*	4.50	4.50	2.65
Steel bars, Pittsburgh...	2.90	2.90	2.90	2.90
Steel bars, New York...	3.095	3.095	3.095	3.069
Tank plates, Pittsburgh.	†*3.25	3.25	3.25	4.25
Tank plates, New York..	...	...	...	4.419
Beams, etc., Pittsburgh..	3.00	3.00	3.00	3.00
Beams, etc., New York..	3.195	3.195	3.195	3.019
Skelp, grooved steel, P'gh.	*2.90	2.90	2.90	2.85
Skelp, sheared steel, P'gh.	*3.25	3.25	3.25	3.00
Steel hoops, Pittsburgh..	3.50	3.50	...	3.25

*Agreed prices. †As yet only a few sales made

**The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Nov. 21, 1917. Cents.	Nov. 14, 1917. Cents.	Oct. 24, 1917. Cents.	Nov. 22, 1916. Cents.
Sheets, black, No. 28, P'gh	5.00	5.00	...	3.65
Sheets, galv., No. 28, P'gh	6.25	6.25	...	5.25
Wire nails, Pittsburgh..	3.50	3.50	...	2.85
Cut nails, Pittsburgh....	....	....	...	2.80
Fence wire, base, P'gh..	*3.25	3.25	...	2.80
Barb wire, galv., P'gh...	*4.35	4.35	...	3.70

Old Materials, Per Gross Ton:				
Iron rails, Chicago.....	$35.00	$35.00	$36.00	$25.00
Iron rails, Philadelphia..	38.00	38.00	38.00	24.00
Carwheels, Chicago	**30.00**	27.75	26.00	18.00
Carwheels, Philadelphia..	**33.00**	30.00	29.00	19.00
Heavy steel scrap, P'gh.	29.00	29.00	27.00	21.00
Heavy steel scrap, Phila.	26.00	26.00	25.00	21.00
Heavy steel scrap, Ch'go	28.00	28.00	26.00	21.00
No. 1 cast, Pittsburgh....	26.00	26.00	27.00	17.00
No. 1 cast, Philadelphia.	**31.00**	30.00	28.00	19.00
No. 1 cast, Ch'go (net ton)	**23.00**	22.50	20.00	16.00
No. 1 RR. wrot, Phila....	35.00	35.00	35.00	24.50
No. 1 RR. wrot, Ch'go (net)	31.00	31.00	28.50	22.00

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	$6.00	$6.00	$6.00	$6.50
Furnace coke, future....	6.00	6.00	6.00	3.75
Foundry coke, prompt...	7.00	7.00	6.00	7.00
Foundry coke, future....	7.00	7.00	6.00	5.00

Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.	23.50	23.50	23.50	34.00
Electrolytic copper, N. Y.	23.50	23.50	23.50	34.00
Spelter, St. Louis.....	7.75	7.75	8.00	12.25
Spelter, New York.....	8.00	8.00	8.25	12.50
Lead, St. Louis.....	6.37½	6.37½	6.12½	7.00
Lead, New York.....	6.50	6.50	6.25	7.15
Tin, New York.....	**77.00**	73.00	61.62½	45.12½
Antimony (Asiatic), N. Y.	13.75	13.75	14.75	14.00
Tin plate, 100-lb. box, P'gh.	$7.75	$7.75	....	$6.00

all the time for several weeks, and when it is not running some of the finishing mills are shut down waiting for steel. The Brier Hill Steel Co. has had to bank several times its Grace and Tod blast furnaces for lack of coke, and as a result of all this the output of steel in the Youngstown district is very much restricted, and just at a time when it is so badly needed. All these steel companies say they have plenty of coal and coke bought, but the railroads are unable to handle it as fast as needed. The growth of the by-product coke industry has resulted in the opening of new fields for the supply of by-product coal, and the railroads do not seem to have fully grasped the situation and are failing in the delivery of this coal to the ovens. Two blast furnaces at the Ohio works of the Carnegie Steel Co. are banked for lack of coke, and Niles furnace was put out of blast largely for the same reason. The Bessemer and open-hearth steel plants at the Ohio works are compelled to run lighter than usual owing to shortage in supply of pig iron. In the Pittsburgh district the situation is not so bad, but all the steel works and smaller manufacturing plants are feeling seriously the shortage in supply of fuel and the inadequate movement of cars by the railroads. So far the only plant that had to absolutely shut down was that of the Carbon Steel Co., which was off three or four days recently, but is again running. Some relief may come when lake navigation closes and cars now in the ore trade are diverted to the hauling of coal and coke. However, this probable advantage may be offset if winter weather should set in and heavy snows come, which always seriously affect railroad traffic. The outlook for any betterment in supply of fuel and traffic movement by the railroads is decidedly discouraging, and conditions are likely to be very bad all through the winter months. Conditions in the iron and steel trades show no important development. Late Tuesday afternoon the general committee on steel and steel products of the American Iron and Steel Institue announced he price of 3c. per pound, base, on light rails, 25-lb. to 45-lb. Prices were also announced on chain and strip steel. The amount of pig iron and finished steel that has been sold since the Government prices first came out on Sept. 24 has been relatively small. The supply of pig iron is short; steel mills are sold up on billets and bars and have nothing to offer. On nearly all lines of finished steel mills are sold up for anywhere from two to three months to a year or more, and consumers are having a hard time finding any mills that will sell material for delivery this year at the Government prices. The supply of labor is reported a little better, but when the second draft comes labor conditions will no doubt be adversely affected. As high as $3.80 per day of 10 hr. is being offered in advertisements in the daily press for common labor, of which there is a very great shortage.

Pig Iron.—The famine in the supply of Bessemer and basic pig iron noted in our report last week has become intensified and local steel companies are scouring the pig iron making centers trying to find iron and not getting it. The National Tube Co., American Steel & Wire Co., Jones & Laughlin Steel Co. and other large producers of pig iron are running very short, and are offering to pay the freight to Pittsburgh on any Bessemer or basic iron that can be had in other localities. One sale of 1500 tons of Bessemer iron has been made to the National Tube Co.; and other subsidiaries of the Steel Corporation are trying everywhere to find iron. The Commonwealth Steel Co. of St. Louis is in the market for 5000 tons of basic iron for second quarter, but gets no encouragement from any of the Valley producers. It is not unlikely that several leading pig iron producers may decide to allot their output to the customers unless the situation soon improves. Many more blast furnaces are active now than a year ago, and yet the output of pig iron is much smaller, due to the shortage of fuel. There have been sales and loans of Bessemer iron up to 40,000 or 45,000 tons and we note a sale of 6000 tons of basic for first quarter at the official price of $33 at furnace. We also note a

sale of 6000 tons of foundry iron for first half of next year at $33 Valley furnace. Were it not for the Government prices that control the market, it is stated here that Bessemer and basic iron would be selling at $70 to $75 per ton at furnace. It is a serious question where the iron is to come from, during the next three or four months, to keep the steel works active. If the fuel supply does not soon improve, other blast furnaces in the Valleys and probably some in the Pittsburgh district will have to bank.

We quote as follows: Basic pig iron, $33; Bessemer, $36.30; gray forge, $32; No. 2 foundry, $33; No. 3 foundry, $32.50, and malleable Bessemer, $33.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being 95c. per ton.

Billets and Sheet Bars.—All the steel mills are running short of steel due to lighter output owing to the growing scarcity in supply of pig iron. One of the Steel Corporation interests has bought 18,000 tons of steel ingots from a nearby steel plant at the billet price of $47.50. There would be no trouble to sell almost any quantity of billets and sheet bars at the Government prices if the steel could be found. The Carnegie Steel Co. is sold up for months ahead, and so far has not considered steel contracts for next year. The Government has fixed the price of $60 per ton on forging billets, an advance of $12.50 over the base price of soft billets. We now quote 4 by 4 in. soft Bessemer and open-hearth billets at $47.50, sheet bars $51, and forging billets $60 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Ferroalloys.—So far there is not much desire shown on the part of consumers of ferrosilicon and silvery iron to contract for next year at the recently announced Government prices, feeling no doubt that they will be able to get a full supply when needed and that the prices will not be any higher. The new demand for ferromanganese is not very active, consumers being covered for some time ahead. One sale was made recently of 1500 tons of 60 per cent domestic ferromanganese at $249 delivered. We quote 80 per cent domestic ferromanganese at $250, delivered, for prompt or future shipments. We quote 1 per cent spiegeleisen at $60 to $65, and 50 per cent ferrosilicon for prompt shipment at $150 to $160 per ton, delivered. On contracts, prices range from $140 and higher. Most large consumers of 50 per cent ferrosilicon have covered with the leading maker for their supply over all of 1918.

We now quote 9 per cent Bessemer ferrosilicon at $54, 10 per cent $55, 11 per cent $58.30, 12 per cent $61.60, 13 per cent $64.90, 14 per cent $68.20, 15 per cent $71.50, and 16 per cent $75. We quote 6 per cent silvery iron $40, 7 per cent $42, 8 per cent $44.50, 9 per cent $47, 10 per cent $50, 11 per cent $53, and 12 per cent $56. These new prices on Bessemer ferrosilicon show reductions over former prices, ranging from $35 to over $60 per ton. On silvery iron the new prices show reductions over former prices of $35 to $40 per ton. All the above prices are f.o.b. makers furnace, Jackson or New Straitsville, Ohio, these furnaces having a uniform freight rate of $2 per gross ton, for delivery in the Pittsburgh district.

Steel Rails.—Late Tuesday afternoon the General Committee on Steel and Steel Products of the American Iron and Steel Institute announced the price of 3c. per lb. on light rails 25 lb. and heavier, f.o.b. Pittsburgh. No change was made on prices for standard sections, and these were not even considered. The Carnegie Steel Co. has not been a seller of light rails for several months, having the entire output of its Edgar Thomson rail mills under contract practically up to the end of next year. The Cambria Steel Co. has been a seller of light rails to some extent. No prices were fixed by the Government on rerolled rails. We quote standard section rails of Bessemer stock at $38, and open-hearth $40, per gross ton, Pittsburgh. We quote new light rails, 25 lb. and heavier sections at 3c. per lb. f.o.b. mill, Pittsburgh. Extras for the lighter sections are given elsewhere in this issue.

Structural Material.—Local fabricators are not bidding actively on new work coming up, being filled for six months or more. The American Bridge Co. has taken 1200 tons of bridge work for the Baltimore & Ohio Railroad. Much of the new work coming up is for the Government, on which details are withheld. We quote beams and channels up to 15 in. at 3c. at mill, but none of the mills has any structural material to offer at this price for this year's delivery.

Plates.—None of the leading plate mills has any plates to offer for this year at the Government price of 3.25c., but occasionally some of the smaller mills sell a limited quantity at that price, owing to some unusual conditions that come up. Three or four plate mills in this district had orders for plates for shipment to Japan, and when the embargo was declared a good part of these were released, and have since been sold to domestic consumers. Last week the Emergency Fleet Corporation placed some very heavy orders for plates and shapes for Government boats with Pittsburgh and Youngstown mills, and that will take a good part of their output for some time. Fully 75 per cent or more of the entire plate output of the Carnegie Steel Co. is going into Government work, and the Jones & Laughlin Steel Co. is also furnishing a very large output of its plates to the Government. The steel car companies report that deliveries of plates by the mills are very little better. We quote ¼ in. and heavier sheared plates at 3.25c. at Pittsburgh.

Sheets.—The new inquiry for sheets is heavy, but the quantity of sheets available from the mills for delivery this year is very limited. All the sheet mills are working on Government orders placed some time ago, which are being rolled and shipped as fast as possible. The Government has been a heavy buyer of sheets for shipment to England and France, and will no doubt be a still larger purchaser for some time to come. The shortage in supply of steel is restricting output of sheets to some extent. Nearly all the mills are booking contracts for sheets to manufacturing consumers for delivery over first half of next year, with the exception of galvanized, on which delivery is restricted to first quarter. Demand for sheets from automobile builders has fallen off very much, owing to decrease in output of pleasure cars.

Tin Plate.—The tin plate distribution committee has recently allotted to the mills nearly 600,000 base boxes of tin plate, most of it for shipment abroad. This business was placed mostly with the mills, whose order books were in such condition that they will be able to make fairly prompt shipment. The tin plate mills are being deluged with inquiries from customers for their supply of tin plate for first half of next year, and a very heavy business has already been booked for that delivery. Owing to shortage in supply of steel for making tin plate, due to the fact that Government requirements are taking so much of the output of the steel mills, it is probable that many consumers will find their allotment cut down materially for first half of next year, and some mill operators say it may be necessary to entirely cut off supply to former customers, as they will not have the tin plate to spare. The outlook is there will be enough tin plate made next year to supply the packers of perishable foods, but packers of non-perishable foods will have to look to other material for containers, and in addition the output of terne plate next year is certain to be lighter than for a long time. The whole energy of the tin plate makers next year will be directed to getting out a maximum output of tin plate. We quote coke plate at $7.75 per base box, f.o.b. Pittsburgh, for Bessemer or open-hearth stock. Prices on terne plate are given in detail on page 1267.

Wire Rods.—The export and domestic demand for wire rods is heavier than the mills are able to supply. Many consumers of rods, knowing sometime ago that lower prices were coming, refrained from buying and allowed their stocks to get very low. As soon as the Government prices were announced, these consumers sent in their orders, but now find the mills are not able to handle them, and they are not getting rods as fast as they are needed. An inquiry from Canada is in the market for 1500 tons of soft rods for early shipment.

Wire Products.—Some fairly heavy contracts for wire and wire nails are being placed with the mills by manufacturing consumers for delivery over first quarter of 1918. Some mills are not inclined to speed up their output of wire and wire nails, as they state they can put the steel into other products on which the prices allow a much larger profit. Small concerns that have to pay $57 for rods, and put these into nails at $50 per ton, say they cannot do so and realize a profit. The

export demand for wire and wire nails is heavy and much higher prices are obtained than from the domestic trade. Prices on wire and wire nails now quoted by all the mills are given in detail on page 1257.

Iron and Steel Bars.—The price of 3.50c. announced last week on iron bars by the General Committee on Steel and Steel Products of the American Iron and Steel Institute does not affect the Pittsburgh district to any great extent. There are only two iron bar mills in this district, and they are sold up for some months ahead on iron bars at prices much higher than 3.50c. On steel bars, consumers claim they are unable to find mills that are able to sell at the Government price at 2.90c., being sold up for some months. The Government has been a heavy buyer of iron and steel bars for some months, and deliveries to domestic consumers on contracts are only fairly satisfactory. We now quote steel bars at 2.90c. and refined iron bars at 3.50c. in carloads f.o.b. mill Pittsburgh.

Nuts and Bolts.—The new discounts on nuts and bolts announced last week by the General Committee on Steel and Steel Products are regarded as eminently fair to makers and consumers alike, and are now being quoted on any new business that the makers are able to take. However, local makers of nuts and bolts are sold up for two or three months ahead, and have very little material to spare for delivery this year. The new discounts now in effect on nuts and bolts are given on page 1267.

Rivets.—Last week the General Committee on Steel and Steel Products announced the price of $4.65 base, per 100 lb. on large rivets, and this is taken to mean both structural and boiler rivets. This price is $12 per ton under former prices on structural rivets and $14 per ton on boiler rivets. The new demand for rivets for general consumers has been very dull for some time, nearly all the new business being placed is either direct or indirect Government work. We now quote structural and conehead boiler rivets at $4.65 per 100 lb.; base in carloads and larger lots f.o.b. Pittsburgh.

Hoops and Bands.—The Government price of 2.90c. on bands, extras as per the steel bar card, and the price of 3.50c. on hoops are now in effect, but none of the mills rolling steel bands has any material to spare for this year delivery, being filled up for some months on contracts at considerably higher prices. We now quote steel bands at 2.90c., extras as per the steel bar card, and steel hoops at 3.50c. f.o.b. mill Pittsburgh.

Shafting.—The new demand for shafting from automobile builders and screw stock machine trade has fallen off very much, due to the decline in the building of pleasure cars. On the smaller sizes up to 2 in., some makers of shafting are active seeking new orders, but on the larger sizes up to 5 in. are sold up for four to six months. The Government continues to be a very large buyer of shafting. We quote cold rolled shafting at 17 per cent off list f.o.b. Pittsburgh.

Cold Rolled Strip Steel.—Late Tuesday afternoon manufacturers of cold rolled strip steel were advised that the General Committee on Steel and Steel Products of the American Iron and Steel Institute had fixed a base price of $6.50 per 100 lb. on cold rolled strip steel and $4.50 on hot rolled. These are the prices submitted by the manufacturers last week that in their opinion would be fair to them and to consumers. About a month ago new extras on strip steel were adopted by the manufacturers and are now standard and in use. We quote cold rolled strip steel at $6.50 and hot rolled at $4.50 per 100 lb. f.o.b. Pittsburgh, terms 30 days, less 2 per cent off for cash in 10 days, when sold in quantities of 300 lb. or more.

Railroad Spikes and Track Bolts.—Last week the Government fixed a price of $5.25 per 100 lb. on base sizes of boat spikes, f.o.b. Pittsburgh, but did not name a price on railroad or small spikes, so that manufacturers are greatly puzzled as to what to quote on these. The new demand for spikes has been very quiet for some time, except for boat spikes, for which the Government direct and indirect demand is very heavy. We quote standard sizes of railroad spikes at 4.50c; small spikes, 5c., and boat spikes, 5.25c., all f.o.b. Pittsburgh.

Wrought Pipe.—Not much new business is being placed with the mills in iron or steel pipe at the discounts recently adopted, to be in effect for the remainder of this year. None of the pipe mills has any pipe to spare for delivery this year, and some of the larger mills are sold up for nearly a year. The Government is a steady buyer of pipe, but has not placed any large orders recently. Discounts now in effect on black and galvanized iron and steel pipe being quoted by all the mills are given on page 1257.

Boiler Tubes.—The discounts named last week on iron and steel tubes by the General Committee on Steel and Steel Products show a very heavy reduction in prices below those being obtained by any of the mills that were able to make fairly prompt shipment. None of the mills making iron or steel tubes can sell for delivery this year, as all are filled up for some months. Discounts now in effect on iron and steel tubes are given on page 1257.

Old Material.—The local scrap market continues excessively quiet, consumers evidently being covered for some time ahead and not in the market as buyers. Offers of scrap by dealers to consumers at prices $1 to $2 per ton lower than the recently fixed Government maximum prices fail to produce business. The restrictions placed by the railroads on shipments of scrap are so severe as to almost prohibit delivery. Dealers believe that the new demand for scrap will soon show betterment. As stocks have been pulled on for so long they figure that some consumers will soon have to come in the market. No transactions of moment in scrap of any kind are reported in the past week.

Dealers are now quoting for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$29.00 to $30.00
No. 1 foundry cast	25.00 to 26.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	30.00 to 31.00
Hydraulic compressed sheet scrap	21.00 to 22.00
Bundled sheet scrap, sides and ends, f.o.b. consumer's mill, Pittsburgh district	20.00 to 21.00
Bundled sheet stamping scrap	18.00 to 19.00
No. 1 railroad malleable stock	22.00 to 23.00
Railroad grate bars	15.00 to 16.00
Low phosphorus melting stock	37.00 to 38.00
Iron car axles	40.00 to 41.00
Steel car axles	40.00 to 41.00
Locomotive axles, steel	47.00 to 48.00
No. 1 busheling scrap	21.00 to 22.00
Machine-shop turnings	18.00 to 20.00
Cast-iron wheels	28.00 to 30.00
Rolled steel wheels	32.00 to 33.00
*Sheet bar crop ends	32.00 to 33.00
Cast-iron borings	18.00 to 20.00
No. 1 railroad wrought scrap	33.00 to 35.00
Heavy steel axle turnings	21.00 to 22.00
Heavy breakable cast scrap	21.00 to 22.00

*Shipping point.

Coke.—Since the $7 on 72 hr. foundry coke was announced by the Government it is surprising how many small coke producers there are that are making nothing but foundry coke. When asked whether they have any furnace coke to sell for prompt shipment their invariable reply is they are making only foundry coke and can share a limited amount for prompt shipment at $7 per net ton at oven. Another practice common among some coke producers is that they have dated contracts back for some months, which they claim were taken at higher than the Government prices. The course pursued by some of the smaller coke producers since the Government fixed prices is very severely condemned. On the other hand, some of the larger coke operators are filling promptly their obligations on furnace coke at $6 and foundry at $7 and say they will continue to do so. The shortage of labor in the coke regions is cutting down output very much, practically none of the coke works being able to make more than a five-day output. The supply of cars last week was bad, some days being as low as 20 per cent of normal. We quote furnace coke at $6; foundry coke, $7, and crushed coke over 1 in. size, $7.30, all in net tons of 2000 lb., all oven. The *Connellsville Courier* gives the output of coke in the upper and lower Con-

nellsville regions for the week ending Nov. 10 as 315,808 tons, a decrease from the previous week of 13,615 tons.

Chicago

CHICAGO, Nov. 19.

The market continues its progress toward a status that makes for greater peace of mind for both buyers and sellers. Inquiries for miscellaneous steel products are reaching the mills in increased volume and specifications are more active, although it is more true than ever that the Government, directly or indirectly, is taking the bulk of production, and that plates, shapes and bars are difficult to procure, bars being easier than shapes and plates, although an Eastern mill is offering some of the latter. The leading local independent undoubtedly will take 4000 tons of plates and shapes which the Emergency Fleet Corporation wants delivered in the Chicago district at the rate of 1500 tons a month, beginning Dec. 1. It is expected that 20,000 tons of sheets, probably blue annealed, will be distributed this week. Deliveries of standard section rails to railroads are very much behind with some makers, and there is but little hope of a betterment in this direction. The jobbers in iron and steel have revised their quotations to conform with agreed prices, the reductions being substantial, plates, for example, dropping from 7c. to 4.45c., structural material from 5c. to 4.20c. and bars from 4.50c. to 4.10c. The new mill price of 3.50c for common iron bars is regarded as satisfactory, but recognized as a price that will not live when steel bars can be obtained at 2.90c. The makers of rail carbon bars are more or less at sea and would like to see the price of their product adjusted. The demand for small and medium sized lots of prompt pig iron is lively, indicating that contract deliveries are not up to par. Requirements which eventually must result in good buying are being measured by the sellers of iron, but consumers show a tendency to wait, evidently in the hope that there will be further revision of prices and again downward. A shortage in scrap appears to be developing, country mixed being especially scarce. Cast scrap shows a higher trend. The leading local independent has been taking heavy melting and shoveling steel at $29 and $28 respectively. If a shortage comes it is believed the East will suffer more than the West, inasmuch as much of the material that ordinarily goes East will be retained here.

Ferroalloys.—Quotations are unchanged with 80 per cent ferromanganese at $250 for delivery this year or in the early part of next. Standard 50 per cent ferrosilicon is offered by one interest at $163 for November and December, and at $150 for next year, and another maker quotes $155 to $165 for 1918 delivery of carload lots. Prompt lots of Bessemer ferrosilicon is in fair demand, but not easily obtainable. Blast furnace 10 per cent is quoted at $22 over base, or $55, although $85 is asked for 10 to 12 per cent electrolytic ferrosilicon, running low in sulphur and phosphorus.

Pig Iron.—Demand for small lots of various grades of prompt iron aggregates several thousand tons, and the character of the inquiry indicates that shipments against contracts are not being made as fully as scheduled. The gray iron inquiry calls largely for high silicon and high manganese. Considerable inquiry is coming out also for the silveries, which are hard to get, but obtainable in small quantities. Dealers are finding it easier to do business because of the increased number of odd lots turning up here and there. Recent basic requirements emanating from St. Louis are understood to have been filled. Belief on the part of some consumers that prices may be revised at the end of the year is causing them to hold back the placement of considerable quantities for which definite inquiry has not yet been formulated. Some have expressed disappointment over the fact that they cannot get Southern iron at a price approximating that for Northern, and it is unlikely that they will be able to do so until something like competition between the Northern and Southern products is restored. At present there are enough willing to pay $37 for Southern iron, or $33, Birmingham, plus $4 freight, to make it unnecessary for the producers to drop below the Government maximum of $33, furnace, but this will be changed when they find it necessary to seek buyers. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 2 to 5	$37.50
Lake Superior charcoal, No. 6 and Scotch	40.00
Northern coke foundry, No. 1	33.50
Northern coke foundry, No. 2	33.00
Northern coke foundry, No. 3	32.50
Northern high-phosphorus foundry	33.00
Southern coke No. 1 foundry and 1 soft	38.50
Southern coke No. 2 foundry	37.00
Malleable Bessemer	33.50
Basic	33.00
Low-phosphorus (copper free)	53.00
Silvery, 7 per cent	44.54

Plates.—Most of the mills continue to assert they have no plates to offer, but sales have been made by an Eastern producer on the basis of 3.25c., plus extras. The leading independent producer is expected to take 4000 tons of plates and shapes for delivery in the Chicago district at the rate of 1500 tons a month, beginning Dec. 1. The jobbers have fallen in line with the agreed prices for material out of warehouse which were announced last week, and quote the Government mill price of 3.25c., plus $1 per 100 lb. and the freight rate from Pittsburgh, which they figure at $4 per ton. (Actual freight at 21.5c. per 100 lb. is $4.30 per ton.)

For material out of warehouse, the quotation is 4.45c. as against 7c. a week ago.

Structural Material.—As noted, shapes as well as plates are included in an order for 4000 tons to be placed by the Emergency Fleet Corporation for delivery in the Chicago district. Local makers are not offering any shapes, and if obtained at all for non-governmental uses, they probably would come from one or two Eastern mills, and it is a question how eager they are to sell at 3c. The large building for Butler Bros., Chicago, which will require about 9000 tons, remains pending. The largest letting for many months consists of 3500 tons just placed for a power house for the Kansas City Light & Power Co., Kansas City, Mo., which went to the American Bridge Co. The Union Foundry Works will supply 130 tons for a building to be erected for the Stewart Mfg. Co., Chicago, and an unknown bidder 144 tons for a gantry crane for the Northern Central Railroad Co. at Baltimore, Md.

For material out of warehouse the quotation is 4.20c.

Bars.—While steel bars are not as tight as plates or shapes, not much is coming to light in the way of actual transactions at 2.90c., the agreed price. It is expected that a price for rail carbon bars will be fixed in the course of a few days, some of the trade believing it will settle around 3.50c., Chicago, the price fixed for common iron bars. Recent sales made by an Eastern mill at 2.90c., Pittsburgh, were equivalent to 3.40c., Chicago, and 3.50c. was quoted by Western makers in competition. Business in rail carbon steel has been exceedingly slow, consumers preferring to await a definite decision as to price. The new price for common iron bars—3.50c.—governed by the usual extras and established custom as regards delivery points, is regarded as satisfactory, but the makers recognize that this price will not hold when mild steel bars at 2.90c. become easily obtainable. Common bar iron usually sells below the level of mild steel bars, a contingency of which there seems to be no immediate prospect. The jobbers have revised their prices.

We quote warehouse prices for Chicago delivery as follows: Soft steel bars, 4.10c.; bar iron, 4.10c.; reinforcing bars, 4.10c.; base, with 5c. extra for twisting sizes ½ in. and over and usual card extras for smaller sizes; shafting, list plus 10 per cent.

Sheets.—It is expected that the Government, early this week, will distribute 20,000 tons of sheets, probably blue annealed. Orders at fixed prices are being booked by the mills to an extent double the rate of production, with very little of it directly from the Government, and the indications are that the mills will

soon be filled. Some of them are taking contracts for sheets, others are not, demanding that specifications for the first quarter be filed with the order. We quote Government mill prices as follows: No. 28 black sheets, 5c.; No. 10 blue annealed, 4.25c., and No. 28 galvanized, 6.25c., all Pittsburgh base. To these prices jobbers add $1 per 100 lb. for blue annealed, No. 16 and heavier; and $1.25 for one pass cold rolled sheets, No. 18 and lighter, and for galvanized, also freight from Pittsburgh.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 5.45c.; No. 28 black, 6.45c.; and No. 28 galvanized, 7.70c.

Wire Products.—The recent fixing of prices by agreement released a lot of business, and the market has been more active. We quote as follows per 100 lb. to jobbers:

Nails, $3.50, Pittsburgh; plain fence wire, $3.25; painted barb wire, $3.65; galvanized barb wire, $4.35; polished staples, $3.65, and galvanized staples, $4.35.

Rails and Track Supplies.—Deliveries of standard section rails are dragging, and it is difficult to see how they can be bettered, considering the pressure on the mills from the Government. We quote:

Standard railroad spikes, 4.50c. to 5c., base; small spikes, 4.75c. to 5.50c., base; track bolts with square nuts, 5.50c. to 6c., all in carloads, Chicago; tie plates, $70 to $90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38; base (nominal); open hearth, $40 (nominal).

Bolts and Nuts.—Following the official fixing of prices at lower levels, business has been appearing at a rate that may swamp the makers, some of whom complain they cannot get sufficient raw material. The volume of delayed business exceeds the supply, and it is considered not a remote possibility that prices may react. For prices and freight rates see finished iron and steel, f.o.b. Pittsburgh, page 1267.

Cast-Iron Pipe.—The only reported letting in prospect is one of 167 tons at Jackson, Mich., Nov. 26. That the market should be quiet at this time is seasonable. Quotations are unchanged.

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., $58.50; 6 in. and larger, $55.50, with $1 extra for class A water pipe and gas pipe.

Old Material.—There is no overabundance of scrap and the market is strong. Country mixed is especially scarce, and cast scrap shows a higher trend. The yards are short of sufficient country mixed to keep their shears in full operation. Buying has been done in better volume, the leading independent steel mill taking a considerable tonnage of heavy melting at $29 and shoveling at $28. The L. E. & W. R. R. is offering 800 tons of rerolling rails, the Erie wants bids on a blank list, and the C., M. & St. Paul is closing to-day on a list of ordinary size. The railroad lists are few and light. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton
Old iron rails	$35.00 to $36.00
Relaying rails	50.00 to 55.00
Old carwheels	30.00 to 31.00
Old steel rails, rerolling	35.00 to 36.00
Old steel rails, less than 3 ft.	33.50 to 34.50
Heavy melting steel scrap	28.00 to 29.00
Frogs, switches and guards, cut apart	28.00 to 29.00
Shoveling steel	27.00 to 28.00
Steel axle turnings	20.00 to 21.00
	Per Net Ton
Iron angles and splice bars	$34.00 to $35.00
Iron arch bars and transoms	35.00 to 36.00
Steel angle bars	26.00 to 27.00
Iron car axles	42.00 to 43.00
Steel car axles	40.00 to 41.00
No. 1 railroad wrought	31.00 to 32.00
No. 2 railroad wrought	28.50 to 29.50
Cut forge	28.00 to 29.00
Pipes and flues	21.00 to 22.00
No. 1 busheling	23.00 to 24.00
No. 2 busheling	16.00 to 17.00
Steel knuckles and couplers	29.00 to 30.00
Coil springs	36.50 to 37.50
No. 1 boilers, cut to sheets and rings	18.50 to 19.50
Boiler punchings	31.00 to 32.00
Locomotive tires, smooth	32.00 to 33.00
Machine-shop turnings	16.00 to 17.00
Cast borings	16.00 to 17.00
No. 1 cast scrap	23.00 to 24.00
Stove plate and light cast scrap	18.00 to 19.00
Grate bars	17.00 to 18.00
Brake shoes	18.00 to 18.50
Railroad malleable	26.00 to 27.00
Agricultural malleable	23.00 to 24.00
Country mixed scrap	18.00 to 19.00

Philadelphia

PHILADELPHIA, Nov. 20.

Coal and coke shortage and railroad congestion are substantially restricting blast furnace and mill output in the eastern Pennsylvania district. A nearby mill had seven of its 12 open-hearth furnaces out of use to-day because of shortage of gas coal, and one of its blast furnaces was banked for lack of coke. A plate mill which requires 18 carloads of gas coal per day has been receiving about 75 per cent of this quantity, and as a consequence is operating at greatly reduced capacity. These are typical instances of the troubles which are besetting the iron and steel industry. Steel mills which are self-contained in coal and coke supply are not having as serious difficulties, their principal trouble being to get sufficient cars to bring coal from the mines to their coke ovens. Congestion of freight at the city of Baltimore is so great that the Baltimore & Ohio Railroad has issued a general embargo against shipments both to seaboard and to the interior. The Philadelphia yards are seriously congested also and the railroads have been putting on special embargoes for a few days at a time to relieve the situation. There has been another active week in the pig iron market, with sales of basic iron totalling more than 25,000 tons, the largest single sale reported being 5000 tons. A fair total of small tonnages of foundry iron has also been booked. As offerings of finished steel for prompt delivery have become freer, buyers holding contracts at high prices, particularly for plates and shapes, have found it possible to pick up sufficient steel to last them until the first of the year, and cancellation of the high priced contracts has resulted in a number of instances.

Pig Iron.—A continued active inquiry for basic iron, with sales totalling 25,000 tons or more, was the feature of the Philadelphia iron market during the past week. A structural mill took 5000 tons for first quarter. A bridge company bought an additional 3000, making its purchases in the past two weeks at least 8000 tons in this market, all for prompt delivery, and a Philadelphia tin plate company bought 4500 tons of off basic. Another lot of 2500 tons and one of 900 tons make a total of nearly 16,000 tons sold by one office. Another sales office had total sales of 11,500 tons of basic during the week. Still another office sold 3000 to 4000 tons of various grades of iron, mostly foundry and special iron. Total sales for the past week have undoubtedly exceeded 30,000 tons. Only a few thousand tons was for prompt delivery, the remainder for first quarter. More than 1000 tons of low phosphorus iron was sold. A cast-iron pipe foundry came into the market for 5000 tons of foundry iron. The Norfolk & Western Railroad has placed orders for 2000 tons of special analysis iron and 1800 tons of foundry iron. The Pennsylvania Railroad Co. is reported to have closed for about 13,000 tons recently inquired for. We quote the following standard grades at furnace, the freight to destination to be added:

Eastern Penna. No. 1 X	$34.50
Eastern Penna. No. 2 X	33.50
Eastern Penna. No. 2 foundry	33.00
Virginia No. 2 X	33.50
Virginia No. 2 foundry	33.00
Basic	33.00
Gray forge	32.00
Bessemer	36.30
Standard low phosphorus	53.00
Low phosphorus (copper bearing)	50.00

Coke.—Shortage of coke for prompt delivery is causing serious trouble among Eastern blast furnaces, several of which are banked. The Eastern Steel Co. and the Alan Wood Iron & Steel Co. each has a blast furnace banked. Some of the coke which furnaces are receiving is of such poor quality that it is causing frequent scaffolding, with increased output of off iron. One furnace has remedied the trouble at considerable expense by screening all of its coke before putting it into the furnace. Two large Eastern sellers of coke are now contracting ahead, one for the first half of next year and the other for the second half. Sales are being made, however, only to regular customers. A provision has been inserted in some contracts that in case of an increase in price before delivery of the coke the buyer shall pay the higher price, but if the

price is reduced the contract shall remain undisturbed; in other words, the buyer takes all the risk. We quote blast furnace coke at $6, ovens, and 72-hr. foundry coke at $7, ovens.

Ferroalloys.—There is no buying of ferromanganese for next year. Sales for prompt delivery are mostly in carload lots. The market is quoted by sellers at $250 for any delivery, but sales are being made below this figure. At least one carload was sold last week at $235. The market for spiegeleisen is also weaker, the price generally quoted ranging from $60 to $65 at furnace.

Billets.—Consumers are making urgent inquiries for open-hearth rerolling billets for first quarter requirements. As yet no sales have been made, but a leading eastern Pennsylvania producer will soon make contracts with its regular customers. A large Eastern producer is prepared to take on a fair tonnage of Bessemer rerolling billets.

Rails.—An Eastern mill will accept orders for Bessemer rails with fairly prompt deliveries.

Sheets.—Several large contracts for blue annealed sheets for first quarter delivery have been placed during the past week. One lot was 1500 tons and another 1000 tons. Orders aggregate several thousand tons. Mills will accept less than carload orders at 50c. per 100 lb. above the Government base prices, and it appears as if warehouses might not find it easy to charge a differential of $1 or $1.25 per 100 lb., as permitted under the scale of agreed prices adopted last week. We quote No. 10 blue annealed at 4.25c., No. 28 black at 5c. and No. 28 galvanized at 6.25c., base, Pittsburgh.

Structural Material.—Several small tonnages for civilian work have been sold in the past week at the Government price, with fairly prompt deliveries. Several thousand tons will be required for additional shops at the American International Shipbuilding Corporation's Hog Island shipyard. The Government will place an order soon for a foundry building at the Washington Navy Yard. We quote mill price on shapes at 3c., base, Pittsburgh. Warehouses will now sell shapes at 4.185c., Philadelphia.

Plates.—Several mills will soon begin to accept contracts, principally from regular customers, for first quarter delivery. There is a freer sale of sheared plates for prompt delivery. Buyers have been able to satisfy their immediate requirements and in some instances have cancelled contracts made at the high prices. Some of the mills which accepted orders for plates for the first 25 ships to be built by the American International Shipbuilding Corporation agreed also to fabricate plates and shapes into standardized boat sections. Production of plates is being curtailed by shortage of gas coal for open-hearth furnaces. The Italian Government order of ship plates has been increased from 15,000 to 22,000 tons. We quote mill prices at 3.25c., base, Pittsburgh, and warehouse prices at 4.435c., Philadelphia.

Iron and Steel Bars.—Fixing of a price for iron bars at 3.50c., base, Pittsburgh, was followed promptly by sales at that figure, though no large tonnages have been taken, as mills are well sold up for this year. A meeting of the Eastern Bar Iron Institute will be held Thursday, when it may be decided to accept first quarter orders at the new price. We quote bar iron at 3.685c., Philadelphia. Steel bar makers may soon accept contracts for first quarter. There is very little business being done for this year. Concrete reinforcing bars are in good demand both for domestic and export trade. We quote steel bars at 2.90c., base, Pittsburgh, from mill and at 4.085c., Philadelphia, from warehouse.

Tin Plate.—A leading Pittsburgh producer is selling heavily for first half shipment at $7.75 per base box, Pittsburgh. Contracts are being made with regular customers only, and all contracts are subject to cancellation on Government order.

Wire Products.—Wire and wire nail orders in fairly large volume have been booked by leading independents at $3.25 and $3.50, respectively, per 100 lb. There has been a good demand for cement coated nails.

Old Material.—Further restriction on shipments of iron and steel scrap will probably be announced soon by the railroads. The American Board of Scrap Iron Dealers, Widener Building, Philadelphia, has obtained an official ruling from Washington that the recent priority order issued by Judge Lovett of the War Industries Board does not discriminate against the shipment of scrap in open cars, providing the consignee is engaged on essential war work. Scrap iron was not specifically mentioned in the order, but the privilege of using open cars was accorded to all raw materials used in the metal industries when required for war work. Some local agents of railroads construed the order otherwise and confusion resulted. All that it is necessary to do is to produce the consignee's Government order number or make affidavit that the shipment is for essential war work. One dealer here uses the following phrase on all bills of sale: "It is understood and agreed that the above material is to be used in connection with the manufacture of essentials as is or may be specified by the authorities." Prices show firmness and in the case of old carwheels and No. 1 cast there has been an advance of $3 and $1 respectively. There is a fair demand from mills in the Pittsburgh district. An Eastern Pennsylvania plate mill is offering $27, delivered, for No. 1 heavy melting steel. At this price dealers can sell more profitably in the Pittsburgh district. The freight from New England points to eastern Pennsylvania is now $2.42, while to the Pittsburgh district it is $3.60, only $1.18 additional, and the prices being paid in the Pittsburgh district are higher than are offered here. Dealers are watching with interest for sales of iron and steel scrap by producers, such as the railroads. Under the method adopted of fixing prices on only four classifications of scrap, there will be plenty of opportunities for producers and dealers to violate the fixed price schedule, if they choose to do so. In the opinion of some in the trade, further price fixing must come, covering all of the classifications. A few dealers construe the price-fixing arrangement to apply only to sales to the iron and steel trade. They do not understand that there is any restriction on sales of cast borings, for example, to chemical plants. Such borings, which are so fine as to be of a special character, have been sold at $24 since the price for cast borings was fixed at $20. We quote for delivery at consuming points in the Philadelphia district the following prices:

No. 1 heavy melting steel	$26.00 to $28.00
Steel rails, rerolling	38.00 to 40.00
Low phosphorus heavy melting	36.00 to 38.00
Old iron rails	38.00 to 40.00
Old carwheels	33.00 to 35.00
No. 1 railroad wrought	35.00
No. 1 forge fire	22.00 to 23.00
Bundled sheets	22.00 to 23.00
No. 2 busheling	15.00 to 16.00
Steel turnings (for blast furnace use)	15.00 to 16.00
Machine shop turnings (for rolling mill use)	18.00 to 19.00
Cast borings (for blast furnace use)	15.00 to 16.00
Cast borings (clean)	20.00
No. 1 cast	31.00 to 33.00
Grate bars	21.50 to 22.50
Stove plate	22.00 to 23.00
Railroad malleable	30.00 to 32.00
Wrought iron and soft steel pipes and tubes (new specifications)	30.00 to 32.50

Buffalo

BUFFALO, Nov. 19.

Pig Iron.—On account of reduced furnace output due to some of the stacks shutting down because of lack of coke, coupled with the fact that furnaces had already taken on heavy forward commitments during the past two weeks, furnace bookings for the past week have been comparatively light. There appears to be very little available tonnage to be contracted for for shipment prior to April 1 of next year, with a strong probability of curtailment of capacity output for the second quarter on account of slowing up caused by shortage in coke supply. Consequently, producers, taking into consideration the limited untaken tonnage for first half, are disposed to give first attention to caring for the needs of their regular customers and are less disposed to cater to the demand that comes in from miscellaneous buyers who have had no regular furnace affiliation. At least three furnaces of the district are out of commission on account of coke shortage.

Furnace shipments on contracts are being seriously retarded on account of inability to obtain adequate supply of cars. We continue to quote the same schedule of prices which has been in force for the past three weeks, which is as follows, f.o.b. furnace, Buffalo:

No. 1 foundry	$34.50
No. 2 X	33.50
No. 3 foundry	32.50
Gray forge	32.00
Malleable	33.50
Basic	33.00
Lake Superior charcoal, f.o.b. Buffalo	39.75

Finished Iron and Steel.—Orders for materials to be used for Government purposes continue to be of large volume, and the demand for material for other uses is commencing to be met a little more freely and with more favorable consideration by sellers. Since Nov. 16 warehouse prices have been quoted as follows, f.o.b. Buffalo: Steel bars, 4.05c. base; iron bars, 4.65c.; shapes and structural material, 4.15c.; plates, 4.40c.; No. 10 blue annealed sheets, 5.40c.; one pass cold rolled black sheets No. 28 base, 6.40c.; No. 28 galvanized sheets, 7.65c. The Schoellkopf Aniline & Chemical Works, Inc., Buffalo, has awarded the contract for the construction of building No. 80 of its new plant on Buffalo River, requiring 300 tons of structural steel, to the John W. Cowper Co., Buffalo. About 1500 tons of steel, largely reinforcing bars, will be used in the construction of Victory Plant No. 2 now building in Buffalo by the Fore River Shipbuilding Corporation of the Bethlehem Shipbuilding Corporation for the manufacture of steam turbines for destroyers for the United States Navy.

Old Material.—Evidences of an appreciable general buying movement are apparent. Inquiry is of large volume, and the market is strong. Demand is especially good for heavy melting steel, old car wheels, borings and turnings, both locally and from eastern Pennsylvania and Pittsburgh districts. Yard stocks, which are now low, are also being replenished. Dealers are hindered in deliveries on contracts by the continued and growing shortage of cars in which to forward shipments, owing to the increasing demand for cars in which to forward finished materials on Government orders, and dealers are afraid this condition will grow more acute. There has been no change in prices, and we repeat last week's schedule of dealers asking prices as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$29.00 to $30.00
Low phosphorus	36.00 to 38.00
No. 1 railroad wrought	34.00 to 35.00
No. 1 railroad and machinery cast	27.00 to 28.00
Iron axles	45.00
Steel axles	45.00
Carwheels	30.00 to 31.00
Railroad malleable	28.00 to 29.00
Machine shop turnings	18.00 to 18.50
Heavy axle turnings	25.00 to 26.00
Clean cast borings	19.00 to 20.00
Iron rails	37.00 to 38.00
Locomotive grate bars	20.00 to 21.00
Stove plate	20.00 to 21.00
Wrought pipe	26.00 to 27.00
No. 1 busheling scrap	25.00 to 26.00
No. 2 busheling scrap	17.00 to 18.00
Bundled sheet stamping scrap	19.00 to 20.00

Cleveland

CLEVELAND, Nov. 20.

Iron Ore.—There has been some feeling of anxiety over the ore situation, but fears of a shortage before the opening of the next season of navigation have about been dispelled by better weather conditions this month and a very satisfactory movement of ore. This fear was at least partly due to the falling off in shipments during September and October. Weather conditions so far in November have been unusually good for this time of the year, and ore shipments continue heavy. It is now predicted that the Lake shipments for the season will come close to 62,000,000 tons. The amount of ore on dock at the close of navigation will be about the same as last year. On Nov. 1 there was 8,823,170 gross tons on Lake Erie docks as compared with 8,793,586 tons on the same date a year ago. Shipments from the docks to interior furnaces up to Nov. 1 amounted to 31,217,010 tons as compared with 32,568,772 tons during the corresponding period of 1916. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, $5.95; old range non-Bessemer, $5.20; Mesaba Bessemer, $5.70; Mesaba non-Bessemer, $5.05.

Pig Iron.—Some foundry iron has been sold for delivery during the last half of next year. Several inquiries have come out for that delivery recently, but most furnaces have declined to take orders for shipment beyond July. The last half business was booked at the Government price and was taken in connection with the first half tonnage. The demand for foundry iron for the first half in lots of 100 to 500 tons is fairly heavy and producers not well sold up are booking considerable business. A Cleveland company is in the market for 2000 tons of either No. 1 or No. 2 foundry iron, and a nearby stove company is inquiring for 2000 tons of Northern, Southern and silvery irons, both inquiries being for first half delivery. In steel making iron one inquiry is out for 5000 tons of basic iron for prompt shipment, and a Northern Ohio consumer has purchased about 5000 tons of basic for the second quarter and wants 10,000 to 15,000 tons additional for the same delivery. The Southern iron market is quiet. Producers are unable to sell in this territory at the Government price, with freight added, except to consumers who must have Southern iron in their mixture. Some consumers look for lower prices on Southern iron so that it will come in competition with Northern grades. We quote, delivered Cleveland, as follows:

Bessemer	$37.25
Basic	33.30
Northern No. 2 foundry	33.30
Southern No. 2 foundry	37.00
Gray forge	32.30
Ohio silvery, 8 per cent silicon	46.12
Standard low phos., Valley furnace	50.00

Coke.—The scarcity of foundry coke for prompt shipment continues, and at the suggestion of the Government one Cleveland interest is furnishing some by-product coke to foundries in this territory; but the supply from this source is very limited. Sales of this coke are being made at $8.75 at oven, which is equivalent to $7, Connellsville. There is considerable inquiry for foundry coke, and some contracts are being closed at $7 per net ton at oven for the first half and all of next year.

Finished Iron and Steel.—The demand for finished steel for Government work continues heavy, but very little inquiry is coming out for material for other purposes. There is a great deal of inquiry for plates, including one for 20,000 tons of 3/16 in. gage in 30-in. squares for the Government. Plate prices quoted by mills able to make early shipments that have been getting higher than the Government price continue to ease off, and a Cleveland mill is now quoting a maximum of 5c. as compared with 6c. a week ago. The Toledo Bridge & Crane Co. is inquiring for 1000 tons of plates and shapes for work in connection with the Emergency Fleet Corporation. Some mills that have stocks of high-priced scrap complain that they will suffer a loss by selling iron bars at the 3.50c. price fixed by the Government. Hard steel bars, the price of which has not been regulated by the Government, are still quoted around 3.50c. at mill. There is a heavy volume of inquiry for sheet bars, many mills being in the market for first quarter contracts. The demand for sheets has been very active since the Government prices were announced, and some of the mills have sold out entirely for this year and are taking first quarter contracts at Government prices. The price of tool steel has not been regulated by the Government, but there is some expectation that a Government price will be named on this steel, which is generally quoted at $2.50 per lb., but this price is being shaded to $2.25 to $2.35. The Government regulation of warehouse prices has left an uncertainty as to whether Cleveland warehouses are to quote f.o.b., Cleveland, or f.o.b., Pittsburgh warehouse, for shipments to points outside of the city. With Cleveland as a basing point, the freight from Pittsburgh to this city would be added. The point has been raised also as to giving buyers from warehouse the advantage of the odd cents. Steel bars figure out at 4.03½c. at Cleveland warehouse, under the Government price, with freight from Pittsburgh added, but 4c. quotations are now being made. Other warehouse prices are 4.10c. for structural material; 4.35c. for plates; 5.35c. for blue annealed sheets; 6.36c. for black sheets, and 7.60c. for galvanized sheets, these giving the buyer the advantage of the odd 3½c. per 100 lb.

Jobbers may yet decide to retain this fraction.

Bolts, Nuts and Rivets.—Now that the Government prices are fixed, a heavy volume of buying is expected in bolts, nuts and rivets, the placing of a large number of orders having been held up recently waiting for the readjustment of prices by the Government. Manufacturers are generally satisfied with the new prices, although they express some concern about getting all the steel they will need. Many inquiries are coming out for bolt and nut contracts. Makers will take contracts at the new prices through the first quarter and possibly the first half. Under the Government prices the large buyer will no longer enjoy the advantage he has generally been able to obtain over the small consumer. Inquiries are pending for a large tonnage of rivets, among them being a new inquiry for 2000 or 3000 tons for the Emergency Fleet Corporation. Under the Government price makers are permitted to charge the usual 10c. extra for boiler rivets. We quote rivets at 4.65c. for structural and 4.75c. for boiler rivets.

Old Material.—Trading is almost entirely between dealers who are still buying to cover short sales. The market has stiffened up somewhat on heavy melting steel scrap. Dealers are paying $28.50 to $29, and sales have made as high as $30. On other grades regulated by the Government the Cleveland prices remain well below those of the Government. Dealers are asking consumers $30 for heavy melting steel, but mills are still out of the market. Sales of railroad wrought scrap are reported at $33 per gross ton, and borings have sold in this market at $20 gross for delivery in Pittsburgh. Borings are quiet, but turnings are in fair demand and about 25c. a ton higher. Cast scrap is very quiet, as foundries are well supplied. We quote, f.o.b. Cleveland, as follows:

	Per Gross Ton
Steel rails	$26.00 to $27.00
Steel rails, rerolling	36.00 to 37.00
Steel rails, under 3 ft.	30.00 to 31.00
Iron rails	35.00 to 36.00
Steel car axles	45.00 to 46.00
Heavy melting steel	28.00 to 29.00
Carwheels	26.50 to 27.50
Relaying rails, 50 lb. and over	50.00 to 60.00
Agricultural malleable	22.00 to 23.00
Railroad malleable	27.00 to 28.00
Steel axle turnings	21.00 to 22.00
Light bundled sheet scrap	20.00 to 20.50

	Per Net Ton
Iron car axles	$44.00 to $45.00
Cast borings	16.75 to 17.25
Iron and steel turnings and drillings	16.50 to 17.00
No. 1 busheling	22.00 to 23.00
No. 1 railroad wrought	30.00 to 31.00
No. 1 cast	23.00 to 23.50
Railroad grate bars	17.25 to 17.75
Stove plate	17.25 to 17.75

Cincinnati

CINCINNATI, Nov. 20—(*By Wire*).

Pig Iron.—The shortage of No. 2 foundry iron is becoming more serious, especially in the Hanging Rock and Virginia districts. No Southern Ohio or Virginia foundry iron is offered for this year's shipment with the exception of an occasional cast and this does not stay on the market as a rule longer than 24 hours. In the South, the situation is almost identical, although there is more standard iron available in that district, but most of it is offered only for next year's shipment. A few sales have been made of Southern iron for first half delivery, among which is one for 500 tons of No. 3 iron to a Cincinnati foundry. Another 500 ton sale of No. 2 was to a nearby melter and numerous smaller contracts were closed, all at the Government's prices. Some Southern iron was sold in Central Ohio for last half of 1918 at the present ruling base price of $33 furnace with the silicon analysis ranging from 1.75 to 2.25 per cent. Iron higher than this and which is within the sulphur limit commands an advance according to the Government's schedule. The furnaces in nearly all districts are complaining about the inadequate supply of coke and also of its inferior quality. Proportionately more high sulphur iron has been produced lately than at any time heretofore and this is attributed to inferior coke supplied. The Ohio silvery irons are practically off the market and it is almost impossible to place an order for even a carload for December shipment, no matter how badly needed. Malleable is also scarce, but contracts can be made for next year's shipment with a number of selling companies. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, prices as follows:

Southern coke, No. 2 foundry and 2 soft	$35.90
Southern Ohio coke, No. 2	34.26
Basic, Northern	34.26

(*By Mail*)

Finished Material.—The readjustment of warehouse prices has now been completed, but, of course, the time since they went into effect has been so short that little new business is reported as being done at the revised figures. The local warehouse price of steel bars is 4.08c., but there is a somewhat elaborate schedule governing the selling prices on twisted bars, which are quoted as follows: ¾ x 1¼ in., 4.23c.; ⅝-in., 4.33c.; ½-in., 4.43c.; ⅜-in., 4.63c. and ¼-in., 4.88c. Structural shapes from stock are now 4.18c., plates ¼-in. and heavier, 4.43c.; cold rolled shafting is unchanged at 10 per cent above list; No. 10 blue annealed sheets from warehouse stocks are quoted at 5.45c. The mill quotations on sheets are as follows: No. 10 blue annealed, 4.18½c.; No. 28 black, 5.18½c., and No. 28 galvanized 6.43½c. all f.o.b. cars Cincinnati or Newport, Ky. There is a wide range in the jobbers' prices on wire nails and orders from old customers have in some cases been taken at $4 per keg base, but some jobbers are holding out for $4.20. As a rule, both nails and barb wire are selling slowly.

Coke.—Operators in the Connellsville district have recently taken on considerable first half foundry coke business and also some for an entire year's supply. These contracts are almost invariably a renewal of old ones and there is no effort to obtain business from new customers. The Government's price of $7 per net ton, at oven, rules in all cases with the understanding that readjustments are to be made later in accord with Government schedules. A few foundry coke contracts have been accepted by Wise County operators on the same basis. Pocahontas and New River producers appear to be still out of the market. No contracts for furnace coke have been made in this territory, and it is extremely doubtful whether any 48-hr. coke could be bought in any producing district for either prompt or future shipment.

Old Material.—The absence of changes in quotations, further than a little stiffening in prices on borings and turnings, denotes conclusively that the demand for scrap is still so light that local dealers have not been able to make the expected adjustments to conform with the Government's schedule. On account of the congested conditions at different large consuming points, embargoes prevent shipments from going forward, and this has caused considerable complaint among dealers. The following are dealers' prices, f.o.b. cars, southern Ohio and Cincinnati:

	Per Gross Ton
Bundled sheet scrap	$17.50 to $18.00
Old iron rails	32.00 to 32.50
Relaying rails, 50 lb. and up	44.00 to 44.50
Rerolling steel rails	33.00 to 33.50
Heavy melting steel scrap	25.00 to 25.50
Steel rails for melting	24.50 to 25.00
Old carwheels	27.00 to 27.50

	Per Net Ton
No. 1 railroad wrought	$29.00 to $29.50
Cast borings	13.00 to 13.50
Steel turnings	13.00 to 13.50
Railroad cast	18.50 to 19.00
No. 1 machinery cast	24.00 to 24.50
Burnt scrap	13.00 to 13.50
Iron axles	40.00 to 40.50
Locomotive tires (smooth inside)	33.50 to 34.00
Pipes and flues	15.50 to 16.00
Malleable cast	19.50 to 20.00
Railroad tank and sheet	14.50 to 15.00

St. Louis

ST. LOUIS, Nov. 19.

Pig Iron.—Pig iron sales are not numerous in consequence of the inability of representatives of furnaces to make deliveries of the standard grades, but there are some sales being reported of iron differing from the strict analysis and there are also some transactions in charcoal iron reported, the largest being for 500 tons for 1918 delivery. The inquiries continue very heavy from all parts of the St. Louis territory, but are being

filed for consideration when opportunity of delivery appears. No orders are being taken for second half delivery. Prices, of course, as made by the Government are being maintained. Not much first half tonnage is left for local representatives, and the local furnace is about sold up, probably 10,000 tons being the limit of what can be done in addition to the business already on the books.

Coke.—Considerable confusion exists in the coke market, and while there are many inquiries in the market ranging from 1000 tons down there are no sales being made by representatives except to old customers, and then only for 1918 delivery. No spot business is being accepted. By-product coke from local and nearby producers is still out of the market.

Finished Iron and Steel.—In finished products a little easier condition is reported in the delivery of light rails, but on standard sections the situation is growing steadily worse. Spikes are also reported easier in delivery than has been the case for some time. Pressure on the warehouses continues heavy and the supplies are very low. The Government prices were put into effect on Nov. 15, and for stock out of warehouse we quote to-day as follows: Soft steel bars, 4.17c.; iron bars, 4.17c.; structural material, 4.27c.; tank plates, 4.52c.; No. 8 sheets, 5.47c.; No. 10 blue annealed sheets, 5.52c.; No. 28 black sheets, cold rolled, one pass, 6.52c.; No. 28 galvanized sheets, black sheet gage, 7.77c.

Old Material.—The scrap market has scarcely settled down to the Government price readjustment, but is rapidly doing so. Dealers are trading among themselves and doing considerable buying, but the consumers are holding out of the market with a view to getting better prices, if possible. Their yards, however, are pretty low, and there is a general feeling that they will have to enter the market shortly to keep their plants going at full capacity. Dealers generally are holding for the Government maximum and are aided in this by the shortage of cars. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

	Per Gross Ton	
Old iron rails	$36.00 to	$37.00
Old steel rails, rerolling	37.00 to	37.50
Old steel rails, less than 3 feet	37.00 to	37.50
Relaying rails, standard section, subject to inspection	60.00 to	75.00
Old carwheels	28.50 to	29.00
No. 1 railroad heavy melting steel scrap	28.50 to	29.00
Heavy shoveling steel	26.50 to	27.00
Ordinary shoveling steel	25.00 to	25.50
Frogs, switches and guards cut apart	28.00 to	28.50
Ordinary bundled sheet scrap	18.00 to	18.50
Heavy axle and tire turnings	18.00 to	18.50

	Per Net Ton	
Iron angle bars	$34.50 to	$35.00
Steel angle bars	27.00 to	27.50
Iron car axles	43.00 to	43.50
Steel car axles	41.00 to	41.50
Wrought arch bars and transoms	42.00 to	42.50
No. 1 railroad wrought	30.75 to	31.25
No. 2 railroad wrought	28.50 to	29.00
Railroad springs	31.50 to	32.00
Steel couplers and knuckles	28.50 to	29.00
Locomotive tires, 42 in. and over, smooth inside	31.00 to	31.50
No. 1 dealers' forge	21.00 to	21.50
Cast iron borings	16.50 to	17.00
No. 1 busheling	23.00 to	23.50
No. 1 boilers, cut to sheets and rings	18.50 to	19.00
No. 1 railroad cast scrap	22.00 to	22.50
Stove plate and light cast scrap	17.00 to	17.50
Railroad malleable	25.50 to	26.00
Agricultural malleable	21.00 to	21.50
Pipes and flues	21.00 to	21.50
Heavy railroad sheet and tank scrap	19.50 to	20.00
Railroad grate bars	18.00 to	18.50
Machine shop turnings	16.50 to	17.00
Country mixed scrap	17.50 to	18.00
Uncut mixed railroad scrap	21.00 to	21.50

British Steel Market

No Demand for American Crude Steel—Readjustment of Iron Prices Deferred

(*By Cable*)

LONDON, ENGLAND, Nov. 21.

Official adjustment of pig iron prices, due to advance in coal and coke, has been deferred. There are rumors that producers are being subsidized. The stringency in hematite iron is unrelieved. American semi-finished steel is lifeless. Finished steel bars have sold at £24, f.o.b. New York. The demand for ferromanganese is improving and Canada has paid $275, c.i.f., for forward shipment. Tin plates are active, chiefly on French account, 30s. 10½d., net basis, having been paid. We quote as follows:

Tin plates, coke, 14 x 20; 112 sheets, 108 lb., f.o.b. Wales, 30s. 10½d.
Ferromanganese, £45 nominal.
Ferrosilicon, 50 per cent, c.i.f., £35 upward.
On other products control prices are as quoted in THE IRON AGE of July 19, p. 171.

(*By Mail*)

Coal and Coke Advances May Affect All Maximum Prices—Ferromanganese Easier

LONDON, ENGLAND, Nov. 6—The steel industry is under the influence of increased working costs while the pressure of war work is more intense than ever. A fortnight ago reference was made to the advance of 2s 6d per ton in coal as foreshadowing a revision of the maximum prices for pig iron and finished products and the rumors since of an advance of 6s 3d in coke appear to have some foundation. At any rate, such an advance is now regarded as a fact. No official decision has yet been announced, although an adjustment of pig-iron prices is expected soon. Owing to the constant rise in production costs, ironmasters contend that the existing maxima leave but a narrow margin of profit and representations have been made to the authorities. If coke and pig-iron prices are advanced, an adjustment must ensue for all kinds of finished iron and steel. In order to avoid disturbing the whole list of maximum rates, the authorities might possibly find it more convenient to bring about an adjustment as between the Government and the makers. An early announcement is anxiously awaited.

The prospect of an advance has stimulated pig-iron demand considerably over the end of October but not a few makers declined to arrange further contracts until the complex position is cleared up. Orders where booked are subject to a revision of the official prices. Owing to greater activity among iron founders, especially in Scotland, heavier applications for Cleveland common iron have been dealt with, users finding no difficulty in securing all the quantities wanted, while output is fully maintained. Deliveries nevertheless are impeded by lack of cars. In view of the ample supplies, it is now suggested that the system of allocation of Cleveland iron under the local Control Committee may be dropped altogether. The stringency of hematite, however, continues. Good quantities are reserved for France under official supervision and there is a continuous demand from Italy. Great efforts are made to push the output of all steel-making irons but many difficulties are being encountered in labor and raw materials. It is confidently expected, however, that the furnaces in blast will be increased before the end of the year.

Semi-finished steel is unchanged, the great bulk being absorbed by national needs, leaving little for mercantile work. Some of the steelworks are unwilling to renew contracts at the official price of £10 7s 6d for Welsh bars and billets. The only feature in American material has been the further considerable reduction in the price of wire rods to about £26, c.i.f. Liverpool, for November-December shipment. Demand is very slow and there is no difficulty in placing small orders on that basis.

Prices of uncontrolled material tend upward strongly, the feature being the sharp advance in gas steel strip to about £18 net, which figure is conceded readily by buyers. Buying pressure in all descriptions of finished iron and steel is unrelaxed, excepting for iron and steel hoops. Only limited quantities of finished steel material are finding their way outside of the control.

Tin plates have stiffened, chiefly under the influence of the wages' question and the increased cost of coal and makers look for an advance in the maximum basis price from 30s for cokes, 20 by 14, net, at works. Demand for the Allies has been fairly active, further considerable orders having been placed for France for November shipment. Some of the works find difficulty

in disposing of wasters which have been accumulating, chiefly owing the lack of trading facilities under the restrictions, which it is hoped will be modified.

The easier feeling lately in ferromanganese is attributed to the weaker and unsettled state of the American market. Practically no export business has been reported lately, f.o.b. quotations for loose for forward shipment to Continental ports being about £70. Business for American North Atlantic ports is still in abeyance, c.i.f. quotations being quite nominal at $290 to $300 for January-June shipment. A revision of the current domestic price of £25 is now understood to be under consideration, this figure being doubtless too low.

New York

NEW YORK, Nov. 20.

Pig Iron.—Complaints with regard to car shortage are coming with increasing force. This applies particularly to Southern iron, which is very far behind in delivery. In spite, however, of unfavorable conditions, fair sales of Alabama iron have been made during the past week. The sales of Northern iron have been numerous but for small tonnages. The demand for malleable is particularly active. Some sales during the past few days have been for delivery as late as the third quarter of next year, but most of them are not later than the first half of next year. For early delivery we quote as follows, tidewater:

No. 1 X	$35.25
No. 2 X	34.25
No. 2 Plain	33.75
No. 2 Southern (rail and water)	37.25
No. 2 Southern (all rail)	39.15
No. 2 X Virginia	37.00 to 37.25

Ferroalloys.—The domestic ferromanganese market is firm at $250 but it is not active. A fair business has been done in the last week for next year's delivery at this level, about 1000 tons being bought by a large steel foundry interest. One representative of a British producer has sold a fair sized lot to the United States Government for delivery in February and can quote on further business at $250, seaboard, for delivery in the first half, subject to license to ship. It is reported that further fair sales of spiegeleisen have been made in the week but details are lacking. The quotation for the 20 per cent grade is $60 at furnace for next year, with $65 to $70 asked for November or December. Ferrosilicon, 50 per cent, is unchanged at $175 for this year and $140 to $150 for next year's delivery.

Finished Iron and Steel.—In a dull week so far as domestic buying is concerned and with a relatively restricted volume of buying for export, requirements for fabricated steel constitute the large factor in fresh commitments for steel. Still increasing quantities for ships and shipyards is the order of the day and fabricators are looking for a continued flow of such business for an indefinite time. The needs over 10 months for the American International Shipbuilding Corporation are put at 450,000 tons; of this the Dominion Bridge Works will supply 50,000 tons. For airplane warehouses, etc., in the New York district for the Navy bids were taken on Nov. 17 for structures involving 3000 tons. The American International Shipbuilding Corporation for eight buildings on Hog Island will require 1500 to 2000 tons. The American Bridge Company has been awarded a large part of the hangars at Langley Fields. The Harris Structural Steel Co. will supply 200 tons for public school No. 40. Against the tremendous quantities of shapes and plates which will ultimately be needed for the shipbuilding program, certainly in the latter half of next year, is the condition of 50 per cent operation of some of the steel mills, as in the Youngstown district, owing to fuel shortage. Little surprise is expressed that in view of the present incomplete condition of shipyards and incomplete ranks of workmen, reports are again received of ship steel received in advance of needs. What little export business has been going is of course done at prices independent of those fixed. Wire nails have sold at 4.5c. and wire at corresponding prices, bars at 4c., 4.25c. and 4.50c., Pittsburgh, and some structural as high as 5c. Warehouse prices have been established quickly with a fair volume of business at the new prices, which are, of course, as stated in last week's issue, 1c. above the mill price plus the freight from mill to warehouse. We quote mill shipments of steel bars at 3.095c., New York; shapes 3.195c., plates 3.445c. and bar iron, the price established last week, at 3.695c., New York. Out of store prices are 1c. higher and to all must be added 3 per cent of the freight charge or about 20c. per 100 lb. for the transportation tax.

Old Material.—The price situation as to scrap is very unsatisfactory and is causing some rather unusual expedients to be resorted to by some buyers and sellers. On account of the price of No. 1 railroad wrought fixed by the Government, $35, being lower than those having it are willing to accept, some deals are being put through whereby No. 1 railroad wrought is sold at $35, but other kinds of scrap on which prices have not been fixed are sold at much higher prices than have prevailed recently. This is regarded as an evasion and is being vigorously denounced by dealers who are strongly supporting the policy of maintaining Government quotations in spirit and letter. Hence it is freely predicted that Government prices will be fixed on all kinds of iron and steel scrap at an early date. We quote prices of brokers as follows to New York producers and dealers, per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$24.00 to $24.50
Old steel rails (short lengths) or equivalent heavy steel scrap	24.00 to 25.00
Relaying rails	45.00 to 50.00
Rerolling rails	33.00 to 34.00
Iron and steel car axles	41.00 to 42.00
No. 1 railroad wrought	32.00 to 33.00
Wrought-iron track scrap	27.00 to 28.00
No. 1 yard wrought long	27.00 to 28.00
Light iron	7.00 to 8.00
Cast borings (clean)	16.00 to 17.00
Machine-shop turnings	14.00 to 15.00
Mixed borings and turnings	13.00 to 14.00
Wrought-iron pipe (1 in. minimum diameter), not under 2 ft. long	25.00 to 26.00

Dealers in New York City and Brooklyn are quoting as follows to local foundries, per gross ton, but for delivery to cupola platforms of Brooklyn foundries, about $3 more is quoted:

No. 1 machinery cast	$25.00 to $26.00
No. 1 heavy cast (column, building materials, etc.)	21.00 to 22.00
No. 2 cast (radiators, cast boilers, etc.)	21.00 to 22.00
Stove plate	19.00 to 20.00
Locomotive grate bars	16.00 to 17.00
Malleable cast (railroad)	27.00 to 28.00
Old carwheels	27.00 to 28.00

Cast Iron Pipe.—Very little business, for either public or private needs is developing. While concessions are made to the Government whenever it comes into the market, New York quotations on ordinary business are still $56.50 on 6-in. and heavier and $59.50 on 4-in.

New Greaves-Etchells Electric Furnaces

The Electric Furnace Construction Co., Philadelphia, announces the following contracts for the installation of Greaves-Etchells furnaces.

The Ford Motor Co., Detroit, Mich., will install one furnace in connection with the manufacture of aircraft steel for the Government.

The Halcomb Steel Co., Syracuse, N. Y., will install two 3-ton furnaces for the manufacture of special aeroplane and motor steels.

The installation of these three furnaces will bring the total operating or contracted for in the United States to 10.

Brazilian Exports of Manganese Ore

Brazilian exports of manganese ore have been very large in 1917. For the first half of each of the last five years the following statistics are given in gross tons:

To July 1, 1917	245,088
To July 1, 1916	240,090
To July 1, 1915	102,870
To July 1, 1914	85,500
To July 1, 1913	49,600

The 1917 half year exports are five times those for the same period in 1913 and already exceed the record breaking exports total in the first six months of 1916.

IRON AND INDUSTRIAL STOCKS

Payment on Liberty Bonds Made Without Causing Trouble

NEW YORK, Nov. 21

The principal event of the past week was the making of payments of more than $700,000,000 on the second Liberty loan. The ease with which this transaction was carried through was a remarkable tribute to the Federal Reserve banking system. Dun's *Review*, in speaking of it, says:

"How skillfully the banking situation is being managed was demonstrated on Thursday, when the payments in connection with the 18 per cent instalment on the second war loan had no appreciable influence on rates for money. That there would be anything resembling a real flurry, no one had imagined, but it had not everywhere been expected that this important financing would be arranged without causing so much as a ripple in the market. The fact that the entire transaction, while nominally involving huge sums, was largely a matter of bookkeeping does not obscure the able handling of the operation, nor the facilities which rendered the maintenance of stable conditions possible."

Although a number of stocks declined during the week, iron and steel shares fared better than many others. Among the stocks that recorded gains were: American Locomotive, com. 1⅜ points; Baldwin Locomotive, com., 3; Bethlehem Steel, com., 1½; Bethlehem Steel, class B, ¾; Gulf States Steel, 1¼; Lackawanna Steel, 3; Midvale Steel, ⅜; Pressed Steel Car, com., 1¼; Superior Steel, 1¾. Among those recording losses were: Republic Iron & Steel, com., ⅜; Republic Iron & Steel, pref., ¼; United States Steel, com., ⅝; United States Steel, pref. 1½.

The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm. com.	16¼ - 18¼	Int. Har. Corp. pf.	98 - 98⅛
Allis-Chalm. pf.	70	Lack. Steel	71 - 78
Am. Can com.	31⅜ - 35⅝	Lake Super. Corp.	10¼ - 11⅜
Am. Can pf.	93¾ - 94	Midvale Steel	41⅝ - 44¼
Am. Car & Fdry. com.	60½ - 64¾	Nat.-Acme.	25½ - 27½
Am. car & Fdry. pf.	104⅞	Nat. En. & Stm. com.	34 - 37⅝
Am. Loco. com.	48½ - 54¾	Nat. En. & Stm. pf.	92
Am. Loco. pf.	94	N. Y. Air Brake.	104 - 109½
Am. Radi. com.	270	Nova Sco. Steel.	60½ - 71⅞
Am. Ship com.	87½ - 88	Press. Steel com.	51¼ - 56½
Am. Steel Fdries.	52½ - 54¾	Press. Steel pf.	90
Bald. Loco. com.	52¼ - 59	Ry. St. Spr. com.	39⅝ - 40⅝
Beth. Steel com.	77⅞ - 82¾	Ry. St. Spr. pf.	96½
Beth. Steel, Class B.	75⅛ - 83¼	Republic com.	68½ - 74⅜
Beth. Steel pf.	85	Republic pf.	94 - 94½
Cambria Steel	120	Sloss com.	34½ - 36
Cent. Fdry. com.	25	Superior Steel	33 - 34⅜
Cent. Fdry. pf.	36	Superior St. 1st pf.	97
Chic. Pneu. Tool.	43 - 46½	Transue-Wms.	37 - 39
Colo. Fuel.	31½ - 34½	Un. Alloy Steel 1st pf.	36 - 37
Crucible St. com.	51¼ - 56½	U. S. Pipe com.	11⅛ - 11⅜
Crucible St. pf.	85¼ - 86	U. S. Steel com.	89¼ - 96⅞
Deere & Co. pf.	95¼ - 97½	U. S. Steel pf.	107½ - 108¾
Gen. Electric	123½ - 130	Va. I. C. & Coke.	51 - 52
Gt. No. Ore. Cert.	24 - 26	Warwick	8½ - 8⅝
Gulf. States Steel.	77½ - 85¼	West. Electric.	36¼ - 39
Int. Har. of N. J. com.	100¾ - 105		
Int. Har. Corp. com.	50¾ - 55		

American Steel Foundries

The American Steel Foundries reports for nine months ended Sept. 30:

	1917	1916	1915
Net earnings*	$5,568,911	$2,265,604	$129,833
Total income	5,783,826	2,353,087	179,045
Charges, sinking fund, depreciation, etc.	597,040	608,958	659,172
War taxes	1,500,000	.....	.....
Surplus after deducting charges	‡3,686,786	1,744,129	†480,127

*After deducting manufacturing, selling, administrative and other expenses. †Deficit. ‡Equivalent to $21.45 a share earned on $17,184,000 stock in nine months' period, compared with $10.14 a share in the same period of 1916.

The charges in 1917 include $433,310 set aside for bond sinking fund and debenture retirement.

More Liberty Loans

An important meeting of bankers was held in New York recently to consider the financial future. It was estimated that the amount of super and excess profit taxes to be paid June 1 in Ohio, Pennsylvania, New York and New England, will amount to $1,250,000,000, and it is felt that the withdrawal in a single day of such an amount of money would cause serious financial disturbance. For this reason, the conference decided to submit to the next session of Congress a bill that will permit the banks to enter the amount to be paid to the credit of the Government and let the Treasury Department draw as needed, so as to scatter the withdrawal over a longer period. At the conference it was stated that there would be a bond issue of $4,000,000,000 in February and one for $4,000,000,000 or $5,000,000,000 in June.

Dividends

The Cambria Steel Co., quarterly, 75c. per share and extra 75c. per share, payable Dec. 15.

The Gulf States Steel Co., quarterly, 2½ per cent on the common, 1¾ per cent on the first preferred and 1½ per cent on the second preferred, all payable Jan. 2.

The Harbison-Walker Refractories Co., quarterly, 1½ per cent on the preferred, payable Jan. 19.

The Republic Iron & Steel Co., quarterly, 1½ per cent on the common, payable Feb. 1, and 1¾ per cent on the preferred, payable Jan. 2.

The Youngstown Sheet & Tube Co., quarterly, 2 per cent and extra 3 per cent on the common, and 1¾ per cent on the preferred, all payable Dec. 31.

Spelter Production in Third Quarter, 1917

WASHINGTON, Nov. 19.—As the result of a canvass by the United States Geological Survey to ascertain the production of spelter in the United States during the third quarter of 1917 it is estimated by C. E. Siebenthal, who has prepared the statistics on the basis of returns of over 95 per cent of the production, that the output of primary spelter from domestic ores was 132,700 net tons and from foreign ores 23,900 tons, a total of 156,600 tons, as compared to an average of 180,569 tons per quarter during the first half of 1917, 175,502 tons per quarter during the last half of 1916, and 158,226 tons per quarter during the first half of 1916. In addition to the primary spelter, the amount distilled from skimmings, drosses, etc., was 4400 tons, as compared with 6000 tons in each of the two quarters preceding. The total production for the first nine months of 1917 was 444,267 tons from domestic ores, 73,457 tons from foreign ores, and 16,550 tons from secondary materials. Returns not yet having been received from the Robert Lanyon Zinc and Acid Co. and the Clarksburg Zinc Co., it has been necessary to estimate their output together with that of two secondary plants.

The stocks of spelter at smelters Sept. 30 amounted to 47,186 tons, as compared with 33,147 tons June 30 and 17,598 tons Jan. 1.

The zinc content of zinc ore imported into the United States in the third quarter of 1917 was 15,000 tons, and the exports during July and August of spelter made from domestic ores were 16,800 tons and of spelter made from foreign ore, 3000 tons. The number of idle retorts Sept. 30 was 64,626, or 28 per cent of the total number of retorts, and included 18 entire plants, several of which are being dismantled. One electrolytic plant also will possibly be dismantled.

It is evident that many zinc smelters, loath to break up their labor forces while there was a probability that Government requirements might call for their full capacity, have continued smelting when it was no longer profitable, or even at a loss, thinking that the heavy orders expected when this country entered the war would eventually be given; but it is also evident that this unprofitable production cannot much longer be maintained.

The Taylor Society will hold its annual meeting at Washington Dec. 7 and 8. Government organization work will probably come in for special attention, with a symposium on centralization versus decentralization. The control of production, storage and distribution of war supplies is likely also to be one of the subjects. H. W. Shelton, Tuck School of Administration and Finance, Dartmouth College, Hanover, N. H., is secretary.

Metal Markets

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
		Electro-	New	New	St.	New	St.
Nov.	Lake	lytic	York	York	Louis	York	Louis
14	23.50	23.50	73.00	6.50	6.37½	8.00	7.75
15	23.50	23.50	73.00	6.50	6.37½	8.12½	7.87½
16	23.50	23.50	73.00	6.50	6.37½	8.12½	7.87½
17	23.50	23.50	....	6.50	6.37½	8.00	7.75
19	23.50	23.50	74.00	6.50	6.37½	8.00	7.75
20	23.50	23.50	77.00	6.50	6.37½	8.00	7.75

NEW YORK, Nov. 21.

Inactivity characterizes all the markets. Copper is under tight control and nominal at the Government price. Tin has continued to advance and has again sold at a record price. Lead is dull but firm. Spelter is again inactive with a tendency to weakness. Antimony is nominally unchanged.

New York

Copper.—Deliveries and sales of copper are under absolute control and there is no market. The metal is being delivered satisfactorily on old contracts but large quantities are unobtainable for early delivery. It is admitted that firms, having Government contracts requiring copper, are awarded sufficient metal at the Government price of 23.50c. which we continue to quote as nominal. Some small dealers are selling small lots at 26c. to 28c. per lb. while others are not. Most of this metal, however, was bought before any price was fixed. It is felt that an understanding as to just where the small dealer stands will soon be given out, since the steel jobbers' position has just been made clear.

Tin.—Spot tin eclipsed the record of last week and sold yesterday in small lots at 77c., New York, the highest price ever recorded. It has continued to advance since a week ago but sales have been light or only just enough to establish a price. There seems to be no immediate relief in sight. After several trips to Washington the Tin Committee has announced no solution of the permit question, though one was expected before this. Some feel that negotiations have struck a snag. Were a satisfactory arrangement made at once, definite relief would not be possible from three weeks to a month. In general the entire market is inactive pending some solution of the spot situation. Arrivals had been 1185 tons for the month, including yesterday, with 4100 tons reported afloat. Spot Straits in London yesterday sold at £279 10s. per ton, an advance of £5 10s. in the week.

Lead.—The market is bare of features or interest. Demand has tapered off until it is very light. There is no pressure to sell. This condition is natural after the large sales of the past few weeks. Quiet strength characterizes the situation, however. The leading producer continues to quote 6.25c., New York, with the outside market at 6.50c., New York, or 6.37½c., St. Louis. Small sales have been made at these prices.

Spelter.—After showing some signs of strength last week and advancing slightly on good inquiry and fair sales for these times, the market has again grown dull and weaker. There is now but little inquiry, and the business done is of small proportion. The market is quotable at 7.75c., St. Louis, or 8c., New York, for prime Western for early delivery, but a few sellers are willing to part with their metal below this. A zinc committee has been formed, made up of representatives of prominent producers, but the results of its deliberations with the Government have not yet been published. Nothing more of a definite nature has been heard of price fixing.

Old Metals.—The market is practically unchanged. Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible (nominal)	22.50
Copper, heavy and wire (nominal)	22.50
Copper, light and bottoms	21.00 to 22.00
Brass, heavy	17.25 to 17.50
Brass, light	12.00 to 13.00
Heavy machine composition	24.00 to 24.50
No. 1 yellow rod brass turnings	15.00 to 15.25
No. 1 red brass or composition turnings	19.00 to 19.50
Lead, heavy	5.50
Lead, tea	4.75
Zinc	6.00

Antimony.—The market lacks interest and buying power and is nominally unchanged at 13.75c. to 14c. per lb., New York, duty paid, for early delivery.

Aluminum.—No. 1 virgin metal, 91 to 99 per cent pure, is in poor demand at 36c. to 38c. per lb., New York, for early delivery

Chicago

Nov. 19.—Small lots of copper have been sold around 28c., but the quantity available is steadily growing smaller, and with some consumers, more particularly the smaller ones, the situation looks more serious. In a general way the entire metal market is quiet. Tin is scarce at 75c. per pound, but there is no pressure to buy. The strain is off the lead market and the metal is easily procurable. Antimony is again quoted, the jobbers asking 15c. to 16c. All prices were withdrawn last week pending action by the Government, but the expected action did not come and quotations were resumed. We quote as follows: Casting, Lake and electrolytic copper, 28c.; tin, carloads, 75c.; small lots, 77c.; lead, 6.25c. to 6.50c.; spelter, 7.75c. to 8c.; sheet zinc, 19c; antimony, 15c. to 16c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 21c.; copper clips, 20c.; copper bottoms, 19c.; red brass, 19c.; yellow brass, 14.50c.; lead pipe, 5c.; zinc, 5c.; pewter, No. 1, 35c.; tinfoil, 42c.; block tin, 47c.

St. Louis

Nov. 19.—Non-ferrous metals, particularly the Missouri product, have been in better tone during the past week. The close, for carload lots, to-day was: Lead, 6.50c.; spelter, 8c. to 8.12½c. In less than carload lots the close to-day was: Lead, 7c; spelter, 8.50c.; tin, 79c.; copper, 27.50c. nominal; Asiatic antimony, 18c. In the Joplin district most of the ore sold at better than $60 per ton for zinc blende, basis of 60 per cent metal, but the basis range was from $57.50 to $72.50 per ton, only a small portion of the tonnage sold at the top price and in consequence the average for the week was but $60 per ton. Demand was weaker and the shortage of cars was much more pronounced. Calamine ranged from $32.50 to $37.50 per ton basis of 40 per cent metal with the average for the district for the week at $35 per ton. Lead ore was steady at $75 per ton, basis of 80 per cent metal, with the average for the week for the district at $74 per ton. Operators seem to be awaiting the results of the conference of producers with the Government War Minerals Committee and this is having its effect on the market. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 10c.; heavy yellow brass, 14c.; heavy red brass and light copper, 19.50c.; heavy copper and copper wire, 20c.; pewter, 25c.; tinfoil, 42c.; zinc, 5c.; lead, 5.50c.; tea lead, 5c.

Foundrymen's War Service Board Appointed

As provided by resolution adopted at the Boston convention a war service board of five for the American Foundrymen's Association has been appointed, as follows: R. A. Bull, Duquesne Steel Foundry Co., Pittsburgh, chairman; C. C. Smith, Union Steel Castings Co., Pittsburgh; J. C. Haswell, Dayton Malleable Iron Co., Dayton, Ohio; G. H. Clamer, Ajax Metal Co., Philadelphia; H. D. Miles, Buffalo Foundry & Machine Co., Buffalo.

The committee represents steel, malleable, gray iron and non-ferrous branches of the foundry industry, and the individual members represent affiliation with the American Foundrymen's Association, the National Founders' Association, the Steel Founders' Society, the American Malleable Castings Association and the American Institute of Metals. An early meeting of the board has been scheduled but date has not yet been settled.

The William F. Remppis Co., Reading, Pa., operating a plant on Spruce Street for the production of iron and steel shapes, has been reorganized and incorporated under the name of the William F. Remppis Iron Works, with capital of $50,000. William F. Remppis, Ferdinand Thun and Lambert A. Rehr, Reading, are the incorporators.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on iron and steel articles, aside from wrought iron and steel pipe in carloads, per 100 lb., New York, 19.5c.; Philadelphia, 18.5c.; Boston, 21.5c.; Buffalo, 11.6c.; Cleveland, 13.5c.; Cincinnati, 18.5c.; Indianapolis, 20c.; Chicago, 21.5c.; St. Louis, 27c.; Kansas City, 47c.; minimum carload, 36,000 lb.; St. Paul, 35.5c.; minimum carload, 36,000 lb.; Denver, 79c.; minimum carload, 36,000 lb.; Omaha, 47c.; minimum carload, 36,000 lb.; New Orleans, 30.7c.; Birmingham, 46c.; Pacific Coast, 75c.; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is 90c.; minimum carload, 40,000 lb. and 85c.; minimum carload, 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 40c. per 100 lb., minimum carload 46,000 lb.; to Omaha 40c., minimum carload 46,000 lb.; to St. Paul 35.5c., minimum carload 46,000 lb.; Denver 79c., minimum carload 46,000 lb. *A 3 per cent transportation tax now applies.*

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in., angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 3c.

Wire Products

Wire nails, $3.50 base per keg; galvanized, 1-in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1-in., $2.50. Bright basic wire, $3.35 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.25; galvanized wire, $3.95; galvanized barb wire, and fence staples, $4.35; painted barb wire, $3.65; polished fence staples, $3.65; cement-coated nails, $3.40 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 47 per cent off list for carload lots, 46 per cent for 1000-rod lots, and 45 per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large rivets ..... $4.65 base
7.15 in. x 6 in. smaller and shorter rivets. 45-10 per cent off list
Machine bolts h.p. nuts, ⅜ in. x 4 in.
Smaller and shorter, rolled threads... 50-10-5 per cent off list
Cut threads ..... 50-5 per cent off list
Larger and longer sizes ..... 40-10 per cent off list
Machine bolts, c.p.c. and t nuts, ⅜ in. x 4 in.
Smaller and shorter ..... 40-10 per cent off list
Larger and longer ..... 35-5 per cent off list
Carriage bolts, ⅜ in. x 5 in.
Smaller and shorter, rolled threads ..... 50-5 per cent off list
Cut threads ..... 40-10-5 per cent off list
Larger and longer sizes ..... 40 per cent off list
Lag bolts ..... 50-10 per cent off list
Plow bolts, Nos. 1, 2, 3 ..... 50 per cent off list
Hot pressed nuts, sq. blank ..... 2.50c. per lb. off list
Hot pressed nuts, hex., blank ..... 2.30c. per lb. off list
Hot pressed nuts, sq., tapped ..... 2.30c. per lb. off list
Hot pressed nuts, hex., tapped ..... 2.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank ..... 2.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped ..... 2.00c. per lb. off list
Semi-finished hex. nuts
⅝ in. and larger ..... 60-10-10 per cent off list
9/16 in. and smaller ..... 70-5 per cent off list
Stove bolts ..... 70-10 per cent off list
Stove bolts ..... 2½ per cent extra for bulk
Tire bolts ..... 50-10-5 per cent off list

The above discounts are from present lists now in effect. All prices carry standard extras.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $57; chain rods, $65; screwetaoshrdluetauutnanan other rods of that character, $65. A tentative differential of $10 per ton over soft rods for high carbon rods has been agreed upon.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $5 to $5.50; ¾ in., 7/16 in. and ½ in., $7.00 base. Boat spikes, $5.25 per 100 lb., f.o.b. Pittsburgh. Track bolts with square nuts, 7c. to 7.50c. to railroads, and 8c. to 8.50c. in small lots for fairly prompt shipment.

Terne Plate

Effective Nov. 7, prices on all sizes of terne plates are as follows: 8-lb. coating, 200 lb., $15 per package; 8-lb. coating, I. C., $15.30; 12-lb. coating, I. C. $16.75; 15-lb. coating, I. C., $17.75; 20-lb., coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.90c. for delivery late this year, and 4.50c. to 5c. from warehouse in small lots for prompt shipment. Refined iron bars, 3.50c. in carload and larger lots f.o.b. mill.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card, as announced Nov. 5 by the Government on steel pipe, those on iron pipe being the same as quoted for some time:

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv
⅛, ¼ and ⅜	44	17½	⅛ and ¼	23	+4
½	48	33½	⅜	24	+3
¾ to 3	51	37½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	44	31½	1¼	18	3
2½ to 6	47	34½	1½	25	11
7 to 12	44	30½	2	26	12
13 and 14	34½	..	2½ to 6	28	15
15	32	..	7 to 12	25	12

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	40	22½	⅛, ¼ and ⅜	22	5
½	45	32½	½	27	14
¾ to 1½	49	36½	¾ to 1½	33	18
2 to 3	50	37½			

Lap Weld, extra strong, plain ends

2	42	30½	1¼	19	4
2½ to 4	45	33½	½	25	11
4½ to 6	44	32½	2	27	14
7 to 8	40	26½	2½ to 4	29	17
9 to 12	35	21½	4½ to 6	28	16
			7 to 8	20	8
			9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots f.o.b. Pittsburgh, announced Nov. 13, as agreed upon by manufacturers and the Government:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.	34	3½ to 4½ in.	12½
2½ to 3¼ in.	24	3 to 3¼ in.	+ 5
2¼ in.	17½	2½ to 2¾ in.	+ 7½
1¾ to 2 in.	13	2 to 2¼ in.	+22½
		1¾ to 1⅞ in.	+35

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton		Per Net Ton	
1 in.	$340	1¾ in.	$220
1¼ in.	280	2 to 2½ in.	190
1⅜ in.	270	2¾ to 3¾ in.	180
1½ in.	220	4 in.	200
		4½ to 5 in.	220

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net or 2 per cent discount in 10 days.

[Open-hearth stock, $5 per ton above these prices.]

Blue Anneal—Bessemer	Cents per lb
Nos. 3 to 8	4.20
Nos. 9 and 10	4.25
Nos. 11 and 12	4.30
Nos. 13 and 14	4.35
Nos. 15 and 16	4.45
Box Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21	4.80
Nos. 22 and 24	4.85
Nos. 25 and 26	4.90
No. 27	4.95
No. 28	5.00
No. 29	5.05
No. 30	5.15
Galvanized Black Sheet Gage—Bessemer	
Nos. 10 and 11	5.25
Nos. 12 and 14	5.35
Nos. 15 and 16	5.50
Nos. 17 to 21	5.65
Nos. 22 and 24	5.80
Nos. 25 and 26	5.95
No. 27	6.10
No. 28	6.25
No. 29	6.50
No. 30	6.75
Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16	4.80
Nos. 17 to 21	4.85
Nos. 22 to 24	4.90
Nos. 25 and 27	4.95
No. 28	5.00
No. 29	5.05
No. 30	5.05
Nos. 30½ and 31	5.10

Prices of Light Steel Rails Are Reduced

Quotations on Chain and Cold Rolled Strip Steel Are Also Revised—Differentials on Sheets, Tin Plate, Billets and Tubes

Two additional announcements were made Tuesday, Nov. 20, by Judge Gary in regard to iron and steel products. The first announcement relates to prices on light rails, chain and cold rolled strip steel, and a most interesting feature is the quoting of light rails on the basis of $3 per 100 lb. for sections from 25 lb. to 45 lb., instead of the former method of quoting on a basis of gross tons. This makes a price of $67.20, compared with recent quotations of $75 to $80 on this weight. The price of chain is fixed at $8 per 100 lb. for ⅜-in. and for cold rolled strip steel at $6.50. The first announcement is as follows:

"Referring to the statement of the chairman of the Committee on Steel and Steel Products of the American Iron and Steel Institute dated Nov. 13, 1917, recommending prices for certain steel products to be adopted as maximum prices, to take effect immediately, to apply to the requirements of the United States Government, to the war requirements of the Allies and for domestic consumption within the United States, the committee now makes similar recommendation to the iron and steel industry in respect of the prices below stated and expresses the hope that there will be no hesitancy in accepting this recommendation."

The second announcement relates to differentials and extras on various products and is as follows:

"The Committee on Steel and Steel Products of the American Iron and Steel Institute has received from a sub-committee a report based on information received from representative manufacturers covering a list of differentials and extras on sheets, tin plates and round billets for seamless tubes, and from such report and other data available the committee has reached a conclusion as to fair and reasonable differentials and extras to be charged for those products and now recommends to the industry that the list of extras and differentials below stated be adopted, to take effect immediately. The committee expresses the hope that there will be no hesitancy in accepting this recommendation."

In addition to the other statements, it is announced that on round billets for seamless tubes the regular steel bar extras and differentials for sizes and carbon specifications are to be used.

Tin and Terne Plate

STANDARD DIFFERENTIALS AND EXTRAS

Cokes and Charcoals—Bessemer or Open-Hearth.

Basis	Cokes	Add for Charcoals A	2A	3A	4A	5A	Prem.
55 lb.	7.35c.	.80c.	1.20c.	1.50c.	2.10c.	2.70c.	3.30c.
60 lb.	7.37½c.	.80c.	1.20c.	1.50c.	2.10c.	2.70c.	3.30c.
65 lb.	7.40c.	.80c.	1.20c.	1.50c.	2.10c.	2.70c.	3.30c.
70 lb.	7.45c.	.80c.	1.20c.	1.50c.	2.10c.	2.70c.	3.30c.
75 lb.	7.50c.	.80c.	1.20c.	1.50c.	2.10c.	2.70c.	3.30c.
80 lb.	7.55c.	.80c.	1.20c.	1.50c.	2.10c.	2.70c.	3.30c.
85 lb.	7.60c.	.80c.	1.20c.	1.50c.	2.10c.	2.70c.	3.30c.
90 lb.	7.65c.	.80c.	1.20c.	1.50c.	2.10c.	2.70c.	3.30c.
95 lb.	7.70c.	.80c.	1.20c.	1.50c.	2.10c.	2.70c.	3.30c.
100 lb.	7.75c.	.80c.	1.20c.	1.50c.	2.10c.	2.70c.	3.30c.
107 lb.	7.90c.	.80c.	1.20c.	1.50c.	2.10c.	2.70c.	3.30c.
128 lb.	8.50c.	1.55c.	1.95c.	2.35c.	3.15c.	3.95c.	4.75c.
135 lb.	8.65c.	1.55c.	1.95c.	2.35c.	3.15c.	3.95c.	4.75c.
148 lb.	9.15c.	2.15c.	2.55c.	2.95c.	3.75c.	4.55c.	5.35c.
155 lb.	9.30c.	2.15c.	2.55c.	2.95c.	3.75c.	4.55c.	5.35c.
168 lb.	9.80c.	2.75c.	3.15c.	3.55c.	4.35c.	5.15c.	5.95c.
175 lb.	9.95c.	2.75c.	3.15c.	3.55c.	4.35c.	5.15c.	5.95c.
188 lb.	10.45c.	3.35c.	3.75c.	4.15c.	4.95c.	5.75c.	6.55c.
195 lb.	10.60c.	3.35c.	3.75c.	4.15c.	4.95c.	5.75c.	6.55c.

No.	lb.	Cokes	A	2A	3A	4A	5A	Prem.
22-24 Gage	per 100..	$6.25	$6.75	$7.00	$7.25	$7.75	$8.25	$8.75
18-21 Gage	per 100..	6.15	6.65	6.90	7.15	7.65	8.15	8.65
16-17 Gage	per 100..	6.05	6.55	6.80	7.05	7.55	8.05	8.55

Unassorted:
Any grade up to 195 lb. ..... Deduct 5c. Base
Heavier than 195 lb. sold unassorted only.
Extra cleaned cokes ..... Add 10c. Base
Best cokes ..... Add 30c. Base
Kanners special cokes ..... Add 40c. Base
Silvered tin ..... Add 50c. Base
Wasters:
Cokes, 112 lb. and lighter ..... Deduct 25c. Base
Cokes, 113 lb. and heavier ..... Deduct 35c. Base
Charcoals, 112 lb. and lighter ..... Deduct 25c. Base
Charcoals, 113 lb. and heavier ..... Deduct 50c. Base

Odd Size:
All weights up to 195 lb. and all sizes except 14 x 20 and 20 x 28 in lots of less than 100 base boxes ..... Add 10c. Base
All weights heavier than 195 lb. see "Quantity Extra."
Primes Only—Cokes:
All sizes in weights 55 lb. to 135 lb. ..... Add 10c. Base
All sizes in weights 136 lb. to 195 lb. .... Add 20c. Base
Charcoals, all sizes in weights 55 lb. to 195 lb. ..... Add 40c. Base
Quantity:
All sizes in weights 55 lb. to 195 lb. in lots of less than 50 base boxes ..... Add 10c. Base
All sizes in weights heavier than 195 lb. in lots of less than 5000 lb. ..... Add 5c. per 100 lb.
Packing:
Sizes which are usually packed 112 sheets per box that are specified 56 sheets.. Add 10c. Base
Fractions to be not less than ⅛ in.
Tin lined cases ..... Add 30c. Base
The minimum charge in any case to be 30c. per package.
Paper lined ..... Add 15c. Base
The minimum charge in any case to be 15c. per package.
Strapping:
Corners only, add 5c. per package.
Double strapping, add 10c. per package.

Ternes

8 lb.—100 lb.	$15.00 per pkg.
8 lb.— IC	15.30 per pkg.
12 lb.— IC	16.75 per pkg.
15 lb.— IC	17.75 per pkg.
20 lb.— IC	19.00 per pkg.
25 lb.— IC	20.00 per pkg.
30 lb.— IC	21.00 per pkg.
35 lb.— IC	22.00 per pkg.
40 lb.— IC	23.00 per pkg.
Weight: For IX	Add $1.80 per pkg.
Wasters: IC and lighter	Deduct 0.50 per pkg.
128 lb. and heavier	Deduct 1.00 per pkg.

Odd Size:
All weights and all sizes other than 14 x 20 and 20 x 28 in lots of less than 100 base boxes ..... Add 10c. Base
Quantity:
Items less than 50 base boxes..... Add 10c. Base

Long Ternes—8 lb. Coating

No. 30 gage	$7.00 per 100 lb.
No. 29 gage	6.75 per 100 lb.
No. 28 gage	6.50 per 100 lb.
No. 27 gage	6.35 per 100 lb.
No. 25-26 gage	6.20 per 100 lb.
No. 22-24 gage	6.05 per 100 lb.
No. 17-21 gage	5.90 per 100 lb.
No. 16 gage	5.75 per 100 lb.

Other grades at usual differentials.
Extras for sizes, etc., same as galvanized sheets.

Seconds	Deduct 50c. per 100 lb.
Unassorted	Deduct 10c. per 100 lb.
Primes only	Add 10c. per 100 lb.

Tin Mill Black Plate

Hot Rolled and Annealed, or Hot Rolled, 1-Pass Cold Rolled

Nos. 15-16	$4.80 per 100 lb.
Nos. 17-21	4.85 per 100 lb.
Nos. 22-24	4.90 per 100 lb.
Nos. 25-27	4.95 per 100 lb.
No. 28	5.00 per 100 lb.
Nos. 29-30	5.05 per 100 lb.
Nos. 30½-31	5.10 per 100 lb.
No. 32	5.15 per 100 lb.
No. 33	5.20 per 100 lb.
No. 34	5.25 per 100 lb.
No. 35	5.35 per 100 lb.
No. 36	5.45 per 100 lb.
No. 37	5.55 per 100 lb.
No. 38	5.70 per 100 lb.
Blued stove pipe stock	Add 10c. per 100 lb.
Enameling Stock	Add 25c. per 100 lb.
Full finished black plate	Add 25c. per 100 lb.
Show card stock	Add 35c. per 100 lb.
Tea tray stock	Add 40c. per 100 lb.
Milk can stock	Add 50c. per 100 lb.
Nickel plating stock	Add 50c. per 100 lb.

Extras for Tin Mill Black

Gage	Widths		Lengths	
Nos. 15 to 31	10 to 30	None	10 to 84	None
	Over 30 to 32	10c.		
	Under 10 to 6	15c.		
	Under 6 to 4	20c.		
Nos. 32 to 35	10 to 26	None	10 to 40	None
	Over 26 to 30	10c.	Over 40 to 48	5c.
	Over 30 to 32	20c.	Over 48 to 60	10c.
	Under 10 to 8	10c.	Over 60 to 72	20c.
	Under 8 to 5	15c.	Under 10 to 8	10c.
Nos. 36 to 38	10 to 20	None	10 to 30	None
	Over 20 to 24	5c.	Over 30 to 36	20c.
	Over 24 to 28	10c.	Over 36 to 42	25c.
	Over 28 to 30	20c.	Over 42 to 48	30c.
	Under 10 to 8	10c.	Under 10 to 8	10c.
	Under 8 to 5	15c.		

Nos. 39 to 40 — 10 to 20 None; Over 20 to 24 10c.; Under 10 to 8 15c.; Under 8 to 5 20c.; 10 to 28 None; Over 28 to 30 10c.; Under 10 to 8 15c.

Quantity: Items less than 5000 lb. 10c. per 100 lb.
Boxing: 10c. per 100 lb.
Oiling: Sizes up to 20 wide of 40 long 10c. per 100 lb.
Resquaring:
No. 28 and heavier—Ends ..... 10c. per 100 lb
Ends and Sides .... 12½c. per 100 lb.
Lighter than No. 28—Ends..... 12½c. per 100 lb.
Ends and Sides ..... 15c. per 100 lb.

One Pass Cold Rolled Black Sheets

STANDARD DIFFERENTIALS AND EXTRAS

Gage	Price Per 100 lb.
30	Add 20c.
29	Add 10c.
28 (Carload quantities)	Add Base
27	Deduct 5c.
25-26	Deduct 10c.
22-24	Deduct 15c.
17-21	Deduct 20c.
15-16	Deduct 25c.
13-14	Deduct 30c.
10-12	Deduct 35c.

Standard Sizes

Gages Nos. 12 to 30, inclusive, 24, 26, 28 and 30 in. wide, by 72, 84, 96 and 120 in. long. Gages Nos. 14 to 28, inclusive, 36 in. wide by 96 in. and 120 in. long.
See note under extras for boxing and crating.

Extras for Length

Gage	Length	Extra Per 100 lb
16 and heavier	60 in. and longer	Base
16 and heavier	Under 60 to 30 in	5c.
16 and heavier	Under 30 to 18 in	10c.
17 to 18	Over 60 to 120 in	Base
17 to 18	Over 120 to 132 in	5c.
17 to 18	Over 132 to 144 in	10c.
17 to 18	Under 60 to 30 in	5c.
17 to 18	Under 30 to 18 in	10c.
19 and lighter	Over 60 to 120 in	Base
19 and lighter	Over 120 to 144 in	10c
19 and lighter	Under 60 to 30 in	10c.
19 and lighter	Under 30 to 18 in	20c.

Extras for Width

Gage	Width	Extra Per 100 lb.
16 and heavier	24 in. and wider	Base
16 and heavier	Under 24 to 12 in	10c.
16 and heavier	Under 12 to 6 in	15c.
17 to 18	Over 24 to 36 in	Base
17 to 18	Over 36 to 48 in	5c.
17 to 18	Under 24 to 12 in	10c.
17 to 18	Under 12 to 6 in	15c.
19 and lighter	Under 24 to 12 in	10c.
19 and lighter	Under 12 to 6 in	20c.
19 to 21	Over 24 to 36 in	Base
19 to 21	Over 36 to 44 in	15c.
19 to 21	Over 44 to 48 in	25c.
22 to 24	Over 24 to 36 in	Base
22 to 24	Over 36 to 40 in	20c.
22 to 24	Over 40 to 48 in	40c.
25 to 27	Over 24 to 36 in	Base
25 to 27	Over 36 to 40 in	20c.
25 to 27	Over 40 to 44 in	40c.
28	Over 32 to 36 in	10c.
28	Over 36 to 40 in	40c.
29 to 30	Over 32 to 36 in	10c.

Galvanized Sheets and Long Terne Sheets

STANDARD DIFFERENTIALS AND EXTRAS FOR GAGE

Gage	Price Per 100 lb.
30	add 50c.
29	add 25c.
28 (carload quantities)	Base
27	deduct 15c.
25-26	deduct 30c.
22-24	deduct 45c.
17-21	deduct 60c.
15-16	deduct 75c.
12-14	deduct 90c.
10-11	deduct $1.00

Standard Sizes

Gages Nos. 12 to 30, inclusive, 24, 26, 28, 30 and 36 in. wide, by 72, 84, 96 and 120 in. long. Gages Nos. 14 to 28, inclusive, 36 in. wide by 96 in. and 120 in. long.

Extras for Length

Gage	Length	Extra Per 100 lb.
16 and heavier	60 to 144 in	Base
16 and heavier	Under 60 to 30 in	5c.
16 and heavier	Under 30 to 18 in	10c.
17 to 18	Over 60 to 120 in	Base
17 to 18	Over 120 to 132 in	5c.
17 to 18	Over 132 to 144 in	10c.
17 to 18	Under 60 to 30 in	5c.
17 to 18	Under 30 to 18 in	10c.
19 and lighter	Over 60 to 120 in	Base
19 and lighter	Over 120 to 144 in	10c.
19 and lighter	Under 60 to 30 in	10c.
19 and lighter	Under 30 to 18 in	20c.

Extras for Width

Gage	Width	Extra Per 100 lb.
10-15	Over 32 to 40 in	None
	Over 40 to 44 in	10c.
	Over 44 to 48 in	20c.
16-18	Over 32 to 36 in	None
	Over 36 to 44 in	10c.
	Over 44 to 48 in	20c.
19-21	Over 32 to 36 in	None
	Over 36 to 40 in	20c.
	Over 40 to 44 in	30c.
	Over 44 to 48 in	40c.
22-24	Over 32 to 36 in	None
	Over 36 to 40 in	20c.
	Over 40 to 44 in	40c.
	Over 44 to 48 in	60c.
25-26	Over 32 to 36 in	Base
	Over 36 to 40 in	30c.
	Over 40 to 44 in	60c.
27	Over 32 to 36 in	10c.
	Over 36 to 40 in	50c.
	Over 40 to 44 in	75c.
28	Over 32 to 36 in	20c.
	Over 36 to 40 in	60c.
29-30	Over 32 to 36 in	20c.
24 and heavier	Under 24 to 12 in	15c.
	Under 12 to 9 in	25c.
25 and lighter	Under 24 to 12 in	20c.
	Under 12 to 9 in	35c.

See note under boxing and crating.

Blue Annealed Sheets

STANDARD DIFFERENTIALS AND EXTRAS

Gage	Price Per 100 lb.
8 and heavier	Less 5c.
9 and 10 (carload quantities)	Base
11 and 12	Add 5c.
13 and 14	Add 10c.
15 and 16	Add 20c.

Extras for Length

Gage	Length	Extra Per 100 lb.
16 and heavier	60 in. and longer	Base
16 and heavier	Under 60 to 30 in	Add 5c.
16 and heavier	Under 30 to 18 in	Add 10c.

Extras for Width

Gage	Width	Extra Per 100 lb.
16 and heavier	Under 24 to 12 in	Add 5c.
16 and heavier	Under 12 to 6 in	Add 10c.
16 and heavier	24 in. and wider	Base

Painted and Formed Products

STANDARD DIFFERENTIALS AND EXTRAS

Extras per 100 lb. over corresponding gages of flat sheets per square are based on weight per square multiplied by extra per 100 lb.

Painting	*Gages* 29	25 to 28	19 to 24	12 to 18	Per 100 lb.
Red oxide of iron	$....	$0.25	$0.20	$0.15	....
Forming					
2-2½-3 and 5 in. corrugated	.05	.05	.05	.05	....
2 V-crimp — without sticks	.05	.05	.05	....	....
⅝-1¼-in. corrugated	.10	.10	.10	....	....
3 V-crimp — without sticks	.10	.10	.10	....	....
Pressed standing seam —with cleats	....	.15	.15	....	....
Plain roll roofing— with or without cleats	.15	.15	.15	....	....
Plain brick siding	.20	.20	....	....	....
Extras in Addition to Above					
Corrugating sheet crosswise	$0.10	$0.10	$0.10	$0.10	....
Curving — corrugated sheets, single curve	.25	.25	.25	.25	....
Curving — corrugated sheets, double curve	.50	.50	.50	.50	....
Forming sheets under 60 in. long to 30 in. inclusive	.05	.05	.05	.05	....
Forming—Sheets under 30 in. long to 20 in. inclusive	.10	.10	.10	.10	....
Forming—Sheets under 20 in. long	.25	.25	.25	.25	....

Lengths—Standard lengths of all forms are 60, 66, 72, 78, 84, 90, 96, 102, 108, 114, 120, 132 and 144 in. Flat sheets extras will apply on lengths over 132 in.
Sticks for V-crimp roofing, 25c. per 100 lin. ft.

Standard Miscellaneous Extras

Shearing Circles, All Gages

9 to 10 gage	Add 25 per cent
11 to 16 gage	Add 30 per cent
17 to 18 gage	Add 35 per cent
19 to 20 gage	Add 40 per cent

Prices on circles lighter than No. 20 will be quoted on application. Prices of finished circles to be determined by adding the percentage extra to the price of the finished rectangle.

Resquaring

5 per cent of price of sheet at time of resquaring.

Patent Leveling

25c. per 100 lb.

Inspection

Special inspection by buyer, 10c. per 100 lb.

Extras for Boxing and Crating

	Per Cwt. Net Weight of Sheets
Skeleton crates	$0.40
Skeleton crates, felt lined	.50
Tight boxes, unlined	.60
Tight boxes, felt lined	.70
Bundled with felt edge	.10

Crating extras are based on crates containing 500 to 600 lb. For any material packed lighter or heavier than 500 to 600 lb. per crate, an extra charge will be made.

NOTE—On all sizes, other than standard, when specified in quantities of less than 4000 lb. to the item, prices will be quoted on application.

Miscellaneous

	Extra Per 100 lb
Full cold rolled and annealed	$0.15
Single pickled, cold rolled and annealed	.40
Single pickled, and oiled or limed	.35
Hot rolled, pickled and annealed	.35
Full pickled, full cold rolled and annealed	.60
Blue stovepipe stock	.15
Range steel to manufacturers	.30
(If patent leveled)	.55
Blue range steel	.50
(If patent leveled)	.75
Deep stamping or drawing	.25
Extra deep stamping or drawing	.50
Patent or stretcher leveling	.25
Oiling	.10
Lime finish	.10
Deoxidizing	.15
P. A. C. R. and reannealed for tinning	.50
Bow socket stock	.50
Shovel stock carbon 0.25 to 0.40	.10
Milk can stock	.50
Roller leveling	.10
Extra box annealing	.15
Long ternes, special finish	.50

Chain

Base price for ⅜-in. common steel proof coil chain, self-colored or blacked, per 100 lb. f.o.b. Pittsburgh, $8.

Extras

Sizes For	5/16	1/4	3/16 In.
Add	55c.	$1.55	$4.10 per 100 lb.

For	7/16	1/2, 9/16	11/16, 5/8	13/16, 3/4	15/16, 7/8	1 In.	1 1/16, 1⅛, 1¼
Deduct	15c.	30c.	40c.	50c.	60c.	70c.	60c.

For twist link—Sizes 3/16 to 7/16 in. inclusive, add 50c. per 100 lb. For bright coil chain—Add 25c. per 100 lb.

Sizes	3/16 and ¼ In.	5/16 and Larger
For B B quality	$1.25	Advance over proof quality $1.00 per 100 lb.
For B B B quality	$1.75	Advance over proof quality $1.50 per 100 lb.

Iron Chain: For iron chain, add as follows to price of regular coil:

3/16	$2.00	5/8	.50
¼	1.50	3/4	.35
5/16	1.00	7/8	.35
⅜	.75	1 in.	.30
7/16	.75	1¼, 1¼	.25
½, 9/16	.50		

Cold Rolled Strip Steel

Base price $6.50 per 100 lb. for 1½-in. and wider, 0.100 in. and thicker, hard temper, in coils, under 0.20 carbon. Extras to be added to base for size, annealing, cutting, packing, etc., as follows:

Standard Extras—In effect Oct. 25, 1917.

Extra for Thickness

0.100-in. and thicker	Base
.050 to 0.099	$0.20
.035 to .049	.45
.031 to .034	.60
.025 to .030	.80
.020 to .024	1.10
.017 to .019	2.10
.015 to .016	2.65
.013 to .014	3.30
.012	3.95
.011	4.20
.010	4.65

Extra for Narrow Widths

Under 1½ In. to 1 In. Inc.

0.100 and thicker to 0.035	$0.25
.034 to .020	.40
.019 to .010	.50

Under 1 In. to ½ In. Inc.

.100 and thicker to .035	.45
.034 to .020	.60
.019 to .010	.70

Extra for Cutting to Length

24 In. and Longer

1-in. and wider:

0.100 and thicker	$0.15
.099 to 0.035	.25
.031 to .034	.40
.025 to .030	.55
.020 to .024	.70
.015 to .015	1.50
.013 to .014	2.00
.012 to .010	Coils only

For cutting to lengths under 24 in. triple extras will be added.

Extra for Wide Widths

Wider than 6 in., not over 9 in.—

0.031 to 0.030	$0.15
.025 to .024	.25
.017 to .016	.50
.013 to .010	*

Wider than 9 in., not over 12 in.—

.035 to .030	.40
.025 to .024	.60
.017 to .019	.75
.015 to .010	*

Wider than 12 in., not over 15 in.—

.036 to .049	.25
.035	.50
.031 to .034	.60
.026 to .030	.75
.025	*
.017 to .010	*

*Extras quoted on application.

Boxing or wrapping, 0.15 extra. Minimum charge, 0.50

Extra for Annealing

0.100 and thicker	$0.45
.050 to 0.099	.45
.035 to .049	.55
.034 to .020, Inc	.70
.019 to .010, Inc	No extra for temper

Extras for Small Quantities

On orders or contracts for 18 tons or more, add extras only on items of less than 2000 lb.

3 to less than 18 tons of one size	$0.10
1 to less than 3 tons of one size	.25
1000 to less than 2000 lb. of one size	.40
500 to less than 1000 lb. of one size	1.00
300 to less than 500 lb. of one size	2.00
200 to less than 300 lb. of one size	3.00
100 to less than 200 lb. of one size	5.00

Orders for less than 100 lb. of one size will be accepted only at the full value of 100 lb. Extra for gages lighter than 0.010 quoted on application.

Note.—The charge for cutting to length does not relieve buyer from scrap loss, and short pieces left from cutting will be shipped and invoiced at price of long lengths. If lengths over 36 in. are ordered and no short pieces taken, add 10 per cent to net price.

Hot Rolled Finished Strip Steel

Base, f.o.b. Pittsburgh, per 100 lb $4.50

Unfinished Hot Rolled Steel for Cold Rolling

Base, f.o.b. Pittsburgh, per 100 lb $3.50

Both subject to following list of extras and differentials:

Hot Rolled Finished Strip Steel

Under 0.20 Carbon

In coils, or cut to lengths 4 ft. to 16 ft., including shorter pieces that accrue in cutting.

Width	6-in. and Narrower	6 1/16-in.-10-in.	10 1/16-in.-15-in.	15 1/16-in. and Wider	Slitting	Pickling
Gage 12 and heavier	Base	.10	.20	.30	.25	.25
13 gage	.10	.20	.30	.40	.25	.30
14 gage	.20	.30	.40	.50	.25	.35
15 gage	.30	.40	.50	...	.40	.40
16 gage	.40	.50	...	...	.40	.45
17 gage	.50	.60	...	...	.40	.50
18 gage	.60	.70	...	...	.55	.55
19 gage	.70	...	...	...	.55	.60
20 gage	.80	...	...	...	.55	.65

Cutting to lengths without end pieces ..... 10 per cent extra
Cutting to lengths 2-ft.-4-ft ..... 10c. per 100 lb. extra
Annealing ..... 30c. per 100 lb. extra

Quantity Extras

Less than 2000 lb. to 1000 lb. inc ..... 15c. per 100 lb. extra
Less than 1000 lb ..... 35c. per 100 lb. extra

Terms: F.o.b. Pittsburgh. Half of 1 per cent discount for cash in ten days from date of invoice.

Light Rails

Base, per 100 lb., f.o.b. maker's mill, including 10 per cent short lengths, down to and including 24 ft $3.00

Subject to following list of extras and differentials for size, quantity, etc.:

Extras for Size

	Per 100 lb. Extra
25 lb. to 45 lb. per yd., inclusive, full carload lots	Base
16 lb. and 20 lb. per yd., full carload lots	$0.045
12 lb. and 14 lb. per yd., full carload lots	.090
8 lb. and 10 lb. per yd., full carload lots	.135

Extras for Quantity

For less than carload lots, down to and including 5 gross tons	$0.045
For less than carload lots, under 5 gross tons	.09

Extras for Length

Special lengths down to, but not including, 12 ft	$0.09
Special lengths 12 ft. and under	.225
For all 30-ft. lengths	.045

Extras for Bond Drilling and Notching

Bond drilling, one hole in each end of web	$0.045
Bond drilling, two holes in each end of web	.090
Bond drilling, one hole in each end of flange	.090
Bond drilling, two holes in each end of flange	.18
Notching	.023

The Embargo on Automobile Alloy Steel

WASHINGTON, Nov. 20.—It is expected that the Automobile Industries Committee will make a report to the War Industries Board during the coming week concerning the minimum amount of chrome steel which the industry should be allowed, to produce a reasonable number of passenger cars and as to the kinds and quantities of war material which automobile plants can supply with the facilities that will be diverted from the manufacture of pleasure cars. This committee, which includes A. W. Copeland, Detroit Gear & Machine Co., chairman; John R. Lee, Ford Motor Co., and Hugh Chalmers, Chalmers Motor Co., has established offices in this city and is making a careful canvass of all manufacturers in the industry.

The original embargo order directed by the War Industries Board, cutting off entirely shipments of chrome steel for the manufacture of pleasure cars, has been modified pending the report of the Automobile Committee, leaving the distribution of this alloy steel in the hands of J. Leonard Replogle, director of steel supply. The War Industries Board has intimated that the Automobile Committee must cut the amount of chrome steel to be used in pleasure cars to less than 40 per cent, and has suggested that the amount used should not exceed 20 per cent of the present consumption. It is believed, however, that the board will permit a gradual reduction and will not insist upon an immediate cut to the minimum. W. L. C.

OBITUARY

ORLANDO MILLER, age 69, and for many years purchasing agent of the Westinghouse Electric & Mfg. Co., East Pittsburgh, died at his home in Edgewood, near Pittsburgh, on Saturday, Nov. 17. He was connected with the Westinghouse interests for 34 years and most of that time was purchasing agent. He was a member of the Pittsburgh Athletic Association, Duquesne Club, and the Westinghouse Veterans' Association. He is survived by his widow and one son.

ABRAHAM W. STEHMAN, president and treasurer of the B. C. Bibb Stove Co., Baltimore, Md., died on Nov. 9 at his home, aged 78 years. Mr. Stehman became associated with the Bibb concern a great many years ago and in 1894 succeeded the late B. C. Bibb as president.

WILLIAM MOLTRUP, a leading stockholder of the Moltrup Steel Products Co., Beaver Falls, Pa., died suddenly, Monday evening, Nov. 5, in the Pennsylvania Station, Pittsburgh, from heart trouble. He is survived by his widow, two sons and one daughter.

A special appeal for skilled men is being made by the aviation section of the Signal Corps, U. S. A. Office clerks, as well as mechanics are included in a list of 48 vocations. For particulars one should address the Volunteer Bureau, 119 D Street, N. E., Washington, D. C.

The E. I. DuPont DeNemours Co., Wilmington, Del., is preparing to erect a two-story clubhouse, 30 x 72 ft., containing 13 sleeping rooms, dining room, kitchens, etc., for the use of employees of its powder plant at Barksdale, near Washburn, Wis.

The erection of the new steel plant at Ymuiden, Holland, has been deferred until after the war. The Government is to take one-third of the shares, while the other shareholders will be Dutch subjects.

Japan Insists on Better Terms in the Plate and Vessel Deal

WASHINGTON, Nov. 20.—Negotiations between the War Trade Board and the Japanese Government for the transfer to the transatlantic trade of a number of Japanese cargo ships in exchange for the release from embargo of a large quantity of ship plates intended for Japanese yards have been broken off by the refusal of the Japanese officials to accept the Shipping Board's offer for the vessels in question. It is believed negotiations will be renewed, possibly on a different basis, and that the United States will ultimately get the ships and the Japanese shipbuilders the plates.

When this matter was first taken up at the instance of the Japanese Government, which was exceedingly anxious that the shipbuilders of Japan should secure adequate supplies of plates in this country, it was proposed by the Shipping Board to lift the embargo on 100,000 tons of plates in consideration of the placing by Japan in the transcontinental trade, under lease or otherwise, of a dozen or more large cargo vessels. Count Ishii, who conducted the negotiations for the Japanese Government, proposed to sell a certain number of ships to the United States instead of leasing them. This proposition was favorably considered by the Shipping Board, which finally offered $175 per ton for any amount of tonnage and agreed to release 100,000 tons of steel. The Japanese Government has since received offers of $300 per ton for several of the ships in question and has therefore declined the tender of the Shipping Board. In a semi-official cablegram from Tokio it is stated that "America's demand for Japanese shipping in return for the concession would virtually destroy Japan's European trade, and while Japan's assistance to her allies will be freely offered, it cannot reach the extent of infringing upon the necessities of her national existence."

The price fixed by the Shipping Board for the Japanese vessels is a maximum figure and it is understood has not been exceeded in any of the contracts taken over for commandeered ships now building in American yards. It is a well-known fact that the cost of construction in the Japanese yards has been substantially less than that prevailing in this country, and was very much lower at the time when the vessels the subject of current negotiations were built. It is quite probable that Japan will ultimately accept a compromise figure from the United States, but it is possible that a larger quantity of ship plates may be insisted upon.

Buys Ingot Mold Department

The Marshall Foundry Co., Pittsburgh, has purchased the stock ingot molds and ingot mold department of the Pittsburgh Iron & Steel Foundries Co. at Midland, Pa. The equipment will be divided between the two ingot mold plants of the Marshall Foundry Co. at Pittsburgh and Josephine, Pa. The acquisition of this department will give the Marshall Foundry Co. an output of about 350 tons of ingot molds at its Pittsburgh works and about 700 tons at its Josephine works, these ranging from 1600 lb. up to 60 tons in weight. Some time ago the Marshall Foundry Co. bought the ingot mold equipment of the Edgewater Steel Co. at Oakmont, Pa., and moved it to its two other plants.

Scrap Board Protests

Reports that sales of some grades of scrap have been made in excess of the Government price have caused the American Board of Scrap Iron Dealers to issue a letter to the trade, advising that this practice, if being indulged in, should be stopped at once and intimating that unless it is the Government will take action to see that it is stopped and punishment provided. Various forms of evasion are being vigorously denounced by reputable scrap dealers.

PERSONAL

John Price Jackson, Commissioner of Labor, Pennsylvania, has been commissioned a major in the United States Army engineers' reserve, and has relinquished his duties under leave of absence. He will be succeeded by L. R. Palmer, chief inspector, as acting commissioner.

Edwin G. Pierce, recently appointed consulting chemist by the Republic Motor Truck Co., Alma, Mich., has completed the equipment of a branch commercial laboratory in that city, which is under the direct supervision of Clyde S. Morgan.

H. M. Fitz has entered the service of the Davenport Locomotive Works, Davenport, Iowa, in the capacity of production engineer.

R. L. Browne, who for the past 15 years has been identified with the electrical and mechanical engineering profession, has recently become associated with the sales department of the Goldschmidt Thermit Co., New York, in the capacity of commercial engineer, after having spent several months in the foundry of that company acquiring a practical knowledge of the Thermit process of welding.

Wilber O. Platt has been elected president of the Joseph Reid Gas Engine Co., Oil City, Pa., succeeding the late Mr. Reid, with whom he was associated for years, latterly for some time being vice-president and superintendent of the company.

Herbert D. Tremper who was recently elected a vice-president of the Federal Export Corporation, New York, has just returned to the United States from France where he has had active supervision of the European branches of the corporation. He made a close study of engineering and manufacturing conditions in France.

Charles C. Tyler, vice-president Remington Arms Union Metallic Cartridge Co., has been placed in charge of all the manufacturing plants of the company, with headquarters in New York.

Edwin H. Williams, foreman of the screw machine department of the Colt's Patent Fire Arms Mfg. Co., Hartford, Conn. was tendered a complimentary dinner at the Hartford Club, Nov. 14, by the executives and foremen in honor of the completion of sixty years of service with the company. Vice-president S. M. Stone, presented Mr. Williams with a purse of gold and a gold watch and chain. Vice-president B. M. W. Hanson and Maj. J. M. Gilbert, U. S. A., were other speakers.

L. R. Brink, superintendent of Barnhart Brothers & Spindler, Chicago, has resigned to accept the position of general manager of The Fort Dearborn Mfg. Co., Sterling, Ill., manufacturer of special machinery, gears and metal stampings.

John A. Green has been appointed superintendent of the steel foundry of the Pittsburgh Crucible Steel Co., Midland, Pa.

Howard G. Benedict has become works manager of the Glenn L. Martin Co., Cleveland, which will shortly begin the construction of airplanes. He was formerly associated in a similar capacity with the Aeromarine Plane & Motor Co., Keyport, N. J., and previously was connected with various automobile and other plants as consulting engineer on factory management.

Willard A. Van Brunt, one of the founders and for many years president of the Van Brunt Mfg. Co., maker of agricultural implements, Horicon, Wis., has resigned because of advanced age. The officers elected at the annual meeting are: President, John Bodden; vice-presidents, A. W. Wilcox and G. W. Mixter; secretary, Harry Marsh; treasurer and general manager, F. H. Clausen. The company is controlled by the John Deere interests of Moline, Ill.

L. T. Harper, representing the Byron Jackson Iron Works, San Francisco, will leave about Dec. 1 for India, where he will spend 18 months establishing agencies for his company and introducing its pumps.

D. W. Dodge, Pacific Coast manager of the Koppel Sales Co., Inc., is in the East on business. He will be away from home about a month and will visit the iron and steel centers before he returns.

W. O. Renkin, for two years chief engineer of the A. M. Byers Co., Pittsburgh, has resigned to become manager of the engineering department of the Quigley Furnace Specialties Co., 26 Cortlandt St., New York, which specialize in powdered coal equipment. Previous to his connection with the Byers Co., Mr. Renkin spent several years as resident engineer in charge of the organization and construction of the works of the Tata Iron & Steel Co., Sakchi, India.

A. J. Stacey, traffic department, Trussed Concrete Steel Co., Youngstown, Ohio, has been given a position in the United States Ordnance Department. In his new work, he will be connected with the traffic department of Langley aviation field, Hampton Roads, Va. The Trussed Concrete Steel Co., has furnished material for much of the new construction at Langley field.

E. A. Hawks, has been appointed special representative of the Youngstown Steel Car Co., Youngstown, Ohio, in the Detroit territory, and will have his offices in the Dime Bank Bldg., in that city.

J. A. Shorey, General Electric Co., is to address the Engineers' Club of Trenton, N. J., on Thursday evening, Nov. 22, on centrifugal blowing engines.

C. H. Van Dyke has been elected vice-president of the Manown Mfg. Co., Pittsburgh, to succeed H. A. Sechrist, who resigned to become associated with the Mt. Union Refractories Co., Mt. Union, Pa. The Manown Mfg. Co, makes sleeves, nozzles and runner brick.

Edson S. Harris, for seven years with the Midvale Steel Co. as export manager, secretary of the London company and for the past two years district manager of sales in Philadelphia, resigned Nov. 1 and has organized the Philadelphia Steel Products Co. with himself as president and E. M. Taussig, who was his assistant with the Midvale Steel Co., as vice-president and J. N. Wilkins as secretary-treasurer. Mr. Harris has been appointed the Philadelphia representative of the Wellman-Seaver-Morgan Co., Cleveland, which has taken large contracts for the manufacture of condensers, uptakes, stacks and steering engines for submarine destroyers being built by the William Cramp & Sons Ship & Engine Building Co., the New York Shipbuilding Corporation and the Newport News Shipbuilding & Dry Dock Co. The Philadelphia Steel Products Co. will also engage in a general brokerage business in steel products and after the war will establish foreign connections.

Alexander C. Brown, vice-president and general manager of the Brown Hoisting Machinery Co., Cleveland, has been called to Washington to take full charge of the locomotive crane department of the Government. He will be in the department of R. S. Brookings, commissioner of finished products, and will seek to increase the production by distributing locomotive crane orders in plants doing other classes of work but which are fairly well fitted for building cranes. The locomotive crane requirements of the Government and various war industries, including the shipyards, are very heavy, and the capacity of the plants regularly engaged in such work is not sufficient to meet the demand.

Joseph McKay, Jr., for 13 years with the Wheeler Condenser & Engineering Co. and for the past two years with the Pittsburgh Valve, Foundry & Construction Co., has been appointed general sales manager of the Deschanel Engineering Corporation, 90 West Street, New York.

The United States Shipping Board announces that Homer L. Ferguson, president and general manager of the Newport News Shipbuilding and Dry Dock Company, will probably head a staff of practical shipbuilders soon to be named to serve with the Emergency Fleet Corporation. Mr. Ferguson is one of the foremost shipbuilders of the country and it is understood there will be associated with him two other experienced builders, the three being charged with the duty of supervising all the technical work for construction. These appointments will complete the reorganization of the fleet

corporation under Charles Piez, its vice-president, and every effort will now be turned toward quantity production.

J. C. Holding, for 15 years in the bureau of structural shapes and plates, general sales department, Carnegie Steel Co., Pittsburgh, has resigned, effective Dec. 1, and will enter the general sales department of the Midvale Steel & Ordnance Co., Philadelphia, and will be associated with J. C. Neale, general manager of sales. Mr. Holding's first business connection was with the Keystone Bridge Works, Pittsburgh, in 1896, and six years later he went into the sales department of the Carnegie Steel Co., where he has been located ever since.

Daniel Willard, president of the Baltimore & Ohio Railroad and head of the advisory committee of the Council of National Defense, has been appointed by President Wilson as chairman of the War Industries Board to succeed Frank A. Scott, who was recently forced to resign on account of ill-health. Mr. Willard was one of the first of the many prominent business men of the country to volunteer his services to assist the Government in the prosecution of the war and for many months past has spent the greater part of his time in Washington.

Star and Crescent Furnace Sold

The plant of the Star and Crescent furnace at Rusk, Tex., is to be removed to Collinwood, Tenn., by the Tennessee Valley Iron & Railroad Co., which has bought the complete plant, including buildings, stoves, engines, rails and other equipment. Plans for further development include the installation at once of brickmaking machinery and the building of 60 charcoal kilns of 80-cord capacity, which will be followed by the erection of a modern wood distillation plant of 150 to 200 cords capacity. Improvements already existing at the Collinwood location include saw mills, planing mill, etc., and 18 miles of standard gage railroad connecting Collinwood at Iron City with the Florence and Sheffield branch of the Louisville and Nashville system. The company at the Collinwood location owns about 85,000 acres of land in Wayne and Hardin counties containing deposits of brown ore and covered with a large amount of hardwood timber, which assures an unlimited supply of fuel. The completed plant will, it is planned, produce large quantities of wood alcohol, acetate of lime, etc. The furnace will be operated on charcoal and as reconstructed will have a capacity of 100 tons per day. It is hoped to have the plant in operation by March 1, 1918. Dismantling is already under way and shipments of material have begun.

The Tennessee Valley Iron & Railroad Co. officers are: C. N. Brady, president; Thomas S. Bailie, vice-president; R. D. Baker, secretary and treasurer. Among the stockholders are those named and also the estate of J. W. Bailie, the Empire Lumber Co. and D. L. Gillespie of Pittsburgh; H. B. Duncan and E. C. Stewart of Washington, Pa.; Nelson C. Hubbard, W. P. Hubbard and J. C. McKinley of Wheeling, W. Va. The sale of the Rusk plant was negotiated with the new owners by William Yule of the Pioneer Coal & Coke Co. of St. Louis.

Fabricators to Discuss War Problems

A meeting of structural steel fabricators has been called, to be held at the William Penn Hotel, Pittsburgh, Nov. 27. It is understood that besides building and bridge fabricators, fabricators of plates are included, and that matters in relation to the Government needs are to be discussed.

Graham furnace of the Pocahontas Pig Iron Corporation at Graham, Va., which is operated by John B. Guernsey & Co., Inc., was blown in last week on spiegeleisen, which it will produce until about Jan. 1, when the furnace will be burdened for ferromanganese. The entire output for the greater part of the coming year will be taken under a conversion contract by New York and Philadelphia interests.

PRESIDENT IS FIRM

Will Not Permit Strike to Stop Operation of the Railroads

WASHINGTON, Nov. 20.—The placing in President Wilson's hands of the interests of the railroads in the effort to avert a strike for higher wages by engineers, conductors, trainmen and brakemen; definite threats from the War and Navy Departments that if the existing freight congestion continues to delay the production of munitions in the war factories the supreme authority of the Government will be invoked to remedy the present highly dangerous situation; the closing of arguments in the Eastern railroads' 15 per cent advance rate case before the Interstate Commerce Commission, and circumstantial reports to the effect that the Joint Congressional Committee on Interstate Commerce will report early in December in favor of some form of Government ownership or possibly of temporary Federal co-ordination and control of all the carriers, have been among the important developments of the past week. While refraining from any public statement on the subject, the President has plainly intimated to several prominent men who have consulted him that he will not permit any interruption of transportation but will invoke all the authority vested in the Government under its supreme power to wage war to prevent the national disaster that would certainly follow a tying up of the railroads.

The questions at issue between the railroad managers and the brotherhoods will probably be brought to a head within a few days. The President will meet the brotherhood leaders in conference here on Thursday, and it is understood will urge the submission of the question of higher wages to Federal arbitration. The brotherhood leaders, while expressing their willingness to submit the matter to some form of mediation, have refused an unconditional submission to any existing arbitration tribunal.

The brotherhood officials have already presented their case informally in discussions with Judge William L. Chambers, chairman of the United States Board of Mediation and Conciliation, who has acted as President Wilson's representative in preliminary conferences with both sides. The labor officials declare that increased wages "are necessary to maintain the operating personnel of the roads against the inducements of higher wages paid in other industries which have Government contracts" and that "recruiting of railroad regiments for service in France, enlistment in the army and the operation of the draft law also have aided in depleting the number of highly trained railroad men."

Prices on By-Product Coke

The Fuel Administration in Washington has announced fixed prices for by-product coke, which are as follows: $6 for run of oven; $7 for selected foundry; $6.50 for crushed oven over one-inch size. Except for the by-product coke produced in New England, maximum prices of each grade f.o.b. point of production shall be the sum of the base price for the grade and the freight rate from the competing bee-hive coke district, which takes the lowest rate to the point where such by-product coke is used. The maximum prices for gas coke for industrial uses shall be fixed at the price established by the Fuel Administration for the corresponding grade produced in by-product ovens. Commenting on the fixing of prices, the Fuel Administration points out that the prices for by-product coke are made the same as those for bee-hive coke to stimulate production of by-product coke and the coal tar products involved in such production for war purposes.

The Canadian Government has placed an embargo on the shipment of iron and steel from Canada save in exceptional cases in which licenses may be granted by the Customs Department. This action is due to the great shortage of these commodities for munitions, shipbuilding and other operations.

SHORT HOURS FAVORED

Administration Announces Policy Regarding Treatment of Labor

WASHINGTON, Nov. 20.—An important pronouncement of the Administration's policy as to the treatment of labor is contained in a summary of an extraordinary general order entitled "Suggestions for Arsenal Commanders and Manufacturers," just made public by the War Department. The order, while not mandatory in terms, is designed especially for the government of private establishments making munitions and other war material and provides a code of shop rules that includes not only hours of labor, wage standards, holidays, etc., but also sanitation of plants, temperature control, and restrictions upon the employment of women and children. The summary follows:

While circumstances are not such as to render appropriate the issuance of definite orders upon this subject at the present time, the following suggestions are commended to the careful consideration of arsenal commanders and manufacturers executing orders for this department.

In view of the urgent necessity for a prompt increase in the volume of production of practically every article required for the conduct of the war, vigilance is demanded of all those in any way associated with industry, lest the safeguards with which the people of this country have sought to protect labor should be unwisely and unnecessarily broken down. It is a fair assumption that for the most part these safeguards are the mechanisms of efficiency. Industrial history proves that reasonable hours, fair working conditions and a proper wage scale are essential to high production. During the war every attempt should be made to conserve in every possible way all of our achievements in the way of social betterment.

In the preparation of the following memorandum no effort has been made to establish, or even to suggest, definite rules of conduct. The memorandum presents what may be considered a fair—if tentative—basis of action.

The department wishes to be assured that schedules of hours obviously excessive, or wage scales distinctly unfair, or working conditions such as should not be tolerated, will certainly be brought to its attention.

HOURS OF LABOR

Daily hours.—The day's work should not exceed the customary hours in the particular establishment or the standard already attained in the industry and in the community. It should certainly not be longer than 10 hours for an adult workman. The drift in the industrial world is toward an eight-hour day as an efficiency measure. It has also been shown that hours of labor must be adapted to the age and sex of the worker, and the nature of the occupation.

Overtime.—The theory under which we pay "time and a half" for overtime is a tacit recognition that it is usually unnecessary and always undesirable to have overtime. The excess payment is a penalty and intended to act as a deterrent. There is no industrial abuse which needs closer watching in times of war.

Shifts in continuous industries.—Eight hours per shift should be a maximum in continuous twenty-four-hour work.

Half holiday on Saturday.—The half holiday on Saturday is already a common custom in summer, and it is advantageous throughout the year, especially if the work day be ten hours long the other days of the week. The working period on Saturday should not exceed five hours. An occasional shift of two or three hours on Saturday afternoons is unobjectionable, if essential, but the additional hours should be regarded as overtime and paid for on that basis.

Hours posted.—It is desirable that the hours of labor for every tour should be posted.

Holidays.—The observance of national and local holidays will give opportunity for rest and relaxation which tend to make production more satisfactory.

One day of rest in seven.—One day of rest in seven should be a universal and invariable rule.

STANDARDS IN WORKROOMS

Protection against hazards and provisions for comfort and sanitation.—Existing legal standards to prevent danger from fire, accident, occupational diseases, or other hazards, and to provide good light, adequate ventilation, sufficient heat, and proper sanitation should be observed as minimum requirements.

Location of toilets.—All toilets should be sanitary and readily accessible.

Extreme temperatures.—Those processes in which workers are exposed to excessive heat—that is, over 80 degrees—or excessive cold—that is, under 50 degrees—should be carefully supervised so as to render the temperature conditions as nearly normal as possible. When extreme temperatures are essential, workers should not only be properly clothed but avoid sudden changes.

Lights.—If any light is at the level of the worker's eyes, it should be so shaded that its rays will not directly strike the eyes.

WAGES

Wage standards.—Standards already established in the industry and in the locality should not be lowered. The minimum wage rates should be made in proper relation to the cost of living, and in fixing them it should be taken into consideration that the prices of necessities of life have shown great increases.

NEGOTIATION BETWEEN EMPLOYERS AND EMPLOYEES

The need of preserving and creating methods of joint negotiations between employers and groups of employees is especially great in the light of the critical points of controversy which may arise in a time like the present. Existing channels should be preserved and new ones opened, if required, to provide easier access for discussion between an employer and his employees over controversial points.

STANDARDS FOR EMPLOYMENT OF WOMEN

Hours of labor.—Existing legal standards should be rigidly maintained, and even where the law permits a nine or 10-hour day, effort should be made to restrict the work of women to eight hours.

Prohibition of night work.—The employment of women on night shifts should be prevented as a necessary protection, morally and physically.

Rest periods.—No women should be employed for a longer period than four and a half hours without a break for a meal, and a recess of 10 minutes should be allowed in the middle of each working period.

Time for meals.—At least 30 minutes should be allowed for a meal, and this time should be lengthened to 45 minutes or an hour if the working day exceeds eight hours.

Place for meals.—Meals should not be eaten in the workroom.

Saturday half holiday.—The Saturday half holiday should be considered an absolute essential for women under all conditions.

Seats.—For women who sit at their work, seats with backs should be provided unless the occupation renders this impossible. For women who stand at work, seats should be available and their use permitted at regular intervals.

Lifting weights.—No woman should be required to lift repeatedly more than 25 pounds in any single load.

Replacement of men by women.—When it is necessary to employ women in work hitherto done by men, care should be taken to make sure that the task is adapted to the strength of women. The standards of wages hitherto prevailing for men in the process should not be lowered where women render equivalent service. The hours for women engaged in such processes, of course, should not be longer than those formerly worked by men.

Tenement house work.—No work shall be given out to be done in rooms used for living purposes or in rooms directly connected with living rooms in any dwelling or tenement.

STANDARDS FOR EMPLOYMENT OF MINORS

Age.—No child under 14 years of age shall be employed at any work under any conditions.

Hours of labor.—No child between the ages of 14 and 16 years shall be employed more than eight hours a day or 48 hours a week, and night work is prohibited.

Federal child labor law.—These and other provisions of the Federal child labor law must be strictly observed.

Minors under 18—Minors of both sexes under 18 years of age should have the same restrictions upon their hours as already outlined for women employees.

Liberty Bond Sales

The recently organized Auxiliary Council of National Defense of the United Alloy Steel Co., Canton, Ohio, made a fine record in the last Liberty bond sale by selling $247,000 worth to subscribers, representing 95.16 per cent of the employees.

The subscriptions made by the employees of the principal plants of the Link-Belt Co., and by the company itself, amounted to $269,000, divided as follows: Indianapolis, $104,300; Philadelphia, $71,300; Chicago, $61,100; Link-Belt Co., $32,300.

The subscription of the Vanadium-Alloys Steel Co., Pittsburgh, for the second Liberty loan amounted to the handsome total of $514,000.

TOLUOL FROM CITY GAS

Manufacture to Be Conducted on Extensive Scale for Government

About two years ago, there was great interest manifested in the discovery of a process for making toluol from crude oil, and claims were made that while the production was not strictly a commercial one, still in a National emergency, this process was the great back log and when the need came, the material could be rapidly produced. The emergency has arrived, and the Nation needs millions of gallons of toluol for itself and Allies. In the meantime, there has been going on without any publicity a development in toluol manufacture which bids fair to be of the utmost importance to the Nation in the supply of tri-nitro-toluol. Early in 1915, the Koppers Co. of Pittsburgh, which at that time was building a large number of by-product coke plants, and in connection with which it was also building benzol and toluol plants, started in the laboratories at the Mellon Institute, Pittsburgh, an investigation into the recovery of toluol from carbureted water gas, the gas made in all the large cities of the country by the gas companies for domestic use.

Experiments were started in a number of plants and it was successfully demonstrated that in this process there was a virgin field for the recovery of large quantities of toluol. The conditions existing in water gas plants were very different from those in by-product coke plants, and special apparatus and special methods had to be devised for the successful recovery of toluol. About this time, the Pittsburgh By-Product Coke Co. was organized, an operating company, associated with the Koppers Co., and a plan was formed in conjunction with the gas light company at Washington, to erect the first plant at the West station of that company, to effect the removal of toluol from 5,000,000 cu. ft. of carbureted water gas per day. This plant was placed in operation on July 14, 1916, since which date there has been secured approximately 200,000 gallons of toluol. While this plant was the first to use this process, and many improvements increasing the efficiency and economy of operation have been introduced, the first plant was so designed that it has proved to be a commercial and technical success, equaling the results promised by the laboratory methods. Since that time, the Koppers Co. has built a number of these plants, as follows: two plants at Newark, N. J., one at Paterson, N. J., one at Jersey City, N. J., two plants at Trenton, N. J., two at Rochester, N. Y., one at Chicago, and one at Evanston, Ill.

Now that the Government has found what an enormous amount of toluol is required and that the tri-nitro-toluol is the most efficient and most satisfactory explosive, the Ordnance Department of the U. S. Army has taken hold of the situation. It finds that every by-product coke oven plant in the country is or has arranged to produce toluol to the utmost capacity, and that the remaining needed toluol must be secured from city gas. Seventy-two plants are available for this recovery distributed over the entire country. Last week, the Koppers Co. arranged with the Government to build "stripping" plants in a number of large cities, and many more are being designed and estimated upon. The plans for securing toluol from these sources involve the use of excess refining capacity in all the by-product coke plants of the country. It is fortunate that in the present National emergency there exists in America a large organization which with its large number of technical experts, engineers and constructors, is able to take hold of the situation and push the production of toluol to the limit.

The Southern Car Co., High Point, N. C., has received a contract from the Government for open cars totaling about $1,000,000. The company is planning for an immediate reorganization and the reopening of its works, recently closed, to construct the cars.

CANVASS OF REGISTRANTS

Industrial Managers Will Be Informed as to Conscription Plans

WASHINGTON, Nov. 20.—Provost Marshal General Crowder has formally announced the policy to be pursued in making the second draft of recruits for the national army who will be assigned to cantonments next March. In this connection he has made public the text of a questionnaire, which is to be sent to all registrants, the answers to which will be used as a basis for the classification of the 9,000,000 whose names have been entered upon the War Department's register into five grades of eligibility for war service based upon their skill, experience, present occupation, and condition with respect to dependents. As already foreshadowed in this correspondence, the plan adopted for the second call differs in all material respects from that employed in the first draft and one of its chief aims is to conserve the skilled labor of the country for use in the industries regarded as essential to the conduct of the war.

The experience of the War Department in securing information concerning the occupations and experience of the recruits embraced in the first call after the men were actually in cantonments, instead of before they were selected for service, has convinced the officials that a vast amount of time can be saved and the labor of the exemption boards reduced to an almost negligible amount by a careful canvass of the registrants before the second call. In this way the sifting process will take place before the men have been called from their present occupations and in a large proportion of cases those entitled to exemption will be informed of that fact in time to relieve them of the necessity of making any preparation for quitting their present tasks. A result of much importance will be the knowledge on the part of the managers of industries contributing to the conduct of the war that their labor will not be demoralized or their organizations invaded, at least until all unemployed men and those engaged in non-essential industries have been called to the colors.

Of very great importance to the general industries of the country, whether contributing directly to the war or not, is the question of the treatment of registrants having dependents or possessing sufficient means to provide for them in the event of being called into service. President Wilson has taken a personal interest in the framing of this feature of the regulations with a view to exempting for as long a period as possible men who have wives, children, mothers, or sisters actually dependent upon them. The War Department, in treating this phase of the matter, proposes to grant exemptions on the basis of full information as to the registrant's ability to provide for his family and other dependents from property or savings now in possession. The inquiries included in this series are of the most searching character.

The questionnaires are now being sent out to local boards, which, in turn, will mail them to the registrants in their respective districts, so that within the next 30 days they will probably be received by all the registrants. The forms must be filled out within seven days from the date of receipt, failure to comply with this regulation being a misdemeanor punishable by fine or imprisonment for one year and resulting in loss of valuable rights and, in the discretion of the Provost Marshal General, in immediate induction into military service.

The Aluminum Ore Co., East St. Louis, Ill., will surrender three tugs and 20 freight barges to the Government to transport knocked-down freight cars from Pittsburgh, to New Orleans, for shipment thence to France. The barges and tugs have been used in transporting bauxite from the Arkansas fields of the company to East St. Louis. The release of the equipment will aid in reducing congestion on the rail lines to New Orleans. It will also reduce the transportation cost about 20 per cent on the freight cars shipped thus.

Machinery Markets and News of the Works

WAR DEMANDS INCREASE

Selling Largely Restricted to Government Needs

A Number of Machine-Tool Companies Decline to Bid on Equipment Unless Buyer Can Show Priority Certificate

Demands for machine tools for the manufacture of war equipment show an increase in several markets, notably in the Central West. Chicago, Cleveland and Cincinnati builders and dealers report an exceptional demand. In the East, the business is somewhat "spotty," but there is nevertheless a large inquiry in volume, although the individual inquiries are fewer in number. Several machine-tool builders have notified their selling agents to bid on nothing but work that is directly or indirectly for the Government. The Government is not permitting tools to leave the country except when the need for our Allies or for American repair shops in France is as urgent as for our own war plants. The Ordnance Division of the Army is finding it extremely difficult to obtain a sufficient number of large machine tools for equipping gun plants such as the Watertown Arsenal and the country is being combed for equipment suitable for the purpose. The scarcity of tools is making it necessary for the Government to anticipate its munitions requirements for a considerable period. For example, several orders placed last week for shell-making tools will not be delivered until next July. As an example of the volume of business being done in some lines, a machine-tool sales office in New York last week had the biggest sales in its history, the total for the week exceeding that done in a whole year in pre-war times. A Cleveland builder reports that its October domestic sales broke all records.

One of the largest inquiries in New York is that of the International Arms & Fuse Corporation, Bloomfield, N. J., which has a 6-in. shell contract. Its requirements in lathes alone total about 225 to 250. Shell contracts have been awarded to the American Can Co., American Car & Foundry Co., Symington-Anderson Co., New York Air Brake Co., Worthington Pump & Machinery Corporation, Bartlett & Hayward Co., Baldwin Locomotive Works and the General Electric Co. The Snead & Co. Iron Works, Jersey City, N. J., has an Allied Government shell order and is buying tools. New purchases of the Worthington Pump & Machinery Corporation will be more than $1,000,000. The Scovill Mfg. Co., Waterbury, Conn., has been buying heavily for fuse work. The Bartlett & Hayward Co., Baltimore, placed additional orders last week. Very large orders have been placed by the Blake & Knowles plant of the Worthington Pump & Machinery Corporation for building pumps for 150 submarine destroyers.

The newest Government development is the Picatinny Arsenal, near Dover, N. J., where new shops are being built. Twenty 10-ton cranes have been purchased and machine-tool equipment will be bought soon.

In Chicago there has been large buying of machine tools for the Rock Island Arsenal. The Four Lakes Ordnance Co., Madison, Wis., will make purchases aggregating at least $325,000 and will build 20 large lathes under its own auspices for work on 300 5-in. naval guns. Dodge Bros., Detroit, have been buying heavily in the Central West markets. Their inquiry calls for 250 milling machines. A considerable number of lathes, planers and boring mills have been purchased. Dodge Bros. will make 155-mm. hydro-pneumatic recoil slides. Its plant will cost more than $2,000,000. The International Harvester Co. has placed orders in Chicago for miscellaneous equipment for its Akron, Ohio, plant. The American Shipbuilding Co. will build on the Great Lakes 36 3500-ton ocean-going steamers for the Emergency Fleet Corporation. Its South Chicago shipyard will be considerably enlarged. Buying in Chicago is confined to war requirements and is without precedent in volume in that section of the country.

Besides large purchases by Dodge Bros., the Cincinnati market has been featured by fairly large inquiries from Dayton manufacturers, who are engaged in munitions work. About the only export orders now being booked by Cincinnati machine-tool builders are for American repair shops in France.

Among the inquiries in the Cleveland market is one from the F. B. Stearns Co., Cleveland, for about 25 machines for airplane motor work. The American Brake Shoe & Foundry Co., Erie, Pa., has inquired for a round lot of lathes for 6 in. shell manufacture.

In New England all machine-tool builders are loaded with orders to the saturation point. It is reported that the Groton Iron Works, New London, Conn., which has Government contracts for steel and wooden ships, will be in the market for more equipment, the Government having authorized the expenditure of $3,000,000 for expansion of its plants.

Large orders for cranes are being placed. The Stone & Webster Engineering Corporation has awarded to the Pawling & Harnischfeger Co., Milwaukee, Wis., an order for 17 for the Watertown Arsenal. The Federal Shipbuilding Co., New York, is expected to close for 10 shop cranes this week. The Worthington Pump & Machinery Corporation is closing for 38 small cranes for its East Cambridge, Mass., pump works. The International Shipbuilding Corporation, Orange, Tex., is in the market for 20 3-ton, 2-motor, I-beam hoists for gantry cranes. An order for 18 single I-beam cranes and hoists has been awarded to the Detroit Hoist & Machine Co. by the Aberthaw Construction Co. for shops of the Fore River Shipbuilding Corporation. The American International Shipbuilding Corporation has bought seven 10-ton shop cranes from the Northern Engineering Co., Detroit. The Baldwin Locomotive Works has bought cranes for shipment to

Vladivostok, Siberia, where its new locomotive shop will be located. Other smaller crane business is reported in the local market reports.

New York

NEW YORK, Nov. 20.

Government shell and gun work has been the principal factor in machine-tool inquiry of the past week. The International Arms & Fuse Corporation, Bloomfield, N. J., will build 300 or 400 new tools, its list calling for 225 to 250 lathes, principally 24-in. This company's contract, announced last week as being for 75 mm. shells, has been changed to 6-in. Shell contracts are reported to have been awarded to the American Can Co., American Car & Foundry Co., Symington-Anderson Co., New York Air Brake Co., Worthington Pump & Machinery Corporation, Bartlett & Hayward Co., Baldwin Locomotive Works and the General Electric Co. The Snead & Co. Iron Works, Jersey City, N. J., has received a shell contract from an allied government and is buying new equipment. The Scovill Mfg. Co., Waterbury, Conn., has a time fuse contract and has been placing large orders for tools.

Machine-tool buying in smaller volume has been done by the Oxweld Acetylene Mfg. Co., Newark, N. J.; the Lachernay Carburetor Co., Paterson, N. J.; the General Ordnance Co., Derby, Conn., and the Kinney Mfg. Co., Boston. M. J. Gourland, 120 Broadway, New York, is buying for the Brasier automobile plant in France. The Blake & Knowles plant of the Worthington Pump & Machinery Corporation, East Cambridge, Mass., has been continuously placing orders for several weeks.

Important additions are being built by the Stone & Webster Engineering Corporation at the Picatinny Arsenal, near Dover, N. J. Twenty 10-ton cranes have been purchased by the Government from the Whiting Foundry & Equipment Co. for new shops, the foundations for which have just been laid. Machine-tool equipment will be inquired for soon.

The Federal Shipbuilding Co., which is building its plant on the Hackensack Meadows so rapidly that it will soon be ready to lay the keels of 10 standardized steel ships for the Emergency Fleet Corporation, is in the market for equipment for its new forge shop, including steam hammers and hydraulic machinery. A list of 10 cranes for shops is still pending, but will probably be placed this week.

The Stone & Webster Engineering Corporation, Boston, has placed with the Pawling & Harnischfeger Co., Milwaukee, Wis., an order for 17 shop cranes for the Watertown Arsenal. The remainder of the 46 cranes on which bids were taken will be placed soon. Orders are being placed by the Blake & Knowles plant of the Worthington Pump & Machinery Corporation, East Cambridge, Mass., for 38 cranes for new shops, which include a brass foundry, machine foundry and machine-shop extensions. This plant has received the contract for pumps for 150 submarine destroyers. The list called for bids on three 1-ton, 14 2-ton, 16 3-ton, one 4-ton, three 5-ton and one 10-ton cranes.

Other crane business includes an inquiry from the International Shipbuilding Corporation, Orange, Tex., whose representatives were in New York last week, for 20 3-ton, 2-motor I-beam hoists for gantry cranes, which the company is building itself at its shipyard. Deliveries were asked for beginning in three weeks, and on this account the company's representatives found difficulty in placing the order. An order for 18 single I-beam cranes and hoists, 2-motor, has been awarded to the Detroit Hoist & Machine Co., Detroit, by the Aberthaw Construction Co. for the shops of the Fore River Shipbuilding Corporation. The Stone & Webster Engineering Corporation has bought a 20-ton Ohio locomotive crane for the Watertown Arsenal. The Oscar Daniels Co., Woolworth Building, New York, has received a contract for fabricated steel ships from the Emergency Fleet Corporation and is preparing plans for a shipyard at Brunswick, Ga. It is expected that its crane and machinery requirements will be made known soon. The Georgia Railway & Power Co., Brunswick, Ga., has bought a 50-ton crane, and the General Electric Co. has also bought a 50-ton crane, both of these orders going to the Northern Engineering Co., Detroit. Westinghouse Church Kerr & Co., New York, are in the market for a 10-ton and a 15-ton traveling crane for a shop they are erecting in Cleveland.

Liebovitz & Stark, operating the East New York Cornice Works, 2042 Union Street, Brooklyn, N. Y., have purchased the adjoining lot, 80 x 95 ft., which, it is said, will be used for additions.

The W. S. Wilson Corporation, New York, has been incorporated with a capital of $50,000 to manufacture hardware, etc. E. A. and H. H. Hirshon, and W. S. Wilson, 90 St. Marks Avenue, Brooklyn, are the incorporators.

The Tidewater Marine Engine & Construction Co., New York, has been incorporated with a capital of $10,000 to manufacture marine engines, etc. T. F. Haggerty, W. Brown and L. W. Davidson, 18 Christopher Street, are the incorporators.

The Standard Concrete Machinery Co., 233 Broadway, New York, manufacturer of concrete machinery, has increased its capital from $100,000 to $250,000. Carlton C. Valentine is president.

The Lexay Co., New York, has been incorporated with a nominal capital of $5,000 to manufacture automatic machinery. M. Sindel, A. Roselman and S. V. Heimberger, 299 Broadway, are the incorporators.

The Liberty Phonograph Co., Brooklyn, has been incorporated in Delaware with capital of $1,500,000 to manufacture talking machines. Alfred A. Case, Brooklyn, and Dudley E. Case, Jersey City, N. J., are the incorporators.

The Charles Hartmann Co., operating a sheet metal works at 985 Dean Street, Brooklyn, has increased its capital from $10,000 to $80,000.

The Gun Corporation, New York, has been incorporated with a capital of $25,000 to manufacture machine guns. E. J. Nathan, Jr., B. Howie and M. L. Macauley, 128 Broadway, are the incorporators.

Stephen Ransom, operating a marine repair works at 401 West Street, New York, will build a four-story addition, about 64 x 81 ft., to cost $60,000, to be used for a boiler works.

The Limited Steel Products Corporation, New York, has been incorporated with a capital of $60,000 to manufacture talking machines. The incorporators are S. P. Durenheimer, O. C. Deutscher and F. C. Canfield, 341 Fifth Avenue.

The Greater New York Metal Box Co., operating a plant at 143 West Nineteenth Street for the manufacture of metal boxes, etc., has been incorporated with capital of $20,000. L. Kossoy and P. Unger, 2512 Seventh Avenue, are the incorporators.

The Stoddard Union Co., New York, has been incorporated with a capital of $100,000 to operate a foundry. Earl O. Aspdin, Albert Hild and Frank B. Potterton, New York, are the incorporators.

The United Metals Corporation, Brooklyn, has been incorporated with a capital of $500,000 to manufacture metal products. J. A. Burns, R. L. Gray and G. K. Wilson, 82 Washington Place, are the incorporators.

The Endicott Forging & Mfg. Co., Endicott, N. Y., has increased its capital from $100,000 to $200,000.

The Twin Energy Engine Corporation, Albany, N. Y., has been incorporated with a capital of $200,000 to manufacture engines. H. J. White, W. H. Schneider and O. Perrault, Albany, are the incorporators.

The Roberts Safety Water Tube Boiler Co., Red Bank, N. J., manufacturer of water tube boilers, has had plans prepared for the erection of a one- and two-story, reinforced-concrete addition, about 80 x 140 ft.

The American Shell Co., 350 Twenty-first Avenue, Paterson, N. J., will erect a one-story addition to cost about $13,000.

L. Adler & Co., New Brunswick, N. J., have been incorporated with a capital of $25,000 to manufacture electrical and gas fixtures. Louis Adler, Bound Brook; Louis P. Ruck and Robert Rosen, New Brunswick, are the incorporators.

The Guilmette-Underwood Brass Foundry Co., Elizabeth, N. J., recently organized, has commenced the operation of a new plant at 160 East Jersey Street, to specialize in the production of aluminum and brass castings, metal patterns, etc.

The General Electric Co., Newark, has acquired property at Seventeenth Avenue and Boyd Street, adjoining its present works, for extensions. It is now building a four-story and basement, reinforced-concrete plant, about 80 x 525 ft., for its Edison Lamp Works division. The new plant will cost about $400,000.

The T. B. Toy Co., Newark, has been incorporated with a capital of $125,000 to manufacture toys. Harry C. Tonks and Phillip C. Brooks, Newark, are the incorporators.

The Newark Model & Pattern Shop, Newark, has been organized to operate a plant at 680 South Eleventh Street. Francis DeGruchy, 529 Twenty-first Street, Irvington, heads the company.

The DeVoe-Smith Co., Newark, has been incorporated with a capital of $50,000 to manufacture automobiles. Prescott S. Smith and Alonzo DeVoe, Newark; and Lester A. DeVoe, Ridgewood, are the incorporators.

The Upson-Walton Co., 462 Riverside Avenue, Newark, manufacturer of wire rope, will build a one-story addition, 35 x 73 ft.

The American File Reclaiming Co., Newark, has been incorporated with a capital of $250,000 to manufacture files. William J. Magee and Isidor Niner, New York, are the incorporators.

The Newark Gear Cutting Machine Co., 69 Prospect Street, Newark, has completed plans for the erection of an addition to its machine shop.

The Butterworth-Judson Corporation, Avenue R, Newark, N. J., will build a new one-story machine and pipe shop, 50 x 90 ft., to cost $8,000.

The Sprague Electric Co., East Orange, N. J., manufacturer of motors, will build a new one-story power plant at its works to cost $20,000.

The New York Revolving Portable Elevator Co., 346 Garfield Avenue, Jersey City, N. J., manufacturer of elevators, will build a one-story addition to its plant.

The Bayonne Brass Foundry Co. has been organized to operate works at 75 Broadway, Bayonne, N. J. W. E. Oakley heads the company.

The American Radiator Co., Bayonne, is said to be planning to devote its local works at the foot of East Forty-ninth Street to the production of guns for the Government, particularly for naval service.

The Leonard Sheet Metal Works, Head Ferry, Hoboken, N. J., has increased its capital from $150,000 to $500,000.

The Perfect Bobbins & Scalloping Works, West Hoboken, N. J., has been organized to manufacture bobbins, etc. Peter Balzerino, 512 Palisade Avenue, Weehawken, heads the company.

New England

BOSTON, Nov. 19.

New England machine-tool builders have almost reached the saturation point on orders in hand. Little new plant extension is under way in comparison with the business being done. Nearly every company is so busy with orders for Government work, direct or indirect, that it is virtually impossible to produce machines for their fellow machine-tool builders or for other numerous metal-working industries of this section. This and the shortage of labor are limiting the number of new factory projects.

Government plants and those directly concerned in munitions manufacture are the chief local purchasers of tools. Reports agree that there is an increased demand for the smaller tools. It is expected that there will be a greatly increased production of small tools, jigs, fixtures and gages in the next three or four months and sales of tool-room machinery will boom.

Much newspaper publicity has been given about the strikes of structural workers on Government jobs at Watertown, Squantum and elsewhere, and some fear that these might increase unrest in the machinist crafts, but the strikers have returned to work on all the jobs except at Squantum, and it is believed that the danger period has passed. The only strike of moment among machinists is at the plant of the Morse Twist Drill Co., New Bedford, Mass., where about 900 men are out. Henry B. Endicott, executive manager of the Massachusetts Public Safety Commission, acting as arbiter, has refused the machinists of the various shops of the Boston & Maine Railroad a further increase of three cents per hr., deciding that the advance of five cents per hr. recently granted them was as large as was justifiable. This may lead to further complications, as the machinists threaten to reopen the case.

It is reported that the Government is planning to spend about $3,000,000 on the plants of the Groton Iron Works, at New London and Noank, Conn., at which merchant ships are to be built. About 2000 more men are being sought for these plants and an extensive housing project will be necessary to take care of the increased working force. Several new buildings are nearing completion.

The Stanley Motor Carriage Co., Newton, Mass., is building an addition, 64 x 100 ft., two stories. This is the first step in the expansion of the plant, following the recent reorganization of the company, which has been manufacturing steam motor cars since 1901. Prescott Warren is president.

The Cunning Boiler & Machine Co., New Bedford, Mass., has awarded a contract for a four story addition, 36 x 124 ft., to be used as a machine shop and foundry.

The Worthington Pump & Machinery Corporation, Blake & Knowles works, East Cambridge, Mass., has awarded contracts for a one story foundry, 81 x 121 ft., and storage building, 42 x 200 ft.

The LaPointe Engineering Co., New London, Conn., engines, etc., has been incorporated with authorized capital stock of $100,000. The incorporators are Joseph N. LaPointe, Charles S. Amadon and P. LeRoy Harwood, all of New London.

The Seymour Metal Goods Co., Seymour, Conn., has increased its capital stock from $100,000 to $200,000.

The Universal Sickle Bar Co., Boston, has been incorporated with authorized capital stock of $100,000. Louis N. Wheelock is president Delano F. W. Douglas, 185 Devonshire Street, treasurer.

The Harrington Cutlery Co., Southbridge, Mass., has begun work on an addition to its plant.

The Eastern Machine Works, Revere, Mass., has been incorporated with authorized capital stock of $10,000. Edward A. Guay is president and Edward R. Berry, Malden, treasurer.

The Colt's Patent Fire Arms Mfg. Co., Hartford, Conn., has awarded a contract for a one story addition, 50 x 250 ft.

The Nicholson File Co., Providence, R. I., has secured permits to build four additions: 42 x 142 ft. and 67 x 147 ft., two stories; 11 x 29 ft. and 39 x 40 ft., one and two stories.

The machinery of the Derby, Conn., plant of the Maxim Munitions Co. is being removed by the United States Cartridge Co. to its main plant at Lowell, Mass.

The Otto Heineman Phone Supply Co., 25 West Forty-fifth Street, New York, has awarded a contract for a factory, 40 x 100 ft., two stories, at Putnam, Conn.

Frank Wheeler & Son, Meriden, Conn., machinery, have been incorporated with authorized capital stock of $100,000 by Frank Wheeler and others.

The Baldwin Chain & Mfg. Co., Worcester, Mass., has let a contract for a one story addition, 35 x 52 ft.

The Biddeford Shipbuilding Co., Biddeford, Me., has awarded a contract for two buildings, 34 x 66 ft., two stories, and 22 x 24 ft., one story.

The Nutter & Barnes Co., manufacturer of metal cutting-off machines, has moved its plant to Greenfield, Mass., forming a part of the machinery division of the Greenfield Tap & Die Corporation.

Philadelphia

PHILADELPHIA, Nov. 20.

For various Government contracts a good volume of machine-tool and machinery business is being placed in this district. Shipbuilding and munitions are the two principal sources of inquiry. The American International Shipbuilding Corporation has placed an order for seven 10-ton shop cranes with the Northern Engineering Co., Detroit, and it has also bought equipment for its plate and angle shop as follows: One 30-ft. bending roll, 8 ft. straightening roll, six radial drills, six radial countersinking drills, three angle shears, eight punches, four shears, one friction saw. The New York Shipbuilding Corporation, Camden, N. J., continues to place orders and the William Cramp & Sons Ship & Engine Building Co., Philadelphia, is buying on a smaller scale. The former has bought two 15-ton Ohio locomotive cranes.

Requirements of the Worthington Pump & Machinery Corporation, Jeanesville Works, Hazelton, Pa., for its new shell contract, will total more than $1,000,000. The Bartlett & Hayward Co., Baltimore, Md., is continuing to buy for munitions work. The Westinghouse Air Brake Co. has been placing large orders for several weeks for its plant at Swissvale, Pa., which will build airplane engines. The Marlin-Rockwell Corporation is buying for its Standard Roller Bearing plant in Philadelphia. The Roller-Smith Co., Bethlehem, Pa., has bought a few tools for work on ammeters for airplane engines.

The large crane order of the Baldwin Locomotive Works has not yet been placed, but this company is doing other buying for this country and Russia. Six 50-ton and two 20-ton cranes will go to the new locomotive shop to be built at Vladivostock, Siberia.

The Philadelphia & Reading Railroad Co. has plans drawn for a round house at South Bethlehem, Pa. The S. S. White Dental Mfg. Co., Philadelphia, will build an addition to its factory for making dental instruments. The Brown Pyrometer Co., Philadelphia, will also build an addition. All three companies are expected to buy some new equipment.

The Acme Gear Co., Philadelphia, has been incorporated with a nominal capital of $5,000 to manufacture gears. Harry C. Cole, Philadelphia, is the principal incorporator.

W. T. White, Philadelphia, has awarded a contract for the construction of a new one-story machine shop, 215 x 250 ft., at Twentieth Street and the Erie Avenue, to cost about $130,000. The Watson Engineering Co., Philadelphia, is the contractor.

The S. S. White Dental Mfg. Co., Chestnut Street, Philadelphia, manufacturer of dental instruments, etc., is building a four-story and basement addition to its plant, about 60 x 75 ft., on De Quince Street, to cost $75,000.

The William Cramp & Sons Ship & Engine Building Co., Philadelphia, will build three shop additions to its plant at East Richmond and Norris streets, to cost about $35,000.

The Roach Automobile Rotary Safety Brake Co., Philadelphia, has been incorporated in Delaware with capital of $1,000,000 to manufacture safety brakes, etc. Mahlon Van Booskirk and Henry R. Heyl, Philadelphia, and A. P. Stevenson, Wilmington, Del., are the incorporators.

Schaum & Uhlinger, Inc., Glenwood Avenue and Second Street, Philadelphia, manufacturer of machinery and parts, has filed plans for improvements in its plant to cost about $5,000.

The Reeves Foundry Co., Trenton, N. J., will erect two small additions on North Logan Avenue.

The Hydro-Submersible Corporation of America, Philadelphia, has been incorporated in Delaware with capital of $1,000,000 to manufacture submarine boats. The incorporators are Harold T. Montague, Edward A. Fretz and Reynolds O. Gilke, Philadelphia.

The Diamond Chain Co., North George Street, York, Pa., manufacturer of chains, has acquired about five acres on Center Street for the construction of additions. The proposed new building will be about 50 x 500 ft. and will be arranged for a machine shop and drop forge works. Two four-story buildings will also be erected to be used for automatic machinery. The company is also planning for an addition to its North End plant, to be used for the installation of new forge equipment, consisting of twelve units. This latter extension will be employed for increased production of a patent skid chain for motor trucks.

The Rowe Motor Mfg. Co., Downingtown, Pa., manufacturer of motor trucks, has purchased a 5-acre tract along the Pennsylvania Railroad, Lancaster, Pa., and contemplates the erection of a new plant which is expected to be ready for occupancy March 1. It is said that the Downingtown plant will be moved to the new location. Samuel J. Rowe is president and J. Cameron Matteer secretary.

The Frick Co., West Main Street, Waynesboro, Pa., manufacturer of machinery, agricultural implements, etc., has commenced the erection of a two-story and basement addition, about 60 x 100 ft., to cost about $10,000, to be used for the manufacture of tractors. A. C. Frick is president.

The Emerson-Brantingham Co., Waynesboro, Pa., manufacturer of traction engines and other machinery, will make extensions and improvements in its foundry to cost about $12,000. Headquarters of the company are at Rockford, Ill.

The Columbus Chain Co., Lebanon, Pa., manufacturer of chains, is planning for extensions to its plant. The company, with headquarters at Columbus, Ohio, recently consolidated with the McKinnon Chain Co., 252 Amherst Street, Buffalo.

The Gibson-Clark Co., Indiana, Pa., has been incorporated with a capital of $5,000 to manufacture farm machinery. Lewis G. Clark, Indiana, is the principal incorporator.

The Lycoming Foundry & Machine Co., Oliver and High streets, Williamsport, Pa., specializing in the manufacture of gas and gasoline engines, has completed remodeling the former plant of the United States Machine Co., South Williamsport, recently acquired, and plans for immediate operations on an increased scale. It is said that employment will be given to about 50 additional men at once.

The Conestoga Traction Co., Lancaster, Pa., will make extensions and improvements at its Engleside power plant to cost about $100,000. Considerable new electrical equipment will be installed.

The Freeland Machinery & Iron Co., Freeland, Pa., recently incorporated, is negotiating for local property for its proposed new works. The former factory of the Salmon Iron Works is being considered. Tonhill Brothers, Scranton, Pa., head the company.

The Grove City Brass & Bronze Co., Grove City, Pa., has been incorporated with a capital of $25,000 to manufacture bronze and brass specialties. T. A. Sampson, Mercer, Pa., is the principal incorporator.

Baltimore

BALTIMORE, Nov. 19.

Fire, Nov. 17, destroyed the machine shop, boiler house and office building of the F. X. Hooper Co., Glenarm, Md., manufacturer of machines for printing on wood. Considerable machinery was damaged or destroyed.

The Standard Electric & Elevator Co., 118 East Pratt Street, Baltimore, has been incorporated with $500,000 capital stock to manufacture machinery, engines, electrical apparatus, elevators, etc. The incorporators are Frederick Stark, Francis Tucker, Cyrus A. Yarrington, Carroll B. Roberts, Frank Pfister, Carl H. Mohr, John S. Dehn, Wilson R. Payne and Frederick E. Wurzbacher.

Three additional buildings will be erected by the Bartlett-Hayward Co., Scott and McHenry streets, Baltimore. One will be a one-story plate shop, 50 x 300 ft., at Pratt and Parkin streets, to cost $15,000; another a one-story frame building, 90 x 153 ft., at Gunpowder and Hamburg streets, to cost $15,000, and a third, one-story, 18 x 32 ft., at Preston Street and Brentwood Avenue, to cost $500.

The American Propeller & Mfg. Co., 233 to 249 East Hamburg Street, Baltimore, will build a one-story dry kiln, 46 x 78 ft., at Jackson and Gittings streets, at a cost of $7,000.

An addition to cost $500 will be made to the machine shop of the Betts Machine Co., Wilmington, Del., recently acquired by the E. I. DuPont de Nemours Co.

Buffalo

BUFFALO, Nov. 19.

Construction is progressing rapidly on the large plant of the Fore River Shipbuilding Co., at Vulcan and Rosedale avenues and the New York Central Railroad, Buffalo, for the manufacture of turbines for the Government, and is expected to be ready for the installation of machinery in a few weeks. It is stated that 7000 men in three shifts will be employed when the plant is completed.

The Russell Motorcar Co., a Canadian corporation, has purchased a one-story building formerly occupied by the Cyphers Incubator Co., at Dewey Avenue and the New York Central Railroad Belt Line, Buffalo, with a floor area of 100,000 sq. ft., in which it will make munitions. Manufacturing will begin as soon as the machinery can be installed. About 400 men will be employed.

The J. P. Devine Co., manufacturer of vacuum drying and impregnating apparatus, Buffalo, is building an addition 35 x 200 ft. to its plant at Clinton and Manitoba streets and the Erie Railroad.

The Transmission Ball Bearing Co., Buffalo, has commenced construction of an addition to its plant at Military Road, Kenmore Avenue and the New York Central Railroad.

The Charles B. Viner Co., organ manufacturer, Buffalo, has commenced work on a factory at Niagara and Penfield streets for the manufacture of church organs.

The Globe Pattern Works, Buffalo, is building a second story to its pattern shops at Norris and Hertel avenues.

The Stewart Motor Co., 9 Randall Street, Buffalo, has had plans prepared for a new two-story machine shop, 30 x 110 ft., on East Delavan Street.

The Gray Machine Tool Co., Buffalo, has been incorporated with a capital of $50,000 to manufacture machine tools. A. W. Sawyer, P. R. Smith and K. Dayton, all of Buffalo, are the incorporators.

The Strong Steel Foundry Co., 33 Norris Street, Buffalo, specializing in the production of steel castings, is building an addition to its plant.

The Misener & Irving Mfg. Co., Syracuse, N. Y., has been incorporated with a capital of $50,000 to manufacture tools and other specialties. The incorporators are J. I. Misener, E. V. B. Tyminski and A. Pearsall, all of Syracuse.

Chicago

CHICAGO, Nov. 19.

Buying is almost entirely confined to war requirements, and is proceeding at a rate that is without precedent in this section of the country. The leading purchaser is the Rock Island Arsenal, which in the past week has continued to distribute large orders with an entire absence of red tape or unnecessary delay, with the further gratifying feature that the orders have been well distributed. All the tools are required in the manufacture of 75 mm. gun carriages with recoil mechanism.

The Four Lakes Ordnance Co., Madison, Wis., continues to place orders for machinery for the manufacture of 300 5 in. naval guns. The tools to be purchased will total at least $325,000. They are to be installed in a plant 150 x 500 ft., which is to be ready for occupancy in 55 days. The company is having made under its own auspices 20 large lathes in addition to the tools to be purchased from other manufacturers.

Reports coming to this market from Detroit indicate that the plant which Dodge Bros. will build for the execution of a huge contract will cost between $2,000,000 and $3,000,000.

Machinery men here understand that the contract is for 155 mm. hydro-pneumatic recoil slides. As previously stated, the chief effect of the buying for Detroit delivery, so far as this district is concerned, is to tighten factory deliveries.

The International Harvester Co. has bought a fair-sized list for delivery at its Akron, Ohio, plant, the requirements being miscellaneous.

An indication of the activity of the market lies in the fact that one dealer sold more tools in the first 15 days of this month than in any entire month in its history, and with the war business has enjoyed a fair run of orders from industrial buyers. The greatest demand continues for large machines and their delivery is correspondingly far off. Large turret lathes of one make, for instance, cannot be had until next March, while smaller machines of the same type are available for December delivery. Large planing, boring and drilling machines are impossible to get inside of several months.

The American Shipbuilding Co. has been awarded a contract by the United States Shipping Board for 36 3500-ton vessels, each to cost $700,000. They are to be delivered in July or August, next, and will be built on the Great Lakes. At its South Chicago plant the company will soon have four additional berths, making six altogether. The boats are to be 261 ft. long, 43 ft. beam.

Plans have been prepared for the $100,000 one and two-story factory, 400 ft. long, which is to be built for the Harrington & King Perforating Co., Chicago.

The Edwards Cylinder Mfg. Co., Pekin, Ill., has been incorporated with a capital stock of $10,000 to manufacture pump cylinders. A factory has been obtained, and it is expected that operations will begin early in December. T. N. Smith is secretary and treasurer.

Negotiations have been closed for the removal of the Menominee Electrical Mfg. Co. from Menominee, Mich., to Cairo, Ill. Several sites for the new plant are under consideration.

Contract has been let and ground has been broken for the first building of a group to be erected at Rockford, Ill., for the C. Mattison Machine Co., Beloit, Wis. The first unit will be of concrete, 100 x 400 ft., part two stories. The company manufactures wood-working and other machinery.

Machine tools and equipment valued at over $1,000,000, formerly the property of the Pullman Motor Car Co., York, Pa., will be sold at auction, beginning Dec. 4, by Samuel L. Winternitz & Co., auctioneers, 506 Rector Building, Chicago. The property comprises about 111 machines, including lathes, milling, grinding and gear cutting machines, turret machinery, motors and miscellaneous tools and supplies.

Milwaukee

MILWAUKEE, WIS., Nov. 19.

The demand for machine-tools from industries executing Government contracts continues in great volume and no slackening is noticeable either in the number or urgency of orders. Requirements of local metal-working industries continue large and no relief is looked for in the near future because of the establishment of new industries. Many new companies have been organized to undertake Government work, but others aim to manufacture implements of peace, notably agricultural tools. Activity in the foundry trade continues at a high ebb and the entrance of several new firms into this field has also been noted. The demand for castings probably has never before been of such large volume. Many manufacturers operating big foundries are finding it necessary to apply to outside shops to take care of the overflow, even though they have increased their capacities.

The Falk Company, Milwaukee, founder and machinist, has awarded a contract to the Worden-Allen Co., Milwaukee, for the erection of a new steel and brick machine shop, 175 x 300 ft. The additional facilities are required for the execution of Government contracts for herring-bone reducing gears for destroyers and other naval purposes. Harold S. Falk is general superintendent.

The United States Gear Shift Co., Eau Claire, Wis., has been incorporated under the laws of Maine with an authorized capital stock of $405,000, of which $150,000 is represented by the Wisconsin interest. It will manufacture a hydraulic gear-shifting mechanism for automobiles, trucks, and other vehicles. The officers are: President, N. J. Whelan; vice-president and secretary, L. A. Laursen; treasurer, J. T. Joyce; directors, R. B. Gillette and Edward Hutchens. Ultimately the capital stock will be $1,500,000, of which $500,000 will be preferred and the remainder common stock. Temporary manufacturing quarters will be leased immediately pending the erection of a plant on a site just purchased in Eau Claire.

Lippert & Rhenstrom, Kenosha, Wis., metal bed manufacturers, have broken ground for an addition costing about $25,000 with equipment. The general contract has been awarded to P. J. Eiffler, Kenosha.

Henry J. Pauly, Milwaukee, will build a two-story machine shop, 41 x 48 ft., at 218-220 Fourth Street, costing $7,500.

The Wisconsin Tractor Co., Sauk City, Wis., has increased its capital stock from $50,000 to $100,000 to accommodate its growing business and to take care of local stockholders in the Shaw Motor Co., who financed the erection of the machine shop and foundry occupied by the tractor works. Upon the completion of the buildings the Shaw company was unable to make arrangements to transfer its works to Sauk City and later the group was taken over by McFarland & Westmont, Lodi, Wis., who organized the Wisconsin Tractor Co. to conduct their tractor manufacturing business.

The Arneson Foundry Co., 319 Exchange Street, Kenosha, Wis., is taking bids through White, White & White, architects, for the erection of a one-story steel, brick and concrete addition, 70 x 125 ft., costing $50,000 with complete equipment.

The C. A. Lawton Co., DePere, Wis., manufacturer of gasoline engines, sustained an estimated loss of $10,000 by fire which almost totally destroyed its main pattern shop. Rebuilding will begin immediately.

Lawrence College, Appleton, Wis., will soon be in the market for two or three large boilers for its central heating plant. Dr. Samuel Plantz is president.

The Northern Foundry Co., organized by Milwaukee and Racine, Wis., capital, has decided upon Marinette, Wis., as the location of its permanent plant and headquarters. It has leased the foundry and pattern shop of the former Marinette Iron Works and expects to be producing castings by Dec. 1. The product will be utilized for the most part by the J. I. Case Threshing Machine Co., Racine, Wis., manufacturer of farm machinery, automobiles, etc. James M. Fitzpatrick is president and S. D. Drew, general superintendent.

The Liberty Foundry Co., Milwaukee, has been incorporated with a capital stock of $30,000 by Walter J. Buckley, Gerhard W. Mockly and Edward G. Mockly, to manufacture castings and patterns.

The Racine Boat Co., Racine, Wis., and the Simmons Boat Co., Chicago, have been consolidated under the control of the Simmons interests. O. M. Godske retires as vice-president of the Racine company and is succeeded by Ned Simmons, who will have charge of the design and construction of both yards. Fred W. Herman remains as president of the Racine company. The Chicago yard will continue to build craft from 50 ft. upward and the Racine yard will specialize in smaller boats up to 50 ft. in length.

The Lawson Aircraft Corporation, Green Bay, Wis., on Nov. 15 took occupancy of its new manufacturing plant, erected especially for the manufacturing of airplanes. The main shop is of reinforced concrete, 75 x 150 ft., two and three stories. The present temporary quarters will be continued in operation as an auxiliary shop. Alfred W. Lawson is general manager of the company.

The Trenam Tractor Co., 403 Cedar Street, Milwaukee, recently organized to manufacture tractors, is negotiating with business men's associations in Stevens Point and other central Wisconsin cities with a view of selecting a permanent location for its proposed new plant. John J. Trenam is president and F. M. Schuler, secretary.

The Pan-American Rubber Co., Milwaukee, has purchased a plant in South Milwaukee for the manufacture of a general line of commercial and automobile rubber goods. Equipment is being installed. Joseph T. Huebner is general manager.

The Appleton Hay Tool Co., Appleton, Wis., will either build a number of additions to its present plant or construct an entirely new group in order to handle its orders for car movers. Bookings from France, Great Britain and domestic sources are so large that the company is behind on its contracts. Plans for enlargements are being made.

Mayer Bros., Inc., Antigo, Wis., manufacturer of power hammers, is completing patterns for several larger types of hammers, production of which will be undertaken after Jan. 1. Up to this time the maximum has been a 100-lb. hammer. Many orders have been received for hammers up to 250 lb., which will be executed next year.

The Menasha Wire & Mfg. Co., Menasha, Wis., is taking bids through Edwin A. Wettengill, architect, Appleton, Wis., for the erection of a new plant to cost $35,000. It manufactures brass screens and other paper and pulp mill devices. John Graf, head of the Star Pointer Pump Mfg. Co., Menasha, is president.

The Globe Shipbuilding Co., Superior, Wis., is adding an area of 400 x 1500 ft. to its yards and will install three electric traveling cranes.

The P. & B. Mfg. Co., Milwaukee, Wis., manufacturer of electrical fittings, has changed its name to the A. H. Petersen Mfg. Co. A substantial expansion of the company's manufacturing facilities will take place soon.

Cleveland

CLEVELAND, Nov. 19.

The demand for machinery for war industries, largely for shell, motor truck and gun work, continues very heavy. Dodge Bros., Detroit, who have a contract for recoil mechanisms for guns, are inquiring for a large amount of equipment, although no definite list has been issued. The F. B. Stearns Co., Cleveland, is inquiring for about 25 machines for airplane motor work, including lathes and drilling, milling, grinding and profiling machines. The American Brake Shoe & Foundry Co. has a new inquiry out for a round lot of lathes for its Erie, Pa., plant for work on 6-in. shells. A local manufacturer has an order for 50 turret lathes for the Worthington Pump & Machinery Corporation, Hazelton, Pa., and 32 turret lathes for the Rock Island Arsenal, in addition to round lot orders from the same sources recently noted, and has a large number of other inquiries. This company reports that its October domestic sales broke all records, its volume of business only being exceeded in one month when it received an unusually heavy volume of export orders.

The Glenn L. Martin Co., Guardian Building, Cleveland, recently organized by men prominent in the iron, steel and metal-working industry to manufacture airplanes, will shortly equip an experimental building and plans to erect a plant in the next few months. The company will devote its attention largely to fighting machines for the Government. It is in the market for wood-working machinery and machine shop and tool room equipment for its experimental plant, and shortly will buy equipment for its permanent works.

The C. & M. Fence & Galvanizing Co., Cleveland, has been incorporated with a capital stock of $35,000 by Ralph J. Crane, Thomas A. Crane, and others.

The Cleveland Gear Grinding Co., Cleveland, has been incorporated with a capital stock of $350,000 by Roy N. Hall, M. E. Noyes, and others.

The Iler Foundry & Mfg. Co., Cleveland, has been incorporated with a capital stock of $30,000 by F. M. Iler, and others, to take over the business of the Iler Co., manufacturer of brass and melting furnaces, ore pulverizers, blowers and other equipment. An addition, 30 x 50 ft., is being erected.

The Lewis Foundry Co., Toledo, Ohio, has been reincorporated under the name of the Lewis Steel Products Co. It operates a foundry and machine shop at 4080 Detroit Avenue and manufactures gas and gasoline valves. Two new factory buildings were added recently.

The Owen Tire & Rubber Co., Bedford, Ohio, is having plans prepared for a fireproof factory. W. C. Owen & Co., Cleveland, are the architects.

The Engel Aircraft Co., Niles, Ohio, has awarded a contract to the Hunkin-Conkey Construction Co., Cleveland, for an addition to its plant.

A three-story addition will be built shortly to the plant of the Knight Tire Co., Canton, Ohio, now a part of the Republic Rubber Co.

The Zanesville Malleable Co., Zanesville, Ohio, is enlarging its plant by the erection of an addition, 50 x 150 ft., and has acquired an adjoining site for further extensions.

The Ashland Brass Foundry Co., Ashland, Ohio, recently organized by James and Waldo Kuffman, is building a plant for the manufacture of brass and aluminum castings.

Cincinnati

CINCINNATI, Nov. 19.

Inquiries for machine tools continue on the increase, practically all being from firms making war munitions. Dodge Bros., Detroit, have issued a list requesting prices on 250 milling machines. This firm has lately bought heavily of lathes, planers and boring mills. Dayton companies are also placing orders for different types of machines. Export business is largely confined to machine tools needed by the Government for repair shops in France, although quite a number of portable electric drilling machines have lately gone forward to Spain and Italy. There does not seem to be as much new demand for shaping machines, but all local companies are very busy. The demand for electric generators and motors is also declining, and the releasing of a small percentage of labor from these plants has been of benefit to a few companies who are shorthanded.

Jobbing foundries making a specialty of small castings are not as busy as they were three months ago, but foundries making machine tool castings have all the work they can take care of.

The United States Machine Tool Co., Cincinnati, has acquired the plant and business of the American Milling Machine Co., Ludlow, Ky., and will continue the manufacture of No. 1½ milling machines in the Ludlow plant. The executive offices of the first named company are at 1950 West Sixth Street, Cincinnati. Henry F. Smith is president.

Carpenter & Weldon, Pickering Building, Cincinnati, refrigerating engineers and contractors, are remodeling the plant of the Crystal Ice Co., Beaumont, Tex. Nearly all the extra equipment has been purchased, with the exception of some small electric motors.

It is reported, but not yet officially confirmed, that the J. A. Fay & Egan Co., Cincinnati, has definitely decided to remove its plant to Bond Hill suburb. The company purchased a building site three years ago, but was held up in its plans by the lack of street car service for its workmen, which has now been remedied by the extension of a city car line.

The plant of the Hamilton Foundry & Machine Co., Hamilton, Ohio, was recently slightly damaged by fire. No delay in operation was experienced.

The Premier Rubber & Insulation Co., Dayton, Ohio, has been incorporated with $100,000 capital stock by Henry M. Granzow and others. No announcement has been made as to manufacturing plans.

The Dayton-Wright Airplane Co., Dayton, Ohio, has purchased the plant of the Darling Motor Co. Additions will be built and machinery installed for the manufacture of airplane parts. This factory was formerly operated by Orville Wright in the manufacture of airplanes on a small scale.

The Hardware Specialties Mfg. Co., Springfield, Ohio, has been incorporated with $10,000 capital stock by J. B. Gaines and others.

The Jeffrey Mfg. Co., Columbus, Ohio, is constructing a temporary manufacturing building at 241 East First Street.

The Banner Pattern Co., Columbus, Ohio, has been incorporated with $10,000 capital stock by James Crooks, Edward Schmid and others.

The Thomas & Armstrong Co., London, Ohio, has decided to erect a new plant that will more than double its present output of sheet metal specialties.

The L. W. Carroll Machine Co., Batavia, Ohio, has removed its shop from the Kreckeler Building to more commodious quarters near the Norfolk & Western depot. It manufactures a patented clutch pulley.

The Central South

LOUISVILLE, Nov. 19.

Inquiries for machines are fewer in number but are as good as orders where reasonably quick deliveries can be made. There is no nibbling for prospects and a good volume of business is being handled. Motors are in good demand. Labor continues scarce.

The Roy C. Whayne Supply Co., Louisville, is in the market for a 25-hp., double-drum electric hoist, 220-volt, three-phase, 60-cycle, with swinger, and for a 7½-hp., three-phase, 25-cycle, 220 or 440-volt motor.

Grainger & Co., Tenth and Rowan streets, Louisville, are in the market for a 5-ton electric traveling crane with about 36-ft. span.

The Farmers' Co-Operative Associations of Kentucky, Lexington, Ky., propose to establish a factory to cost $500,000 to manufacture farm equipment and supplies. John H. Humphreys, College of Agriculture, University of Kentucky, Lexington, may be addressed.

The John G. Duncan Co., Knoxville, Tenn., is in the market for an 8, 10 or 12-hp. double cylinder, double-drum hoisting engine, without boiler.

The G. W. Simmons Co., Memphis, Tenn., is in the market for a steam driven air compressor, capacity 300 to 400 cu. ft. per min. at 100 lb., to run at variable speed, controlled by a pressure governor.

Indianapolis

INDIANAPOLIS, Nov. 19.

The Muncie Cap & Set Screw Co., Muncie, Ind., has increased its capital stock from $20,000 to $50,000.

The Protective Electrical Supply Co., Fort Wayne, Ind., has increased its capital stock from $25,000 to $200,000.

The T. W. Warner Co., Muncie, Ind., manufacturer of automobile parts, has increased its capital stock from $100,000 to $2,000,000.

The Newtown Electric Light Co., Newtown, Ind., has been

incorporated with $10,000 capital stock to generate electric light and power. The directors are James R. Campbell, Thomas Schultz and George F. Chamberlain.

The Printers' Machinery Co. has been incorporated at Kokomo, Ind., with $25,000 capital stock to manufacture binding machines. The directors are Reuben Hawkins, Harrison D. Wilcutts, Harry M. Lynch, M. E. Louth and James C. Patten.

The Stutz Motor Car Co., Indianapolis, is building a one story brick and steel addition to its plant, 92 x 182 ft., for the manufacture of four-cylinder automobile motors. It is expected to be in operation by Jan. 1.

St. Louis

ST. LOUIS, Nov. 19.

The Tchula Gin Co., Tchula, Miss., is in the market for about $10,000 worth of equipment for its plant.

The Mitchell Round Bale Co., Marietta, Okla., is in the market for equipment to replace about $20,000 worth of machinery destroyed by fire.

The Mitchell Ginning Co., Oklahoma City, Okla., is in the market for about $50,000 worth of equipment to replace machinery destroyed in a recent fire.

The Empire District Electric Co., Joplin, Mo., will install equipment at a cost of about $275,000 to increase its capacity to 55,000 kw.

Wheeler & Rogers, Sumner, Miss., will erect a machine shop at Tutwiler, Miss., and are in the market for equipment.

The N. O. Nelson Mfg. Co., St. Louis, manufacturer of plumbing supplies, will increase its capital from $1,500,000 to $2,500,000 to enlarge its capacity and add new equipment.

The Marianna Motor Car Co., Marianna, Ark., capital $50,000, is in the market for equipment for a repair plant and machine shop. H. Banks is president.

The Jahncke Shipbuilding Co., Madisonville, La., Ernest Lee Jahncke, New Orleans, president, will equip a plant at Madisonville to build steel steamships. It has a Government contract.

The Mitchell Ginning Co.'s gin at Sapulpa, Okla., with offices at Oklahoma City, Okla., has been burned with a loss of $50,000 on machinery.

The Williams Mill Mfg. Co., Texarkana, Ark., is in the market for boring machines, particularly drill presses, etc.

The Ingalls Iron Works, Birmingham, Ala., recently incorporated with a capital of $250,000, will operate a machine shop and foundry. R. I. Ingalls is president and A. L. Gilliland, treasurer.

Texas

AUSTIN, Nov. 17.

Industrial activities are unusually brisk throughout this section. Machinery dealers state that more orders have been received for heavy machines within the last three weeks than at any time for several years. Conditions in Mexico do not improve, and there has been a temporary cessation of buying for that country.

The Uvalde Electric Light Co., Uvalde, will enlarge its plant and provide power for pumping water from shallow wells for irrigation purposes.

The Acme Iron & Metal Co., Dallas, has been incorporated with a capital stock of $15,000. Sam Weinberg is a stockholder.

It is announced that the Dallas Power & Light Co., Dallas, will make improvements to its property at a cost of approximately $2,500,000, which will involve the expenditure of about $750,000 within the next few months. Additional machinery will be installed in the power plant.

It is stated that the Missouri, Kansas & Texas Railroad will build an ice and cold storage plant at San Antonio at a cost of $100,000.

The San Marcos Utilities Co., San Marcos, will make improvements to its electric light and waterworks plant at a cost of $20,000.

The Snowflake & Taylor Light & Power Co., Snowflake, Ariz., is being organized with a capital stock of $50,000. A. Z. Palmer of Taylor, Ariz., and John A. Freeman, Snowflake, are among the stockholders.

The Sinclair Gulf Pipe Line Co., which has its principal office at Portland, Me., has been granted a Texas charter with headquarters at Houston. It has a capital stock of $3,500,000 and will lay a pipe line from the Oklahoma fields to the site of its proposed refinery at Houston, at a cost of about $5,000,000, including the installation of pumping plants.

The Canadian Water, Light & Power Co., Canadian, will install a new engine and other equipment in its waterworks and electric light plant.

The United Verde Copper Co. will install steam shovels and other equipment at its mines at Jerome, Ariz. Charles Clark is general manager.

The City Council, Victoria, will soon begin the construction of a new municipal electric light and power plant to cost $40,000.

California

SAN FRANCISCO, Nov. 13.

The demand for machine tools, especially the largest type, continues very strong. One prominent supply company, claiming two weeks ago to have the largest stock of tools on the coast, says that to-day its stock is so low that the question of replenishment has become a serious problem. Within two weeks it has sold between $50,000 and $75,000 worth of tools, bringing its record of sales beyond that of any year since 1906. The demand is especially for automatic machinery, large lathes, planers and radial drills. Cranes have also been unusually active. For smaller machines the call is normal. The inability of Eastern manufacturers to fill orders for machinery is causing a good deal of dissatisfaction, and unless conditions improve it is said the Government may find itself with a lot of hulls on its hands without machinery or equipment. The freight situation is also unsatisfactory. Machinery people realize the strain that is being put upon the railroads, but say it would make conditions much easier if the roads could furnish information regarding the whereabouts of shipments.

The Koppel Sales Co., Inc., San Francisco, reports that business has been unusually active within the past two weeks, especially in supplying narrow gage equipment for industrial plants controlled by the Government at Mare Island, San Diego and other points.

The American Can Co. has purchased for $85,000 a 15-acre site at Park and Fruitvale avenues, Oakland, on which it will immediately begin the erection of a plant to cost about $1,000,000.

The Golden Gate Shipbuilding Corporation, San Francisco, has been incorporated with a capital stock of $1,000,000. The incorporators are C. Bruno Carlson and Victor O. Post, Oakland; A. G. Kazebeer, A. C. McNamara, Thomas W. Firby and Herman Virde, San Francisco, and J. E. Pemberte, Berkeley.

The Michaelsen Machinery Co., Reno, Nev., has been incorporated with a capital of $2,000,000 by Edwin M. Ferguson, Emanuel Cohen and Wilbur D. Shaw.

The California Wire Cloth Co., Oakland, is adding machinery for the manufacture of fine-drawn copper and brass wire. A battery of annealing furnaces and machinery for manufacturing fence wire are also to be added.

The Marchant Calculating Machine Co., Emeryville, has added 16,000 ft. of floor space to its factory and will install machinery to increase its capacity to 1000 machines per month.

The Valley Foundry & Machine Works, Fresno, will erect an addition to its shops at a cost of $3,000.

The Goldy Machine Works, Sunnyvale, has been sold to Joseph Brack, Lodi, who will manufacture a patented motor truck.

The Commandant of the Navy Yard, Mare Island, has called for bids for an extension to the boiler shop, 98 x 93 ft. A 40-ton crane will be installed.

The board of education, Oakland, has called for bids for bench lathes and other tools for the Oakland technical high school.

The National Engineering Co., Wilmington, Los Angeles, will build a one-story addition, 40 x 75 ft., to its machine shop. Plans have been filed.

The World Aircraft & Development Co., Los Angeles, has been incorporated with a capital of $1,000,000 to manufacture aircraft and is negotiating for a site for its proposed plant, which will specialize in the production of high speed machines. A branch plant at San Diego is also contemplated. Floyd Smith and Fred C. Stillwell, Los Angeles, are the incorporators.

The Master Carburetor Co., Los Angeles, recently organized, has secured the patent rights to manufacture Master carburetors and will equip a plant. C. G. Harness is president and general manager.

The Los Angeles Railway Corporation, Pacific Electric Building, Los Angeles, will establish a new machine shop on Girard Street.

The Electro-Industrial Tractor Co., Vernon, Los Angeles, has been incorporated with a capital of $50,000 to manufacture tractors. Richard H. Norton, 335 West Twenty-seventh Street, is the principal incorporator.

The Savage Arms Corporation, San Diego, Cal., has acquired a building on Market and State Streets, which it will equip for a gun manufacturing plant. Considerable machinery has been ordered.

The George W. Eno Rubber Co., Los Angeles, has been incorporated with a capital of $150,000 to manufacture rubber specialties. George W. and D. M. Eno, John C. Stockwell and A. T. Sackett are the incorporators.

The Los Angeles Shipbuilding & Drydock Co., Los Angeles, will increase the capacity of its plant at Smith's Island, Wilmington, by the addition of two new shipways. It has secured a new contract from the Government for 10 steel ships with a capacity of about 8800 tons each.

The Pacific Northwest

SEATTLE, Nov. 13.

The efforts of the lumber industry of this section are concentrated on the production of ship and aircraft material, of which only comparatively small percentages are obtained from the logs. This results in the accumulation of much lumber of lower grades.

The car shortage, which is already acute on the Southern Pacific lines, it is feared will grow even worse than a year ago. The immense demand by the Government for cars is working extreme hardship on private shippers. Shortage of labor, especially in the logging camps, is becoming more pronounced.

Recent statistics show that in Seattle shipyards there are 42 ways for constructing ocean-going wooden vessels, as compared with a total of five one year ago. For the fiscal year ended June 30, the annual report of the State Corporation Commissioner shows that 15 shipbuilding companies, representing capital stock of $5,952,000, were organized in Oregon.

The Oceanic Shipbuilding Co., Portland, is completing arrangements for the establishment of a shipbuilding plant at Milwaukie, Ore.

The W. A. Vigiers Iron Works, Astoria, Ore., has changed its name to the Astoria Marine Iron Works. It will be moved to the port dock, to become a part of the new plant to be erected for the manufacture of marine boilers, engines, propelling and other gear.

The Standard Boiler Works, Seattle, has completed plans for its proposed boiler house, 64 x 160 ft., 33 ft. high, to be erected at a cost of $12,000.

The Erickson Engineering Co., Seattle, has received contracts from the Government for the construction of 10 9,500-ton steel steamships, involving an expenditure of $20,000,000. C. J. Erickson, president, has secured a 12-acre site on the Duwamish Waterway, and preliminary work is under way for the construction of a plant to cost $500,000. Besides six ship ways, a boiler shop, plate shed, foundry, machine and blacksmith shops will be built.

The Patterson-McDonald Shipbuilding Co., Seattle, Wash., has received contracts from the Government for the construction of 8 800-ton steel steamships, at a cost of $24,000,000. The contract is the largest single award ever made in the Northwest and will mean the establishment of another steel shipbuilding plant in Seattle. The company has a shipyard on the Duwamish Waterway, where 10 wooden ships are under construction. Four ways will be added, with two additional ones later. The machine shop and foundry will be enlarged to a length of 440 ft. Every detail of the ships will be constructed in the plant, including machinery, engines, boilers, deck and cabin fittings.

The Thomas Engineering Works, Portland, Ore., has been incorporated for $100,000 to manufacture a patented drag saw, pneumatic cleaner, riveting machine and pneumatic hammer. A factory will be established. Edwin E. Thomas is president and H. G. Beckwith manager.

Canada

TORONTO, Nov. 19.

The Gillette Safety Razor Co. of Canada, Ltd., Montreal, has been incorporated with a capital stock of $2,000,000 by Arno A. Bittues, Gordon W. MacDougall, Lawrence Macfarlane, and others, to manufacture safety razors, blades, cutlery, etc.

The Laval Industrielle, Ltd., Ville Laval de Montreal has been incorporated with a capital stock of $99,000 by Joseph O. Dion, Alberic Cote, Emile E. Parent, and others, of Montreal, to manufacture jewelry, sheet metal, clocks, etc.

The Conquest Machine Works, Ltd., Conquest, Sask., has been incorporated with a capital stock of $30,000 to manufacture machinery, tools, iron and steel, etc.

The Grand Trunk Railway, Lindsay, Ont., will build a roundhouse, machine shop and coal hoists at Lindsay. J. D. McMillan, Belleville, Ont., is manager.

The British Forgings, Ltd., 27 Atlantic Avenue, Toronto, is building a galvanized iron and frame plant to cost $4,000.

W. K. Colville & Son, 25 Front Street East, Toronto, will build an addition to their blacksmith shop and garage to cost $5,500. Material and equipment will be purchased by G. D. Redmond, 33 Fairview Boulevard, architect.

Delta, B. C., will build a pump house and install an electric pump to cost $12,000. N. A. McDiarmid is clerk.

The Hydroelectric Power Commission, Eugenia, Ont., is having plans prepared for extensions to its power plant to cost about $75,000.

The Dunlop Tire & Rubber Co., Ltd., 244 Booth Avenue, Toronto, will build an addition to its power plant to cost $5,500.

The factory owned by the Cranbrook Sash & Door Co., Ltd., Cranbrook, B. C., was totally destroyed by fire with a loss of $40,000. It will be rebuilt and new machinery purchased.

The Volta Mfg. Co., Welland, Ont., is in the market for a radial drill with 4 to 6-ft. swing.

George Hall, Alton, Ont., is in the market for a No. 5 Daisy or Oxford boiler.

The Western Tools, Ltd., Winnipeg, has been incorporated with a capital stock of $5,000 by L. Holling, A. B. Cail, M. E. Cail, and others, to manufacture tools, machinery, etc.

The Multipower Motor Sales, Ltd., Winnipeg, has been incorporated with a capital stock of $100,000 by F. L. Malcolm, V. A. Leslie, L. M. Sharn, and others, to manufacture automobiles, motors, engines, accessories, etc.

The forge shop owned by P. Melanson, Moncton, N. B., was destroyed by fire with a loss of $30,000.

The Canadian Metals, Ltd., 195 Alexander Street, Vancouver, will equip a scrap yard and is in the market for shears, acetylene cutters and a magnet for lifting iron.

Government Purchases

WASHINGTON, Nov. 19.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, opening dates unassigned, schedule 1569, for one heavy-duty engine lathe for Brooklyn, N. Y.; schedule 1567 for one horizontal boring and drilling machine for Hingham, Mass.; schedule 1568, for one electrically driven planer and joiner for South Charleston, W. Va.; schedule 1570, for one tool grinder, one radial drill and one 16-in. engine lathe for San Diego, Cal.

Bids will be received until Nov. 19 by the General Engineer Depot, U. S. Army, 1419 F Street Northwest, Washington, under circular 441, for 14 hand-power boring machines. Also bids will be received until Nov. 19 at the office of the Commanding Officer, San Antonio Arsenal, San Antonio, Tex., under circular 233, for one double-cylinder air compressor and one 8 x 42 air receiver.

Bids were received at the Bureau of Supplies and Accounts, Navy Department, Washington, on Nov. 9, 12 and 13 for furnishing material and supplies for the naval service as follows:

Schedule 1862½, Ordnance, Class 1, South Charleston, W. Va.—Three universal boring, drilling and milling machines—Bid 45, item 1a, $55,740; 1b, $55,740; 1c, $55,740; 46, part, $50,150, on any class of above schedule. Class 2, South Charleston, W. Va.—One open-side planer—No bid. Class 3, South Charleston—Two 6-ft. universal radial drills—Bid 8, $5,065; 40, $4,891 and $4,973; 44, $5,147; 45, $4,050; 60, $4,837. Class 4, South Charleston—One pit planing machine—Bid 45, $126,920. Class 5, South Charleston—One cutting-off planing machine—No bid. Class 6, South Charleston—One or two universal drilling machines—Bid 45, item 1a, $32,845; item 1b, $32,845. Class 7, South Charleston—One or two 10-ft. universal radial drills—Bid 45, item 1a, $28,910; item 1b, $28,910. Class 8, South Charleston—One to three platen planers—Bid 45, item 1a, $78,200; 1b, $78,200; 1c, $78,200; 45, item 1a, $134,155; 1b, $134,155; 1c, $134,155. Class 9, South Charleston—One or two grinding machines—Bid 45, item 1a, $20,435; 1b, $20,435. Class 10, South Charleston—One post planing machine—Bid, 45, $59,750. Class 11, South Charleston—One or two rotary or circular planing machines—Bid 45, item 1a, $58,230; 1b, $58,230.

Names of the bidders and the numbers by which they are designated in the above list follow: Bid 8, Brown & Zortman Machinery Co., 2535 Liberty Avenue, Pittsburgh; 40, Motch & Merryweather Machinery Co., 711 Lakeside Avenue Northwest, Cleveland; 44, Manning, Maxwell & Moore, 119 West Fortieth Street, New York; 45, Niles-Bement Pond Co., 111 Broadway, New York; 60, William K. Stamets, Pittsburgh.

Schedule 2119½, Steam Engineering, Class 61, Portsmouth, N. H.—Two engine lathes, belt-driven—Bid 24, $2,778.50; 43, $2,789; 45, $1,797; 47, $2,544 and $2,510; 49, $2,845; 61, $3,484 and $3,717; 70, $1,818; 82, $2,929.90. Class 62, Portsmouth—One four-spindle motor-driven drill—

Bid 47, $592 and $655. Class 63, Portsmouth—One engine lathe, belt driven—Bid 45, $810; 61, $1,512; 70, $1,030. Class 64, Portsmouth—Two sensitive, three-spindle drills—Bid 43, $505; 47, $515; 49, $507.

Names of bidders and their numbers follow: Bid 24, The Fairbanks Co., 416 Broome Street, New York; 43, Lynd-Farquhar Co., 419 Atlantic Avenue, Boston; 45, the Monarch Machine Tool Co., Sidney, Ohio; 47, Manning, Maxwell & Moore, 119 West Fortieth Street, New York; 49, Niles-Bement-Pond Co., 111 Broadway, New York; 61, Henry Prentiss & Co., New York; 70, the Philip Smith Mfg. Co., Sidney, Ohio; 82, Walcott Lathe Co., Jackson, Mich.

Schedule 1540, Construction and Repair, Class 1, Mare Island—One motor-driven, direct-connected squaring shear—Bid 7, $3,600; 53, $3,283.80; 62, $3,610; 68, $4,900. Alternative bid—Do. f.o.b. works—Bid 7, $3,215; 40, $2,937 and $2,657; 48, $3,284; 61, $5,940; 97, $3,230, $3,298, $3,279 and $3,309.

Schedule 1546, Ordnance, Class 11, Mare Island—Two duplex milling machines—Bid 62, $1,625. Alternative bid—Do. f.o.b. works—Bid 62, $1,550; 80, $1,565; 97, $1,562; 81, $16,647.29, part; 90, $24,995.04; 98, $35,219.12.

Names of the bidders and their numbers in the above lists follow: Bid 7, Bertsch & Co., Cambridge City, Md.; 40, Loy & Nawrath Co., 29 Runyon Street, Newark, N. J.; 48, Niagara Machine & Tool Works, 683 Northland Avenue, Buffalo; 53, George A. Ohl & Co., 161 Oraton Street, Newark, N. J.; 61, Sherritt & Stoer Co., 603 Finance Building, Philadelphia; 62, the T. O. Stallman Supply Co., 129 First Street, San Francisco, Cal.; 68, the D. H. Stoll Co., 26 Lansing Street, Buffalo; 80, Van Norman Machine Tool Co., Springfield, Mass.; 81, Ward & Co., 816 Fourteenth Street Northwest, Washington; 90, the Manhattan Supply Co., 115 Franklin Street, New York; 97, Manning, Maxwell & Moore, New York.

NEW TRADE PUBLICATIONS

Ventilating Sets.—B. F. Sturtevant Co., Hyde Park, Boston. Bulletin No. 237. Concerned with a line of ready-to-run portable ventilating sets which consist of an electric motor with one of the builder's multivane type fan wheels mounted on the shaft. A number of views of the sets in use for a great variety of purposes are presented, together with dimension and specification tables.

Ball Bearings.—Standard Roller Bearing Co., Philadelphia. Bulletin No. 52. Calls attention to a line of single and double row annular ball bearings. The construction of the bearings is first mentioned, followed by a brief description of the balls employed and the tolerances to which the bearings are made. Dimension diagrams and tables of the various types of bearings that can be supplied are included.

Saws.—Simonds Mfg. Co., Fitchburg, Mass. Booklet entitled, "Methods of Cutting Metals." Size, 4 x 6 in.; pages, 44. Illustrates and describes the various styles of solid and inserted tooth metal cutting saws. Information on the uses of each saw, the sizes in which they can be supplied, the number of teeth and the speeds and feeds recommended to give satisfactory operation are included. The saws covered included circular, milling, splitting and screw slotting types as well as those that have been especially developed for cutting aluminum, brass, copper, electrotypes, rubber, etc.

Plate Mills.—United Engineering & Foundry Co., Farmers Bank Building, Pittsburgh, Bulletin G. Gives a complete description with illustrations of large plate mills which have been built for the Inland Steel Co. and other plants. All of the various types of mills are illustrated, together with descriptions of the method of rolling both sheared and universal plates. A list of the mills that have been built by the company and those now under construction is included. Mention is made of the facilities possessed by the company for furnishing complete mechanical equipment for the mills, as well as designing the best arrangement of the auxiliary mills.

Industrial Engineering.—W. G. Archer & Associates, 320 Broadway, New York. Pamphlet. Devoted to the subject of profit conservation. Gives a brief discussion of the subjects of cost and general accounting, industrial engineering and factory management and layout. All of these are briefly touched upon and the facilities possessed by the firm for planning new systems or improving existing ones are mentioned.

Screw Machine Products.—National Acme Co., Cleveland. Calendar. Size, 12 x 15½ in. Each of the 12 leaves in addition to giving the calendar for one month beginning with November also has the dates for the previous and the following months. As usual the upper portion of the leaf contains an illustration of the company's screw machines, the operations performed by them and the accessories employed. In addition to the engravings of the different operations, a number of views of products are included.

Gear Shaping Machines.—Fellows Gear Shaper Co., Springfield, Vt. Booklet. Size, 6 x 9 in.; pages, 136. Devoted to the setting up and operating of the company's spur and helical gear shaping machines. It comprises a group of printed instructions and suggestions supplementing those given by the machine demonstrators together with data on roughing and finishing cuts, care and maintenance, methods of clamping and supporting work, cutting oils and cooling compounds, gaging and inspection of work, rules for calculating the elements of the teeth and tables of gear parts, etc. In preparing the booklet numerous halftone engravings and line drawings have been included to supplement the text.

Portable Tiering Machine.—N. Y. Revolving Portable Elevator Co., 344 Garfield Avenue, Jersey City, N. J. Bulletin No. 42. Illustrates and describes the use of the company's Revolvator which is a portable machine for piling cases, bales, barrels, crated machinery, etc. Among the features emphasized are savings of time and labor and utilization of all the floor space as the goods can be packed clear to the ceiling. A number of views of the machine in use for handling various kinds of packages are included, together with lists of the industries using these particular forms of containers.

Boronic-Metal Alloys.—American Boron Products Co., Inc., Reading, Pa. Pamphlet. Points out the advantages of using Boronic-Copper and Boronic-Metal Alloys as deoxidizers. After a brief discussion of what these products are and briefly mentioning the economies to be derived from employing them, the various uses of the products are mentioned. These comprise a series of 23 numbered paragraphs, one for each product with a brief statement of the composition and purposes to which it may be put. Directions for using the various products are included.

Grinding and Polishing Machines.—Gardner Machine Co., Beloit, Wis. Catalog. Size, 6½ x 10 in.; pages, 121. Describes an extensive line of grinding and polishing machinery together with the various accessories and supplies. The machines covered include disk type machines for metal working and pattern shops, polishing and buffing lathes and ring wheel grinding and band finishing machines. As a general thing each machine is given a separate page with an illustration and brief description, and where possible the same arrangement is followed for the different accessories and supplies. A number of views of the machines in use are presented.

Punch Press Safety Devices.—Benjamin Electric Mfg. Co., 120 South Sangamon Street, Chicago. Two circulars. Present illustrations and brief descriptions of two safety devices for punch presses. One of these is a guard which requires the use of both hands to trip the press, while the other is a small air compressor, designed for the rapid ejection of pieces of work, dirt, chips and foreign substances from the dies during the upstroke of the machine.

Vacuum Drying and Impregnating Apparatus.—J. P. Devine Co., Buffalo. Bulletin No. 104. Gives complete detailed information of the equipment that has been developed for impregnating electric coils, cables, insulator pins, electrical work of all kinds and wood. The operation of the unit is descrbed at length and a number of vews of installations are included.

Flexible Metal Hose.—Breeze Mfg. Co., 252 South St., Newark, N. J. Mailing card. Relates to a line of flexible metallic hose with interlocking walls. A number of views of the various kinds of hose and fittings that can be furnished supplement the descriptive matter and a table of the standard sizes is given.

Oil Storage Systms. — Gilbert & Barker Mfg. Co., Springfield, Mass. Pamphlet. Deals with systems for storing, handling and distributing volatile, lubricating and paint oils in machine shops, mills, factories, engine rooms and railroad oil houses. The different pumps and tanks are illustrated and briefly described and a number of views showing the way in which the various parts of the system can be installed are included.

Oxy-Acetylene Cutting Equipment.—General Welding & Equipment Co., 107 Massachusetts Avenue, Boston. Pamlet. Treats of a line of oxy-acetylene cutting equipment for handling extra heavy work. In addition to illustrations and a brief description of the apparatus, a number of views of work that has been done in making cuts ranging from 6 to 18 in. in length, are presented with short statements of the work that was done and the time required to do it. A few suggestions as to the proper method of handling the apparatus for doing this work are offered.

THE IRON AGE

New York, November 29, 1917

ESTABLISHED 1855 VOL. 100 : No. 22

Fostering the Shop Spirit

New Departure's Handling of the Man Problem—Helpful Movements for the Development of Employee and Community Interest



BY W. E. FREELAND

A BIG factory in a little city has its own big problems. If it has grown so large that in a measure it dominates the town, it has also its big responsibilities. This is the present situation of the New Departure Mfg. Co., maker of ball bearings, at Bristol, Conn., a city of less than 25,000 people. The proportion of growth of the factory in the last three years has been almost ten to one of that of the town. So it can be readily seen that the problems of welding a large accretion to its original working force, of housing the many families brought into the town, and of developing many things in the community at large have had to be met.

Back of such growth lies an interesting story of industrial development. The New Departure Mfg. Co. was incorporated June 27, 1889, and its original product was the older types of mechanical door-bells. Out of this business grew the manufacture of the New Departure bicycle bells, so well known to men now of middle age. Later came the development of the coaster brake, perhaps the most important factor in bringing the bicycle back into popularity after the near dissolution of the bicycle industry in the early years of the present century.

In 1906 the manufacture of ball bearings was taken up. This has now become the major interest of the company, although the output of coaster brakes and bells continues to be an important part of the yearly production.

One of the things that has promoted the growth of the company, aside from the constant betterment of product, has been its continued and finally successful effort to change the character of ball-bearing measurements from a multitude of special sizes to the standard sizes which now prevail. Prior to the outbreak of the European war the company had a ball bearing plant that seemed adequate for the growth of several years. Then machinery and motor conveyances of all kinds were ordered in enormous quantities. The ball bearing business received an impetus that swept away all preconceived ideas of factory expansion.

In the two years between June 30, 1915, and June 30, 1917, the company was compelled to add to its factory until it had doubled the value of its plant investment and tripled its output. A series of buildings was added. First came a grinding plant which is believed to house more grinding machines than are assembled under one roof anywhere else. Then a steel ball plant was added that has a capacity of 25,000,000 steel balls a day. It is also building a big structure alongside the railroad track, locally known as the Terminal building, which will house over $1,000,000 worth of steel stock and a large equipment of the machinery used in the initial processes of manufacture, as well as the packing and shipping facilities for the finished product.

While this story pertains principally to plant A at Bristol, the company also has a plant in East Bristol, known as plant B, where bells are made, and another plant, C, at Elmwood, a suburb of Hartford, engaged principally in the making of the smaller sizes of bearings.

102 Houses in 102 Days

Naturally, in the rapid growth of the plant, the

housing facilities of the town quickly proved inadequate. Then the company took up its own housing work through an auxiliary organization, the New Departure Realty Co. Twenty-two acres of land adjoining a city park formed the site for an extensive effort to overcome the housing difficulties. Streets and lots were graded, a somewhat difficult matter because of the hilly nature of the ground, and water, sewers, electricity and gas put throughout the tract, which is called Endee Manor. The work of building was begun in June, 1916, and the first house was occupied Oct. 17, the same year. In all, 102 houses were built in 102 days.

These houses are on lots 50 x 150 ft. and were designed by the company's engineers. All are of attractive design and well constructed and comprise about eleven different types, including quite a number of both the usual two-family house and the duplex, two-family house. The 102 houses have altogether 174 apartments of four to six rooms. They are both sold and rented. In case of sale the property is put under special rigid restrictions intended to keep the tract thoroughly residential and to prevent nuisances that would lower the value of neighboring property. The houses are all set back 20 ft. from the street and only people of the Caucasian race are permitted to live in them. When rented, the following rates prevail—four rooms, $14; five rooms, $16; single houses, $18. The rents are collected in advance.



Many of the Houses Are for Two Families

The sales plan has several interesting features. Varying initial payments are permitted, $100, however, being the minimum payment. A local bank takes a first mortgage at 5 per cent and the realty company a second mortgage at 6 per cent. Arrangements are made to pay off this second mortgage in ten years or less. The houses vary in price from $2,900 to $6,500, being sold at net cost, as there is no desire to make a profit. In the care of the property after purchase the company maintains no paternalistic attitude. The men are compelled to look after their own property as they would if they had built independently. The realty company pays for the fire insurance for the first three years. If the purchaser becomes ill, payments are extended, without interest, for a period of not over six months. The company carries life insurance of $3,000 on each purchaser and in case of his death within ten years an immediate cash payment of $500 is made to his family and such other portion of the insurance money as is necessary is applied against the second mortgage, the surplus being turned over to the family in cash. The deeds carry a provision that the grantor has first option on the property, if the grantee desires to sell.



Office of Endee House, the Employees' Hotel

Endee House—An Employees' Hotel

The single man is a problem to every manufacturer. Just how he should be properly housed is nearly always a question. The manager of the realty company, L. A. Wheeler, maintains a record of all the available boarding places in the city and is able, because of the influence of the company, practically to put a stop to excessive charges for board and lodging. This method, however, proved to be only a partial solution and about a year ago the company bought the leading hotel in the city, the Gridley House, and turned it into a company hotel, changing its name to the Endee House. A portion of an adjoining building was taken over so that the present number of rooms is 74 and the usual number of lodgers from 100 to 110. Room and board cost a fixed sum of $7.50. Men who come to the hotel are required to give proof of actual employment or that they are negotiating for employment and are further required to make a deposit of $5. All the rooms are nicely furnished in the usual hotel style and the best rooms are awarded on the basis of a rating of the men's seniority and conduct. The house has 22 baths scattered about in various parts of the two buildings and 30 bowls with hot and cold water. There are iced drinking fountains on each floor.



Eleven Different Types of Houses Were Built

The street floor of the building is occupied by stores, above which is the large office with club features, pool tables, card tables, etc. Adjoining is a large room used as a writing and music room. Whist and pool tournaments are a part of the usual entertainment and a bowling club and other features add interest and promote acquaintance and good feeling among the men. Every Sunday there is a musicale, and another Sunday feature of much interest to the older men is the customary session of what has grown to be called the Amen Corner Club, where no subject is taboo and usually no agreement is reached upon any subject in the free-for-all discussions.



Section of the Office Is Equipped as a Club Room

One of the chief uses of the hotel is as a clearing house through which a constant stream of men can be kept circulating and kept happy until they find for themselves a home or boarding place to their taste. About 60 per cent of the men are single and some of these stay permanently at the hotel. As a rule the married men stay only long enough to locate a home to which they can bring their families.

Mutual Relief Association

Another way in which the employees of New Departure are drawn together is through the New Departure Mutual Relief Association. This was organized in 1904 and any male employee, 18 to 45 years old, who has been three months on the payroll, is eligible for membership upon approval of his application by the board of directors, which consists of nine men, selected from different departments. One dollar first payment is required and



The General Offices of the Company Are in This Building

50 cents a month during the first year. The rate continues at 50 cents at such times as there may be less than $1000 in the treasury, but when there is more than $1000, which is ordinarily the case, the dues are only 25 cents a month. Extra assessments can be made, but that has only been necessary twice in the history of the organization and those two instances were during its early days. The organization pays, beginning with the second week of illness, $1.50 for each working day, for not more than thirteen weeks in any one year. The death benefit is $50. The company does not contribute to the funds of the organization, which is run and supported through the efforts of the men themselves. One great means of adding to its funds is by conducting numerous social affairs.



One of the Floats in the Annual Picnic Parade

The most ambitious of these social affairs and the big event of the year for the employees is the annual barbecue held every fall. The company furnishes food, music, prizes and everything but the actual work. This year a considerable group of friends of the company enjoyed the affair and several reels of film were made by Pathe Weekly and other operators.

At the annual barbecue just held, 3500 people were seated in a grove eating at one time. The barbecue, which was really a sheep bake this year, was held on a Saturday afternoon and the employees worked until 11 o'clock. Then the New Departure band took its place opposite the administration building and filled in the hour before the parade with a concert. A parade of costumed marchers and floats passed through the main streets of the city, drawing a large crowd to the grove where the barbecue was to be held.

One unusual float, which won the first prize, carried 53 girls from the inspection department, who were dressed so that when seated on the rising tier of seats on the float they formed a United States flag. The men from the tin shop had composed themselves into a band with instruments made from tin plates. From the company's grinding department 30 deaf mutes organized themselves into a section of the parade and carried humorous signs.



The Girls' Inspection Department Won First Prize for Floats

Over 1000 employees of the company are members of the New Departure division of the Health Protective League, established a year ago, which has branches in several factories of Bristol. The work of this league is wholly against tuberculosis. The dues are $1 per year and the provisions for relief extend to the family of the employee as well as himself. A member becoming ill from this disease is given from $4 to $8 a week according to his needs, and if necessary is sent to the state sanitorium. The organization takes care of the families of members under such circumstances although there is no such obligation in the by-laws of the organization.

Social Activities of Fire Fighters

One of the interesting phases of the social side at the New Departure plant is the great success of the fire department, both in its purpose and as a social factor. It has its own business organization, a treasurer, bank account, kitchen and recreation room. The fire department is a live factor in building up good feeling and better acquaintance among the employees of the plant and between the employees of the plant and the citizens of the town. It has a chief and four assistants. Of these assistants one is a workman, another is the foreman of the piping department, a third the shop electrician, and the fourth the head of the safety department. Two companies are maintained, each of which has a foreman and assistant foreman, six regular men and six call men. There are also two men who are designated as fire police. The chief of the department is paid $50 a year; the



The Plant Fire Department and Part of Its Equipment

assistant chiefs, $40; foremen, $35; assistant foremen, $30; regular men, $25, and the call men for the actual time devoted to the work. Three men known as bunker men are paid $75 a year and given free lodging. These men never leave the plant without providing substitutes to take their places.

The factory buildings are equipped with sprinklers and standpipes. There is also a 1000-gal. steam pump arranged so that it can be operated in any one of three ways: in connection with the 8-in. city main, with the river or with a reservoir on a hill. This pump is also connected with a pump of the same size in a neighboring factory. Hydrants built according to standard insurance plans are scattered throughout the yard of the plant. Because of this good fire protection, not much heavy apparatus is needed. The portable fire-fighting equipment consists of three 50-gal. chemical tanks on wheels, one hose reel carrying 500 ft. of hose and a set of extension ladders. Hundreds of hand chemical tanks are scattered throughout the various buildings. The plant is equipped with a Gamewell alarm system having 35 boxes. The alarm system operates the factory whistle and bells and sirens in all the workrooms.

Weekly drills are held in the summer and there is keen competition between the two companies to see which will get the chemicals and hose-lines to a designated point first. In the winter the companies meet monthly for instruction in the handling of the apparatus and in the location of piping, hydrants, valves, etc. The men are fined $1 for absence from drill.

Control and Promotion of Athletics

In common with most companies, the New Departure Mfg. Co. has found it wise both to foster athletics and, in a measure, to control athletics and sports. It maintains teams in practically all the major sports and has inter-departmental teams in the more quiet sports like bowling. There is very great interest in the inter-factory contests. Such contests are, perhaps, more a feature in Connecticut than in any other state in the Union. For instance, there are several Connecticut factories that have baseball teams that are ready to try conclusions with any other amateur or professional team in the country at any time.

Other Service Departments

The employment, safety and medical deparments of the company are not dissimilar to those existing in most modern factories. Just at present all of these are in a state of flux because the growth of the factory is making radical changes necessary. The company is now engaged in installing a modern hospital department, in charge of a competent graduate physician and surgeon. This supplants a hospital that has been doing very effective work for some time and is only a step in the direction of extending the supervision of health and of medical inspection and services along a path that is expected to include not only the employee himself, but also in all probability his family. Modern safeguards are installed wherever the need is shown and a stream of suggestions for further safeguarding flows in to the head of the department.

The activities of the company in its social work and of the social organizations and protective organizations of the employees find expression in a lively shop paper called "The New Departure News," published weekly. This paper has been running about eight months and has established a place for itself in the minds of the workmen that makes it a vital part of the whole social fabric of the organization. Its editor-in-chief is DeWitt Page, president of the company, whose keen interest in their welfare is understood thoroughly by the older men who have grown up in the business with him and who form the most efficient missionaries among the new men for the building up of good will within the entire organization. Its managing editor is Charles F. Olin, advertising manager, who has also seen the company grow from a group of 300 or 400 men to its present size. Today "New Departure News" is a real force in perpetuating the good spirit that now exists and in creating a community of interest of management and employee.

As the company grew so rapidly in the last two years, drawing to itself so many young men and young women, it became evident that something must be done for the young people and for the older ones as well. A little study showed, however, that other factories in the town were also growing rapidly and drawing men to the little over-burdened community. Out of this has sprung the organization of a Community Club and the gathering of a fund of $250,000, more than half of which has come from the New Departure Company and its employees, to build a clubhouse. President Page was a leader in bringing this about. The work of the organization is for the benefit of men, women and boys, along the line of the Y. M. C. A. or Y. W. C. A., but without emphasis on the religious features. The building will have separate sets of rooms for men, women and boys, including parlors, reading, writing and game rooms. There will be dormitories, class rooms, a gymnasium, swimming pool and a theatre seating 2000 people.

Enough has been said to show that Bristol is rising to meet its needs and that the New Departure Mfg. Co., which has been such a factor in creating these needs, is doing its share, not only for its own people but for the community as well. Such a linking together of city and industry is one of the ideals toward which leading American industrialists are trying to point the way for all manufacturers.

First-Aid Work at Bethlehem Steel Co.

First-aid work at the Bethlehem Steel Co., South Bethlehem, Pa., is divided into two parts, according to a paper presented by J. R. Mulligan, assistant safety engineer of the company, at the recent National Safety Council meeting. It consists of training in the rescue of men from danger, treatment of shock, bandaging of wounds, etc., and also along another line which prevents injury to fellow employees by knowing the hazards of the various operations and guarding against them. Each shop has at least one first-aid team, which is given a course of instruction in first-aid work for 2 hr. per week for four months and a portion of this time is given over to the discussion of safe practices for the various operations of the plant. Three years of organized accident prevention work has shown an average reduction in the number of accidents of 28.38 per cent as compared with a similar period of unorganized work.

Price Fixing and Production

The National Foreign Trade Council discusses the principle underlying the co-ordination of price-fixing, taxation and the maintenance of foreign trade in a report which the council has submitted to the President and to Congress. The report was prepared for the Council's Committee on Banking Facilities for Foreign Trade by Lewis E. Pierson, chairman of the board of the Irving National Bank of New York. It recommends to the Administration and Congress the co-ordination of its efforts at price fixing and taxation upon principles that will stimulate production, insure the fullest maintenance of foreign trade and so provide a steady source of funds for the vigorous prosecution of the war.

The report declares that "the relation of price fixing and taxation to the maintenance and development of foreign and domestic trade in war times is direct and of the greatest force."

For converting dollars and cents into pounds Sterling and also into French currency, Edward LeBas & Co., 64 Broad Street, New York, have prepared two tables. They are designed particularly for insertion in catalogs.

IRON ORE FOR THROPP FURNACES

Prospect That Conneaut Will Be Made Available as a Shipping Port

WASHINGTON, Nov. 27.—A recommendation that the Pennsylvania and the Bessemer & Lake Erie Railroad be required to open Conneaut as a port from which merchant blast furnaces at Saxton and Earlston, Pa., may obtain iron ore has been made to the Interstate Commerce Commission by Charles F. Gerry, its attorney-examiner, who took the testimony in the complaint of Joseph E. Thropp vs. Bessemer & Lake Erie et al. His opinion is that the railroads mentioned should publish a rate of $1.375, plus the six cents per ton charge for transferring the ore from the rail of the vessel to the cars. Up to this time, the commission has always adopted and made the reports of its attorney examiners its own, hence the importance attached to this one which creates the prospect of a rate of $1.375 per ton from all lake ports to the furnaces near the southern border of Pennsylvania.

At present the Thropp furnaces are paying $1.60 per ton from Buffalo and Erie. The report says that for ore rate purposes these furnaces are in a group the easternmost limit of which is at Wharton, N. J., while for rate-making purposes on pig iron going to New England they are in the Johnstown group. Thropp can now obtain ore only at Buffalo and Erie because joint rates to his furnaces are published alone from those ports. Conneaut is 285 miles from his furnaces. The mileage to the other ports is substantially greater, but the Pennsylvania has rails from them to within a few miles of the Thropp furnaces. Presumably, it has made the rate adjustment so as to keep the tonnage on its own rails.

The proposed order is based on a finding that "in the present emergency" the $1.60 rate from Buffalo and Erie is not unreasonable or unduly discriminatory but that Thropp is entitled to a reasonable rate from the nearer port because there is a practicable route, composed of Bessemer & Lake Erie rails from Conneaut to Butler, Pa., and thence via the Pennsylvania's rails to the short roads leading to the Thropp furnaces.

Bessemer & Lake Erie Through Route

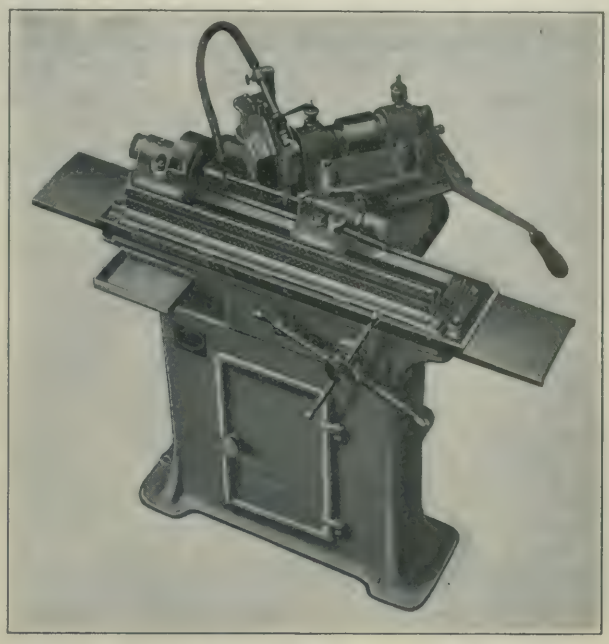
In the big iron ore rate case, in which a general readjustment was ordered, and the so-called "a la carte" system of stating rates on ore was introduced, the commission ordered the Bessemer & Lake Erie to establish a through route via Butler as the junction point. It said, however, that carriers from other ports might meet the rate made to Johnstown from Conneaut via Butler, if they so desired. They did so desire but the route via Butler was never established, because the furnaces did not care by what rails their ore moved. What they wanted and what they received was a rate based on the shorter mileage via Butler, regardless of the port. The commission acted on a conclusion that the carriers had not performed the legal duty placed on them to establish through routes and joint rates from Conneaut to Johnstown.

In his complaint Thropp set forth that for the 77-mile haul the ore receives from Pittsburgh to Johnstown the railroads charge only 12c. more than to Pittsburgh. For the 75-mile haul via one route from Johnstown to Saxton and Earlston and 90 miles via another, the railroads charge 51c. more than to Johnstown. On raw material Thropp and a considerable number of furnaces similarly situated were grouped with Wharton, N. J., while on finished product sent to New England they were grouped with Johnstown. The railroads retorted that as to the rate on pig iron to New England, Johnstown has the benefit of the competition, with them, of the more direct route of the Buffalo, Rochester & Pittsburgh. The furnaces in question are beyond the sphere of that influence.

In his original complaint, filed before the rate was advanced 15 cents, Thropp made no demand for reparation. At the hearing, however, he argued that because the commission allowed an advance notwithstanding his protest, it had in effect modified his demand so as to insert therein a prayer for reparation. That is a novel plea, says the report, based on an obviously untenable position. W. L. C.

A Recent Valve Seat Grinding Machine

The Ott Grinder Co., Indianapolis, has added a new machine to its line. Although designed especially for grinding the valve seats of internal-combustion engines



Internal Combustion Engine Valve Seats Can Be Ground at Any Angle Between 15 and 60 Deg. on a Recently Developed Machine

at a 45-deg. angle, the machine can be employed for similar work where the angle is between 15 and 60 deg., as a special wheelbase, operated by a hand lever, is provided.

A straight-faced wheel is employed, and is traversed across the valve seat, an arrangement which it is emphasized insures quick and accurate work. The traverse of the table is controlled by a handwheel of the capstan type.

If the machine is to be used with valve stems the heads of which have no centers, a draw-in collet chuck operated by a foot lever, to facilitate quick handling, is furnished.

Niles-Bement-Pond Co. to Build New Plant

The Niles-Bement-Pond Co., New York, has purchased 50 acres near Kearny, N. J., fronting on the Lincoln Highway and Hackensack River, and will build a plant for the manufacture of machine tools and cranes. The site is opposite that of the Federal Shipbuilding Co.'s new shipyard. The Niles-Bement-Pond Co. took an option on the property about six months ago and at that time it was understood that a plant would be built at once to assist the Government in providing large tools and cranes for war work. Fay Ingalls, secretary of the company, states to THE IRON AGE that plans have not definitely been made. He says that it is the intention of the company to build a new plant, but whether this will be completed in time to be of assistance in the war program depends upon how long the war lasts.

The Alloy Steel Works, Ltd., Toronto, Ont., recently incorporated, will take over the steel plant on Front Street East formerly operated by the Moffatt-Irving Steel Co. The new concern will continue to make steel castings by the electric-furnace process. It proposes to make considerable additions to its plant and to install an additional electric furnace. John R. Russell and H. T. Armstrong of Toronto are interested in the company, which is capitalized at $100,000.

Utilizing Domestic Manganese Supplies

Manganiferous Iron Ore in the Blast Furnace to Make Higher Manganese Iron—Conserving Manganese in Basic Open-Hearth Bath Metal

BY EDMUND NEWTON

THE difficulty in obtaining ferromanganese for steel manufacture has given some companies much concern. A careful analysis of the situation shows that, because we are depending almost entirely on imported manganese ores, the future quantities of available ferromanganese will be controlled largely by our ability to maintain such imports or to utilize our available domestic material to a larger extent than heretofore. If it were possible to utilize such domestic supplies to a greater extent, at the same time maintaining the quality and amount of our steel, we could do without a certain amount of imported ore and thereby divert ships to other purposes. How can this be done?

While we produced only a relatively small quantity of high grade manganese ore in 1916, we produced nearly 170,000 tons containing from 15 to 40 per cent manganese, and approximately 440,000 tons containing from 5 to 15 per cent manganese. Much of the 170,000 tons could be mixed with a certain amount of high grade ore and used to produce an alloy carrying from 40 to 60 per cent manganese. While the use of such material is not standard practice in this country, such alloys have apparently been used successfully on the continent, in England and in at least one steel plant in the western part of the United States, even in ordinary times. It is desirable to try to develop satisfactory practice for utilizing them, at least during the war.

The producers of domestic ores are trying hard to beneficiate these so as to make them more desirable for making alloys which are now used in standard practice. All logical and even very complicated processes are being investigated. In some cases these methods are successful, but in others the physical characteristics of the ores are such that relatively no improvement can be made.

Relative Amounts of Ferromanganese and Spiegel Now Used

Present metallurgical practice in the manufacture of ordinary steel consists in adding manganese in the form of ferromanganese or spiegeleisen at the end of the open-hearth "heat" or Bessemer "blow." The purpose of these additions is principally to remove oxide of iron (FeO) and some sulphur from the steel and also to impart certain desirable properties by virtue of the added manganese, which remains in the steel. Table 1, modified somewhat, from that of D. F. Hewitt, shows the relative amounts of ferromanganese and spiegeleisen used from 1912 to 1916 inclusive, the tonnages of metallic manganese contained in the same and the percentage of the total metallic manganese used in both alloys.

From this table, it is evident that in normal practice before the war, about 10 per cent of the total manganese was used in the form of spiegeleisen while 90 per cent was used in the form of ferromanganese. During 1915 and 1916, it is evident that the use of greater relative quantities has been practised.

Manganese in Basic Pig Iron

The data now available indicates that there are distinct advantages to be gained through an increased manganese content of pig iron used in the basic open-hearth process, although there is considerable difference of opinion among steel operators on this point. The American Iron and Steel Institute reported that in 1916 there were 29,616,658 gross tons of basic open-hearth steel produced in the United States out of a total steel production of 42,773,680 tons. In other words, nearly 70 per cent of the total steel was made by this process.

Until a few years ago in this country basic pig iron was usually specified to contain under 1 per cent manganese, for normal practice. Recently, some operators have been using considerably higher percentages of manganese. It is evident why our practice grew up around a manganese content of 1 per cent in basic pig iron. The average Lake Superior iron ores carry only about 0.70 per cent manganese which will produce a pig iron containing about 0.70 per cent manganese, assuming a 40 per cent loss in the blast furnace. Higher contents of manganese in the pig iron can only be obtained by mixing manganese or manganiferous iron ores.

The line of least resistance has been generally followed until recently, and the advantages of more manganese in the open-hearth have been disregarded in this country. Oddly enough, there appears to be little or nothing in our technical literature describing the behavior of manganese in the basic open-hearth. I have seen private reports by steel metallurgists that argue against the practice on the basis of certain tests made.

In certain European countries, even before the war, the amount of manganese contained in basic pig iron was considerably higher than that used in American practice. In some cases this was due to higher manganese in the iron ores and in others it was obtained by mixing manganese or manganiferous iron ores, because the foreign operators believed that certain distinct metallurgical advantages were gained by such practice. It is now generally realized in this country that manganese in the basic open-hearth tends to eliminate sulphur, to make the heats work better and offers certain other advantages.

Manganese Retained in the Basic Bath

Attention has also been called to the fact that manganese is not completely removed in the basic open-hearth, particularly when the original charge contained considerable manganese. Forsythe, in his book on the blast furnace, mentions this fact as a disadvantage in using a high manganese iron because the usual manganese addition may then produce too high a content in the steel. Campbell also speaks of it and says that "not only must this be allowed for but there will be less oxygen in the bath and consequently, a smaller loss of manganese in the ferromanganese addition."

This possibility of retaining manganese in the bath metal is important at the present time with our shortage of ferromanganese. If it is possible by using a fairly high manganese pig iron, to retain considerable residual manganese in the bath at tapping time, there would be a direct saving in the quantity of ferromanganese added. The manganese content of the pig iron could be increased by mixing manganiferous iron ores in the blast-furnace charge.

There seems to be considerable difference of opinion among American steel makers as to the possibility of retaining manganese in the bath under such conditions. In a report rendered by a committee of open-hearth men it was stated that when the manganese in the pig iron was approximately 1 per cent, the residual manganese in the bath was 0.14, while with a 2 per cent manganese pig, the residual manganese was only 0.18. On the other hand, I have talked personally with one metallurgical engineer of a large steel company who stated that it was practicable to economize ferromanganese in this manner if conditions in the open-hearth were properly controlled. He further stated that with from 2 to 2.25 per cent manganese in the pig iron it was possible to retain from 0.25 to 0.30 per cent residual manganese in the bath at tapping time. Another metallurgical engineer of a large steel com-

pany stated that a high manganese pig was advantageous for reducing sulphur and making cleaner heats but did not agree that it effected a saving in ferromanganese. On further questioning he admitted that, with 1 per cent manganese in the pig metal, the residual manganese would range from 0.10 to 0.14 per cent, whereas their practice, which was based on the use of 2 to 2.25 per cent manganese in the pig iron, produced an average residual manganese of 0.30 to 0.35 per cent. We have apparently conflicting testimony indicating that conditions are different in the various cases.

Effect of Large Amount of Manganese in Basic Practice

As already stated, there are practically no discussions on the behavior of manganese in the basic open-hearth in our literature. There is, however, in German literature and the Germans have apparenly realized the advantages for some time. Dichman* states that in either the basic open-hearth or basic Bessemer, satisfactory steel can be made without any additions of ferro-alloys at the end of the heat, if the raw materials of the charge are sufficiently high in manganese. Corroborating this statement, Cone† says:

> The German practice also involves the incorporation of 4 or 5 per cent manganese in basic open-hearth pig iron. To accomplish this, considerable manganese ore has been necessary, depending upon the manganese content in the iron ores from which this is made * * * The metallurgical reasons for so large a manganese content in Germany's basic open-hearth pig iron is the belief that a better steel is the result of the presence of so much manganese. This is without doubt correct and the practice is gaining favor in the United States in many quarters * * *.

Accounting for these facts, Dichman states that the manganese of the metal in the basic open-hearth will be oxidized by free FeO in the slag or bath and will form the silicate, $FeMnSiO_4$, which passes to the slag. If there is sufficient manganese present this action will continue until a state of equilibrium is established between the manganese of the slag and that of the metal. Also, the greater the quantity of manganese in the original metal, the sooner will this state of equilibrium take place.

Naske‡ states that manganese passes to the slag or reverts to the bath metal in the open-hearth, depending upon the relative amounts of manganese in the slag and metal and upon the temperature. A series of tests shows that when the manganese of the slag is less than that of the iron, the bath loses manganese. If the iron and manganese of the slag are equal, the manganese of the bath remains unchanged, while if the manganese exceeds the iron in the slag, manganese is reduced and passes back to the bath. Dichman also suggests that

> manganese acts as a powerful reducing agent upon the iron oxide of the slag or metal, returning iron to the bath while the manganese as MnO combines with silica and joins the slag. The slag can further only take up a specified maximum content of metallic oxides, and the more manganese contained in it, the less must its content of ferrous oxide become. Therefore, a slag rich in manganese oxide will contain less iron oxide and will not react as powerfully with the metallic manganese of the bath metal.

Obviously, there are then two tendencies at work—the manganese of the bath decreases more slowly and the exhaustion of ferrous oxide in the slag permits of the reduction of manganese from its oxide by the carbon of the bath. Manganese in the bath tends to destroy ferrous oxide contained in the metal, regarding which he makes the statement:

> One can, therefore, use manganese also as a preventive agent against red shortness (due to contained FeO) by means of large additions of manganese to the charge. This takes place nowadays in all cases where metal of the highest quality is to be manufactured.

Let us see how Dichman's explanation applies to our practice. It is, of course, necessary to have an oxidizing slag to act upon the carbon, silicon and phosphorus of the bath metal. Iron ore is often added during the heat to work out these impurities. If there is sufficient manganese in the charge to saturate the slag, we will have considerably less ferrous oxide contained in it, for that has been reduced by the manganese. The slag will contain practically as much oxygen on account of that combined with the manganese and will, therefore, have nearly as oxidizing an effect on the carbon, phosphorus and silicon as before, but not on the manganese of the bath.

While this theory is interesting, it is essential to make actual investigations in the laboratory covering the equilibria of open-hearth metal and slags and also confirm this with large-scale tests with a number of heats with pig iron containing from relatively small amounts through successive increases up to pig iron with large amounts of manganese. Samples of the bath metal and slag should be taken at intervals so that it would be possible to ascertain just what happens under a certain set of conditions; what the best conditions are for retaining residual manganese in the bath, and whether such conditions could be applied commercially at the present time without retarding practice or producing poorer steel.

The argument has been that this practice would be wasteful, because a large quantity of manganese would be lost to the slag. However, this manganese would be lost in accomplishing a useful purpose in preventing oxidation of the steel and in the amount of ferromanganese for this purpose.

Table 1—Metallic Manganese Used as Ferromanganese and Spiegeleisen in Steelmaking in the United States

Year	Ferro-manganese, Gross Tons	Analysis, Per Cent Manganese	Metallic Manganese, Gross Tons	Spiegel, Gross Tons	Analysis, Per Cent Manganese	Metallic Manganese, Gross Tons	Metallic Manganese: Total Metallic Manganese, Gross Tons	Metallic Manganese: Per Cent in Ferro-manganese	Metallic Manganese: Per Cent in Spiegel
1912.....	224,515	79.17	177,740	103,576	19.12	19 801	197,541	89.9?	10.02
1913.....	247,565	79.49	196,798	107,057	19.43	20.804	217,602	90.44	9.56
1914.....	183,728	79.36	145,806	79,495	19.76	15,705	161,511	90.28	9.72
1915.....	199,523	76.35	152,344	114,756	19.91	22,844	175,188	86.96	13.04
1916.....	286,225*	76.35†	218,533	197,518*	19.91†	39,326	257,859	84.75	15.25

*Statistics from IRON AGE, Feb. 8, 1917, p. 374.
†Analysis assumed to be the same as in previous year.

Manganiferous Ores in the Blast Furnace

Without considering the advantages gained in this practice by decreasing sulphur or making better steel, let us see whether it could be justified on the basis of saving ferromanganese. Certain manganiferous iron ores could be used to increase the manganese content of the pig iron. Material of this character could be obtained from the Cuyuna and Lake Superior ranges which on the natural basis analyze as given in Table 2.

Table 2—Analysis of Cuyuna and Lake Superior Ores

	Cuyuna, Per Cent	Lake Superior, Per Cent
Iron	33.86	51.30
Manganese	11.48	0.58
Silica	7.23	7.48
Alumina	2.98	2.20
Phosphorus	0.145	0.088
Lime	0.30	....
Magnesia	0.14	....
Ignition loss	8.50	....
Moisture	15.00	12.00

Assuming first that a pig iron containing 2.50 per cent manganese used as 50 per cent of our open-hearth mixture, we would have a residual manganese content in the bath metal of 0.25 per cent. Let us also assume that the steel to be made is specified at 0.50 per cent manganese. If, then, there was a loss of 40 per cent manganese in the blast furnace, a ton of pig iron con-

*Basic Open-Hearth Steel Process, Carl Dichman, p. 172.
†Edwin F. Cone, THE IRON AGE, Dec. 28, 1916, p. 1452.
‡"Chemistry of the Open Hearth Process"—Theodore Naske, *Stahl und Eisen*, vol. 27, pp. 157-161, 191-194, 229-236, 265-269.

taining 2.46 per cent manganese would be produced with the following ore mixture (natural basis):

Ores	Per Cent of Mixture	Weight, Pounds	Iron, Per Cent	Manganese, Per Cent
Cuyuna	14.44	618	33.36	11.48
Av. Lake Superior.	85.56	3,661	51.30	0.58
	100.00	4,279	48.71	2.15

In a ton of steel containing 0.50 per cent manganese there would be required $2240 \times 0.50 = 11.20$ lb. metallic manganese. With our assumption of a residual manganese content of 0.25 per cent, there would be actually in the bath at tapping time $2240 \times 0.25 = 5.60$ lb. metallic manganese, leaving 5.6 lb. of manganese which would have to be added, probably as ferromanganese at the end of the heat. The large quantity of residual manganese would indicate that the steel was not very highly oxidized and, therefore, there would be a smaller loss of manganese in the addition. We will assume, therefore, that in this case this loss will be 15 per cent. Therefore, 6.60 lb. metallic manganese should be added.

This would be equivalent to 8.25 lb. of 80 per cent ferromanganese per ton of steel.

If, instead of the high manganese pig iron, a pig iron were used containing from 0.75 to 1 per cent manganese, the residual manganese would have been practically 0.10 at tapping time. Therefore 8.96 lb. of metallic manganese per ton steel (2240×0.40) would have to be added. The steel would be more highly oxidized under such conditions and a loss of 25 per cent of the manganese in the addition would have to be assumed. The manganese to be added would be 11.95 lb. metallic manganese or 14.95 lb. of ferromanganese per ton of steel. Consequently the saving would amount to $14.95 - 8.25 = 6.70$ lb. of ferromanganese per ton steel.

This method of using manganiferous ores in the blast furnace does not take into consideration the other advantages which would be gained by such practice which may be summarized as follows:

Better working in the blast furnace:

The high manganese tends to eliminate some sulphur.

It keeps the hearth clean and prevents scaffolds.

The iron is more fluid and results in less scrap in runners and ladles.

Better working in the open-hearth furnace:

The high manganese tends to further eliminate sulphur.

It makes the heats work better.

Results in betterment of finished product.

Effects a saving in the quantity of ferromanganese to be added.

The above suggestions are obvious and apparently are based upon sound premises. It would be of great value if steel metallurgists would contribute in discussion of these suggestions any actual data which they may have gained by possible attempts along such lines.

National Foreign Trade Convention of 1918

Chairman James A. Farrell of the National Foreign Trade Council will shortly issue a formal call for the 1918 convention of that organization. A preliminary announcement by the secretary, O. K. Davis, India House, New York, says that the fifth national foreign trade convention will be held at the Gibson Hotel, Cincinnati, on Thursday, Friday and Saturday, Feb. 7, 8 and 9. The secretary says: "The convention will center about the absorbing subject of winning the war—what is being done in the various industrial and other lines; the part that foreign trade in its various phases plays in this great task; the wise program for the future, and the problem of the merchant marine. As in previous conventions, a considerable share of the time and attention will be given to the question and answer form of group discussion, which has proved so informative and helpful to delegates in the past."

Robert S. Alter, president of the Foreign Trade Association of the Cincinnati Chamber of Commerce, was instrumental in securing the convention for Cincinnati. Mr. Alter is vice-president and export manager of the American Tool Works Co.

PERIL OF THE CLOSED SHOP

Walter Drew Addresses Boston Branch of National Metal Trades Association

Under the auspices of the Boston Branch of the National Metal Trades Association, over 300 of the leaders of the machine tool industry of New England held an important meeting, Nov. 16, at the City Club, Boston. At the afternoon session Winslow Blanchard, Blanchard Machine Tool Co., presided. The first speaker was Walter Drew of the National Erectors' Association. His subject was "The Experience of British Industries in the War and Its Lesson for Us." Practically all of his address was devoted to a discussion of the closed shop, which, he pointed out, had been abandoned by England, as it had been compelled to adopt the open-shop program in place of the closed shop in order to meet the national exigency for increased production. He emphasized his belief that the closed-shop propaganda was the greatest menace confronting American industry to-day because it depended for its establishment and maintenance upon force and coercion. It introduces internal controversy and does not fit into our free American institutions. It brought about, he said, either a complete and automatic control of industry by unions which had no responsibility or by causing a divided control was a still more sinister, devastating and dangerous menace to the foundations of industry.

Experience of England

The speaker pointed out how English workers had laid aside all the old rules and regulations and all craft and apprentice limitations. Millions of non-union workers were introduced into the shops, and under these open-shop principles an industrial miracle had been brought about. We now had, he believed, what England had been compelled to secure, and, if we should adopt the closed-shop program, we would be accepting what England had been compelled to reject. The first check to our war program has been the thousands of strikes which have taken place since we entered the war, and the speaker laid much stress on the point that in the final analysis the captains of industry had been to blame because they had shirked their duty and had not educated the workmen to a better understanding of the problems involved in the closed-shop principle.

Clarence E. Whitney, Whitney Mfg. Co., Hartford, Conn., told in considerable detail of the Hartford plan of co-operative employment control, which has been the greatest factor in the maintenance of open-shop conditions in Hartford and Connecticut.

David S. Earll, employment manager New Process Gear Corporation, Syracuse, N. Y., gave in considerable detail the experiences of his company in the employment of women on machines. The first women were put to work in the shops on May 21 of this year. The company has about 100 women at work on Gleason bevel gear generators, Fellows gear shapers, drill presses, burring and filing machines, and on bench filing and inspecting. In all, it had hired 150 women, and of these only 12 have not made good after a fair trial. The other 38 left after a short time because of distaste for the work. Those now at work equalled or exceeded the men in production in virtually every case. All work is on a day-work basis, and the women were first started at the same pay as boys, 17½ cents an hour. It is now starting them at 20 cents an hour, paying 22½ cents at the end of one month and 25 cents at the end of three months. After that they were increased to the same rate as the men when they reached the same standard of output.

Women Exceed Men

On 3-in. Gleason generators, making differential side gears and pinions, the best record of the men was 91 gears and 260 pinions in a 9-hour day. The record of the women was 126 gears and 320 pinions. On 24-in. Fellows gear shapers the women were turning out from 20 to 30 pieces per day more than the men. On burring

and filing machines the women were turning out 250 pieces per day more than the men, the output of the women being 1150 pieces and of the men 900 pieces. On the drill press on a job of putting in a radius and reaming the bore of differential pinions, two operations on machines placed side by side, the men turned out 3200 each a day and the women 4400 each a day. On an operation of drilling out two 5/32-in. oil holes, ¼ in. deep and one ⅛-in. oil hole, ⅜ in. deep, the women turned out 246 stem gears in 9 hours, 50 pieces more than the men. The speaker said that all the women now working show strong mechanical ability, and he could not see that age or marriage made any difference.

At the dinner Robert G. Morse, president of the Boston Branch of the association, acted as toastmaster, and Lieutenant-Governor Calvin Coolidge extended the greeting of the State. Walter Gordon Merritt, counsel of the American Anti-Boycott Association, said that the nation faced the problem of whether the majesty of the law would be able to cope with the economic power of labor. He stated that labor was making progress out of the fluid state of our present conditions. Pointing out that the work of the labor adjustment board had been a failure, the speaker said that "If the President will come out boldly for a war program of the compulsory adjustment of disputes, the entire American people and the great majority of the workers will stand behind him." We have had, he said, for a long time restriction of capital, and now we need restriction of labor in order to curb its anti-social practices.

Troubles at the Arsenal

Col. Tracy C. Dickson, commandant of Watertown Arsenal, described at length the labor troubles at the arsenal and the demands that the union leaders had made upon Stanley King, who had been sent by Secretary Baker to bring about a settlement. He then described in some detail the additions under way which were vitally needed for the speeding up of guns and gun mounts. About 1500 were now employed, and the new additions would require about 2700 more men. There was great interest in his statement that it was planned to employ women on the machining of the large gun forgings. The melting capacity of the new plant would be about 230 tons a day. It was expected that about 40 tons would be used for projectiles and 150 tons for gun forgings.

Albert Greene Duncan, of the power plant conservation committee, spoke in place of James J. Storrow, fuel administrator for New England, who was detained in Washington. He stated that New England was not badly off for anthracite coal, as the shipments to Oct. 1 were 9,142,000 tons, against 8,300,000 tons for the same period last year. The bituminous situation was different and more serious. Up to Oct. 1 only 19,000,000 tons had been received, and at the prevailing rate of shipment only 25,000,000 tons could be secured by Jan. 1, which would mean that New England would go into the new year with a shortage of 7,000,000 tons.

Plant Tests for Refractory Brick

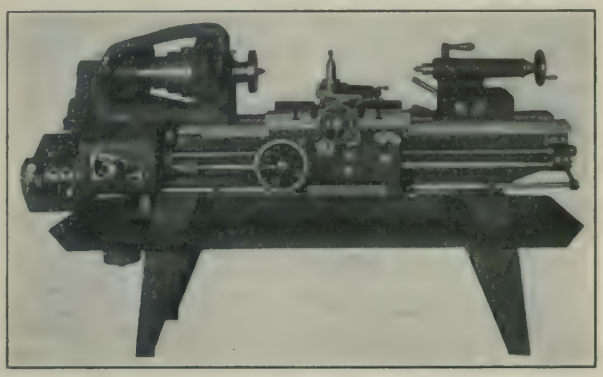
Pointing out that tests to determine the physical properties and adaptability to particular service of silica, magnesite and fire-clay bricks may be conducted by any plant at small expense, H. C. Arnold, University of Illinois, Urbana, Ill., in a paper presented before the American Foundrymen's Association at its annual meeting in Boston, September 25, described some of these and urged that they be made by consumers. He held that if operators would conduct such tests it would bring to them a more thorough knowledge of refractory materials; it would afford common grounds for discussion between the consumer and the producer, and would bring about a wiser and more profitable use of such raw materials. A thorough knowledge of material, he believes, will help the consumer of refractories to produce a better grade of metal at a less cost. He also said that silica bricks are subject to permanent expansion on heating and that allowance should be made for this when the bricks are placed in the furnace wall.

A New 15-In. Lathe for Toolrooms

A 15-in. engine lathe designed for toolroom use and also for general manufacturing work has been placed on the market by the Joseph Crawford Jr. Co., Erie, Pa. Instead of fastening the drip pan under the bed to the legs the pan is supported by the legs and extends beyond them while auxiliary legs directly above in turn support the bed.

The bed is wide and deep and correspondingly heavy with a number of reinforcing webs. There are three large V's and one flat way in front. The headstock also is of massive design. The spindle which is a piece of forged carbon steel finished by grinding has a 1¼-in. hole extending through its entire length. The front bearing, which is 2⅝ in. in diameter and 4½ in. long and the back bearing which is 2¼ in. in diameter and 3¼ in. long, are fitted with bronze bushings. A quick change gear mechanism provides for 48 different speeds and enables from 2 to 120 threads per inch to be cut. These changes are secured by manipulating the two handles underneath the headstock. A separate feed rod is provided thus enabling the lead screw to be reserved solely for screw cutting, an arrangement calculated to insure accurate work at all times.

The carriage has a bearing surface of 21 in. on the ways. The apron is secured to the carriage by an arrangement of tongues and grooves. Friction drive is provided for both the longitudinal and cross feeds, thus



Heavy Construction and the Placing of Auxiliary Legs in the Oil Pan to Support the Bed Characterize a New 15-In. Engine Lathe for Toolroom and General Manufacturing Work

enabling them to be engaged or disengaged readily, while the screw of the latter has a micrometer adjustment. The tailstock has set-over screws for use in taper work and is designed so that the compound rest can be used at right angles to the cross slide if necessary. The tailstock spindle is 1⅞ in. in diameter and has a travel of 6 in.

The taper attachment, which is not regularly supplied, is connected on the back of the carriage so as to be always within easy reach of the operator. The spiral relieving attachment enables straight and taper work and inside and outside relieving to be done on both right and left hand work with any number of flutes from 2 to 28 inclusive. With this attachment four cams, each arranged to relieve 3/32 in. in depth, are provided and the different flutes specified are taken care of by change gearing forming a part of the attachment. A universal joint and bearing block can be supplied when axial relieving is desired.

A Union of British Steel Chemists

A chemists' union is a possibility in England. The metallurgical chemists engaged in the laboratories of the iron and steel works of the Sheffield district held a meeting recently with an attendance of 120 at which it was decided to form a chemists' union. One speaker said there was a strong feeling that it was desirable either to form a union of their own or to organize as a section of a union already in existence. A committee was formed consisting of one representative from each of the 34 laboratories represented, and this committee will elect an executive body of 12 members.

Deoxidizing Basic Steel with a Saving of Manganese

A new suggestion in basic open-hearth practice, whereby a partial substitute for ferromanganese and an efficient deoxidizer of the bath is claimed to result, is offered J. I. Bronn, of Rombach, Germany, in a U. S. patent No. 1,233,970. He advocates using a molten pig iron high in phosphorus and adding it to the bath near the end of the basic Bessemer or open-hearth processes. If a calculated amount of phosphorus is used to react with the oxygen in the bath, no substantial impurification results. Under certain circumstances it may be advisable to charge an excess of phosphorus, which can easily be removed by a short refining without appreciably reoxidizing the metal. The deoxidizing effect of the addition of Thomas pig iron to the basic converter charge appears from the following comparative data relating to working with Thomas pig iron containing 0.45 per cent silicon, 1.20 per cent manganese, 1.85 per cent phosphorus and 3.5 per cent carbon:

	Manganese, Per Cent	Phosphorus, Per Cent	Carbon, Per Cent
Iron bath at end of blow.....	0.19	0.045	0.05
After addition of Thomas pig iron.	0.25	0.085	0.07

It is advisable to add the molten phosphorus-containing pig iron in the converter after skimming in order to improve the intermixing.

In connection with the open-hearth furnace the bath is refined as usual and the iron rich in phosphorus added in the molten condition when the furnace charge is nearly finished. Care is to be taken that the slag layer on the iron bath is not very high in phosphorus and that it is in as thin liquid condition as possible. The following comparative data show the effect of the addition of Thomas pig iron:

	Manganese, Per Cent	Phosphorus, Per Cent	Carbon, Per Cent
The furnace charge (33 tons) after refining contained	0.26	0.030	0.10
The Thomas pig-iron addition (1500 kg.) contained	1.75	2.78	3.5
The deoxidized bath contained....	0.43	0.062	0.15

The bath shows an increase in manganese over the amount of manganese contained in the pig-iron addition as follows:

The bath contained.....	330 x 0.26 = 85.8 kg.
And the addition.....	15 x 1.75 = 26.1 kg.
Total manganese	111.9 kg.

The bath contained, as above stated, 0.43 per cent manganese or 148 kg., so that an increase of 36.1 kg. manganese has taken place. The phosphorus on the contrary shows a considerable decrease, as follows:

The charge contained.....	330 x 0.03 = 9.9 kg.
The addition	15 x 2.78 = 41.8 kg.
Total phosphorus	51.7 kg.

The bath contained $345 \times 0.062 = 21.3$ kg. phosphorus, so that a decrease in phosphorus of 30.4 kg. has taken place which have been used for deoxidizing purposes.

These data relate to the pig and ore process. Similar results are obtained in connection with the pig and scrap process. If compared with the usual deoxidation process with ferromanganese alone the deoxidation with the pig iron (Thomas pig iron) rich in phosphorus results in saving 2 kg. metallic manganese or 4 kg. ferromanganese with 50 per cent of manganese for each ton of steel.

Proposed Increase of Rates

At Washington, on Friday, Nov. 23, the Interstate Commerce Commission authorized railroads to file tariffs applying increased rates on iron and steel from Cleveland, Zanesville, and the Mahoning and Shenango valleys, to points between Buffalo and Pittsburgh and the Mississippi River. The increase would be accomplished by applying class rates instead of commodity rates.

A new foundry will be established in Martinette, Mich., by the Northern Foundry Co. It will occupy the Iron Works plant on Main Street.

British Steel Exports and Imports for the Third Quarter

British steel exports for the third quarter of 1917 have been larger than for any quarter this year. The total, excluding iron ore and including scrap, was 660,644 gross tons, comparing with 636,397 tons for the first quarter and 600,591 tons for the second quarter. The exports in the last quarter, however, have been constantly decreasing from 268,190 tons in July, the highest of the year, to 177,393 tons in September, the lowest of the year.

Pig-iron exports have been fairly steady. For July they were 67,382 tons, for August 56,996 tons and for September 59,869 tons. Ferroalloy exports, mostly ferromanganese, have been normal under present conditions. For July they were 6709 tons, for August 8387 tons and for September 8197 tons. Total pig-iron and ferroalloy exports for the three months were 207,540 tons comparing with 200,865 tons for the first quarter and 212,732 tons for the second.

Rail exports in the third quarter were 12,139 tons, nearly double the 6808 tons of the second quarter, and comparing with 12,938 tons for the first quarter. The extent to which they are below normal is indicated by the exports for the first nine months in 1913 of 379,105 tons and of 365,939 tons to Oct. 1, 1914.

Steel-bar exports in the third quarter were 157,314 tons and exceed those of the other two quarters this year when they were 103,592 tons and 73,027 tons respectively. The July exports of 68,103 tons was the largest month this year with 52,594 tons in August and 36,617 tons in September. The total to Oct. 1, 1917, of 333,933 tons compares with 498,073 tons to Oct. 1, 1916.

Steel imports, excluding iron ore and including scrap, were 157,665 tons exceeding the two previous quarters when they were 96,397 tons and 105,779 tons respectively. The August imports of 73,298 tons were the largest of any month this year. This was due to larger receipts of blooms, billets and slabs. Total imports to Oct. 1, 1917, of 359,841 tons compare with 610,803 tons to Oct. 1, 1916. To Oct. 1, 1913, they were 1,708,174 tons, indicating the extent of the decline.

Imports of steel blooms, billets and slabs in the third quarter were 34,633 tons comparing with 11,927 tons in the first quarter and 8687 tons in the second quarter. The August imports were 24,615 tons, the largest of any month this year. The total to Oct. 1, 1917, has been 55,247 tons as compared with 117,800 tons to Oct. 1, 1916. The extent to which these imports have declined is shown by the fact that to Oct. 1, 1915, they were 359,867 tons.

British and American Data on Crude Steel

A great discrepancy exists between the British official figures of imports of steel ingots, billets and blooms and those given in the United States Government's figures for exports to Great Britain. The comparison follows in gross tons:

	British Report of Imports	U. S. Exports to Great Britain
To Aug. 1, 1917.....	31,890	361,981
To Sept. 1, 1917.....	57,066	486,054

The probable explanation of the very wide variation in the figures as shown is that the published reports of British imports do not include those of the British Government, which in the case of billets and blooms have been very heavy.

The Erie Forge & Steel Co., Erie, Pa., will expend between $5,000,000 and $10,000,000 on the construction and equipment of new buildings for forging guns. Three buildings are now being planned, measurements of which are 64 x 276 ft., 40 x 64 ft. and 192 x 300 ft. The engineers are Day & Zimmerman, 611 Chestnut Street, Philadelphia. K. F. Devine is president of the Erie Forge & Steel Co.

The Southern Ferroalloys Co., Chattanooga, Tenn., has appointed the Canada Carbide Sales Co., 30 Church Street, New York, as exclusive sales agent for the 50 per cent ferrosilicon produced electrolytically at Chattanooga.

Motor-Driven Portable Scoop Conveyor

The Portable Machinery Co., Inc., Passaic, N. J., is building a new type of portable belt conveyor. It may be driven by a self-contained electric motor or internal combustion engine and is designed for handling loose material or boxed products.

When handling the loose material the conveyor is supplied through a scoop at the lower end which can be pushed into or completely buried by the material to be moved. A portable machine handled by one man is thus available for loading and unloading, storing or reclaiming loose materials, such as coal, coke, ashes, crushed stone, sand, gravel, etc. In connection with the handling of coal from hopper or drop bottom cars, the lower end of the conveyor can be run in under the car and the material elevated from the track level a distance of 6 to 9 ft. to a storage pile. Or it can be elevated in one or more successive stages as indicated in the illustrations, until the pile is filled up to the desired height. In addition to handling loose material at the rate of 1 ton in 1½ min., the conveyor can also be employed for sacks, packages, boxes and manufactured products.

The conveyor is built of steel and is mounted on two wheels attached to the upright supports of the conveyor. At the lower end of this upright are two horizontal pipe section members which join the side supports of the conveyor near the lower end, the arrangement being roughly that of right-angled triangle with an extended hypothenuse. The driving motor is mounted on the horizontal support and transmits power through a chain and sprocket connection to a shaft located directly above it and extending underneath the conveyor from one side to the other. From a sprocket on the other end of this shaft power is transmitted to another sprocket at the upper end of the conveyor which does the actual driving. When it is desired to move the conveyor from place to place, this is readily accomplished by inserting two pieces of pipe in the ends of the horizontal member, when a man may move it somewhat as he would a wheelbarrow.



The Lower End of a Portable Motor-Driven Belt Conveying Mechanism Forms a Scoop That Can Be Forced into the Material Being Handled



Coal Can Be Dumped from a Railroad Car and Elevated by Successive Steps to the Storage Pile

Methods for Producing Spur Gears

The rotary or disk cutting process and the shaper method for producing spur gears were discussed in papers presented at the recent meeting of the American Gear Manufacturers' Association. In one by Henry E. Eberhardt, secretary Newark Gear Cutting Machine Co., Newark, N. J., the rotary or disk cutting process was gone into at some length. The progress made in the past half century in the development of cut gears was mentioned and the part played by the electric motor in the development of cut gears shown. At the present time Mr. Eberhardt stated that this method of production had a range from as fine as 64 diametral pitch up to as coarse as 6-in. circular pitch. Either very accurate work can be produced with care or the average demand for a fairly accurate gear at a low price can be met by this method. When changes in the form of tooth became necessary from time to time in the advance of the art, the cutter readily lent itself to such changes as the form that would be produced could be seen in advance.

In the other paper Franklin Schneider, manager the Van Dorn & Dutton Co., Cleveland, stated that the gear shaping machine possessed great flexibility for cutting from 4 to 2 pitch in steel and up to 48 in. in diameter. In addition to producing ordinary spur gears of the external type rapidly and accurately, internal, shoulder and cluster gears can be produced without the use of any attachment or device, the same type of cutter being employed as for the external gear and no changes being necessary in the machine.

A training school for women has been established by the Packard Motor Car Co., Detroit. They are expected to do work in the carriage division chiefly, in upholstering and trimming jobs. The safety-first department has prescribed costumes. The women may wear either loose overalls or jumpers or bungalow aprons made of khaki or overall material and must wear caps to protect the hair. Most of the young women in the factory, it is stated, prefer not to wear overalls.

War Excess Profits Law Attacked

Charged that Discrimination Imperils Existence of Many Concerns—Advisers Will Report—Congress Meets Next Monday

WASHINGTON, Nov. 27.—The Board of Excess Profits Advisers, appointed by Secretary McAdoo to assist the Commissioner of Internal Revenue in administering the war revenue act of Oct. 3, 1917, will close its conferences to-morrow and will make a formal report to the Commissioner on Dec. 1. The work of the board has been expedited by devoting the mornings to executive conferences and confining to afternoon sessions the hearings granted to parties who desired to submit criticisms of the law or recommendations for its amendment. Coincidently with the work of the board, the offices of the Commissioner and of the Secretary of the Treasury are framing suggestions for further revenue legislation to be enacted at the coming session which convenes on Monday next, designed to produce approximately $1,700,000,000 additional, thus making the net income of the nation from all forms of taxation $5,700,000,000 per annum. Upon this basis and putting the actual expenditures for all purposes, exclusive of loans to the Allies, at $15,000,000,000 per annum, about 35 per cent of the current cost of maintaining the Government and carrying on the war will be paid by taxation and 65 per cent by the issue of bonds, short-time Treasury certificates and five-year war savings stamps.

Amendments Proposed

The business men of the country, especially of the big manufacturing concerns, are making a hard drive to bring about the comprehensive amendment of the war excess profits tax and have laid before the Internal Revenue Bureau a mass of facts and figures that it is believed will result in the substantial revision of this extraordinary piece of legislation. The new law is being attacked, not on the ground that it is an unreasonable taxing measure with respect to the share of so-called war profits which it will require to be turned into the Treasury, but solely on the score that it is inequitable and discriminatory to the extent to absolutely imperil the existence of many large establishments which are fully prepared to contribute their entire share of taxation but cannot live and make any return to their stockholders under the operation of the war excess profits provision.

It is a conservative statement that since the war excess profits advisers began their work in the Internal Revenue Bureau, several thousand communications have been received pointing out glaring inconsistencies and inequalities in the operation of the new law, many of them supported by carefully worked-out examples of the effect of the law upon specified concerns. One of the most graphic illustrations brought to the attention of the board has been prepared jointly by a corporation lawyer of high standing assisted by an actuary of long experience. The memorandum submitted to the board cites four hypothetical concerns, each with the same invested capital and the same profits, but which, under the terms of the law, will pay taxes ranging from a minimum of $52,224 up to $123,952. The four cases are designated as follows:

1. John Smith—Invested capital, $500,000; profits, $250,000.

2. Jones, Brown & Gray (copartnership)—Capital, $500,000; profits, $250,000.

3. Johnson, White & Little (incorporated since March 3, 1917)—Preferred stock, $500,000 (representing tangible assets and $100,000 common stock, issued for good will); net tangible assets, $500,000; profits, $250,000; annual salaries of $25,000 paid to each of the three executive officers.

4. Black, Thompson & Wilson, Incorporated (incorporated prior to March 3, 1917)—Preferred stock, $500,000 (representing tangible assets and $100,000 common stock issued for good will); net tangible assets, $500,000; profits, $250,000; annual salaries of $25,000 paid to each of the three executive officers.

The individual concern operated by John Smith would pay the maximum taxes, which are accurately figured out in detail as follows:

1. John Smith—From 1917 net income subtract 15 per cent of 1917 invested capital, which 15 per cent would be $75,000; from which amount deduct 9 per cent of 1917 invested capital and $6,000, to wit, $51,000, leaving $24,000, which, taxed at 20 per cent, equals $4,800. From this balance of 1917 net income subtract 5 per cent of 1917 invested capital, $25,000, which, taxed at 25 per cent, equals $6,250. From this balance of 1917 net income subtract 5 per cent of 1917 invested capital, $25,000, which, taxed at 35 per cent, equals $8,750. From this balance of 1917 net income subtract 8 per cent of 1917 invested capital, $40,000, which, taxed at 45 per cent, equals $18,000. Leaving a balance of net income, $85,000, which, taxed at 60 per cent, equals $51,000. Total war excess profits, $88,800. In addition to the foregoing John Smith, as an individual, would pay his personal income tax upon income for the year of $250,000, less excess profits tax of $88,800; viz., $161,200, tax being $35,152. Total tax of John Smith, $123,952.

The next largest contribution to this tax would come from the copartnership, Jones, Brown & Gray, which is figured as follows:

2. Jones, Brown & Gray—This partnership would pay the same excess profits tax on an income of $250,000 as in the case of the above-named individual, namely, $88,800. Each partner would also pay his individual income tax on his one-third share of the undivided profits of the firm for the year, less excess profits tax, namely, $161,200, being a tax on $53,733 to each; in the case of each partner being a tax of approximately $5,627.96 in each instance, $16,883.88, a total of $105,683.88.

Blow Misdirected

In framing the war excess profits tax, the conference committee, which is solely responsible for this feature of the war revenue bill, the original work of the Ways and Means and Finance committees having been abandoned, sought to strike a heavy blow at concerns doing business in corporate form but utterly failed of their object. The calculation as applied to a new corporation—"new corporations" being a category specially designed to include munition manufacturers—produces the following result:

3. Johnson, White & Little, Inc.—In this case, inasmuch as the three executive officers constitute a close corporation, and in reality a partnership in corporate form, and each draws a salary of $25,000, the net income of the corporation would be reduced to $175,000, which, computed in the manner above described, the excess profits tax would be $45,600; in addition to the above, the corporation would pay war income and federal income taxes of 6 per cent, namely, $7,764; assuming that the surplus income is used in the business and not paid out as dividends, the individual stockholders would each pay an excess profits tax of 8 per cent on the salaries drawn by each in excess of a statutory exemption of $6,000, namely, 8 per cent of $19,000—$1,520 each, or for all three persons, $4,560. In addition thereto, each of them would pay an individual income tax based on the salaries so received, after deducting the amount of excess profits tax paid, namely, a tax on $24,480 for each, the amount of which tax would be approximately $1,500 for each, or a total of $4,500; total tax paid by corporation and stockholders, $62,424.

In striking contrast with the taxes levied upon individuals and copartnerships and even as compared with a new corporation is the small impost incurred by corporations in existence before Congress began the framing of the war revenue act, as will be seen from the following:

4. Black, Thompson & Wilson, Inc.—In the case of this corporation, which was incorporated prior to March 3, 1917, and therefore, under the statute, entitled to include as part of its invested capital the sum representing the value of its good will, namely, $100,000, the tax would be reduced because of computation on the basis of an enlarged invested capital,

namely, $600,000, instead of $500,000. This enlarged invested capital, based purely on the accidental fact of date of incorporation, would reduce the amount of the excess profits tax, so that the same in the case of this corporation would be only $36,400, as compared with $45,600 in the case of the corporation covered by the preceding illustration. And the total taxes payable by the corporation and stockholders in this instance would be reduced accordingly.

The Next Session of Congress

The opening of Congress will be signalized by the introduction of numerous bills designed to amend the war excess profits tax feature of the revenue act, but the Ways and Means Committee, which has original jurisdiction of the subject, will probably take no action until the Secretary of the Treasury has had time to pass upon recommendations of the board of advisers. It is improbable that the Administration's measure will be approved by the committee before the holiday recess, but there is little doubt that if it is confined to amendments of this particular feature of the law it can be put through both houses before March 1, next. Should these amendments be consolidated with the general revenue provisions now under consideration, some very vigorous work will be necessary to pass the bill by that date.

Owing to the fact that the departments have not been able to spend as rapidly as was anticipated the enormous appropriations granted at the last session, the Treasury Department will be able to cut down its estimate of necessary additional revenue from $2,500,000,000 to $1,700,000,000. The war revenue act is estimated to produce $2,600,000,000 and prior revenue legislation $1,400,000,000, so that the Federal income will total $5,700,000,000. The money to be raised at the coming session, according to members of the Ways and Means Committee, will be derived from four chief sources, namely, increased income taxes, larger war excess profits taxes, consumption taxes on certain commodities including sugar, tea, coffee, and cocoa, and an increase in the existing customs tariffs coupled with the transfer of a large part of the free list to the dutiable schedules.

Proposed Tariff Changes

The proposed tariff changes will be stubbornly fought in both House and Senate and in view of the rejection of a similar proposition at the last session its consideration by the House will probably be less perfunctory than before. The Senate having gone on record against this unscientific method of revising the tariff and the tariff commission having expressed its disapproval, members of the House will be disposed to display much more independence than during the last session. The imposition of duties upon the free list will be attacked with great vigor on the special ground that current importations upon which no duties are now levied are chiefly of food products and materials of value for war purposes. The imposition of tariff taxes on such articles as iron ore, ferromanganese, manganese, tin, rubber, hides and leather, etc., cannot be defended upon any theory except that the revenue thus derived is absolutely essential to the conduct of the war and cannot possibly be obtained from any other source. No such condition exists and it is believed that whatever action may be taken by the House, the Senate will adhere to the position assumed at the last session when the proposed tariff increases were rejected on the ground that they would be most demoralizing to the industries of the entire country and especially to those depended upon for the prosecution of the war. W. L. C.

The Defiance Machine Works, Defiance, Ohio, will place its plant on an eight hour basis Jan. 1, but the present rates and the ten hour day, 55 hour per week schedule, will be maintained. However, all overtime beyond eight hours will be paid at the rate of time and a half and each employee who works the full 55 hours each week will be paid a 5 per cent bonus.

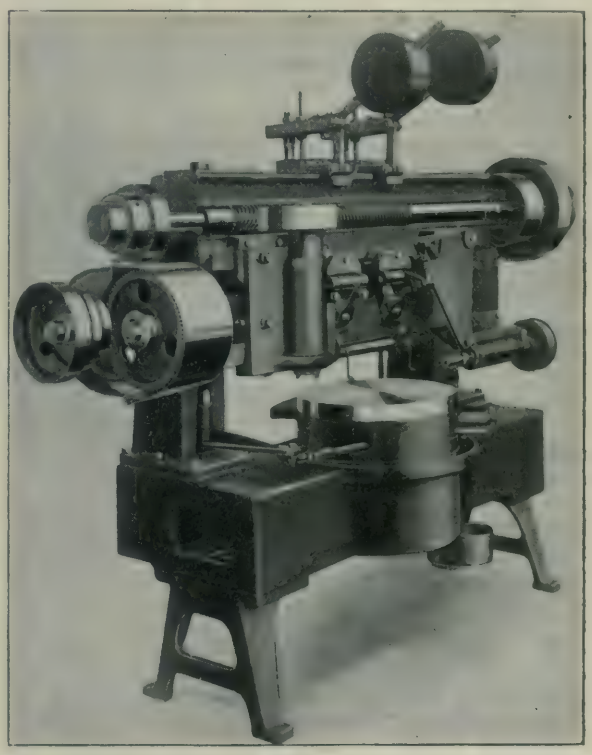
Between 1500 and 1800 women have taken the place of men in the last few weeks in Cleveland metal-working establishments. They are employed largely on drill presses, punching machines and light bench work.

A Special Milling and Drilling Machine

To enable the knuckles of automobile steering gear to be milled and drilled at a single setting, the Moline Machinery Co., Moline, Ill., has built a special machine. It is designed for continuous operation, a revolving table being provided. Another advantage claimed for the machine is that the surfaces that are milled and the holes which are drilled in the knuckles are in absolute alignment, since all of the operations are performed at a single setting of the work.

The machine is equipped with four spindles, on one of which a milling cutter is mounted, while the remaining three are employed for drilling. A direct belt drive from the main shaft is employed for one of the drilling spindles, while the remaining two and the milling spindle are driven by spiral gears. Cam feed is provided for all of the spindles, the throw of the cams being varied to suit the work. Adjustments to care for the wear of tools are provided for all the spindles, and that employed for milling has a large taper bearing on the lower end to compensate for wear.

A revolving work table is 22 in. in diameter, and after the tools are withdrawn upon the completion of an operation it is indexed automatically through an arc of 60 deg. to bring the work in position for the next operation. While one piece is being milled and



Continuous Milling and Drilling of Automobile Steering Knuckles Is Obtained in a Recent Four-Spindle Machine Equipped with a Revolving Table

drilled the operator is engaged in removing the previous piece and replacing it with another. In this way continuous operation is secured.

The machine occupies a floor space of 3 x 8 ft. and has an over-all height of 6 ft. The distance from the floor to the table is 36 in., and the shipping weight is approximately 5900 lb. The power consumption is 5½ hp. The machine can be used to handle a wider range of the work than that for which it was especially designed, and the travel of the spindles can be varied within certain limits according to the requirements of the work which has to be accommodated.

Shellmakers and munition manufacturers in British Columbia have been informed that no contracts for shells for the United States are to be awarded in British Columbia. It is stated that contracts for huge numbers of shells will be let in Canada, but work will be confined to plants in the East, due to the extra cost of freight, should they be manufactured on the Pacific coast.

Whitaker-Glessner Blast Furnace

The new blast furnace at the Portsmouth, Ohio, works of the Whitaker-Glessner Co., that was blown in on Aug. 27, has three hot-blast stoves and turbo-blowers for furnishing the blast. It has a daily capacity of 550 tons and is 92 ft. high with a 17-ft. hearth, 22-ft. mantle, 17-ft. stock line and a bosh angle of 78½ deg. The hot-blast stoves are of the two-pass side combustion chamber type with 4½-in. checkers. These stoves measure 24 ft. in diameter and are 110 ft. high. Two electrically driven turbo-blower units with a capacity of 44,500 cu. ft. at 22-lb. pressure furnish the hot air for the blast. Washed gas will be used both in the hot-blast stoves and under the boilers.

The ore yard has a capacity of 400,000 tons of ore. Ore is recovered from the yard by a bridge carrying a 7½-ton bucket. The stockhouse equipment is of the Hooven and Mason design and contains one 60-ton transfer car and two single-compartment scale cars.

The iron is taken from the furnaces in 75-ton hot metal ladles to the pig machine house. From there it is transferred into 30-ton charging cars to be used in the open-hearth furnaces. Iron desired for stocking is poured over a two-strand Uehling pig casting machine.

The power house equipment consists of six 825-hp. vertical water tube boilers, two 3000-kw. turbo-generators, two 750-kw. motor-generator sets, two hydraulic pumps for operating the bell, etc., two turbine-driven boiler feed pumps, two turbine-driven 15,000-gal. service pumps and two motor-driven 3,250,000-gal. gas washer pumps.

The water supply is obtained from the Ohio River through a pump house containing three 20,000-gal. motor-driven pumps which deliver to a 40-ft. standpipe. This standpipe furnishes water directly to the condensers and hot well. The service pumps deliver water from the hot well to a standpipe 115 ft. high. All the cooling water used at the furnace is supplied by this standpipe, as well as the water for general use.

Germany and the French Lorraine Iron Ore Deposits

A prominent German steel maker stated at a recent meeting of the Haspe Iron & Steel Works Co. that Germany is not in a position to go without the iron ore supply from the occupied district of French Lorraine. Germany only has at her disposal, he said, an ore reserve of something over 3000 million tons and is therefore substantially dependent upon iron ore imports. In addition to large quantities obtained elsewhere, Germany has principally directed her attention to French Lorraine and only the annually increasing quantities obtained there have made it possible for France to reach an output which nobody in France had ever thought of before. German enterprise has also taken a share in the development of these iron ore deposits and France, the speaker said, is not dependent upon them, being the richest iron-mine-owning country in Europe, if her colonies are included. According to reliable estimates, France has at her disposal reserves of 10,000 million tons of iron ore, the colonies alone representing 400 million tons of this total. The Briey and Longwy basins contain 3000 million tons, so that, leaving out this quantity, France would still own iron ore reserves of about 7000 million tons, of which 5000 million tons in Normandy are of a quality greatly surpassing in iron content the ores of Germany and French Lorraine.

The Youngstown Wage Table Co., Youngstown, with a capital of $10,000, has been incorporated. The company has devised a new method of computing wages, which has been worked out satisfactorily at the plants of the Youngstown Sheet & Tube Co., where H. W. Kerr, one of the incorporators, is paymaster.

A new booklet, Electric Furnace Bulletin No. 40, October, 1917, has been issued by the Industrial Electric Furnace Co., Chicago. It is descriptive of the Snyder furnace and is well illustrated.

Pipe Corrosion in Buildings

To determine the life of water pipe in buildings under varying conditions of service, Thomas F. Payne, a sanitary engineer of Pittsburgh, was commissioned by the A. W. Byers Co., maker of iron pipe, Pittsburgh, to make a house-to-house canvass. It appeared that apartment buildings offered the best field for investigation, and 125 such buildings, all in Pittsburgh, were studied. A tabular statement compiled by the company gives the year of erection of each building and the life of both hot and cold water lines of brass, steel and wrought iron where such had to be removed.

The investigation showed the corrosion to be most severe in hot water mains (exposed basement piping) and the recommendation is that pipe one size larger than that used in regular practice be used. The point is that the larger size, having a greater thickness and larger bore, would not so easily rust through or become stopped up with rust. The hot water risers, which are usually concealed, proved to have a much longer life than the basement mains. It is therefore a question whether the practice of specifying brass pipe for risers, and iron or steel for mains, might not better be reversed.

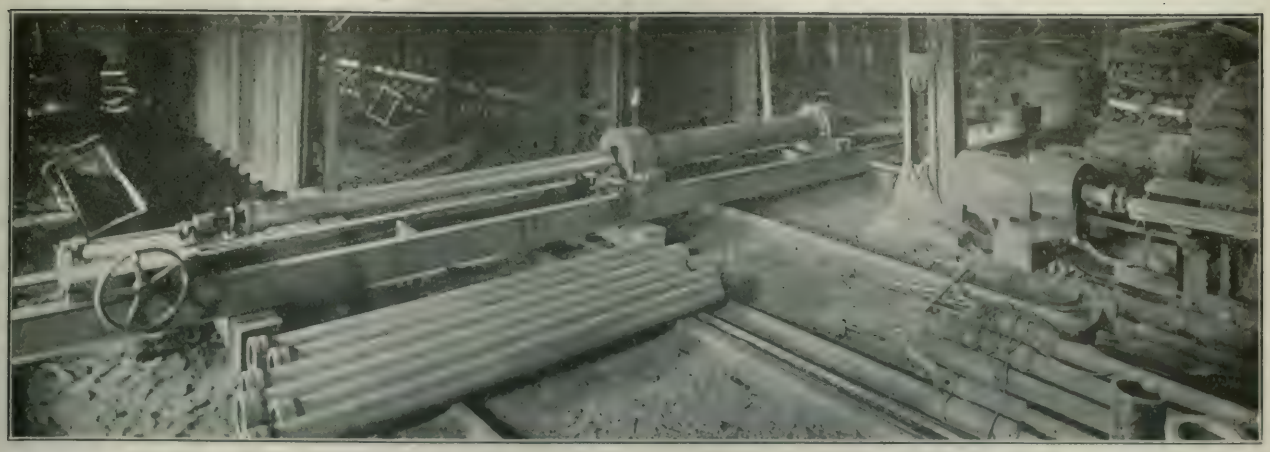
Brass pipe in this investigation did not show up as well as might be expected. Genuine wrought-iron pipe, in 65 buildings, ranging in age from 8 to 20 years, did not show a single failure when used for cold water supply, and in only one or two of these buildings did the iron hot water risers require repairs in the same period of time. Lead pipe, for hot water risers, seemed to have an average life of 18 years, one complete failure being recorded after 14 years' service. It appeared from the investigation that the pipe lasted a little longer where an automatic water heater was used. This is regarded as due to the possibility that a lower temperature of the water is maintained than with a heater without thermostatic control, corrosion increasing with temperature and reaching its maximum between 140 and 170 deg. Fahr. Temperatures from 115 to 130 deg. are recommended wherever they will serve the purpose.

Will Build Sheet Zinc Rolling Mill

The American Zinc Products Co., recently organized at Youngstown, Ohio, with an authorized capitalization of $1,000,000 to build and operate a sheet-zinc rolling-mill plant at Greencastle, Ind., has effected a permanent organization, as follows: D. W. Kerr, president and treasurer; F. W. Stillwagon, vice-president; H. S. Buck, vice-president and general manager; R. A. Leitch, secretary; Edward Lagenbach, Wade A. Taylor, D. W. Kerr and F. W. Stillwagon, executive committee. President Kerr states that rapid progress is being made on the 10-mill rolling-mill plant at Greencastle, and that his company will engage in production of various articles from sheet zinc, which heretofore have been made from copper and tin plate. A stamping department for this work is being installed. Oil and food containers, formerly made from tin plate, will be made from zinc, in keeping with the recommendation of the Department of the Interior. Zinc sheets also are displacing copper in many cases, owing to the high cost of the latter. Zinc is also used in large quantities for ammunition containers. Operations will start early in the spring.

The general advisory committee on safety of the State Industrial Commission of Ohio, representing the Ohio Manufacturers' Association and the Ohio Federation of Labor, has appointed committees on fire prevention and electrical safety. The former committee will make a study of fire hazards in the workshops and factories of the state and prepare a state fire prevention code. The committee on electrical standards will review the standards prepared by the United States Bureau of Standards, with a view of having them adopted in Ohio.

Recently the W. H. Mullins Co., Salem, Ohio, laid off about 250 men, due to cancellation of orders for automobile parts by builders of pleasure cars.



The Machine in a Canadian Plant Which Produces 6-In. Cast-Iron Pipe by a Centrifugal Process, and Some of the Pipe. About 25 pipes are made each hour

CENTRIFUGAL CAST-IRON PIPE

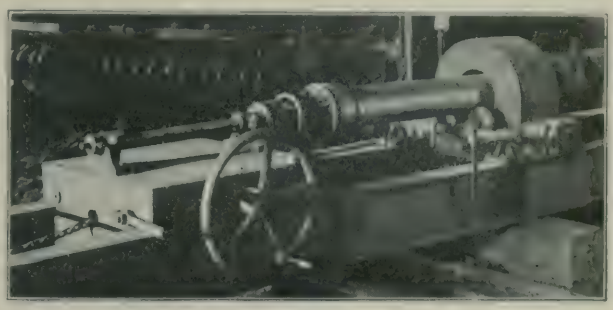
A Plant in Canada Making 6-Inch Pipe by the New Process

IN THE IRON AGE of Sept. 7, 1916, there was described a machine for making cast-iron pipe by a centrifugal process. It was stated at the time that pipes of all sizes were being produced on a commercial scale in Brazil in two localities by machines of this character and that a small machine for making 4-in. pipe had been made in this country to demonstrate the process, which is the invention of a Brazilian.

Since that time the developments have been fairly rapid and successful. A company was formed early this year in Canada to exploit this patented process in that country. It is known as the National Iron Works, Ltd., Toronto. A machine has been constructed and installed in a plant in that city, built on very much the same lines as the 4-in. one referred to, only it is considerably larger. Since Sept. 14, 1917, this machine has been operating and turning out successfully 6-in. cast-iron pipe each 10 ft. long. The view at the head of this article shows the new machine as it appears in the Toronto plant. Some of the pipe made in it are also shown. Its capacity is easily 20 to 25 such pipe each hour and this has been its record since it was started. The company's president is Cawthra Murdock and its vice-president and general manager, Gordon F. Perry, and it owns the exclusive right to use the process in Canada.

Briefly, the process consists in introducing hot iron from a cupola or blast furnace in prescribed quantities, corresponding to the weight of the pipe, into a trough. This is immediately inverted in the rapidly revolving water-cooled steel mold inside the machine where, by centrifugal force, the metal is deposited uniformly, forming a pipe of the usual form, only thinner and of uniform thickness. The other two illustrations show how the metal is introduced from the ladle into the machine and how the pipe appears as it is coming out. The pipe is almost immediately withdrawn as soon as congealed.

An announcement as to interesting developments in this country is expected in the near future.



How the Finished Pipe Appears Immediately After Casting, as It Comes from the Machine



How the Hot Metal Is Introduced Into the Trough from the Ladle

Investigating Virginia Manganese Ore

An outcome of the work of the war minerals committee, composed of representatives of the American Institute of Mining Engineers, the U. S. Geological Survey, the U. S. Bureau of Mines and the State geological surveys, is an examination of Virginia manganese properties to be made by four prominent mining engineers—Philip N. Moore, F. Lynwood Garrison, Prof. Robert H. Richards and Allen H. Rogers. These men are now in Virginia and will follow a program arranged by Dr. Thomas L. Watson, the State geologist, in co-operation with the manganese miners of the State. Mining and milling methods that will improve production will be considered as will the problem offered by the inadequate water supply at most of the mines during certain seasons of the year.

McLain System, Inc., 906 Goldsmith Building, Milwaukee, Wis., has changed its name to the McLain-Carter Furnace Co. Oil fired open-hearth and metal melting furnaces will be the company's specialties.

Dangers of Blast-Furnace Breakouts

Their Causes and Methods of Prevention Discussed in Bulletin to Be Issued by Bureau of Mines—Some Kinds of Accidents Have Almost Entirely Disappeared

WASHINGTON, Nov. 27.—The results of a study of the dangers of blast-furnace breakouts, the technical aspect of their occurrence and the methods in use for preventing them are incorporated in a bulletin prepared by F. H. Wilcox and about to be issued by the Bureau of Mines.

A "breakout" is the term employed to denote the conditions and results of the escape of gas and coke, or slag, or iron, from the bosh, tuyere breast, or hearth of a blast furnace. Breakouts may occur at any point below the fusion zone in the furnace, but the most frequent breakouts are of molten iron at a level below the surface of iron lying in the hearth, and are either through the hearth walls and jacket or into the hearth bottom and out under the hearth jacket.

If this runaway fluid comes in contact with water or wet material an explosion occurs which may wreck the furnace or casthouse equipment. An explosion in one plant caused damage amounting to $80,000. Several furnaces have been put out of blast by such accidents, and in numerous instances men have been injured or killed by flames, flying metal, brickbats, and castings when these explosions take place. The term "explosion," as applied in this sense, should not be confused with explosions of gas.

Hazards from Breakouts

At most plants in this country the danger of hearth breakouts has been reduced remarkably during the past 10 years, and at these plants, so the writer believes, is becoming almost negligible as a factor in the accident risk. The hearth has received much attention, and heavier, stronger, and more expensive construction has been developed until the two types of hearth now standard rarely permit explosive breakouts.

Slag breakouts occur from the top of the hearth jacket and about the cinder notch up to the level of the tuyeres. They are seldom dangerous to life or limb, but may cause some damage to the brick lining and are a considerable nuisance and annoyance, because of the resulting delay for repairs and the time necessary to clean up the "mess" they cause.

Blast, gas, and coke breakouts, usually known as bosh breakouts, are almost a thing of the past; the last one in this country was in the spring of 1914. Their elimination may be attributed quite as much to improvements in practice, smoother work on increasingly inferior ores, and less violent "slips," as to strengthening of boshes. Although improvement in boshes is generally keeping pace with other furnace construction in augmenting security, nevertheless at many plants the bosh is not so strong, proportionately, as other parts of the furnace. With the present control over furnace operation, the bosh does not fail except at infrequent intervals. However, if plants with somewhat weak boshes should be subjected to periods of heavy driving for large production, with consequent severe slips, such as have happened in the past, it may be that some boshes, although adequate for normal pressures and slips, would give way. One such accident has happened.

In the trade journals from 1885 up to 1907, frequent mention was made of bosh breakouts; since 1907, they have steadily decreased. Rarely are any details given in these notices, and they are mentioned here only because of the significance of their decreasing number.

Tuyere-Breast Breakouts

The tuyere breast is comprised in that part of the hearth which extends from the bottom of the bosh to the top of the hearth jacket. The brickwork at this point is 18 in. to 2 ft. 9 in. thick and is built of standard 9-in. brick inclosing the tuyere-cooler arches and cooling-plate openings. The tuyere breast in a modern 500-ton furnace is about 5 ft. 6 in. high and the outside surface, with a 2-ft. 6-in. wall inclosing a 17-ft. hearth, 22 ft. in outside diameter, is about 390 sq. ft., which is diminished by 12 cooler openings 30 in. in diameter and usually by 36 cooler-plate openings 5 in. by 24 in. in size, making a total exposed surface of approximately 330 sq. ft.

The most energetic combustion of coke and the strongest inthrust of the blast are directly within this part of the furnace. The temperature at the nose of the tuyere may reach 3300°F., and may be as high for a considerable space adjacent, because the combustion of 750 pounds of coke cannot be instantaneous at the 12 or 16 small spaces in front of and above the tuyeres. As the nose of the tuyere is but 6 to 15 in. beyond the face of the brickwork, the combustion temperature must reach nearly maximum intensity at the face of the brick. This temperature is sufficient to melt any but the best hearth brick and to soften the best brick so that it becomes plastic or will flow under compression.

The danger of breakouts between the tuyere coolers, when the brickwork gets thin from melting, slagging, and mechanical abrasion from the back thrust of the gas, is usually provided against by the insertion of bronze cooling plates. These plates are usually built solidly into the brickwork from the outside face to within 9 in. to 4½ in. of the inside face. Occasionally only one plate, placed vertically, is used; more often, two plates are laid horizontally one above the other, about 15 to 18 in. apart, center to center; infrequently, three plates, 12½ in. apart, center to center, are used. The plates are roughly of the same type as those used in the bosh, being tapered horizontally and vertically. Although the wearing action is most severe, such plates have proved entirely satisfactory. A few managers go a step further and provide water-cooled plate boxes in which to place the plates, but many furnace men do not consider it necessary or advantageous to do so, as a water-cooled plate cools the brickwork just as effectually and also prevents thinning and breakouts of the tuyere-breast wall.

Safe methods of practice are of little avail in preventing tuyere-breast or bosh breakouts, if by faulty design or construction, weakly built, insufficiently reinforced, or improperly cooled segments of brickwork have been incorporated in this part of the furnace. Modifying methods of practice are of little benefit because of the suddenness with which such accidents occur. Possibly 95 parts of prevention lie in construction and five parts in experience, resourcefulness, and arrangement of the cast house for accessibility of signals and possibilities of escape.

The bosh plates should be flushed out regularly to prevent loss of cooling efficiency from sediment depositing in them. Hot spots on the bosh jacket should be remedied by putting on additional sprays. The use of longer tuyeres is effective in correcting any tendency to local heating on the side of a bosh jacket. A longer tuyere also diminishes the tendency to cutting about the bosh plates, between the tuyere arches, on the tuyere breast walls, or near the cinder cooler. At best, longer tuyeres, tuyeres with a smaller nose, or plugged tuyeres are but temporary expedients, and if they must be persistently used to prevent fast or abnormal working on the walls and severe erosion, their use is likely to produce off-grade iron and dangerous conditions of scaffolding, hanging and slipping.

Hearth Breakouts

During the past few years serious breakouts occur more frequently at the hearth than at the bosh and

tuyere breast. In fact, this has always been so, but with small amounts of iron in the hearth the breakouts were not necessarily serious, especially as the blast pressure was not high. With increasing tonnage and fast driving they assumed serious proportions, sometimes wrecking the furnace, occasionally costing lives, and almost always causing bad messes, delays and inconveniences.

The destructive agencies within the hearth walls are as follows: (1) Erosion of the hearth walls by the blast, especially over the tapping holes; (2) disintegration of the brickwork by the chemical action of liquid slag and iron; (3) mechanical action of fluid in penetrating the joints of the brickwork.

It is evident that the bringing down and accumulation of molten iron and slag in a zone of intensive combustion, pressure, and heat, require exceptional construction. Improvement in strength, insulation and cooling has developed this part of furnace design to a point where plants at which one or more breakouts always occurred during a blast, have reduced the danger of breakouts to an almost negligible factor.

One point should be kept in mind in regard to hearth breakouts, and that is: regardless of the thickness of hearth walls or the cooling intensity on the exterior, all furnaces become worn away on the inside, so that the wall becomes relatively thin, and retains its form only by virtue of the cooling and reinforcement of a metal jacket. This condition is found in furnaces blown out even after a short run. The thinning of hearth walls is partly attributed to the erosive action of currents of gas caused from combustion and the blast, when the cinder and iron is low after a cast. Erosion is effected as in the bosh and tuyere-breast walls, and is especially active when at casting or flushing the gas sweeps down along the wall and blows out of the tapping hole or cinder notch. Although the temperature may be theoretically too low to melt fire brick, it is high enough to soften it so that it may be abraded by coke ground against it by the back thrust of the blast.

Added to this erosion is the attack of slag. While the composition of blast-furnace slag is frequently acid —that is, rich in silica and alumina—nevertheless, even when viscous with silica it will combine with avidity with more silica. This is because slags of even pronounced acidity as regards furnace requirements, are basic from a mineralogist's standpoint. Of greater significance, however, is the physical state of the slag and its effect on the facility with which the slag will attack brickwork. A thinly liquid slag will penetrate the interstices and joints of the brickwork more easily than will viscous, aluminous or mucilaginous, limy slags. Such slags tend to adhere to the walls and to freeze in cavities, whereas a fluid slag is more likely to drain from the walls at each cast and flush, and on rising it again attacks the exposed surface of the constantly enlarging cavities in the brickwork. All refractory materials tried are destroyed by the physical-chemical activities of heat, erosion, and slag, and with a sharp slag and highly heated furnace, corrosion will bring about an unperceived destruction of hearth walls in a very short run, the hearth walls sometimes losing 3 ft. of thickness.

Cracking of the Walls

The protected brickwork may be destroyed unless held solidly in a tight, jointless ring, with no opportunity to develop cleavage cracks through displacement by expansion. Fire brick expands approximately 0.5 per cent in volume on being heated to incandescence and before it vitrifies. Consequently, if the hearth walls are not held equally rigid about their circumference, that segment or wedge opposed by the least resistance will move out bodily, forming a crack from the inside to the outside face.

Practice varies in regard to the packing space between the hearth wall and hearth jacket; some plants use packing, others do not. The use of packing is based on the presumption that cracks are bound to develop in the brickwork, and that a ring of some material independent of the brick must be placed between the brick and jacket so that molten iron following a crack cannot penetrate to the jacket. Also it is claimed that packing allows for the inevitable adjustment of hearth walls that results from expansion stresses. The two claims are somewhat contradictory in that the packing is supposed to combat the effects of the cracking which it permits.

Breakouts Below the Tapping Hole

Where rolled-plate jackets are provided for holding in the hearth brickwork the spray cooling does not extend down to the base of the jacket. Commonly it extends only to the level of the tapping hole, or perhaps up to 2 ft. below the hole, which is approximately the level of the hearth bottom. It is thought dangerous to have the bottom of the ditch about the jacket lower than the bottom of the hearth, because of the probability of very severe breakouts, and the jacket is bricked up solidly from this point down, completely around the furnace. The jacket usually extends 2 ft. 6 in. to 4 ft. 6 in. below the bottom of the hearth, and rests on second-quality fire brick, ordinary river brick, or even concrete, the lower segment of hearth being filled with fire brick of hearth and bosh quality.

Under these conditions it is apparent that this mass of brickwork without water cooling comprises a highly heated reservoir, which continually attains higher and higher temperatures and affords ideal conditions for melting and penetration of the bottom brickwork by iron. This is found to be the case. Upon blowing a furnace out the brickwork of the hearth bottom is seen to be replaced by a mass of pig iron, or a mixture of pig iron, slag and graphite, varying in depth from 4 ft. to, in one instance, 26 ft. below the tapping hole. Comparatively shallow depths are usually liquid, while deep pockets are usually solid, or, unless drained, solidify after the furnace is blown out. These masses of material have long been known as "salamanders."

Formation of Salamanders

Whenever a furnace shows indications of such a condition there is danger of an explosion if the iron comes in contact with moisture. Even if the hearth alone becomes unusually deep the danger of a breakout is increased, for as the iron in the hearth becomes lower than the brickwork inclosed by water-cooled jackets, it begins to eat outward. The deeper the hearth becomes the farther downward the hearth walls extend and the greater is the lateral pressure owing to the increasing head of liquid iron. Once displacement is fairly started by reason of bricks insecurely tied in, uneven shape, thick joints, inadequate anchoring by the hearth walls, or shrinkage cracks, the iron, as the hearth becomes deeper, automatically acquires an increasingly uncontrollable and destructive power, and tends to penetrate downward and laterally into the brickwork. The danger which threatens if this deep pool of molten iron suddenly breaks through is evident. To date, the efforts of furnace men and engineers to prevent the formation of salamanders have failed. Except on special grades of iron and on a few cold-blast furnaces, a salamander always forms to a greater or less depth and presents the annoying condition arising from a pool of iron that cannot be removed through the tapping hole. So long as salamanders form there will always be uncertainty concerning the depth to which the iron is penetrating the distance to which it is working sideways, and the possibility of outbreaks beneath the tapping-hole level.

Breakouts Through the Hearth Wall or Jacket

Thus far, no material ever used in hearth bottoms has resisted the destructive agencies inside the hearth. The presence of graphite coatings on the hearth walls and in crevices in the salamander, which are seen when the furnace has been blown out, has presented the obvious suggestion of a lining of carbon or coke brick in the bosh, hearth and bottom. Theoretically, such bricks should be highly satisfactory, because they are infusible at the highest temperatures reached inside the furnace and resist the corroding action of slags, either basic or acid. Also, they are not acted on by molten iron, unless the iron is unsaturated with carbon, in which case the iron would probably satisfy its re-

quirements for carbon at the expense of the carbon brick.

So far as is known, these bricks are not now, nor have been for many years, used in this country. Many works abroad, and three works in America, have introduced them, thinking that a panacea for the preservation of the hearth had been found and that the costly work and expensive delay in removing salamanders would be largely eliminated. It was found, however, that the carbon brick were failures when used about the tuyere breast and the tapping hole; that the hearth bottom tended to float up and disappear; and that if even the smallest gas flame issued from the joints between the brick a hole formed in a few minutes which steadily grew larger, and had to be stopped with fire clay, so that a prejudice against their use developed in this country. They are, however, used abroad, but do not appear to possess any advantage over good fire brick.

Subjackets are sometimes used to reinforce hearth bottoms. With the exception of the water-cooled subjacket, difficulty is found with any of them when used beneath a steel-plate jacket that is spray cooled, and when the bottom of the water ditch about the jacket is 2 ft. or more above its base line. It has repeatedly happened in such cases that the surrounding brickwork has become so hot that the subjacket is melted or cut and the iron has come through. It is clearly established that positive water cooling must extend down to the bottom of the hearth jacket if the subjacket is to be of value. So many subjackets have been found cut from top to bottom that several plants cool the subjacket or bands by means of 2-in. extra heavy pipes, set vertically about the outside of the jacket or band, on 10-in. centers. These pipes are welded or otherwise connected at the bottom to form a gooseneck circuit.

Probably the most courageous method of combating the penetration of iron into the bottom and the formation of a salamander is the placing of jamb pipes inside the hearth brickwork and extending from the top of the hearth jacket, between the hearth and tuyere jacket, diagonally downward to beneath the bottom of the hearth. Until this construction has been thoroughly tried out, few furnace men will admit that any good can come of it.

On the basis of inquiries made, it seems that about 35 per cent of the furnaces in this country make the salamander the hearth bottom. The men in charge of these furnaces have come to the conclusion that regardless of the kind of brick or construction employed the bottom will disappear to a certain depth, and that if the iron should by any chance go any deeper, no harm is done. The view has also been advanced that the iron eats to a certain depth at the first blast, then solidifies into a permanent block, which undergoes no change during the remaining life of the furnace. This solid mass of cast iron, it is claimed, is more effective than the best brickwork in preventing breakouts, because it is without cracks or joints, and, from its high heat conductivity, will dissipate heat quickly and freeze any iron that may be lowering the bottom. In support of this view, instances have been cited where, on blowing the furnace out and tearing out the brickwork between the jacket and salamander, a distinct and separate layer or skull of iron could be seen on top of the old salamander from a previous blast. This skull represented the new salamander, and goes to support the theory that once the lower part of the salamander formed on the first blast is solidified in any way the hearth temperature never after becomes high enough to remelt it.

Attention to Signs of a Breakout

The cast-house crew should be instructed to pay particular attention to any indications or signs of breakouts. Although breakouts through the hearth jacket above the tapping-hole level are frequently sudden and without warning, nevertheless indications are not always lacking; the jacket may get unusually hot and steam heavily, or the water discharge from the cooling pipes set behind the jacket, or in plates or jacket segments, may start to steam and boil.

Impending breakouts beneath the tapping-hole level are indicated as follows: The pavement and brickwork about the jacket may become abnormally hot; the base itself, if not inclosed, may get unduly hot; the columns, if uncooled, may become too hot to touch, or, if cooled, the discharge water becomes very steamy; steam or gas, the latter igniting and burning with a bluish flame, may issue from the cracks and joints in the pavement and in the brickwork about the columns and jacket. "Losing the iron," and flames about the base, are unmistakable signs of lowering of the bottom, undue penetration of iron to moisture-impregnated brickwork, or a breakout.

Tapping-Hole Breakouts

With hearth jackets and hearth brickwork strongly constructed and copiously cooled, the weakest point is immediately over and at the tapping hole. The iron notch is expected to withstand the erosion of fluid iron forced out at high velocity, the slagging action of cinder, which begins to come out with the iron during the latter half of the cast, and the cutting of the gas or blast sweeping down from the tuyeres when the iron sinks to a low level in the hearth near the end of the cast. To withstand this action, there is provided simply a plug of fire clay, which fills the opening left in the hearth walls at lining, 6 in. by 24 in. by 36 in. in size.

Perhaps the chief difficulty in stopping the tapping hole is that the clay is likely, unless the gun is handled correctly and the clay mixed properly, to fill the hole straight ahead and not flatten out about the edges on the inside hearth walls or close up the uneven places and eroded channels in the hole itself, so that the stopping is neither safely keyed in nor firmly packed into the irregular contour of the tapping-hole surface. The clay is mixed to such plasticity that when squeezed in the hand, it will flow between the fingers only slowly or with difficulty. As a rule, a high grade of gray, weathered, flaky fire clay is used, because a red or yellow clay containing upward of 5 per cent of iron oxide may set too hard, although in certain districts yellow clay is used without difficulty.

When the hole does not take clay freely, it is the custom to fill the gun barrel about half full of clay, then pour in half a pail of water, or loam and water, and force the clay and water into the hole. This thins the clay so that it fills the hole tightly. Many plants use water in the gun regularly. In this case, the larger part of the first barrowful of clay, if two or more are used, is fed; then about half a pail of water is poured into the gun funnel after the barrel is well filled with clay, and the load shot into the hole. This procedure may be repeated a second and third time.

Cinder-Notch Breakouts

The cinder-notch, as it is used to "flush" or drain the slag from the hearth previous to casting, being subject to erosion and attack of slag during 12 to 18 "flushes" a day, would last but a short time if it were simply built up and stopped with clay without the blast being taken off. In fact, a clay notch could not be used unless stopped in exactly the same way as the iron notch, and this would mean turning off the blast a prohibitive number of times. Consequently, in the cinder-notch arch or opening is placed a bronze cooler, similar to a tuyere cooler; within this bronze cooler and extending inside 6 to 12 in. is an intermediate cooler, and inside the intermediate cooler is the "monkey," also water-cooled, which projects in about 3 in. The monkey has an opening 2 to 2½ in. in diameter, and is stopped by an iron "bot" or plug which chills the cinder key. The only danger of breakouts about the cinder cooler is escape of cinder between the large cooler and the brick walls, a rush of cinder when the intermediate cooler is changed, outbursts of slag and flame when the monkey is changed, or an explosion of the intermediate and the large cooler. If iron comes over the monkey by accident, it may cut the bronze and come in contact with the water inside, when all three coolers may be blown out of the furnace, and an outrush of furnace contents follow.

Breakouts about the cinder-notch cooler are minimized by painstaking care in setting and packing the cooler, which usually should be done after the kindling and scaffold have been placed in the hearth and bosh,

and before the furnace is filled preparatory to blowing in.

The packing more generally used, and the firmest, is rope asbestos saturated with water, rammed in tightly all around from front and back with light blows of a sledge. Clay is usually plastered on the face of the brick before the cooler is inserted, and the asbestos rope is used to make a tight fit. W. L. C.

British Steel Trade After the War

In England the question of the distribution after the war of that country's greatly increased steel output is receiving thoughtful attention. The following editorial comment in the London *Ironmonger* of Oct. 27 shows the drift of sentiment:

With the growth of our production of iron and steel the question of the conversion of the industries from war work to work for civil requirements is becoming more pressing as time goes on and if peace should come soon there is danger that the whole trade may temporarily be thrown into a state of chaos. The conversion of a number of blast furnaces to the production of basic iron is a predominant factor and, if the production of this class of iron is persevered with and the best use made of the ore which is obtainable in England, we should have a fair chance of taking over a considerable proportion of the trade in the cheaper grades of steel which was formerly in the hands of Germany and Belgium. The latter country is not likely to export for a long time after the war and the demand for steel from all quarters of the world will be so great that Germany, if she is again allowed to trade with her present enemies and if her production should remain in excess of her own needs, may be in a position to step back at once into a large portion of her former export trade. That probability must be taken into account, for it is very doubtful if effective measures could be taken to prevent Germany from exporting commodities if people abroad are willing to buy them and shipping space is available. Much, if not all, of her former export trade with this country, however, will perhaps be lost to her and our home producers should then not only be able to satisfy most of the needs of the United Kingdom, but should have a good balance for export and that branch will have to be very strongly pushed.

The American producers will have to be reckoned with, particularly in the South American, Indian and Australian markets where they have already seized during the war a good deal of the business that formerly came to Europe and on the question of quality of the goods we have little or no advantage over America.

The development of our rolling and other manufacturing plants during the war should give this country a sound foundation from which to work up the trade in plates, sheets and structural steel of all kinds. The cutting away of Continental supplies has been a blessing in that it has forced our manufacturers to develop their plants in a manner they could never have hoped to attain in times of normal foreign competition. The United States is better placed now than before the war: Germany remains for the present a doubtful quantity, but British iron and steel plants, as a whole, are better now than they ever were and it is for our manufacturers to see that the best use is made of them.

The enormous increase in our capacity for producing steel, which will probably be augmented by a further 20 per cent during the coming six to twelve months, is a factor that should have a very potent influence on the country's prosperity after the war, if reasonable measures are taken for the standardization of products and the abolition of the old system under which most iron and steel mills turned out almost every variety of rolled product. That system may have had its advantages but its disadvantages were manifest, the chief being that it was almost impossible to compete with Continental makers who were confining their attentions, as far as practicable, to the manufacture of one class of steel goods at one works or group of works. This arrangement prevented small quantities of one size of bar, angle, channel, tee, and so forth being rolled at several works at once, with the ensuing frequent stoppages of mills and changing of rolls. It is one thing to get the country's production of steel up to record figures during the present war stress (in itself no mean achievement), and another to maintain such a production under peace conditions, and there may have to be some measure of centralization of the country's resources. However, Government control will have to go as soon as possible after the cessation of hostilities. That control is now accepted as an unavoidable evil; but after the war is ended producers will take a lot of convincing that any measure of Government control of output is necessary, particularly if it is exercised by a horde of civil servants.

The future of the British steel trade is also discussed as follows by the London *Times:*

The preliminary reports presented by the Metallurgical and Mechanical sections of the Steel Committee appointed by the Iron and Steel Institute, must be regarded as a powerful indictment of the manufacturing methods, coming from those engaged in it, of what we have been accustomed to regard as one of our primary industries. The work assigned to the committee included a comparison of open-hearth and rolling mill practice at home and abroad, and the reports now issued are founded on replies to questions submitted to British firms. The basis from which they start is that the output of British establishments, even allowing for the difficulties of making a true comparison, is considerably below that of competitors in Germany and the United States. The chief causes assigned for this inferiority are costly and apparently inefficient labor, and inferior design and layout. The higher wages paid in proportion to output in Great Britain are certainly an important factor, but there is a disposition to question the figures given in the committee's report, which suggest that the wages bill for an equal output of steel melted is, on a pre-war basis, seven times that of the German manufacturer.

On the subject of rolling mill practice British manufacturers are at a disadvantage by reason of the non-adoption of specialization, but it is not contended that the British mill equipment lags behind that of foreign works as regards either design or construction. The suggestion that the British steel trade should establish a central board to which all orders would go, and from which the work would be allocated to different mills according to their ability to handle it, implies a species of combination which is coming to be viewed with favor in other than the steel trades. That some action is necessary was shown clearly by the statement made by a well-known authority in the discussion which followed the presentation of the reports that, unless the defects of our manufacturing system to which the committee direct attention receive consideration, there is no economic future for at least one-half of the British steel trade.

German Embargo on Steel

The German Ministry for War, the War Board and the Raw Materials Department issued a new order, effective Oct. 18, putting an embargo on all existing stocks and on the new production of iron and steel bars and shapes, sheets and tubes and castings. The use of these materials is only permitted in work that does not apply to new plant, extensions or reconstruction. For these an emergency certificate has to be obtained. The veto, however, does not apply to material for railroad bridges or for maintenance work in mines. Structural firms and those engaged on reinforced-concrete work are also required to notify the War Board of the stocks held by them on the first of every month, except in cases where the stocks of the same shape and cross-section do not exceed 10 cwt. on that date.

Lead Output in 1917

The lead production of the United States for the first half of 1917, according to C. E. Siebenthal of the U. S. Geological Survey, was 306,062 net tons as compared with 571,131 tons for all of 1916. Exports of domestic lead to July 1, this year, were 29,241 tons, as against 100,565 tons in all of 1916. Lead available for consumption on July 1, 1917, was 268,995 tons. It was 461,173 at the end of 1916.

The prevailing high prices of hematite iron ore of good quality has stimulated this class of mining in Ontario and Quebec. One of the companies recently incorporated in Canada is the Canadian Union Iron Mines Corporation, Montreal, with a capital stock of $1,000,000, which intends opening deposits near Sutton, Que., where hematite iron ore has been uncovered analyzing 68 per cent metallic iron. This company has already commenced operations at another mine near Perth, Ont., from which it is said there were several thousand tons of iron ore taken a few years ago.

The spring convention of the National Machine Tool Builders Association will be held in Atlantic City, N. J., probably in May.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

Owned by the United Publishers Corporation, 243 West 39th Street, New York. H. M. Swetland, *Pres.* Chas. G. Phillips, *Vice-Pres.* W. H. Taylor, *Treas.* A. C. Pearson, *Secy.*

BRANCH OFFICES—Chicago: Otis Bldg. Pittsburgh: Park Bldg. Boston: Equitable Bldg. Philadelphia: Real Estate Trust Bldg. Cleveland: Guardian Bldg. Cincinnati: Mercantile Library Bldg. San Francisco: 320 Market Street.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

Mobilizing Man Power

Industrial labor is the paramount problem of the war. To say so is telling nothing new, but now and then, as in the urgent call of Lloyd George last week for word as to the day when the United States would have a million men in its army in France, the emphasis is put on the need of a large fighting force. But the Secretary of War, in an appeal to the trade and technical press of the country, makes it plain that the need yonder is more pressing to-day for American mechanics and workers in other employments auxiliary to the army than for men specially trained to fight. The call is sounded on other pages of this issue and readers of THE IRON AGE are urged to help in making a prompt and adequate response.

It may be said that iron and steel and metal-working industries need every man now employed. But that is not to say that adjustments cannot be made in scores of places, by putting on less skilled men and training them to do the work of others whose skill can thus be released to back up the army in France. The task of sifting labor so as to insure a full supply for the work that is most vital to the winning of the war must not be left to Washington where men are over-burdened day and night with war loads. Manufacturers in every line must make this a personal problem.

Just now aviation is pressing its demands, and in this connection emphasis is put upon the announcement that men subject to the draft will not be permitted to volunteer after Dec. 15.

It need not be said that the shipyard labor problem has first place in the large plans that are having right of way at Washington. At 100 points the recruiting of shipyard forces through Government organization is under way, and yet in the New York district alone, including New Jersey, probably 30,000 more men will be required for shipyard work before April 1. It has been assumed too quickly in some comment that the release of labor from so-called non-essential industries is the main solution of the shipbuilding situation. Housing is equally important. In its plans for feeding its Mobile yards with steel the Steel Corporation includes the quick construction of 1000 houses at Fairfield, Ala. On Staten Island and in New Jersey the call is immediate for the building of hundreds of houses. It has been shown in coal mining that more men is not the desideratum so much as more cars and less whisky and beer. Short car supply is credited with only 13 per cent of the 26 per cent shortage in coal production reported by the Government for the six weeks ended Nov. 10.

The labor question, as is being proved every day, is not simply one of shifting blocks of men from one industry or district to another industry or district. It may be that a labor census by employments in much greater detail than has been attempted should be undertaken at once. There would be much help also from an early canvass of industries to classify them as essential, less essential and non-essential. But it should be appreciated right at the start that sweeping orders from Washington will not meet the situation and that this imperative labor adjustment which must go on steadily will be for the most part a hand-picking operation calling for widespread co-operation. Dilution by unskilled labor is under way; but it must proceed faster and there must soon be some revolutionary moves in the hiring of women to replace men.

Steel for the "Unessentials"?

The wish has sometimes been expressed that the steel industry had an analysis of the destinations of its products. Often as general business conditions change or as the relations between industries change it would be very advantageous to the business man to know where the steel goes, and in what form. While the uses of steel are wellnigh infinite it would not be impossible to list by ultimate destination by far the greater bulk of the steel that leaves the mill. In individual branches of the industry analyses are frequently made, but instead of their filling the general want the fact that they are attempted in such fragmentary form indicates how useful a general classification would be. Even as to the greatest single customer of the mills, the railroads, there has been much divergence of opinion or estimate. By co-operation, through such a body as the American Iron and Steel Institute, for example, a work of this sort could be accomplished.

Hitherto the demand for such a compilation has been merely spasmodic or sporadic, but now it is general, by reason of the Government's program to curtail operations in unessential indus-

tries. It is the intention of the Washington authorities to avoid publicity in the work of curtailment, but the observer can pick out unessential or relatively unessential industrial activities much better than he can judge the amount of steel they normally consume.

In a general way, however, there is ground for assuming that even an extensive curtailment in unessential industrial operations would not directly affect the demand for steel to any great extent. Directly for the prosecution of the war there will be required by the Government and its Allies an amount of steel which has been variously estimated at 30 to 40 per cent of the output at the rate of the past few months, with the latest developments pointing to the higher rather than the lower figure. Thus an extensive curtailment would be forced by lack of supply, and the curtailment at the instance of the Government could only begin where that left off, and would apply not against all tonnage, but against only about two-thirds of the tonnage.

Judge Lovett is quoted to the effect that there will be no more priority orders of the nature of order No. 2, which prohibited the use of open-top cars for carrying materials for building or repairing roads, sidewalks, etc., for places of amusement, or manufacturing passenger vehicles and furniture. That order could only affect the steel industry very slightly. A small tonnage of structural steel would be involved, perhaps, in connection with road building and repair. Theaters and other places of amusement do not consume steel in anything like the same proportion of total cost as obtains in the case of hotels, office buildings and factories. The only steel used in connection with furniture manufacture is transported in box cars. As to passenger vehicles, curtailment in production is occurring partly through decrease in demand and partly through the factories being given war work.

One of the rules it appears will be followed as far as possible is to effect curtailment in the production of unessentials by giving manufacturers war work to do instead. On the whole such a diversion would not reduce the consumption of steel, for naturally the plant that has been using steel for the production of something deemed unessential would be given work of the same general character, utilizing the plant equipment, and thus the consumption of steel at that point would continue.

Manganese in the Basic Open Hearth

It is a common contention that all the manganese introduced in any form in the early stages of the open-hearth process is practically lost so far as its appearance in the final steel is concerned. In his article in this issue, Mr. Newton suggests that by the use of high-manganese pig iron in the basic open-hearth process, a point may be reached where the equilibrium between the composition of the slag and the metal may be such that manganese, amounting to a considerable saving, ultimately remains in the steel. The idea is worth serious consideration and trial in these days when manganese conservation is so live a topic. If it is practicable, it affords a means of employing certain domestic manganiferous iron ores so as to reduce the ferromanganese commonly necessary, as well as to produce a better steel. The supply of such ore of suitable composition is very large.

The objection offered to this metallurgical practice, that there is a decided waste of manganese in the slag, is not as serious as it appears. Such basic slags, high in manganese, are being used in regular blast-furnace charges, producing a pig iron higher in manganese and effecting an economy in other factors such as lime. Their use also would somewhat lessen the amount of manganiferous iron ore necessary to secure the end suggested.

Mr. Newton's article also gives an idea of the extent to which spiegeleisen has replaced ferromanganese during the war. It appears that at the end of 1916 of the total manganese theoretically employed in making steel 15 per cent was used as spiegeleisen and 85 per cent as ferromanganese, whereas in the three years previous to the war the ratios were 10 per cent and 90 per cent respectively. It is probable that the spiegeleisen percentage has been further increased this year.

The effect of using manganese ores from many sources is shown by the decline from a 79 or 80 per cent manganese content in the years previous to the war to an alloy containing only a little over 76 per cent in the war period. The manganese content of the spiegeleisen has not changed appreciably in the same time.

Co-operation No Transient Phase

An important development in the relations of business men with each other and with the Government will be overlooked if the co-operation now practised in carrying on the war be viewed as a transient phase in men's affairs, to be dismissed as useless when the war ends. It is true that the war has emphasized the desirability of co-operation, but it has not made a distinction that co-operation is useful only for winning a war. Prosecuting this war is largely the utilization of industrial resources, and there is the same occasion for utilizing industrial resources in time of peace as in time of war. It is the object only that is different.

When the Federal Trade Commission was established many business men received advice of counsel that it had practically no legal authority, while from the practical standpoint it was thought that it would require many years of development, aided perhaps by additional legislation, for the commission to become an important factor in the conduct of the commerce of the nation. It had required a very long time for the Interstate Commerce Commission to develop real control of the railroads. It should have been obvious, however, that the actual developments in connection with the Federal Trade Commission's work would not be precisely determined by law, but would depend in fact upon a variety of circumstances—the personnel of the commission from time to time, the spirit shown by business men, in working with it or endeavoring to resist its activities, the changing needs of commerce, and various other matters. Even in the interpretation of laws long on the

statute books there are gradual changes. If the Northern Securities decision was not a reversal of the Knight sugar trust decision it was a step in that direction, several such steps having since been taken, and the power of the Federal Trade Commission, recognized by law or by common consent, could certainly increase, and more or less rapidly according to circumstances.

The war is such a circumstance. It has greatly broadened and quickened the activities of the commission. Those activities, directly the result of war needs, are so intimately associated with the peace functions prescribed for the commission that they cannot be expected to cease when the war ends. The purpose may be slightly different, and yet perhaps not so different after all. The commission has been directed to inquire into costs of production, so that the paying by the Government of unfair prices for commodities may be avoided; but simultaneously the principle is established that the same prices shall apply to the public, and the public's needs will remain after the Government has ceased waging war.

It certainly would appear that many have misused the precedent of the Interstate Commerce Commission in seeking light on what might be expected of the Federal Trade Commission. The matter was not well illuminated from one angle. that of the early accomplishment of the Commerce Commission in abolishing rate wars, rebates and passes. The Trade Commission is already proceeding along lines essentially similar.

A very significant instance is given in this official statement of the Federal Trade Commission made late last week:

> The Federal Trade Commission to-day made a long step forward in correcting of certain trade abuses when manufacturers of 90 per cent of the printer's ink made in America, personally or through representatives, voluntarily agreed to sign a stipulation to eliminate the practice which has been prevalent among some manufacturers of giving commissions to the buyers of their ink. The agreement was reached following a meeting at the Trade Commission to-day, which was called at the request of the ink makers.

The courts have been unable to draw clear distinctions, if indeed any at all, between abolishment of unfair competition and abolishment of competition, by co-operative work among sellers. In the incident recorded above the Trade Commission has been glad to sanction and approve an agreement among manufacturers at which the courts in all probability would have looked askance. Commissions to buyers of printer's ink and rebates to large shippers are essentially in the same category.

At the outset the Trade Commission expressed its commendation of trade associations, pointing out various directions in which they could be of use, and for the clear purpose of enabling their members to make more money. A species of injurious if not unfair competition is the cutting of extras. Not merely under the approval, but rather under the instruction, of the Government the American Iron and Steel Institute has been promulgating standards of extras, differentials and analyses for the purchase and sale of iron and steel commodities. The methods of such procedure may change after the war, but the essence of the activity will undoubtedly remain.

Co-operation of manufacturers and business men generally, among themselves and with the Government, is being encouraged, and this must not be considered a transient phase, an incident of war to pass afterward. The idea of co-operation had taken a strong hold upon business long before the war, and it had been formally recognized, if not distinctly by the action of Congress in passing the act constituting the Federal Trade Commission, at least distinctly by the commission itself when organized. What the war does chiefly is to afford opportunity for a striking illustration of the benefits of co-operation, and that lesson once learned is not going to be forgotten.

CORRESPONDENCE

For a Pig-Iron Reservoir

To the Editor: This war is bringing to the understanding of every intelligent citizen the fact that the underlying basis of a nation's power and wealth is its possession of iron and coal, and its capacity to use them with intelligence.

Nature has given to the United States an ample supply of iron and coal, but as far as making the best use of them is concerned our nation is as far behind Great Britain as can be imagined. For instance, Great Britain for more than half a century has carried a reserve stock of pig iron equal to six months' production, and at one time for five years in succession carried more than twelve months' production. The United States during this same half century has carried a reserve stock equal to less than three weeks' production. These conditions enabled England in the first year or more of the war to supply herself and her Allies with tremendous quantities of war materials. The reserve supply was so great that there was hardly an appreciable advance in price during the first year or so of this great demand. Whereas, in the United States, with little or no reserve stock of iron, the war demand quickly carried up its price several hundred per cent, and the whole business of the nation is being held back in consequence of an inadequate supply of iron.

No nation can afford in times of peace to maintain a capacity to produce iron sufficient to supply its need in times of war; consequently, every nation should accumulate in time of peace a sufficient reserve stock to supply its need in times of war.

There has been, since the beginning of war in this country, such perfect silence upon this great question that I am quoting below from a recent circular of Matthew Addy & Co., which shows that at least one business concern in the country appreciates this great question:

> A few weeks ago the question in the iron trade was, How high will prices go? Now the question is (and a far more vital and important question), Where will all the iron come from that is needed? Much more is needed than can be supplied. Demand continues unabated. No consumer has been able to accumulate pig iron, and practically all consumers are going into the winter with their storage yards absolutely empty. There never was a time when a reserve stock of iron was so urgently needed by the country as at present, but there is no surplus whatever, and each day's output of the blast furnaces is needed to keep the mills and foundries in operation.
>
> For years economists have been preaching the necessity for a great stock of iron—iron to be piled up in something of the fashion in which Joseph gathered grain during the seven years of plenty, or like the manner in which a nation heaps up coin in a war chest during prosperous peace times so as to have it immediately available in case of pressing emergency. Had we now such a reservoir of iron it would be of inestim-

able value. The trouble has been that every time in the past when iron began to accumulate and it was evident production was ahead of consumption, market prices fell until ironmakers faced a positive loss.

Evidently there is something wrong in our system, though no one has yet found a practical way to remedy the trouble. Certain it is, however, that if all the furnaces which were idle during the lean years—between 1908 and 1914—had been able to run and make iron, to-day the iron so made and put aside against the day of need would be a national asset worth more than any mere figures would show. That iron would go a long way toward winning the war. But as it is, we are on a mere hand-to-mouth basis. Furthermore, iron production is being pitifully curtailed and hampered because of a lack of coke.

THE IRON AGE reaches such a vastly large proportion of the whole mechanical business of the nation that I ask you to publish this letter, together with the quotation from the Matthew Addy circular.

GEORGE H. HULL,
President American Pig Iron Storage Warrant Co.

New York, Nov. 27, 1917.

Following Up Purchase Orders in Small Plant

To the Editor: In a recent issue of THE IRON AGE there appeared an interesting account by H. A. Russell of his system of following up urgent purchase orders. The writer believes that an outline of a method employed in a small plant where the purchases are only a few daily will also be of interest.

Three copies of the order are made, the original being mailed, the duplicate or green copy remaining in the office and the triplicate or yellow copy going to receiving clerk. Every morning before the green copies are filed away the purchase order number and the name of the firm to which the original was sent are entered on a small white card. These cards are then placed in a small tray, which has two sets of monthly guides, one marked "current" and one marked "proximo." There is a third division marked future, but without guides. These follow-up cards are placed behind the dates upon which an acknowledgment would be reasonably expected. When this date arrives a form postal card is sent to such concerns as have not replied, the idea being that some reply must be exacted, no matter how indefinite as to promise, to show that the order was not lost in the mail.

The green copies are placed in a case having several compartments. There are many firms from which goods are ordered frequently, and each has a compartment of its own. All other orders are placed in the one marked "miscellaneous." When the mail is sorted each morning all letters pertaining to these purchase orders are placed on a clerk's desk. The dates of shipment are noted on the follow-up cards and also on the backs of the green copies.

Once every day the receiving clerk sends in the yellow copies of such orders as have been completed or partly filled. The green copies of the former are then destroyed as are the white cards, if both sides have been used, and the yellow copies filed away for future reference. The part shipments are listed on the green copies and the yellow ones returned to the receiving department. Before noon of each day the white cards are taken from behind the date guide of that day and either the aforementioned postal card sent, or the necessary follow-up letter dictated. If it becomes advisable to write about an order before it would appear chronologically, it is an easy matter to locate the white card, make notation of the follow-up date and place it ahead for future attention.

The cards grouped behind the "future" guide refer to those orders which are not promised, or specified as not wanted, until after the approaching month. These are looked over each week. On the first of each month they are sorted out as then many of them become eligible to a place in the proximo group. If at any time the orders should become too numerous to locate a card easily either in the current or proximo group, a cross-index could be instituted by having a card for each order number, noting thereon the date back of which the follow-up card would be found.

To make sure that all material affecting any certain customer's order is not being overlooked, a sheet is kept on the buyer's desk and opposite each factory order is noted the purchase order number for the raw material.

Not the least merit of this system is the little time each day which it takes to keep it going.

H. D. MURPHY.

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Congestion Causes Alarming Conditions

All Railroad Lines East of Chicago to Be Operated as One System—Steel Plants Compelled to Close on Account of Fuel Shortage

WASHINGTON, Nov. 27.—In a desperate attempt to relieve the congested condition of railroad transportation throughout the eastern part of the country, which has resulted in heavy reductions in the output of munition plants and coal mines and which seriously threatens the building programs of the United States Shipping Board and the Navy, the Railroad War Board has decided upon the operation of all railroad lines east of Chicago as one unified system. Cars and trackage facilities, regardless of ownership, are to be pooled in the effort to obtain a maximum of efficiency in traffic movement. A committee of vice-presidents of the pooled lines will operate the roads under the general direction of the Railroad War Board, which is composed of five of the best known railroad men in the country. The operating committee will be clothed with full authority and will consider only the general welfare, irrespective of the policies or special interests of the pooled lines.

As officially announced, the operating program will include (1) diversion of locomotives, employees and machine tools from Western to Eastern railroads; (2) utilization of repair shops on Western lines for repairing Eastern equipment; (3) pooling of all tracks and equipment in the East wherever practicable; (4) pro rata distribution among Eastern roads of open top cars on a basis of tonnage carrying capacity of the equipment in the pool, and (5) diversion from congested lines of all freight that can be handled by any open route.

Steps Recommended

With a view to rendering the pooling arrangement more effective, the Railroad War Board has recommended that the following steps be taken forthwith by the Federal Government:

Survey the present contracts and methods of purchase and shipment of coal that cross hauls may be eliminated and that coal may move on the shortest route from producer to consumer. Extend the pooling of coal production and shipment. Transfer as far as possible the movement of foodstuffs and other export commodities to Southern ports to relieve congestion in North Atlantic ports. Survey all Government requirements involving the movement of raw materials and manufactured products, so that accumulations on roads and in terminals may be eliminated while products are awaiting shipments or export. Require wherever possible the building of war industrial plants in territory other than the Eastern seaboard.

If the measures suggested by the Railroad War Board do not prove effective in relieving the present situation, the board will immediately demand the execution of the policy recently outlined in a recommendation to the War Industries Board, cutting off coal and transportation from the so-called non-essential industries of the country. The board's original recommendation included a list of 524 products, the majority of which it was asserted could easily be dispensed with, while no great embarrassment would result to the Government or to the consumers at large if the production and distribution of the entire list should be suspended. Judge Lovett, the priority officer, appreciating the effect of such a blow upon a large number of industries, declined to indorse the Railroad War Board's recommendation, declaring that the use of such drastic measures to control the situation might easily precipitate a panic. Steps have since been taken, however, through the authorization of a Bureau of Manufacturing Resources, to attack this big problem conservatively and in careful detail, and it is altogether probable that, should the pooling of the Eastern roads fail to relieve existing congestion, the War Industries Board will at once direct the new bureau to begin the work of discriminating against non-essential industries.

Would Prevent Cross Hauls

It is understood that the War Industries Board will at once adopt the recommendations of the railroad board as to federal activities to relieve the transportation situation. It is a well known fact that enormous quantities of coal have been transported from one section of the country to another by cross-hauls which could have been eliminated if the entire subject of coal supply had been carefully studied from a National standpoint. The Fuel Administration has not thus far devoted much attention to this phase of the difficult supply problem, but, acting upon the recommendation of the Railroad War Board, will take it up at once with a view to working out a system by which all large consumers will obtain their coal from the nearest mines, while the general distribution for industrial and domestic purposes shall be made with a view to reducing the mileage of coal cars to a minimum.

The pooling of coal production and shipment, so far as it has been attempted in certain districts, has worked very well, and the broad extension of this plan is likely to result from the railroad board's recommendation. The Fuel Administrator, during the past week, approved a producers' pool formed in Cleveland to handle shipments of coal from mines in Ohio, West Virginia, and a part of Pennsylvania, with the possible addition of Tennessee and Kentucky.

One Plan for Relief

A substantial measure of relief is promised through the adoption of the recommendation that the movement of foodstuffs and other export commodities be transferred from North Atlantic to South Atlantic ports, with a view to relieving congestion in Northeastern territory where conditions are now must acute. There is no reason why the commodities referred to cannot be sent abroad through Southern ports, and if this is done it will relieve the rails and terminal facilities now greatly needed for the handling of coal and munitions in Ohio, Pennsylvania, West Virginia, Maryland, Delaware, New Jersey and New York.

The records of the War Department show very large quantities of raw materials and manufactured products that have been piled up in storehouses or on cars awaiting unloading, the bulk of which are intended for exportation but the shipment of which is not now immediately required. These goods have been accumulated by the Commissary, Quartermaster and Ordnance Departments with commendable enterprise and forehandedness, but the result has been to congest the railroad and storage facilities to an extent that has added greatly to the problem now confronting the Government. It is believed that a careful study of this phase of the subject will result in considerable relief, especially in the releasing of cars now loaded with war material.

Location of Industrial Plants

The suggestion that wherever possible the war industrial plants be built in territory other than the Eastern seaboard is interesting, but Government officials do not look for much relief from any change in policy in this respect. Aside from the three big Government-owned shipyards now being laid out and equipped, which it was absolutely necessary should be built on the Atlantic Coast, there are few industrial plants financed by the Government that have not already been developed to a point making removal impracticable. Under the direction of the Ordnance Bureau of the War Department a dozen or more forg-

ing, treating and machining plants have been constructed or extended for the manufacture of big guns and ammunition. In nearly all cases, however, there was a nucleus for each of these establishments in a private plant which undertook work with the Government's co-operation and financial assistance. It would have been difficult, even at the outset, to have located these extensions elsewhere, and as a matter of fact the expansion work has now proceeded to a point where production will begin in a short time. Generally speaking, the Government is disposed to locate manufacturing plants at a considerable distance from the Atlantic seaboard for military reasons, but the officials have felt obliged to pay some attention to the elements of transportation, convenient supply of raw materials, labor market, etc. Ordnance officials suggest that little would be gained by locating war industrial plants at distance from the Eastern seaboard, in view of the fact that the products of such establishments must be sent to the seaboard for testing and for shipment to Europe.

Many Appeals Received

Munition manufacturers are watching the twin problem of transportation and coal production with interest and not a little anxiety. Hundreds of appeals have been received in Washington during the past week by the War Department, the War Industries Board and the Fuel Administration, which indicate that the manufacture of war supplies, urgently required for the National safety, is jeopardized by freight conditions which have reached a critical stage, especially in Pennsylvania. A telegram received by Fuel Administrator Garfield from the Pittsburgh Coal Co. is typical of the calls that are now daily being made for relief from conditions that have reduced output in some cases as much as 50 per cent. It reads as follows:

> It is out of the question for us to do anything for Bethlehem Steel under present car supply, as practically all the steel mills which we are supplying are partially shut down and unless the situation changes immediately, we figure they will not be able to operate after this week.
>
> I advised you last Friday what the results would be unless transportation improved, so that you might place the responsibility where it belongs. The seriousness of the transportation situation in this district is alarming and must be handled in a vigorous way to avoid the disastrous results which will follow unless a remedy of some kind is put into effect at once.

A sharp controversy has arisen between the railroads and the coal operators concerning the responsibility for the present coal shortage. The coal men declare that they have mined coal in unprecedented quantities, but that the railroads have not supplied the cars to haul it away. To this the Railroad War Board answers that the operators are actually behind "full-time output," and that labor controversies in which the mine operators have become involved, and not car shortage, are the real reasons for the present situation. In this connection, Fairfax Harrison, Chairman of the Railroad War Board, has made public the reply to a statement by the National Coal Association to the effect that "bituminous coal production in the United States was reduced approximately 2,000,000 tons last week by car shortage and railroad congestion." He said in part:

> The railways do not attempt to say that all the blame for failure to secure a larger production of coal should be put on the mining companies, but, on the other hand, the public should be made to know that the larger part of the failure to secure maximum output is due to causes under the control of the managements of the mines and not to causes under the control of the managements of the railways.
>
> After allowing for all the shortage of production attributed by the Geological Survey to the railways, there still remains the much larger additional shortage of 2,209,000 tons a week, or 15,500,000 tons in seven weeks, which it was entirely within the power of the National Coal Association to produce and deliver to the public.

The President's Conference

The outcome of the President's conference with the officials of the four railroad brotherhoods held at the White House Nov. 22 has been inconclusive and unsatisfactory from the standpoint of the public. The railroads had placed their interests entirely in the President's hands, and Mr. Wilson, therefore, sought assurances from the labor leaders that they would accept Federal mediation and would pledge themselves not to precipitate a railroad strike during the war. After the conference, the President gave out a guarded statement to the effect that the brotherhood heads agreed "in case of any critical situation of the controversy * * * to consider any proposed solution in a spirit of accommodation and patriotic purpose." At the same time the brotherhood representatives made public a memorandum declaring their willingness to "discuss and consider any solution * * * if a situation should arise which threatens the interruption of transportation." In addition, it was stated that the brotherhoods had renewed their demands for higher wages, basing their stand on the ground that war conditions had increased the cost of living to such a degree that more pay is necessary for their existence. Subsequently, when it became apparent that these official statements were vague and unsatisfactory, certain administrative officials attempted to construe them into assurances that there would be "no Nationwide railroad strike during the war." More detailed adjustment was not attempted, it was said, because the brotherhood leaders "had no exact wage demands formulated and the method of relieving railroad finances for greater war efficiency had not been finally determined."

The Brotherhoods have already rejected the proposition that their wage demands be referred to the Federal Board of Conciliation and Arbitration, and while administration officials express the conviction that they will ultimately agree to abide by the decision of a special tribunal appointed by the President, the brotherhood leaders have been very careful not to confirm this suggestion. It is evident the labor leaders have determined to force the roads to raise wages and to rely upon the President to influence the Interstate Commerce Commission to increase freight rates under pending petitions for the purpose of absorbing the resulting increase in operating expenses. W. L. C.

German Substitute for Lycopodium

A substitute for lycopodium has been found in Germany. The London *Ironmonger* says that at a recent meeting of the German Foundrymen's Association a member described it. Lycopodium is a vegetable material which, before the war, was used for dusting or coating the molds in order to prevent sand from clinging to castings. Lycopodium came exclusively from Russia and there is none left in Germany now. Experiments showed that by a centrifugal process the dust, which is precipitated in the lignite briquetting works from the gas exhalations of the drying apparatus can be successfully used to replace lycopodium. The light dust particles, which contain a large percentage of paraffin, have the same properties as lycopodium, as may be seen when water is poured on them.

Contract for Wilputte Coke Ovens

The Wilputte Coke Oven Corporation, New York, has been awarded a contract for the installation of 25 Wilputte regenerative by-product coke ovens, with by-product equipment, as an extension to the present coke oven plant of the Algoma Steel Corporation, Ltd., at Sault Ste. Marie, Ontario, Canada. Work will be started immediately, and the construction is expected to be completed by July 1, 1918.

Crombie Steedman & Co., Ltd., of London, Liverpool and West Africa, have opened an office at 10 Wall Street, New York, and would be glad to receive catalogs and correspondence from sellers of corrugated galvanized iron sheets, bar iron, bolts, nuts and hinges for export to South Africa and the British colonies.

The Buffalo Union Furnace Co., Buffalo, has had plans prepared for a blower engine house and for alterations and additions to be made to Furnace C at its plant, Buffalo River and the Erie Railroad, at the foot of Katherine Street.

Iron and Steel Markets

GROWING STEEL DEMAND

Blast Furnace and Steel Works Situation Still Acute

Greater Activity in Pig Iron Under Fear of Shortage—Ore Prices for 1918

The week has seen an increasing demand for steel products both from the Government and from manufacturing consumers. Many of the latter are buying for requirements not directly growing out of the war. Steel absorbed by the Government and by war contracts is a growing factor and is made to seem still larger as output is cut down by coal and coke shortage.

Blast furnace and steel works operations are no better. At Youngstown steel is being produced at 50 to 75 per cent of capacity. Pittsburgh is suffering in less degree, but 15 to 20 blast furnaces there have been banked for a part of the week.

With the approach of Jan. 1, the date named in connection with present prices, some agitation of a lower basis for iron and steel products has started at Washington; but the trade itself calls for stability and it is pointed out that as only a beginning has been made in working under the new schedules they should not now be disturbed.

The larger producers have been practically a unit in carrying out the spirit of their agreement with the Government. Here and there higher prices have been charged and those who have thus profited have simply helped to head the industry into Government control.

In the Chicago district one producer is turning 75 per cent of its ingot output into war steel. In Pennsylvania, a large company with plants at three points is supplying from 60 to 70 per cent of its output to the Government and Government contractors.

While priority decisions are limiting the amount of steel going to some consumers, there is as yet no shutting down of plants, even in non-essential lines, though such steps may not be far off. A sharp falling off in steel specifications from automobile plants has come in the Middle West.

New inquiry for billets and sheet bars is larger than in months, and some sheet producers are finding difficulty in covering for their first quarter's supply. Steel mills are scouring the market for ingots or billets to make up their own shortages. A large tonnage of slabs for the Sparrows Point plate mill is sought in the Eastern market. In northern Ohio a quotation has appeared on slabs considerably above the Government's price.

While in the end the Government is expected to take nearly the full output of sheared plates, the supply for the general market is still considerable. The premium over the Government price is shrinking, and in the Middle West mills are less able to get 5c. For the 36 vessels the American Shipbuilding Co. is to build for the Emergency Fleet Corporation, 50,000 tons of steel will be required. At Chicago, 9800 tons has just been placed for the Submarine Boat Corporation, and 5100 tons for a local shipyard. Italy has been a buyer of plates to the extent of 22,000 tons.

The identical Pittsburgh-Chicago basing called for by the Government price schedules is causing some friction; for example, Eastern mills have been called on to send plates to Chicago and to accept 3.25c., Chicago.

Eastern bar-iron producers seek to establish 3.50c., Pittsburgh, as the market price, and have not yet made this quotation at mill. Some smaller iron rolling mills are asking 4c. and over. In the Eastern jobbing trade the outcome of the collision between higher jobbers' extras on bars, as long maintained, and the mill extras announced by the Steel Committee, is being watched with some interest.

That the Russian debacle will release locomotive capacity for domestic orders is of no little significance to railroads and shippers. Domestic car orders also may be more of a factor. The Union Pacific has just placed 3500 all-steel cars.

Foundries having Government contracts may find it necessary to appeal to the Government to get them enough coke to keep running. The probability is also that some steel producers will call on the Government to furnish coke to operate their blast furnaces, if they are to carry out their ship and shell-steel contracts.

Fear of even a greater shortage in pig iron has caused an active market for delivery in the first half of 1918. Some makers are withdrawing from the market for the first half, having sold all that they can deliver if fuel conditions get no better. In Illinois, 20,000 tons of basic iron have been bought, three-fourths to come from Chicago and the remainder from Southern furnaces. The $4 more that must be paid for Southern iron is causing a greater pressure on Northern furnaces to take care of Central Western foundries. The whole pig-iron situation is growing more acute, and Government intervention to secure prompt iron for castings needed for war machinery is very common.

Lake Superior iron-ore prices for 1918 are being discussed. In the first Government price fixing, in September, ore was not changed, being really low if $33 was fair for pig iron. Indications now are that the 1917 ore basis will carry over into 1918 unless there should be a slight advance to cover possible new increases in labor and transportation.

Pittsburgh

PITTSBURGH, Nov. 27—(*By Wire*).

Mill operating conditions in the Youngstown, Ohio, district, due to the shortage of fuel, show no betterment. This week the Youngstown Sheet & Tube Co. and the Republic Iron & Steel Co. are operating their finishing mills to only about 50 per cent of capacity. The Youngstown Sheet & Tube Co. still has one Youngstown furnace banked, one Hubbard furnace idle for repairs and another banked. The Republic Iron & Steel Co. has been able so far to keep its five furnaces at Hazleton in blast, but they are running light, making only about 75 per cent of usual output. The company has blown out Hannah furnace at Youngstown for re-

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Nov. 28, 1917.	Nov. 21, 1917.	Oct. 31, 1917.	Nov. 29, 1916.
No. 2 X, Philadelphia...	$34.25	$34.25	$34.25	$27.50
No. 2, Valley furnace...	33.00	33.00	33.00	30.00
No. 2 Southern, Cin'ti...	35.90	35.90	35.90	24.40
No 2, Birmingham, Ala.	33.00	33.00	33.00	21.50
No. 2, furnace, Chicago**	33.00	33.00	33.00	27.00
Basic, del'd, eastern Pa.	33.75	33.75	33.75	27.00
Basic, Valley furnace...	33.00	33.00	33.00	30.00
Bessemer, Pittsburgh....	37.25	37.25	37.25	34.45
Malleable Bess., Ch'go**.	33.50	33.50	33.50	27.00
Gray forge, Pittsburgh..	32.75	32.75	32.75	29.95
L. S. charcoal, Chicago...	37.50	37.50	37.50	28.00

Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	....	....	....	$38.00
O.-h. rails, heavy, at mill	....	....	....	40.00
Bess. billets, Pittsburgh.	$47.50	$47.50	$47.50	55.00
O.-h. billets, Pittsburgh.	47.50	47.50	47.50	55.00
O.-h. sheet bars, P'gh....	*51.00	51.00	51.00	55.00
Forging billets, base, P'gh	60.00	60.00	....	80.00
O.-h. billets, Phila.....†	*47.50	....	....	55.00
Wire rods, Pittsburgh...	57.00	57.00	57.00	65.00

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	3.685	3.685	4.25	2.659
Iron bars, Pittsburgh....	3.50	3.50	...	2.90
Iron bars, Chicago.....	3.50	3.50	4.50	2.65
Steel bars, Pittsburgh....	2.90	2.90	2.90	3.00
Steel bars, New York....	3.095	3.095	3.095	3.169
Tank plates, Pittsburgh..	3.25	3.25	3.25	4.25
Tank plates, New York..	3.445	...	...	4.419
Beams, etc., Pittsburgh..	3.00	3.00	3.00	3.00
Beams, etc., New York..	3.195	3.195	3.195	3.019
Skelp, grooved steel, P'gh	*2.90	2.90	2.90	2.85
Skelp, sheared steel, P'gh.	*3.25	3.25	3.25	3.00
Steel hoops, Pittsburgh...	3.50	3.50	...	3.25

*Agreed prices. †As yet only a few sales made.
**The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Nov. 28, 1917. Cents.	Nov. 21, 1917. Cents.	Oct. 31, 1917. Cents.	Nov. 29, 1916. Cents.
Sheets, black, No. 28, P'gh	5.00	5.00	...	4.00
Sheets, galv., No. 28, P'gh	6.25	6.25	...	5.50
Wire nails, Pittsburgh...	3.50	3.50	...	3.00
Cut nails, Pittsburgh....	...	...	...	2.95
Fence wire, base, P'gh..	3.25	3.25	...	2.95
Barb wire, galv., P'gh..	4.35	4.35	...	3.85

Old Material, Per Gross Ton:				
Iron rails, Chicago.....	$36.50	$35.00	$34.00	$26.00
Iron rails, Philadelphia..	38.00	38.00	38.00	24.00
Carwheels, Chicago	30.00	30.00	26.00	20.00
Carwheels, Philadelphia..	33.00	33.00	29.00	21.50
Heavy steel scrap, P'gh..	30.00	29.00	27.00	25.00
Heavy steel scrap, Phila.	27.00	26.00	25.00	23.00
Heavy steel scrap, Ch'go.	28.00	28.00	26.00	23.00
No. 1 cast, Pittsburgh....	28.00	26.00	27.00	19.50
No. 1 cast, Philadelphia.	31.00	31.00	28.00	20.00
No. 1 cast, Ch'go (net ton).	23.50	23.00	20.00	16.00
No. 1 RR. wrot, Phila....	35.00	35.00	35.00	25.00
No. 1 RR. wrot, Ch'go (net)	31.00	31.00	28.50	23.00

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	$6.00	$6.00	$6.00	$7.00
Furnace coke, future....	6.00	6.00	6.00	4.00
Foundry coke, prompt...	7.00	7.00	6.00	7.50
Foundry coke, future....	7.00	7.00	6.00	5.00

Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.	23.50	23.50	23.50	34.00
Electrolytic copper, N. Y.	23.50	23.50	23.50	34.00
Spelter, St. Louis.....	7.75	7.75	7.75	13.00
Spelter, New York.....	8.00	8.00	8.00	13.25
Lead, St. Louis.....	6.37½	6.37½	5.62½	7.17½
Lead, New York.....	6.50	6.50	5.75	7.25
Tin, New York.....	80.00	77.00	66.00	45.25
Antimony (Asiatic), N. Y.	14.00	13.75	14.25	14.50
Tin plate,100-lb. box, P'gh.	$7.75	$7.75	....	$6.00

pairs, and will also blow out Hall furnace at Sharon, Pa. It is operating only 75 per cent of its Koppers by-product ovens. Two units, comprising 102 by-product coke ovens, of the Youngstown Sheet & Tube Co. are also idle for lack of coal. The Brier Hill Steel Co. is not able to operate its open hearth steel works at Youngstown or its sheet mills at Niles to full capacity owing to the coal shortage. Last week a meeting of manufacturers was held at Youngstown, at the suggestion of the Chamber of Commerce, to try to devise some means of improving the situation, but nothing definite was done. The Republic, Brier Hill and Youngstown Sheet & Tube interests are all working on contracts for shell steel for the Government, and the shortage in fuel is cutting down output one-half. The car situation is also bad and shipments by the mills are made under great difficulties. The coal and car supply in the Pittsburgh district is nearly as bad as in Youngstown. Car service bureaus are doing their utmost to secure empty cars for shipment, but with little success. There is a coal famine in the Pittsburgh district and mills and domestic users are suffering alike. It is feared that unless the car supply increases very soon a large number of coal mines will shut down for lack of cars, and this will intensify the shortage in coal supply. Homer H. Johnson, Federal Fuel Administrator of Ohio, and D. W. Kuhn, Federal Fuel Administrator of Pennsylvania, are at work with the various coal carrying railroads trying to get them to route cars direct from leading coal mines to places of distribution, thus eliminating classification yards. The situation is serious and unless more coal is soon secured some plants in the Pittsburgh district that are now running light will have to close down entirely. The railroad situation in the Pittsburgh and other districts has become so bad that a meeing of railroad operating vice-presidents was held in Washington, Monday, Nov. 26, to try to work out a plan for pooling the supply of cars. The whole matter was put up to a committee to establish offices in Pittsburgh, and the committee will sit continuously until the traffic problem brought about by the abnormal war business in the eastern territory has been settled. Another meeting of this committee will be held in Pittsburgh to-morrow. It is said a controller will be appointed for Government traffic on the railroads and that private routing must be abolished. The railroad situation is the most serious ever known and seems to be steadily getting worse. The Pennsylvania Railroad has declared an embargo on all freight originating on all lines east of Pittsburgh and also on all freight originating on conecting lines destined for points on or by way of the Western Pennsylvania division. Shipments are being held up in every direction and the car movement is the slowest ever known. There is a lack of cars, motive power and men to handle the enormous freight that is confronting the railroads. General conditions in the iron and steel trades showed no important developments in the past week. The amount of business being placed with the mills is relatively small, mainly for the reason that most mills are sold up for some months and have little or no material to offer for early delivery. Regular Government prices are being quoted on all lines of steel products, but reasonably prompt deliveries are very hard to obtain.

Pig Iron.—The famine in the supply of Bessemer and basic pig iron is getting worse, and large steel companies are scouring the market everywhere trying to find iron, but are not getting it. The next move to relieve the situation will likely be the cutting off of shipments of pig iron to steel plants that are not working strictly on war materials. Several such plants are named that are making automobile parts, car couplings and other products which are not necessary for the prosecution of the war. Owing to the shortage of the supply of coke, due to the congested railroad conditions, blast furnaces are running light, and are not making more than 75 to 80 per cent of their regular output. Sales of pig iron in the past week have been

very few for the reason that the iron cannot be had. We note a sale of 1000 tons of Bessemer iron for prompt shipment at the official price of $37.25, Pittsburgh, and also a sale of 1500 tons of No. 2 foundry iron for first half delivery at $33, Valley furnace. The Pennsylvania Railroad has closed with a central Pennsylvania furnace for about 11,800 tons of various grades of foundry iron for delivery at its shops at Altoona, Pa., all at regular Government prices. The outlook is that a number of furnaces in the Pittsburgh and Valley districts will soon have to bank on account of shortage of supply of coke.

We quote as follows: Basic pig iron, $33; Bessemer, $36.30; gray forge, $32; No. 2 foundry, $33; No. 3 foundry, $32.50, and malleable Bessemer, $33.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being 95c. per ton.

Billets and Sheet Bars.—New inquiry for billets and sheet bars is heavier than for some months. Owing to the banking of so many blast furnaces, output of steel by the mills has been cut down very materially, and some of the larger steel producers are combing the market trying to find ingots or billets to help out. All the steel mills are in the same condition, and instead of having any steel to sell would be eager buyers if the steel could be found. Some tin plate mills have made provisional contracts for their supply of sheet bars for first half of next year.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $47.50, sheet bars $51, and forging billets $60 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Ferroalloys.—As yet, consumers of ferrosilicon and silvery iron are not showing much disposition to buy for next year, there being no incentive to do so, as a full supply seems assured and at regular prices recently fixed by the general committee of the American Iron and Steel Institute. The price of 80 per cent domestic ferromanganese is about $250 per ton, delivered, but a few sales have been made at slightly lower figures. We quote 80 per cent domestic ferromanganese at $245 to $250, delivered, and 18 to 22 per cent spiegeleisen at $60 to $65. A sale of 1200 to 1500 tons for delivery over 1918 is reported at $60, delivered. We quote 50 per cent ferrosilicon for prompt shipment at $150 to $155, and on contracts about $140 or higher, depending on quantity.

We now quote 9 per cent Bessemer ferrosilicon at $54, 10 per cent $55, 11 per cent $58.30, 12 per cent $61.60, 13 per cent $64.90, 14 per cent $68.20, 15 per cent $71.50, and 16 per cent $75. We quote 6 per cent silvery iron $40, 7 per cent $42, 8 per cent $44.50, 9 per cent $47, 10 per cent $50, 11 per cent $53, and 12 per cent $56. These new prices on Bessemer ferrosilicon show reductions over former prices, ranging from $35 to over $60 per ton. On silvery iron the new prices show reductions over former prices of $35 to $40 per ton. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, these furnaces having a uniform freight rate of $2 per gross ton, for delivery in the Pittsburgh district.

Structural Material.—Nearly all the new work being given out is being placed by the Government. The McClintic-Marshall Co. has taken 1500 tons for a plate and angle shop for the American International Shipbuilding Corporation, Hog Island, Philadelphia, and the same company is said to have taken another Government order for about 2000 tons. The American Bridge Co. has taken 2100 tons of steel shapes for the hangars and buildings to be constructed at the Langley aviation field. Second bids have been asked for the steel for the new buildings to be erected by the Kelly-Springfield Tire Co. at its proposed new plant at Cumberland, Md., which require about 1000 tons. This may possibly be awarded this week. We quote beams and channels up to 15 in. at 3c. at mill.

Steel Rails.—So far no important sales of light rails have been made at the new Government prices at 3c. per pound on 25-lb. and heavier sections. It is said that rerolling mills are now quoting light rails at higher prices than new rails rolled from billets. We quote light rails, 25-lb. and heavier, at 3c. per lb.; 16-lb. and 20-lb., 3.45c.; 12-lb. and 14-lb., 3.90c., and 8-lb. and 10-lb. at 4.35c. for full carload lots, f.o.b. Pittsburgh; for less than carload lots, down to and including five gross tons, 0.045c. extra, and small lots under five gross tons, 0.09c. extra, all per lb., f.o.b. Pittsburgh.

Plates.—There is a very heavy new demand for plates for prompt shipment, but mills are sold so far ahead that it is very difficult to place orders and secure even reasonably prompt delivery. The Government is getting to be a heavier buyer of plates right along, and the quantity available for domestic consumers is getting steadily less. On Government orders for cars mills are making fairly prompt deliveries on plates and shapes, but on orders for other cars, deliveries are only about 50 per cent of normal. We quote ¼-in. and heavier sheared plates at 3.25c. Pittsburgh.

Sheets.—The Government demand for sheets is still very heavy, orders coming out nearly every day. Last week the sub-committee on sheet steel distributed among the mills Government orders for 20,000 tons of 3/16-in. blue annealed No. 7 gage, and since has distributed 5000 to 6000 tons of Bessemer black and galvanized to go to France and Italy. The general demand is also heavy, and the American Sheet & Tin Plate Co. and other leading sheet mills have under contract practically their entire output of blue annealed and black sheets for first half of next year, and galvanized for first quarter. However, the demand for sheets from the automobile builders has fallen off very rapidly, and this will likely release a large quantity to other consumers that were intended for automobiles. Large sheet mills will take care of jobbers to the best of their ability after contracts with manufacturing consumers have been finished. The shortage in supply of steel and coal is cutting down output of sheets at nearly all the mills to some extent. Reports that the Government will issue orders cutting off entirely the building of pleasure cars is not credited, but the output may be reduced by Government orders to about 40 per cent of normal. It is not believed there will be any change in prices of sheets by the Government on Jan. 1, but at the same time it is still felt that the price of 6.25c. on galvanized is low. Detailed prices on sheets are given on page 1323.

Tin Plate.—Practically the entire output of the tin plate mills for the first half of next year is under contract. While none of the mills so far has taken contracts for tin plate except for manufacturing consumers, it is likely they will later take care of jobbers where the jobbers' orders are from manufacturers or for goods essential to the prosecution of the war. Consumers are well aware that there will be a shortage in tin plate this year, and many are trying to increase their contract over last year, but the mills are allotting to most consumers no more tin plate than they bought last year, and in some cases less. The Government is still a heavy buyer of tin plate for its own use, and also considerable for shipment to France and Italy. Some makers of tin plate will probably not be able to turn out as much next year as this year, as their allottment of steel has been cut down. There are still some export inquiries from countries other than our Allies, but little attention is paid to them, as it is not likely the Government would issue a license for such shipments. Small sales from stock are being made at the regular Government price. We quote coke plate at $7.75 per base box, f.o.b. Pittsburgh, for Bessemer or open hearth stock. Prices on terne plate are given on page 1323.

Iron and Steel Bars.—The several local makers of iron bars are now quoting the Government price of 3.50c., but say they have no bars to sell for delivery this year, and very few for the first quarter of next year. The new demand for both iron and steel bars is heavy, many consumers having held off placing orders until the Government prices came out, and now find their stock low and badly in need of replenishing. Consumers who want to buy iron and steel bars for prompt shipment say they cannot find mills that will quote for prompt delivery. The Government continues to be a heavy buyer of steel bars. We quote steel bars at 2.90c. and refined iron bars at 3.50c. in carloads, f.o.b. mills, Pittsburgh.

Muck Bar.—We quote ordinary grades of muck bar made from all pig iron at $75 to $80 per gross ton, f.o.b. Pittsburgh. We quote standard grade low phosphorus melting bars, running 0.015 in phosphorus, $95 to $100, and No. 1 standard grade, running 0.012 in phosphorus, $105 to $110 per gross ton.

Wire Rods.—Mills report a very active export and domestic inquiry for wire rods, and their output is well sold up for the next two or three months, or longer.

One local maker has practically retired as a seller of rods, preferring to put the steel into other products, on which there is a larger margin of profit. Consumers are having trouble in getting deliveries of rods as fast as needed. Prices on rods are given in detail on page 1323.

Wire Products.—One leading local maker of wire and wire nails has practically retired from the market as a seller, having all the obligations on its books it cares to take. The prices of $3.50 on wire nails and $3.25 on plain annealed wire, the mills say, are not attractive. Where they can, they prefer to put the steel into other products. Small drawers of wire say that to pay $57 for rods and sell plain wire at $3.25 and wire nails at $3.50 leaves practically no profit. The Government is a fairly heavy buyer of wire nails, and there is also an active export demand. On nails and wire for export, much higher than the Government prices can be obtained, but there is often trouble in getting a Government license to make export shipment. Prices on wire and wire nails being quoted by all the mills are given on page 1323.

Nuts and Bolts.—All the local makers of nuts and bolts will quote the new Government discounts, but say they are sold up for the next two to three months and are unable to take orders for delivery this year. The Government prices on these products given out two weeks ago are regarded as fair by all makers and consumers, but the trouble is a good many makers of nuts and bolts are running on old contracts for steel bars at prices considerably higher than 2.90c., which makes the margin of profit on the finished product very small. The new discounts are given on page 1323.

Rivets.—All the makers are now quoting the regular Government prices, $2.65 on structural rivets and $4.75 on cone-head boiler rivets. In addition, all the rivet makers that are members of the Institute of Bolt, Nut and Rivet Makers have revised their contracts to the basis of Government prices, so that all material now being shipped out is billed at the official price. The new demand for rivets is quiet, but the Government is a fairly heavy buyer on direct orders. We now quote structural rivets at $4.65 and cone-head boiler rivets at $4.75 base, in carloads .f.o.b Pittsburgh.

Hoops and Bands.—There have been very few sales of bands at the Government price of 2.90c. or on hoops at the 3.50c. prices. Mills making these products are sold up for some months ahead and have no material to spare for early delivery. We now quote steel bands at 2.90c., extras as per the steel bar card, and steel hoops at 3.50c. f.o.b. mill Pittsburgh.

Shafting.—Makers report that the new demand for shafting from the automobile and screw stock machine trade has fallen off over 50 per cent, and this is releasing a good deal of shafting for consumers making other products. The demand for small sizes has been dull for some time, and some makers of shafting are seeking new orders for sizes up to 2-in., but on the larger sizes running up to 5-in. most makers are sold ahead for four or five months. The Government is still a heavy buyer of shafting on direct and indirect orders and it is said is taking 35 to 40 per cent of the entire output. We quote cold rolled shafting in large lots at 17 per cent of list, f.o.b. Pittsburgh.

Cold Rolled Strip Steel.—All makers are now quoting the new Government price of $4.50 on hot rolled and $6.50 per 100 lb. on cold rolled strip steel. Some makers made a readjustment from the former price of 9c. to a 7c. basis, but this did not apply to consumers working on Government contracts unless they in turn made a reduction in their prices on Government work. The prices on hot and cold rolled strip steel are regarded as fair, and the new extras printed on page 1270 of THE IRON AGE of Nov. 22 were those submitted by the manufacturers to the War Industries Board, and were adopted. These discounts have really been in effect since Oct. 26.

We quote cold rolled strip steel at $6.50 and hot rolled at $4.50 per 100 lb., f.o.b. Pittsburgh, terms 30 days, less 2 per cent off for cash in 10 days, when sold in quantities of 300 lb. or more.

Railroad Spikes and Track Bolts.—The new demand for railroad spikes is quiet, but the Government demand for boat spikes is heavy, several leading makers stating that practically their entire output is being shipped to the various boat yards on Government orders. We quote standard sizes of railroad spikes at 4.50c., small spikes 6c. to 6.25c. and boat spikes 5.25c., all per 100 lb., f.o.b. Pittsburgh.

Wrought Pipe.—Mills report a fair amount of new domestic business in small lots, but they could book a very much larger quantity of pipe if they were in position to make deliveries wanted by consumers, which they are not. Most mills are sold up on both iron and steel pipe anywhere from six months to a year, and the obligations of the National Tube Co. are such that its output is practically sold over all of 1918, and over first part of 1919. The Government is still buying moderate quantities of steel pipe, which the mills are turning out and shipping promptly. The amount of line pipe used this year in gas and oil projects was much less than last year, due to the fact that the mills were filled up so far ahead on merchant pipe they were not in position to take on any large contracts for gas or oil lines and make the delivery. Discounts on iron and steel pipe now being quoted by all the mills, which are very firm, and with no pipe available for delivery this year excepting a few sizes in butt-weld pipe, are given on page 1323.

Boiler Tubes.—The Government has been a very heavy buyer of both iron and steel tubes for equipment of the boats being built now all over the country. One leading maker reports its entire output of steel boiler and seamless tubes sold up for the next 18 months. Other makers of iron tubes say they have none to sell for delivery before late next year. The discounts recently fixed by the Government on iron and steel tubes are now being quoted by any mills that are in position to take on orders for delivery this year or early next year. These discounts are given on page 1323.

Coke.—Last week the car supply averaged only 40 to 45 per cent, and efforts of coke producers and consumers with the railroads to get more cars have been without success. This is holding down output, as many plants have closed ovens, waiting to get cars. There is no incentive for consumers to place contracts for furnace or foundry coke for 1918 delivery, and nothing is being done. There is still a strong feeling that either the price of coal will have to be advanced or coke reduced, as the differential in price between coal and coke is too great. The chances favor a reduction in the price of coke. Sales of both furnace and foundry coke for prompt delivery are being made at regular prices, but the amount of coke available for quick shipment is very small. Blast furnaces in the Valleys and several in the Pittsburgh district are banked, being unable to get coke fast enough. Many by-product coke ovens are also down, being unable to get coal. The supply of labor is much better than it has been for some time. Many men who formerly had outdoor positions are going to work in the mines and at the ovens to be away from the cold weather. Another thing that is helping the labor situation is that many coke workers bought Liberty bonds and they are working steadier since doing so, to earn money to pay for them. We quote furnace coke at $6, foundry at $7 and crushed coke over 1-in. size $7.30, all in net tons of 2000 lb., at oven. The Connellsville *Courier* gives the output of coke in the upper and lower Connellsville region for the week ending Nov. 17 as 306,240 tons, a decrease from the previous week of 9568 tons. This is the smallest output of coke in the two regions for some months.

Old Material.—The local scrap trade is looking very much better from the standpoint of the new demand, which is heavier than for a long time, while prices on nearly all grades of scrap used for open-hearth purposes are up from $2 to $3 per ton. The famine in supply of pig iron is compelling many steel mills to use more scrap in their mixtures, and this is creating a heavier demand. The supply of available scrap is short, and dealers seem somewhat indifferent about making sales. They claim they cannot buy heavy steel scrap much below $30, and as they must sell it at that Government price, their margin of profit does not pay for the trouble they have in getting cars, looking after the shipment and carrying the account on their books. Sev-

eral leading scrap brokers say they would be just as well off, if it were not for their desire to keep their organizations intact, to close their offices for the next three or four months, and take a good vacation. The trouble in getting cars is getting worse and they are disgusted at the treatment they are receiving from the railroads. Even when the war order number is given, railroads often refuse to furnish cars, and dealers have to go back several times, and then do not get the order. The Carnegie Steel Co. bought last week upward of 15,000 tons of heavy steel scrap for delivery to Munhall, and the Sharon Steel Hoop Co. bought 7000 to 8000 tons, all this at the official $30 per ton. There has been an advance, in re-rolling rails, heavy steel scrap, low phos melting scrap and in all grades of sheet scrap. Last week re-rolling rails sold here as low as $34 and $35, but yesterday a sale of 1000 tons was made at $38 delivered, netting about $37.50 to the seller. Local scrap dealers deny reports that they have tried to sell scrap at higher than the Government prices.

Rerolling rails should have been quoted $34 to $35 last week. Dealers quote for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$29.00 to $30.00
No. 1 foundry cast	27.00 to 28.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	36.00 to 37.00
Hydraulic compressed sheet scrap	24.00 to 25.00
Bundled sheet scrap, sides and ends, f.o.b. consumer's mill, Pittsburgh district	22.00 to 23.00
Bundled sheet stamping scrap	20.00 to 22.00
No. 1 railroad malleable stock	26.00 to 27.00
Railroad grate bars	18.00 to 19.00
Low phosphorus melting stock	39.00 to 40.00
Iron car axles	42.00 to 43.00
Steel car axles	43.00 to 44.00
Locomotive axles, steel	50.00 to 51.00
No. 1 busheling scrap	24.00 to 25.00
Machine shop turnings	18.00 to 19.00
Cast-iron wheels	32.00 to 33.00
Rolled steel wheels	34.00 to 35.00
*Sheet bar crop ends	34.00 to 35.00
Cast-iron borings	18.00 to 19.00
No. 1 railroad wrought scrap	35.00 to 36.00
Heavy steel axle turnings	23.00 to 24.00
Heavy breakable cast scrap	24.00 to 25.00

*Shipping point.

Chicago

CHICAGO, Nov. 26.

Governmental demands are steadily absorbing mill capacity at a rate that augurs ill for those engaged in non-essential manufacture. Already one local independent mill is setting aside 70 per cent of its ingot production for war needs, and the tide shows no abatement. Examples of the business which is filling the mills are 8800 and 1000 tons of plates and shapes for the Submarine Boat Corporation, 5100 tons of the same materials for the American Shipbuilding Co. and 4000 tons of blue annealed sheets. Meanwhile one or two Eastern mills are making reasonably prompt deliveries of plates, shapes and bars at the fixed prices. One mill accepted 2000 tons of hard steel reinforcing bars for the first half, out of 10,000 tons offered, and another producer has also been taking bar business. Sheets are extremely active, both for export and domestic use. The base price fixed for light rails—$60 per net ton—is regarded as liberal. Fear that a shortage greater than now exists may come in pig iron has caused consumers to buy actively for first-half delivery and some few consumers are looking ahead to the last half. A sale of 20,000 tons of basic is reported for first-half delivery. Some charcoal iron, the makers of which fear they may not have enough to supply their regular customers, has been sold for last-half delivery at the Government price. Old material has been more active, and here again a shortage threatens, it being feared that the demand will be greater than the supply. One result is that prices are higher in many directions.

Pig Iron.—Consumers of pig iron have been buying actively as a result of their fear that there may be a shortage of iron. Some heavy purchases have been made for delivery in the first half of 1918, and in one instance a melter wants 1000 tons for delivery in the last half. Last-half inquiry, however, is the exception. A Kewanee foundry has closed for at least 4400 tons, and there have been many sales of lots running 1000 tons and smaller. A Central Illinois consumer recently closed for 20,000 tons of basic, first half delivery. The producers have not much iron to offer for delivery this year, although a little is being sold. A Southern producer can place a limited amount, analyzing 2.25 and over silicon; and small lots running 1.75 to 2.25 silicon have been placed for prompt delivery. The Northern furnaces have no prompt iron to offer. One unusual source of demand is from furnaces which are behind in their production and would buy iron to apply against their commitments, standard Bessemer and basic being in special demand for this purpose. It appears that need may arise for some readjustment of the commission which furnaces are paying for the sale of their iron, the selling agents being of the opinion that their services are not sufficiently compensated. With the makers of charcoal iron the demand is as active as ever, and they are turning business away every day. One maker is doubtful as to his ability to meet the demands of his regular trade up to July 1, 1918. He has had inquiries for last half, and another has made several sales into that period at existing Government prices. Meanwhile production is about normal, and shipments are heavy. In all grades of iron Government prices prevail. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 2 to 5	$37.50
Lake Superior charcoal, No. 6 and Scotch	40.00
Northern coke foundry, No. 1	33.50
Northern coke foundry, No. 2	33.00
Northern coke foundry, No. 3	32.50
Northern high-phosphorus foundry	33.00
Southern coke No. 1 foundry and 1 soft	38.50
Southern coke No. 2 foundry	37.00
Malleable Bessemer	33.50
Basic	33.00
Low-phosphorus (copper free)	53.00
Silvery, 7 per cent	44.54

Ferroalloys.—Despite some reports to the contrary, $250 appears to be the minimum for 80 per cent ferromanganese, that being the price quoted by the leading sellers. Considerable business has been done in the Ohio district. Bessemer ferrosilicon, 10 to 12 per cent, is very scarce, and the outlook is for a greater scarcity, owing to the probability that another Jackson County furnace will have to be blown out. The official prices are $55 for 10 per cent; $58.30 for 11 per cent, and $61.60 for 12 per cent, all furnace.

Plates.—Fairly prompt deliveries are being made by an Eastern producer at 3.25c., mill, it being understood that the buyer pays the freight to consuming point, but Western makers are not yet factors in the market. Meanwhile the Government is steadily placing business with local mills. One requirement of the Government which will be supplied by the leading independent calls for 8800 tons of material, chiefly plates, for the Submarine Boat Corporation, which also placed Saturday last an order with the same company for 1000 tons of plates and shapes which are wanted in a hurry. The same maker will supply 5100 tons of plates and shapes to the American Shipbuilding Co., delivery at Cleveland, to be completed by next March. Orders of this kind, coming one after the other, make it dubious how the industrial consumer will fare.

For material out of warehouse the quotation is 4.45c.

Structural Material.—Beyond occasional sales by an Eastern producer at 3c. very little is stirring in shapes, except for Government purposes, as noted in the foregoing plate paragraph. The producers have little to sell, not only because of their commitments and the demand of the Government, but also because considerable of their capacity is diverted to the manufacture of shell steel. Only one structural letting is reported this week—430 tons for a Chicago school building to the Duffin Iron Co. The Union Pacific has placed some cars, including 1000 gondolas, with the Pullman Co. An Eastern maker received an order also. The Govern-

ment is buying small cars for trench use in France, but these take very little steel.

For material out of warehouse the quotation is 4.20c.

Bars.—This product is not nearly so much in demand for war purposes as are plates and shapes. Both mild and hard steel bars have been sold in the past week on the basis of 2.90c., Pittsburgh, principally by Eastern makers. One mill booked 2000 tons of concrete reinforcing bars for first half delivery, and could have taken 10,000 tons just as easily, but mill conditions stood in the way. With the Western makers, rail-carbon bars are quiescent, pending the fixing of an official price. Recent sales were made close to 3.50c., Chicago. Common iron bars are held at the Government maximum of 3.50c., Chicago.

We quote warehouse prices for Chicago delivery as follows: Soft steel bars, 4.10c.; bar iron, 4.10c.; reinforcing bars, 4.10c.; base, with 5c. extra for twisting sizes ½ in. and over and usual card extras for smaller sizes; shafting, list plus 10 per cent.

Sheets.—The demand for sheets at the Government prices recently fixed has assumed immense proportions, coming from the Government, domestic consumers and exporters. The Government alloted 4000 tons of blue annealed sheets last Saturday. Government mill prices follow: No. 28 black sheets 5c.; No. 10 blue annealed, 4.25c., and No. 28 galvanized, 6.25c., all Pittsburgh base.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 5.45c.; No. 28 black, 6.45c.; and No. 28 galvanized, 7.70c.

Cast-Iron Pipe.—Winnipeg, Man., will Dec. 3 take bids a second time on the 4500 tons for which it made inquiry several weeks ago, but did not buy for the reason that prices exceeded estimates. Quotations are unchanged.

Quotations per net ton, Chicago, are as follows: Water pipe, 4-in., $58.50; 6-in. and larger, $55.50, with $1 extra for Class A water pipe and gas pipe.

Old Material.—The demand has been active, some interests asserting that it is larger than the supply, and statements that a real scarcity of scrap is approaching are general. The leading interest bought another lot of melting steel, paying $28, instead of $29 as it did in the last two purchases. A considerable quantity of busheling also has been purchased. Speculative operations of scrap brokers are greatly curtailed by limiting prices, and it has been suggested that they be compensated on a commission basis, but this has yet to be worked out, if it comes at all. A list of the Rock Island is being closed to-day, and the trade also has under consideration one from the C., B & Q. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Old iron rails	$36.50 to $37.50
Relaying rails	50.00 to 55.00
Old carwheels	30.00 to 31.00
Old steel rails, rerolling	35.00 to 36.00
Old steel rails, less than 3 ft	33.50 to 34.50
Heavy melting steel scrap	28.00 to 29.00
Frogs, switches and guards, cut apart	28.00 to 29.00
Shoveling steel	27.00 to 28.00
Steel axle turnings	22.00 to 23.00
Per Net Ton	
Iron angles and splice bars	$36.00 to $37.00
Iron arch bars and transoms	37.00 to 38.00
Steel angle bars	26.00 to 27.00
Iron car axles	45.00 to 46.00
Steel car axles	41.00 to 42.00
No. 1 railroad wrought	31.00 to 31.25
No. 2 railroad wrought	28.50 to 29.50
Cut forge	28.50 to 29.00
Pipes and flues	22.00 to 23.00
No. 1 busheling	23.00 to 24.00
No. 2 busheling	16.50 to 17.00
Steel knuckles and couplers	31.00 to 32.00
Coil springs	37.50 to 38.50
No. 1 boilers, cut to sheets and rings	19.00 to 20.00
Boiler punchings	31.50 to 32.50
Locomotive tires, smooth	33.00 to 34.00
Machine-shop turnings	16.00 to 17.00
Cast borings	16.00 to 17.00
No. 1 cast scrap	23.50 to 24.50
Stove plate and light cast scrap	18.00 to 19.00
Grate bars	17.00 to 18.00
Brake shoes	19.50 to 21.00
Railroad malleable	27.00 to 28.00
Agricultural malleable	23.25 to 24.25
Country mixed scrap	18.00 to 19.00

Bolts and Nuts.—Specifications are heavy and there has been much contracting for delivery next year on the part of the railroads, aggricultural implement makers and others. The Submarine Boat Corporation wants 1500 tons of rivets for 1918. For prices and freight rates see finished iron and steel, Pittsburgh, page 1323. Store prices are as yet unchanged. They follow:

Store prices are as follows: Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to ⅜ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to ⅜ x 6 in., 40-2½; larger sizes, 30-5; hot pressed nuts, square, $2, and hexagon $2 off per 100 lb.; lag screws, 50 per cent off.

Wire Products.—Business is good at the recently established Government levels. We quote as follows per 100 lb. to jobbers:

Nails, $3.50, Pittsburgh; plain fence wire, $3.25; painted barb wire, $3.65; galvanized barb wire, $4.35; polished staples, $3.65, and galvanized staples, $4.35.

Rails and Track Supplies.—Inquiries for track fastenings have been more active. The prices officially fixed for light rails, the base being 3c. per pound, or $60 per net ton, for 25 to 45 lb. in carload lots, are regarded as liberal. We quote:

Standard railroad spikes, 4.50c. to 5c., base; small spikes, 4.75c. to 5.50c., base; track bolts with square nuts, 5.50c. to 6c., all in carloads, Chicago; tie plates, $70 to $80 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38; base (nominal); open hearth, $40 (nominal). For prices of light rails see finished iron and steel, Pittsburgh, page 1323.

Buffalo

BUFFALO, Nov. 26.

Pig Iron.—Demand is heavy and exceeds production. All classes of consumers are trying to buy, and inquiry is coming in from users in other districts outside of territory naturally tributary to Buffalo district furnaces, endeavoring to secure placement here. Melters everywhere appear to be seeking new sources of supply because their regular sources have been subjected to curtailed output on account of restricted fuel resources. One of the large producers of the district reports taking on 9000 tons of No. 2 plain and malleable for second and third quarter delivery, to go to old customers exclusively, but the sales of other producers are much smaller in the aggregate. One furnace interest was able to accommodate only old customer trade to the extent of 1000 tons out of urgent inquiry for over 5000 tons from that class of buyers. In addition it had large inquiry from other users who had never before approached it for placement of orders. Inability to obtain early delivery of coke has handicapped furnacemen very seriously, and it is understood that six furnaces tributary to this market are out of blast because of coke shortage. Foundry coke, however, is reported as a little easier as regards delivery. All sales made are at Government prices. We continue to quote as follows, f.o.b. furnace, Buffalo:

No. 1 foundry	$34.50
No. 2 X	33.50
No. 3 foundry	32.50
Gray forge	32.00
Malleable	33.50
Basic	33.00
Lake Superior charcoal, f.o.b. Buffalo	39.75

Finished Iron and Steel.—Sales agencies report a good deal of inquiry is coming in for all classes of finished products, both from domestic and Canadian sources; but that they are still unable to take on very much tonnage, aside from war material. Demand for wire products has been heavy, with considerable placed for galvanized and barbed wire in Canada. Consumers of tin plate in this territory and in Canada have placed contracts for the first six months of 1918, mills having opened their books for a tonnage equal to the amount that they had supplied during the first six months of 1917. The Donner Steel Co. of this city has its new 14-in. merchant mill nearly ready to put into operation, and it is expected it will be started up about Dec. 1.

Old Material.—Large inquiry is reported for all commodities in scrap materials, and a tendency toward a hardening of prices is noted in consequence; particularly for heavy melting steel, of which there appears to be a growing scarcity, steel turnings, cast borings, old car wheels and No. 1 railroad cast scrap. As a sequence to the heavy demand for and growing scarcity of heavy melting steel, other grades of scrap steel, such as heavy axle turnings, hydraulic com-

pressed No. 1 busheling scrap, etc., are coming more prominently into the market, with an upward trend in price. The increasing demand for heavy melting steel and allied commodities is attributable to a considerable extent to the efforts being put forth by dealers who have old contracts which must be completed prior to Jan. 1 to secure and ship necessary unfilled tonnages before that date. Shipments are still very much impeded by the gondola car stringency. We quote dealers' asking prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$29.00 to $30.00
Low phosphorus	36.00 to 38.00
No. 1 railroad wrought	34.00 to 35.00
No. 1 railroad and machinery cast	27.00 to 28.00
Iron axles	45.00
Steel axles	45.00
Carwheels	30.00 to 31.00
Railroad malleable	28.00 to 29.00
Machine shop turnings	18.00 to 18.50
Heavy axle turnings	25.00 to 26.00
Clean cast borings	19.00 to 20.00
Iron rails	37.00 to 38.00
Locomotive grate bars	20.00 to 21.00
Stove plate	20.00 to 21.00
Wrought pipe	26.00 to 27.00
No. 1 busheling scrap	25.00 to 26.00
No. 2 busheling scrap	17.00 to 18.00
Bundled sheet stamping scrap	19.00 to 20.00

Cincinnati

CINCINNATI, Nov. 27.—(*By Wire.*)

Pig Iron.—Basic iron is in good demand. A St. Louis firm purchased approximately 20,000 tons for first half shipment, about 25 per cent of this iron to be shipped by a Southern producer and the remainder from Chicago territory. A Southern Ohio mill is asking for prices on 10,000 tons for shipment over the next 90 days, and is expected to close a contract before the end of the week, if the iron can be located. Foundry iron for first half shipment is wanted by a large number of melters, and sales are easily made when the iron can be found. There was never before as much difficulty in formulating mixtures due to the scarcity of No. 2 foundry and the substitution of No. 3. There is a shortage of high silicon iron for nearby shipment. Only one furnace in the Virginia field is now selling any iron in this territory. There is a much better supply in the South, if off grades are taken into consideration, but even this available iron is growing scarcer. Since the Government's price adjustments went into effect, melters are no longer concerned about quotations, but are worried about finding the kind of iron wanted and at a point taking the best freight rate. Local melters have bought Southern foundry iron in medium sized lots, and stocks on hand will not likely run low enough during the coming months to cause any shutdowns, but the uncertain coke supply may bring about this action on the part of more than one foundry operator. Southern Ohio foundry iron is practically unobtainable for any shipment, and the Ohio silvery irons occupy the same place. All furnaces in that district are behind in shipments on their old contracts. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, prices as follows:

Southern coke, No. 2 foundry and 2 soft	$35.90
Southern Ohio coke, No. 2	34.26
Basic, Northern	34.26

(*By Mail*)

Finished Material.—Information as to the jobbers' prices has now reached the trade, and orders are coming in again at a satisfactory rate. A prominent wholesale house is authority for the statement that, while orders are smaller than usual, the number received is surprisingly large for this time of the year. Practically no special line is affected, and there is a general demand for all kinds of finished material. The new schedule on twisted steel bars in now fully understood and is considered a very fair one by the sellers, as the differential in price between the smaller and larger sizes has been fixed and conforms with costs. We quote plain steel and iron bars at 4.08c. and twisted steel bars as follows: ¾ x 1¼-in., 4.23c.; ⅝-in., 4.33c.; ½-in., 4.43c.; ⅜-in., 4.63c., and ¼-in., 4.88c. Structural shapes are hard to obtain, and the jobbers' price is 4.18c.; plates ¼-in. and heavier, 4.43c.; cold rolled shafting from stock is 10 per cent above list, and No. 10 blue annealed sheets is quoted at 5.45c. We quote flat-head rivets at 5.50c. and cone-head rivets at 5.60c. The nearby rolling mills quote sheets as follows: No. 10 blue annealed, 4.18½c.; No. 28 black, 5.18½c., and No. 28 galvanized, 6.43½c., all f.o.b. Cincinnati or Newport, Ky. The jobbers' price on nails has stiffened somewhat, and they are now quoted at $4.10 to $4.20 per keg base.

Coke.—Quite a large number of contracts for foundry coke have been made for first half shipment and also some for the last half of next year. Practically all of this coke is bought from Connellsville producers, with the exception of a few sales that are still being made by Wise County operators. The Government's price of $7 per net ton at oven rules in all cases, and late contracts made do not carry any proviso for readjustment later on. Furnace coke is not being sold, as the supply is very limited. Shipments of both furnace and foundry coke show little improvement, due to the short car supply.

Old Material.—Shipments to Pittsburgh territory represent a hard problem to solve. On account of the freight congestion there, permits have to be obtained, and as a consequence of the red tape necessary comparatively few shipments are going forward. Under these conditions, dealers are slow in adding to their stocks, and this has also tended to hold prices on certain grades of scrap down to the present figures named, as dealers claim they are depending largely on the demand from nearby customers whose relative consumption of scrap is limited. The following are dealers' prices f.o.b. cars, southern Ohio and Cincinnati:

Per Gross Ton

Bundled sheet scrap	$17.50 to $18.00
Old iron rails	32.00 to 32.50
Relaying rails, 50 lb. and up	44.00 to 44.50
Rerolling steel rails	33.00 to 33.50
Heavy melting steel scrap	25.00 to 25.50
Steel rails for melting	24.50 to 25.00
Old carwheels	27.00 to 27.50

Per Net Ton

No. 1 railroad wrought	$29.00 to $29.50
Cast borings	13.00 to 13.50
Steel turnings	13.00 to 13.50
Railroad cast	18.50 to 19.00
No. 1 machinery cast	24.50 to 25.00
Burnt scrap	13.00 to 13.50
Iron axles	40.00 to 40.50
Locomotive tires (smooth inside)	33.50 to 34.00
Pipes and flues	15.50 to 16.00
Malleable cast	19.50 to 20.00
Railroad tank and sheet	14.50 to 15.00

Philadelphia

PHILADELPHIA, Nov. 27.

Pig iron sales offices in Philadelphia were fairly beseiged this week with inquiries, mostly by telephone, for iron. There were many demands for prompt shipment iron, but contracts were made well into next year as well. A number of orders for third quarter delivery were accepted. The largest inquiry in the market was from the National Enameling & Stamping Co., St. Louis, which had been unable to satisfy its need of 25,000 tons of basic in other markets, and had come here. An eastern Pennsylvania structural mill also sent out an inquiry for 5000 tons of basic iron for April-May delivery. While inquiry for steel-making iron was the most insistent, there was also a very active demand from foundrymen. Consumers all seem to have realized at the same time that a shortage of pig iron is certain. Unless a remedy is soon found for the difficulties which handicap furnace production and shipments, it is expected that the country will experience this winter the worst pig iron shortage it has ever known. Little is being done in finished steel aside from Government orders. Bar iron producers have revised contracts so that unfilled tonnages will be delivered at the new price of 3.50c., Pittsburgh. The old material market is still upset as a result of price fixing.

Pig Iron.—There is scarcely a blast furnace in this district that has been working at full capacity during this month, and producers and consumers alike have come to a realization that there will be a most serious shortage of pig iron throughout the winter unless a remedy is speedily found for the troublesome coke situation. Railroad embargoes are also complicating mat-

ters. Southern furnaces have been under an embargo for several days and are far behind on contracts. There is also an embargo on Virginia railroads which prevents shipments of iron except to consumers who have war contracts. Congestion of freight is yet another factor in the iron shortage, as shipments are on the road a much longer time than under more normal conditions. With these conditions preventing production and delivery of iron, consumers have been caught short and have come into the market for a sufficient supply to help them out. Sales offices here have sold every available ton of iron, and in a number of instances have been notified by the furnaces to make no further commitments for nearby delivery. Manufacturers who have war contracts are clamoring for iron and are insisting that the Government assist them in getting it. Some of these consumers had not contracted for iron ahead, but had depended on Washington to obtain a supply for them when it was needed. This adds to the troubles of furnaces in making deliveries on contracts, and the consumer with iron contracted for frequently does not get each month's quota on schedule because of the interference of priority orders. Pig iron men here are discussing the possibility of the Government assuming more drastic control over pig iron to insure a full supply to all concerns engaged on war work. Such Government control would undoubtedly mean pooling of orders and the distribution of priority orders to furnaces regardless of the contracts already on their books. Some believe that the pig iron trade will be permitted to work out the situation without such Government control, but they admit that the deliveries to consumers who have no war contracts must suffer delays and possible curtailment. A factor which has disturbed pig iron producers is the tendency of consumers to use a Government order number to obtain more iron than is really needed on the Government work. Steps are being taken so that such priority shipments will cover only the iron actually needed on the Government job, with no surplus for the consumer's civilian work. Word has reached here that the Canadian Government has established an embargo on shipment of pig iron except to British possessions. This will probably interfere with shipments of low phosphorus iron to the United States. Several cars were held up at the border when the order was issued, but were later released. A permit system, similar to that in this country, will probably be adopted. One of the large inquiries for iron this week was for 25,000 tons of basic wanted by the National Enameling & Stamping Co., St. Louis. An eastern Pennsylvania structural mill inquired for 5000 tons of basic for April-May delivery. There were a number of other large inquiries in the market, many of which will not be satisfied. The American Bridge Co. and the Alan Wood Iron & Steel Co. were looking for more basic iron. All of the subsidiaries of the United States Steel Corporation are in great need of iron. Selling this week has included several contracts for delivery in the third quarter of 1918. We quote the following standard grades at furnace, the freight to destination to be added:

Eastern Pennsylvania No. 1 X	$34.50
Eastern Pennsylvania No. 2 X	33.50
Eastern Pennsylvania No. 2 foundry	33.00
Virginia No. 2 X	33.50
Virginia No. 2 foundry	33.00
Basic	33.00
Gray forge	32.00
Bessemer	36.30
Standard low phosphorus	53.00
Low phosphorus (copper bearing)	50.00

Coke.—Shipments of coke show no improvement despite efforts of the Fuel Administration to remedy the situation. Blast furnaces are working at only partial capacity and the quality of the coke is such that a great deal of off iron is being produced. Coke contracts for next year are being freely made by two leading Eastern sellers, but only customers who have been on their books in the past are receiving consideration. It is said here that efforts of the Fuel Administration to solve the coke problem by the pooling of orders will not be successful, if attempted, because of the varying requirements of iron producers. Under such an arrangement, it is pointed out, furnaces would not be assured of obtaining the grade of coke they must have to produce standard grades of iron. Spot coke is not to be had. One sales office here reports that it has not sold a carload of coke in two months.

Ferroalloys.—There is a better inquiry for ferromanganese. The nominal quotation is $250 per ton for any delivery, but this is being shaded, in some instances as low as $240 having been quoted on good sized orders. There is an inquiry in the market for 600 tons, and a leading seller said that this would probably be placed at a price somewhere between $240 and $250. A report that a large tonnage was sold at $225 to the Government probably arose from the fact that a producer, from patriotic motives, put in a bid at that price, but the bid was received too late and the Government order was placed at $249. Two large contracts for the Central West are said to have been placed in this market recently. An Eastern steel company has sent out an inquiry for 5000 tons of 10, 11 and 12 per cent ferrosilicon for delivery throughout 1918. Spiegeleisen is weaker and is now being freely quoted at $60, furnace.

Billets and Slabs.—The Bethlehem Steel Co. has sent out an inquiry for a large tonnage of slabs for its Sparrows Point, Md., 110-in. plate mill, which was recently placed in operation. The company has no slab mill and has been using ingots for rolling plates ½ in. and thicker. The slabs are required for plates of ¼ to ½ in. The demand for billets and slabs is active. Discarded forging billets have been sold by steel companies in a number of instances at the fixed price for rerolling billets, $47.50, Pittsburgh.

Sheet Bars.—Production of merchant sheet bars has been decreased, owing to the fact that a number of companies are using their sheet bar rolls for rolling shell bars. Some of the sheet manufacturers have been so crowded with shell bar contracts that they have not rolled sufficient quantities of sheet bars for their own use. The Bethlehem Steel Co. came into the market a few days ago for 5000 tons of sheet bars. It is difficult to find mills with sheet bars to offer.

Sheets.—Since the fixing of prices for sheets, there has been an active demand. A leading Ohio manufacturer has sold almost up to its capacity for first quarter. A few producers are said to be accepting orders for second quarter. We quote No. 10 blue annealed at 4.25c., Pittsburgh; No. 28 black at 5c. and No. 28 galvanized at 6.25c.

Structural Material.—Structural mills continue to receive liberal specifications from the Government for merchant ships. There is very little building inquiry in the market aside from Government work. Regardless of the ability of mills to accept their orders, builders probably feel that their chances of obtaining deliveries, in view of the gradual elimination of all non-Government work from the railroads, would be doubtful. Among the Government projects for which bids have been submitted by fabricators are three buildings at the Washington Navy Yard, totaling about 1200 tons, and eight buildings at the Hog Island shipyard of the American International Shipbuilding Corporation, totaling about 2000 tons. The Pennsylvania Railroad requires 200 tons for a bridge and 300 tons for a roundhouse in Philadelphia. We quote shapes from mill at 3c., Pittsburgh, and from warehouse at 4.185c., Philadelphia.

Plates.—Eastern plate producers are greatly disturbed over the action of the Government in placing orders for shipment of ship plates to the West, with Chicago as a basing point instead of Pittsburgh. A large Eastern mill refused to accept a Government order for 1500 tons on this basis, but from patriotic motives reversed its decision and will ship the material. Some of the plate producers say that at the price-fixing conferences in Washington they did not agree to accept Chicago as a basing point. Manufacturers of plates here contend that if Chicago is to be accepted as a basing point, the Government should place its Western orders with mills in the Chicago district. The question of the propriety of plate mills exacting a charge of 50c. per 100 lb. for plates for

prompt delivery, as has been done in this market, has been discussed in Washington. A large Eastern producer, which has been selling plates on this basis, defends the practice, maintaining that such a charge is as legitimate under the agreed schedule of prices as it is for a mill to own its warehouse and charge the recognized warehouse extras. Most of the mills in this district have sold some plates from stock recently, and in nearly all cases a charge for service has been made. In some instances this extra has been $10 per ton. An Eastern Pennsylvania mill, which had a limited tonnage of universal plates for early delivery, has sold all that it cares to take and has withdrawn from the market. Sheared plates for non-Government work are to be obtained only from one or two mills in this district. We quote mill prices on plates at 3.25c., Pittsburgh, and from warehouse 4.435c., Philadelphia.

Iron and Steel Bars.—At the meeting held in New York recently to discuss fixed prices on bar iron no definite decision was reached as to whether the 3.50c. price should be f.o.b. mill or f.o.b. Pittsburgh, according to bar iron sellers here. In the announcement issued by the committee of the American Iron and Steel Institute this phrase was used: "Usual and customary extras for size, quantity, etc., and established custom as regards delivery points to govern." The established custom of bar iron mills in Eastern Pennsylvania is to sell f.o.b. mill when competing with mills in the Pittsburgh district, but on business in the Philadelphia or New York districts the usual custom has been to sell on a Pittsburgh base. Whatever the intention of the committee, the mills have construed the price-fixing agreement as giving them the right to sell on a Pittsburgh base at all times, and this custom now generally prevails. The bar iron makers have in most cases revised prices of unfilled tonnages on all contracts to the 3.50c. base. The same has been done on bolts and rivets. New demand for bar iron and its allied products continues active, the shipbuilding industry absorbing a large part of present mill output. The American International Shipbuilding Corporation has been distributing large orders for bolts for its new shop buildings. The situation as to steel bars remains practically unchanged. Most of the mills are not taking on new business in soft steel bars, though one mill has sold fairly good lots of high carbon bars in this district. This demand for concrete reinforcing bars continues active. We quote bar iron at 3.685 c., Philadelphia, and steel bars at 2.90c., Pittsburgh.

Old Material.—The old material market is in somewhat of a turmoil owing to conditions growing out of the fixing of prices by the Government on four major classifications. A growing certainty is that jobbers and brokers must be content with smaller profits than they have been accustomed to make. Large producers of scrap will undoubtedly be more inclined to sell direct in order to realize the highest possible price for their material, while even the small dealers show an inclination to hold out for prices within such close range of the fixed maximums that very little margin is left for the jobber or broker. Steel mills have not shown a disposition to pay the top prices which some sellers are asking, and as a result scrap is not moving as freely as might be expected in view of the great scarcity of pig iron. As the highest prices are obtainable in the Pittsburgh district, local dealers prefer to sell there, and the offers which nearby Pennsylvania mills have made are not attracting large tonnages. The congested condition of railroad transportation adds to the difficulties of trading. In the past week there has been an embargo on shipments into Pittsburgh, due to the congestion of terminals there. This may be lifted at any time, but will undoubtedly be renewed whenever traffic bcomes too great for the railroads to handle, as may now happen frequently. A few violations of the fixed price agreement are unofficially reported. A bar iron mill is said to have been called to task for paying more than the $35 price for No. 1 railroad wrought, and a certain railroad is accused of accepting more than the fixed price for some of its scrap. Some of the violations, however, are "within the law;" that is, they are not technically violations, but the effect is the same. As a dealer remarked, "There are many ways to 'beat the game' if one wants to do so." The iron and steel scrap committee of the American Iron and Steel Institute and the American Board of Scrap Dealers are keeping a close watch on the situation, and it is said that persistent violations will be dangerous for the violators. We quote for delivery at consuming points in the Philadelphia district as follows:

No. 1 heavy melting steel	$27.00 to $28.00
Steel rails, rerolling	38.00 to 40.00
Low phosphorus heavy melting	36.00 to 38.00
Old iron rails	38.00 to 40.00
Old carwheels	33.00 to 35.00
No. 1 railroad wrought	35.00
No. 1 yard wrought	32.00 to 32.50
No. 1 forge fire	22.00 to 23.00
Bundled sheets	22.00 to 23.00
No. 2 busheling	15.50 to 16.50
Steel turnings (for blast furnace use)	15.50 to 16.50
Machine shop turnings (for rolling mill use)	18.00 to 19.00
Cast borings (for blast furnace use)	15.50 to 16.00
Cast borings (clean)	20.00
No. 1 cast	31.00 to 33.00
Grate bars	21.50 to 22.50
Stove plate	22.00 to 23.00
Railroad malleable	30.00 to 32.00
Wrought iron and soft steel pipes and tubes (new specifications)	30.00 to 32.50

British Steel Market

Price Readjustments Unsettle Pig-Iron Market—Tin Plates Firmer

(*By Cable*)

LONDON, ENGLAND, Nov. 28.

The pig-iron market is unsettled pending official adjustment of prices. The stringency in hematite iron continues. Quotations on American wire rods are widely divergent, from £24 upward c.i.f. having been asked, but the business reported has been at lower figures, presumably on cheap government freight. Tin plates are firmer at 31s., including tin allowance. Ferromanganese is quiet. We quote as follows:

Tin plates, coke, 14 x 20; 112 sheets, 108 lb., f.o.b. Wales, 31s.
Ferromanganese, £45 nominal.
Ferrosilicon, 50 per cent, c.i.f., £35 upward.
On other products control prices are as quoted in THE IRON AGE of July 19, p. 171.

St. Louis

ST. LOUIS, Nov. 26.

Pig Iron.—Inquiries for pig iron continue to multiply in this market, but the inability of producers tc meet demands continues, though there was some relieving of the strain during the past week by a few of the furnaces represented in St. Louis. This applied chiefly to second quarter requirements and considerable tonnage was booked, among them one for 2000 tons of No. 2 Southern foundry and one of 1000 tons of No. 2 Northern foundry. There were also some sales of No. 3 Southern. Quite a considerable number of small orders for No. 2 Southern ranging downward from 200 tons to carload lots were placed and accepted, the aggregate for the market being about 5000 tons. Inquiries now outstanding include one for 2000 tons of malleable, one for 1500 tons of malleable and one for 12,000 tons of northern basic. The situation seems to be improving and readjusting itself to the Governmental needs and while the prices are fixed the activity over placing of orders is becoming more brisk as furnaces find that they can squeeze in a little more business for specific datings. A very large tonnage, however, remains unplaced, as consumers needs cannot be met by the furnaces.

Coke.—Greater activity in coke was reported during the week with a considerable number of sales in tonnages ranging from 600 tons downward. Inquiries for about 5000 tons are still in the market unfilled owing to conditions prevailing at the ovens. No representatives of ovens are taking any new business, their orders being to confine themselves to old customers until these are all taken care of to the best of the ability of the

producers. By-product coke continues out of the market.

Finished Iron and Steel.—In finished products, light rails are reported slightly easier at 3c. mill base and deliveries are reported better, with the result that business is being sought. Announcement is also made that about two-thirds of the standard section steel rail contracts which it was sought to be turned over from Bessemer to open-hearth with an addition to the price have been amended to meet the situation in order to assure to the buyers deliveries at earlier periods than otherwise would have been possible. The added sum is $2 per ton. In other finished products, no consideration beyond the regular routine is being shown customers except those having government orders and in this division stove companies having contracts for field kitchens are getting needed material promptly. Movement out of warehouse continues up to capacity and for stock out of warehouse we quote as follows: Soft steel bars, 4.17c.; iron bars, 4.17c.; structural material, 4.27c.; tank plates, 4.52c.; No. 8 sheets, 5.47c.; No. 10 blue annealed sheets, 5.52c.; No. 28 black sheets, cold rolled, one pass, 6.52c.; No. 28 galvanized sheets, black sheet gage, 7.77c.

Old Material.—In scrap material, conditions have measurably readjusted themselves to the Government's fixed prices, though the complete settling down of the trade has not yet been accomplished. Dealers are still endeavoring to get their contracts into the clear and are doing some trading among themselves, but there is no buying of moment being done by consumers, save in one instance in which one of the heaviest consumers in this market has closed for its needs for 90 days under prices based on the Government figures but allowing for variations from the Government specifications. Consumers' yards generally are low in scrap iron supplies, but purchasing agents are out of the market awaiting a completion of the readjustments under way as a result of the Government's action. One list came out during the week, 600 tons from the St. Joseph and Grand Island, mostly rails. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district as follows:

Per Gross Ton	
Old iron rails	$35.00 to $35.50
Old steel rails, re-rolling	36.00 to 37.00
Old steel rails, less than 3 feet	37.00 to 37.50
Relaying rails, standard section, subject to inspection	60.00 to 75.00
Old carwheels	28.50 to 29.00
No. 1 railroad heavy melting steel scrap	27.00 to 27.50
Heavy shoveling steel	26.00 to 26.50
Ordinary shoveling steel	25.00 to 25.50
Frogs, switches and guards cut apart	28.00 to 28.50
Ordinary bundled sheet scrap	19.00 to 19.50
Heavy axle and tire turnings	19.00 to 19 50

Per Net Ton	
Iron angle bars	$34.50 to $35.00
Steel angle bars	27.00 to 27.50
Iron car axles	43.50 to 44.00
Steel car axles	41.00 to 41.50
Wrought arc bars and transoms	42.00 to 42.50
No. 1 railroad wrought	31.00 to 31.50
No. 2 railroad wrought	29.50 to 30.00
Railroad springs	32.50 to 33.00
Steel couplers and knuckles	29.50 to 30.00
Locomotive tires, 42 in. and over, smooth inside	31.50 to 32.00
No. 1 dealers' forge	21.75 to 22.25
Cast iron borings	15.50 to 16.00
No. 1 busheling	23.00 to 23.50
No. 1 boilers, cut to sheets and rings	20.00 to 20.50
No. 1 railroad cast scrap	23.50 to 24.00
Stove plate and light cast scrap	17.00 to 17.50
Railroad malleable	25.50 to 26.00
Agricultural malleable	21.50 to 22.00
Pipes and flues	21.00 to 21.50
Heavy railroad sheet and tank scrap	19.50 to 20.00
Railroad grate bars	18.00 to 18.50
Machine shop turnings	16.00 to 16.50
Country mixed scrap	18.50 to 19.00
Uncut mixed railroad scrap	21.00 to 21.50

Cleveland

CLEVELAND, Nov. 27.

Iron Ore.—It is expected that ore prices prevailing this year, which were approved by the Government at the time of the first price agreement late in September, will not be changed next season with the exception of a possible slight advance to cover any increase in the costs of mining operations and transportation. In the past few months the cost per ton has increased 22½c., of which 10c. is for labor, 8c. for rail haul from the mines, and 4.50c. for war tax on freight charges. Some reservations of special grades of ore have already been made for next season. Shipments have continued heavy until the past day or two, but now cold weather is causing a slackening in the movement. The supply of boats is plentiful. Lake shipments will be kept up well into December or as long as weather conditions permit. It is expected that sufficient ore will be brought down to cover the minimum requirements of practically all the consumers. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, $5.95; old range non-Bessemer, $5.20; Mesaba Bessemer, $5.70; Mesaba non-Bessemer, $5.05.

Pig Iron.—The demand for pig iron has increased and the market is very active in both foundry and basic grades. The danger of an acute shortage, particularly in foundry iron, is growing more serious. Most of the sellers in this territory have booked about all the tonnage they dare to take on for the first half in view of the coal and coke shortage and the danger of a curtailment of their production. Some blast furnace plants are barely securing sufficient fuel to keep them running. Sellers are trying to supply their regular customers, but many consumers have not placed contracts for the first half and are having great trouble in finding furnaces that are willing to take their orders. In steel making iron a Northern Ohio consumer that recently bought about 5000 tons of basic for the second quarter secured about 5000 tons additional iron during the week and still wants 10,000 tons more for the same delivery. A Southern Ohio consumer is inquiring for 10,000 tons and a Valley interest for 3000 to 5000 tons, both of these inquiries being for December-January delivery. One leading Cleveland interest has no more basic iron to offer during the first half. Foundry iron inquiries range from small lots up to 2000 tons. The Government is inquiring for 600 tons in addition to 3300 tons placed last week for a Hamilton plant for the Emergency Fleet Corporation. The situation is doubtless aggravated somewhat by the fact that the higher prices for Southern iron have practically shut that iron out of the Ohio market, as consumers are unwilling to pay approximately $4 a ton more for Southern iron than for Northern. There is considerable inquiry for high silicon iron which is also very scarce for first half delivery. A Youngstown steel plant is in the market for 1000 tons per month of 9 to 10 per cent silvery iron for delivery through the entire year. We quote delivered Cleveland, as follows:

Bessemer	$37.25
Basic	33.30
Northern No. 2 foundry	33.30
Southern No. 2 foundry	37.00
Gray forge	32.30
Ohio silvery, 8 per cent silicon	46.12
Standard low phos., Valley furnace	50.00

Coke.—There is a great deal of inquiry for foundry coke and considerable business was placed during the week in contracts for the first half and entire year. Many consumers are having a great deal of trouble in securing a supply of coke and as a result sellers are receiving frequent inquiries from consumers whom they have not previously supplied. Owing to the scarcity, some foundries having Government contracts may find it necessary to appeal to the Government to secure them enough coke to keep their plants running. We quote coke at $6 per net ton at oven for furnace and $7 for foundry, standard Connellsville makes.

Finished Iron and Steel.—Consumers are inquiring for steel for their regular requirements outside of Government work for the first half and first quarter, and some of the mills are trying to take care of their regular trade as far as they can, subject to Government requirements. One independent mill is taking steel bar specifications for the first quarter, and another will take contracts for bars, plates and structural material for the first half and nails and wire for the first quarter. New inquiry for steel for Government work continues heavy. The thirty-six 3500-ton boats placed by the Emergency Fleet Corporation with the American Shipbuilding Co. will require approximately 50,000 tons of plates and structural material. These boats will be 251 ft. long, and the contract provides for their delivery during the year 1918. A Canton manufacturer is in-

quiring for 1200 tons of Bessemer bars for truck axle work. The automobile industry, as far as pleasure car production is concerned, continues to slow down, and this is indicated by a sharp falling off in specifications. Some automobile manufacturers are asking a suspension of deliveries on their contracts. One mill will probably consent to suspensions for a limited period. Some of the bolt, nut and rivet makers who have revised old contracts to meet the new Government prices are asking for readjustment of their steel contracts, but are not meeting with success. The demand for plates continues heavy, but mills that have been getting higher than the Government prices are finding it more difficult to make sales at their maximum price of 5c. There is a great deal of inquiry for sheet bar contracts for the first quarter. One quotation on slabs has been made at considerably higher than the Government price. Sheets continue in heavy demand, and at least one Valley producer is entirely sold up for first quarter. New requirements from the Government are also heavy. We quote sheets out of Cleveland warehouse at 5.35c. for No. 10 blue annealed, 6.35c. for No. 28 black and 7.60c. for galvanized. Jobbers are now taking orders, f.o.b. Cleveland warehouse, for shipments outside of Cleveland. This means that the price from Pittsburgh to Cleveland is added to the selling price. There is still some irregularity in warehouse prices for the Cleveland trade. We quote as minimum warehouse prices: Steel bars, 4c.; plates, 4.35c., and structural material, 4.10c., but jobbers are authorized under the Government regulations to quote 3½c. per 100 lb. higher than the above prices, and some are making the higher quotations. Mill extras except as to quantity differentials apply. Prices on hard steel bars continue to ease off, and the general quotation now is 3.25c. at mill.

Bolts, Nuts and Rivets.—The demand for bolts and nuts has improved now that Government prices have been fixed. Implement manufacturers, railroads, and jobbers are in the market. Contracts are being taken from consumers for the first half and from jobbers for the first quarter. Rivet manufacturers are covering their customers with first half contracts. In some cases old contracts for bolts, nuts and rivets have been readjusted at the Government prices. We quote rivets at 4.65c., Pittsburgh, for structural, and 4.75c. for boiler rivets.

Old Material.—There is a fair amount of trading between dealers, some of whom still have considerable high-priced tonnage due on old contracts and wish to complete shipments before Jan. 1 to avoid cancellations. The activity is almost wholly in heavy melting steel, borings and turnings. Prices are practically the same as a week ago. Dealers are paying $28.50 to $29 for heavy melting steel and are asking the Government price of $30 from the mills, but none of the latter are in the market. Sales of borings are reported at $19 gross delivered to outside mills. Owing to the fact that the Government has named maximum gross prices on such grades as are being regulated, trading in the Cleveland market on borings, turnings and railroad wrought, which has generally been on a net ton basis, is now being mostly done on a gross ton basis and quotations below have been changed to correspond with the practice. Cleveland scrap dealers have organized a division of the American Board of Scrap Iron Dealers, which will handle such matters as transportation, rejections and other problems, and have named A. Bialosky as temporary president. A permanent organization will be effected at a meeting this evening. We quote, f.o.b., Cleveland, as follows:

Per Gross Ton

Steel rails	$26.00 to $27.00
Steel rails, rerolling	36.00 to 37.00
Steel rails, under 3 ft.	30.00 to 31.00
Iron rails	35.00 to 36.00
Steel car axles	45.00 to 46.00
Heavy melting steel	28.00 to 29.00
Cast borings	18.00 to 18.40
Iron and steel turnings and drillings	18.25 to 18.75
No. 1 railroad wrought	34.00 to 35.00

Per Net Ton

Iron car axles	$44.00 to $45.00
No. 1 busheling	22.00 to 23.00
No. 1 cast	23.00 to 23.50
Railroad grate bars	17.25 to 17.75
Stove plate	17.25 to 17.75

New York

NEW YORK, Nov. 27.

Pig Iron.—Very fair activity has characterized the pig iron market during the past week. The demand has in fact been considerably stronger than the supply, and in some cases, notably that of a railroad which was trying to buy from a Virginia company, from which it had bought for years, necessary tonnage to cover requirements was not obtainable. A Buffalo steel company which sold freely for a week or so is now out of the market for the first half of next year and is so seriously embarrassed by coke shortage that it may not be able to keep up with its deliveries of pig iron. The fuel shortage is serious and numerous furnaces will carry over into the new year large tonnages which should be delivered this year. The delay in delivery is due almost entirely to coke shortage, although there has been some trouble in getting cars. The new rail and water rate of $5.75 on pig iron from Birmingham to New York became effective Nov. 25, being an advance of $1.50 over the rate of $4.25 which had prevailed. This advance has not excited much interest for the reason that no boats are obtainable except when specially chartered, and pig iron shippers are depending almost entirely on all-rail shipments, on which the rate from Birmingham to New York is $6.15. The rate to Boston is $6.40, all rail, and $6 rail and water. Some Southern furnaces whose iron analyzes 2.25 to 2.75 silicon for No. 2 foundry are quoting $33.50 furnace, as they are entitled to do, for the iron is equal to No. 2X, according to the nomenclature in vogue in the East. Others, however, continue to quote $33 straight. For early delivery we quote as follows, tidewater:

No. 1 X	$35.25
No. 2 X	34.25
No. 2 Plain	33.75
No. 2 Southern (rail and water)	38.75 to 39.25
No. 2 Southern (all rail)	39.15 to 39.65
No. 2 X Virginia	37.00 to 37.25

Ferroalloys.—The domestic ferromanganese market is fairly firm and active at $240 to $245, delivered. There have been sales of 100-ton and carload lots for prompt delivery which have aggregated a fair volume in the past week. There is very little contracting for next year thus far, consumers apparently buying what they need as they need it. The report last week of a sale of 750 tons to the Government at $225 delivered is unconfirmed, it being generally understood that the original sale at $249 stood. The spiegeleisen market is also active with inquiries from various sources and for different deliveries amounting to 3500 to 4000 tons. The quotation for the 20 per cent grade is from $57 to $60 per ton, furnace, for delivery this year or first quarter. There have been no large sales. The market for 50 per cent ferrosilicon is strong at $140 to $150 per ton for delivery next year and $160 to $175 is the range for prompt and December.

Finished Iron and Steel.—No great volume of business is moving. Plates are sold at the fixed price to domestic consumers, but for indirect Government use, such as apparatus for plants on Government work. The mills as a whole are finding no great pressure for the sheared material. The volume of fabricated steel work in November will hardly equal the total for October. Bar iron producers are holding that the fixed price of 3.50c. is on a Pittsburgh basis and not a general mill price. Considerable contracting for the first quarter of 1918 has been done on this basis. Bar iron manufacturers are still complaining that the price is too low, and the case of one mill may be noted which is refusing to sell at the new price, planning instead, if it cannot get business at its own price, 4c. and over, to quit rolling the sizes involved. The feeling in these circles is that with the large spread between steel bars and iron bars, steel bars have also got to be advanced and, of course, along with them plates and shapes. Reports continue that steel is delivered in advance of needs at shipyards, but ultimately it is believed that storage of material to a greater or less extent will be necessary to provide for the especially high rate of shipbuilding likely to occur in the latter part of 1918—a rate prob-

ably larger than the plate producing rate. Railroad terminal congestion is interfering seriously with the receipt of materials and the shipping of finished factory products. Meanwhile, railroad equipment buying is of no larger proportions, nor is anything expected from this quarter in the near future. A large new fabricated steel job, likely to be closed soon, covers 6000 tons for the E. W. Bliss Co., Brooklyn. Some foundry extensions at the Washington Navy Yard, on which bids have been taken, involve 1600 tons. At Lake Denmark 10 buildings for the Government will take 425 tons. The New York State Barge Canal is to provide a pier terminal at Coenties Slip, New York, taking 450 tons, and an addition for the Eighth Coast Artillery Armory, New York, calls for 300 tons. Some miscellaneous bridge work, including steel castings, for the Pennsylvania Railroad, totals 270 tons. Of contracts awarded mention may be made of 1900 tons for a plate and angle shop at the Hog Island shipyard, to the McClintic-Marshall Co.; 950 tons for eight buildings at Hog Island to the Belmont Iron Works; 475 tons for the New York Central at Tonawanda, to the Phoenix Bridge Co., and 1000 tons, in addition to similar work for export, for an airplane storage building, Brooklyn, to the Samuel Austin Co. Some railroad bridge work has also been closed, including 250 tons for the Chesapeake & Ohio, and 450 tons for two bridges for the New York Central. It appears that the buildings at Langley Field, requiring some 2000 tons and given to the American Bridge Co. and Lewis F. Shoemaker & Co., are not to be built. The only sizable railroad car purchases noted are 1000 gondolas for the Union Pacific, awarded to the Cambria Steel Co., and 1000 hopper cars for the same road to the Pullman Co. We quote mill shipments of steel bars at 3.095c., New York; shapes 3.195c., plates 3.445c. and bar iron, the price established last week, at 3.695c., New York. Out of store prices are 1c. higher and to all must be added 3 per cent of the freight charge or about 20c. per 100 lb. for the transportation tax.

Old Material.—Much dissatisfaction continues to prevail in the scrap market, especially on the part of brokers, who say that dealers are asking within 50c. of the price at which brokers must sell material on which the Government has fixed prices. Brokers declare they cannot carry on business on this basis. As a result very little is being done on heavy melting steel, No. 1 railroad wrought and borings and turnings. There have been no further developments in regard to price fixing and the attitude of the Government is uncertain. There is fair demand for machinery cast and prices on it are somewhat higher. We quote prices of brokers as follows to New York producers and dealers, per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$24.00 to $24.50
Old steel rails (short lengths) or equivalent heavy steel scrap	24.00 to 25.00
Relaying rails	45.00 to 50.00
Rerolling rails	35.00 to 36.00
Iron and steel car axles	41.00 to 42.00
No. 1 railroad wrought	32.00 to 33.00
Wrought-iron track scrap	27.00 to 28.00
No. 1 yard wrought long	27.00 to 28.00
Light iron	7.00 to 8.00
Cast borings (clean)	16.00 to 17.00
Machine-shop turnings	14.00 to 15.00
Mixed borings and turnings	13.00 to 14.00
Wrought-iron pipe (1 in. minimum diameter), not under 2 ft. long	25.00 to 26.00

Dealers in New York City and Brooklyn are quoting as follows to local foundries, per gross ton, but for delivery to cupola platforms of Brooklyn foundries about $3 more is quoted:

No. 1 machinery cast	$26.00 to $27.00
No. 1 heavy cast (column, building materials, etc.)	21.00 to 22.00
No. 2 cast (radiators, cast boilers, etc.)	21.00 to 22.00
Stove plate	19.00 to 20.00
Locomotive grate bars	16.00 to 17.00
Malleable cast (railroad)	27.00 to 28.00
Old carwheels	27.00 to 28.00

Cast-Iron Pipe.—No action has yet been taken by the Government in regard to the 2000 tons of pipe for shipment to France, on which bids were recently received. There is much uncertainty as to the attitude of the Government in regard to prices and this is causing a feeling of hesitancy in the market. New York quotations continue at $56.50 for 6-in. and heavier and $59.50 for 4-in.

IRON AND INDUSTRIAL STOCKS

Better Feeling on Wall Street—Numerous Advances Recorded

NEW YORK, Nov. 28.

A distinctly better tone prevailed in the stock market last week and advances all along the line were recorded, especially in leading iron and steel shares. This change in feeling was generally attributed to the growing conviction on the part of the public that stocks are too low, regardless of how long the war may be prolonged and what temporary reverses may come. The announcement of a radical change in policy in regard to railroads has not yet caused any excitement on the Stock Exchange, although no one can figure what the effect on earnings will be. The general disposition is to credit the railroad men and Government officials with a spirit of fairness in dividing earnings equitably.

Baldwin Locomotive was one of the very few stocks recording losses last week. It declined 1⅞ points, while among the shares which recorded gains were the following: American Can, com., 3½; American Car & Foundry, pref., 4⅞; American Locomotive, com., 3; American Steel Foundries, 3⅛; Bethlehem Steel, 2⅛; Bethlehem Steel, class B, 2⅝; Colorado Fuel & Iron, 3½; Crucible Steel, com., 3; General Electric 1¼; Gulf States Steel, 5¾; Lackawanna Steel, 7¾; Midvale Steel, 1½; National Acme, 1; Nova Scotia Steel & Coal, 15; Pressed Steel Car, com., 4½; Republic Iron & Steel, com., 8⅛; Sloss-Sheffield, 4¼; Superior Steel, 4; U. S. Cast Iron Pipe & Foundry, com., 1⅞; U. S. Steel, com., 5; U. S. Steel, pref., 2.

The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week has been as follows:

Allis-Chalm. com.	18 - 19¼	Int. Har. Corp. com.	53 - 54¾
Allis-Chalm. pf.	72	Int. Har. Corp. pf.	97¼
Am. Can com.	34½ - 37¾	Lack. Steel.	76¾ - 82⅛
Am. Can pf.	93 - 96½	Lake Sup. Corp.	11 - 12⅜
Am. Car & Fdry. com.	63⅝ - 66¾	Midvale Steel	43½ - 45⅛
Am. Loco. com.	54 - 56	Nat.-Acme.	26½
Am. Rad. com.	260	Nat. En. & Stm. com.	36¾ - 38¾
Am. Rad. pf.	133	N. Y. Air Brake.	110 - 114
Am. Ship com.	88 - 92	Nova Scotia St.	62⅞ - 66
Am. Ship pf.	87⅝ - 89½	Pressed St. com.	56 - 56¾
Am. Steel Fdries.	55 - 58	Pressed St. pf.	94
Bald. Loco. com.	54 - 58⅝	Ry. Steel Spring com.	40½ - 45
Beth. Steel com.	81⅝ - 83¼	Republic com.	72⅞ - 80¾
Beth. St., Cl. B.	80⅞ - 83⅞	Republic pf.	94 - 95½
Case (J. I.) pf.	78	Sloss com.	36½ - 39½
Cent. Fdry. com.	24½ - 31½	Superior Steel.	33⅝ - 38⅜
Cent. Fdry. pf.	36 - 43	Transue-Wms.	39
Chic. Pneu. Tool.	47 - 49	Un. Alloy Steel.	36¾ - 37¾
Colo. Fuel	33¼ - 36¼	U. S. Pipe com.	11⅝ - 12½
Crucible St. com.	55⅛ - 57¼	U. S. Pipe pf.	47 - 47½
Crucible St. pf.	88	U. S. Steel com.	95⅜ - 99⅛
Deere & Co. pf.	95 - 96	U. S. Steel pf.	108¾ - 111
Gen. Electric	128 - 134¼	Va. I. C. & Coke.	50½ - 52½
Gt. No. Ore. Cert.	25½ - 28⅛	Warwick	8½ - 8⅝
Gulf States Steel.	86¼ - 89	Westingh. Elec.	38⅜ - 39⅞
Int. Har. of N. J. com.	105½ - 108½		

Industrial Finances

The Republic Rubber Co., Youngstown, Ohio, will very shortly issue $3,000,000 more of preferred stock. Payments for the stock subscribed for must be made on or before March 1, 1918.

The Lewis Foundry & Machine Co., Groveton, near Pittsburgh, manufacturer of machinery and parts, has increased its capital from $200,000 to $1,000,000.

The National Steel Products Co., Birmingham, Ala., has increased its capital from $33,340 to $80,340.

For several years, the affairs of the Carter Iron Co., formerly operating a puddling plant at Paden City, W. Va., and the Monongahela Iron & Steel Co., operating a puddling and bar iron plant at Hays Station, near Pittsburgh, were in the hands of receivers. This receivership has been terminated, and a new company organized, known as the Vulcan Iron & Steel Co., which is now operating the plant at Paden City, which contains 24 puddling furnaces and other equipment for the manufacture of low phosphorus melting bar, the capacity, when running full, being 750 to 1000 tons per month. This product is sold largely to makers of high speed and tool steels. The plant of the Monongahela Iron & Steel Co., at Hays Station, continues to be operated under that name, and contains 14 puddling

furnaces and other equipment, the output being muck bar, low phosphorus melting bar, and stay-holt iron, also a limited quantity of wrought iron chain, the capacity of the plant on all these products being about 500 tons per month. The Vulcan Iron & Steel Co., and the Monongahela Iron & Steel Co. are identified interests, having general offices in the Union Bank Bldg., Pittsburgh. Robert Locke is president, and George B. Meanor, Jr., is secretary and treasurer.

Dividends

The Baldwin Locomotive Works, 3½ per cent on the preferred, payable Jan. 1.

The Bethlehem Steel Co., quarterly, 2½ per cent on the common "A" and 2½ per cent on class B, payable Jan. 2.

The J. I. Case Threshing Machine Co., quarterly, 1¾ per cent on the preferred, payable Jan. 1.

The Central Foundry Co., quarterly, 1¼ per cent on the preferred and 2 per cent on the first preferred, both payable Jan. 15.

The Lackawanna Steel Co., quarterly, 1½ per cent on the common and extra 3½ per cent, payable Dec. 31.

The Moline Plow Co., quarterly, 1¾ per cent on the first preferred, payable Dec. 1.

The National Enameling & Stamping Co., quarterly, 1¾ per cent on the preferred, payable Dec. 31.

The Railway Steel Spring Co., quarterly, 1¼ per cent on the common, payable Dec. 29, and 1¾ per cent on the preferred, payable Dec. 20.

The United States Cast Iron Pipe & Foundry Co., quarterly, 1¼ per cent on the preferred, payable March 15.

OBITUARY

LYMAN B. JEWELL, until his retirement a few months age, president of the Jewell Belting Co., Hartford, Conn., died at his home in that city Nov. 20, at the age of 90 years. He was born in Winchester, N. H., in 1827, and from 1856 to 1873 was engaged in the dry goods commission business in New York and Boston. In the latter year he became a member of the firm of P. Jewell & Sons, founded by his father, Pliny Jewell. He was treasurer of the Detroit Leather Co. and a director in the Phoenix Insurance Co., the Southern New England Telephone Co. and the American National Bank.

GRANT BARNEY SCHLEY, head of the brokerage firm of Moore & Schley, New York, died Nov. 21. Mr. Schley was a director of the American Smelting & Refining Co., the Republic Iron & Steel Co., the Pittsburgh Coal Co., the Northern Pacific Railway Co., the Electric Storage Battery Co. and other large companies. He was 73 years old and had not taken an active part in business for several years.

EMERY H. DIEHL, assistant general manager of the United Alloy Steel Corporation, Canton, Ohio, died Nov. 20 after a short illness, age 33 years. He was graduated from the Pennsylvania State College in 1906 and was connected for a time with the Carnegie Steel Co., which he left four years ago to become associated with the Canton plant.

R. B. DANGELEISEN, age 31, sales manager of the Globe Machine & Stamping Co., Cleveland, died at Saranac Lake, N. Y., Nov. 12. He entered the employ of the company in 1902 and, because of his efficiency and executive ability, was advanced rapidly and deservingly to the position which he held at the time of his death.

Fishel & Marks, Cleveland, dealers in iron and steel scrap, have purchased a two-story building opposite their scrap yard at 3013 East Fifty-fifth Street, which will be used for offices. Extensive improvements have been made in the yard, including the installation of two electro-magnet cranes, 70-ton capacity each, and several new shears. The yard has an Erie Railroad siding capable of holding 14 cars at a time.

Completed in six and one-half months, a 90-in. plate mill, which has a capacity of about 125,000 tons a year, has just been placed in operation at the South Chicago works of the Illinois Steel Co.

FABRICATORS' WAR MEETING

Permanent War Organization Empowered to Distribute Tonnage and Cover Employment Matters

PITTSBURGH, Nov. 27.—The fabricating interests of the country at a meeting held at the William Penn Hotel to-day took measures to have the industry represented by a specially appointed organization in dealings with the Government. Some 76 concerns, with about 100 individuals, representing bridge and building fabricators and also steel plate fabricators, were present. They voted approval of collective dealing as a means for getting better and quicker results in relations with the Emergency Fleet Corporation or any other Government agency which may desire to enter into negotiation. The plan is that the fabricators agree formally to the institution of the war service committee, announced in THE IRON AGE of Nov. 8, and bestow the following rights on the committee: The distribution of tonnage for given Government work, as for ships; the making of contracts in that connection; the control of employment matters, and adjustment of details of construction.

To provide for the plan, the meeting voted the establishment of a permanent war organization for the period of the war, to which it gave the name, the Steel Fabricators of the United States. C. E. Michael, president Virginia Bridge & Iron Co., Roanoke, was made permanent chairman, and Lewis D. Rights, Lewis F. Shoemaker & Co., New York, was made permanent secretary. They were made ex-officio president and secretary-treasurer, respectively of the collective dealing organization. As an executive committee of this was appointed the war service committee mentioned in THE IRON AGE of Nov. 8, together with George P. Bard, Petroleum Iron Works, Sharon, Pa., who was later added as a representative of the plate fabricators, to be supplemented by four others to be recommended by the permanent chairman. Since the meeting the permanent chairman has made the appointments as follows: Paul Willis, Kenwood Bridge Co., Chicago; William S. Simpson, Jr., Christopher & Simpson Co., St. Louis; W. A. Garrigues, Levering & Garrigues Co., New York, and E. A. Gilbert, Standard Boiler & Plate Iron Co., Niles, Ohio.

Prices of By-Product Coke in Chicago District

Never in the history of Chicago sellers of coke has buying been so heavy as at the present time. Buyers are eager to contract into next year, while prompt coke is almost impossible to find, despite the fact that some consumers are begging for it, in consequence of which representative sellers are pointing out that long ago they advised the same consumers to cover their future needs.

Quotations at Chicago for by-product coke are $8.65, ovens, for furnace coke; $9.15, ovens, for crushed coke, and $9.65 for foundry coke. In accordance with the stipulation in the Government's price announcement, quotations are now made f.o.b. producing ovens, instead of delivered at the consuming point. The freight from the Connellsville region, $2.65, is added to the official oven price, to which the consumer must add the freight to his plant.

The F. H. Linthicum Bronze Foundry, Baltimore, Md., has been formed, with F. H. Linthicum, who for the past two years has been sales manager for the American Manganese Bronze Co., Philadelphia, and for the past seven years has held positions of superintendent and assistant manager in several large foundries, as proprietor. W. C. Lilly, who will be superintendent after Dec. 1, was for four years superintendent of the Nelson Valve Co. and more recently has been superintendent for the American Manganese Bronze Co. The new company will specialize in small duplicate castings, and has capacity for castings as large as 500 lb. each.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on iron and steel articles, aside from wrought iron and steel pipe in carloads, per 100 lb., New York, 19.5c.; Philadelphia, 18.5c.; Boston, 21.5c.; Buffalo, 11.6c.; Cleveland, 13.5c.; Cincinnati, 18.5c.; Indianapolis, 20c.; Chicago, 21.5c.; St. Louis, 27c.; Kansas City, 47c.; minimum carload, 36,000 lb.; St. Paul, 35.5c.; minimum carload, 36,000 lb.; Denver, 79c.; minimum carload, 36,000 lb.; Omaha, 47c.; minimum carload, 36,000 lb.; New Orleans, 30.7c.; Birmingham, 46c.; Pacific Coast, 75c.; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is 90c.; minimum carload, 40,000 lb. and 85c.; minimum carload, 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 40c. per 100 lb., minimum carload 46,000 lb.; to Omaha 40c., minimum carload 46,000 lb.; to St. Paul 35.5c., minimum carload 46,000 lb.; Denver 79c., minimum carload 46,000 lb. *A 3 per cent transportation tax now applies.*

Structural Material

1-beams, 3 to 15 in.; channels, 3 to 15 in. angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 3c.

Wire Products

Wire nails, $3.50 base per keg; galvanized, 1-in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1-in., $2.50. Bright basic wire, $3.35 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.25; galvanized wire, $3.95; galvanized barb wire, and fence staples, $4.35; painted barb wire, $3.65; polished fence staples, $3.65; cement-coated nails, $3.40 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 47 per cent off list for carload lots, 46 per cent for 1000-rod lots, and 45 per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large rivets	$4.65 base
7.15 in. x 6 in. smaller and shorter rivets	45-10 per cent off list
Machine bolts h.p. nuts, ⅜ in. x 4 in.	
Smaller and shorter, rolled threads	50-10-5 per cent off list
Cut threads	50-5 per cent off list
Larger and longer sizes	40-10 per cent off list
Machine bolts, c.p.c. and t nuts, ⅜ in. x 4 in.	
Smaller and shorter	40-10 per cent off list
Larger and longer	35-5 per cent off list
Carriage bolts, ⅜ in. x 5 in.	
Smaller and shorter, rolled threads	50-5 per cent off list
Cut threads	40-10-5 per cent off list
Larger and longer sizes	40 per cent off list
Lag bolts	50-10 per cent off list
Plow bolts, Nos. 1, 2, 3	50 per cent off list
Hot pressed nuts, sq. blank	2.50c. per lb. off list
Hot pressed nuts, hex., blank	2.30c. per lb. off list
Hot pressed nuts, sq., tapped	2.30c. per lb. off list
Hot pressed nuts, hex., tapped	2.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank	2.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped	2.00c. per lb. off list
Semi-finished hex. nuts.	
⅝ in. and larger	60-10-10 per cent off list
9/16 in. and smaller	70-5 per cent off list
Stove bolts	70-10 per cent off list
Stove bolts	2½ per cent extra for bulk
Tire bolts	50-10-5 per cent off list

The above discounts are from present lists now in effect. All prices carry standard extras.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $57; chain rods, $65; screw, rivet and bolt rods and other rods of that character, $65. A tentative differential of $10 per ton over soft rods for high carbon rods has been agreed upon.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $5 to $5.50; ¾ in., 7/16 in. and ½ in., $7.00 base. Boat spikes, $5.25 per 100 lb., f.o.b. Pittsburgh. Track bolts with square nuts, 7c. to 7.50c. to railroads, and 8c. to 8.50c. in small lots for fairly prompt shipment.

Terne Plate

Effective Nov. 7, prices on all sizes of terne plates are as follows: 8-lb. coating, 200 lb., $15 per package; 8-lb. coating, I. C., $15.30; 12-lb. coating, I. C., $16.75; 15-lb. coating, I. C., $17.75; 20-lb. coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.90c. for delivery late this year, and 4.50c. to 5c. from warehouse in small lots for prompt shipment. Refined iron bars, 3.50c. in carload and larger lots f.o.b. mill.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card, as announced Nov. 5 by the Government on steel pipe, those on iron pipe being the same as quoted for some time:

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛, ¼ and ⅜	44	17½	⅛ and ¼	23	+4
½	48	33½	⅜	24	+3
¾ to 3	51	37½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	44	31½	1¼	18	3
2½ to 6	47	34½	1½	25	11
7 to 12	44	30½	2	26	12
13 and 14	34½	..	2½ to 6	28	15
15	32	..	7 to 12	25	12

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	40	22½	⅛, ¼ and ⅜	22	5
½	45	32½	½	27	14
¾ to 1½	49	36½	¾ to 1½	33	18
2 to 3	50	37½			

Lap Weld, extra strong, plain ends

2	42	30½	1¼	19	4
2½ to 4	45	33½	½	25	11
4½ to 6	44	32½	2	27	14
7 to 8	40	26½	2½ to 4	29	17
9 to 12	35	21½	4½ to 6	28	16
			7 to 8	20	8
			9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots f.o.b. Pittsburgh, announced Nov. 13, as agreed upon by manufacturers and the Government:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.	34	3½ to 4½ in.	12½
2½ to 3¼ in.	24	3 to 3½ in.	+ 5
2¼ in.	17½	2½ to 2¾ in.	+ 7½
1¾ to 2 in.	13	2 to 2¼ in.	+22½
		1¾ to 1⅞ in.	+35

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton		Per Net Ton	
1 in.	$340	1¾ in.	$220
1¼ in.	280	2 to 2½ in.	190
1⅜ in.	270	2¾ to 3¾ in.	180
1½ in.	220	4 in.	200
		4½ to 5 in.	220

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net or 2 per cent discount in 10 days.

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer	*Cents per lb.*
Nos. 3 to 8	4.20
Nos. 9 and 10	4.25
Nos. 11 and 12	4.30
Nos. 13 and 14	4.35
Nos. 15 and 16	4.45
Box Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21	4.80
Nos. 22 and 24	4.85
Nos. 25 and 26	4.90
No. 27	4.95
No. 28	5.00
No. 29	5.05
No. 30	5.15
Galvanized Black Sheet Gage—Bessemer	
Nos. 10 and 11	5.25
Nos. 12 and 14	5.35
Nos. 15 and 16	5.50
Nos. 17 to 21	5.65
Nos. 22 and 24	5.80
Nos. 25 and 26	5.95
No. 27	6.10
No. 28	6.25
No. 29	6.50
No. 30	6.75
Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16	4.80
Nos. 17 to 21	4.85
Nos. 22 to 24	4.90
Nos. 25 and 27	4.95
No. 28	5.00
No. 29	5.05
No. 30	5.05
Nos. 30½ and 31	5.10

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
Nov.	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
21	23.50*	23.50*	78.50*	6.50	6.37½	8.00	7.75
22	23.50*	23.50*	80.00*	6.50	6.37½	8.00	7.75
23	23.50*	23.50*	80.00*	6.50	6.37½	8.00	7.75
24	23.50*	23.50*	....	6.50	6.37½	8.00	7.75
26	23.50*	23.50*	80.00*	6.50	6.37½	8.00	7.75
27	23.50*	23.50*	80.00*	6.50	6.37½	8.00	7.75

*Nominal.

NEW YORK, Nov. 28.

The markets are all inactive. Copper is an absolutely controlled commodity and nominal at the Government price. Tin is unobtainable for spot delivery and is nominal at higher prices. Lead is very quiet but firm. Spelter is dull but no weaker. Antimony is a little stronger.

New York

Copper.—Sales of copper to large buyers for November-December delivery from producers at any price are practically impossible and we continue to quote the Government price of 23.50c. as nominal. The only interesting news is the official announcement that jobbers are permitted to sell copper in small lots at a 5 per cent profit above the Government price. This refers to metal bought at that price. The announcement has been variously interpreted: By some that they can sell their present stocks at a 5 per cent profit; by others that, no matter what they paid for it, it can be sold only at 23.50c. plus 5 per cent, or 24.675c. per lb. At any rate this part of the market is more active with metal in small lots selling at 27c. to 28c., New York. Under regulation by the Copper Producers' Committee sales of large lots are being made at 23.50c. for delivery in the first quarter to the general trade, with the understanding that those buying the metal for commercial needs must give it up if the Government requires it. Copper is also being delivered for prompt use at 23.50c. if the consumer has Government business. The entire situation apparently is working out satisfactorily.

Tin.—The week has been an eventful one. Official announcement was made to the trade late last week that the American Iron and Steel Institute would act for the War Industries Board so as to completely control the tin market. All imports and distribution will be regulated by this organization, in a manner similar to that now effective with the British Consul. All consignments will be made to the Institute instead of to the consul. The entire situation will, however, be under more stringent control than in the recent past. The new arrangement is not effective yet as some details are still to be worked out. It is expected it will be in working order soon. A pamphlet has been issued giving the rules to be complied with by those desiring to do business. The spot market is unrelieved with no immediate prospect of betterment. Spot tin is unobtainable with 80c. bid all this week but no sellers. Under the circumstances no business is possible. It is reported that the Government has commandeered all tin in bonded warehouses and perhaps in others. After its needs are supplied the metal remaining will be released to the owners. Arrivals to Nov. 27, inclusive, were 1310 tons, with 4100 tons reported afloat. Spot Straits in London yesterday was £284 per ton, an advance in the week of £4½.

Lead.—The market is unchanged at the price levels of last week of 6.50c., New York, and 6.37½c., St. Louis, for the outside market, with the leading producer still quoting 6.25c., New York. Demand is light, with very little business recorded. The market is a drifting one, but its tone is firm. Some import business has been done in bond at 6c., New York.

Spelter.—There has been very little change in the market in the last week. It still lacks life. Somewhat better demand is reported from the galvanizing interests, to whom some metal has been sold. The quotation is unchanged at 7.75c., St. Louis, or 8c., New York, for prime Western for early delivery or even for delivery through January. There are still a few sellers willing to shade these prices. Very little is heard of the negotiations of the new Zinc Committee with the Government or the fixing of prices.

Antimony.—The market is a little more active and higher at 14c. to 14.25c., New York, duty paid, for the brands available.

Aluminum.—There is no change and little demand. No. 1 virgin metal, 98 to 99 per cent pure, is quoted at 36c. to 38c. per lb., New York.

Old Metals.—The market is practically unchanged. Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible (nominal)	23.50
Copper, heavy and wire (nominal)	23.50
Copper, light and bottoms	21.00 to 22.00
Brass, heavy	17.25 to 17.50
Brass, light	12.00 to 12.50
Heavy machine composition	23.75 to 24.00
No. 1 yellow rod brass turnings	15.00 to 15.25
No. 1 red brass or composition turnings	19.00 to 19.50
Lead, heavy	6.00
Lead, tea	4.25
Zinc	6.00

Chicago

Nov. 26.—It is understood that the prices which the Government will approve for the resale of copper by dealers are 26c. for Lake and 25.87½c. for electrolytic. It was proposed that the dealers sell at 23.50c. plus 5 per cent, but they dissented vigorously, at least one important interest declaring that it would terminate its contracts and retire from the copper business if that basis became effective. Sales have been few, but a little copper has been sold at prices ranging from 26c. to 28c. Tin is higher and exceedingly scarce. Sellers have been informed that it is to be controlled by the Government through the American Iron and Steel Institute. Lead is fairly active, but presents no features of especial interest. Spelter is weaker. Antimony is a trifle stiffer. We quote as follows: Casting, Lake and electrolytic copper, 28c.; tin, carloads, 80c.; small lots, 85c.; lead, 6.25c. to 6.50c.; spelter, 7.75c. to 8c.; sheet zinc, 19c.; antimony, 15.50c. to 16c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 21c.; copper clips, 20c.; copper bottoms, 19c.; red brass, 19c.; yellow brass, 14.50c.; lead pipe, 5c.; zinc, 5c.; pewter, No. 1, 37.50c.; tinfoil, 45c.; block tin, 50c.

St. Louis

Nov. 26.—In non-ferrous metals a condition of quietude prevailed, but prices continued firm and in some divisions higher, particularly tin. On carload lots the quotations to-day for lead and spelter were: Lead, 6.50c.; spelter, 7.87½c. to 8c. In less than carload lots the quotations were: Lead, 7c.; spelter, 8.50c.; tin, 84c.; copper, nominal; Asiatic antimony, 18c. In the Joplin district there was a further weakening of low grade ores which sold down to $55 and below, but there was no change in the top grades, which sold as high as $72.50 on 60 per cent metal analysis basis. The average for the week for the district was $57 per ton. The top price is being paid for only a very small tonnage each week, and this renders the average very low. Lead ore remained unchanged during the week with the basis sales of 80 per cent metal at $75 per ton and the average at the same figure. Calamine ranged from $32 to $37 per ton, basis of 40 per cent metal, with the average for the district for the week at $35 per ton. We quote dealers' prices on miscellaneous scrap metals, buying, as follows: Light brass, 10c.; heavy yellow brass, 14c.; heavy red brass and light copper, 19.50c.; heavy copper and copper wire, 20c.; pewter, 25c.; tinfoil, 42c.; zinc, 5c.; lead, 5.50c.; tea lead, 5c.

The annual convention of the American Institute of Chemical Engineers will be held in St. Louis Dec. 5 to 8, inclusive, and the local branch of the organization has completed plans for the entertainment of the visitors on an elaborate scale.

Pittsburgh and Nearby Districts

Recently the Standard Car Construction Co., Sharon, Pa., made a shipment in one train load of 75 tank cars. This train load left its plant late on Nov. 10, and reached St. Louis on the morning of Nov. 14, which is remarkably fast time for freight shipment for this distance, when the present congestion in railroad movement is considered.

Members of the Engineers' Society of Western Pennsylvania, Pittsburgh, recently made a trip of inspection to the plant of the American Steel & Wire Co., at Donora, Pa. The open-hearth steel plant, rod and wire mills, and also the spelter plant were inspected. In addition, a visit was made to 100 concrete houses built by the American Steel & Wire Co., at Donora for employees. There are five different designs of these single and double houses. All are fitted with gas, fireplaces, electric light, complete baths and other conveniences. It is claimed that owing to their construction, these houses are heated with 10 per cent less coal than ordinarily used. The danger of fire is almost entirely eliminated, and the cost of maintenance is reduced to a minimum.

The Manufacturers' Light & Heat Co., Pittsburgh, supplier of natural gas, has notified the Public Service Commission that after Jan. 1, it will discontinue selling gas for manufacturing purposes. Early notice is given to allow manufacturers affected by this order time to install other heating appliances.

Referring to the recent meeting of the stockholders of the Carbon Steel Co., Pittsburgh, W. D. Updegraff, who was chairman of the stockholders' committee, has issued a statement as follows:

"The meeting was entirely harmonious; every action was unanimous. President McKnight announced that he would accept no further bonuses for a period of five years, and all future bonuses to be given to other employees or officers are referred to a committee consisting of W. H. Baker, Mr. Spear and myself. The present management and policies of the company will be continued."

The Liberty Carbon Co. has been organized at Clarksburg, W. Va., with a capital of $100,000 to manufacture carbon black.

Wm. B. Scaife & Sons Co., Pittsburgh, has applied for a Pennsylvania charter with a capital of $850,000. This concern formerly operated under a New Jersey charter. No changes have been made in the personnel of the company or in its products, which consist of steel structures of all kinds, bridges, coal tipples, also welded, riveted and brazed steel tanks for all purposes.

The Federal Sales Co., Pittsburgh, has been organized with a capital of $25,000 to deal in mill and builders' supplies.

The Keystone Bronze Co., Pittsburgh, has recently bought some property adjoining its plant in that city, on which it will probably build a large addition in the near future, but definite plans have not yet been made.

The Edgewater Steel Co., Pittsburgh, works at Oakmont, Pa., has recently bought a very heavy line of iron-working tools, to be installed in its plant for the manufacture of Government forgings.

The Pittsburgh Saw & Mfg. Co., a new interest, is now occupying its new plant in that city, and is prepared to manufacture a complete line of circular metal saw blades. The officials of the company are: J. G. Vilsack, president and treasurer; Charles Greer, vice-president and assistant treasurer; G. W. Agerter, secretary, and J. A. Carothers, manager. Mr. Agerter was formerly office manager of the Hunter Saw & Machine Co., Pittsburgh, and Mr. Carothers was superintendent of the same company.

The Virginia Chain Co. has been organized at Parkersburg, Va., with a capital of $40,000 to manufacture chain.

The foundry of the Bronzbraswyte Metal Co. is located at 4909-4911 Butler Street, Pittsburgh, the office of the company being located in 611 First National Bank Building, in that city. Thomas D. Maloney is president and Joseph F. Erny, secretary and treasurer. J. F. Leever is superintendent of the foundry. The concern manufactures bronzes, brasses and special metals and has facilities for making castings up to 3000 lb. in weight. Its equipment is modern, and the company specializes in the manufacture of mill bearings according to formula, and also on special mixes. The company has been very successful and recently increased its capacity about 100 per cent.

The Sidney Tool Co., Sidney, Ohio, has awarded a contract to the Concrete Steel Construction Co., Springfield, Ohio, for a 50 x 150-ft. machine shop. The company will be in the market for some machine tools.

The Aluminum Solder Mfg. Co., New Castle, Pa., has been organized with a capital of $25,000 to manufacture aluminum solder curtain stretchers. The incorporators are Andred Knittel, Frank E. Alborn, J. V. Cunningham, all of New Castle, Pa.

The Duke Motor Co., Pittsburgh, has been organized with a capital of $500,000 to manufacture automobiles and motor vehicles of all kinds. The company plans to build a new plant in the Pittsburgh district.

The new plant of the United States Electric Steel Co., at South Connellsville, Pa., is now in successful operation. The plant is equipped with one 10-ton Grönwall-Dixon electric furnace. The company buys its power from the West Penn Power Co. This power comes over a high transmission line and is stepped down to 220 volts. The company so far has made only electric steel ingots, which are sold to the general trade, but later on expects to add a finishing mill, for rolling either billets or sheet bars, or both. The company has also made a small quantity of pig iron in its electric furnaces from scrap, using coke for recarburizing, the product being pig iron running low in sulphur and phosphorus.

The Lewis Foundry & Machine Co., manufacturer of steel works and rolling mill machinery, works at Groveton, P. & L. E. Railroad, has opened an office in room 508 Farmers Bank Bldg., Pittsburgh. W. A. Herron, is president.

The Government has requested the Pittsburgh Commercial Club to co-operate with it in the Pittsburgh district in placing work with manufacturers. Ira C. Harper, president, has requested that manufacturers communicate at once with the club at its headquarters, 609 Penn Avenue, Pittsburgh. The appeal is made to all in a position to handle Government work on small tools and lathes. The Government has notified the club that it also needs about 30,000,000 small pressed-steel cups, drawings of which are on exhibition at the club's rooms.

The Crucible Steel Co. of America, Pittsburgh, has taken an order from the British Government for 150,000 6-in. shell forgings.

Furnace Limestone Taken for Camp Roads

In commenting on some of the troubles encountered by pig iron producers, the Matthew Addy Co., Cincinnati, says: "Production should be increased, and there are ample facilities in the country to turn out much more iron than is now being made. The problem is so to co-ordinate effort as to focus effort on the moving of raw materials needed for making iron. There is apparently so little team work in this direction that one furnace has been obliged temporarily to suspend operations because an army officer, or at least an army contractor armed with the right of eminent domain, so to speak, has commandeered the limestone which was going to this furnace to be used as flux, because it was needed in making roads in a cantonment. Perhaps the roads in the cantonment were a more vital necessity than the iron, but we have our doubts. Then, at the furnaces the same iron has been ordered shipped out by Government priority agents to several different manufacturers. There is a conflict of authority which is most confusing. Of course these problems will all be worked out in time. From the looks of things it would seem that each Government agent or contractor regards the particular job on which he is engaged as the most important, and he goes ahead without regard to the needs of other Government contractors."

PERSONAL

Guy D. Leopold, purchasing agent and traffic manager Edgewater Steel Co., Pittsburgh, has been elected president of the Purchasing Agents' Association of Pittsburgh. The other officers and directors elected are:



Guy D. Leopold

First vice-president, C. T. Stewart, Harbison-Walker Refts. Co.; Second vice-president, D. E. Ferguson, H. K. Porter Co., secretary, H. E. Harmon, Pittsburgh, Des Moines Steel Co., treasurer, C. W. Forcier, Mackintosh-Hemphill Co.

Directors: Robert McMillan, Pittsburgh Steel Co., W. E. Motherall, Standard Seamless Tube Co., Davis N. Glass, Booth & Flinn, C. W. Lepper, Pittsburgh Railways Co., W. A. Forrester, Westinghouse Air Brake Co., W. A. Kober, H. J. Heinz Co., E. H. Vockrodt, Frick & Lindsay Co., F. C. Bortz, Bessemer Coal & Coke Co., J. E. Stauffer, A. M. Byers Co., A. Davia, Dravo Contracting Co. Directors of the National Association elected are: Robert F. Blair, Pittsburgh Gage & Supply Co., and E. H. Ridgway, Colonial Steel Co.

Dan Lewis, formerly employed as salesman for the Seaman-Sleeth Co., Pittsburgh, manufacturer of rolls, and who resigned to accept a position as salesman for the Standard Engineering Co., Elwood City, Pa., has returned to the employ of the Pittsburgh Rolls Corporation, successor to the Seaman-Sleeth Co., and in the same capacity as before.

Dr. Edward Ewing Pratt, until recently chief of the Bureau of Foreign and Domestic Commerce at Washington, has been elected vice-president of the Pacific Commercial Company, 11 Broadway, New York.

Fred J. Miller, who for nine years past has been general manager of the factories of the Remington Typewriter Co., has resigned.

W. L. Schaeffer, for some years in the advertising department of the National Tube Co., Frick Building, Pittsburgh, will, on Dec. 1, succeed L. F. Hamilton, who has had charge of the advertising department, and who has resigned to connect himself in the same capacity with the Walworth Mfg. Co., Boston.

Dr. Raymond F. Bacon, director of the Mellon Institute of the University of Pittsburgh, will be commissioned a lieutenant-colonel in the Ordnance Department of the Army, and will be directed to take charge of the chemical work for our armies in France.

Russell G. Caldwell, formerly sales manager of the central department of the General Fireproofing Co., Youngstown, Ohio, has been transferred to the office of the company at Washington, D. C.

Dwight Smith, Mt. Gilead, Ohio, has been appointed secretary of the Chamber of Commerce, Middletown, Ohio, succeeding J. A. Finegan, who has retired on account of ill health.

Norton A. Booz has resigned as secretary of the Machinists' Supply Co. Chicago, to become general manager of the Machinists' Supply Co., Pittsburgh. The two companies are not connected. By the departure of Mr. Booz the Chicago Machinery Club loses its secretary and one who has been an unceasing worker for the firm establishment of Chicago's new luncheon club. He formerly lived in Reading, Pa.

Louis A. Freedman has been elected secretary of the Aeronautical Society of America, succeeding Edward Durant. Mr. Freedman is a mechanical engineer and has developed machinery for the production of dry batteries.

Wallace T. Roberts, who has been sales engineer for the Sullivan Machinery Co., Chicago, in southern Michigan, northern Indiana and northern Ohio has been appointed district manager for the company in Denver, Col. He succeeds Capt. Matt R. Blish, who has been acting manager since last May, but whose duties with the Ordnance Department, United States Army, now take him away. George W. Blackinton, who was manager in Denver up to last May, is now captain commanding the third battalion, 343d Infantry, National Army, Camp Funston, Kansas. The Sullivan Machinery Co. also announces that Joseph H. Brown assistant manager of its New York office, has been appointed district sales manager in Chicago, succeeding William P. J. Dinsmoor, who resigned to engage in business in Denver.

L. F. Hamilton, for several years advertising manager National Tube Co., Pittsburgh, has resigned to become manager of sales promotion of the Walworth Mfg. Co., Boston. Mr. Hamilton takes up his new duties Dec. 1.

C. P. Perin, of Perin & Marshall, New York, who has been in India for some months in connection with new construction at the works of the Tata Iron & Steel Co., Sakchi, Bengal, will probably remain in India until some time in 1919. T. W. Tutwiler, general manager of the company will leave India for the United States early in January and plans to be in this country a considerable part of next year. In the meantime Mr. Perin will have charge of operations at Sakchi.

Frank L. Estep has resigned as chief engineer of the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., and on Dec. 1 will become chief engineer of the Nova Scotia Steel & Coal Co. New Glasgow, Nova Scotia. He has been connected with the Tennessee company for the past eight years, first as assistant chief engineer, being promoted to his present position on the resignation of E. J. Best in 1912.

W. F. Trenary, Jr., has been appointed representative of the Harrison Safety Boiler Works at Birmingham, Ala., with headquarters at 419 Brown-Marx Building. He succeeds W. R. Jennison, who has terminated his connection with the company.

Bernard H. Prack will hereafter conduct under his own name the industrial architecture and engineering business of Prack & Perrine. Offices are located in the Keystone Building, Pittsburgh, and in the Lumsden Building, Toronto, Ont.

John H. Gledhill, for many years electrical engineer of the Baldwin Locomotive Works, Philadelphia, has resigned and will go into business for himself. He has been succeeded by F. W. Up de Graff.

The President has appointed Rear Admiral Frederick R. Harris, Corps of Civil Engineers, United States Navy, to succeed Rear Admiral Washington L. Capps as general manager of the Emergency Fleet Corporation. Admiral Harris has had no experience in shipbuilding, but he is an accomplished engineer who has handled many extensive projects, involving serious problems. For the past two years he has served as the chief of the Bureau of Yards and Docks and to-day is the youngest bureau chief and officer holding the rank of rear admiral in the navy, being but 40 years old. As chief of the Bureau of Yards and Docks, he is in control of all construction work of the navy on shore and the maintenance of all navy yards and naval stations.

J. H. Pardee, president, and J. P. Ripley, railway engineer, J. G. White Management Corporation, New York, are visiting the Philippine Islands, making a general inspection of the Manila Electric Railroad & Light Co. and other interests in the islands operated by the Management Corporation. They are expected to return to New York about Jan. 15.

The announcement is made by J. Frater Taylor of his intention to retire from the presidency of the Algoma Steel Corporation, Sault Ste. Marie, Ont., at the end of the present year. Mr. Taylor will still retain his association with the Soo industries in an advisory capacity as chairman of the Lake Superior Corporation. It is understood that W. C. Franz, now vice-president, will succeed Mr. Taylor as president of the Algoma Steel Corporation.

F. D. Walden has resigned as superintendent of the Giddings & Lewis Mfg. Co., Fond du Lac, Wis., manu-

facturer of lathes and other tools and sawmill and woodworking equipment. Employees presented Mr. Walden a watch.

George T. Fonda, safety engineer for the Bethlehem Steel Co., Bethlehem, Pa., has been appointed director of labor and safety for all plants of the company.

D. J. Murphy, formerly associated with the New York sales offices of the American Steel & Wire Co., has resigned to become manager of sales for the West Leechburg Steel Co., Pittsburgh, in charge of New York and New England territory, with headquarters at 50 Church Street, New York.

O. P. Blake, manager of sales at St. Louis for the Inland Steel Co., Chicago, has been transferred to Washington for the purpose of facilitating co-operation by his company with the Government. An office has been opened in the Wilkins Building.

Edward F. Goltra, president of the Mississippi Valley Iron Co., St. Louis, has been made a member of the committee of the Upper Mississippi River Improvement Association, which is to determine a feasible way to rehabilitate the river traffic. Mr. Goltra's interest in the movement has been accentuated by the recent successful transportation of iron ore from Minnesota fields to his blast furnace in St. Louis.

William T. Price has resigned as manager and chief engineer of the power department of the De La Vergne Machine Co. and has established the Price Engine Corporation, with headquarters at 110 West Fortieth Street, New York, to manufacture a crude oil engine of his own design.

John L. Haines, assistant to vice-president Willis L. King of the Jones & Laughlin Steel Co., Pittsburgh, who spent the summer at Kingston, Mass., in an effort to regain his health, has returned to his residence in the East End in Pittsburgh. His health does not show the improvement expected.

C. C. McBride of Pittsburgh has been elected treasurer and assistant secretary of the West Penn Power Co., offices at Connellsville, Pa. John Young succeeds Mr. McBride as auditor.

The Non-Essential Industry Problem

WASHINGTON, Nov. 27.—Automobile manufacturers have deluged Washington officials with telegrams protesting against an order reported to have been sent out by the War Industries Board denying transportation to passenger automobiles or to materials for their manufacture. In that regard Judge Lovett, priority officer of the board, yesterday issued the following emphatic statement: "The report that I am contemplating an order shutting off cars from the automobile industry is without any foundation in fact. I said a week ago that I did not have in mind any transportation order treating any industry as non-essential, since priority order No. 2 went as far as it seemed to me wise to go in dealing with so-called non-essentials by transportation orders. That statement still stands."

At the present time the committee of automobile and accessories manufacturers is at work upon a plan for the gradual reduction of the output of passenger cars and the diversion of manufacturing facilities to the production of airplanes, engines, shells, shrapnel, etc. In the meantime the steel situation is being handled by Mr. Replogle, whose object is the conservation of alloy steel with the least possible hardship to automobile manufacturers.

The Railroad War Board has aroused renewed interest in the problem of the non-essential industries by reiterating its recommendation that transportation be denied to some 500 products which it is claimed are not essential either to the conduct of the war or to the general welfare of the public. Judge Lovett, however, adheres to his original position that no solution of the non-essential industry problem by railroad embargo is practicable. The War Industries Board supports the priority officer in this position and promises full hearings before any action is taken discriminating against any particular line of manufacture.

Mechanical Engineers' Meeting

The engineers' part in the war is to be the dominant theme of the annual meeting of the American Society of Mechanical Engineers to be held next week in New York. Under this general subject, sessions will be held on the morning and afternoon of Dec. 5, and the following addresses are announced:

Universal Public Service in Peace and War, Dr. Ira N. Hollis, president American Society of Mechanical Engineers.

The Engineering Societies in the National Defense, Gano Dunn, president J. G. White Engineering Corporation, New York.

Special Education in Time of War, Dr. Charles S. Howe, president Case School of Applied Science, Cleveland.

The Agricultural Problem, Dr. W. H. Jordan, director New York Agricultural Experiment Station, Geneva, N. Y.

The Fuel Problem, Prof. L. P. Breckenridge, Sheffield Scientific School, Yale University, New Haven, Conn.

Engineering Research, C. E. Skinner, engineer research division, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Motor Transportation, William P. Kennedy, consulting engineer, New York.

Army Transportation, Major L. B. Moody, carriage division of the ordnance department, Washington, D. C.

The Aircraft Problem, Prof. W. F. Durand, chairman National Advisory Committee on Aeronautics, Washington, D. C.

The Solution of the Cantonment Construction Problem, Leonard Metcalf, consulting engineer, Boston.

Interest will center in the opening session on Tuesday evening, in the conferring of honorary membership upon Maj.-Gen. George W. Goethals and an address by Hon. William H. Taft, ex-President of the United States.

Simultaneous with the continuation of the keynote session on Wednesday afternoon will be three sessions devoted respectively to power-plant subjects; to general papers technical in character; and to codes prepared by the sub-committee on protection of industrial workers, on safety standards for elevators and woodworking machinery.

On Thursday morning the papers to be read include the following: "An Exact Volume Regulator for Blast Furnace Engines," by L. C. Loewenstein; "Expenses and Costs," by H. L. Gantt; "By-Product Coke and Coking Operations," by C. J. Ramsburg and F. W. Sperr, Jr.

At 12.30 p.m. luncheon, with an address by Prof. Dexter S. Kimball, Cornell University, on "The Relation of Industrial Management to Engineering," is announced.

In the afternoon a session will be devoted to "Inspection in Munitions Manufacture."

On Friday morning a session will be devoted to the employment of women in such industrial plants as machine shops and munition works, and the preparatory work now being undertaken for training the large numbers of crippled men who may be expected to return from the war and who will need to become efficient and self-supporting.

Plan Not Approved

At the suggestion of the Chamber of Commerce of Youngstown, Ohio, blast furnace interests held a meeting Nov. 22, to discuss the coke shortage situation growing out of congested traffic conditions in the Connellsville coke regions. After considerable discussion regarding the proposal to pool shipments of fuel to furnaces, the plan was held to be impracticable. It was pointed out that furnaces use different grades of coke and that, therefore, the pooling plan is not tenable. One suggestion being given serious consideration is a proposed extension of the present system of making up solid trains going from given originating points to given destinations. This plan has been before the traffic emergency committee of the Council of National Defense and appears to be accepted generally as one source of relief. It would be applied to coke shipments as well as to traffic of all kinds. It has been already adopted in the case of many shipments of steel products. The car supply in the Connellsville coke regions continues light, with no signs of improvement, and the congestion there is as serious as ever.

Our Manganese and Chromium Supplies*

Some of the Problems and Their Solution—Role of the Electric Furnace—Substitutes for Manganese—Higher Prices for Ores—The Chromium Situation

BY J. E. JOHNSON, JR.

THE war has brought about a situation in regard to several minerals which is unprecedented in the world's history. America has been liberally endowed by nature with most of those minerals which are required for the purposes of civilization, among the first of which are coal and iron ore, but in regard to others, quantitatively less important but still vital to our progress, she has not been so generous to us. Hitherto this has made no difference to us; cheap and unrestricted navigation to and from all parts of the world have supplied without difficulty those things of which our own supply was scanty or wanting, but with a blockade existing in a large part of the world, with a huge proportion of the world's total tonnage of ships sunk and most of the rest commandeered by the governments for war purposes, the supply of ships for commercial work has become almost a vanishing quantity. In some cases it is not a matter of price but of a lack of bottoms at any price.

Some minerals which could be imported more cheaply than they could be produced, can no longer be obtained abroad except at prohibitive prices and our own supplies must now be developed, be the cost what it may. In regard to those minerals of which we have no supply of our own, the situation is exceedingly serious. These are the underlying causes which have produced an abnormal situation in regard to all the minerals of which I shall speak but the details vary in the different cases.

Supplies of Manganese

This is one of the minerals with which nature has been niggardly in her supply to America and it has been imported to supply our needs, either as ore or as ferromanganese. This need comes from the fact that about 17 lb. of manganese, or roughly three-quarters of one per cent, are required per gross ton of steel to deoxidize the steel and make it a useful product. We are not using any more manganese per ton of steel than we were formerly, rather less, but our total consumption tends to rise because of the unprecedented output of the steel industry under present conditions.

We have had in the past three principal sources of supply which are in fact the three principal manganese producing districts of the world: Russia, India and Brazil. This is the order of importance of the districts from a tonnage point of view in the pre-war period, though Brazil was a bad third, producing roughly only about one-quarter of a million tons as against nearly a million for Russia. The Russian deposits are cut off from us entirely by the closing of the Dardanelles. The Indian fields are at so great a distance that the freight under present conditions has become absolutely prohibitive. Of the three, therefore, only the Brazilian remains available to us.

For several years past practically no manganese has been produced in the United States until present conditions caused renewed activity in mining this mineral, but the Geological Survey advises me that the total supply of manganiferous materials in this country is considerable although much of it is low grade. With development our domestic ores could supply a large part of our needs if we make our metallurgy fit the conditions.

The Metallurgical Problem

The metallurgical side of this situation is a very important one. There have been in the past only two varieties of manganese alloy in common use, spiegeleisen, containing about 20 per cent manganese and 5 per cent carbon, and 80 per cent standard ferromanganese with about 6 per cent carbon.

In the days when the Bessemer process was the only one of any importance for producing steel and when rails were the principal steel product made, the use of speigel was almost universal. It was melted in cupolas alongside those for supplying the Bessemer; it was tapped as required from the cupola into a ladle which was charged with the required amount for a heat, taken to the converter and poured into the bath after the completion of the blow.

You will note that the ratio of carbon to manganese is about one to four in spiegel, whereas it is about one to fourteen in ferromanganese. This means that one per cent of manganese imparted to the steel with spiegeleisen would raise the carbon 25 points, whereas if imparted by ferromanganese it would only raise the carbon about 7 points. Assuming the carbon to be blown down to 0.08 per cent in both cases, the total carbon with one per cent manganese would be 0.33 per cent in one case and 0.15 per cent in the other; 0.33 per cent carbon is much less than is required for rails, and the remainder of the recarbonization was accomplished by adding straight pig iron.

When the open-hearth came in, all this was changed. The open-hearth brought about the application of steel to a multitude of purposes for which wrought iron had been used in the past. The steel to be suitable for these purposes must be low in carbon. For a vast proportion of the total output, exclusive of rails, the 0.33 per cent carbon is entirely too high. This situation brought about the use of ferromanganese, and once introduced its use grew. On account of its small volume, it could be charged direct into the furnace or the ladle and all the bother of handling another ladle of molten material was eliminated. As rails have become a decreasing percentage of our steel output, the importance of the low carbon steels has grown greater and greater and in the period immediately before the war there was no sale for spiegeleisen. The New Jersey Zinc Co. had stacked up more than 30,000 tons of spiegel which was virtually unsalable under the conditions then prevailing. The material was produced as a by-product and the situation was a serious one for that company. A few months after, the present conditions in the steel industry began to appear and this huge accumulation was all sold at prices many dollars higher than those which previously the company would have been glad to take.

The high grade manganese ores are, therefore, necessary if we are to produce ferromanganese. It was for this reason that our numerous enormous deposits of low grade materials have remained undeveloped. If more than a certain limited percentage of iron, roughly one-sixth of the amount of manganese, be present, standard 80 per cent ferromanganese cannot be produced. Spiegel, as I have already shown, is normally almost unsalable.

Not alone the presence of iron ruins manganese ores, but phosphorus and silica as well. Phosphorus becomes increasingly important as the content of manganese is lower because the amount of alloy to be added obviously increases as the percentage of manganese in it decreases, and a phosphorus content which might be tolerable in a 50 per cent manganese ore may be prohibitive in a 25 per cent ore. Silica is objectionable because of the loss of manganese that it causes.

Manganese is very much more active chemically than iron. It is easily possible to run an iron blast

*From an address on "The Situation in Regard to Manganese, Sulphur Pyrite and Other War Materials," before the Engineers' Society of Western Pennsylvania, on Tuesday evening, Nov. 27. The author is a consulting engineer, New York.

furnace so as to keep the iron content of the slag down to 0.2 per cent or under, but with manganese this is not the case. Each unit of silica carries away with it in the slag a proportion of manganese, this proportion depending roughly on the amount of other bases in the slag and on the temperature at which the furnace is run. If the temperature is high, the reduction of manganese is more complete than if it is low, but we are not free even to attempt to make a complete recovery by raising the temperature indefinitely since we run into another difficulty by so doing. Manganese is volatile and is driven off as a vapor in the hearth and passes out with the gases in a huge yellow cloud which you can see coming out of the boiler stack at most ferromanganese furnaces. The cinder, on the other hand, always has a strong yellowish-green tint, characteristic of manganiferous slags. It used to be considered that of the total manganese charged, one-third was lost, but practice in this respect has been greatly bettered in recent years. One of the best furnacemen in the country claims to be running with a loss of 15 per cent. I have heard stories of other losses much lower than this but the information was so indirect that I cannot feel assured of its correctness.

Returning now to the ores, it has been customary to penalize all silica in excess of 12 per cent for the reasons just given. The recoverable manganese in the ore is smaller and smaller as the silica rises. This condition has made worthless the low manganese ores, even when they were approximately free from iron, because manganese could not be produced from them without a loss that was commercially prohibitive. To summarize we have here then the following situation:

A small tonnage of high grade ore in the United States; a considerable tonnage of low grade manganiferous material not suitable for ferromanganese manufacture because of either too much iron, too much silica, or too much phosphorus, or a combination of all three; a steel works demand for a manganese alloy with a low ratio of carbon to manganese so that low carbon steels can be produced containing enough manganese to deoxidize them thoroughly; the requirement that an ore to produce the desired alloy must be pure.

The Problem and Its Solution

In the face of the present scarcity of ships, which has already limited severely our imports of rich manganese ore and which threatens to limit it still more severely, what are we going to do? The answer is not to be found in a sentence but only by applying these rigid conditions to each problem and working out the best solution on its merits. The solutions broadly are to be found along three lines.

First, the absolute conservation of ferromanganese for steels, the requirements of which rigidly demand that they be low in carbon.

Second, breaking down our metallurgical prejudice in favor of the exclusive use of high grade alloys and using 70, 60, 50, 40 and 30 per cent alloys for those purposes in which the carbon and manganese requirements of the product permit their utilization. This is a matter of psychology as much as of practice. We must overcome the inertia of the steel men, which very naturally prejudices them in favor of the practice to which they are accustomed. They must get out of this rut and learn to do something different, not only because it may be cheaper, but because the safety of our country as a whole depends upon our production and because the outcome of the war depends upon the production of steel.

Third, the specifications for steel should be rigidly revised by all steel manufacturers and steel users, perhaps under the auspices of the American Society for Testing Materials, so as to lower the manganese requirements in all cases where the absolute necessities of the case do not require them to be as high as at present. Some of our best steel makers are convinced that the present specifications for manganese in many classes of material are higher than they used to be, and I will suggest to you the possibility that, in the manufacture of steel, manganese, like charity, may cover a multitude of sins. I believe that steel well made can have its manganese content distinctly lowered and still be better than a badly made steel doused with a parting hypodermic of manganese to make it stagger through the tests.

Fourth, changes in the metallurgy of manganese itself. The electric furnace has been used for several years in Europe in the production of ferromanganese, and its application to this purpose has made a good start in the United States. It has distinct advantages over the blast furnace under present conditions for the price of the product is so high, that the balance in favor of coke as against electric power for its production no longer controls.

The electric furnace has the great advantage that it uses very little fuel in comparison with the blast furnace and therefore does not have to contend with anything like silica which comes from that source in the blast furnace and all af which takes its toll from manganese when it goes out as slag. Further than this, part of the silica, a very considerable part, can be reduced and combined with the manganese to form a ferrosilicon manganese; this has a distinct advantage. It prevents the loss of manganese which accompanies the silica when the latter is slagged, and what is even more important, it forces down the carbon. I am advised that in ferromanganese, containing 10 or 15 per cent of silicon, the carbon is only about 2 per cent instead of 6.

This means that the carbon-manganese ratio in such a material is far lower than in straight ferromanganese, even though its content of manganese be materially lower than that of the standard alloy. This offers us possibilities which I believe have not yet been fully realized. I refer to that of using a mixture of spiegel, or low grade ferromanganese, with this silico-ferromanganese, so as to obtain the required amount of manganese without permitting the carbon to rise above the desired percentage.

In talking with one of the electric furnace people recently, he made the claim that by melting the ferromanganese before charging, a saving of about 20 per cent in the amount required could be made. This, of course is a statement of an interested party, but there seems to be good reason for believing that at least some improvement could be made in this way and if so, there is no excuse under present conditions for not making it.

Beneficiation of Manganese Ores

You will naturally ask why the lower grade ores of manganese cannot be treated like other low grade ores and brought up to standard metallurgical grade by washing, jigging or some other process. The answer to this question is twofold: first, the cheapness of the imported ores has made such a course commercially unprofitable until recently; second, the nature of the manganese minerals themselves.

Manganese seems to have the faculty of diffusing itself through gangue material in a condition of almost impalpable fineness and while in many cases there is no chemical union between the two, the problem of separating them by any of the accepted methods of ore treatment has so far failed absolutely. Of course, when lumpy manganese is associated with clay, the latter can be washed out, or if it is mixed with particles of rock, these can be jigged out; but there is a great deal of material containing 20 to 30 per cent of manganese and about 25 per cent of silica with a considerable amount of alumina. This material has a consistency about like that of stove polish and no method of ore treatment, so far developed, has sufficed for the apparently easy task of separating this simple mechanical mixture.

Experiments are under way at the present time looking to a solution of this problem along lines radically novel but the investigation is as yet incomplete and is entirely unprotected by patents. We are hopeful that within a few months very low grade material now worthless can be converted into extremely high grade ferromanganese, but it is obviously unsuitable to speak further of this at the present time.

Substitutes for Manganese

Various substitutes for manganese have been proposed. Many years ago Henry D. Hibbard tried deoxidizing a heat of steel with ferrosilicon. He killed the heat absolutely so that it poured like cream, but when the ingot went through the rolls it broke up into pieces more like bird-shot than like billets. In other words, in spite of its higher heat of combustion, silicon has nothing like the deoxidizing power of manganese in steel. It has been found that about 25 per cent of the work of deoxidation could be done by silicon but that the remainder had to be done by ferromanganese.

In the electric furnace, I am advised that this con-

dition does not exist and that a heat can be so thoroughly killed and deoxidized in the electric furnace that good steel can be made without the addition of any manganese. It is doubtful, however, if our prejudices would permit us to accept such steel without a much longer time of trial than we have available under present conditions.

It has been proposed by various people to use other metalloids or particularly combinations of these, such as calcium-silicon or calcium-silicon-aluminum in such proportions that their oxides after they had been converted to oxide in deoxidizing the bath would form a fluid slag and so free itself from the steel in the way that the oxide in manganese does. I am told that this has been done extensively in Europe but this practice has not been developed to any important extent in this country.

Conserving Manganese in Steel Making

One of the most hopeful methods of bettering conditions is by so altering our practice as to leave the manganese in rather than to introduce it at the end of the process. While ores high enough in manganese to be considered as ores of that element are scarce, there are available enormous tonnages of manganiferous iron ore, and some of even the very lean grade manganiferous material can be charged into the furnace to produce a high manganese pig iron without causing excessive expense by increasing the slag volume. Then by starting steel manufacture with an iron containing more than one per cent of manganese and preferably two, an important amount of manganese can be left in the bath at the conclusion of the oxidizing operation which is the essence of steel making.

This manganese has two good effects—first, by its presence it tends to prevent excessive oxidation of the heat; second, it replaces at least a part of the manganese which must otherwise come from the scarce high grade alloys. Somewhat similar results can be obtained by adding enough manganese ore to the slag to make it decidedly manganiferous. I am informed that by this means there occurs a very considerable reduction of the manganese oxide to metallic manganese by the metalloids of the bath and that the manganese content of the iron rises as the heat progresses. My information is not sufficient to permit any figures as to the relative consumption of manganese by this process and by the other. My feeling is that the efficiency of the manganese would be higher if charged into the blast furnace and almost completely reduced there than if charged into the open-hearth and only reduced to a fractional extent.

The situation which confronts us in regard to manganese is acute and it is a commercial duty and a patriotic necessity to conserve the supply, not by one means but by all within our power. I hope to see shortly a meeting of the metallurgists of all the steel plants of the country under instruction from the executives of their respective countries to thrash out all these matters to the very bottom; each one to have instructions from his chief, not to strive for a partisan advantage, but as a matter of patriotic duty to lay all the cards on the table and give to all the experience and knowledge of each for the benefit of the country as a whole.

Higher Prices for Manganese

Let me close this portion of my subject with a warning. The thing for the steel men of this country to hope for is that the price of manganese will go higher. The shipping situation is so serious that ships are almost certain to be taken out of the manganese trade and that will cut off a corresponding percentage of our present supply of manganese ore. It is positively known that our supplies in this country are sufficient to last us for two or three years if they are intelligently handled but they will do us no good unless they are developed and they will not be developed unless it can be done at a profit to someone.

I have recently urged upon the Government Bureaus with the utmost emphasis at my command the absolute indispensability of a pronouncement from the highest authority in Washington that the price of manganese ore would not be regulated downward during the period of the war and I have recommended to them that if pursuant to this policy the price of manganese should rise, as it probably will, that the steel makers should be allowed a compensating increase in the prices fixed for their product.

The Bureaus of the Government are, I believe, favorable to this idea and if you work along this line, you can accomplish much, but if you take the short-sighted view of holding down the price of manganese by price regulation, the steel industry as a whole and the country with it is likely to suffer because of the fact that manganese which you can get at $500 a ton is much better than manganese at a nominal price of $100 which you can't get.

Supplies of Chromium

The importance of chromium to the steel industry is twofold. First, when alloyed with steel in small percentages, it exercises a tremendous effect on the physical qualities of the material, raising the elastic limit and increasing the hardness. It also has a marked effect in intensifying the effect of other alloying elements. Chrome steels, with relatively very high percentages of chromium, are used where extreme hardness is desired—in crusher jaws, stamp dies, roll shells and the like. When alloyed in smaller percentages with vanadium or nickel, it gives wonderful properties to steel used for high grade construction purposes; automobile and aeroplane steel are very largely chromium steels.

Second, it is used in the form of oxide as a refractory. The oxide has an extremely high melting point and is chemically exceedingly inactive. For this reason chrome bricks have become almost indispensable in certain parts of the open-hearth furnace.

Our supplies of this material have come in the past principally from Greece, New Caledonia, Rhodesia and Russia. These are all far distant points, measured in terms of present-day freight rates so that our recent supplies of chromium have been woefully inadequate and the price risen to correspond. This has fostered the development of mines in Canada and later in this country.

Chromium appears on this Continent at least to be a pockety material, it occurs as a segregation or as a breaking-down product of certain eruptive rocks, and deposits of this character are in general of relatively small size and uncertain in extent. A considerable interest has been aroused on the West coast where there are a number of deposits and there is room to hope that these, in addition to those which are now producing some by the introduction of ore-dressing methods, will be able to make an acceptable product.

Except through Governmental action, which now appears unlikely, the price of chromium will probably not decline while the war continues, for there is no hope that the shipping situation will ease up for a year or more and not much likelihood that we shall develop mines of chromium in this country comparable with those from which our supply has come in the past.

[After discussing the question of potash supplies, Mr. Johnson concluded his address with the following general remarks.]

In conclusion I wish to leave with you one thought in connection with that event to which all our energies and hopes are directed, the settlement of the war on terms satisfactory to us. Many of the questions involved are matters of world politics which we perhaps may not be competent to discuss, but one of them is a matter in which our knowledge and opinion should guide the rest of the world. In recent years great deposits of potash have been discovered in Alsace. I understand that little is known about these yet except that they are very extensive. In the post-war period we can well conceive that Germany will be bled dry financially and she will be unable to pay in money, for the crimes which she has committed, but she may be made to pay in resources which can be readily turned into cash and of these one of the best is obviously a vitally important fertilizing material of which the world's supply is all too scanty.

Lorraine Iron Ore and Peace

But Alsace-Lorraine involves a question even more important, if such a thing be possible, than justice to France. It involves the possible future safety of the world. You do not need me to tell you that the raw materials of war to-day are iron and steel. Without them no nation could last a week. In Lorraine and Luxemburg are one of the greatest deposits of ore in the world, low grade it is true, measured by our standards but still commercially of immense value and utilized to the extent of 90 per cent in Germany's iron industry before the war. This ore body then constitutes a huge potential arsenal, for without it or its equivalent all other arsenals would be useless. The question then which will confront the world at the peace conference is: To whom shall be entrusted the guardianship of a great potential arsenal; Germany, who has proven herself an assassin ready to arm herself to the teeth and spring on her victim unaware, or France, who in spite of hardship and suffering has kept burning in a steady and brilliant blaze the fires of liberty, civilization and peaceful industry? This is a question which politicians do not understand or realize. It is one of your great duties as the iron and steel men of the world's greatest steel center to force on the public an understanding of it so that intelligent public opinion will demand insistently that the motto which controls in the disposition of Alsace and Lorraine is that which your work in the past 10 years has made famous—"Safety First."

Extras on Tin Plate

The following statement by E. H. Gary, chairman, Committee on Steel and Steel Products of the American Iron and Steel Institute was issued Nov. 27.:

E. H. Gary, chairman, Committee on Steel and Steel Products, American Iron and Steel Institute, referring to the recommendation of the committee, under date of Nov. 20, covering certain differentials and extras on sheets, tin plates and round billets for seamless tubes, states that the Committee now recommends a further list of extras on tin plates covering width and length on cokes and charcoals as follows:

WIDTH AND LENGTH EXTRAS ON COKES AND CHARCOALS
All Grades—Cokes to Premier Charcoals:—

No. 16 gage to No. 24 gage, inclusive
1c. per 100 lb. for each inch or fraction over 30 in. wide.
1c. per 100 lb. for each inch or fraction over 30 in. long.

195 lb. to 90 lb., inclusive.
5c. basis for each inch or fraction over 28 in. wide.
2c. basis for each inch or fraction over 30 in. long.

Lighter than 90 lb. to 75 lb.
10c. basis for each inch or fraction over 28 in. wide.
4c. basis for each inch or fraction over 30 in. long.

Lighter than 75 lb. to 55 lb.
15c. basis for each inch or fraction over 28 in. wide.
5c. basis for each inch or fraction over 30 in. long.

The Austin Co., Cleveland, is erecting four new buildings for the New York Air Brake Co. at Watertown, N. Y. Two of these are 90 x 1000 ft., one 90 x 800 ft., and one 250 x 400 ft. These are in addition to a building 100 x 802 ft. recently completed by the same builder for this company. The Austin Co. has also recently taken a contract for a Government building at Jacksonville, Ind., 45 x 167 ft., to be used for sponging cloth, a building for the Four Lakes Ordnance Co., Madison, Wis., 150 x 500 ft., the contract including heat, lighting, plumbing and the installation of a traveling crane, two buildings for the Illinois Watch Co., one 146 x 40 ft. and one 82 x 29 ft., and an additional building for the Elyria Iron & Steel Co., Cleveland, 60 x 300 ft.

Twelve of 117 drafted men of Manitowoc, Wis., leaving for the National Army cantonment at Camp Custer, Battle Creek, Mich., on Nov. 20, were held at home on Government orders which indicated that the men will be recruited in the industrial naval reserve for service in the plant of the Manitowoc Shipbuilding Co., a large shipyard which was commandeered by the Government several months ago.

CHANGE IN AIRPLANE PROGRAM

Liberty Motor Will Be Built for Scout Duty and French Motors for Fighting 'Planes

Recent rumors that the Liberty airplane engine had proved a failure are emphatically denied in official quarters in Washington. Unofficially, THE IRON AGE learns, however, that a decision has been reached to limit the use of the Liberty motor to scout duty and the time-tried French motors will be used on the battle airplanes used by the United States Government. In various ways, the airplane plans of France and the United States appear to have been consolidated. "The French-American airplane program" is a phrase that is now frequently used in Washington.

The decision to use the Liberty motor for scout duty only is believed to have followed the criticism of French airplane experts that the United States in putting all its faith in the one motor was placing its eggs all in one basket, and that if, under actual fighting conditions, the Liberty motor did not measure fully up to expectations, there would be nothing to fall back upon. The motors which the French and English have used most successfully in battle are the Renault Gnome, Hispano-Suiza and the Rolls-Royce. It is now apparent that this Government will build a certain number of each of these motors in the United States. Contracts have recently been placed with American manufacturers for Renault and Hispano-Suiza motors and other contracts are pending. In addition, this Government will provide additional equipment for the French automobile plants which are making airplane engines and will also supply several thousand mechanics, who are now being recruited. The original program was to build only 5000 Liberty motors in France, but latest information is to the effect that the United States will assist the French in building a large number of French and English engines as well.

An important step in the airplane program was the taking over by the Aircraft Production Board of the plant and equipment of the General Vehicle Co., Long Island City, N. Y., at a price said to have been fixed at $2,500,000. The General Vehicle Co. has been figuring for some time on a large contract for the manufacture of Gnome motors and had issued a list of about 900 machine tools to be purchased. The plant will probably be used by the Aircraft Production Board for experiments in airplane engine construction.

October Ferromanganese Imports Small

Ferromanganese imports into the United States in October were only about 2000 tons, or the lowest for any month this year. According to reports to THE IRON AGE, 1135 tons of this came through the port of Philadelphia and 865 tons through Baltimore.

The pupils of the schools of Baltimore, Md., are to be told of the city's greatness as a manufacturing and industrial center through a plan advanced by A. S. Goldsborough, director of the Civic and Industrial Bureau of the Merchants and Manufacturers' Association, with the approval of the Board of School Commissioners. A series of lectures will be given in the Polytechnic Institute, City College, Teachers' Training School and the high schools. Among those who will deliver the lectures and their subjects are Holden A. Evans, president of the Baltimore Dry Docks & Shipbuilding Co., "Baltimore as a Shipbuilding Center and Why It Should Be a Leader"; and J. A. Davis of the Bethlehem Steel Co., "Baltimore as a Steel-Making Center."

It is announced that the Pennsylvania Railroad Co. plans to increase the ore-handling facilities at Erie, Pa., by the erection of a new dock and storage tracks. It is stated that the improvement will involve an expenditure of $2,000,000.

The Government and Iron and Steel Prices

Further Hearings on the Pomerene Bill Expected, but Its Passage Is Not Likely by Jan. 1, If at All

WASHINGTON, Nov. 27.—The question as to the program to be pursued with respect to the Pomerene bill providing for governmental control of iron and steel prices will be considered at a meeting of the Senate Committee on Interstate Commerce to be held next week and interest in the outcome is intensified by the fact that the existing arrangement, under which the President has promulgated prices fixed as the result of negotiations with the committee representing the steel industry, expires on Jan. 1. The bill is now in the hands of a subcommittee of which its author, Senator Pomerene, and its most energetic advocate, Senator Cummins of Iowa, are the leading members. Senator Pomerene has reached Washington and it is understood that a quorum, both of the full committee and of the subcommittee, will be here when Congress re-convenes next Monday.

"It is too early for me to form an opinion as to the action that will be taken on my bill," said Senator Pomerene to the correspondent of THE IRON AGE. "I gather from correspondence and as the result of intercourse with business men that there is no abatement of interest in this subject and it is evident that the importance of the steel industry to the country in the conduct of the war is increasing rather than diminishing. Our subcommittee has given considerable attention to the measure and I expect that we shall take it up again very soon and reach a decision as to the recommendation we shall make to the Senate. I have given the matter considerable thought during the recess and my convictions on the subject are quite as strong if not stronger than they were when I originally presented my bill."

Cannot Pass by Jan. 1

Notwithstanding the fact that certain members of the Senate Committee express the opinion that the Pomerene bill can be passed by Congress in time to become effective when the present arrangement as to steel prices expires on Jan. 1 next, there is really little basis for such a belief. The expectation that the bill can be put through within the next 30 days is based almost wholly upon the fact that the Sixty-fifth Congress is already organized and that the active work of legislation may begin as soon as the two houses reassemble. On the other hand, however, although Congress will convene on Dec. 3 it will adjourn for the holiday recess about Dec. 20 until Jan. 4, leaving only about 15 working days before the first of the new year. Even should the subcommittee report the bill at its first meeting it would undoubtedly be debated at some length in the full committee and, as the committee will hold but one meeting a week, it is unlikely that the bill can be reported to the Senate much before the holiday recess. At least a dozen Senators are prepared to discuss so promising a subject as governmental price-fixing in the iron and steel industry and the debate on this measure would undoubtedly consume a week or ten days even if its immediate consideration could be secured.

Hearings for Steel Consumers

The situation in the House foreshadows still further delay. The bill would probably be referred to the House Committee on Interstate and Foreign Commerce which will be reorganized under the chairmanship of Representative Sims, of Tennessee, who succeeds Representative Adamson, of Georgia, recently transferred to the Board of United States General Appraisers. Several members of this committee have already begun a study of the Pomerene bill and are prepared to demand hearings for steel consumers. They point out that while the Senate committee issued a general invitation to all interested parties to appear at the hearings accorded at the last session, the notice was so brief and the hearings were so limited that no one representing actual consumers took advantage of the opportunity. Assurances are now given that if the House committee takes the matter up there will be plenty of witnesses to keep the hearings going for a considerable period. It is safe to say that it will require not less than 30 days and possibly a much longer time for the House committee to consider the measure and for the House to pass it. A further delay would ensue in the event the House changed the Senate bill in any important particular as it would then be necessary to refer the measure to a conference committee.

Presidential Price Fixing

Sentiment in Congress and especially in the House is growing in favor of that feature of the Pomerene bill which authorizes the President "whenever and wherever in his judgment necessary for the efficient prosecution of the war for the purposes aforesaid, to fix the price of iron ore, iron, steel, and their products wherever and whenever sold, either by producer or dealer, to establish rules for the regulation of and to regulate the production, sale, shipment, distribution, apportionment, or storage thereof among dealers and consumers, domestic or foreign." The proposition is also favored that the President shall exercise this authority through the agency of the Federal Trade Commission and that in the event that any producer or dealer fails or neglects to conform to promulgated prices the President shall have power to take over his plant or his business and operate it through any agency he may select for the purpose. This method of procedure, it is contended is likely to prove more satisfactory than the alternative proposition embodied in the Pomerene bill giving power to the President to require all producers of iron ore, iron, steel and their products "to sell their products or designated portions thereof only to the United States through an agency to be designated by the President, such agency to regulate the resale of and to resell such iron ore, iron, steel, and their products or designated portions thereof and to regulate and fix the prices thereof, and to establish rules for the regulation of and to regulate the production, shipment, distribution, apportionment, or storage thereof among dealers, consumers, domestic or foreign, and to make payment of the purchase price thereof to the producers thereof, or to the person or persons legally entitled to said payment."

It is not proposed, however, to strike from the measure the alternative provision quoted but to leave it in the bill for the purpose of strengthening the President's hands. If clothed with full powers the President, it is pointed out, will be able to control the entire situation with respect to prices without difficulty and without raising the vexatious questions that might arise under the alternative provision of the Pomerene bill, which might result in the arbitrary commandeering of output and the raising of issues as to consequential damages.

Federal Trade Commission for Lower Prices

Developments with reference to the Pomerene bill are being closely followed by the Federal Trade Commission, the members of which not only favor legislation on this subject but are practically on the record, through Commissioner Davies' declarations, as advocating the abrogation of contracts, especially those made at prices above the present market. Certain members of the commission also are strongly in favor of the substitution of a law for the present mutual consent arrangement and believe that there should be a general scaling down of all the prices thus far promulgated and especially a substantial reduction in the price of pig iron and other basic products. Members of the commission feel that the elaborate investigation into the cost of producing iron and steel in various forms, which preceded the promulgation by the President of the first schedule in which the price of pig iron was fixed, was a waste of time and that the figures obtained by the commission's experts were wholly ignored.

Commissioner Davies compiled a voluminous report on costs of production and utilized some of his figures in the elaborate statement he made before the Senate committee during the consideration of the Pomerene bill. Only a small part of the data gathered in the cost investigation has been published, however, and the opinion is entertained by certain members of the commission that a comparison of the report with the schedule of prices since promulgated would make an exceedingly interesting exhibit that would probably hasten the passage of the Pomerene bill or some similar legislation.

Steel Men Do Not Expect a Change

To the extent that representatives of the steel industry here will express any opinion on the subject, it appears to be their view that there is no necessity for legislation dealing with price fixing so long as the matter can be handled so satisfactorily by negotiation. It is urged in this connection that the situation with respect to prices and supplies of iron and steel is certainly much better than that concerning coal and coke, the cost and distribution of which the President is specifically authorized to regulate by the terms of the Lever food, feed and fuel act. Emphasis is put upon the fact that there is no steel famine nor marked shortage, except so far as the actual tie-up of loaded cars has produced congestion in certain districts, and this, of course, is in no way attributable to lack of presidential authority to fix prices or regulate distribution. The steel men here who are co-operating with the Council of National Defense do not expect that the Pomerene bill will be passed in the near future and express the opinion that when the present arrangement expires on Jan. 1 it will be renewed for a considerable period as the result of negotiations between the war industries board and representatives of the steel industry.

W. L. C.

Serious Car Shortage

SEATTLE, Nov. 24.—The most serious question confronting manufacturers in the Northwest is the extreme car shortage, which has now reached the state of Washington. Strenuous efforts are being made to obtain relief, but this has not been forthcoming. The lumber industry is particularly affected, and a number of mills are facing a complete shutdown unless cars are speedily available. The organization of the extensive lumbering operations to get out spruce for military airplanes is progressing rapidly, and huge tracts from Alaska to southern Oregon will be opened up. Dozens of sawmills will be released from ordinary work, and enter exclusively into the manufacture of airplane stock.

STEEL CORPORATION AT MOBILE

Shipyard Construction to Be Pushed—The New Mills at Fairfield

President George G. Crawford of the Tennessee Coal, Iron & Railroad Co., has given out this week the following statement concerning the United States Steel Corporation's shipbuilding plant at Mobile, Ala., on which construction work will begin at once. The principal officers of the new company, which will be known as the Chickasaw Shipbuilding Co., are identical with those of the Tennessee company. The statement gives more detail than has been published heretofore concerning plate and structural mills and the other capacity that will be provided at Fairfield, Ala., to supply material for the new shipyard.

It is proposed to begin construction immediately on a shipyard upon the land recently purchased north of Mobile, Ala. Ten shipways will be laid down and wharves of suitable capacity for fitting out the ships will be built. A large power plant, boiler shop, plate and angle shop, machine shop, steel metal shop, joiner shop, forge shop, storehouse and main office will be constructed.

Two large villages have been laid out, one for white and the other for colored workmen. Both villages will have paved main streets and sidewalks, storm and sanitary sewers, a pure water supply and street railway and electric light service. About 1600 houses of attractive appearance will be completed during the next twelve months. The health, safety, comfort and recreation of the employees and their families will be considered in planning the works and villages.

The construction of the shipbuilding plant will be done by the Chickasaw Shipbuilding Co. The board of directors will be as follows: E. H. Gary, J. A. Farrell, George G. Crawford, H. C. Ryding, L. T. Beecher. The officers of the company will be: George G. Crawford, president; H. C. Ryding, vice-president; J. F. Coleman, general superintendent; L. T. Beecher, secretary and treasurer; F. B. Winslow, auditor; A. W. Carey, traffic manager; Geo. H. Gray, purchasing agent; Lloyd Noland, superintendent health department; F. M. Joy, superintendent roads and buildings department; J. F. Vance, superintendent central labor bureau.

For the purpose of supplying steel plates and shapes suitable for building ships, the following construction is now under way at the Fairfield works of the Tennessee Coal, Iron & Railroad Co.: A 40-in. blooming mill, a 110-in. plate mill, a 26-in. shape mill, and 600 houses for employees. In addition there will be constructed at Fairfield the following plants for the manufacture of parts and machinery for ships: A plate and angle shop, a forge shop, a foundry, a machine shop and 400 houses for employees.

To secure additional steel capacity a third converter will be installed in the converting mill at Ensley Works and an additional open hearth furnace of larger size than the existing furnaces.

Will Meet in Cleveland

The triple convention of the National Supply and Machinery Dealers' Association, the Southern Supply and Machinery Dealers' Association and the American Supply and Machinery Manufacturers' Association will be held in Cleveland on May 15, 16 and 17, 1918, according to the announcement just issued to members by F. D. Mitchell, Woolworth Building, New York, secretary of the latter organization.

The Chicago Superheater Co., Chicago, has been formed to engage in the manufacture of locomotive, marine and stationary superheaters and independently stoker-fired superheaters. The company's offices are in the First National Bank Building, 38 South Dearborn Street. Officers are Charles F. O'Connell, president; Edward A. Geoghegan, vice-president and mechanical engineer, and N. L. O'Connell, secretary.

Book Reviews

Electric Furnaces in the Iron and Steel Industry. By I. W. Rodenhauser, J. Schoenawa and C. H. Vom Baur. Pages XVIII + 429, 6 x 9, illustrated. Published by John Wiley & Sons, New York. Price, $3.75.

With the great growth of the electric steel industry, especially in the United States, where nearly every type of furnace is in commercial operation, a book containing up-to-date theoretical and practical information on this subject answers a real necessity and will be warmly welcomed. The second edition of this work adequately meets every present demand and is as modern in its data as it is possible for a book to be.

About five years ago the first edition appeared with Mr. Vom Baur as the translator of the German original. The new edition is now offered as largely rewritten, and Mr. Vom Baur is joint author, owing to the large amount of original matter incorporated. The author has had a wide experience in practical electric furnace work, especially from the electrical engineering standpoint, and his acquaintance with leaders in the new field has opened up valuable sources of information, much of which he has been able to incorporate in a book now largely his own.

Comparing this edition with the original, Chapters 1, 2, 3 and 4 are unchanged; they treat of general historical and theoretical matters. Chapter 5, "General Conditions for the Operation of Electric Furnaces," has been amplified to some extent. Chapter 6, "Arc Furnaces in General" has been largely rewritten with the aid of first-hand data from Dr. Carl Hering. The importance of this chapter is emphasized by the fact that the great majority of electric furnaces in the United States are of the arc type.

Chapter 7, "The Stassano Furnace," has also been rewritten and the author shows why the furnace had to be taken from active competition. Chapter 8, "The Heroult Furnace," is an entirely new one and contains very recent data from reliable sources. Chapter 9, "The Girod Furnace," is unaltered with the exception of a new illustration. Chapter 10, "The Rennerfelt Furnace," has been completely rewritten from the author's own experience and observation. Chapters 11 and 12 on "The Induction Furnace" and "The Kjellin Furnace" are practically unchanged. Chapter 13, "The Röchling-Rodenhauser," has been modified somewhat. An interesting addition are two illustrations of the large transformer core and coils of the 20-ton induction furnaces at Lebanon, Pa. Chapter 14, "The Electric Shaft Furnace," has not been changed much. In Part II of the book, under "The Electric Metallurgy of Iron and Steel," Mr. Vom Baur has added a great deal concerning iron smelting in the "Heroult" furnace, now the Crawford furnace at Heroult, Shasta County, Cal.

In a "General Review," Chapter 15, the treatment of the Grönwall-Dixon furnace has been expanded, with a few pages on the Greaves-Etchells furnace, recently introduced into this country. The Snyder furnace is discussed in a few words as not in large use because of its single phase and its low power factor of 60 per cent.

Part II treats of the "Materials for Furnace Construction and the Costs of Operation." Carborundum brick are mentioned as giving good results under certain conditions. The electric steel output of the world is considered and on page 304 J. H. Gray is quoted as stating that with a 6-ton basic Heroult furnace, operating 24-hr. each day and 6 days each week, with electricity at 1c. per kw. hr., the cost of refined steel, one or two slags, should not be on the average over $15 per ton, plus the cost of scrap in normal times. There is much other new material in this section.

The author emphasizes the use of the electric furnace for melting ferromanganese before its introduction into the molten steel, saving 20 to 30 per cent of the alloy and producing a better steel. He cites the fact that there are only two furnaces so used in the United States against 20 to 25 in Europe.

A table on page 271 shows the number of furnaces in the steel industry in the world on July 1, 1917. The grand total was 562, of which 177 were in the United States, 94 in Great Britain, 45 in Sweden, 40 in France and 34 in Canada. The Heroult comprises nearly half or 244, and the Rennerfelt is next with 84.

The Design of Machine Elements. By W. G. Dunkley. Two volumes; pages, 210 with 123 illustrations in Vol. I and 220 with 122 illustrations in Vol. II; 4½ x 7 in. Published by Scott, Greenwood & Son, London, England, D. Van Nostrand Co., 25 Park Place, New York, American distributer. Price, $1.50 per volume.

Described by the publishers as "A handbook for students and draughtsmen engaged in engineering design," and each complete in itself, the above two volumes by an English author make their appearance in what is termed "The Broadway Series of Engineering Handbooks."

The first volume deals with forces and stresses, shafting and bearings, couplings and springs. This volume consists of seven chapters, the opening one dealing briefly with the conditions for equilibrium between forces acting on a body. Then follows a long chapter on "Stress, Strain, Twisting and Bending Moment." Here the ordinary textbook facts on such subjects are dealt with, but in a very practical manner, and with very comprehensive examples. The third chapter is devoted to shafts and studs, and the fourth with bearings, pedestals, hangers, wall brackets and swivel pedestals. The fifth chapter deals briefly, but in an up-to-date manner, with ball and roller bearings, the sixth with keys and couplings, and the seventh with springs.

The second volume deals with screws and bolts, clutches, belts and pulleys, and gearing. This volume consists of five chapters, opening with one in which screw threads, bolts, and screws are dealt with at length, discussing standards, methods of measuring and efficiencies of various types. The second chapter deals briefly with belts and pulleys, the information set down being, unfortunately, the least modern of any given in either volume.

The third chapter deals with driving clutches, and is, perhaps, the most comprehensive in either volume. The various types of clutches are explained and illustrated in principle, and excellent data for their construction given. The fourth chapter treats on gearing at length, merely duplicating, however, the data given in any standard work on the subject. The concluding chapter deals with driving chains, lifting chains and wire ropes.

The Application of Efficiency Principles—By George H. Shepard. Pages X + 368, 5½ x 9 in., illustrated. Published by the Engineering Magazine Co., New York, and for sale by U. P. C. Book Co. Price $3.

The author of this book, a former member of the staff of Harrington Emerson, has attempted to elucidate the twelve principles of efficiency as laid down in the writings of that engineer. In his preface, the author states that while Mr. Emerson made an excellent presentation of the principles in his books, he gave but little information as to the procedure to be followed in their application. This criticism has occurred to more than one reader of the principles, and an attempt to set forth, in a practical manner, the difficulties of using them and the precautions to be observed will be welcomed by many who have sought after efficiency but without any definite knowledge of how to obtain it.

The author treats the subject in a somewhat different manner than it has been handled heretofore. Each principle, as planning, scheduling, despatching, routing, etc., is outlined and restated in the author's own language. Its application is illustrated by citations of examples from various industries and commercial establishments. Several illustrations are given in each case to present the idea from several different angles and to show the wide scope and universal application of the doctrine of efficiency. The author comments on the results and frequently buttresses his comments by quotations from authorities on the subject under discussion. There is no attempt made to trace the entire

set of principles through in their application to a single industry or business.

Whether or not the author has succeeded in accomplishing his object of making more clear the application of Mr. Emerson's principles is an open question. If his idea has been to enable the manufacturer and the business man to install the Emerson methods, using this book and Mr. Emerson's works as textbooks, the reviewer feels that he has not accomplished what he set out to do. The treatment is so disconnected that it would be rather difficult for the uninitiated to link up he twelve principles into a smoothly working mechanism. The principles of efficiency are so interrelated that they must be considered in their effects one upon the other, if the best, in fact, if workable results are to obtain. The efficiency engineer, already familiar with the principles and their working, can readily see this interrelation, but it is doubtful if the untrained mind can, from Prof. Shepard's discussion, connect them into a harmonious whole. From the reviewer's point of view it would have been better to have taken a single industry and followed the application of the principles to it from beginning to end. Variations of the application of the principles could have been appended, showing how they apply to cases of somewhat different character than the one forming the body of the work. This method would have given the reader a clear idea of the mutual dependency of the principles, and at the same time would have shown that they could be adapted to every class of industry.

If however, the author has endeavored to show that the principles of efficiency are of universal application, he has succeeded admirably. His examples are well selected, and the comments on them show judgment and clear thinking. He has covered the subject in a thorough manner, and has met many of the adverse criticisms that have been and still are leveled against the movement of which he is an exponent. The book contains much that is good, and can be read with profit by manufacturers and business men in general. Even the engineer who is familiar with the subject will benefit by reason of the new angle from which his work is viewed. R. K.

The 1918 edition of "Motor Trucks of America," by S. V. Norton, manager of truck tire sales B. F. Goodrich Rubber Co., Akron, Ohio, will be ready for distribution Jan. 1. The book consists of 200 pages of text and illustrations. It is the sixth to be issued in as many years. Complete specifications of nearly 150 of the leading gas and electric-driven motor trucks will be found in the volume. The illustrations show the latest models and the information is compiled by the manufacturers themselves.

A book on industrial conciliation has been prepared by John F. Sherman, 20 Broad Street, New York, intended for distribution among executives. It explains methods he employs in meeting employer-employee dissensions.

STEEL PLANT NEAR SEATTLE

Definite Announcement Follows Report of New York Engineer

Formal announcement that the projected steel plant to be built in the vicinity of Seattle, Wash., is to become a reality has been made by Bart. L. Thane, general manager of the Alaska-Gastineau Mining Corporation and head of the steel syndicate that will construct the plant. Mr. Thane made the announcement at a recent dinner given in his honor by Frederick Karl Struve, banker of Seattle, which was attended by 50 prominent business men of that city. The plant, according to Mr. Thane, will be located in King county, between Seattle and Tacoma, on a site of 1000 acres of level land, adjacent to salt water, with a water level grade to the mines. The site has been under option for months.

Mr. Thane has received the moral support of Seattle business men, and a committee has been named, as follows, to promote the steel plant, and to use its influence to secure Federal approval of the purchase by the steel syndicate of the equipment needed for the construction and operation of the plant: Clarence W. Wiley, president of the Seattle Construction & Dry Dock Co., representing the shipbuilders; F. K. Struve, president of the Seattle National Bank, representing the bankers; A. J. Rhodes, president of the Seattle Chamber of Commerce and Commercial Club, representing Seattle's chief business organization; James D. Lowman, vice-president of the Union Savings & Trust Co., representing the city's business interests at large; William Pigott, president of the Seattle Car & Foundry Co. and vice-president of the Pacific Coast Steel Co., representing the iron and steel men. A. J. Rhodes is chairman of the committee, which will devote its entire influence toward securing necessary materials to insure the construction of the plant, through Government order to the Eastern steel plants.

Mr. Thane states that the steel syndicate is composed of five San Francisco men: William H. Crocker, president of the Crocker National Bank; Wellington Gregg, vice-president of the Crocker Bank; Herber Fleischacker, president of the Anglo-London-Paris and American Bank; Samuel F. B. Morse, manager of the Pacific Improvement Co., and Mr. Thane.

The proposed plant will represent an ultimate expenditure of $25,000,000 and the initial unit to be constructed will cost $9,000,000. The syndicate has spent $250,000 in the various steps of the investigation into the feasibility of the enterprise. Mr. Thane, in discussing the steps taken by the syndicate, said:

"First, we satisfied ourselves as to the present availability of the three materials needed for our pig iron; coke, iron ore and limestone; second, we were interested only in coking coals and iron ores that could be delivered at our strategic center, meaning Seattle, at a total cost not greater than the cost of similar raw materials delivered at furnaces in the East, and we found such coals and ores; third, we studied the market and plant sites, taking two of the latter under option. Then we laid every bit of data before an eastern checking engineer of great repute, J. E. Johnson, Jr., of New York. His report was extremely favorable in all respects. It showed that while the plan originally submitted to him by our engineers called for a $25,000,000 plant, conditions existing now were such as to warrant starting one blast furnace at a cost of $5,000,000, with $4,000,000 to be expended later for the manufacture of steel from the pig iron." The $5,000,000 includes purchase of coal mines and of the large site for the plant and also the cost of leases and development of ore properties.

The project is receiving the hearty support of shipbuilders in the Puget Sound district, who have experienced great difficulty in securing steel from eastern centers, and who have had to pay constantly advancing prices for all such materials. It is conceded that the establishment of a steel plant in the Puget Sound section would insure the permanency and steady growth of the shipbuilding business, with its allied lines of industry.

Mr. Thane states that ground will be broken for the project within 90 days, and that within 18 months after that date the first pig iron will be turned out, if Federal permission to secure materials can be obtained.

The Cleveland Milling Machine Co., Cleveland, has begun the monthly publication of a stock list of milling cutters. The list is contained in a conveniently arranged booklet and includes standard cutters in both high-speed and carbon steel which are in stock and from which immediate shipments can be made. It is published on the fifteenth of each month.

In order to supply electric current on a large scale for electric furnaces in the coming year, the Sheffield City Council of England, has decided to embark on a big and costly scheme which will permit of a large growth in consumption in that district.

CALL FOR AVIATION SERVICE

Crying Need for Skilled Men on the Ground Behind the Lines

IT has been said repeatedly that this war will be won in the air. The United States is building an air fleet that is calculated to astound the fighting world. Factories from Maine to California are working day and night on airplane parts. Guns and oil and gasoline and cameras and other material parts of these war machines are coming along as fast as skilled organized American factories can bring them out. Already they are being assembled, and manufacture of that acme of the American get-together spirit, the Liberty motor, is being pushed as fast as possible.

Ever since the war started, the Government has been establishing aviation schools to perfect the men who will be the eyes of the national army. The machines and many of the fliers are taken care of, but there is a crying need of trained men to care for these machines.

There is a blank at the bottom of the facing page that when properly filled out will be the answer of skilled men to the challenge of skilled brutes. Men of draft age cannot enlist after Dec. 15, under the new selective draft regulations. To complete an enlistment in time one should report to a recruiting officer before Dec. 13.

Here is a list of the kind of men wanted, arranged in the order of number of men needed:

Chauffeurs.
Auto mechanicians.
Automobile engine repair men.
Office clerks.
Carpenters.
Radio operators.
Electricians.
Instrument repair men.
Cooks.
Coppersmiths.
Armorers (machine gun repair men).
Sail makers.
Photographers.
Machinists.
Blacksmiths.
Motorcycle repair men.
Stenographers.
Cabinet makers.
Draftsmen (mechanical).
Magneto repair men.
Metal workers.
Automobile engine testers.
Rope riggers (Cordage workers).
Propeller makers (airplane)
Riggers (airplane assemblers).
Telephone linesmen.
Tool makers.
Vulcanizers.
Welders.
Lithographers.
Packers.
Telephone operators.
Motorcyclists.
Plumbers.
Painters.
Tailors.
Gas works employees.
Buglers.
Molders.
Pattern makers.
Telephone adjusters.
Barbers.
Truck masters.
Brick layers.
Cobblers.
Propeller Testers (airplane).
Boat builders
Saddlers.
Stock keepers (experts)

New Electric Welding Machine Company Organized

The Taylor Welder Co. is being incorporated under the laws of the State of Ohio to manufacture and sell an electric welding machine employing a new process which is covered by a patent granted to A. C. Taylor. A temporary office has been opened at Warren, Ohio, and it is expected the company will make arrangements to have the machine built by contract at present. Mr. Taylor has been connected with the Winfield Mfg. Co. for a number of years, and was one of the organizers of the Winfield Electric Welding Machine Co. He will still act in a consulting capacity for the former company. A. E. Hackett, who has been connected with the engineering and sales departments of the Winfield Electric Welding Machine Co., will be secretary, and have direct supervision of the sales. J. H. Ewalt, formerly treasurer and purchasing agent of the Winfield Mfg. Co., will be treasurer.

A card system for coal distribution at Youngstown, Ohio, has been worked out and will be under the general direction of the coal committee of the Chamber of Commerce, of which W. P. Arms is chairman. The coal shortage there has become so serious that a distribution system is imperative. Only one ton of coal will be given to a family at one time.

TO REGULATE TIN IMPORTS

American Iron and Steel Institute Will Act as Consignee

Through its committee on steel and steel products and the sub-committee on pig tin of which John Hughes is chairman, the American Iron and Steel Institute issued a bulletin Nov. 22 giving rules and regulations covering the importation of pig tin, chloride of tin and tin ore to the United States, as approved by the War Trade Board Nov. 16. The Government has requested the institute to act as consignee of these importations and they will be released only to approved recipients under the conditions set forth in the bulletin. The institute undertakes this work at the request also of consumers, jobbers, importers and dealers, who desire to avoid interruptions of their business.

The institute agrees to receive applications for tin, to transmit the approvals, by cable if necessary, to representatives in London, so that they may co-operate in obtaining export license from foreign countries, if necessary, and the institute also agrees to supervise importations and sales in the United States. Associated with Mr. Hughes on the committee are E. R. Crawford, John A. Fry, A. B. Hall and Theodore Pratt.

In connection with the bulletin referred to the American Iron and Steel Institute has sent out various forms, including importing consumer's guarantee, importer's and consumer's guarantee combined, importer's and stock or jobber's guarantee combined, jobber's monthly statement of sales, and application for approval as recipient of tin.

High-Manganese Pig Iron in the Open Hearth

In U. S. Geological Survey Bulletin 666-EE on Manganiferous Iron Ores, E. C. Harder gives complete data on the occurrence, volume and composition of these ores in the United States. Discussing the various ways in which such ores may be utilized, he says:

It has been suggested that by methods of concentration, resulting in the elimination of iron, silica or other constituents, a product high in manganese might be derived from them. Such concentration has been attempted locally but with very little success, owing mainly to the intimate mixture which manganese generally forms with associated materials.

The steelmaking practice might be changed so that more spiegeleisen and less ferromanganese would be used for deoxidizing. By the addition of small quantities of high-grade manganese ore much of the manganiferous iron ore could be used in the manufacture of spiegeleisen

The most effective solution, however, seems to be to so change the practice in the manufacture of basic open-hearth steel as to make possible the use of high-manganese pig iron. Experimentation along this line is extremely desirable. The successful application of such a change would make large reserves of manganiferous iron ore commercially available and would greatly decrease the quantity of high-grade manganese ore consumed.

German preparations for trade after the war are being scrutinized carefully by experts in the Bureau of Foreign and Domestic Commerce, Department of Commerce, and the recent important report on the subject of "German Foreign-Trade Organization" by Chauncey D. Snow has established a new sales record for Government trade reports. The bureau now plans to get out a supplementary bulletin on German trade and preparations for the commercial future about the first of the year, and further supplements as rapidly as important additional information is received.

Some investigations in arc welding are to be discussed at a meeting of the Philadelphia Section of the Association of Iron and Steel Electrical Engineers at the Majestic Hotel, Philadelphia, Saturday evening, Dec. 1, by O. H. Eschholz, research division, engineering department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.



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Volunteer Department, 119 D Street, N. E., Washington, D. C.

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Trade . . . . . No. years in trade . . . . . .

Machinery Markets and News of the Works

NOVEMBER A BUSY MONTH

Large Volume of Orders Has Been Placed

Government Trying to Increase Production of Large Tools—Contracts Being Placed for French Airplane Engines

November has been one of the most active months of the year in the machinery and machine-tool trade. Orders have been placed quietly, with fewer lists being issued, but the aggregate in some lines of tools, particularly those for making guns, shells and other ordnance equipment, has been tremendous. As an example of the size of many orders placed, a Rochester, N. Y., company received a single contract for 102 lathes, costing about $1,000,000.

Machine-tool market reports this week reflect several interesting developments. More is heard of the effort of the Government to increase production, particularly of large tools for gun work, and it is learned that the Otis Elevator Co. is one of the concerns figuring with the Government on building large tools. The Niles-Bement-Pond Co. will build a new plant on a 50-acre site just purchased near Kearny, N. J., to build large tools and cranes.

The program of the Government in curtailing wherever possible the manufacture of luxuries and utilizing the plant equipment and labor for war work is indicated by the placing of a munitions contract with the Victor Talking Machine Co., Camden, N. J. The manner in which the automobile industry will be utilized is shown by the recent contract given to the Ford Motor Co., Detroit, for airplane engines. The Atwater Kent Mfg. Works, Philadelphia, manufacturer of ignition systems for automobiles, is expected to devote its large new plant to some kind of war equipment.

Restriction on exports serves to emphasize the great need of certain tools in this country. These tools are on what is known as the conserved list and their exportation is forbidden except under the most unusual circumstances. Even our Allies must prove their absolute need of them to obtain shipments. The French Government has adopted a plan of giving certificates to its manufacturers, indicating that the tools are needed for urgent war work.

Contracts are being placed in this country for the manufacture of French and English airplane engines. The Rutenber Motor Co., Marion, Ind., bought tools in New York last week for work on Renault motors. It is understood that Gnome and Rolls-Royce motors will also be made here. The Simplex Automobile Co., New Brunswick, N. J., is already at work on Hispano-Suiza motors. The Aircraft Production Board is said to have finally decided not to put all of its trust in the Liberty motor, but to use the motors which the French and English have found by experience to be successful. Reports that the Liberty motor is not a success are denied in Washington and no one claims it is a failure, but it is learned unofficially that the motor will be used for scout duty and the French and English motors for battle 'planes. The Government has taken over the plant and equipment of the General Vehicle Co., Long Island City, N. Y., and it is understood will use it as an experimental shop for airplane engines.

Buying of machine tools in the Eastern market continues active. In New York the largest buyer is the International Arms & Fuse Corporation, Bloomfield, N. J., which has a 6-in. shell contract. The lathes it will need total nearly 600. The American Can Co. has been buying for new machine shops in Newark, N. J. The Ford Motor Co., Detroit, has commandeered 20 tools in New York. The Standard Aero Corporation, Elizabethport, N. J., is buying. Other purchasers are the H. E. Boucher Mfg. Co., New York, and the Davis-Bournonville Co., Jersey City, N. J. The Bayles Shipyards, Inc., Port Jefferson, N. Y., has issued a small list of plate and angle shop machines it will buy. The Federal Shipbuilding Co. has issued another list of 10 cranes.

In Philadelphia the American International Shipbuilding Corporation and the Baldwin Locomotive Works continue large buyers. The latter has closed with the Pawling & Harnischfeger Co. and the Shepard Electric Crane & Hoist Co. for 20 cranes, at a total cost of about $900,000. The American International Shipbuilding Corporation bought 45 hoists from the Shepard Electric Crane & Hoist Co.

Miscellaneous machine-tool and crane orders are reported in the local market reports.

The Rock Island continues to buy in the Chicago market for its gun carriage shop. The Nordyke & Marmon Co., Indianapolis, Ind., has placed orders for additional turret lathes for airplane engine work. The Holt Mfg. Co., Peoria, Ill., has not placed all of its orders for its new tractor plant addition. The Four Lakes Ordnance Co., Madison, Wis., continues to buy for gun manufacture. Westinghouse Church Kerr & Co., New York, have bought a 10-ton and a 15-ton crane for the Hydraulic Pressed Steel Co., Cleveland, from the Abell-Howe Co., Chicago. Industrial expansion in the Chicago district continues. Large additions to the plant of the Standard Steel Car Co., Hammond, Ind., will be built for building cars, and 10,000 more men will be employed.

In Cleveland the principal buying has been for airplane engine and shell work and for the manufacture of equipment for the new merchant fleet. Among the large buyers are Dodge Bros., Detroit, and the Ford Motor Co., Detroit, and there are other large inquiries for Government work.

Cincinnati builders and dealers anticipate a list from the Smith-Form-a-Truck Co., Chicago. It is reported that this company will engage extensively in the manufacture of munitions. Canadian companies are also expected to require new lathes for shell contracts.

War contracts placed in Detroit are estimated to total about $500,000,000. A large part of the contracts have been placed with automobile concerns.

In New England there is a large demand from shipyards and munition plants. The S. A. Woods Co., Boston, has taken a contract for bombs for trench mortars and is in the market for a large list of tools.

New York

NEW YORK, Nov. 27.

One of the largest purchasers of machine tools in the East this week is the International Arms & Fuse Corporation, Bloomfield, N. J., which is buying for a 6-in. shell contract. Its requirements of lathes are double those mentioned last week, numbering about 350 26-in. and more than 200 18-in. Turret lathes and other tools have also been bought in large quantities. The American Can Co., New York, will consolidate all of its machine shops in three new buildings to be constructed in Newark, N. J., contracts for which have been let. Purchases of the major part of the new equipment have been made.

A development that was of considerable interest to machine-tool sellers was the transfer of the plant and equipment of the General Vehicle Co., Long Island City, N. Y., to the United States Government for a consideration said to be $2,500,000. The General Vehicle Co. had been figuring on buying a large number of machine tools for building Gnome motors, but its contract has been held up for many weeks. Whether the Government will buy new equipment for the plant has not yet been made known. The Ford Motor Co., Detroit, has been obtaining some tools in New York for building Liberty motors. About 20 tools, which were held here in export warehouses, were commandeered. The Standard Aero Corporation is buying tools for its new plant at Elizabethport, N. J. Another interesting development of the airplane program is the placing of contracts with American manufacturers for French motors. The Rutenber Motor Co., Marion, Ind., has received an order for Renault motors and will begin manufacturing them about Jan. 1. Through the J. G. White Engineering Corporation this company ordered new equipment in New York last week.

As an example of the large size of some of the individual machine-tool orders being placed these days, it is interesting to note that the Bridgeford Machine Tool Works, Rochester, N. Y., recently received a contract for 102 large lathes for gun work at the Watertown Arsenal from the Stone & Webster Engineering Corporation. The total cost of the lathes is about $1,000,000.

The H. E. Boucher Mfg. Co., New York, has bought a few tools for Government work. The Davis-Bournonville Co., Jersey City, N. J., has also bought a number of tools.

The Government is making efforts to increase the production of large tools, particularly those required for gun work, and several companies which have the equipment necessary for such work may receive contracts. The Otis Elevator Co., which made large lathes for the British Government early in the war, is reported to be about to close a contract with this Government to build large tools. The Niles-Bement-Pond Co., New York, has purchased 50 acres at Kearny, N. J., and will put up a new plant for building large tools and cranes.

The Bayles Shipyards, Inc., Port Jefferson, Long Island, has issued a list of about a dozen machines wanted for a plate and angle shop. The Federal Shipbuilding Co. has issued a second list of cranes for its plate and angle shop and boiler shop. The new list asks bids on four 10-ton, double-trolley cranes, 60-ft. span; four 20-ton, single-trolley, 45-ft. span, and two 35-ton, single-trolley, 28-ft. span.

Other activities in the crane market are as follows: Horace A. Staples, engineer, 103 Park Avenue, New York, is in the market for five 3-ton cranes for a brass foundry. Okura & Co., New York, want a 5-ton and a 20-ton crane for export to Japan. The Lehigh Valley Railroad Co. is in the market for five gantry cranes. The Union Pacific Railroad Co. has ordered one 25-ton and one 15-ton crane for its Pocatello, Idaho, shops. The American Can Co. has received bids on a 10-ton and a 20-ton crane for its new machine shops in Newark, N. J. The Liberty Ordnance Co., successor to the Bridgeport Projectile Co., Bridgeport, Conn., has bought a 10-ton crane. The Erie Steel Construction Co., Erie, Pa., has received a contract for a number of cranes for the Watertown Arsenal and several small cranes for the Blake & Knowles plant of the Worthington Pump & Machinery Corporation. Some of the companies which have lately entered the crane industry are offering fairly early deliveries, from one to three months. On non-Government work about six-month deliveries are generally quoted.

Export trade in machine tools is being restricted in various ways. The Exports Administrative Board in Washington, of which J. R. Vandyck of the Vandyck-Churchill Co., New York, is machinery expert, is scrutinizing all applications for export, even to our Allies, very carefully. The French Government now issues certificates to its manufacturers who need machines. It is understood that these certificates are being issued only when the tools are greatly needed in France for war work.

The Washburn Wire Co., foot 118th Street, New York, is having plans prepared for rebuilding its works recently destroyed by fire. B. and J. P. Walther, 147 East 125th Street, are the architects.

The Militer Corporation, New York, has been incorporated with a capital of $1,000,000 to manufacture guns, airplanes and other products. E. McM. Mills, A. W. Britton and G. V. Reilly, 65 Cedar Street, are the incorporators.

The Bull's Eye Rubber Co., New York, has been incorporated with a capital of $250,000 to manufacture rubber specialties. A. C. Squires, E. C. Tengzelius and J. Futoransky, 149 Broadway, are the incorporators.

Marion T. Brockway, Long Island City, N. Y., has acquired the six-story factory now being erected on Jackson Avenue, near Skillman Place, on property about 350 x 500 ft., for the establishment of a plant to manufacture automobile accessories.

The Cross Metal Products Corporation, New York, has been incorporated with an active capital of $155,000 to manufacture metal snap fasteners, etc. The incorporators are R. Hartmann and S. Schwartz, 165 Broadway.

The Tock Screw Machine Products Corporation, Eighth Street, Long Island City, N. Y., has increased its capital from $50,000 to $100,000.

The New York Rotary Motor Co., New York, has been incorporated with a capital of $1,700,000 to manufacture motors, etc. A. M. Sullivan, H. and S. S. Meyers, 60 Wall Street, are the incorporators.

The Roberts Numbering Machine Co., 706 Jamaica Avenue, Brooklyn, is having plans prepared for the construction of a two and one-half-story addition to its plant to cost about $30,000.

The Liberty Equipment Corporation, New York, has been incorporated with a capital of $10,000 to manufacture equipment and appliances for machine shops. The incorporators are F. Leder, R. R. Mitchell and O. J. Korb, 27 Cedar Street.

The Price Engine Corporation, New York, has been incorporated with a capital of $1,000,000 to manufacture engines. G. F. Jebbett, J. M. Harding and J. T. Crowley, 81 Morton Street, are the incorporators.

The Electric Welding Co., 801 Vernon Avenue, Brooklyn, has had plans prepared for the erection of a new one-story machine shop, about 35 x 70 ft., at the foot of Court Street.

The Automobile Tire Co., 1625 Broadway, New York, manufacturer of tires, has increased its capital from $10,000 to $500,000.

The Franklin Railway Supply Co., New York, has been incorporated with a capital of $50,000 to manufacture railroad specialties. H. F. Ball, F. R. Series and C. L. Winey, 181 Amherst Street, Brooklyn, are the incorporators.

The Oneida Motor Truck Co., New York, has been incorporated with a capital of $10,000 to manufacture motor trucks. W. L. Fuhrer, C. D. W. Rogers and J. H. Boyle, 502 West 180th Street, are the incorporators.

The Corning Foundry, Corning, N. Y., has been incorporated with a capital of $100,000. S. E. Flitner, W. M. Gurnsey and B. W. Wellington, Corning, are the incorporators.

The Bossert Co., Hickory Street, Utica, N. Y., manufacturer of stamped metal goods, electrical switch boxes, etc., will build a one-story addition about 40 x 70 ft.

The Threadless Pipe & Coupling Co., Cohoes, N. Y., has been incorporated with a nominal capital of $5,000 to manufacture pipe, couplings, etc. T. H. Burke, W. and W. J. Beattie, Cohoes, are the incorporators.

Firth & Marshall, New York, have been incorporated with a capital of $100,000 to manufacture electrical appliances. J. Firth, C. Marshall and H. Freece, 35 Wall Street, are the incorporators.

The Howes Co., Silver Creek, N. Y., has been incorporated with a capital of $250,000 to manufacture machinery and tools. M. L., A. C. and M. A. Barbau are the incorporators.

The National Pneumatic Co., 50 Church Street, New York, has purchased property on New Brunswick Avenue, Rahway, N. J., and plans the construction of a new plant.

The Norton Shipbuilding Co., Bloomfield, N. J., has been incorporated with a capital of $250,000. Elmer E. Wigg, Bloomfield,; Alfred E. Norton and Carl Nordstrom, New York, are the incorporators.

The International Arms & Fuse Corporation, Bloomfield, N. J., is planning for the erection of a 600-ft. addition to its works, fronting on the tracks of the Erie Railroad.

A. H. Bryant, associated with the Simmons Hardware Co., 17 Battery Place, New York, will build a new two-story, reinforced-concrete plant, about 80 x 120 ft., at Bloomfield, N. J.

Burlington, N. J., has had plans prepared for a new municipal power plant and will call for bids for construction early in December. Haines & Sherman, 415 Market Street, Camden, are the engineers.

The American Auto Top Co., Morristown, N. J., recently organized, has acquired property at Ford and Franklin avenues for the establishment of a factory for the manufacture of automobile seats, tops, etc. George H. Quennard heads the company.

The Waclark Wire Co., Bayway Street, Elizabeth, N. J., manufacturer of wire and cables, has awarded a contract for the erection of a two-story and basement addition, 105 x 180 ft., to its plant at Bayway and South Front streets to cost about $100,000.

The American Stove Co., 209 West Forty-third Street, New York, a New Jersey corporation, has increased its capital from $7,000,000 to $10,000,000.

Brandis & Sons, Inc., Jersey City, N. J., has been incorporated with a capital of $100,000 to manufacture precision instruments. C. H. Jarvis, H. A. Black and J. R. Turner are the incorporators.

The American Can Co., 449 Communipaw Avenue, Jersey City, will erect a one-story addition to its plant.

The Drop Forging Co. of New York, 301 Westside Avenue, Jersey City, will build a one-story addition to its plant.

The Central Railroad of New Jersey, Jersey City, is considering the erection of a new one-story power plant at its local terminal to cost about $150,000. Headquarters of the company are at 143 Liberty Street, New York.

The Otto Snap Fastener Co., Newark, N. J., has been incorporated to manufacture metal snap fasteners, etc. George B. Brandt, John Kovats and Harry M. Salyer are the incorporators.

The Meco Engineering Co., 800 Broad Street, Newark, has been organized to manufacture machinery. Irving Hirsch, 354 Livingston Street, heads the company.

The C. F. Massey Co., Newark, manufacturer of concrete products, will build two one-story additions to its plant, 80 x 216 ft. and 40 x 150 ft., respectively, to cost $15,000. Plans have been filed.

Buffalo

BUFFALO, Nov. 26.

The Automatic Transportation Co., Buffalo, has let contract for an additional machine shop, 55 x 150 ft., two stories, at its plant at Main Street and the Erie Railroad.

The Atlas Steel Casting Co., Buffalo, George H. Chisholm, president, will add a shop and finishing building, 40 x 96 ft., to its plant at Elmwood Avenue and the Erie Railroad.

The Muller-Ulrich Machine & Tool Co., Buffalo, has been incorporated with a capital of $20,000. F. and A. Muller and C. Ulrich are the directors.

The United States Lens Co., Geneva, N. Y., is taking bids for an addition to its melting department. It has also let contract for an addition, 65 x 140 ft., to cost $30,000.

The Kellogg Structural Steel Co., Buffalo, has let contract for an addition to its fabricating shop, 55 x 150 ft., at the New York Central Railroad and Stone Street.

The Wilson & Greene Motor Co., Inc., Syracuse, N. Y., has been incorporated with a capitalization of $50,000 to manufacture automobiles. The incorporators are G. M. Wilson, O. H. Green and L. Will, Syracuse.

The foundry building for the American Radiator Co., Buffalo, at its Pierce plant, will be 150 x 200 ft. and cost $150,000.

The New Idea Double Tire Co., Syracuse, H. P. Kupperman, president, 261 West Onondaga Street, is having plans prepared for a three-story factory on West Taylor Street at an estimated cost of $25,000.

The Cousins & Son Boiler Works, 74 Wabash Avenue, Buffalo, manufacturer of boilers, stacks and tanks, will erect a boiler shop, 80 x 120 ft., at Hamburgh Turnpike, Childs Street and the Buffalo Creek Railroad.

Watertown, N. Y., is having preliminary plans prepared by the S. M. Greene Co., architect and engineer, Springfield, Mass., for a power plant, to be constructed at an estimated cost of $300,000. J. W. Knowlton is president of the water board.

The Atwood Phototaker Co., Inc., Albany, has been incorporated with a capital stock of $300,000 to manufacture a device for cameras. H. C. Atwood, Ardmore, Okla.; J. A. O'Connor, 131 Lancaster Street, and J. L. Mallett, 916 Madison Avenue, Albany, are the incorporators.

The Simons Mfg. Co., Lockport, N. Y., manufacturer of saws, is adding a one-story building, 50 x 150 ft., to its plant at Ohio Street and the New York Central Railroad.

The Bossert Corporation, Utica, N. Y., Frank Norman, president, 1021 Hickory Street, is having plans prepared for a tool building, 40 x 70 ft., and a boiler house, 20 x 80 ft.

W. Ralston & Co., Ltd., Niagara Falls, N. Y., will build an addition, 36 x 120 ft., to its plant on Whirlpool Avenue.

The board of water supply, Olean, N. Y., William Sheehan, chairman, will receive bids until Dec. 5 for a filtration plant, including pump house and equipment with a daily capacity of 2,500,000 gal., estimated to cost $75,000.

The O'Neil Iron Works, Perry Street, Buffalo, recently incorporated with a capital of $400,000 to manufacture sugar mill machinery, has increased its capital to $500,000.

The New Idea Double Tire Co., 261 West Onondaga Street, Syracuse, N. Y., is planning for the erection of a three-story addition to its plant, about 50 x 150 ft., on West Taylor Street, to cost $25,000.

The Bay City Forge Co., Cranberry Street, Erie, Pa., will build a new one-story machine shop, about 67 x 176 ft., at Cranberry and West Eighteenth streets, to cost $30,000.

The Bowen Products Corporation, Auburn, N. Y., has been incorporated with a capital of $2,500,000 to manufacture engines, motors, etc. A. F. Dillman, E. T. Williams and W. B. Reynolds, 240 West 102d Street, New York, are the incorporators.

The Willys-Morrow Co., Elmira, N. Y., manufacturer of airplanes, has had plans prepared for the erection of a one-story addition, to cost about $20,000.

New England

BOSTON, Nov. 26.

New England machine shops continue to participate in a large measure in orders being placed by all sections of the country for machine tools, special machines and tools and attachments of all kinds for war production. There is considerably greater activity in the market for the smaller sizes of machine tools. Orders from Government ship and munitions plants continue the leading feature of the local demand, but there are many orders of one or two machines each from industries in all parts of New England.

Makers of tools, gages and radio apparatus are active purchasers. The S. A. Woods Co., Boston, which has been particularly successful in shell making, has taken on a large order for bombs for trench mortars and is in the market for a large list of tools for this work. Well authenticated reports indicate that several plants which have never made munitions will soon be in the market for equipment to fill large Government contracts which they are undertaking.

A large majority of the long-established machine tool plants are accepting virtually no orders except for munitions and ship work and are working closely with the Priority Board. Several are making plans to greatly increase their present output. The business being offered is at least three times the present production and it is expected that, with Government assistance on the labor problem, the industry will enter into the new year at a greatly accelerated pace.

The Terry Steam Turbine Co., Hartford, Conn., is to erect a one-story addition, 100 x 108 ft.

The American Broaching Machine Co., Marlboro, Mass., has been incorporated with authorized capital stock of $60,000 by Francis Lapointe, and others.

The Rhode Island Tool Co., Providence, R. I., is to build an addition, 32 x 90 ft., one story, and an annealing shop, 45 x 140 ft.

The Boston Stove Foundry Co., Boston, has been incorporated with authorized capital stock of $50,000. Joseph Lanes, Dorchester, is president, and Isaac Bachrach, Chelsea, treasurer.

The B. F. Sturtevant Co., Readville, Mass., has begun work on a one-story addition containing 20,000 sq. ft.

The Safety Ventilating Lock Co., Norwich, Conn., has been incorporated with authorized capital stock of $200,000

and will begin business with capital of $100,000. The incorporators are David D., Frank A. and Samuel G. Wellman.

The Mattatuck Mfg. Co., Waterbury, Conn., has had plans drawn for an addition, 60 x 200 ft., four stories.

The H. A. Matthews Mfg. Co., Seymour, Conn., has increased its capital stock from $300,000 to $400,000.

The Naugatuck Valley Crucible Co., Huntington, Conn., has been organized with $50,000 capital. D. N. Clark is president; W. H. Carpenter, vice-president; Ray E. Carpenter, secretary, and O. F. G. Boeker, treasurer.

The International Machine Co., Lowell, Mass., has been incorporated with authorized capital stock of $36,000. Wheaton Kittredge is president and Ira Harris, 62 Lincoln Street, treasurer.

The H. & H. Foundry Co., Stamford, Conn., has been organized with $15,000 capital. Benjamin Harris is president; John Hanson, vice-president; and Nickolas Rominello, treasurer.

The E. Horton & Son Co., Windsor Locks, Conn., manufacturer of lathe chucks and castings, is building a two-story addition, about 40 x 50 ft.

The Bureau of Yards and Docks, Washington, D. C., has awarded a contract to Westinghouse Church Kerr & Co., New York, for the erection of a one-story power plant at Newport, R. I., to cost $900,000.

Philadelphia

PHILADELPHIA, Nov. 27.

As showing the plans of the War Industries Board to organize for war work the factories of the country which are engaged on so-called non-essentials, it is interesting to note that the Victor Talking Machine Co., Camden, N. J., has been awarded a Government contract for war material. It is understood that only a part of the talking machine plant will be devoted to war work for the present. New equipment was purchased some weeks ago. The organization of automobile and accessory plants for war work is also indicated by the report that the Atwater Kent Mfg. Works, Philadelphia, maker of ignition systems for automobiles, is ready to devote its large plant to the manufacture of war material as soon as a Government contract is signed. New machine tools will be purchased, tentative negotiations now being made.

The Government is recognizing the railroads' need of locomotives and is giving A1 priority to equipment for the new erecting shop of the Baldwin Locomotive Works. A large gain in production has already been made this month. It is reported that the first week of the month 70 locomotives were built, the next week the record was 78 and 100 a week will now be the production. With the new plant, which will be ready early next year, this capacity will be considerably increased. Orders were placed last week with the Pawling & Harnischfeger Co. and the Shepard Electric Crane & Hoist Co. for 20 large cranes for the new shop. The total cost is approximately $900,000. There were four 150-ton, four 100-ton, two 70-ton, two 50-ton and eight 20-ton.

It is also unofficially reported that the Government is urging the railroads to increase their facilities wherever possible for the manufacture of locomotives and cars. The Pennsylvania Railroad Co. has awarded contracts for extensions at its Columbus, Ohio, shops. Three new buildings will be erected at a cost of about $1,000,000. Buying of equipment will be done in Pittsburgh. Plans for increasing the equipment at the Altoona, Pa., shops are also said to be under consideration.

Although no cancellation of orders has been reported, it is said here that the plans of the Baldwin Locomotive Works for a shop at Vladivostock, Siberia, for the Russian railroads has been temporarily held up. At last report the experts sent from the Baldwin shops had not sailed from a Pacific port, and possibly will not do so until a more stable form of government is obtained in Russia.

Shipbuilders continue to buy, but are having difficulties in getting equipment as quickly as required. The American International Shipbuilding Corporation has placed an order with the Shepard Electric Crane & Hoist Co. for 45 hoists for its shops at Hog Island. It has also issued a small list of tools needed for a machine shop. Equipment is being bought for one shop at a time. The Clinton Shipbuilding & Repair Co., Philadelphia, is making numerous additions and improvements for the building of steel barges. A small quantity of equipment will be purchased.

The Tioga Steel & Iron Co., subsidiary of the Taylor-Wharton Iron & Steel Co., has been buying additional large tools for its gun machining shop and smaller tools for a tool room. The Frankford Arsenal continues to buy miscellaneous tools, mostly for fuse work.

The Philadelphia & Reading Railroad will build a new machine shop at Erie Avenue and Tulip Street, for which equipment has been ordered. The Tioga Machine Co. will build a machine-shop addition at Ontario and Twenty-third streets, and will need a few tools. The New York Shipbuilding Corporation has bought equipment for a forge shop addition.

The Carlson-Wenstrom Co., manufacturer of ball bearings, expects to build a new plant at East Stroudsburg, Pa., for the fulfilling of a war contract. The Merchant & Evans Co., Philadelphia, has bought a few new tools for the manufacture of universal joints for automobiles. The Arguto Oilless Bearing Co., which had plans prepared for the erection of a plant at Wayne Junction, Philadelphia, for manufacturing a newly patented ignition system, announces that nothing will be done until after normal conditions return. The J. G. Brill Co., Philadelphia, is manufacturing airplane engines for the Government.

The Lykens Valley Fuel Co., Reading, Pa., has been incorporated with a capital of $10,000 to build a plant at Williamstown for the manufacture of coal briquettes. John J. Knoll, Charles E. Kirlin and Donald B. Heilman are the incorporators.

The H. Belfield Co., 435 North Broad Street, Philadelphia, manufacturer of plumbing supplies, steam fittings, etc., has awarded a contract for the construction of additions to its plant to cost $100,000. The structures will comprise a one-story foundry, 100 x 280 ft.; five-story manufacturing plant, 100 x 280 ft.; one-story power plant; and one-story warehouse, 100 x 280 ft. The William Steele & Sons Co., 30 South Fifteenth Street, is the contractor.

The Acme Steel Products Co., Philadelphia, has been incorporated with a capital of $5,000 to manufacture steel and iron specialties. A. L. Wurster, Haddon Heights, N. J., heads the company.

Halstead & Co., 1129 Cherry Street, Philadelphia, operated by the estate of L. R. Halstead, manufacturers of brass and bronze products, have filed plans for improvements in their brass foundry to cost about $3,000.

The J. G. Brill Co., Sixty-second Street and Woodland Avenue, Philadelphia, has commenced the manufacture of the new Liberty motors for airplane service for the Government at its works. Considerable new machinery has recently been installed.

The Philadelphia & Reading Railroad, Reading Terminal, Philadelphia, has taken bids for the erection of a new 16-stall engine house, 200 ft. in diameter, and one-story machine shop, 156 x 220 ft., at its Erie Avenue yards. S. T. Wagner is engineer.

The William Cramp & Sons Ship & Engine Building Co., Philadelphia, has purchased property, about 143 x 143 ft., adjoining its works at Adams and Thompson streets, for extensions.

The Hulton Printing Processing & Dyeing Co., 3851 Frankford Avenue, Philadelphia, has awarded a contract for the erection of a new one-story machine shop, about 72 x 186 ft., to cost $21,000.

The Stokes Rubber Co., Trenton, N. J., will erect a one-story addition, 22 x 65 ft., on Taylor Street.

The Columbia Bronze Foundry Co., 529 Columbia Avenue, Camden, N. J., has increased its capital from $10,000 to $200,000.

The Schwab-Kenemuth Co., Bradford, Pa., has been incorporated with a capital of $15,000 to manufacture automobiles. John S. Kenemuth, Bradford, is the principal incorporator.

The Calley Iron Works, West Street, Williamsport, Pa., is having plans prepared for the erection of a one-story addition. W. J. Riley is president.

The Rowe Motor Mfg. Co., Downingtown, Pa., manufacturer of motor trucks, is having plans prepared for the erection of a one-story building, 120 x 200 ft., on property recently acquired at Lancaster, to form the initial unit of its proposed new plant. Samuel J. Rowe, president.

The Holgate Brothers Co., Kane, Pa., operating a woodturning works at Biddle and Welch streets, will build a two-story addition, about 35 x 165 ft., to cost $18,000. W. H. Davis is general manager.

The Reifft & Nestor Co., Lykens, Pa., has been incorporated with a capital of $140,000 to manufacture taps and dies. The officials of the new company are operating a local works under the name of Nestor & Reifft, for the manufacture of machine tools. The incorporators are John S. Reifft, J. P. Nestor and B. M. Kline.

Pettinos Bros., Bethlehem, Pa., manufacturers of graphite products, have acquired property adjoining their works for extensions.

The Allentown Standard Mfg. Co., Allentown, Pa., has completed the erection of its new plant, which will be devoted to manufacturing sheet iron and metal ware. Henry J. Franklin is president and Samuel I. Periman, secretary and treasurer.

Spang & Co., Etna Street, Butler, Pa., manufacturers of oil well supplies, will build a one and two-story addition to their plant, about 170 x 250 ft., to cost $150,000.

W. L. Browning, Wayne, Pa., has acquired the machine shop of Lownes & Butler, Washington Street, near DeKalb Street, Norristown, Pa., and is planning improvements.

The National Carbon Co., Cleveland, has acquired property at Scranton, Pa., and contemplates the erection of new works.

The Guerber Engineering Co., Bethlehem, Pa., manufacturer of structural shapes and railroad specialties, has increased the capacity of its plant about 50 per cent. A considerable portion of the works is now being devoted to the manufacture of iron and steel products for the Government.

Baltimore

BALTIMORE, Nov. 26.

The Baltimore Dry Dock & Shipbuilding Co., Baltimore, will erect a boiler house, pump room and other buildings at a cost of about $25,000.

The Federal Electric Welding Co., foot of Thames Street, Baltimore, will build a one-story repair shop, 18 x 36 ft.

The Pyrites Co., Ltd., Wilmington, Del., will rebuild the factories recently destroyed by fire.

The American Chain Co. of Virginia, Norfolk, Va., recently incorporated, has awarded a contract for its new works, to consist of two initial buildings, one-story, 90 x 560 ft. and 60 x 300 ft. respectively. It is a subsidiary of the American Chain Co., Bridgeport, Conn.

Cahill & Co., Second and French streets, Wilmington, Del., are taking bids for the erection of a two-story building to cost about $30,000, to replace their carriage and automobile factory recently destroyed by fire.

Reus Brothers, 146-50 West Mount Royal Avenue, Baltimore, have acquired property adjoining their plant for the construction of a new machine shop. A new ignition department for repair and maintenance work for automobile systems will also be installed.

The F. X. Hooper Mfg. Co., Glenarm, Md., manufacturer of rotary printing presses, is planning to immediately rebuild its plant recently destroyed by fire.

The Piot-Rola Mfg. Corporation, Wilmington, Del., has been incorporated with a capital of $1,500,000 to manufacture motion picture machinery. John J. Jolls and K. E. Longfield, Wilmington, are the incorporators.

The Bureau of Yards and Docks, Washington, D. C., has taken bids for the erection of a new one-story foundry, 54 x 275 ft., and a five-story optical works, 35 x 60 ft., at the Washington Navy Yard.

The Louisana Shipbuilding Co., Richmond, Va., has been incorporated with a capital of $1,500,000. James Mullen and Cyrus W. Beale, Richmond, are the incorporators.

Chicago

CHICAGO, Nov. 26.

The Rock Island Arsenal has completed distributing orders for the huge number of machine tools it requires for the manufacture of French 75 mm. gun carriages, practically all of the dealers and district sales offices getting their share. No new lists of notable size have made their appearance in the past week, but there are still many important orders pending against old lists. The Nordyke & Marmon Co., Indianapolis, has placed additional orders for turret lathes. The Holt Mfg. Co., Peoria, Ill., has not yet placed all of its orders. The Four Lakes Ordnance Co., Madison, Wis., continues to buy to round out its equipment.

In a number of cases conflict has arisen as to which deliveries should precede where buyers have class A priority certificates, and in some cases the expected order of delivery has been reversed. So many class A certificates are now extant that the broad classification does not mean anything, and sub-classifications must rule. In several instances industrial buyers have cheerfully consented to a long postponement of delivery when they learned that the Government needed the tools. Dealers are not taking chances and will not deliver a machine until they receive specific Government authority. One company is advising all customers, to whom they have sold machines for future delivery, to obtain priority certificates regardless of what class they may come under. The same seller is also inserting in contracts a clause that the tools purchased shall not be resold, this proviso being directed against speculators.

Through the Abell-Howe Co., Chicago, Westinghouse Church Kerr & Co. have purchased a 10-ton and a 15-ton crane for the Hydraulic Pressed Steel Co., Cleveland. The Abell-Howe Co. also has sold to the International Shipbuilding Co., Orange, Tex., three 3-ton American electric hoists.

The George A. Fuller Co. has been awarded the general contract for the eight-story concrete factory, 100 x 100 ft., to be erected at West Kinzie and Franklin streets, Chicago, for the Union Special Machine Co., at an estimated cost of $125,000.

The general contract for a one-story factory at 3239 and 3241 South La Salle Street, Chicago, for the International Leather & Belting Co. has been awarded to Jacob Rodatz, 209 South La Salle Street, Chicago. It will cost $20,000.

Marshall Field & Co., Chicago, will erect a garage covering a city block, 238 x 354 ft. Graham, Anderson, Probst & White, 80 East Jackson Boulevard, Chicago, are taking bids for the structure, which will be one and two stories and cost about $400,000.

The plant which the American Wire Fabrics Co. will build just south of Blue Island, Ill., on a site of nine acres recently purchased, will cost $250,000. Four one-story buildings are to be erected.

It is reported that extensive additions are to be made to the plant of the Standard Steel Car Co., Hammond, Ind., to facilitate handling a large war order for the execution of which 10,000 additional men will be employed.

Sears, Roebuck & Co., Chicago, have purchased 280 acres at Wood River, Ill., where it is said a plant will be erected for the manufacture of tractors, stoves and other products.

The V. A. Smith Co., Chicago, maker of boilers and furnaces, has purchased the Maple City Foundry, Monmouth, Ill., which will be enlarged for the manufacture of their products. W. C. Talbot, who sold the foundry, will remain as manager.

The Keystone Steel & Wire Co., Peoria, has completed the steel work of a large machine shop for which the equipment has been provided, either by recent purchases, or transferring machinery from other parts of the plant.

The Ogden Mfg. Co., Ogden, Iowa, has been incorporated with a capital stock of $10,000 to manufacture automobile and truck chains and anti-skid devices. The officers are O. M. Needham, president; C. O. Nelson, secretary, and Orson Peterson, treasurer.

The Stutesmar Farm Tractor Co., Chicago, has been incorporated in Delaware with a capital of $100,000 to manufacture farm tractors and machinery. Frank J. Stutesmar, Cary W. Martin and George R. Walker, Chicago, are the incorporators.

The Fort Wayne Tire & Rubber Mfg. Co., Chicago, has been incorporated in Delaware with a capital of $500,000 to manufacture automobile tires and rubber products. L. E. Kraft, J. C. Brown and H. J. Karr, Chicago, are the incorporators.

Milwaukee

MILWAUKEE, Nov. 26.

Orders booked and delivered by machine tool manufacturers in this district during November are by far the largest ever known in the history of the industry. After Jan. 1 the facilities for manufacturing milling machines will be considerably enlarged by extensions to shops now under way, but the additional capacity thus available is virtually occupied by the business on hand. As practically all tools now manufactured are for Government account, machine tool builders are not seriously affected by the growing acuteness of the car shortage and congestion of freight transportation as are other manufacturers. It is noticeable that industries of a more or less non-essential type are getting along with existing facilities, and a temporary halt has been called on expansion. Essential industries, however, are filling the void thus created by pushing their extensions more rapidly.

The Harley-Davidson Motor Co., Milwaukee, manufacturer of motorcycles, engines, parts, etc., has awarded contracts for the erection of a one-story steel and brick addition, 120 x 180 ft., to its works at Thirty-eighth and Chestnut streets. It will be used as a machine shop.

The Common Council, Hartford, Wis., has engaged Andrew Martin, consulting engineer, to prepare specifications for a new pumping station and reservoir for the municipal waterworks system, at an estimated cost of $20,000. The work will be undertaken next spring.

The Eagle Mfg. Co., Appleton, Wis., manufacturer of tractors, gas engines and farm machinery, has awarded the general contract for the erection of a one-story brick, steel and concrete machine shop, 120 x 120 ft., to Greunke Bros. It will be equipped principally for tractor production and

when completed will cost about $50,000. Frank Saiberlich is president and general manager.

The Milwaukee Ice Machine Co., Milwaukee, has been incorporated with an authorized capital stock of $50,000 by Edwin Olsen, Fred Marggraff and Matthew Ferko. It intends to manufacture a new line of refrigerating machinery and equipment.

The DePere Mfg. Co., DePere, Wis., will start work Dec. 1 on the construction of fifty 200-hp. marine boilers for the Emergency Fleet Corporation, which will require a large part of the capacity of its boiler and structural shop for six months or longer. In addition, the company is working on private contracts which will keep it at maximum capacity for a long time ahead. The plant is closely affiliated with the Joliet, Ill., Bridge & Iron Co., and A. W. Woodman is president of both companies. Ward Clark is manager at DePere.

The Northern Wood Products Co., Glidden, Wis., will spend about $40,000 in the erection and equipment of additions to its hardwood products factories and power plant. W. A. Thomas is president and general manager.

The Lasure Friction Clutch Co., Watertown, Wis., has accepted contracts from gas engine manufacturers for clutch requirements during the coming year which insures capacity operation of its plant for at least eight or ten months.

The Liberty Foundry Co., Milwaukee, which has been incorporated with a capital stock of $30,000, intends to erect a brick and steel plant, 60 x 120 ft., with auxiliary buildings, in West Allis and will take bids after Dec. 1. Gerhardt W. Mockly is president and W. J. Buckley secretary. Temporary offices have been established at 867 Grant Boulevard.

William Koeck, Oshkosh, Wis., has organized the Oshkosh Auto Jack Mfg. Co. to manufacture jacks and other automobile accessories and supplies. Factory quarters have been established in the Libbey Building. For the present the castings will be purchased under contract.

The Liberty Mfg. Co., Milwaukee, has been incorporated with an authorized capital stock of $200,000 by William J. Schubert and Walter J. Raley, of the Milwaukee Auto Specialty Co., 705 Chestnut Street, and William Saddlemire, 450 Twenty-ninth Street, to manufacture automobile and motor truck parts and other supplies for manufacturers executing Government contracts. Details of the project will be announced later.

A. J. Schutte, architect, 421 Camp Building, Milwaukee, who has been preparing plans for a $30,000 motor truck factory in North Milwaukee, announces that the owners, as yet unnamed, have indefinitely postponed the project because of unfavorable conditions surrounding the building material, labor and equipment markets.

The National Auto Wheels Corporation, Wausau, Wis., has been incorporated with a capital stock of $50,000 by M. Philopp, E. J. Coerper and Robert T. Steretzky.

Detroit

DETROIT, Nov. 26.

This city is readjusting itself for what is believed will be a period of the greatest industrial activity in its history. War contracts placed by the Government approach $500,000,000. A large part of these have been placed with automobile companies which are particularly adapted for the manufacture of munitions.

In addition to the $30,000,000 contract, to handle which Dodge Bros. are building a factory, and a huge order placed for trucks and airplane engines with the Packard Motor Car Co., the Cadillac Motor Car Co. has announced the beginning of work on a second order which is said to call for millions of dollars worth of airplane engines and munitions. The Cadillac Co. has been turning out a large number of automobiles for the Government and will continue the manufacture of pleasure cars. Large metal working companies in this district are working on Government orders, and plans have been made by smaller firms by which Government contracts can be divided among them.

The Ford Motor Co. is taking on more Government work and if necessary will turn over its entire plant, employing 30,000 men, to the Government.

The American Twist Drill Co., Detroit, recently organized, has obtained the plant of the Holihan Mfg. Co., 866 West Jefferson Avenue, Detroit, and will manufacture forged high speed twist drills. Arthur C. O'Connor is president; Peter J. Hoehscheid, vice-president; John O'Connor, treasurer, and Gerald C. Hodge, secretary.

The Blood Bros. Machine Co., Allegan, Mich., has moved into a larger plant where it will employ 40 more men and machines. It manufactures universal joints for automobile trucks.

The Republic Motor Truck Co., Alma, Mich., contemplates the manufacture of 40,000 trucks during the coming year. To care for this increased production additions are under way which will increase the floor space 70,000 sq. ft.

The Solvay Process Co., Detroit, will not immediately begin work on its addition on Zug Island, where it recently purchased 1300 ft. frontage on the Detroit River.

Assets of the Detroiter Motor Car Co., Detroit, will be offered at auction Nov. 27. It is the successor of the Briggs Detroiter Co., which became insolvent three years ago.

The Chevrolet Motor Co., Flint, Mich., a subsidiary of the General Motors Co., has taken out a permit for extensions to cost $150,000. This follows a permit recently secured for additions which call for $100,000 and still further building plans costing $30,000.

The Saginaw Shipbuilding Co., Saginaw, Mich., will increase its capital from $350,000 to $500,000 and nearly double the capacity of its plant. Machinery will be installed shortly.

The F. F. Wood Motor Co., Grand Rapids, Mich., has been organized with $15,000 capital by F. F. Wood, W. L. Marsh and F. M. Todd.

The Michigan Bolt & Nut Works, Detroit, is completing an addition which will cost $100,000, being the second unit in expansion.

Dodge Bros., Detroit, will add the manufacture of trucks to their product, each to have a capacity of 1500 lb.

The Wolverine Motor Co., Kalamazoo, Mich., has increased its capital stock to $250,000 and is planning for the production of 600 automobiles the first year.

The Independent Stove Co., Owosso, Mich., has let contract for a four-story addition, 60 x 100 ft., to its plant, to be completed by Jan. 15.

C. R. Hardy, Louisville, Ky., will manufacture light vehicles and automobile parts in Grand Rapids, Mich., occupying the former plant of the Jelke-Steck Co.

Cleveland

CLEVELAND, Nov. 26

The purchase of machinery for Government work continues at a rapid rate. The demand is largely for machines for large shells and for shipyards. Contracts for marine engines have been distributed among Ohio plants, and additional equipment is being purchased for their manufacture. Dodge Bros., Detroit, purchased a large amount of equipment the past week. A local manufacturer took an order from this firm for 30 screw machines. The Ford Motor Co. purchased some additional equipment for airplane work. Two new inquiries have come out from Ohio manufacturers for equipment for Government orders, one being for about one hundred machines, and the other for 225 machines of various types. The demand at present is mostly for large machines, including planers, radial drills, grinders, gear cutters and boring machines. Deliveries on milling machines are growing worse, and some manufacturers cannot make shipments before 1919. On lathes 20 in. and larger deliveries are tighter, and manufacturers are promising shipments from February to July.

Thirteen buildings for use for automobile truck repair sheds by the American forces in France have been fabricated by the Austin Co., Cleveland, Ohio, and were recently shipped. These are 100 x 200 ft. The company has also received a Government contract for an airplane repair shop for shipment to France, this to be 260 x 600 ft., and for an airplane and storage building, 300 x 380 ft., to be erected at Brooklyn, N. Y., for the Bureau of Yards and Docks.

The Blomquist-Eck Machine & Mfg. Co., Cleveland, will move about Dec. 1 to its new plant on East 152d Street, where a new ball bearing horizontal boring, drilling and milling machine will be manufactured. All the equipment in the plant will be motor driven.

The plants of the Bowen Mfg. Co., Auburn, N. Y.; Zerk Mfg. Co., Cleveland; Wiskley Co., Detroit, and the Canadian Wiskley Co., Windsor, Ont., have been consolidated, to be known as the Bowen Products Corporation, with a capital stock of $2,500,000. The merged plants manufacture automobile parts and are now largely engaged on Government motor truck work. The main offices will be located at Auburn. E. W. Bowen is president and George W. Severson vice-president.

The Kirk-Latty Mfg. Co., Cleveland, has placed a contract for the erection of a two-story addition 83 x 282 ft. for office and shipping purposes.

The Metalcraft Co., Cleveland, has increased its capital stock from $100,000 to $200,000 and is considering extensions.

The Davis Tool Co., Cleveland, has been incorporated with a capital stock of $50,000 by J. H. Grayson, C. C. Howard and others.

The National Carbon Co., Cleveland, has placed a contract for the erection of a two-story factory.

The American Metal Wheel Co., Toledo, and the National Wheel Co., Perrysville, Ohio, have been consolidated under the name of the American-National Co., with a capital stock of $1,000,000. William R. Diemer, president of the former company, is at the head of the new organization. Henry Streetman is vice-president and John C. McKisson, secretary-treasurer. The company will continue the manufacture of children's vehicles.

The Harrington Lock Co., Toledo, has been incorporated with a capital stock of $25.000 by Bert Harrington, Thomas L. Gifford, and others.

The American Magneto Co. will move its plant from Monroe, Mich., to Toledo and will occupy quarters at Fernwood Avenue and the New York Central Railroad. Some new equipment will be required.

The Taylor Welder Co., Warren, Ohio, has been incorporated with a capital stock of $10,000 by A. C. Taylor, A. E. Hackett and others.

The Dall Motor Parts Co., Vermilion, Ohio, has increased its capital stock from $35,000 to $100,000 and contemplates building extensions.

The Gramm-Bernstein Co., Lima, Ohio, has placed contracts for an addition 165 x 200 ft. to be used for assembly purposes and a paint shop. It is working on Liberty motor trucks and needs greater capacity.

The Sebring Tire & Rubber Co., Sebring, Ohio, will erect additions and install new equipment that will more than double its present capacity.

The Thomas & Armstrong Co., London, Ohio, will erect a new factory.

The Phoenix Electric Co., Mansfield, Ohio, will erect a one-story factory, 50 x 100 ft.

The National Pipe Die Machine Co., Archbold, Ohio, has reopened its plant and is manufacturing a line of pipe threading machines.

The Automatic Sprinkler Co. of America, Youngstown, Ohio, which contemplated an addition to its plant, has postponed it until the early part of next year.

The Elgin Tractor Co., Piqua, Ohio, will immediately commence the erection of the first unit of its new plant, 80 x 220 ft., to cost about $50,000. Contracts have been let.

Cincinnati

CINCINNATI, Nov. 26.

Co-operation in this section by manufacturers and the Government has now reached the point where it is nearly 100 per cent perfect. The Cincinnati branch of the National Metal Trades Association, of which A. H. Tuechter is president and J. M. Manley secretary, has been especially active in rushing the production of machine tools that are needed directly or indirectly for Government work. The absence of labor troubles also reflects credit on workmen employed by the metal-working industries.

No new large lists of machine tools have been issued, but local firms are anticipating one from the Smith-Form-A-Truck Co., Chicago. According to current rumors this company expects to engage extensively in the manufacture of munitions. Reports are also in circulation that several Canadian firms are expecting rush orders for shells from both this and the French governments, and will need lathes especially to take the place of those now out of commission. Nothing definite can be learned of this, however. With the exception of small lathes and shaping machines, second-hand machine tools are very scarce and are being sold above the cost of new machines in many instances.

The John H. McGowan Co., Cincinnati, is inquiring for a vertical boring mill with a table 60-in. or under. It manufactures pumping machinery.

The Rapid Cooler Auto Radiator Co., Cincinnati, has been incorporated with $60,000 capital stock by J. B. Towler and others. Manufacturing plans have not yet been given out.

Hamilton, Ohio, contemplates adding to its municipal waterworks plant. No definite plans have as yet been decided on.

The Hamilton Machine Tool Co., Hamilton, Ohio, whose plant was recently out of commission a few days, due to trouble in its power plant, is now operating at full capacity.

The Liberty Tool & Production Co., Dayton, Ohio, has been organized and will be incorporated at an early date. Fred Stevens and Herbert L. Beeler, both formerly of the Stevens Mfg. Co., are the principal members of the new firm. It will make a specialty of tool and die work.

The Davis Sewing Machine Co., Dayton, Ohio, has issued an additional list of machine tools wanted that includes a number of large lathes, milling and small drilling machines.

The Dayton Metal Products Co., Dayton, Ohio, will build an addition to its plant on Taylor Street, estimated to cost $7,000. It will also add equipment to its electrical plant on Ludlow Avenue.

The John W. Brown Mfg. Co., Columbus, Ohio, maker of automobile lamps, is reported to be adding to its equipment for the purpose of taking on a Government munition contract.

The W. E. Lamneck Co., Columbus, has a contract for furnace fittings from the Government and is adding machinery. Thomas W. Pearson is general manager.

The Hardware Specialties Mfg. Co., 124-126 East High Street, Springfield, Ohio, has been incorporated with $10,000 capital stock. C. J. Tuttle is president and R. L. McIntire, secretary.

The Lunkenheimer Co., Cincinnati, manufacturer of engineering specialties, has acquired a 6-acre tract, adjoining its property, for extensions. No definite plans have been prepared for the additions.

Indianapolis

INDIANAPOLIS, Nov. 26.

The Colonial Broom Mfg. Co., Indianapolis, has been incorporated with $50,000 capital stock to manufacture brooms, brushes and novelties. The directors are E. E. Stokes, Perry M. Murphy and Samuel Lewis.

The Weidely Motors Mfg. Co., Indianapolis, has increased its capital stock from $600,000 to $1,100,000, made necessary, it is said, by a $3,000,000 contract with the Cleveland Tractor Co. to manufacture motors. New machinery to be purchased, it is estimated, will cost about $70,000.

The National Fuel Saving Co., Evansville, Ind., has been incorporated with $50,000 capital stock to manufacture smoke consuming devices. The directors are Henry C. Kleymeyer, William A. Koch, Alfred A. Klein, John D. Craft and Morton Mannheimer.

The H. E. Miller Mfg. Co., Indianapolis, has been incorporated with $25,000 capital stock to manufacture permutation hasp locks and other articles. The directors are H. E. and M. Miller and R. D. Burress.

The Wagner Axle Co., Anderson, Ind., has a Government contract amounting to $4,000,000 and will increase its floor space to 280,000 sq. ft. and add new equipment.

The Pittsburgh Model Gas Engine Co., Peru, Ind., has purchased $50,000 worth of machinery and will increase its force by 100 to 125 men. It has received Government orders through the Baldwin Locomotive Works.

The Central South

LOUISVILLE, KY., Nov. 26.

An increasing demand for electric motors is a feature of the local market. With coal scarce the motor offers a ready solution to the problem of additional power, wherever central station service is available. Second-hand equipment is in good demand and generally selling at a premium. Structural iron foundry companies report a brisk business.

The Reciprocating Electric Tool Co., Louisville, has been incorporated with capital stock of $100,000 by J. J. Roberts, James K. Jarvis, F. L. Robinson and J. D. Kean. It will buy parts for electrical drilling and riveting tools, to be made in all sizes, and assemble them in Louisville. Later a factory will be erected to manufacture the parts. J. J. Roberts, 412 Courier-Journal Office Building, Louisville, may be addressed.

The Roy C. Whayne Supply Co., Louisville, is in the market for two low pressure, belt or steam driven air compressors, with a capacity of about 900 cu. ft. each, with air lock; also for two double-driven engines, with drums side by side.

The Continental Car Co. of America, Louisville, is in the market for a 6 to 10-ton alternating-current electric hoist, 220 volts, to operate on a 12-in. I-beam.

Paul J. Mahoney, Glasgow Junction, Ky., is in the market for a 25-hp. boiler and a No. 25 to 27 Star well-drilling rig.

W. C. Daniels & Sons, Whitesburg, Ky., will make improvements to their electric lighting plant to cost several thousand dollars.

The Southern Machinery Exchange, Somerset, Ky., is in the market for a 5-hp., 220-volt, single-phase motor, any speed.

The Darling Air Craft Co., Louisville, has been incor-

porated with capital stock of $25,000 by Omer F. Darling, Henry T. Kraft and Clem W. Huggins, Inter-Southern Building. It contemplates assembling airplanes and later may erect a factory.

The Frick-Lindsey Co., Winchester, Ky., is preparing to establish a shop for working over oil-well casings and other piping, and will install re-threading and cutting machinery.

The Gallatin Buggy & Implement Co., Gallatin, Tenn., has increased its capital from $5,000 to $15,000. S. T. Ramsey, W. B. Echols and J. T. Durham are directors.

The Barker Lumber Co., American National Bank Building, Knoxville, Tenn., contemplates development of sand mines and requires machinery for mining and lifting sand vertically 25 ft., using steam pumps, nozzles and elevating machinery to handle up to 5000 yd. per day.

The Loping Horse & Novelty Co., Huntington, W. Va., has been incorporated with capital stock of $25,000 and will establish a factory. Drill presses, iron bending and wire-wheel making machinery are required. George L. Summers is president, and P. M. Hayes, manager.

Texas

AUSTIN, Nov. 24.

The machinery and tool trades have been stimulated by recent rains covering most of the drought stricken area of the State. There is an unusually large demand for small tools.

The Petroleum Refining Co., Houston, will build a machine shop, carpenter shop and install a steam plant in connection with its oil refinery which it is constructing at a cost of about $1,000,000. It will have a daily capacity of 15,000 bbl.

J. F. Christian will rebuild his cotton compress at Lufkin recently wrecked by an explosion. It will be of larger capacity than the one destroyed.

The Big Four Ice Co., Waco, will enlarge its plant by installing a 50-ton electrically driven ice machine. It will also build a 3000-ton cold storage plant and install an automatic stoker. The total cost of the improvements will be $50,000.

Catalogs Wanted

The San Antonio Machine & Supply Co., San Antonio, Tex., desires catalogs of machinery and factory and mill supplies, together with price lists and discount sheets.

California

LOS ANGELES, Nov. 20.

The American Can Co., Los Angeles, is planning for the erection of an addition, 124 x 392 ft., to its plant at Forty-eighth Street and Santa Fe Avenue, Vernon, to cost about $1,100,000. It is proposed to build a series of units to increase the capacity to over 2,000,000 cans in a 24-hr. day. C. J. Gordon is local sales manager.

The Crawford & Saunders Aircraft Co., Los Angeles, has been incorporated with a capital of $200,000 to manufacture airplanes. Harry J. Crawford, 2120 South Third Street, Santa Monica; Leslie R. Saunders, 903 West Thirty-seventh Street, Los Angeles, and John G. Harrah, 3815 Ocean Front, Venice, are the incorporators.

The Pacific Fire Extinguisher Co., Los Angeles, has acquired property at 125 East Ninth Street for the manufacture of a patented fire alarm attachment.

The Oldfield Tire Co., Los Angeles, has been incorporated with a capital of $50,000 to manufacture automobile tires. The incorporators are Barney Oldfield and R. R. Colby, Los Angeles, and Frank L. Chance, Glendora.

The California Aviation Co., Los Angeles, is operating at capacity for the manufacture of airplanes for Government service. In connection with expansion of the works the company has received an offer to establish a plant at Portland, Ore. Earle Remington is general manager.

The San Francisco Bridge Co., San Francisco, has leased property at the corner of Fifteenth and Mateo streets, Los Angeles, and will establish a plant for the manufacture of fire briquets.

The Cementograph Co., 1084 West Thirty-ninth Place, Los Angeles, has been organized to manufacture imitation tiles. Harry J. DeTurck, 468 North Lake Street, and William F. Walling, 219 East Thirtieth Street, head the company.

The Republic Motor Truck Co., Alma, Mich., is reported to be considering the erection of new assembling works at San Francisco. It recently acquired property on Santa Fe Avenue, Los Angeles, for about $125,000 for the construction of a similar plant.

Fire, Nov. 17, destroyed a portion of the plant of the J. H. McMaster Machinery Co., San Francisco.

The Pacific Northwest

SEATTLE, WASH., Nov. 20.

Machine shops and foundries are working to capacity in an effort to keep up with the demand for tools and equipment. Many new plants are under construction in this section, and practically every foundry and repair shop has made or is making improvements and extensions. A good demand exists for second-hand tools, which are extremely scarce and are picked up as rapidly as they are put on the market.

Barton & Co., Seattle, have purchased a 15-acre tract, on which will be erected a packing plant to cost $250,000.

It is reported the American Can Co., Vancouver, Wash., plans the construction of a plant on a 17-acre tract which it owns.

The Collier Harvesting Co., Aberdeen, Wash., recently incorporated for $200,000 by J. F. Collier and M. J. Keating, plans the construction of a factory for the manufacture of a harvesting machine.

The Perine Machinery Co., Seattle, has increased its capital stock from $25,000 to $50,000.

The Harbor Island Mfg. Co., Inc., Seattle, is rushing work on the construction of its new sawmill on Harbor Island, which will have a daily capacity of 50,000 ft. and will specialize in shipbuilding lumber.

The Gardiner Mill Co., Roseburg, Ore., W. H. Jewett, owner, has completed plans for rebuilding its sawmill recently destroyed by fire. It will have a daily capacity of 75,000 ft.

The Valveless Pump & Foundry Company, Portland, Ore., has leased the former plant of the Portland Stove Works, which it is equipping for a foundry and machine shop. The first unit of the foundry has been placed in operation, and work on the machine shop and a second blast furnace will start at once. Its patented valveless pump has been manufactured on contract, but this will be one of the features of the new plant. M. L. Jones is president and T. H. Beverly, secretary.

The Salmon Bay Foundry Co., Inc., Seattle, has recently installed a new 20-ton furnace, 10-ton stationary crane, a mixer and new unit for cleaners, increasing its capacity more than 300 per cent in the past year. It makes a specialty of machinery and ship iron castings.

L. J. Simpson, North Bend, Ore., states that a syndicate will install a plant on Coos Bay, near North Bend, for the manufacture of box cars and finished airplane stock.

Canada

TORONTO, Nov. 26.

The American Steel Products Corporation, Brantford, Ont., has been organized with a capital stock of $1,000,000. It will take over the Dominion Steel Products Co., and it is reported that the capacity of the latter plant, which is manufacturing a line of propelling shafting, will be doubled The officers are W. P. Kellett, president; D. O. Johnston, vice-president; M. M. McGraw, treasurer; P. H. Secord, secretary, and W. S. Brewster, all of Brantford, and W. S. Tomlinson, Toronto.

The International Shipbuilding Corporation, New Castle, N. B., has commenced the erection of a plant at Nordin, N. B., for building wooden vessels.

The Dussault Co., Levis, Que., has completed arrangements for the erection of a machine shop, and construction will begin at once. Equipment will be purchased.

The Gray Marine Motor Co., Bridgewater, N. S., proposes to build a manufacturing plant there.

The Winnipeg Tool & Forging Co., Winnipeg, is being reorganized. It manufactures a special line of mechanical tools, wrecking bars, etc.

The Kent Shipbuilding Co., St. John, N. B., is interested in a company which proposes to build a shipbuilding plant at Tuft's Cove, near Dartmouth, N. S.

Gauvin & Beauchemin, civil engineers, Quebec, are preparing plans and specifications for power development at Armagy, Que., County Bellechasse, on Ricer Fourche-de-Nord-Ouest, and will receive bids for water turbines, dynamos, sluice gates, etc.

The City Council, Brantford, Ont., will receive bids for a 40 hp., 25 cycle induction motor for the sewage pumping station.

The City Council, Lethbridge, Alberta, will install a new turbo-generator and other power plant equipment to cost $65,000.

G. A. Roy of G. A. Roy, Ltd., Bagot, Que., is interested in a company which will erect a plant at St. Hyacinthe, Que., at a cost of about $60,000, to manufacture caskets and casket hardware.

The Holmes Foundry Co., Sarnia, Ont., recently incor-

porated, will build a plant, construction to be started at an early date.

The St. Andrews Wire Works of Canada, Ltd., Orillia, Ont., has secured a building at Strathroy, Ont., which it will remodel and equip for the manufacture of wire products, etc. G. M. Haldane is local manager.

The plant of the Mueller Mfg. Co., Ltd., Sarnia, Ont., which is being erected at Port Huron, is progressing rapidly, and plans are being prepared for a power house, 60 x 100 ft. When completed the plant will represent an investment of $400,000. James, Loudon & Hertzberg, Ltd., Toronto, Ont., are the consulting engineers.

J. A. Gregory, St. John, N. B., proposes to establish shipyards at St. George, N. B., to cost about $100,000.

The K. & S. Canadian Tires, Ltd., 527 Yonge Street, Toronto, will build a factory at Weston, Ont., 70 x 150 ft., to cost $60,000.

John Clement and C. H. Moineau, directors of La Campagnie de Breton Special, Three Rivers, Que., who are erecting a factory at a cost of $30,000, are in the market for boilers, engines, stack, belting, etc.

The forge shop at St. Anthony, N. B., owned by Philip Melanson, was completely destroyed by fire with a loss of $25,000.

The building at Niagara Falls, Ont., jointly occupied by the Davis-Bournonville Co. and the Davis Acetylene Co., has been taken over by the former company and will be operated exclusively for the manufacture of oxy-acetylene apparatus for the Canadian trade.

The Canadian Appliance Co., Ltd., Montreal, has been incorporated with a capital stock of $25,000 by Waldo W. Skinner, William G. Pugsley, George G. Hyde, and others, to manufacture equipment, appliances and specialties for railroads cars, machinery, tools, etc.

The Harrington Pick & Tool Co., Ltd., Toronto, has been incorporated with a capital stock of $50,000 by Frank S. Harrington, New York; John M. Blackhall, William P. Crow, 1353 Bathurst Street, Toronto, and others to manufacture tools, machinery, implements, etc.

La Compagnie d'Engin-Turbine Revolution, Limited, Montreal, has been incorporated with a capital stock of $100,000 by Charles J. E. Charbonneau, Dominique Pelletier and John Clement, all of Montreal; Bernard Melancon, Outremont, Que., and others to manufacture engines, motors, machinery, aeroplanes, automobiles, etc.

The Dominion Shipbuilding Co., Ltd., Toronto, has been incorporated with a capital stock of $1,000,000 by John M. Bullen, 44 King Street West; Harold L. Steele, 437 Broadview Avenue; James H. Fraser and others. It has secured a site and will soon commence the construction of a plant for building steel ships.

E. Langham, general purchasing agent, Canadian Northern Railway, Toronto, is in the market for two lathes with 24-in. swing, 8 to 12-ft. bed. Offers should be submitted with cuts and full description.

Pratt & Whitney, Dundas, Ont., machinery and tool manufacturers, have awarded contracts for the erection of a plant and office building to cost $200,000.

W. W. Porter, Detroit, is looking for a site at St. Mary's, Ont., where he proposes to build a plant for the manufacture of farm tractors.

Robert H. Hassler, Ltd., Indianapolis, Ind., manufacturer of shock absorbers for Ford cars, has decided to locate its Canadian factory at Hamilton, Ont. A building has been leased and operations will be started immediately. J. C. Piper will be managing director of the Canadian company.

Catalogs Wanted

The Cluff Ammunition Co., Ltd., Atlantic Avenue, Toronto, desires catalogs of equipment for a forging plant.

Government Purchases

WASHINGTON, Nov. 26.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, opening date unassigned, schedule 1581, for 72 motor generator sets, for various deliveries; opening date Dec. 18, schedule 1570, one 4-ft. plain radial drill, one tool grinder, five 5-ft. bed, 12-in., universal high-duty engine lathes, and one 12-ft. bed, 16-in. engine lathe, all for San Diego, Cal; opening date unassigned, schedule 1582, for five engine lathes for Annapolis, Md.

Bids will be received at the Bureau of Yards and Docks, Navy Department, Washington, until 11 o'clock a. m. Dec. 10, for providing and installing on the runway rails two 6-ton, 2-trolley, 5-motor bridge traveling cranes and one 3-ton swinging jib crane in the new galvanizing plant at the United States Navy Yard, Philadelphia, drawing and specification No. 2699. Bids will also be received until 11 o'clock a. m. Dec. 10, for providing and installing on the runway rails one 5-ton, 3-motor bridge crane, one 2-ton hand-operated bridge crane and one 1-ton hand-operated bridge crane in the machine shop at the submarine base, New London, Conn., specification No. 2701.

Bids were received at the Bureau of Supplies and Accounts, Navy Department, Washington, Nov. 16, for furnishing material and supplies for the naval service, as follows:

Schedule 2150½, steam engineering, class 31, Norfolk—One milling machine, duplex swivel head and one set cutters—Bid, 42, $10,030.20. Class 32—One horizontal spindle removable-housing milling machine and one set cutters—Bid 42, $10,173.50. Class 33—One 4-head adjustable-rail milling machine and one set cutters—Bid 42, $18,040.60.

Schedule 2276½, steam engineering; class 197, Philadelphia—13 toolroom engine lathes, back geared, screw cutting, motor driven—Bid 48, $972.75; 53, $1,454, $1,334, $1,220, $1,253, $1,299, and $1,177; 68, $953; 71, $1,095 and $850, alt.; 88, $1,360 and $1,370, alt.; 93, $1,629.50, $1,991.50, $1,391.50, alternate, and $1,726.65, alternate.

Names of the bidders and the numbers by which they are designated in the above list follow:

Bid 42, Ingersoll Milling Machine Co., Rockford, Ill.; 48, Monarch Machine Tool Co., Sidney, Ohio; 68, Philip Smith Mfg. Co., Sidney, Ohio; 71, W. E. Shipley Machine Co., Philadelphia; 88, Fairbanks Co., New York; 93, Manning, Maxwell & Moore, Inc., New York.

NEW TRADE PUBLICATIONS

Milled Screws.—Standard Pressed Steel Co., Twentieth and Clearfield streets, Philadelphia. Catalog. Illustrates, describes and lists an extensive line of milled screws with the V, United States standard or Whitworth threads. These include hollow and headed set screws, the latter with various styles of points, and cap screws with different kinds of heads. Mention is made of a line of shafting hangers and a cold-rolled steel collar for use with hollow or countersunk set screws. A number of tables of useful information are included.

Wood Screw Machinery.—Asa S. Cook Co., Hartford, Conn. Catalog. Shows a line of machinery for the manufacture of wood screws. The machines are arranged in the catalog in the order in which they are used in a plant. The method of manufacturing the screws is briefly described and data on the equipment and the force of operators required are included. For the most part a pair of pages is given to each of the machines, with a brief description on one and an illustration and table of the sizes that can be supplied on the other.

Elevating Trucks.—Barrett-Cravens Co., Transportation Building, Chicago. Folder. Treats of the use of elevating trucks in corerooms to lower the cost and increase the amount of production. The folder is a reprint of a portion of an article which appeared in THE IRON AGE, Oct. 11, 1917. An illustration of a truck handling a number of core racks supplements the text matter.

Steel Pulleys.—American Pulley Co., 4200 Wissahickon Avenue, Philadelphia. Booklet entitled, "Getting Maximum Pulley Efficiency." Points out briefly and in a non-technical way some vital facts regarding the efficiency of pulleys. The points to be considered in buying belt pulleys are listed and wood, cast iron and steel pulleys are compared from the viewpoint of transmission of power and service. These facts are supplemented by a brief description of the construction of the company's split steel pulleys and the results of a number of tests that have been made are included.

Reinforced Concrete Construction.—Turner Construction Co., 244 Madison Avenue, New York. Circular. Illustrates the 70 buildings erected by the company in 1916. These include factories, warehouses, office buildings, pier sheds, etc. Data on the quantity of material used and the length of time required to complete the buildings are presented. In the view of this city all of the different structures are numbered to correspond with the list showing the owner and the location of the building.

Tumbling Barrels and Dust Arresters.—Whiting Foundry Equipment Co., Harvey, Ill. Catalog No. 132, superseding No. 120. Pertains to a line of tumbling barrels that are made in a great variety of sizes and shapes. Illustrations of the different barrels are presented together with tables of the sizes in which they can be supplied. Mention is made of a line of dry and water cinder mills for recovering iron. A dust arrester with a screen cleaning device which was illustrated in THE IRON AGE, Aug. 5, 1915, is also featured. Several views showing tumbling barrels and the dust arrester in use are given.

THE IRON AGE

New York, December 6, 1917

ESTABLISHED 1855 VOL. 100 : No. 23

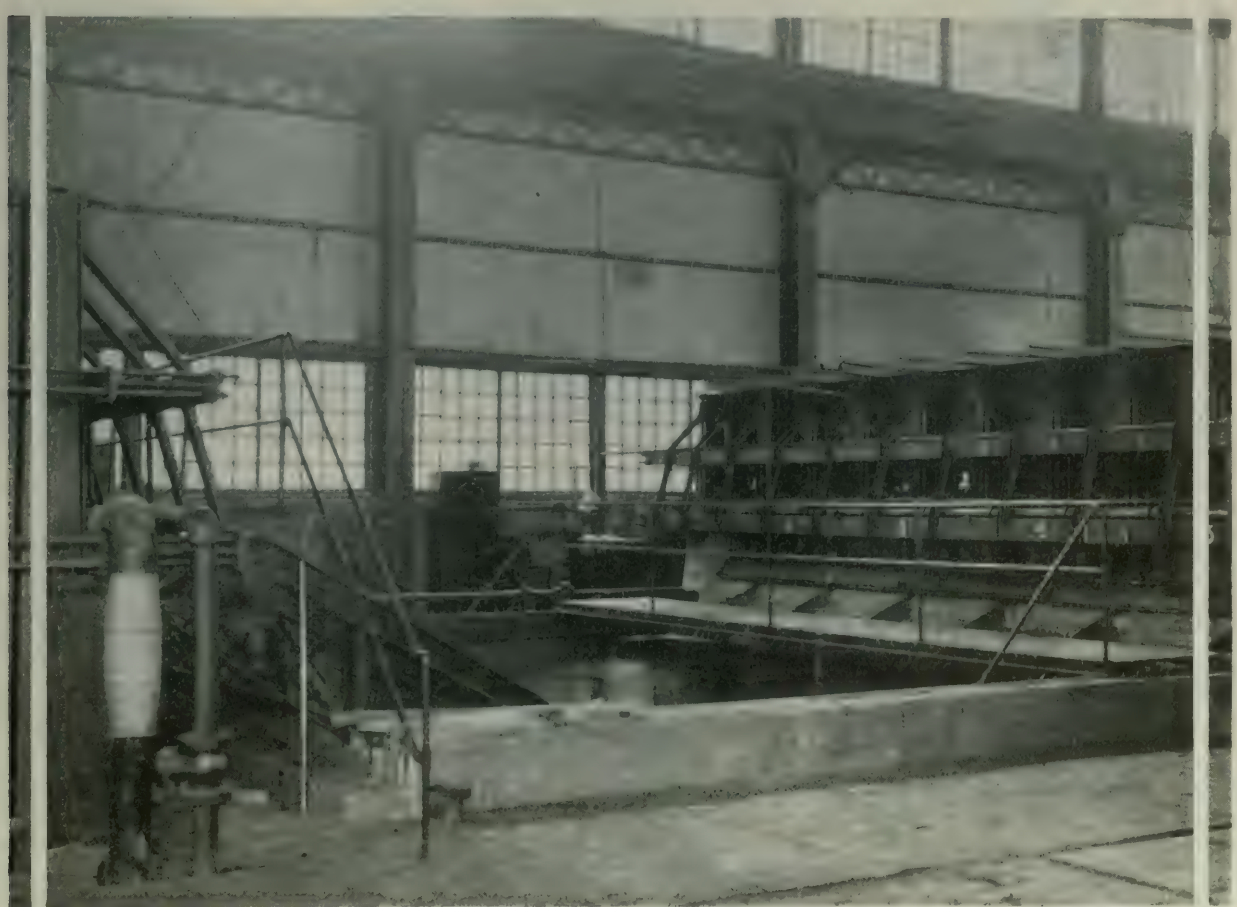
New Steel Works Heat-Treating Plant

Continuous Automatic Furnace for Long Round Bars in the Works of the United Alloy Steel Corporation, Canton

A PLANT designed for heat treating mill products of carbon and various alloy steels made by both the electric and open-hearth processes, for annealing bar stock and coils and for annealing and heat treating heavy forgings has recently been placed in operation by the United Alloy Steel Corporation, Canton, Ohio. A very important feature of this plant is a new type of automatic continuous furnace for heat treating long round steel bars in quantities.

The heat treating department occupies a modern mill type of building, 480 ft. long and 90 ft. wide, and conveniently arranged for handling material. It is served its entire length by a 10-ton Morgan electric traveling crane with a crane runway 25 ft. above the floor, and a duplicate crane will be installed shortly. All the handling work will be done by these two cranes. Steel is brought to the plant on industrial cars on narrow-gage tracks that traverse each end of the building. Extending half way through the plant on one side is a standard-gage track, on which steel is brought on railroad cars, and after being heat treated is reshipped in carload lots to the consumers. Stock that is to be cold drawn after annealing is taken in the small cars to the cold drawing department, where it is straightened, cut to length, rough turned, cold drawn, or turned and polished.

The automatic heat treating unit consists of two coke oven or natural gas fired furnaces, one for heating before quenching, a second for drawing after quenching, and a quenching tank, which is located between the two furnaces. These furnaces are used for heat treating round steel bars from



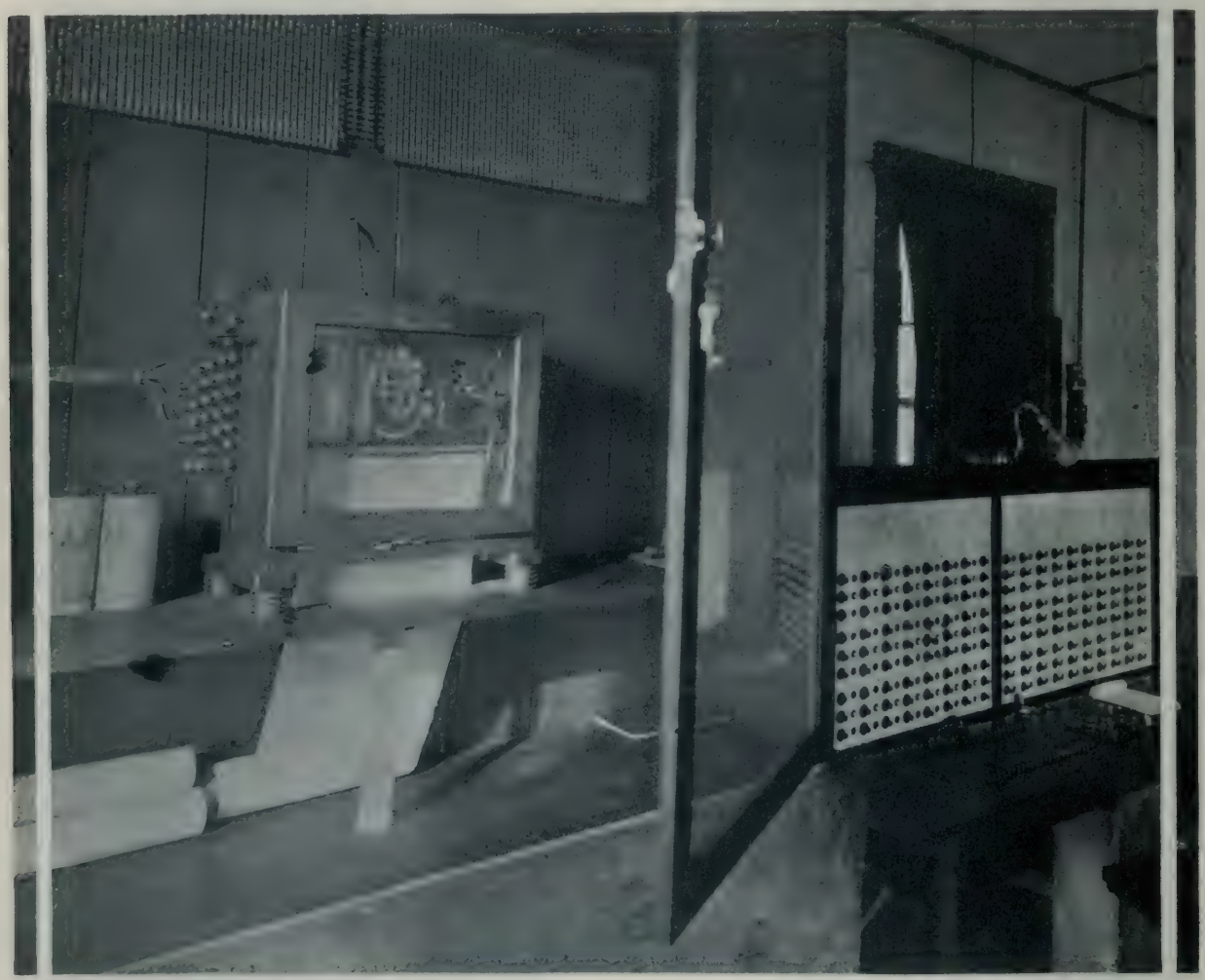
New Type of Continuous Automatic Furnaces for Heat Treating in Large Quantities Bars up to 25 Ft. in Length Which Are Mechanically Conveyed through the Furnaces Sidewise. The bars are discharged from the chamber of the heating furnaces at the right into the quenching tank between the two furnaces, and are then mechanically conveyed up the incline at the left and through the drawing furnace

1 to 2½ in. in diameter and in lengths up to 25 ft. The steel bars are mechanically conveyed through the furnaces sidewise by motor-driven conveyors, the width of the furnace chambers being sufficient to accommodate a bar 25 ft. long. The temperature of the automatic furnaces is taken by a row of thermocouples inserted in the discharge end of each furnace. These couples are connected to both indicating and recording potentiometers. These instruments are located adjoining the furnaces, the control of the furnaces being independent of the control system used in connection with the other furnaces. Both Brinell and tensile strength tests of the bars are taken at such intervals as will assure uniformity of results.

For general heat treating on all sizes of round bars, four standard under-fired furnaces are provided, arranged in two rows, with an oil quenching tank at one end of two furnaces and a water quenching tank at the end of the other two. These furnaces have hearths 25 ft. in length and 46 in. wide and may be charged or discharged from either end.

For annealing there are two stationary floor level furnaces and two car type furnaces. The former have hearths 10 ft. wide and 20 ft. in length and are used for pipe and pot annealing of high-carbon steels and various high-carbon alloys, both in electric and open-hearth steels. Straight bars up to 20 ft. in length are placed in pipe 6 and 8 in. in diameter. One end of the pipe is placed in a pit 12 ft. deep, 8 ft. long and 6 ft. wide, adjoining a platform, and is filled with bars and packed with charcoal from this platform. Then the pipes are capped and sealed with fireclay and taken to the furnaces. This method of annealing is used only on special steels where very slow heating and cooling is required, and to prevent the decarbonization of the surface.

For annealing coil sizes the coils are packed in pots 42 in. in diameter inside, with 18-in. chimneys. About 1000 lb. of coil steel can be packed in one pot. This method of annealing is used for the same grades of steel as the pipe annealing. The pots have lugs on each side for handling and are charged into the furnaces with a long-handled carrier having two roller bearing wheels. The material is first given a normalizing treatment from 14 to 20 hr., depending on its size, composition, etc., and then an annealing treatment at a lower temperature, usually at about the critical temperature of the steel. The latter operation requires very thorough heating, followed by a very slow cooling to get the material in the softest possible condition. Tests are taken of the material given this treatment, and it is also subjected to microscopic examinations.



Central Control Station for the Furnaces. The control board is at the right, and at the left are shown the busbar board and recording instrument permitting the taking of a continuous record of any 10 thermocouples

The car type of furnaces is used for general annealing of alloy steel bars, heavy forgings, coils, etc., and also for heat treating heavy forgings. Bar stock is annealed to refine the grain, remove strains, and to give the steel good machining, shearing and cold drawing qualities. These furnaces have a capacity of 25 tons to a charge. Two cars are provided, and while the one charge is being annealed the other car is being loaded. The cars are moved by a drum and cable arrangement, and when one car of material is drawn out of the fur-



View of the Pipe Annealing Section. A pit is provided in which the pipe is placed, leaning against the platform from which the pipes are filled with bars to be annealed. Annealing pots used for coils are shown in the background



The Car Type of Furnaces for Annealing and Heat Treating. Each furnace is provided with two cars operated by a drum and cable, and while the charge on one car is in the furnace, the other car is being unloaded and reloaded

nace the other is drawn in. These furnaces are approximately 35 ft. long and 6½ ft. wide. The cars are 29 ft. long and have five sets of wheels, all running on Hyatt roller bearings. Located near the furnaces is an oil quenching tank 30 ft. long, 6 ft. wide and 6 ft. deep, used principally for quenching heavy forgings.

The blast for the furnaces is supplied by two No. 10 Sturtevant fans arranged in duplicate, so that either may operate the entire plant. Each unit is driven by a 60-hp. motor. Air is supplied at 10 oz. pressure, and gas at 12 oz. pressure. All air blast, gas and water lines and pyrometer leads and electrical wires are carried through the plant in a concrete and brick conduit covered with cast-iron plates. The main gas lines are equipped with quick closing valves, which automatically close if the power goes off the blowers. These valves, together with check valves on the air lines, are safety devices installed to prevent explosions.

The temperatures of all furnaces are taken and observations are made at a control board in the department office, the board operator flashing signals to the furnace operator by red, white and green lights. The furnaces are equipped with base metal thermocouples with nichrome protecting tubes. The control station is provided with a busbar board, so that connections can be made to take a continuous record on a 10-point recording instrument of any 10 thermocouples in the plant. The pyrometers, recording instrument and busbar board were supplied by the Leeds & Northrup Co.

Coal Deterioration from Storage

Bulletins discussing the effects of storage on the properties of coal, No. 97, by S. W. Parr, professor of applied chemistry, University of Illinois, Urbana, Ill., issued by the Engineering Experiment Station of that school, and No. 136, by Horace C. Porter and F. K. Ovitz, Bureau of Mines, Washington, have been issued. The former deals with bituminous coal of the Illinois type and the latter covers tests made on New River, W. Va., and Pocahontas semi-bituminous coal, Pittsburgh gas coal and Sheridan, Wyo., sub-bituminous coal.

Results from experiments at the University of Illinois, begun in 1910 and recently completed, indicate that coal in storage increases in weight due to the absorption of oxygen, and Professor Parr ascribes indicated heat losses per pound of fuel largely to this. Porter and Ovitz, using Pittsburgh gas coal, found little, if any, change in weight over a five-year period of outdoor exposure, but explain that laboratory experiments have shown such increases in weight and that net heat losses may be slightly less than indicated on this account. Conclusions of both investigations are that actual heat losses due to deterioration of the coal are small, the maximum loss as determined by the Bureau of Mines being 5.5 per cent in three years for Wyoming coal, while for the other coals losses did not exceed 2.1 per cent in two years.

Storage in open bins was found by the University of Illinois to effect consistently lower percentage losses of heat value than storage under cover, and the Bureau of Mines concludes that, in the storage of Sheridan coal for more than three months, the use of covering bins is not as advantageous as that of air-tight bottoms and sides and the accumulation of fine slack on the surface. Professor Parr recommends that in dry storage all fine material be screened out and that only the lump coal, preferably sized, be stored. An increase in fines or slack was found in both investigations to result from storage, the Bureau of Mines finding this more prevalent in open than in closed bins.

The Asbestos Protected Metal Co., Pittsburgh, announces that it will be represented in Georgia by J. F. Schofield's Sons Co., located at Macon.

Accident Hazards of Forming and Forging Machines

In an address delivered at the recent convention of the National Safety Council, New York, J. P. Bender, welfare director Ralston Steel Car Co., Columbus, Ohio, said that the accident hazards in connection with press forming work were relatively few and relatively serious when compared with those of other lines. To guard against the sudden descent of the platen which would catch the workman unawares he recommended the installation of a check valve in the pressure line which feeds the columns. This valve is open to a flow of water toward the press, but closes against any back pressure which might result from lack of power at the accumulators, or an accident to the pressure lines between the power house and the press. It insures the permanence of the water column under the column pistons and can only be released by a lever in the hands of the press operator.

Bulldozers, unlike hydraulic presses, he stated, present a wider range of accident hazards because of the large number of gears, pinions and shafts required to obtain the necessary power. At first all that was considered necessary in the way of guarding these parts was to furnish individual safety appliances for each separate gear train, but later developments have demonstrated the superiority of a single-unit guard built of angle iron and wire mesh and bolted together in sections, each of which can be easily removed for repair purposes. All the moving parts are readily visible and the time taken to remove the guard and reapply it is practically negligible. Another source of danger mentioned in connection with this machine is that of the operator being caught by stepping between the overhang of the base plate as it comes forward and the stationary head of the machine. To guard against such a possibility at the Ralston plant the base plates were notched out at both ends flush with the outside edge of the housing and back far enough from the front edge to permit the passing of a man's leg without pinching.

In connection with forging machine accidents Mr. Bender pointed out that there is one feature which had caused a number of serious accidents. This was the attempt of the operator to make die adjustments without blocking the pedal. If the clutch became accidentally thrown in, the portion of the hand between the dies was almost invariably lost. He recommended that the guards around the forging machine flywheels be made so that they will permit ready access to the wheel since the only way to back the machine off in case the dies stick is to turn the wheel over by hand, and it is sometimes of great importance that this should be done very quickly.

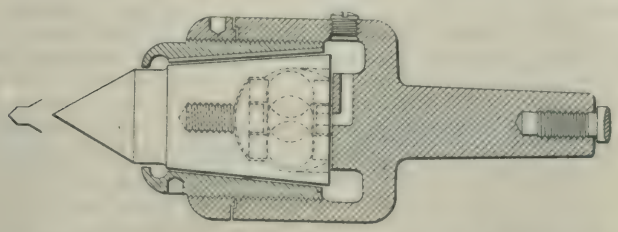
The annual convention of salesmen of the Blaw-Knox Co., Pittsburgh, builder of steel forms for concrete construction, structural steel work and transmission towers, was recently held in its general offices at Hoboken, Pa. One day was given to the inspection of the Blaw plant at Hoboken, Pa., and on the following day a special train conveyed the officials and salesmen to the Knox plant at Wheatland, Pa., complete inspection of both plants being made. The next morning a conference was held at Hoboken, and the convention closed with a banquet at the Concordia Club, 110 men, all connected with the sales department, attending.

Superintendents, foremen and assistant foremen of the Harlan plant of the Bethlehem Steel Co., Wilmington, Del., recently gave a farewell dinner at the Hotel Stoeckle, that city, in honor of Walter F. Alexander, superintendent of engineers; William T. Budd, auditor, and J. H. Ferris, chief storekeeper, who severed their connection with the company.

The Champion Engineering Co., Kenton, Ohio, manufacturer of cranes, is now represented in the Chicago territory by Hawkins & Co., with offices at 79 West Monroe Street.

Ball Bearing Center for Shell Lathes

For high-speed engine lathe production work J. A. Moller, New Rochelle, N. Y., has designed a ball-bearing lathe center. It is explained that with this



A Ball Bearing Stem Which Is Free to Revolve in the Middle of a Dead Lathe Center Is Claimed to Reduce the Cost of Shell Production

center a large amount of friction between the revolving work and the dead tailstock center is done away with, which eliminates the generation of heat that tends to draw the temper from the center.

In the new center there is a revolving stem which turns with the work. This arrangement is intended to provide radial support for the work, and this is supplemented by the use of a centrally located floating ball bearing, which is relied upon to distribute the radial stresses on the stem. The bearing or cap for the stem has oil channels and a drip retainer, the lubricant being provided by an oiling device from a large oil chamber. The stem can be adjusted in the housing and has a locking ring for maintaining any desired position. The shank is made in one piece, with the housing, and has an extension rod for the knockout.

Leather Belt Specifications

A general form of belt specifications recently published in *Safe Practices*, a publication of the National Safety Council, Chicago, contains the following items:

Belting must be cut longitudinally and no piece of hide must exceed 54 in. in length. Widths less than 7 in. are to be cut within 15 in. of the center of the hide; widths 7 in. and over are to be cut from the center of the hide; neither shoulder, belly, side nor flank stock, nor any padding nor shimming will be permitted. It must be uniform in thickness and width, and be perfectly straight from end to end.

Laps must not be less than 4 in. or more than 8 in., excepting that in single belting 8 in. and over in width, the lap may be 1 in. longer than the width of the belting; no lap should be within 4 in. of the end of a strip. Laps must be thoroughly cemented, and when pulled apart the exposed surface must not show any resinous, vitreous, oily or watery condition; no rivets will be permitted.

Belting must have an ultimate tensile strength, both in the leather and in the splice, of not less than 3600 lb. per sq. in., and must not show an elongation in 2 in. to exceed 12½ per cent when measured under a load of 2250 lb. per sq. in. for one hour.

Belting must not crack open on the grain side when doubled strongly by hand with the grain side on the outside, nor must it show piping or raising on the grain side when similarly treated with the grain side on the inside.

Belting not waterproofed must come within the following range of weights, which must be guaranteed to be not more than 10 per cent in excess of the actual weight of the leather:

Minimum Weight per Sq. Ft.

Width	Single Belting	Double Belting
1 to 2 in.	13 oz.	24 oz.
2¼ to 4 in.	14 oz.	26 oz.
4½ to 5½ in.	15 oz.	28 oz.
6 in. and over	16 oz.	28 oz.

At the recent annual meeting of the California Metal Trades Association in San Francisco the following officers were elected: O. H. Fischer, Union Gas Engine Co., Oakland, president; A. S. Gunn, the Union Iron Works, first vice-president; Frank B. Drake, the Hall-Scott Motor Car Co., Berkeley, second vice-president; Fred C. Metcalf, secretary. James A. Emery, Washington, D. C., member of the National Metal Trades Association, addressed the meeting on "The Relation of War and Industry."

New Vertical Disk Grinding Machine

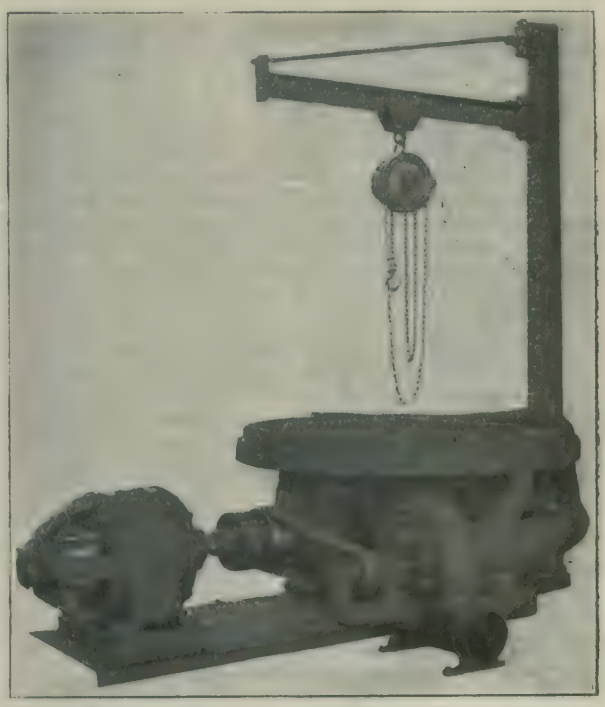
A number of interesting features are embodied in a new vertical spindle disk grinding machine that has been brought out by the Gardner Machine Co., Beloit, Wis. The one which is most apparent is the hoisting attachment for handling heavy pieces of the work, although others are the dust exhaust system and the means for the adaptation of the machine for direct-connected motor drive.

The machine is equipped with a disk wheel 53 in. in diameter and is designed for heavy grinding work. This wheel is supported by a cast-iron flange 20 in. in diameter and 1⅝ in. thick located on the upper end of a vertical spindle 3⅝ in. in diameter. This spindle which is driven by a pair of hardened steel bevel gears having a ratio of 2.4 to 1 at a speed of 500 R.P.M. is mounted in two self-aligning radial ball bearings and a thrust bearing, the balls of which measure 1⅛ in. in diameter, is provided to take care of the end thrust. Ball bearings are used throughout the machine.

The hoisting attachment for handling heavy work pressure weights when the lighter work is being ground consists of a ¼-ton hand-operated chain hoist mounted on a trolley and swinging jib. The jib is attached to a crane column that in turn is rigidly fastened to the base of the machine.

The dust exhaust system includes a fan driven by a belt running over an extra pulley on the driving shaft of the machine and connected to an exhaust manifold. This in turn connects with four openings in the bottom of a dust channel which is cast into the base of the machine just below and around the edge of the disk wheel. A detachable guard ring which permits the occasional removal of any coarse particles is located above the channel and extends slightly over the edge of the wheel.

The machine can be furnished for either belt or direct-connected motor drive. With the latter the armature shaft of the motor is connected to the driving shaft



A Hand-Operated ¼-Ton Chain Hoist with a Trolley and Swinging Jib Facilitates the Lifting of Heavy Parts from the Floor to the Wheel of a New Vertical Spindle Disk Grinding Machine

of the machine through a flexible coupling, an arrangement which eliminates the necessity of mounting the motor on a side bracket and the employment of a chain and sprocket drive.

A service flag with one large star and the numerals 338 is displayed by the Republic Iron & Steel Co., Youngstown, Ohio, indicating the number of men employed by this concern in its Youngstown district mills that have gone to war.

SUPPLIES OF FERROMANGANESE

Record Domestic Output in October—Available Quantity Increasing

THE domestic manufacture of standard ferromanganese has made pronounced strides in the last few months. The output in October, according to the blast furnace reports of THE IRON AGE, was 26,591 gross tons, the largest ever recorded. The increase had been steady and progressive since the war started until July, this year, when there was a decided spurt. While the average for the first half of this year was 19,892 tons per month, the average for July, August, September and October has been 24,749 tons per month. This is three times the monthly average of 8280 tons per month in the five-year period 1910-1914. The following table gives details of the progress in this important product.

The Domestic Output, Imports and Exports of Ferromanganese—Gross Tons

	Output*	Imports	Exports	Available Supply
January, 1917	21,130	6,211	....	27,341
February	19,942	6,379	....	26,321
March	18,529	5,324	....	23,853
April	17,989	6,846	....	24,835
May	20,722	2,019	....	22,739
June	21,041	3,817	....	24,858
Six-month average	19,892	5,099	....	24,991
July	23,949	2,037	629	25,357
August	24,482	2,840	453	26,869
September	23,973	3,402	57	27,318
October	26,591	2,000	†500	†28,091
Four-month average	24,749	2,056	....	26,909
Monthly average, 1916	18,461	7,577	....	....
Monthly average, 1915	12,021	4,605	....	....
Monthly average, 1913	9,958	10,672	....	....
Monthly average, 1912	10,448	8,261	....	....
Five-year average, 1910 to 1914	8,280	8,399	....	....

*As taken from the blast-furnace reports of THE IRON AGE.
†Estimated.

This shows that the average for the last four months, 24,749 tons per month, was three times the output of 8280 tons per month for the five-year period of 1910-1914. It is interesting to note also how the imports have declined. In the last four months the average has been only 2056 tons per month or over 50 per cent less than that for the first six months when they were 5099 tons per month. While exports have not been large recently, they are significant, as showing the shifting of the dependence of foreign countries, particularly Italy, from England to the United States for supplies of the alloy.

An important fact regarding the October output is that more ferromanganese was made in electric furnaces than in any other month.

The 1917 output of ferromanganese will be about 268,000 tons, if the November and December production equals the average for the last four months. This contrasts with 221,532 tons in 1916. The output to Nov. 1 has been 218,348 tons or nearly equal to the 1916 production. Imports in 1917 will not exceed 45,000 tons at the present rate of decline.

Manganese ore imports, on which our whole ferromanganese industry depends, have been very large this year as shown by the following table:

Manganese Ore Imports into the United States in 1917—Gross Tons

January	49,530	June	62,778
February	39,796	July	53,437
March	56,394	August	87,650
April	27,023	September	36,755
May	81,269	Total	494,632

This is at the rate of 54,959 tons per month as compared with 48,027 tons per month in 1916. If this rate is kept up for the rest of the year, the 1917 imports will be 669,510 tons or more than has ever been imported into any country in one year. In 1913 these imports were 345,090 tons, the record to that time, so that the present year may double that record.

Consumption and Supplies

Late in July the Alloy Committee of the Council of National Defense stated that the consumption needs of ferromanganese in the United States were about 28,000 tons per month. This estimate has not been greatly altered since. In the first table of this article, it will be seen that the available supply for consumption in October was estimated at 28,091 tons, after deducting probable exports, with the average for the four months ended Oct. 31 at about 27,000 tons per month. It will thus be evident that our needs have been gradually practically met.

Assuming the steel output for 1917 at the present rate to be 44,000,000 tons and that 74 per cent of this is open-hearth steel, as in 1916, with two-fifths of the Bessemer steel output absorbing spiegeleisen as high carbon steel, the following calculation gives the estimated amount of ferromanganese necessary this year, at 17 lb. per ton of steel produced:

44,000,000 X 74	= 32,560,000	open-hearth steel.
44,000,000 — 32,190,000	= 11,440,000	Bessemer steel.
11,440,000 X 2/5	= 4,576,000	high carbon Bessemer steel.
11,440,000 — 4,524,000	= 6,864,000	low carbon Bessemer steel.
32,560,000 + 6,864,000	= 39,424,000	steel requiring ferromanganese.
39,424,000 X 17 — 670,208,000 lb.	= 299,190	ferromanganese necessary in 1917.

Add to the 299,190 tons the 10,000 estimated as needed in the iron foundry business and we have a total of 309,190 tons necessary for our needs. To meet this total we have the probable production of 268,000 tons this year with imports aggregating 45,000 tons making the total in sight 313,000 tons or apparently sufficient to meet the theoretical needs. The Alloy Committee's estimate however calls for 336,000 tons at 28,000 tons per month.

The Spiegeleisen Output

A summary of the subject would not be complete without reference to the spiegeleisen output of the country. The October output, according to THE IRON AGE, was 22,947 gross tons or the largest for any month this year, bringing the total to Nov. 1, to 177,607 tons or 17,760 tons per month. At this rate the year's total will be 213,127 tons or the largest on record. The 1916 output was 194,002 tons, showing that corresponding strides in output have not been made in spiegeleisen as in ferromanganese.

Aliens May Recover

The Industrial Commission of Wisconsin has issued an official statement to the effect that all aliens residing in Wisconsin, although they may be alien enemies, may recover compensation under the Wisconsin workmen's compensation act if they sustain injuries in the course of their employment in this state. The commission made an investigation of the status of aliens upon learning that an insurance company writing compensation protection in Wisconsin had instructed its agents not to make payments to aliens who are subjects of Germany or its allies. The war industries board, Washington, in an opinion given the Wisconsin commission, states that citizens and subjects of Germany, Austria-Hungary, Turkey and Bulgaria resident within the United States are not enemies or allies of enemies merely by reason of their nationality. Such aliens may become enemies through trading with the enemy or otherwise engaging in hostile acts, but until then or they are proclaimed by the President to be enemies or allies of the enemy, they are entitled to recover compensation in the same manner as heretofore.

The American Zinc Products Co., Youngstown, Ohio, recently incorporated with a capital stock of $1,000,000, has completed its organization by the election of the following officers: B. W. Kerr, president and treasurer; F. W. Stillwagon, vice-president; H. S. Buck, vice-president and general manager; R. A. Leitch, secretary. The directors, in addition to the officers, are Edward Langenbach, Wade A. Taylor, G. P. Gilmer, W. Manning Kerr, and G. W. Finney. The company recently acquired a plant in Greencastle, Ind.

SUNK BY SUBMARINES

Interesting Facts Developed by Senator Hitchcock's Query

WASHINGTON, Dec. 4.—Nine hundred British vessels aggregating more than 3,000,000 tons dead weight have been sunk by German submarines and mines during the past ten months, according to the first authoritative statement on this subject embodied in a letter from Chairman Hurley of the United States Shipping Board to Senator Hitchcock of Nebraska, written in reply to a series of interrogatories propounded by the Nebraska Senator. These losses, Mr. Hurley states, exceed the tonnage constructed by any nation during the period of a full year.

The greatest shipbuilding feat any nation ever accomplished was that of England in 1913, when 688 vessels of 2,989,229 tons were completed. The American program now on foot, however, will far surpass Great Britain's remarkable performance and will produce 6,000,000 tons by the end of the calendar year, 1918. Of this amount, about 5,000,000 tons will be completed in 1918 alone, thus surpassing Great Britain's best effort by about 1,000,000 tons.

The United States now has available for transatlantic service 582 ships of a total of 3,729,806 tons, including a number of former German and Austrian cargo vessels and oil tankers. The shipping board is now operating 105 German and Austrian ships having an aggregate of 688,960 tons. American private citizens hold 11 more of these ships totaling 63,915 tons and making the aggregate American holding of enemy vessels 752,875 tons.

As illustrating the rapidity with which the construction of cargo vessels in the United States has increased, Mr. Hurley presents some figures not heretofore published, the Bureau of Navigation of the Department of Commerce having abandoned last February its former practice of giving out monthly statements of ship construction. It appears from Mr. Hurley's figures that in the five months from Jan. 1 to June 1 of the present year there were built and launched 87 ships with a total of 503,922 tons, of which 55 vessels of 430,994 tons were of steel while 32 vessels aggregating 72,928 were of wood. The construction of the first five months of the current year therefore, substantially exceeded the average annual production of the past ten years. It is interesting to note that during the five months referred to, contracts were placed by private parties for 394 new ships of an aggregate of 2,784,367 tons. These vessels have since been commandeered and are now being completed for the account of the shipping board.

Electric japanning ovens are being installed in a number of Northern Ohio plants. These installations include the following: Fostoria Pressed Steel Co., Fostoria, 200-kw. oven; Holmes Auto Co., Canton, 200-kw. oven; International Harvester Co., Akron, 400-kw. oven for Government truck work; Hunt & Dorman Mfg. Co., Cleveland, two 36-kw. ovens; American Multigraph Co., Cleveland, two 63-kw. ovens. The motors for conveyors, heating units and control panels are being supplied by the General Electric Co., and the ovens for the Fostoria Pressed Steel Co., Holmes Auto Co. and American Multigraph Co. are being furnished by Young Bros., Detroit.

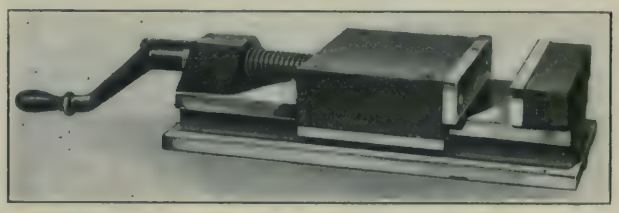
As the result of the acute shortage of coal throughout the country, the Merchants and Manufacturers' Association of Milwaukee has put under way an investigation of the plentiful peat deposits known to exist in Wisconsin and the question of the manner in which these deposits may be utilized as a commercial fuel.

The Biggs-Watterson Co., has removed from 722 Guardian Building to 1235-1237 West Ninth Street, Cleveland.

Plain Vise for Milling Machines

A plain vise designed particularly for use in connection with milling machines has been brought out by the Cleveland Milling Machine Co., Cleveland. The prime object in the design of this vise was to provide a tool that is particularly rigid in its construction and one that is very compact so that the work can be held close to the table, being made as low as possible without sacrificing strength. A machine finished flange is provided on the four edges, allowing the vise to be clamped in any position. It is pointed out that milling machine vises are often used in place of a jig or fixture and become an efficient addition to the milling machine, especially when used in pairs, one vise being loaded or unloaded while the cutters are working on the piece or pieces to be milled in the other vise, and that the vise is adapted for this service by having the tongue slot on every vise an exact distance from the face of the solid jaw.

The jaws are of steel, 6 in. wide and 1½ in. deep and open 4½ in., and can be readily removed for occasionally increasing the range or inserting special jaws. The ways are solid, giving the base greater strength and the construction of the block and gibs is such that they wipe the ways free of chips and foreign material. The movable jaw is of ample thickness to allow for as large a diameter of screw as is consistent with the height of the vise. The tongue slots are milled at right angles to each other so that the vise can be held parallel to, or at right angles with, the spindle. The



Making the Distance Between the Tongue Slot and the Face of the Solid Jaw Exactly the Same in Each One of a New Plain Vise for Milling Machines Tends to Facilitate the Production of Duplicate Work

screw bearing and solid jaws are cored to provide a more even distribution of metal, eliminate shrinkage and make a stronger construction, it being claimed that breakages most frequently occur in these two parts of the vise. The base of the vise is in one piece. The movable jaw is gibbed around the outside. This design eliminates the necessity of having slots cut in the base for clamping the gibs directly underneath. These gibs, however, do not interfere with the clamping of the vise to the milling machine table.

The regular equipment furnished with the vise includes a pair of clamps and bolts and hardened and ground tongues. The vise weighs 50 lb.

Prices on Iron and Steel Products with Differentials and Extras

The prices on iron and steel products with differentials and extras, as agreed upon by Government officials and committees of the American Iron and Steel Institute in September, October and November, 1917, have been published in a 12-page pamphlet by THE IRON AGE, and a copy will be sent to any subscriber requesting it as long as the supply lasts.

The first group dwellings among the number being erected at East Youngstown, Ohio, for the Youngstown, Sheet & Tube Co., by the Unit Construction Co., of St. Louis, is practically completed. It consists of two apartments. The building is made of concrete and the parts are assembled after being poured in molds. The house has attracted much comment, for it is the first one in that district to be built under such a plan. The constructing company has devoted its efforts primarily to building the various parts before cold weather sets in. Thereafter the assembling will be done on a larger scale.

Trade Regulation by Import Licenses

Iron and Steel and Other Metal Products in Which Government Will Control Commerce—An Export Embargo Also

WASHINGTON, Dec. 4.—Another long step toward the domination of the commerce of the world by the United States was taken in the past week when the President issued his first proclamation requiring licenses for the importation of many important products. The action taken will also greatly facilitate the Federal Government in supervising and restricting the operations of so-called non-essential industries if it becomes necessary to limit their output for the purpose of concentrating manufacturing and transportation facilities to provide greater efficiency in the prosecution of the war.

The President's proclamation is based upon authority granted by the trading with the enemy act, which gives the Executive "power to prescribe such regulations governing imports as the public safety may require." Pursuant to this statute, an import division of the War Trade Board was recently created and at its head was placed Clarence M. Woolley, for many years president of the American Radiator Co. Mr. Woolley represents the Department of Commerce on the board and was appointed by the President upon the nomination of Secretary of Commerce Redfield. Mr. Woolley has been in Washington for the past month conferring with the war trade, war industries and shipping boards, the work of which is closely co-ordinated for the supervision of our foreign and domestic commerce, and the list of articles embraced in the President's proclamation for the importation of which licenses will now be required has been most carefully compiled with a view to strengthening materially the power of the President to exert a compelling influence upon the neutral nations to refrain from giving aid and comfort to Germany and her allies.

The list embraced in the President's proclamation includes the following articles of special interest to the readers of THE IRON AGE:

Metals and Ores Requiring Licenses

Antimony, antimony ore, or any chemical extracted therefrom; asbestos, chrome, chrome ore, or any ferroalloy or chemical extracted therefrom, cobalt, cobalt ore or any ferroalloy or chemical extracted therefrom, industrial diamonds, all ferroalloys, iridium, manganese, manganese ore or any ferroalloy or chemical extracted therefrom, mica, molybdenum, molybdenum ore or any ferroalloy or chemical extracted therefrom, naxos emery and naxos emery ore; nickel, nickel ore, matte or any ferroalloy or chemical extracted therefrom, optical glass, platinum, plumbago, pyrites, scheelite, spiegeleisen, tin in bars, blocks, pigs or grain or granulated, tin ore and tin concentrates or any chemical extracted therefrom, titanium, titanium ore or any ferroalloy or chemical extracted therefrom, tungsten, tungsten ore or any ferroalloy or chemical extracted therefrom, vanadium, vanadium ore or any ferroalloy or chemical extracted therefrom, and wolframite.

The countries from which importations are interdicted except under licenses cover practically the entire world, the purpose of the proclamation being to impose the license restriction upon every source of the products mentioned therein. The license requirement becomes immediately effective and applies to all goods arriving in American ports subsequent to Nov. 28. It is understood, however, that it does not apply to goods now in customs custody which actually arrived in port prior to the date of the President's order.

Not Exclusive But Better Control

The War Trade Board is anxious that the practical effect of the licensing requirement should be understood in order that consumers of the articles enumerated in the President's proclamation should not be unnecessarily alarmed. If it were proposed to exclude the articles embraced in this category the proclamation would spell disaster for many industries and would deal a severe blow to the producers of iron and steel in view of the fact that manganese, nickel, practically all the ferroalloys, tin, spiegeleisen, etc., are placed under license requirement.

The primary object of the War Trade Board is neither to exclude nor to restrict the importation of these articles, but to regulate their supply and direct its distribution in such a way as to cause them to contribute to the largest possible extent to the conduct of the war. A secondary but hardly less important aim is to exert pressure upon the countries producing the articles embraced in the proclamation to prevent them from supplying food and war material to the Central Powers. This influence can be exerted through the imposition of restrictions upon a number of important products of no direct interest to the iron and steel industry included in the President's proclamation and not embraced in the list above presented. The Netherlands, for example, produce in the islands of Sumatra and Java large quantities of tobacco, the annual importations of which into the United States aggregate many million dollars. The licensing of this commodity will render the Government of the Netherlands very solicitous to meet the wishes of the United States, and especially to co-operate in the matter of providing shipping facilities, a subject which for several weeks has been under negotiation between the State Department and a special mission representing the Dutch Government.

A third object of the license requirement is the absolute control by the Government of cargo space on vessels entering American ports, whether of established lines or tramp steamers. It is obvious that unless a license can be procured to import a certain commodity it cannot be shipped to the United States and that, if shipped without a license, the carriers may be required to convey it elsewhere, as in the case of excluded emigrants. The proposed measure of regulation, therefore, will enable the War Trade Board to dictate the exact character of merchandise to fill every cubic foot of cargo space available to bring commodities to the United States and thus the shipping of the world may be made tributary to the big governmental machine now being organized for the more efficient prosecution of the war.

Not Aimed at "Non-Essentials"

The effect of the first import proclamation upon so-called non-essential industries of the country cannot yet be measured, and it is significant in this connection that the War Trade Board announces that a supplemental list of controlled articles will soon be issued. Many so-called luxuries are composed largely of imported materials and if such materials should be embraced in the list of those subject to license the future of the industries in question would be fully committed to the tender mercies of the War Trade Board. Notwithstanding the fact that a number of so-called luxuries are embraced in the President's proclamation, it is understood that they have not been included therein with a view to developing the Government's policy for the treatment of non-essential industries, but for other reasons, and that no attempt will be made by the War Trade Board to regulate importations of non-essentials or of raw materials for their production until the Bureau of Manufacturing Resources, about to be established by the Council of National Defense, has had an opportunity to perfect its organization and make such investigations as are necessary to form a basis of future action. The whole program concerning non-essentials will be developed slowly and with great conservatism.

Additions to Export License List

Coincidentally with the promulgation of the President's first import proclamation there was issued by the

War Trade Board a supplemental order adding a number of important articles to the long list of those for the exportation of which licenses are required. The new list includes iron and steel wire rope, cable and strands consisting of six or more wires, stud link chain cable, micrometers and calipers, lathe chucks, antimony, antimony ore, asbestos, mica, mica splittings, strontium ores, titanium, wolframite and iridium, and surgical instruments. The export control policy of the War Trade Board is rapidly being developed to a point where licenses will be required for the exportation of practically every product of the United States.

Embargo on Export Iron and Steel

The statistical bureaus of the Government are following with interest the work of the general operating committee of the Eastern railroads, which, from its headquarters in Pittsburgh, has just imposed an embargo, immediately effective, upon the shipment of all export steel billets, bars, plates, scrap and pig iron except that intended for use abroad by the United States Government. This action is expected to result in the very substantial slowing down of the export movement of iron and steel, but it is believed that the interruption will be but temporary and, further, that as soon as possible arrangements will be made for the exportation of a considerable proportion of these commodities through Southern ports, which will relieve the congestion on the lines of the Eastern carriers and obviate an extended embargo. W. L. C.

Southern Mills Active

BIRMINGHAM, ALA., Dec. 4.—Steel mill operations are active. Inasmuch as the greater portion of the output of the steel mills is going to the Government or Allies, information is not given out. It is announced that three steel fabricating plants will be set up or evolved from plants in existence for the manufacture of steel shapes for shipbuilding, Birmingham interests being concerned in the Southern Shipbuilding Corporation, the new company that recently received a contract for 16 steel cargo ships of the Whittlesey panel type of 7500 deadweight tons each. The ships will be assembled at Charleston, S. C.

All work on the Fairfield Works development of the Tennessee Coal, Iron & Railroad Co., near here, is being rushed and by middle summer it is expected the larger portion of the new plant will be up. Plans are being worked on for the immediate construction of the shipbuilding plant at Mobile, by the Chicasaw Shipbuilding Corporation, subsidiary of the Tennessee Coal, Iron & Railroad Co., recently announced. Labor is being hired in all directions.

The Massachusetts Institute of Technology, Cambridge, Mass., is to begin at once the erection of the Pratt School of Naval Architecture and Marine Engineering Building. Charles H. Pratt, a Boston lawyer, left the bulk of his estate to the institute for this purpose, stipulating that the trustees should hold the fund until it amounted to $750,000. The fund now exceeds that amount by $100,000. The erection of the building has been deferred until this time on account of the high cost of materials and labor, but is now undertaken as a patriotic duty on account of the urgent demand for naval architects and draftsmen.

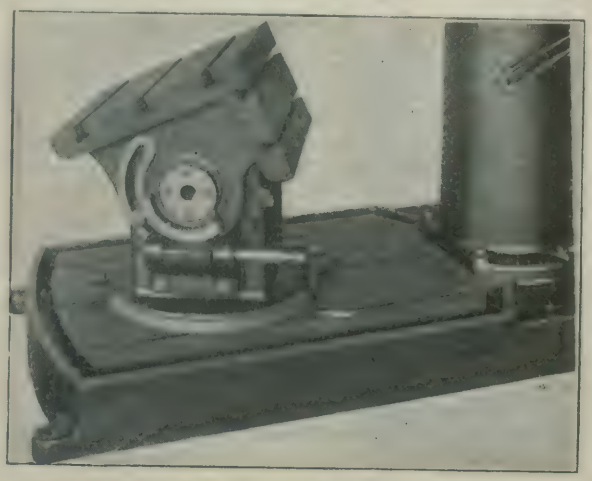
The LaCrosse Tractor Co., LaCrosse, Wis., has appointed F. C. Upton, Minot, N. D., to represent the company, and Gaston, Williams & Wigmore, Inc., New York in connection with recent shipments of several hundred tractors to France. Mr. Upton is on the way to France and will remain there until the spring of 1918.

The plant of the H. A. Matthews Mfg. Co., Seymour, Conn., has been closed by a strike of about 250 hands. A compromise offer of the company has been refused by the strikers.

Radial Drilling Machine Tilting Table

The Morris Machine Tool Co., Cincinnati, has developed a universal tilting table for use on its radial drilling machines as a substitute for the regular box table. A working surface 18 in. square is provided on the top, while the side surface measures 11 x 18 in. The top of the table has three T-slots ¾ in. wide and the side has two.

The construction of the table is rigid and a worm and wormwheel segment operated by a crank enable the table to be tilted to any angle. The wormwheel segment is graduated in degrees to facilitate setting and when the table is in its normal position with the top horizontal, it rests on positive stops. In addition



A Worm and Wormwheel Segment, the Latter Graduated in Degrees, Facilitates the Tilting of a Universal Table for Radial Drilling Machines

to being tilted to any angle within the customary range, the table can be swiveled on the base of the machine and clamped in position by bolts in the T-slots of the base.

Meeting of Taylor Society

A war meeting will be held by the Taylor Society in Washington, D. C., Dec. 7 and 8. It will also be its annual meeting. On the afternoon and evening of Dec. 8 in the Washington Club, a conference is scheduled on "The Centralization of Administrative Authority." Among those scheduled to take part are: Major W. P. Barba, gun division, ordnance department and formerly of the Midvale Steel Co.; Walter S. Gifford, director Council of National Defense; J. E. Otterson, chairman sub-committee on small arms and munitions, Council of National Defense and vice-president and general manager Winchester Repeating Arms Co.; Judge Edwin B. Parker, member priority board, Council of National Defense; Henry B. Thayer, president Western Electric Co., and Robert P. Bass, member subcommittee on mediation and conciliation, Council of National Defense.

On Friday evening at the Cosmos Club, two papers are announced. One of these is by Capt. H. K. Hathaway on "Organization Work in the Supply Division of the Ordnance Department."

The Terry Shipbuilding Co., Port Wentworth City, Savannah, Ga., has perfected plans for the construction of a number of dwellings for its employees. The buildings will be erected by the Port Wentworth Terminal Corporation and will be leased to the Terry company at a rental based upon construction cost.

A strike of about 200 workmen at the American & British Mfg. Co., Providence, R. I., for an eight-hour day has been settled by Federal mediators. The basis of settlement has not been announced. The company is engaged on a Government contract for anti-aircraft guns.

The Electric Furnace and Central Station*

Relations Between the User and Producer of Electricity for Steelmaking — Standardized Equipment — Future of the Electric Steel Furnace

BY EDWIN L. CROSBY

PROBABLY no instrument for the use of electrical energy for industrial purposes, other than the induction motor, has caused as much interest among both central-station operators and their patrons as the electric furnace, particularly in its application to the steel industry. Up to the present time approximately 200 steel furnaces of various types, having an annual capacity of about 1,200,000 tons of steel, have been installed or contracted for on this continent. This steel production involves the use of approximately 750,000,000 kw.-hr. per year. Thus is the very healthy interest of the aggressive central station man in the problem justified.

Errors That Have Been Made

Naturally in the attempt to secure all the new business possible by the use of electric furnaces many companies, both in the steel casting trade and central station business, have made serious errors. Many steelmakers and foundrymen have installed furnaces which for various reasons were utterly unsuited to their use. Also many central stations have listened to the luring tales of various highly estimable furnace salesmen and permitted, even urged, the connection of furnaces to their lines, the operation of which was fatal to the happiness and peace of mind of the entire production department of the stations concerned. Beautiful visions of regulation equivalent to that of a lighting load, perfect phase balance, etc., have become nightmares of despair to not a few of the power companies of the country. Others have quoted rates for this class of service inconsistent with the characeristics of the load with rather disastrous results to their balance sheet.

To avoid unnecessary repetition of such occurrences it is essential that a closer study of the adaptability and operating characteristics of electric furnaces in general and the more common types of steel furnaces in particular be made by foundrymen contemplating the installation of such apparatus as well as by the central stations from which the foundrymen are likely to purchase power.

Right of a Foundryman to Advice

Any foundryman has a right to expect intelligent advice from his local central station on the electrical characteristics, their advantages or disadvantages, of any electrical equipment he may contemplate purchasing. Central stations certainly stand ready to advise a storekeeper as to the best form of lighting equipment for him to use or to tell the power consumer which type of motor is best fitted for the particular purpose under consideration.

By the same token, the central station anticipating electric furnace business should be prepared to discuss intelligently with the buyer of an electric furnace the electrical and metallurgical characteristics of the various types offered for sale. The power salesman must have a fairly good understanding of the metallurgical practice involved before he is able to give dependable data on the electrical performance of any furnace, as these two matters are very closely related. For instance, an electric steel furnace connected to a large power system capable of handling large blocks of energy may be operated with less regard to fluctuating power input than if it were connected to a system of which it constituted a large proportion of the total load.

Take a specific case—melting and refining cold scrap for small steel castings. The only limiting factor in the rate of current input during the melting period seems to be the effect upon the customer's demand. The scrap has an infinite capacity for absorbing heat, the refractories will not be injured, the radiation losses per heat are decreased and the electrical equipment, if properly designed, can stand considerable overload during this period, if it is really desirable to increase the rate of energy input. When refining, however, a much lower rate of heat, hence energy, input may be desired, perhaps only that rate necessary to maintain the temperature already acquired until sufficient time has elapsed for the desired chemical reactions to occur. It would seem, therefore, desirable to operate with a much higher arc voltage during the melting period, decreasing the potential when the bath becomes fluid and refining is begun. It is entirely possible that such a method may result in a lower cost of power per ton. Quite certainly it would result in a lower current consumption per ton and if carefully controlled, an extra heat per day is easily obtained. Balanced against the increased demand charge per ton of metal are lower overhead charges, lower labor charges, lower radiation and electrical losses and general increased operating efficiency.

Here is where it is quite necessary for the central station man to assist the furnace user in determining the most economical point for operation. The method of determining demand and greater current fluctuations upon the distribution system are important factors in the determination of this point, and require a fair degree of familiarity with electric furnace practice as well as with the central station rate schedule.

Standardization of Equipment

In this connection it is the writer's sincere belief that there is considerable opportunity for standardization of demands by the central stations of the country. It does not seem reasonable that local conditions are sufficiently diverse to account for the extremely variant methods now employed by companies selling service under relatively similar conditions.

While the cost of power per ton of steel produced is of course important, being one of the greatest tangible items in the cost sheet, the writer has visited several electric furnace installations where power cost seemed to be the paramount issue, while in reality a lack of superintendence and generally loose organization ran up charges far in excess of any reasonable power cost. As a matter of fact, industry in general is rapidly awakening to the fact that with the present greatly increased cost of labor and material together with a very slight (if any) increased cost for electricity, the power cost of most any article manufactured is not as important as formerly was the case.

Heretofore, the greatest item for consideration among central stations desiring an electric furnace load has been the power factor. There is no occasion for unrest upon this point at the present time, as very careful investigation of several furnaces of various types has shown that with the possible exception of one type of arc furnace, and the certain exception of the induction furnace, all steel furnaces on the market to-day, if properly installed, will operate with a power factor of 0.80 to 0.85 during the early stage of the melting period, later rising to 0.85 to 0.90, and finally to a point as high as 0.95 or better during the refining period.

Inasmuch as single-phase arc furnaces should never be connected to polyphase systems except through phase converters, while induction furnaces operate more satisfactorily at frequencies below those in general use, thus

*From a paper presented at the annual meeting of the American Foundrymen's Association in Boston, Sept. 25 to 28, 1917. The author is with the Detroit Edison Co., Detroit, Mich.

requiring frequency changes, either of these types, thus equipped, may be connected to a polyphase system so as to impose unity or even a leading power factor.

Phase Balance and Wave Distortion

Regulation, phase balance and wave distortion have not, on the other hand, received the attention they undoubtedly deserve. Present electrode regulation is at the best very unsatisfactory, it being impossible with any existing equipment to obtain sensitive regulation without considerable hunting of electrodes and disturbance of phase balance. If it is proposed to connect an electric furnace to a network properly designed to satisfactorily operate under existing conditions and with existing load, very careful consideration should be given to this point of regulation, and it may be advisable that carefully selected reactances be placed in the furnace circuit.

Recent oscillographic investigations have shown a very marked distortion of the current wave in all types of arc furnaces. This subject is a very important one, as it may affect the accuracy of induction type watthour meters. Large wave distortion is also detrimental to the operation of other apparatus connected to the system, for instance, lowering the efficiency of rotary converters.

At first thought it may seem that such subjects are irrelevant before a foundrymen's meeting, but the writer wishes to call attention to the fact that it is necessary for a public utility serving any particular class of business to charge back to that class any expense contingent upon the service; so that if in order to superpose upon existing systems, satisfactorily operating any new form of load, it becomes necessary to increase the investment to an abnormal point, that investment must be reflected in the rate charged for the new class of business.

The writer does not wish to pose as an alarmist, nor does he believe that in the large majority of cases any such fears need be serious deterrents, but when a central station operating a transmission system of considerable length with somewhat limited capacity in generating and distributing equipment connected, attempts to take electric furnace business, especially at rates based upon existing conditions, it is quite likely to get into serious difficulty which may later cause the station, as well as the furnace user, deep regret.

Advice as to New Installations

For the reasons mentioned, it is obvious that the representative of a central station anticipating electric furnace business should thoroughly familiarize himself not only with the operating characteristics of various types of electric furnaces, but also with his customers' requirements, and after careful consideration should offer an unprejudiced opinion upon the relative desirability of the various furnaces obtainable. It may be good judgment to advise against the electric furnace installation entirely. This was the writer's experience upon two occasions recently. Two customers having more or less scrap to sell and experiencing the universal difficulties in steel deliveries contemplated the installation of electric furnaces to supply their demands. After considering the investment, delivery on furnace and electrical equipment, the uncertainty of the market both during and after the war, the customer in each case was unhesitatingly advised not to make the installation. Incidentally, I believe any central station who urges the installation of electric furnaces for steel based upon the present market may later have cause for regret, unless he receives a rate commensurate with the risk.

The central station and the steel manufacturer have to consider from different standpoints the conditions peculiar to the present time, in deciding whether the investment in an electric furnace or the investment in the power plant and transmission necessary to supply that electric furnace should or should not be made. The steel manufacturer may be able to recover his entire investment by the sale of his output at high prices in a war time market which cannot get enough high-grade steel, whereas the central station is required by financial methods, and in some cases by law, to treat all of its investments as permanent, or if not permanent to be amortized over a long period of time, and is further required to have its rates for all classes of service consistent with one another. Therefore, the central station is compelled to consider the future of the steel market, the permanency of the service and the possibility of selling its capacity to some other industry in case the steel furnace should cease to be profitable to the manufacturer after the normal market conditions are restored.

Electric Steel Now and After the War

Perhaps the demand for high-grade alloy steel for new uses after the war will keep all the electric furnaces busy. Perhaps the increased cost of labor and fuel will operate against the open-hearth or other less efficient processes sufficiently to allow the electric furnace to compete in ordinary tonnage production. The central station certainly hopes so. But meanwhile any installation should be carefully considered. Such advice at this time is perhaps superfluous, as it is doubtful whether deliveries on electric furnace equipment are attractive enough to cause any great interest.

As stated in the report of the electric steel furnace committee to the National Electric Light Association this year, that body believes that the electric furnace should supplant or successfully compete with the crucible or converter processes for any purpose. It should, given usual freight differentials, supply local markets with the equivalent of the higher grade open-hearth material, local scrap markets being favorable. However, under normal conditions the committee did not feel that the electric furnace was a competitor in tonnage steel.

In the steel castings trade there appears to be no reason why the electric furnace, when thoroughly developed, should not supplant practically all other methods in foundry use. By close co-operation between foundrymen and the central station people that development can quickly be carried to completion. We may reasonably hope to realize that long anticipated ideal which I once heard stated at a meeting of this society by a representative of a competitor of the electric furnace, namely: "The electric furnace method is the ideal method for making ideal steel." The central station is willing to do its part.

Organization of New Chain Company Completed

The merger of the Columbus and McKinnon Chain companies which was announced in THE IRON AGE, Nov. 1, was recently completed by the election of Charles M. Wambaugh, formerly president of the Columbus Chain Co., as president of the new organization, which will be known as the Columbus-McKinnon Chain Co., with general offices at Columbus, Ohio. George J. Armstrong and Daniel Carroll are the vice-presidents, L. E. McKinnon, former president of the McKinnon Chain Co., is treasurer, and Arthur R. Markel secretary and assistant treasurer. The other directors of the company are S. A. Webb, I. B. Cameron, Cyrus Huling, Howard C. Park, W. A. Nottman and R. A. McKinnon. New office and factory buildings, to cost over $50,000, are being erected at the Columbus plant. Three plants beside that at Columbus will be operated at Lebanon, Pa., Buffalo and St. Catherines, Ont., Canada, and the total number of employees will be approximately 1500.

New Record for Electric Furnace Lining

The Hess Steel Corporation of Baltimore established a new record in its plant for the life of furnace linings, when its furnace No. 2 lining lasted for 146 heats. This furnace is a Heroult electric of 6-ton capacity, lined with standard silica brick above the slag line. The steels made during the period were chiefly chrome vanadium and chrome nickel steel and some high carbon tool steel.

The General Fireproofing Co., Youngstown, Ohio, recently distributed a bonus of $19,000 to its 530 employees.

ANALYSIS OF FERROSILICON

Rapid Commercial Method for Determining Value of 50 Per Cent Alloy

FOR some time, at least in the early stages of the use of high-grade ferrosilicon in steelmaking, the analysis of this alloy has been a source of annoyance and difficulty to both buyer and producer and there have been conflicting results on the same samples. In a paper, "A Method for the Commercial Analysis of Ferrosilicon," presented at the thirty-second general meeting of the American Electrochemical Society at Pittsburgh, Oct. 4, 1917, Russell E. Lowe, chemist with the FitzGerald Laboratories, Inc., Niagara Falls, N. Y., gave details of an excellent method which is claimed to meet modern commercial conditions. It is of special interest and value to the steel chemist. An abstract follows:

This analytical procedure is the result of an extended series of experiments to evolve a rapid and accurate method for the analysis of ferrosilicon without the aid of the powerfully oxidizing fluxes at present used. By "commercial analysis" is meant the quantitative determination of sulphur, phosphorus, manganese, iron, aluminum and silicon, since these elements are the ones generally specified in contracts for the 50 per cent alloy.

The older procedures require a flux consisting of 20 grams of sodium carbonate and 4 grams of potassium nitrate to break down a 1-gram sample of the alloy. A fusion of this character is decidedly destructive to platinum, and requires almost constant supervision because of its tendency to creep over the side of the crucible. Another fault is that it is slow. Because of the minute quantities of impurities present, a gram sample must be used. This means the tedious handling of a large volume of silica, and involves a second fusion since it is impossible to wash silica absolutely free from the heavy metals.

The following method of procedure has been tried on several samples of ferrosilicon that were previously analyzed by an outside laboratory of recognized standing, and in practically all cases the agreement was found to be within the limits of experimental error. The method is recommended as being simple, accurate, rapid and saving of platinum.

Determination of Sulphur and Phosphorus

Mix sample thoroughly and powder in a diamond mortar until it passes through a 100-mesh screen. Weigh about 1 g. of the powdered sample into a 100 c.c. platinum dish, add 25 c.c. of concentrated nitric acid, cover with a watch glass and place on a boiling-water bath. When the contents of the dish have reached the temperature of the bath add a few drops of hydrofluoric acid. As soon as the resulting violent reaction has ceased add a second portion of the acid. Continue this procedure until only a slight residue is visible on the bottom of the dish, then add about 5 c.c. more of hydrofluoric acid. Remove the watch glass, carefully washing any matter adhering to it into the platinum dish with a stream of hot water, and evaporate the solution to dryness. Add 10 c.c. of concentrated nitric acid to the contents of the dish and repeat evaporation on water bath. Dissolve residue in dish with 50 c.c. of a 5 per cent solution of nitric acid, heating to hasten the process.

Add to the dish a concentrated solution of sodium carbonate in small portions and with constant stirring until it is present in slight excess, then transfer the contents to a glass beaker and dilute with hot water to about 200 c.c. Heat contents of beaker to boiling and allow to settle. Filter solution through a 12.5 cm. filter, washing the precipitate five times with hot water.

Sulphur.—The filtrate contains the sulphur, and to it is added an aqueous solution of calcium chloride until the precipitation of calcium fluoride and calcium carbonate is complete. Boil the solution for a few minutes, allow the precipitate to settle, filter through a 12.5 cm. filter paper. Wash the precipitate five times with hot water.

Acidify filtrate from the calcium chloride precipitation with hydrochloric acid. Heat the solution to boiling and add 25 c.c. of boiling 6 N barium chloride. Allow solution to stand in a warm place for one hour, then filter through a 9-cm. No. 42 Whatman filter, or its equivalent. Wash filter with hot water until it is free from chlorides.

Ignite this filter in a weighed platinum crucible, cool in dessicator and weigh the sulphur as barium sulphate. Calculate to sulphur. It is advisable to run a blank.

Phosphorus.—The sodium carbonate precipitate contains the phosphorus, as iron *phosphate*. This precipitate is dissolved from the filter with hot nitric acid, specific gravity 1.13 (about 1 vol. of concentrated nitric acid to 3 of water). Fifty c.c. of the acid will be found ample if it is poured through the filter several times. When the precipitate is completely dissolved the filter is washed, first with a 1 per cent solution of nitric acid, then with hot water until it is free from iron.

The solution is now heated to boiling, with the addition of a few drops of a concentrated solution of potassium permanganate, and kept at this temperature for about five minutes. Add a solution of ferrous sulphate in water, acidified with sulphuric acid, until any precipitate of manganese dioxide dissolves and the solution becomes quite clear.

Remove solution from the source of heat and add 50 c.c. of ammonium molybdate solution. Allow to stand for 30 minutes, filter through a 9-cm. filter paper, then wash first with 1 per cent nitric acid solution, second with hot water until the yellow precipitate is free from iron.

After the method of J. O. Handy (Blair, Chemical Analysis of Iron, 7th ed., p. 104), transfer the filter paper and yellow precipitate to a glass beaker, add a definite volume of sodium hydroxide solution that has been standardized against a steel of known phosphorus content, and titrate for the excess of alkali with a standardized solution of nitric acid. Calculate to phosphorus.

Manganese, Iron and Aluminum

Weigh about one gram of the finely powdered sample into a platinum dish and proceed with the decomposition of the alloy in a manner identical with that given in the surphur-phosphorus procedure, up to and including the first evaporation to dryness.

Cover residue in the dish with 25 c.c. of a 1:5 solution of sulphuric acid. Evaporate solution almost to dryness. Cool. Add 25 c.c. of distilled water, raise contents of the dish to the boiling point, then transfer to a glass beaker. Add 100 c.c. of water, a few drops of concentrated hydrochloric acid and boil until solution is complete. Determine manganese, iron and aluminum in this solution in the regular manner, as given in Blair's Analysis of Iron and Steel, or any standard work on qualitative analysis.

Determination of Silicon

Silicon is calculated by summing up the percentages of the elements determined and subtracting from 100. For an extremely rapid but approximate determination of silicon, accurate within 0.5 per cent, weigh 0.25 g. of the sample into a weighed platinum dish. Decompose with mixed acids as before. Evaporate solution to dryness. Ignite dish at red heat, cool in dessicator and weigh. Assume residue to be entirely composed of iron oxide. Calculate to iron and subtract this value from the weight of the sample, calling the difference silicon.

Notes on the Analysis

Nitric acid must be added first to prevent the volatilization of iron, sulphur, phosphorus, etc., as fluorides.

By keeping the solution hot it is possible to maintain a much more even rate of decomposition. When hydrofluoric acid is added to a cold solution the reaction is very apt to start with such violence as to eject the contents of the dish.

The treatment with sodium carbonate prior to transferring the solution from platinum to glass is necessary because of the traces of free hydrofluoric acid in-

variably present in the acid solution. For the determination of sulphur and phosphorus it is obviously impossible to make use of a sulphuric acid evaporation to remove the last traces of fluorine. Likewise, the contents of the dish cannot be evaporated to dryness and baked owing not only to the danger of volatilizing phosphorus, but also to the difficulty of getting the ignited oxides back into solution. By the addition of sodium carbonate, the traces of fluorine remaining are converted to the fluoride and this is later removed by precipitation with calcium chloride in the sulphur determination. Before this method was adopted the etching of beakers and cover glasses was quite noticeable, while the presence of gelatinous silica made filtrations most difficult.

It is to be noted that in no case is there an evaporation of a ferric chloride solution in contact with platinum. This eliminates another source of loss of that expensive metal.

Government Steel-Plant Accident Statistics

WASHINGTON, Dec. 4.—The trend of accident frequency rates in the iron and steel industry during the war period has been made the subject of a study by the Bureau of Labor Statistics, which is about to publish a report compiled by Dr. L. W. Chaney, covering more than 50 per cent of the industry. The following table from the bulletin shows the fatality rates and frequency rates of all accidents from 1913 to 1917, the statistics being presented by overlapping years ending with March, June, September and December:

Accident Frequency Rates from 1913 *to* 1917 *Per* 1000—300-*Day Workers*

Year Ended	No. of Workers	Fatalities	Total Accidents
Dec., 1913	153,098	1.34	181.0
Mar., 1914	146,522	1.29	168.4
June, 1914	137,816	1.09	154.7
Sept., 1914	128,023	.81	138.9
Dec., 1914	117,214	.70	130.4
Mar., 1915	111,881	.63	118.0
June, 1915	111,794	.65	114.0
Sept., 1915	117,933	.85	118.6
Dec., 1915	133,627	.86	124.5
Mar., 1916	148,221	.96	131.8
June, 1916	160,819	1.09	134.1
Sept., 1916	168,790	1.02	135.5
Dec., 1916	175,013	1.11	133.2
Mar., 1917	178,937	1.15	128.5
June, 1917	182,587	1.08	121.6

Factors in the results are industrial conditions and accident-prevention effort. Accident rates rise with recovery from depression and fall again with declining industrial activity. Also, each successive rise has not reached the altitude of those preceding.

Zirconium Steel for German Armor Plate

That ferro-zirconium has been successfully employed in Germany for the production of zirconium steel, was brought out by J. A. Audley in a recent address before a meeting of the Refractory Materials Section of the Ceramic Society (British). Such steel is being used for armor plates, projectiles, bullet-proof steel and other special purposes. Zirconium steels are stated to be particularly hard, one inch of such material being equal to three inches of the best German armor plate. Before the war the Germans had practically a monopoly of the supplies of zirconia, which was mainly dealt with under German patents, but this state of affairs has since been modified. It is of interest to note that practically every rare element has proved of industrial importance in steel metallurgy, but it is doubtful if such elements would be of much value without the very common element carbon.

The Republic Rubber Co., Youngstown, Ohio, will triple its capacity in the manufacture of automobile tires. The company has recently issued $3,000,000 of stock to provide funds for the proposed extensions.

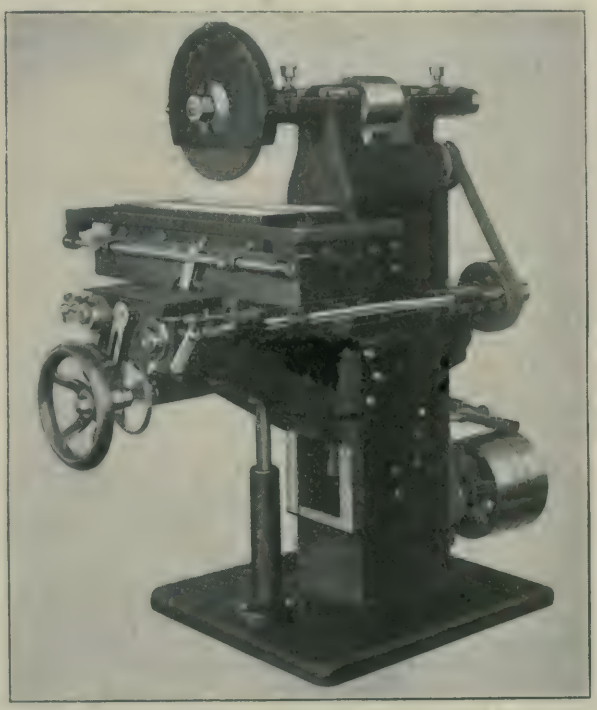
The Electric Appliance Co., 881 Third Street, Milwaukee, Wis., has recently purchased the patents on the Acme pinch dogs and is now supplying these to pattern shops.

Automatic Surface Grinding Machine

The Noble & Westbrook Mfg. Co., Hartford, Conn., has recently brought out the new surface grinding machine. A guard practically covers the entire grinding wheel, and there are automatic stops for the cross slide and the platen may be started and stopped without interfering with the operation of the spindle or other parts of the machine.

The machine will handle work which does not exceed 20 in. in length and 8 in. in width, the maximum distance between the bottom of the grinding wheel and the top of the platen being 7½ in. The table-elevating mechanism is equipped with ball thrust bearings, and it is possible to start or stop the platen at any point within the limits of its travel without stopping the spindle or any other part of the machine.

The wheel, which is 12 in. in diameter with a ¾ in. face, is mounted on a spindle measuring 1 9/16 in. in diameter. A belt drive is provided for a countershaft equipped with self-lubricating steel hangers. The spindle bearings are 6 in. in length, and are arranged to compensate for wear, as are all of the slides as well.



The Wheel of a New Automatic Surface Grinding Machine Is Almost Entirely Covered by a Guard and Automatic Stops Are Provided for the Cross Slide to Insure Safety

The diameter of the spindle between the flanges of the wheel is 1¼ in. The machine can be supplied either with or without a magnetic chuck.

Manganese Ore Prices

Indian manganese ore has sold recently in this country as high as $1.30 per unit, seaboard, for high-grade material. Brazilian ore has been quoted at $1.10 to $1.20 per unit, seaboard. For domestic ores a leading dealer is now offering the following prices: $1.20 per unit for ore containing 50 per cent or more manganese; $1.10 per unit for ore averaging 46 to 49.99 per cent; $1 per unit for 42 to 45.99 per cent ore, and 90c. per unit for 38 to 41.99 per cent ore. For all these grades maximum limits of 10 per cent silica, 0.20 per cent phosphorus, and 3 per cent iron are stipulated.

A Beaumont, Tex., dispatch says that by an almost unanimous popular vote approval has been given for a bond issue of $300,000 to deepen the waterway to the sea from Beaumont to a depth of 28 ft. Heretofore 26 ft. draft has been the limit. The deepening of the channel is considered important to the Texas Steel Co.'s project for the location of a steel plant at Beaumont.

NEW MERCHANT MARINE

Building Program Will Add 1408 Vessels with Large Tonnage

WASHINGTON, Dec. 4.—The addition to the American merchant marine of no less than 1409 vessels, with a total dead-weight capacity of 8,363,801 gross tons, is embraced in the building program of the United States Shipping Board, according to the first comprehensive official summary just made public here. The significance of these figures will be appreciated when it is remembered that the total tonnage under the American flag when the Shipping Board was organized was slightly less than 8,000,000, so that the increase to be realized within the next 15 months will exceed 100 per cent. In point of actual efficiency the increase will be far greater, as the great bulk of the new tonnage will be standardized cargo-carrying vessels of relatively high speed.

The total tonnage included in the official statement made public by the Shipping Board includes 884 vessels contracted for, with a total dead-weight capacity of 4,724,300 tons; 99 vessels with a total of 610,000 tons, for which contracts will be closed within a few days, and 426 vessels with a total capacity of 3,029,508 tons, which have been requisitioned on the stocks in the various shipyards of the country. Of the vessels requisitioned, 33, with a total of 257,575 tons, have been completed and put into service since the Shipping Board was organized. Of the vessels thus released seven, with a total of 73,760 tons, are ore carriers which were allowed to perform the service for which they were originally designed.

The following table shows the vessels under contract, pending contract and requisitioned by the Emergency Fleet Corporation:

Type of Vessels	Number of Vessels	Total Dead-weight Capacity
Wood	375	1,330,900
Composite	58	207,000
Steel	451	3,186,500
Total contracted for	884	4,724,300
Contracts pending	99	610,000
Total	983	5,334,300
Total requisitioned (all types)	426	3,029,508
	1,409	8,363,808

An important feature of the work of the Emergency Fleet Corporation is the completion and releasing of requisitioned vessels which were building at the time the Shipping Board was organized; in fact, the placing of these ships in service represents the only practical fruits of the board's program to date. As these vessels averaged 50 per cent completed when the board took them over, and as they aggregated more than 3,000,000 tons, it is apparent that their addition to the merchant marine will constitute a factor of great importance. The requisitioned vessels already completed and released number 33, with a dead-weight tonnage of 257,575.

The building program will exhaust about $1,300,000,000 of the Shipping Board's appropriation of $2,000,000,000, the outstanding contracts, including those commandeered, having been made on a basis averaging about $160 per ton. The board therefore has to its credit approximately $700,000,000, with which, after deducting the cost of equipping the three Government-owned shipyards now being laid out, it is estimated there can be built from 350 to 450 additional vessels aggregating 3,300,000 tons. Contracts for these additional ships will be made as rapidly as possible, but preference will probably be given to contractors who propose to build on the Great Lakes, the Gulf or the Pacific Coast, as the Government will seek to divert as much construction work as possible from the Atlantic seaboard, where a badly congested condition now exists. Shipyards on the Great Lakes are being encouraged to take contracts for vessels of the smaller types and during the past week no less than 40 of 3500 tons each were placed with lake shipyards.

Chairman Hurley has been advised by William M. Piggott, president of the Seattle Manufacturers' Association, that the Pacific Coast Chambers of Commerce and other business organizations, for the purpose of stimulating shipbuilding, will offer a bonus of $5,000 to the men at work upon each steel ship that is completed in less time than is consumed in the construction of vessels of the same type in the East. There is a shortage of labor skilled in steel-ship construction on the Pacific Coast, and a special committee of Western business men, co-operating with agents of the Emergency Fleet Corporation, is about to canvass Western labor markets for the purpose of building up the working organizations of the shipyards having Government contracts.

The Government is preparing to co-operate with all well-equipped shipyards having contracts with the Fleet Corporation to the extent of assisting in solving the labor question, especially with reference to the housing of workers in proximity to the plants. In an authorized statement made before the Merchants' and Manufacturers' Association in Baltimore during the past week, Rear Admiral Francis T. Bowles, who has been serving as an aide to Admiral Capps, stated that the Shipping Board had discovered that the output of the Bethlehem Steel Corporation's shipyards at Sparrows Point could be increased 100 per cent with proper aid and that it had been decided to lend the Bethlehem corporation money to build 1500 homes for workmen near the plant. Incidentally, Admiral Bowles deplored the contracts heretofore made for wooden ships, which he said were "conceived in trouble and dissension."

Progress in Making Parts of Steel Cars

For shaping the heavier parts of steel railroad cars, such as center sills, bolsters, doors, etc., the hydraulic press is depended upon entirely, as explained by G. P. Bender, in an address at the recent convention in New York of the National Safety Council. The presses usually range in capacity from 250 to 1000 tons pressure, and where a great number of pieces of the same shape are required elaborate dies and tools have been worked out by the Ralston Steel Car Co., Columbus, Ohio, to enable a maximum amount of fabricating to be done with a single operation of the press.

Two of the most interesting of these developments have come in the manufacture of car doors and heavy pressed steel bolsters. In making the drop doors for flat-bottom gondola cars the original method was first to shear the plates to the blank shape and notch them, after which they were punched, flanged and trimmed, each operation requiring a separate machine and individual handling between each. By the skillful grouping of two dies under a 1000-ton hydraulic press, one equipped for punching and shearing and the other for flanging, an entire door is now completed each time the platen descends, thus reducing the five original operations to one.

When an order was received for 2000 cars to be equipped with pressed steel truck bolsters of ¾-in. metal, a problem requiring considerable thought presented itself since metal of this thickness does not draw evenly when pressed hot. It was thus impractical to blank the plates to shape before pressing and as the top of the bolster was truss shaped after being formed the trimming of the flanges at that time was also difficult. To overcome these obstacles a shear blade was attached at the outside of the female die on both sides and corresponding blades were designed which were gagged in to work in conjunction with the female die. After the forming was finished the gags were thrown in and with the second movement of the top platen of the press the complete bolster was removed.

Several machine-tool salesmen in New York have been assisting United States recruiting officers in obtaining mechanics for shops to be built back of the army in France for the repairing of guns. The plan generally followed is to hold a noon meeting at manufacturing plants, calling together only those mechanics of draft age, to whom the proposition is explained. Comparatively few men are taken from each plant, so that manufacturers will not be seriously crippled. The so-called non-essential industries are the first to be visited. The gun shops alone will require 21,000 men.

BRAZIL'S FIRST STEEL

Made from Native Pig Iron in Whiting Converter —Locomotive Parts Cast

THE first successful manufacture of commercial steel in Brazil, as announced in a cable dispatch in THE IRON AGE, Oct. 25, was accomplished in the Engenho de Dentro works of the Central Railroad of Brazil, about 10 miles from Rio de Janeiro, on Oct. 19. Up to this time all attempts to manufacture steel from native pig iron had not apparently been commercially successful. The railroad used a Whiting converter, purchased in this country, and though the steel was made for its own use for locomotive parts, the success of the undertaking is looked upon as demonstrating the commercial possibilities of the process and the feasibility of making steel in this way for market consumption. For the following information THE IRON AGE is indebted to F. H. Tackaberry, of the American Steel Export Co., who witnessed the test:

The Central Railroad foundry is located at its locomotive repair shops. As a part of its equipment it installed in 1914 two No. 3½ cupolas purchased from the Whiting Foundry Equipment Co., having a rated capacity of 5 to 6 tons per hr. For some years it has been making gray-iron castings ranging in size to 3000 lb. These have been satisfactory. Native pig iron with a mixture of about 40 per cent scrap iron and no steel scrap was used.

In November, 1916, Wonham, Bates & Goode, Inc., the New York agents of the Whiting company, received an inquiry from Dr. Silva Freire, subdirector of the fourth division of the Central Railroad, for complete No. 1 steel converter equipment having a capacity of 1 ton. This equipment was shipped in March, 1917, and its installation was completed Oct. 15 under the personal supervision of George P. Fisher of the Whiting company.

On Oct. 19, 1917, the first heat was blown. The charge consisted of native pig, analyzing as follows:

Silicon, 1.645 per cent; carbon, 3.50 per cent; phosphorus, 0.09 per cent; manganese, 1 per cent; Sulphur, 0.02 per cent.

About 20 per cent steel scrap, consisting of car springs, was added, and to insure a sufficient amount of silicon about 10 lb. of 50 per cent ferrosilicon was added.

Blast	1.7:45 p. m.
Light	1.11:20 p. m.
Beginning of boil	1.12:00 p. m.
End of boil	1.14:40 p. m.
Finish	1.23:15 p. m.
Total time of the blow	15 min. 30 sec.

There were predictions that the experiment would be a failure, so preparation was made with care. Particular attention was given to the preheating of the converter and the ladle with fuel oil. The total time of the blow and of the different stages are given in the accompanying table.

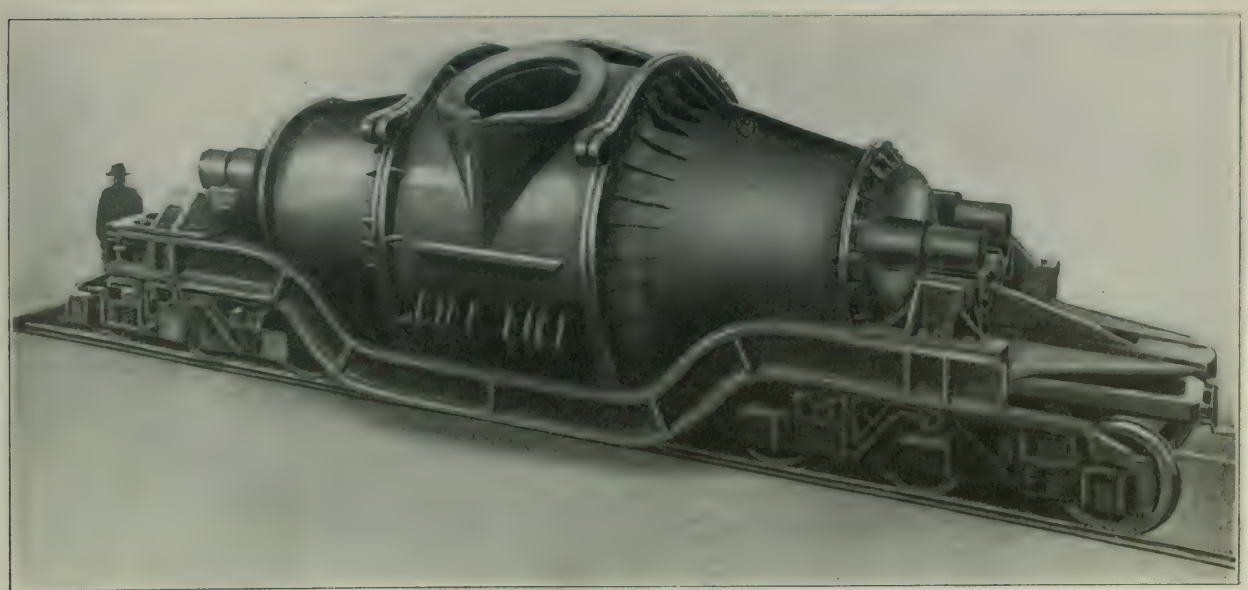
The charge was recarburized with 10 lb. of native manganese ore running about 47 per cent manganese, and 22 lb. of 50 per cent ferrosilicon, added to the molten metal in the converter. The first steel casting poured was a locomotive coupler. A number of pieces have since been machined, showing a well-finished surface, and the fracture shows a fine, homogeneous grain. The following pieces were cast from about a ton of metal, the converter's capacity: Four brake-heads for type Pacific locomotives, four Climax couplers, two slide-rod guides for ten-wheel locomotives, and some brake shoes.

A New Large Capacity Hot Metal Car

A new type of car for transferring molten pig iron from the blast furnace to the steel plant has been designed by John D. Pugh, Title Building, Baltimore, Md. It is especially noteworthy for large capacity, thus conserving heat and minimizing sculling.

The car illustrated has a capacity of approximately 92 tons and it is pointed out that by increasing the length the capacity can be materially augmented without changing the side or overhead clearances. The body of the ladle is made up of flanged steel castings bolted together, which arrangement enables the sections to be separated and the entire lining removed if this should become necessary on account of the charge freezing or for any other reason. The ladle, which is supported and tilted on trunnions in the customary manner, is of circular construction which it is explained gives the maximum strength. The ladle trunnions are supported by two six-wheel trucks, the arch bars or frames being hinged to enable the three wheels on one side of the truck to bear equal loads. If desired the ladle body can be made of steel plate in place of the castings illustrated.

The capability of carrying a large amount of metal has, of course, the effect of reducing the dead weight of the cars required to transport a given tonnage with a corresponding decrease in the wear and tear on the equipment and cost of repairs. The opening in the top of the ladle is comparatively small in proportion to the capacity and it is explained that this form of construction tends to conserve the heat and insure the delivery of hotter metal. In a number of cases, although several hours elapsed between the time of charging the ladle and emptying it, the fluidity of the charge was found not to be impaired. The ladle is claimed to be entirely self-cleaning, as if it should not be entirely emptied at any time, the succeeding charges of metal will cut out all material left.



A Load of 92 Tons of Hot Metal Can Be Transported with a Decrease in the Loss of Heat and Without Sculling in a New Type of Ladle Car

A reduction in the length of the iron runners at the blast furnace and the number of spouts required for charging the car are secured, the number of the latter being decreased from four or six to two or even a single spout according to the size of car that is being charged. The cost of labor for cleaning the runners and the amount of scull left therein is, of course, cut down and as the size of the cast house building and floor is decreased with the shortening of the runners, the cost of construction will be lessened.

At the present time one of these cars is in use at the plant of the Jones & Laughlin Steel Co., Pittsburgh. It was built by the Treadwell Engineering Co., Easton, Pa.

Great Activity in Shipbuilding at Seattle

SEATTLE, Dec. 3—The steel shipbuilding plants in Seattle have increased their forces by 1800 men since the first of October, and the wooden plants have added 200 men, giving a total of 14,900 employees in the shipbuilding industry in the city. It is expected that from now on, the yards will record substantial increases each month, particularly in the wooden yards. The total monthly payroll of the industry in both steel and wooden plants amounts to $1,600,000 as compared to $1,400,000 two months ago.

Above figures relate only to shipyards, and do not include the hundreds of other plants in the city that are employed all or part time in contract work for the shipbuilding industry. It is estimated that these plants employ at least 3000 workers. The machine shops and foundries are working to capacity, and many of them are employing three shifts to keep up with the orders on hand.

The West Coast Lumbermen's Association has signed a contract with the United States Shipping Board for 40,000,000 ft. of ship timber, to be cut in Washington and Oregon mills and delivered to Gulf and Atlantic Coast shipyards.

The car shortage is becoming more serious daily, and it is reported that unless relief is obtained in Oregon shortly, that at least 20 mills, 50 per cent of whose output is war material, will be forced to suspend operations.

PLATE SHEARING MACHINE

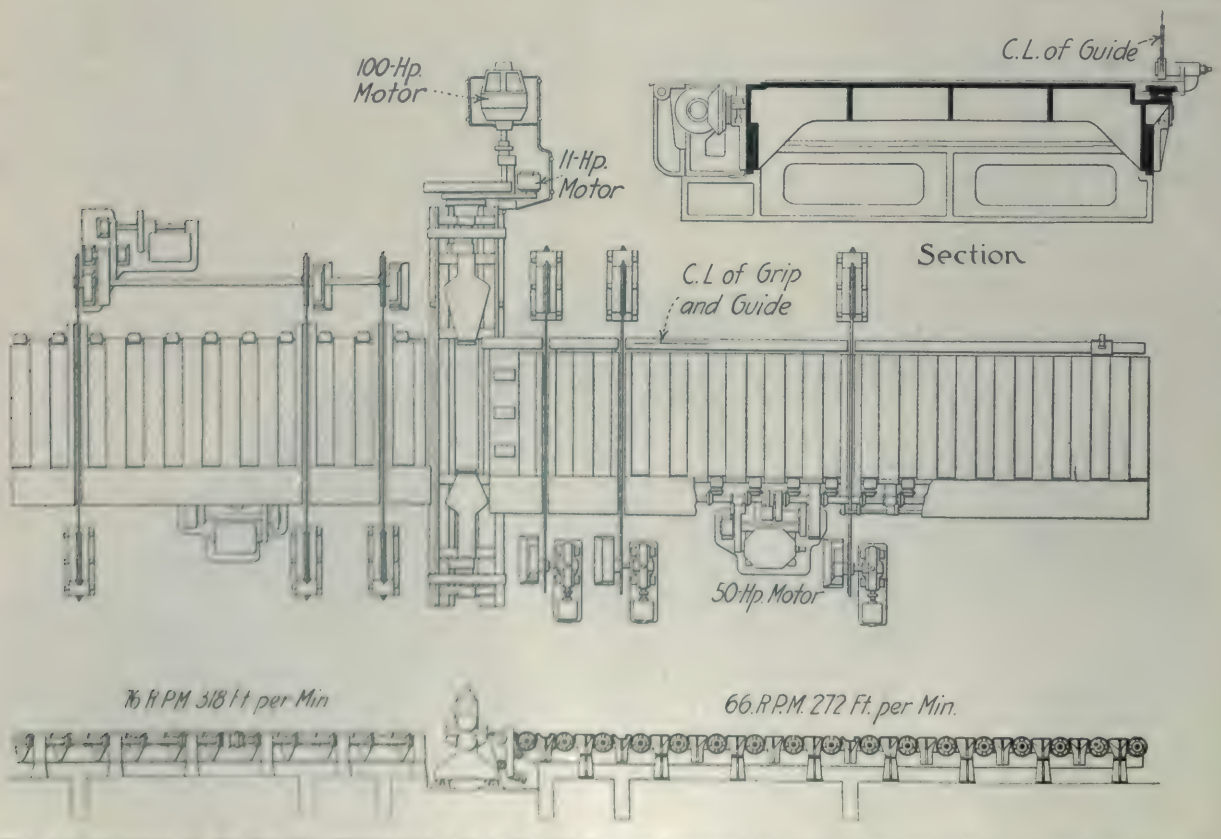
Double Rotary Type in Which the Material Is Held by a Sliding Grip

RECENTLY the R. L. Newbold & Son Co., Norristown, Pa., installed a double rotary plate shearing machine at the plant of the Republic Iron & Steel Co., Youngstown, Ohio. This machine, which is capable of handling material ranging from 18 to 100 in. in width and having a maximum thickness of 1 in., is equipped with a sliding grip and guide. This feature, it is pointed out, has overcome the objection formerly raised to the use of rotary shearing machines for plate trimming due to the fact that a straight cut was difficult to secure, to say the least. The application of the guide and sliding grip for holding the tail of the plate, it is emphasized, has solved the problem and enables a merchantable sheared plate to be produced within the capacity of the machine.

The sliding grip operates on a guide which is rigidly bolted to brackets on one side of the roller table provided with the machine. This grip bears down on the plates at one corner and is adjustable to take care of material ranging from ¼ to 1 in. in thickness. This adjustment is made by an eccentric pin on which the grip turns.

After the plate is delivered from the rolls of the rolling mill, it is sent through the leveler and passes out on the table in front of the rotary shearing machine. Here the plate is manipulated by the cross-over and the tail end caught by the sliding grip. The roller table, which is driven by a 50-hp. compound wound electric motor operating at 500 r.p.m., is started and the circular knives of the shearing machine draw the plate along over the rolls of the table, the power for these being transmitted through bevel gears at the end of the individual rolls connecting with corresponding gears on the shaft which is meshing through a set of gears with the motor. As the tail end of the plate approaches the shearing machine the handle of the grip comes in contact with a stop. This automatically releases the grip and permits the plate to go through.

A spring placed in the floor is employed in some cases to return the grip to the starting point and an



The Arrangement of the Tables, Crossovers and a Double Rotary Shearing Machine in the Plate Mill of the Republic Iron & Steel Co.



Steel Plates having a Maximum Thickness of 1 In. Are Sheared in Widths of from 18 to 100 In. in a Double Machine of the Rotary Type, the Use of a Special Grip for Holding the Material in Position Being Relied upon to Insure a Straight Cut

arrangement of counterweights or pulleys in others, although the arrangement recommended is to have the man operating the grip return it to the starting point. It is pointed out that by holding the end of the plate so that it cannot move while the other end is in shearing machine gives a straight cut.

The shearing machine consists of two units, one of which is fixed and the other movable. The construction of these units follows the conventional design for machinery of this type. The shearing machine is driven by a 100-hp. electric motor while the movable unit is adjusted by 11-hp. motor to take care of various widths of plates.

VERY BUSY AT DETROIT

Large Output While Preparing for Still Greater Production

DETROIT, Dec. 3—Manufacturers of this district are expecting the greatest industrial activity that Detroit and the surrounding cities have ever had. War orders are pouring in, factories are being built to care for them, building of pleasure cars is increasing over the past few months, and Washington has promised there will be no Government interference in the production of automobiles nor in the use of freight cars for their transportation. Factories are still going through the period of adjustment, prior to the making of munitions. One of the largest automobile firms in Detroit reports the heaviest business in its history in pleasure cars. The Ford Motor Co. is increasing its production of material for the Government, and its factory, which employs from 30,000 to 40,000 men in normal times is expected to house one of the greatest war industries of the country. Dodge Bros. have increased their capitalization from $6,000,000 to $10,000,000, the increase to partly take care of the new factory being built for ordnance work. The Packard Motor Car Co., is increasing its production of war trucks and Liberty motors. The new Lincoln Motor Co., Detroit, is rapidly completing its factory for the making of Liberty motors. The Cadillac Motor Co. is working on its second large war order, but not curtailing the production of pleasure cars.

Purchases of real estate by large manufacturers show that the future is being anticipated. The Detroit Shipbuilding Works and the American Shipbuilding Co. are working to capacity, although handicapped by the lack of skilled labor. The Government has taken so many skilled mechanics from Detroit factories that there is general complaint of the dearth of skilled men. Unskilled labor at present surfeits the demand, but the training of new men for expert work is progressing rapidly. Transportation is much better than at this time last year, and money more obtainable than for some time.

Manufacturers Confer at Indianapolis

Representatives of 16 state associations attended a meeting of the National Conference of State Manufacturers' Associations at the Claypool Hotel, Indianapolis, Nov. 25. The sessions were closed. The object of the meeting, it was stated, was to discuss plans for closer cooperation between the manufacturers and the Government, to enlarge the scope of the conference and to provide for meetings of representatives of the state associations to discuss national as well as basic industrial conditions. Thirty members of the conference attended the meeting. John M. Glenn, president of the organization, was in the chair. At an open meeting preceding the closed session, addresses were made by Mr. Glenn and Harrison Riley of Washington, a representative of the department under the secretary of the treasury, which is directing the war financial operations. Mr. Glenn quoted extracts from President Wilson's address at the Buffalo convention of the American Federation of Labor, among them this: "I believe I am speaking not only of my own experience but of the experience of others when I say that you are more reasonable in a larger number of cases than the capitalists."

"I do not know what the president meant by these statements," Mr. Glenn said. "He has not made such a statement to the representatives of the men who have invested money in the plants. Is it clear to your minds what the President meant? There is no question," he said, "as to the responsibility that rests upon the manufacturers of the country, and there is no intention on their part to lie down on the job, no matter what kind of criticism emanates from Washington. The way for us to win control of the situation is to win the confidence of the people of the United States. When we have this we will have the administration at Washington with us." Mr. Glenn said the administration had uniformly been with public sentiment, that Washington had constantly kept its ear to the ground. In the face of all trouble, obstacles and criticisms, it is the duty of the manufacturers of the country, Mr. Glenn said, to stand up as one man and use every ounce of influence and every dollar of money they have for the country.

Mr. Riley said that some of the less essential concerns will have to close their doors in the interest of those manufacturing war munitions and supplies. He discussed the war certificates soon to be issued and suggested that manufacturers give these instead of the usual Christmas bonuses to their employees.

The following new officers were elected: President, R. H. Rice, General Electric Co., West Lynn, Mass.; vice-president, J. E. Frederick, Kokomo Steel and Wire Co., Kokomo, Ind.; secretary-treasurer, John M. Glenn, secretary Illinois Manufacturers' Association, Chicago.

Adjustment of Labor to War Needs

New Bureau Organized by Council of National Defense — Investigation of Causes of Industrial Unrest in England

WASHINGTON, Dec. 4.—The necessity for the speedy mobilization of labor for the more efficient prosecution of the war, a necessity that has become increasingly apparent during the past month and which now presents a problem to the administration no less serious than that involving the transportation of the country, has induced the Council of National Defense to create a bureau to be known as the Section on Industrial Service which will immediately undertake a comprehensive investigation to determine the steps that must be taken to bring about a proper adjustment of labor supply to the war needs. The council has designated as chief of the new section L. C. Marshall, at present dean of the School of Commerce and Administration of the University of Chicago. In order to secure a basis of facts on which to work out policies, Mr. Marshall has been directed to undertake the following work:

1. To determine present and probable future demand for labor in war industries.

2. To determine in connection with the priorities committee of the War Industries Board the relative priorities of the labor demand.

3. To arrange for the supplying of the demand through the Department of Labor or such other governmental or civilian agencies as can best meet the demand.

4. To determine the needs for dilution of labor including the introduction of women into industry and recommend policies to be followed in regard thereto.

Will Collect Information

In a statement issued by the director of the Council of National Defense, it is explained that it is not contemplated that there will be created under the council any agencies for executive action with respect to the problems concerned. The purpose is to have under the council a section to which these various labor problems may be brought for common consideration. The new section will work in close co-operation with the War Industries Board and its priorities committee and will, like the War Industries Board, bring to the council digested information from all Government departments as to the above subjects. Policies can then be worked out to secure the most efficient utilization of existing agencies and to facilitate the development of such new agencies as may be necessary.

Administration leaders here have been convinced for some time that energetic steps must be taken to deal with the labor problem as affecting those industries upon which the prosecution of the war chiefly depends. While the attitude of the majority of the labor leaders has been fairly satisfactory and while in general terms a full measure of co-operation has been pledged, yet in detail the results have been disappointing and present conditions are such as to cause great anxiety to the President and his advisers as well as to the business men of large experience who are assisting the Government in Washington. Strikes and threats of strikes in the coal mines, the shipyards, the machine shops and on the railroads have been more frequent within the past 90 days than at any time since the beginning of the war. In addition many spokesmen for labor are demanding "more liberal treatment" for the workers and are insisting that they be "guaranteed protection" against more or less imaginary encroachments upon their liberties. The eight-hour day, the curtailment of overtime and the maintenance of a standard wage whether paid to a skilled mechanic or to an unskilled temporary substitute are being demanded and the suggestion that in this great crisis labor, relieved of military duty, should be prepared to make some sacrifice for the common welfare has been received with ill-disguised impatience.

Greater Flexibility Needed

The necessity for greater flexibility of the labor supply is a phase of this important subject which will receive special consideration at the hands of the new organization. The Council of National Defense has been working for many weeks in the effort to so coordinate the manufacturing establishments, the transportation facilities and the labor supply of the country as to obtain the best possible results and the maximum output of war material. It has been found necessary to enlarge plants located at a distance from good labor markets and the managers of these establishments have been obliged to go far afield in building up their organizations. Labor has shown an indisposition that is by no means unnatural to be transferred in a large volume from one part of the country to another; nevertheless, it is the opinion of many experienced manufacturers that an army of skilled mechanics available for use where needed would do more to hasten the production of war material and to relieve transportation congestion than any other possible agency.

The organization of such a force would prove a difficult and delicate task and it is a question as to whether it is practicable at this time. There is no thought of conscription in the minds of administration officials in connection with the work now being planned by the Council of National Defense, but the new section will undoubtedly give serious consideration to the desirability of increasing the flexibility of the labor supply in every conceivable way. It is more than probable that an effort will be made through the aid of the priorities committee of the War Industries Board to secure the speedy transfer from one point to another, on an entirely voluntary basis, of comparatively large numbers of skilled workmen who may be needed from time to time in certain establishments engaged upon war work.

Dilution of Labor

The dilution of labor which, in view of the experience of England and France, not to mention Germany, in the manufacture of war material, has demonstrated to be an ultimate necessity here, will be carefully studied from every point of view. The introduction of women into industry is not favorably regarded by the labor leaders but there can be no doubt that it must be effected to a very material extent if the war lasts long enough to permit the Government to exhaust the existing draft registers. The question of compensation, it is believed, will not prove a difficult one provided manufacturers are permitted to operate freely on a piece basis. There is not likely to be a disposition to withhold standard rates of pay from women simply because they are women, but it will hardly be practicable to secure an output from female labor on a per hour or per diem basis that would justify the payment of wage scales fixed for men's labor.

It should be clearly understood that the newly created bureau is in no sense an arbitration or conciliation tribunal. While it will have points of contact with both employers and employees, as well as with the managers of Government manufacturing plants and their workers, it will have nothing to do with labor controversies as such, but will concern itself with the formulation of broad policies to be put into execution by the executive officers of the various departments of the Government. Mr. Marshall, who will at once assume the duties of Chief of the Section of Industrial Service, is not only well equipped for his task, but is in close touch with the existing situation, having given much

time recently to the special consideration of labor matters as affecting certain procurement divisions of the War Department and thus takes up the new work with broad general information and special detailed knowledge of a number of the more pressing problems.

The British Report

As bearing on certain phases of the labor problem, which has numerous international aspects, the report of the British Commission of Inquiry into Industrial Unrest, which has just been reproduced by the Department of Labor, is of special interest at this time. The report is presented in eight sections, showing the results of inquiries in eight separate districts of Great Britain. The commission was appointed June 12, 1917, and the completed report was submitted July 17, 1917.

The reports for all the districts emphasize as the leading cause of industrial unrest the fact that the cost of living has increased disproportionately to the advance in wages and that food distribution is unequal. Another cause regarded as particularly serious is the restriction of personal freedom under the munitions of war acts, by which workmen have been tied up to particular factories and have been unable to obtain wages in proportion to their skill; in many cases the skilled man's wages were less than those of the unskilled. The requirement of "leaving certificates" was reported as one of the chief causes of dissatisfaction, but this restriction has been abolished by an order to the Minister of Munitions, effective Oct. 15, 1917, under which any munitions worker may leave his present employment for other war work by giving a week's notice, or such longer notice as is provided for in his existing contract of service.

Lack of Co-ordination

Dilution of labor and lack of confidence in the Government growing out of the surrender of trade-union customs and the fear that promises regarding the restoration of pre-war conditions will not be kept, are given special attention. It is stated that the irritation caused by the withdrawal of the trade card scheme under the Military Service Acts has subsided, but there remains much anxiety regarding the working of the schedule of protected occupations. All the reports refer to the lack of co-ordination between Government departments in dealing with labor, and considerable complaint on account of the delay in dealing with disputes and the difficulty of securing prompt awards is reported.

Besides the more general causes of industrial unrest, certain causes, such as inadequate housing, liquor restrictions, and industrial fatigue, are mentioned as acute in some districts. Mention is also made of lack of proper organization among the unions, inconsiderate treatment of women as regards wages, delay in granting pensions to soldiers, and inadequacy of compensation under the workmen's compensation act.

Important Recommendations

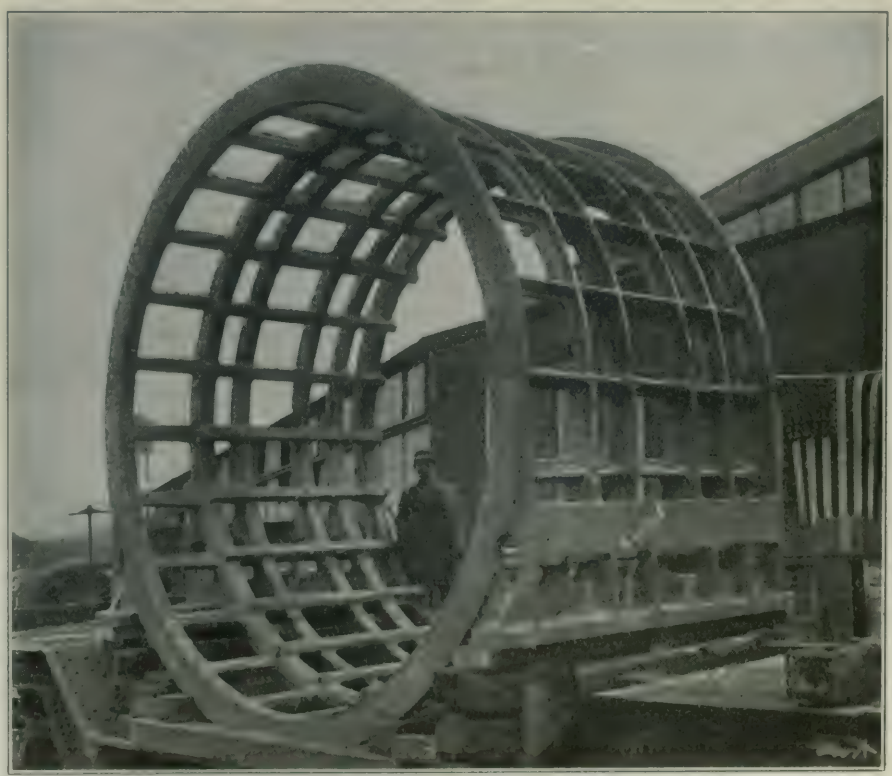
A number of recommendations are made by the commissioners. Of these the first is that there should be an immediate reduction in food prices, the increased cost of food to be borne to some extent by the Government, and that there should be a better system of distribution. The necessity of reducing hours, readjusting wages to a fairer basis for skilled as against unskilled workmen, the fuller use of trade-union machinery, and renewal by the Government of the declaration that trade-union rights and privileges which have been interfered with on account of the war shall be restored after the war, are insisted upon. The commissioners strongly urge the adoption of the principle of the Whitley report for the establishment of industrial councils for each of the organized trades, such councils to be composed equally of employers and employees. Other recommendations are that compensation under the workmen's compensation act should be increased, that announcement should be made of the Government's policy as regards housing, that pensions committees should have larger discretion in their treatment of men discharged from the army, that the recruiting system should have most careful handling, that the work of Government departments dealing with labor should be more thoroughly co-ordinated, and that when an agreement is drawn up between representatives of employers' federations and trade-unions, it should be binding on all in the trade concerned.

While the report shows very clearly the prevalence and the nature of industrial unrest in Great Britain, it at the same time indicates that "there is a strong feeling of patriotism on the part of employers and employed throughout the country and they are determined to help the State in its present crisis." W. L. C.

Intricate Cast-Steel Motor Frames for Battleship Turbines

An unusual steel casting, which has been necessitated by recent developments in battleship construction, is shown by the illustration. It is one of a number of motor frames for the battleship turbines being built by the Westinghouse Electric & Mfg. Co. This particular motor frame and three companion ones were made for the U. S. battleship Tennessee by the Pittsburgh Steel Foundry Co. at its plant at Glassport, Pa.

Such a casting is an extremely difficult one to make in steel. This is true not because of its weight, but rather on account of its lack of weight, or particularly because of its great size and light section. Its production requires an enormous flask



Large Cast-Steel Motor Frame for U. S. Battleship Turbines as Made by a Pittsburgh Foundry

and many hundreds of cores. Considering the molding space and time required, the return in actual weight is small, for the casting finished weighs only 23,660 lb. Its inside diameter is 12 ft. 6 in., not including feet or brackets. Its length is 7 ft. 3 in.

Because of these dimensions it presented an unusual problem in shipping. Were it placed on a regular gondola car there would not be sufficient clearance on railroad bridges. Therefore, a specially made car, of which there are only a few in this country, had to be provided for carrying it. The illustration also shows part of this car.

HIGH-SULPHUR CAST IRON*

Within Certain Limits It Increases the Strength of Soft Gray Iron

By T. Mauland

SULPHUR is considered cast iron's worst enemy, and many of the troubles of the foundry are laid to it whenever it happens to be high. Authorities say that sulphur combines carbon, increases hardness, shrinkage and chill; reduces strength; causes dirty iron, blow holes and shrinkage cracks and makes iron congeal quickly. Generally this is true, but my experience has been that sulphur within certain limits increases the strength in soft iron. For agricultural or similar classes of castings, specifications have called for a maximum sulphur of 0.08 or 0.09 per cent. The American Society for Testing Materials, I understand, is considering increasing this limit to 0.10 per cent.

In castings of this class sulphur is generally taken as an indication of the hardness. I have noticed, however, that castings with a higher sulphur, up to 0.12 per cent, will sometimes be good, strong and soft, while at other times, with the other elements the same, the castings will be hard with sulphur less than 0.09 per cent. It has been my experience that when using a mixture of, say, 55 per cent pig, 35 per cent home scrap and 10 per cent No. 1 cast scrap, and it became desirable on account of economy to substitute 0.12 to 0.15 per cent sulphur off-grade pig iron for the No. 1 cast scrap, I could use a mixture of 45 per cent pig iron, 35 per cent home scrap and 20 per cent off-grade pig. In other words, I would use 20 per cent off-grade pig in place of 10 per cent No. 1 cast scrap, although the average sulphur analysis of the scrap would be better than the off-grade pig. The analysis of the castings from the off-grade pig mixture would be the same, except that it would show a higher sulphur. But the iron would be just as good and soft as the lower sulphur iron made from the scrap mixture.

Sulphur in Steel

In steel, sulphur has had the same bad reputation that it has in the foundry. Bessemer steel specifications generally call for 0.08 per cent or less, and open-hearth specifications for 0.05 per cent or less, as the maximum sulphur limit. Dr. J. S. Unger of the United States Steel Corporation has made some extensive tests with high sulphur in open-hearth steel, and has showed that high-sulphur steel can be made with mechanical and working properties equal to that of low-sulphur steel.

Dr. J. E. Stead, the eminent English metallurgist, in a paper before the British Iron and Steel Institute, cites experiments with steel containing from 0.10 to 0.50 per cent sulphur with as good, or superior mechanical properties, as steel of lower sulphur. The following extract is taken from his paper:

> It was proved long ago that manganese counteracted the effect of sulphur, but books have been written in which sulphur was condemned, and engineers and then experts read those books and copied them, so that even to this day steel rails, etc., of exceptional quality are rejected because the sulphur exceeds arbitrary limits, even when all mechanical tests proved that the material is perfect. Steel high in sulphur resembles wrought iron and is more or less fibrous. It is a fact that steel called free-cutting fibrous steel is used to-day and the peculiar properties referred to are due to the deliberate introduction of sulphur into the steel. Such material contains about 0.15 per cent sulphur. Sulphur, then, may be regarded as a friend when it is used intelligently and is not invariably the enemy it is represented to be.

Some High-Sulphur Iron Soft

Within the last few months I have run into some rather extraordinary cases of high sulphur iron showing up very soft. The casting used as a test piece was a small gray iron box or bushing 2½ in. long with a ¾-in. core. The lighter portion, including the upper end, is 3/16 in. thick. The heavier portion is ¼ in. thick. The ¾-in. cored hole is reamed to a 0.890-in. hole on a gang drill. This machining is done with a feed of 4¼ in. per minute. This casting is one that is very apt to cause trouble in machining on account of a hard upper edge in the lighter section. Ordinarily it is not safe to run this iron over 0.10 per cent in sulphur, and this casting has given trouble with sulphur as low as 0.08 per cent. In the cases just mentioned where the iron was satisfactorily soft the analyses were as follows:

Lot No.	Sulphur, Per Cent	Silicon, Per Cent	Manganese, Per Cent	Phosphorus, Per Cent	Total Carbon, Per Cent
1.....	0.156	2.11	0.44	0.70	3.39
2.....	0.143	2.12	0.44	0.70	3.47
3.....	0.145	1.93	0.46	0.40	—
4.....	0.170	2.09	0.44	0.40	—

The casting, the small box previously referred to, machined soft from all of the four lots.

The high sulphur in lots Nos. 1 and 2 was obtained accidentally. I had already tested the castings for softness, and was very much surprised that analysis showed such high sulphur. The high sulphur in lots Nos. 3 and 4 was obtained by using high-sulphur pig and adding sulphur to the molten metal. All sulphur determinations mentioned have been checked by at least one other laboratory besides our own.

Sulphur Not So Bad as Painted

The cases of good iron with high sulphur and many cases of poor iron of practically the same analysis but lower sulphur, lead me to believe that sulphur in itself is not nearly so bad as it has been painted. Where sulphur is blamed for poor iron, I do not say that this iron would not have been better had it been lower in sulphur, but I believe that in most cases iron higher in sulphur could be made that would give satisfactory castings.

I will not try to explain now why some high sulphur iron makes very good castings, but I am inclined to believe that oxygen, as described in papers written by J. E. Johnson, Jr., one of which was read before this association several years ago, has much to do with it. The oxygen in the four lots cited above was very low, but I have not had the opportunity to do enough work along this line to draw definite conclusions.

*From a paper presented at the annual meeting of the American Foundrymen's Association in Boston, Sept. 25 to 28, 1917.

Generous Employees

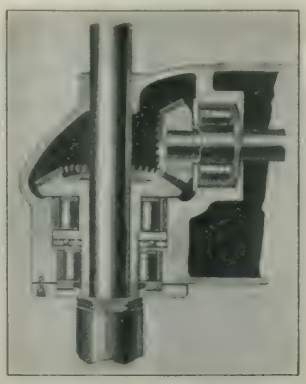
The employees of the Wrought Iron Range Co., St. Louis, recently advised of a Christmas bonus aggregating something more than $10,000, have voted unanimously to transfer the total sum to the Young Men's Christian Association war fund. The action of the employees was in response to an appeal from the Y. M. C. A. secretary stationed at Jefferson Barracks and the amount has already been turned over to the fund by President B. B. Culver of the company.

The Wagner Electric Mfg. Co., St. Louis, announces the opening of a sales office at 129 Church Street, New Haven, Conn., in charge of C. M. French, formerly the company's representative at Springfield, Mass.

The Peerless Tube Co., Bloomfield, N. J., manufacturer of collapsible tin tubes, has purchased 100 x 120 ft. adjoining its present factory and has begun the erection of a plant addition.

A 26-In. Vertical Drilling Machine

A new 26-in. high-duty vertical drilling machine has been brought out by the Buckeye Tool & Machine Co., New Philadelphia, Ohio. This is a single-column machine with a single-pulley drive, all inclosed gears and of rigid construction, and is designed for manufacturing purposes and to drive any high-speed drills within its capacity at maximum speed as well as for rapid and accurate production on tapping, facing, and counter-boring work. It has a flat working base and a round swinging table 22 in. in diameter that can be swung the full circle of the machine and out of the way when the base is being used.

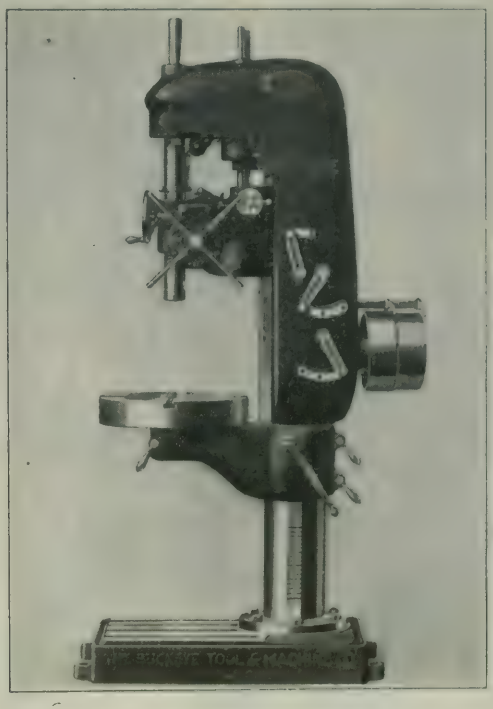


A Combination of Roller and Ball Bearings Are Employed in the Head of a New 26-In. Vertical Drilling Machine

The driving gears are located in the upper half of the column and are controlled by three conveniently located levers, providing 18 spindle speeds ranging from 16 to 500 r.p.m., any one of these being instantly obtainable. The speed of the driving pulley is 460 r.p.m. The driving gears are mounted on a sleeve and assembled on the bench, being placed in the machine as a unit and held in place by a dead shaft. Wide face cut gears are used and run in oil in bronze bearings. Other bearings are of the Hyatt roller type. The crown gear Hyatt bearings are placed as near each end as practical with a ball thrust in the center. The crown, tapping and feed gears run in grease.

Six feeds are provided for each spindle speed, any rate being obtained by manipulating a single lever. The feed range is from 0.006 to 0.048 in. per revolution of the spindle. It is pointed out that the design is such that the machine is ready applicable for the use of a multiple-spindle head for drilling 2 to 10 holes at one time.

The spindle, which is of high carbon steel, is 2⅛ in. in diameter in the sleeve, and 2 in. in diameter above the sleeve. The sleeve is 3⅜ in. in diameter. The distance from the base to the spindle is 50 in. and that from the table to the spindle is 33 in. The travel of the table on the column is 18½ in., the travel of the head on the column, 22 in., and that of the spindle in the head, 12 in. The column is 9 in. in diameter. The machine will drill in the center of a 27-in. circle. Having a heavy knee it can do the work of an upright milling machine by using a compound table which can be supplied. The spindle nose is slotted across the end for driving heavy boring and facing heads.



Three Conveniently Located Levers on the Upper Portion of the Column Control the Engagement of the Driving Gears and Provide for 18-Spindle Speeds Ranging from 16 to 500 R.P.M.

Given a Chance to Reciprocate

Concerning the purpose of the Administration to utilize the import license requirement to force countries receiving American exports to reciprocate by shipping more freely the commodities needed by the United States, the War Trade Board makes the following statement:

Control of imports was made effective by the allied Governments many months ago, the necessity therefor having become obvious if the resources of each were to be most effectively utilized for national and international demands. With the organization of the Bureau of Imports of the War Trade Board, the requisite machinery has been supplied for increasing the importation of certain indispensable commodities produced abroad.

Supplies now coming forward to this country are limited by reason of export embargoes imposed by foreign powers controlling the territory in which such materials originate. Such action was made necessary because of interference with normal production, as well as the extraordinary consumption caused by the war. Among notable examples of such materials may be mentioned tin, wool, rubber, ferromanganese, leather, flax and jute.

Prior to the enactment of the recent legislation there was no governmental agency especially designated to deal with the proper officials of other governments in order to procure the release of commodities required by the United States and which had been embargoed by other Governments. Governmental supervision of imports makes possible a more effective scheme of reciprocity and brings about a closer unity of the countries associated together in the war.

Heretofore the allied Governments were not in a position to know that all products exported by them to the United States would be utilized in a manner most conducive to the success of the great common enterprise.

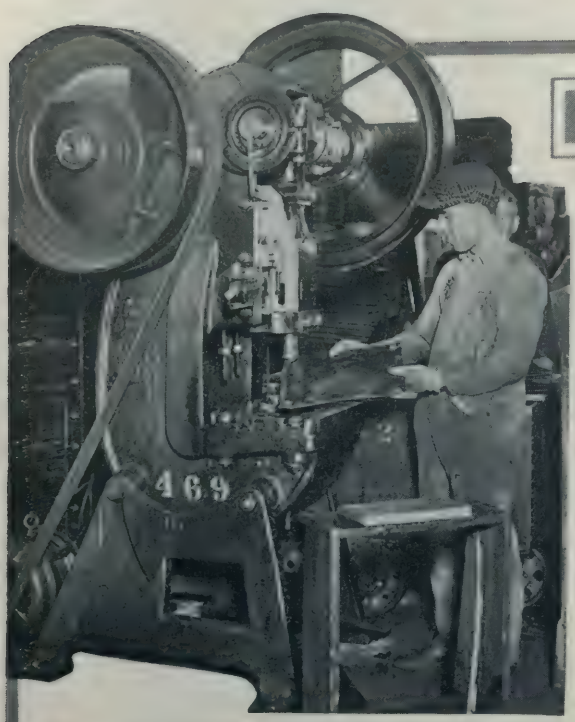
With the extension of scope in the operations of the War Trade Board there is at hand a dependable medium through which the Allies will be enabled more effectively to express their willingness to reciprocate by making liberal shipments of commodities much needed by this country in exchange for the vast quantity of vital supplies which are going forward to them in an unending stream.

Officials and heads of the departments of the Chester Shipbuilding Co., Chester, Pa., and the Merchants' Shipbuilding Co., Bristol, Pa., were entertained at a banquet given by the company at Greene's Hotel, Philadelphia, on Nov. 26. W. T. Smith, general manager of the plants, had charge of the program. Speeches were made by L. T. Kniskern, assistant general manager of the Chester plant; B. D. Smith, assistant general manager of the Bristol plant; H. E. Frick, of the United States Emergency Fleet Corporation; Meyer Bloomfield, head of the United States Industrial Department of the United States Shipping Board; and Daniel Bloomfield, of Boston.

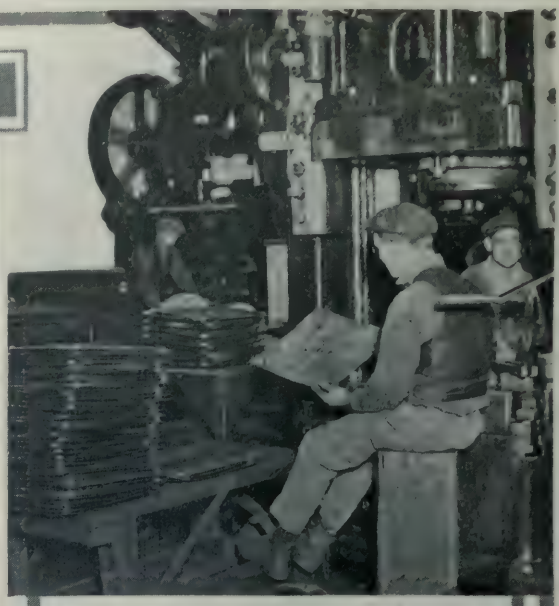
John P. Bech, formerly at 60 Wall Street, and Troels Fode have opened an office in the Woolworth Building, New York, under the name of Bech & Fode and will be metal brokers for the sale and purchase of any kind of metal such as spelter, copper, tin, lead, antimony and also tin plate. Mr. Bech was active in the trade during the campaign in 1915-16 against the high prices of spelter.

An example of the manner in which war business radiates from the principal contractor is presented by the working out of the contract which the Crane Co., Chicago, took for the sanitary and piping equipment for 16 National Army cantonments. Within less than three months, the Crane Co. obtained material from no less than 90 different outside sources.

A Glimpse of the Making of War



Testing Sheets for Stamping Quality



First Step in Forming Process



Steel Ready for the Dies



Helmet in the Rough



Rims Are Next Trimmed

Helmets in an American Factory



Putting Formed Strip on Rough Edge

Fixing Strips to Make Them Hold

Government Inspection

General View of Helmet Factory

Photographs copyrighted by Underwood & Underwood

Mining Industry Would Amend Tax Law

Important Changes in Excess Profits Tax Proposed—Many Inequalities Pointed Out by Committee—Quarterly Payments Provided For

WASHINGTON, Dec. 4.—A comprehensive project for the construction and amendment of the war excess profits tax provisions of the war revenue act of Oct. 3, 1917, to meet conditions surrounding corporations engaged in the production of coal, gas, petroleum, iron ore and other minerals had been laid before the Treasury Department by a committee representing the National Coal Association. All branches of the mining industry are interested to an important degree in the problems concerning the application of the war excess profits tax, as the framers of the law appear to have taken little, if any, account of the peculiar conditions under which mining operations are prosecuted and especially the manner in which capital and tangible assets are affected by depletion or accretions through purchase or lease. It is understood that many corporations engaged in the production of a great variety of minerals are prepared to cooperate in this movement to secure the most favorable construction of ambiguous provisions of the existing law and in addition the passage by Congress of much needed amendatory legislation.

Section 207 of the war revenue act, if literally and strictly construed, the coal association's committee points out, will result in many inequalities and injustices and will tax at different rates corporations, partnerships, or individuals who should stand upon an equal footing. The section provides that "invested capital" in the case of a corporation or partnership means, first, "actual cash paid in." If the company was organized 20 years ago and $100,000 in cash was paid into that company for its stock and the company used that $100,000 to purchase property, its invested capital, so far as this part of the section is concerned, would be restricted to $100,000, no matter what increase of value might have taken place in the property which was bought for $100,000. Another company, organized 20 years later with a paid in cash capital of $2,000,000, might invest that cash in another property absolutely identical in value with that of the first company, and on exactly the same earnings one company would get 20 times as much deduction as the other company.

Invested Capital Defined

Invested capital is further defined by the war revenue act to mean the actual cash value of tangible property paid in other than cash for stock or shares in such corporation or partnership at the time of such payment, with, however, an allowance for increase in value up to Jan. 1, 1914, but not to exceed the par value of the original stock or shares specifically issued therefor. Under this part of the section, a company which issued stock conservatively in the amount of the real value of the property would be limited to such amount, even though the property increased in value prior to Jan. 1, 1914, whereas a corporation which was grossly overcapitalized at the time of the purchase of its property for stock would get the benefit of the increased value of the property up to the par value of the stock issued.

These illustrations indicate how unfairly the law works with respect to the taxpayer. On the other hand, however, it is conceded that examples can readily be furnished of injustices to the Government. Property bought for stock or cash may decrease in value, but under the literal construction of the act, the company would get credit for the original price. If, for example, a company producing coal or iron ore had invested $100,000, either in stock or cash in a property 95 per cent of which was worked out prior to Jan. 1, 1917, so that during the taxable year, this company was operating with only 5 per cent of its original property, it might, as the result of war conditions, make a very large profit out of such operation, but would be entitled to a deduction based on the original $100,000.

Reorganized Companies

Similar cases might arise in connection with reorganizations of businesses which had failed and the reorganized company get the benefit of the capital of the original company. These and numerous other examples have led the committee to suggest the possibility of giving a liberal construction to this and other sections of the excess profits tax provisions of the revenue act, so as to result in the ascertaining of the real value of the assets of the corporation, partnership, or individual subject to the tax.

Special emphasis is put by the committee upon the fact that the most common form of acquiring and operating coal, oil, gas, iron ore and other minerals is by means of leases. These are commonly regarded as "tangible property." In many instances, they form the basis of capital issues. It seems advisable, therefore, that regulations should be promulgated by the Treasury Department, making it clear that such forms of property are "tangible property" within the meaning of section 207.

Important Assets

Accounts and bills receivable constitute one of the important assets of any business. It is advisable that proper regulations should be made in connection therewith; otherwise they might be construed as to be intangible property, for which the corporation would get only 20 per cent credit as provided in proviso (b) of section 207, although they may in fact constitute a part of earned surplus or undivided profits.

Another important phase of the proper construction of the excess profits tax concerns the definition of "surplus" and "profits." Increased value of property, it is contended, is a profit earned by the owner thereof. If it is not capitalized or distributed in dividends, it is an undivided profit or a surplus used and employed in the business or trade, and should be included in computing "invested capital." A corporation which owns or buys undeveloped mineral rights takes a risk which entitles it to profits, if any. By drilling, sinking shafts, building railroads, switches, driving entries, etc., at once such rights are given a value in excess of their original cost, plus the cost of the development work. The enterprise may result disastrously, but if the development work proves up the property, at once many hazards of the investment are gone. The condition and quality of the coal or ore, the danger of flooding the mine with water, and the cost of drainage are fixed, and the product is at hand ready for mining and ready to be marketed.

Section 207, sub-division A-(1) and (2), covers the cost of the property, and sub-division A-(3) covers the increased value or the profit resulting from the investment. This increase in value, it is urged by the committee, is a profit earned in the enterprise just as much as the excess selling price of the product mined over the production cost is a profit. A person who has blocked up a field, bought the mineral rights, given his time, energy and ability, and risked his money in the development work is entitled to the increased value of his property as a profit, and entitled to include this profit in "invested capital" as "earned surplus and undivided profits used and employed in the trade or business."

Increase in Value

An increase in value due to proving up properties, or an accumulation of contiguous properties, or the risk of capital or labor, is beyond question a profit and should be so considered in the determination of "capital invested." Certainly the accumulation of mining properties so that they may be made available in case of

public need should not be discouraged, and the committee therefore suggests that appropriate regulations be adopted by the Treasury to permit such profits resulting from increase in value to be included in "invested capital."

The properties of the corporation, it is contended, have acquired a greater actual cash value, which certainly is an earned profit which the corporation is entitled to include in "invested capital." The increased value of a property of this nature is distinct and is emphasized by the fact that when the deposit is worked out, as it will ultimately be, the property itself, the mineral rights, are valueless and gone. This profit, therefore, is the difference between the amount of the original cost of the mineral rights added to the cost of development and its actual cash value.

In view of the great diversity of practice in the capitalizing and financing of subsidiary concerns controlled by a parent corporation, the Secretary of the Treasury is urged to give an equitable interpretation to the law in order that hardships may not result because of conditions which are purely accidental and which have not been brought about for the purpose of evading any statutory requirements. It is well known that in most cases a subsidiary company has very little capital and that its operations are financed entirely by the parent company; nevertheless, these subsidiaries are the real money makers in the business and if taxed under section 207, their nominal capital would subject them to a most unjust burden. To avoid such unfair taxation, it is suggested that parent and subsidiary companies may, without any unreasonable interpretation of the statute, be permitted to make a common, joint, or pooled return or report.

Quarterly Payments

The Secretary of the Treasury, in response to appeals made by many taxpaying corporations and by the representatives of large banking interests, has prepared an order authorizing that payments of war excess profits taxes may be made quarterly during the 12 months following the taxpayer's fiscal year. Many business men protested against the payment of these taxes at one time, the bankers, especially, claiming that it would cause a heavy drain upon the financial resources of certain districts. W. L. C.

The Copper Industry in 1916

The principal features of the copper industry for 1916 are given by B. S. Butler, in U. S. Geological Survey Bulletin 666-Q on "Copper." The production of the primary refined copper in 1916 is given as 2,259,000,000 lb., of which 1,928,000,000 lb. was from domestic ores. These figures compare with an average for 10 years, including 1916, of 1,502,750,000 lb. and 1,201,400,000 lb. respectively. The 1916 imports were 462,000,000 lb. compared with 337,400,000 lb. for the 10-yr. average.

Exports of metallic copper in 1916 were 784,000,000 lb., comparing with a 10-yr. average of 735,500,000 lb. and with a high record of 926,000,000 lb. in 1913. Domestic consumption in 1916 is estimated at 1,430,000,000 lb. at an average per pound of 24.6c., which compares with a 10-yr. average of 773,000,000 lb. per year at 16.3c. per lb. The world's production is put at 3,078,000,000 lb. for 1916, with a 10-yr. average of 2,092,000,000 lb.

The terms of the order-in-council prohibiting the exportation of iron and steel products from Canada to countries other than Great Britain and British possessions and protectorates have been made public. The prohibition extends to pig iron, steel ingots, billets, blooms, bars and slabs; iron and steel plates; iron and steel shapes, comprising beams, channels, angles, tees and zees; iron and steel fabricated for structural work and shipbuilding.

The Steel Co. of Canada, Hamilton, Ont., has started work on its by-product coke oven plant of between 300,000 and 400,000 tons annual capacity.

TO ORGANIZE BY INDUSTRIES

New Committees of Manufacturers to Work with the Government

WASHINGTON, Dec. 4.—Representatives of all the industries of the country have been called to meet in Washington on Dec. 12 by the Chamber of Commerce of the United States to perfect plans for co-operation with the Government in the conduct of the war. These representatives, in the main, will be the chairmen of war service committees heretofore appointed at the suggestion of the chamber pursuant to a resolution adopted at the recent war convention of American business held at Atlantic City, which called upon the industries in their own behalf and in order to render the most efficient service to the Government to organize war service committees which should in each case be fully representative of the entire industry. An official statement on behalf of the Council of National Defense of the need for such action is contained in the following letter to the chamber from Director Gifford:

"I beg to assure you of the appreciation of this office and of the Council of National Defense of the steps taken by the Chamber of Commerce of the United States in the organization of war service committees. We feel that the establishment of representative committees, formed in such manner as to entitle them to speak for their entire industries, will render immediately available valuable sources of information upon which the Government may draw in connection with the countless business and industrial problems attendant upon the conduct of the war.

"For your information in this connection I will add that the several committees appointed by the Council of National Defense and by the Advisory Commission have in each instance tendered their resignations and, in order to prevent a continuance of the embarrassing situation wherein members of the committee were called upon to act both as Government agents or advisers and at the same time as representatives of their respective industries, that these resignations have been accepted. For the purpose of furthering the valuable work instituted by the Government committees, however, it is most desirable that representative committees of the industries be formed by the industries themselves at the earliest possible moment."

A large number of organizations have already completed the appointment of their war service committees and many have already established offices in Washington. The meeting on Dec. 12 will be for developing definite plans for the industries' representatives and in general to aid in the work which they will be called upon to undertake.

The National Chamber resolution calling upon industries of the country to mobilize asked that their committees be "made up of representative men in the industry, whether or not they be members of existing organizations" and further recommended that in all matters pertaining to any given industry the Government should deal with this group wherever possible, leaving to it, where practicable, the proper distribution of all orders for material.

British Need of More Iron Ore

Sir John Ferguson at the last meeting of Bolckow, Vaughan & Co. made a most interesting statement concerning iron ore. He thought the iron and steel manufacturers of Great Britain might, with advantage to themselves and to the national trade, act together in securing the control of some of the undeveloped deposits of iron ore, and he suggested that the government interest itself in the matter. There are very large deposits in Brazil which from a national point of view should be secured for future use.

G. W. Drach, architect, Cincinnati, is preparing plans for a hospital for the Tennessee Coal, Iron & Railroad Co., Fairfield, Ala., a Birmingham suburb, estimated to cost $420,000.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

Owned by the United Publishers Corporation, 243 West 39th Street, New York. H. M. Swetland, *Pres.* Chas. G. Phillips, *Vice-Pres.* W. H. Taylor, *Treas.* A. C. Pearson, *Secy.*

BRANCH OFFICES—Chicago: Otis Bldg. Pittsburgh: Park Bldg. Boston: Equitable Bldg. Philadelphia: Real Estate Trust Bldg. Cleveland: Guardian Bldg. Cincinnati: Mercantile Library Bldg. San Francisco: 320 Market Street.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

Unwise Price Tinkering

From Washington comes word of the dissatisfaction of certain members of the Federal Trade Commission with the present schedule of iron and steel prices as agreed upon between the Government and the manufacturers. The time originally set for bringing up the question of continuing these prices was Jan. 1, which is less than four weeks distant. A few of the prices, including those of iron ore, pig iron and plates, structural shapes and bars, were promulgated on Sept. 24, or ten weeks ago. Considerable pig iron has been sold to foundries and steel works on the $33 basis. The Government has bought large tonnages of plates and shapes for ships and of bars for shells at the new figures, and private buyers have done some business at the same prices, though the volume is small compared with that of the Government. A steel manufacturers' committee, at the request of the Government, has spent many days in the readjustment of market prices of a great variety of finished products to the new levels. The jobbers have been brought in line, and throughout the trade, with a few outstanding exceptions where the appetite for unusual profits would not be curbed, there has been an acceptance of the President's position that war demand must not be exploited for inordinate gain and that the steel capacity of the country must develop the largest production of which it is capable.

But now comes the complaint of members of the Trade Commission that their elaborate investigation of the cost of producing iron and steel in various forms, which it was announced six months ago would be made the basis of fixing Government prices, has gone for naught, and hence these commissioners want to see reductions from the schedules already fixed. Evidently the lesson of the price fixing on coal—and this was exclusively Government price fixing—has been lost on the commission. After weeks of effort to develop coal production on a $2 basis had brought failure, the 45-cent increase was finally allowed. But it is a question to-day whether the small country coal openings which the $2 price promptly closed can be made available again, after weeks of suspension. Their miners, who, as the fuel administrator said, would turn to the machine operated mines, have evidently not been heard from in that connection, for coal output has decreased rather than increased.

The mistake was made of fixing a price too low to develop the full capacity of the country's coal mines. The same mistake can be made in the steel industry, already suffering seriously from lack of fuel due in part to the original insistence at Washington on a theoretical rather than a practical readjustment of coal prices. In the September conferences between iron and steel manufacturers and the War Industries Board the former made what most of them considered extreme concessions, and the so-called agreed prices were practically of the War Industries Board's own making. Because the manufacturers have accepted these prices and have gone to work in a broad spirit to make them effective, it would be a grave mistake for the Federal Trade Commission to reason that the next step is to apply the screws and then at intervals to give them a fresh turn downward.

The co-operative plan under which the Government and the iron and steel industries have now begun to work has accomplished much already. It stopped a runaway market and thus averted a situation that was full of danger. It secured for this country's allies prices for iron and steel well below what they had been paying. In the wise way in which the manufacturers have been carrying it out it has been a guarantee of a more stable market at home, and under their lead both producers and consumers have been carrying out the necessary readjustments with a minimum of disturbance to the industry. They should be allowed to go on for a period of months in the way in which they have begun. Any changes in costs of production that have come since the first price announcements of Sept. 24 have been to higher figures and overhead has increased with the cutting down of output. The effort to bring about reductions in market prices on Jan. 1 is ill-timed and mischievous and should not succeed. No excuse will be taken for a repetition of the blundering that has proved so costly in the Government handling of fuel.

Iron and steel makers might well consider more intensive advertising campaigns. If for purposes of rough camparison we say that steel making

capacity in this country has increased one-third in the last three years, that England's capacity shows a 40 per cent expansion and Germany's no one knows what, not to mention minor countries, there ought to be severe competition after the war. Advertising is a business expense; but if the outlay is not made the money goes in taxes to the Government. The industry can stand the expenditure, and each company should pick out some one product and try to establish a name and reputation for it. Brand names have long been a factor in pig iron selling and more could be done in giving them prestige. In respect to steel, it is sufficient commentary on the value of reputation that in the present price fixing program electrical sheet prices had to be named on qualities represented by well known trade names.

The Eastern Railroad Pool

The last test is being made to determine whether the physical facilities of the railroads are sufficient to handle the freight that is being offered them. Various half-way measures have been tried and found not entirely adequate, the partial failure leading up to the decision of the Railroad War Board, as approved by the War Industries Board, to operate all the railroad facilities east of Chicago as one pool. The decision was announced Saturday, Nov. 24, the direction being placed in the hands of seven vice-presidents, known as the General Operating Committee. Tuesday afternoon of last week offices in Pittsburgh were made ready, and on Wednesday morning the committee arrived in Pittsburgh and began issuing orders.

It is frankly admitted that the first orders issued were directed chiefly toward relieving the freight congestion in the Pittsburgh district, for the purpose of bringing about fuller operation of the iron and steel industry. Orders having been put into effect calculated to afford speedy relief in this one respect, the committee is now engaged chiefly in a broader program, seeking first of all to co-ordinate its work with other bodies "where necessary to secure progress."

It is recognized, of course, that some of the measures adopted may cause embarrassing conditions elsewhere. If a general embargo on the movement of through freight east and west through the Pittsburgh gateway and its diversion to lines north and south, as ordered a week ago, represented a complete step toward the furnishing of general relief to the whole traffic situation it could, presumably, have been taken some time ago. The results must be watched narrowly and other measures eventually taken in connection with this first step, which is distinctly an emergency step. On the other hand, some of the measures taken are permanent and dissociated from other matters, as, for instance, the annulment of the "Broadway Limited," which has already provided game worth much more than the powder.

A freer movement of Connellsville coke to the Pittsburgh district and points beyond and a freer movement of Pittsburgh district coal to Youngstown district steel mills seem to be assured. Unfortunately "freer" and "larger" movement in connection with coke, and to an extent with coal also, are not synonymous terms. It does not follow that the production of Connellsville coke, which has been about 17 per cent less this year than in the same period of last year, will increase precisely as additional supplies of cars are furnished. The railroads involved assert that they tried the experiment of more cars several months ago, and no more cars of coke resulted. The coke operators on their part explained that they were not given sufficient time to marshal increased working forces. It is believed at present, however, that with the two wage advances recently made and the termination of much outdoor work the Connellsville coke region can now muster much larger working forces than formerly. In recent weeks the production of pig iron, the production of steel, and to a large extent the production of munitions, have hinged upon the supply of coke, and occasional idleness of cars in the Connellsville region, awaiting loading, is relatively a small matter, when weighed against the large increase in production of pig iron, raw steel and munitions that would occur by reason of an enlarged supply of coke. The experiment should be prosecuted to the utmost extent.

The pooling of the eastern railroads is such a stupendous revolution that various measures for relief of traffic congestion, hitherto considered difficult or impossible, must be looked upon from a new viewpoint. The *Railway Age Gazette*, commenting in its last issue on its recent statement that a pool of the railroads was impossible until the anti-pooling laws were repealed, admits frankly that it was mistaken. If the impossible has been done, other things in the same connection can be done. The proposal that the Government, with its priority and other powers, secure and place on the tracks a large number of new locomotives and cars seems now quite a simple one, merely a detail in the utilization of the country's resources for prosecuting the war to the best advantage. The question who would own the equipment either now or after the war seems like a small matter. The pooling of the eastern railroads has raised much larger questions as to ownership, earnings, and so on, which must be answered now that the pooling is an accomplished fact.

As regards physical limitations, it is possible for the Government to secure the building of large numbers of locomotives and cars, for use on the roads, in a short time. A recent survey removed the chief uncertainty, whether plates would be available for standard type construction of freight cars. It has been found that there will still be a plate tonnage available after the full requirements of the merchant shipping program have been met.

There is no reason to suppose that the basic principle will be departed from, that the full operation of the essential industries, of which iron and steel are admittedly chief, must be secured. If the pooling of the eastern railroads does not entirely accomplish that desideratum, additional measures doubtless will follow, including a forced curtailment in the unessential industries. There is reason to expect that as long as pig iron and steel are scarce no effort will be spared to provide for an increase in production up to the physical limit of works capacity, which lies 10 per cent, possibly more, above the rate of production recently obtaining.

Railroad Securities and Pooling

It may easily be that through the great changes in railroad operation that are occurring the way will be made clear for a solution of the whole question of what we shall do with our railroads. Experiments are being conducted to determine what can be done with the material things—track, locomotives, and so forth—that are at hand. With such physical experiments the only thing to do is to try them and watch the results. There is another factor in this matter, however, that must be watched narrowly, and that is the financial. We can experiment by pooling all the miles of track, all the locomotives, all the other physical facilities, and see how best they can be operated to produce the maximum movement of freight; but we cannot try any corresponding experiment with railroad security values. The physical experiment is under the direction of the best railroad talent there is, with men placed in position where they can instantly order this thing to be done and that not to be done, and where they can try the effect of a given order for as many days or hours as appears best.

But no such means exist for regulating security values as disclosed by stock exchange transactions from day to day. It may be found highly desirable to establish regulation or control of these values. They should not be the football of the daily and temporarily uncertain results of the physical experiment of conducting the railroad pool. Wide fluctuations would be detrimental to the interests of both railroads and Government, if there is later to be a closer association between the Government and the railroads, and it is absurd now to assume that such a thing ought not to be considered as a possibility. Apart from the interests of either the railroads or the Government, wide fluctuations in security values are undesirable. The Federal Reserve Board may well consider the matter of exercising some control of market value of railroad securities while the General Operating Committee is conducting in the East its great experiment upon the physical properties those securities represent.

Increased Capital Demands

The output of the Baldwin Locomotive Works is now at the rate of 225 locomotives per month as compared with 160 per month in 1916. Since continually increasing activity is likely to require the continued employment of all the capital now in use in the business, the directors consider it inexpedient to increase loans in order to provide common stock dividends. An unusual situation is the employment of the company's works on export work for the Allies of this country to the exclusion of orders which American railroads need to place. It was stated recently that so far this year 4800 locomotives, or 90 per cent of the country's estimated output, have been commandeered by our Government for export to Allied countries, and that for orders placed now for domestic use the earliest delivery that could be had is the latter half of 1918. However, with chaos in Russia, it is entirely unlikely that the large locomotive orders for that country will be filled in the near future, so that there is a good prospect of speedier relief than had been expected from the shortage of motive power at home.

The meeting of the Baldwin company's directors recently emphasized again the greatly enlarged capital demands of business in all lines. The effect of high prices in increasing capital requirements has been noted constantly in the past two years, but there is now the added effect of the necessity upon all manufacturers of accumulating large sums against the day when these must be turned over to the Government as taxes in the coming year. This necessity has operated and is still operating against the undertaking of extensions of plant and in some cases even the continuance of work on new construction begun earlier in the year. There have been cases of this in the iron and steel trades.

Higher Freight Rates on Iron and Steel for Western Roads

WASHINGTON, Dec. 4.—Important increases in rates on iron and steel were granted by the Interstate Commerce Commission to-day to railroads in western trunk line territory. The original petition of the roads sought to cancel commodity rates and apply fifth class rates, which would have resulted in increases all along the line ranging from 20 to 50 per cent. The proposed advances were regarded by the commission as excessive, and accordingly a varying scale of increases ranging up to 90 per cent of the fifth class rate was conceded. This will result in maximum advances of approximately 40 per cent, although the average will be much below that figure.

In justifying the advances allowed in to-day's decision, the commission declared that former rates on iron and steel were much too low in western trunk territory "owing mainly to the depression of the Chicago-St. Paul rate on competition with water carriers." Referring to the abnormally low rates prevailing on iron and steel in this territory, the commission said that "if the difference between class rate levels in central freight association and western trunk line territories may be taken as representative of transportation conditions generally, the proposed rates are not relatively high."

The new tariffs, which will be filed at an early date, will apply chiefly from Chicago, Peoria, St. Louis, Kansas City, Minneapolis, St. Paul, Duluth and Mississippi River crossings to various western destinations.

Representatives here of shippers in western territory express disappointment at the commission's decision, as they had protested vigorously against the proposed increases and believed they had presented a strong case.

W. L. C.

The Government's Large Needs for Toluol

The Government's requirements of toluol for the coming year are estimated at 22,000,000 gal. for conversion into tri-nitro-toluol and high explosives. The present annual output of the by-product coke ovens of the United States is put at the rate of 11,000,000 gal. or only 50 per cent of the quantity actually needed. Strenuous efforts are being made by Government officials and others to make up this deficiency. It is expected that this will be accomplished by a special method of scrubbing city illuminating gas, which was discussed briefly in THE IRON AGE, Nov. 22, 1917. The Ordnance Department of the Army has interested itself in the matter and it has been found that the remaining toluol needed must be secured from city gas.

The plant of the Southern Wisconsin Foundry Co., Madison, Wis., was destroyed by fire Dec. 1, the loss being estimated at $50,000. Part of the company's business was supplying castings to the Steinle Turret Machine Co., Madison. The plant will be rebuilt at once.

FEDERAL CONTROL OF STEEL

Predictions that Pomerene Bill Will Pass, in View of President's Message

WASHINGTON, Dec. 4.—Many Senators and Representatives to-day predicted the passage of the Pomerene bill clothing the President with power to fix the prices of iron and steel or to require the output of the industry to be sold through a governmental agency, basing their confidence on the statement contained in the President's address to the joint session of Congress this afternoon relative to the necessity for specifically authorizing the Government to go beyond the limits of the Lever food, feed and fuel bill in the fixing of prices. In this connection the President said:

"Recent experience has convinced me that the Congress must go further in authorizing the Government to set limits to prices. The law of supply and demand, I am sorry to say, has been replaced by the law of unrestrained selfishness. While we have eliminated profiteering in several branches of industry, it still runs impudently rampant in others. The farmers, for example, complain with a great deal of justice, that while the regulation of food prices restricts their incomes, no restraints are placed upon the prices of most of the things they must themselves purchase; and similar inequalities obtain on all sides."

Notwithstanding the apparent confidence at the Capitol that the Pomerene bill will pass, there is little prospect that it will become a law before the expiration of the present mutual agreement as to iron and steel prices on Jan. 1. Conservative men in both Houses anticipate an extended debate on this measure and express doubt as to the outcome in view of the fairly satisfactory results of the voluntary agreement made by representatives of the steel industry with the War Industries Board.

Mechanical Engineers Hold War Meeting

War topics predominate at the convention of the American Society of Mechanical Engineers, now being held at the Engineering Societies Building, New York, discussions covering the shipbuilding problem, the aircraft problem, the fuel problem, etc.

Methods were considered whereby the problem of fuel conservation will be met either by compelling coal consumers to execute such measures of economy as the authorities prescribe, or else by disseminating correct information regarding the mining and consumption of coal, accompanied by an appeal to the patriotism of the consumers.

On Tuesday night honorary membership was conferred on Major-General George W. Goethals in recognition of his achievements in engineering, and Ex-President Taft addressed the engineers on the war's call to professional men.

Charles T. Main, Boston, a consulting engineer, has been elected president. He was born in Marblehead, Mass., in 1856 and was educated at the Massachusetts Institute of Technology. Since 1892 he has practised as a consulting engineer, with offices in Boston, until 1907 being associated with F. W. Dean in the firm of Dean & Main. He has designed and supervised the construction of numerous industrial, steam-power and water-power plants. Among his largest undertakings were worsted mills and four hydroelectric developments for the Montana Power Co., aggregating about 280,000 hp.

Germany is reported to have contracted for one and a half millions tons of hematite ore from Sweden for 1918. At present the vessels carrying the ore are convoyed by Swedish warships until they are picked up by German warships.

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SMALL PIG-IRON INCREASE

Youngstown Curtailment Made Up in Other Districts

A Net Loss of Ten in Active Furnaces in November

November pig-iron returns show an unexpected though slight increase in daily output. From the amount of banking forced by fuel shortage in the Youngstown district, a considerable falling off was looked for, but other districts made up the deficiency. The output for the month was 3,205,794 gross tons, or 106,859 tons a day for the 30 days, compared with 3,303,038 tons in October, or 106,550 tons a day. Continued poor working compelled the blowing out of a good many furnaces last month and the number active on Dec. 1 was 345 with a capacity of 106,953 tons a day as against 355 furnaces with a daily capacity of 109,059 tons on Nov. 1. There was thus a net loss of 10 furnaces and a reduction of 2100 tons a day in the capacity.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from November, 1916, is as follows:

Daily Rate of Pig-Iron Production by Months—Gross Tons

	Steel Works	Merchant	Total
November, 1916	80,141	30,253	101,394
December	74,264	28,273	102,537
January, 1917	72,394	29,249	101,643
February	65,280	29,193	94,473
March	73,731	31,132	104,863
April	79,031	32,134	111,165
May	77,561	32,677	110,238
June	76,805	32,197	109,002
July	76,440	31,380	107,820
August	71,436	33,336	104,772
September	73,290	31,175	104,465
October	76,664	29,886	106,550
November	77,135	29,724	106,859

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces in November and the three months preceding:

Monthly Pig-Iron Production—Gross Tons

	Aug. (31 days)	Sept. (30 days)	Oct. (31 days)	Nov. (30 days)
New York	178,841	182,171	202,939	188,760
New Jersey	21,315	25,169	27,397	28,205
Lehigh Valley	111,583	110,418	117,523	110,758
Schuylkill Valley	91,236	75,727	80,478	80,121
Lower Susquehanna and Lebanon Valley	88,295	84,758	90,386	91,022
Pittsburgh district	664,141	638,611	666,731	663,909
Shenango Valley	164,709	140,205	161,615	148,617
Western Pennsylvania	213,731	211,513	218,814	203,256
Maryland, Virginia and Kentucky	83,233	90,466	100,446	93,653
Wheeling district	124,627	118,195	122,066	112,685
Mahoning Valley	300,740	309,570	316,906	274,788
Central and Northern Ohio	272,109	271,519	275,996	266,718
Hock. Val., Hang. Rk. & S. W. Ohio	59,577	62,499	64,061	66,334
Chicago district	503,723	457,330	455,045	481,537
Mich., Minn., Mo., Wis. Col. and Wash.	105,486	108,325	117,397	112,266
Alabama	232,355	222,687	260,469	251,694
Tennessee and Ga.	32,246	24,791	24,769	31,471
Total	3,247,947	3,133,954	3,303,038	3,205,794

Among furnaces blown in in November were Genesee in New York, one Bethlehem in the Lehigh Valley, one Donora in the Pittsburgh district, Graham in Virginia, one Ashland in Kentucky, one new Gary in the Chicago district, and LaFollette and Chattanooga in Tennessee.

The list of furnaces blown out last month includes one Niagara and Burden in New York, one Duquesne, one Edgar Thomson, one Isabella and one Eliza in the Pittsburgh district, Hall in the Shenango Valley, Colonial in western Pennsylvania, one Bellaire and Top Mill in the Wheeling district, two Ohio and two Hubbard in the Mahoning Valley, one Central and one Lorain in northern Ohio, Globe and Union in the Hanging Rock district, one Miami in the Chicago district, Irondale in Washington, one Bessemer and one Sloss in the Birmingham district.

Capacity in Blast Dec. 1 and Nov. 1

The following table shows the daily capacity in gross tons of furnaces in blast Dec. 1 and Nov. 1 by districts:

Coke and Anthracite Furnaces in Blast

Location of furnaces	Total number of stacks	Dec. 1: Number in blast	Dec. 1: Capacity per day	Nov. 1: Number in blast	Nov. 1: Capacity per day
New York:					
Buffalo	18	18	5,801	18	6,014
Ferro	1	0	0	1	40
Other New York	4	3	224	3	545
New Jersey	4	4	911	4	846
Ferro	1	1	30	1	45
Pennsylvania:					
Lehigh Valley	21	15	3,749	14	3,546
Spiegel	2	2	222	2	245
Schuylkill Val.	13	9	2,606	9	2,610
Spiegel	1	1	90	1	90
Lower Susquehanna	8	6	1,786	6	1,695
Spiegel	2	2	97	2	89
Lebanon Val.	8	7	880	7	1,030
Ferro and Spiegel	3	2	87	2	95
Pitsburgh dist.	53	49	22,134	48	21,656
Ferro and Spiegel	4	2	256	4	541
Shenango Val.	19	16	4,519	17	5,193
Western Pennsylvania	25	24	6,569	24	7,007
Ferro and Spiegel	3	2	78	2	60
Maryland	4	4	1,525	4	1,510
Ferro	0	0	0	0	0
Wheeling district	14	10	3,756	12	4,038
Ohio:					
Mahoning Val.	26	20	9,368	24	10,152
Central and Northern	26	23	8,810	25	9,516
Hocking Val., S. W. Ohio & Hanging R'k.	17	13	1,885	15	2,066
Illinois and Ind.	38	34	15,755	33	15,125
Ferro	1	0	0	1	85
Michigan, Wis. & Minn.	12	10	2,720	10	2,619
Colorado, Mo., & Wash.	7	4	1,025	5	1,155
Ferro	1	1	145	1	190
The South:					
Virginia	16	12	1,620	13	1,585
Ferro	3	3	125	1	50
Kentucky	5	4	715	3	510
Alabama	37	32	8,310	32	8,227
Ferro	1	0	0	1	82
Ten. & Ga.	16	12	1,155	10	802
Total	415	345	106,953	355	109,059

Production of Steel Companies

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies show the following totals of steel-making iron month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons

	Pig, total production: 1915	1916	1917	Spiegeleisen and ferromanganese: 1915	1916	1917
Jan.	1,115,944	2,251,035	2,244,203	18,041	24,866	38,792
Feb.	1,237,380	2,183,845	1,829,846	13,319	23,877	32,137
Mar.	1,551,082	2,365,116	2,285,430	12,274	29,388	36,563
Apr.	1,584,111	2,316,768	2,370,937	12,337	31,862	39,595
May.	1,694,290	2,408,890	2,404,380	13,440	35,844	37,701
June	1,770,657	2,295,784	2,304,155	19,200	38,597	30,829
July	1,949,750	2,306,303	2,369,630	17,854	31,353	43,884
Aug.	2,101,818	2,313,122	2,214,513	27,463	33,338	39,492
Sept.	2,129,322	2,309,710	2,198,705	23,159	29,451	42,235
Oct.	2,281,456	2,530,806	2,376,589	23,992	34,566	48,691
Nov.	2,198,459	2,404,210	2,314,857	28,741	44,975	34,688
Dec.	2,283,047	2,294,620	.....	25,004	43,470	.....

The Record of Production

Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1913—Gross Tons

	1913	1914	1915	1916	1917
Jan.	2,795,331	1,885,054	1,601,421	3,185,121	3,150,938
Feb.	2,586,337	1,888,670	1,674,771	3,087,212	2,645,247
Mar.	2,763,563	2,347,867	2,063,834	3,337,691	3,251,352
Apr.	2,752,761	2,269,655	2,116,494	3,227,768	3,334,960
May	2,822,217	2,092,686	2,263,470	3,361,073	3,417,340
June	2,628,565	1,917,783	2,380,827	3,211,588	3,270,055
July	2,560,646	1,957,645	2,563,420	3,224,513	3,342,438
Aug.	2,545,763	1,995,261	2,779,647	3,203,713	3,247,947
Sept.	2,505,927	1,882,577	2,852,561	3,202,366	3,133,954
Oct.	2,546,261	1,778,186	3,125,491	3,508,849	3,303,038
Nov.	2,233,123	1,518,316	3,037,308	3,311,811	3,205,794
11 mo.	28,740,494	21,533,700	26,459,244	35,861,705	35,253,063
Dec.	1,983,607	1,515,752	3,203,322	3,178,651	.....
Total yr.	30,724,101	23,049,752	29,662,566	39,039,356	.....

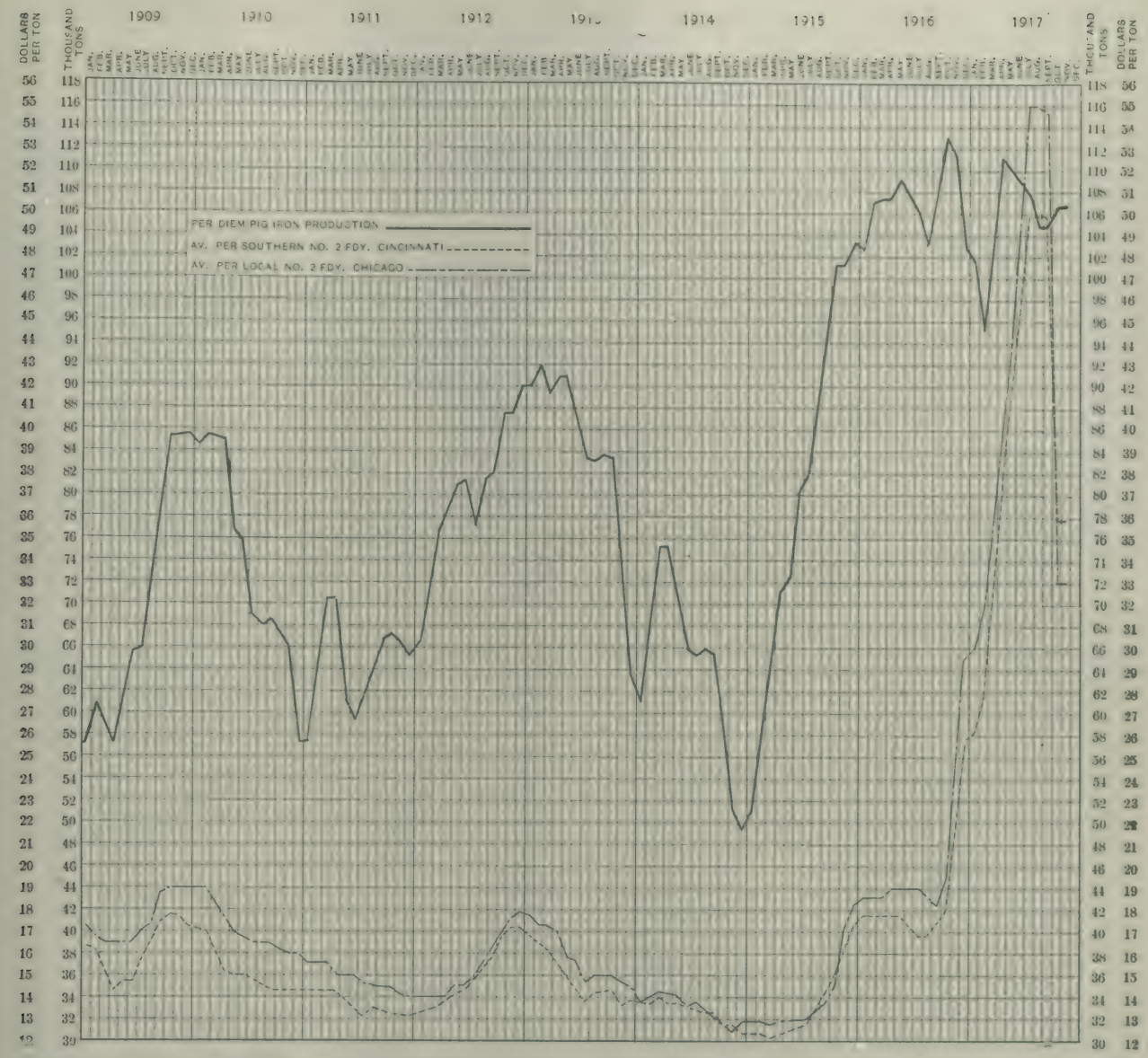


Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from Jan. 1, 1908, to Dec. 1, 1917; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron at Chicago District Furnace

The figures for daily average production, beginning January, 1910, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1910—

Gross Tons

	1910	1911	1912	1913	1914	1915	1916	1917
Jan.	84,148	56,752	66,384	90,172	60,808	51,659	102,746	101,643
Feb.	85,616	64,090	72,442	92,369	67,453	59,813	106,456	94,473
Mar.	84,459	70,036	77,591	89,147	75,738	66,575	107,667	104,882
Apr.	82,792	68,836	79,181	91,759	75,665	70,550	107,592	111,165
May	77,102	61,079	81,051	91,039	67,506	73,015	108,422	110 238
June	75,516	59,585	81,358	87,619	63,916	79,361	107,053	109,002
July	69.305	57,841	77,738	82,601	63,150	82,691	104,017	107,820
Aug.	67,963	62,150	81,046	82,057	64,363	89,666	103,346	104,772
Sept.	68,476	65,903	82,128	83,531	62,753	95,085	106,745	104,465
Oct.	67,520	67,811	86,722	82,133	57,361	100,822	113.189	106,550
Nov.	63,659	66,648	87.697	74.453	50,611	101,244	110.394	106,859
Dec.	57,349	65,912	89,766	63,987	48,896	103,333	102,537	.....

Diagram of Pig-Iron Production and Prices

The fluctuations in pig-iron production from January, 1909, to the present time are shown in the accompanying chart. The figures represented by the heavy lines are those of daily average production by months of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron at furnace at Chicago. They are based on the weekly market quotations of THE IRON AGE.

Three Blast Furnaces Idle

CHICAGO, Dec. 5 (*By Wire*).—Three blast furnaces of the Illinois Steel Co., South Chicago, are shut down as the result of a fire in a gas main last night. The full extent of the damage is not determined, but it is hoped that operations will be resumed within a day or two.

Blast Furnace Notes

The Indiana Steel Co. blew in its new No. 2 furnace at Gary, Ind., Nov. 4, making a total of 11 furnaces in the Gary group.

The second of the two Iroquois furnaces operated by the Miami Metals Co. at South Chicago, Ill., in the production of ferromanganese blew out Nov. 28.

Stack D at the Maryland plant of the Bethlehem Steel Co. at Sparrows Point, Md., blew out for partial relining Nov. 3 and resumed operations Nov. 25.

The furnace of the Clinton Iron & Steel Co., Pittsburgh, was out of blast 21 days in November for relining.

An American Arsenal in France

WASHINGTON, Dec. 4.—Plans are being made by the Ordnance Bureau of the War Department to establish an arsenal at the United States military base in France. This establishment will consist of two departments, one of which will be utilized for the repair of small arms and the other for the relining of big guns. The big gun department will include foundry and forging facilities and a well equipped machine shop. Secretary Baker will speedily announce the name of the officer who will be assigned to command the arsenal and will detail a number of experts from the Ordnance Bureau in this city. The statement published in the daily press to the effect that Major General William Crozier, chief of the Ordnance Bureau, will have personal charge of the arsenal is denied by Secretary Baker.

Iron and Steel Markets

SURPRISING OUTPUT

November Better Than Expected in Pig Iron and Steel

Pig Iron Scarcity Accentuated—Railroad Difficulties Increase

Pig-iron statistics for November show an unexpected, though very slight, increase in the daily rate. For the 30 days the total was 3,205,794 tons, or 106,859 tons a day, against 3,303,038 tons in October, or 106,550 tons a day. So much has been made of the banking down of furnaces at Youngstown last month, due to coke shortage, that a serious falling off was looked for. But other districts made up the loss, which turned out to be only about 10 per cent from the Youngstown output of October.

So many furnaces have been working badly, due to frequent bankings and in part to poor coke, that more are compelled to go out for relining. The net loss was 10 in November, and the 345 furnaces active Dec. 1 had a capacity of 106,953 tons a day, against 109,059 tons a day for 355 furnaces on Nov. 1. November just wiped out the October gain of 10 in active stacks.

Railroad difficulties continue the most serious handicap of blast furnaces and steel works. The Youngstown situation is better, but Pittsburgh is now affected more than in November by lack of coke, and there and in Ohio the Steel Corporation to-day has 20 furnaces banked. Steel production has been kept up heretofore by drawing on pig-iron stocks, but now the reserve of pig iron has been used up. In November some steel companies surprised themselves by a larger rolling-mill output than for October.

The first effect of the pooling arrangement of Eastern railroads has been the cancellation of many permits both for export and domestic shipments of pig iron and steel, some plants meanwhile having practically no outlet. The special effort to facilitate the movement of ore, coal and coke will work for betterment in the raw-material supply, but the problem of freight congestion, particularly at Pittsburgh, promises to dominate the steel industry for months.

New calls for cost sheets have come to steel producers in the past week from the Federal Trade Commission, and fresh agitation of Government control and of price reductions comes from the same quarter, as the Pomerene bill is brought up for Congressional action. Added to all the troubles encountered in production and distribution, the possibility of fresh price unsettlement just as the new schedule was becoming effective makes the outlook by no means encouraging.

Government buying continues large, but chiefly in pursuance of programs already outlined. The past week has seen considerable orders for plates and for forging steel for shells, but thus far little is heard of new contracts for shell steel for the Allies.

Additional rails have been bought for shipment to France—about 15,000 tons. In a recent purchase of rails for a great storage operation in New Jersey the Government paid $55, but as high as $73 was paid by a domestic road on 2500 tons for delivery in the early months of 1918. The urgent need of rails for increased siding and terminal facilities is bringing rail prices more nearly in line with those for shell rounds, which are largely a rail-mill product.

In the plate trade it is a growing belief that the Government will take all sheared plates ¼ in. and heavier after April 1. Recently Government orders for 50,000 to 60,000 tons of universal plates were placed with Youngstown mills and for some time plate shipments to the Government by one Pittsburgh company have been at the rate of 60,000 tons a month.

Most sheet mills have now covered their large trade for first quarter or first half of next year, and the Government is a liberal buyer both for export and domestic needs. Tin plate contracts for the first half have been generally closed and in some cases a full year's supply has been covered, the price for the second half to be adjusted later.

Billets and sheet bar offerings by large producers are much restricted. One large steel company in the Central West has sold no semi-finished steel in months, apart from its regular contracts. A 25,000-ton sheet bar sale has just been made by a Pennsylvania mill for delivery over the next three months.

Pig iron consumers are buying for next year in a way indicating that they expect difficulty in getting sufficient metal. The scarcity of iron for early delivery is growing more acute, and but for the agreement with the Government the spot market would doubtless be well above the $55 point at which the September agreement found it. Many furnaces are sold up for the first half and are now selling only for third quarter or second half. Urgent inquiry for basic iron in lots of 10,000 tons and more has appeared in the East and Middle West.

Domestic production of ferromanganese fell off sharply in November and British exports to this country are becoming inconsiderable. British producers seem unable to supply even the Canadian demand in full.

Lake Superior ore shipments to Dec. 1 were 61,585,402 tons and with favorable weather the December movement may reach 1,500,000 tons, or a total of 63,000,000 tons—much nearer than was expected to the total of 64,734,000 tons moved by water last year.

Pittsburgh

PITTSBURGH, Dec. 4—(*By Wire*).

The fuel situation in the Youngstown district is better and industrial operations in that district this week will be on a larger scale than for some time. However, the situation is still very far from being satisfactory and the output of the steel mills there is very little over 75 per cent of capacity. The Youngstown Sheet & Tube Co. has one Hubbard and one furnace at East Youngstown idle, and the Carnegie Co. has two of the Ohio stacks down for lack of coke. So far the Republic Iron & Steel Co. has been able to operate its five blast furnaces at Hazleton, but has very little coke ahead.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Dec. 5, 1917.	Nov. 28, 1917.	Nov. 7, 1917.	Dec. 6, 1916.
No. 2 X, Philadelphia...	$34.25	$34.25	$34.25	$28.50
No. 2, Valley furnace....	33.00	33.00	33.00	30.00
No. 2 Southern, Cin'ti...	35.90	35.90	35.90	25.90
No. 2, Birmingham, Ala..	33.00	33.00	33.00	23.00
No. 2, furnace, Chicago*	33.00	33.00	33.00	28.00
Basic, del'd, eastern Pa..	33.75	33.75	33.75	30.00
Basic, Valley furnace....	33.00	33.00	33.00	30.00
Bessemer, Pittsburgh....	37.25	37.25	37.25	34.45
Malleable Bess., Ch'go*..	33.50	33.50	33.50	28.00
Gray forge, Pittsburgh..	32.75	32.75	32.75	29.95
L. S. charcoal, Chicago..	37.50	37.50	37.50	31.75

Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	....	....	....	$38.00
O.-h. rails, heavy, at mill	....	....	....	40.00
Bess. billets, Pittsburgh.	$47.50	$47.50	$47.50	55.00
O.-h. billets, Pittsburgh.	47.50	47.50	47.50	55.00
O.-h. sheet bars, P'gh...	51.00	51.00	51.00	55.00
Forging billets, base, P'gh	60.00	60.00	....	80.00
O.-h. billets, Phila.....	47.50	47.50	....	60.00
Wire rods, Pittsburgh....	57.00	57.00	57.00	65.00

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	3.685	3.685	4.685	2.909
Iron bars, Pittsburgh....	3.50	3.50	...	3.25
Iron bars, Chicago.....	3.50	3.50	4.50	2.75
Steel bars, Pittsburgh...	2.90	2.90	2.90	3.00
Steel bars, New York....	3.095	3.095	3.095	3.169
Tank plates, Pittsburgh..	3.25	3.25	3.25	4.25
Tank plates, New York..	3.445	3.445	...	4.419
Beams, etc., Pittsburgh..	3.00	3.00	3.00	3.25
Beams, etc., New York..	3.195	3.195	3.195	3.419
Skelp, grooved steel, P'gh	2.90	2.90	2.90	2.85
Skelp, sheared steel, P'gh.	3.25	3.25	3.25	3.00
Steel hoops, Pittsburgh..	3.50	3.50	...	3.25

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Dec. 5, 1917. Cents.	Nov. 28, 1917. Cents.	Nov. 7, 1917. Cents.	Dec. 6, 1916. Cents.
Sheets, black, No. 28, P'gh	5.00	5.00	5.00	4.00
Sheets, galv., No. 28, P'gh	6.25	6.25	6.25	5.50
Wire nails, Pittsburgh...	3.50	3.50	...	3.00
Cut nails, Pittsburgh....	4.50	...	...	2.95
Fence wire, base, P'gh...	3.25	3.25	...	2.95
Barb wire, galv., P'gh...	4.35	4.35	...	3.85

Old Material, Per Gross Ton.				
Iron rails, Chicago.....	$37.00	$36.50	$35.00	$29.00
Iron rails, Philadelphia..	38.00	38.00	38.00	25.00
Carwheels, Chicago	30.00	30.00	27.00	21.50
Carwheels, Philadelphia..	34.00	33.00	29.00	22.50
Heavy steel scrap, P'gh.	30.00	30.00	30.00	26.00
Heavy steel scrap, Phila.	27.00	27.00	25.00	24.00
Heavy steel scrap, Ch'go.	28.00	28.00	28.00	23.50
No. 1 cast, Pittsburgh....	28.00	28.00	27.00	20.50
No. 1 cast, Philadelphia..	31.00	31.00	28.00	20.00
No. 1 cast, Ch'go (net ton)	23.50	23.50	21.00	16.50
No. 1 RR. wrot, Phila....	35.00	35.00	35.00	26.00
No. 1 RR. wrot, Ch'go (net)	31.25	31.00	31.00	26.00

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	$6.00	$6.00	$6.00	$7.50
Furnace coke, future....	6.00	6.00	6.00	4.00
Foundry coke, prompt...	7.00	7.00	6.00	7.50
Foundry coke, future....	7.00	7.00	6.00	5.00

Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.	23.50	23.50	23.50	34.50
Electrolytic copper, N. Y.	23.50	23.50	23.50	34.50
Spelter, St. Louis.....	7.75	7.75	7.62½	12.50
Spelter, New York.....	8.00	8.00	7.87½	12.75
Lead, St. Louis.....	6.37½	6.37½	6.12½	7.40
Lead, New York.....	6.50	6.50	6.25	7.50
Tin, New York.....	80.00	80.00	68.00	44.37½
Antimony (Asiatic), N. Y.	15.25	14.00	14.00	14.00
Tin plate, 100-lb. box, P'gh.	$7.75	$7.75	$7.75	$6.00

Hall and Atlantic furnaces of the Republic company have both been blown out for relining, taking advantage of the present shortage in supply of coke. In the Pittsburgh district operating conditions are very little better than they were last week. Measures are being taken to facilitate the movement of ore, coal and coke and food supplies over the railroads east of Chicago, and as soon as these are put in effect the present greatest freight congestion ever known in this district will be relieved. The committee of vice-presidents of the Eastern railroads has opened a suite of ten offices in the Union Arcade Building, in this city, and has already put in effect a movement to facilitate the bringing of ore in quicker time from lower lake ports to the Pittsburgh districts. One plan is to use more motive power and this will be done. This committee has also decided that foodstuffs shall have the right of way over coal, steel or any Government freight on the Eastern railroads. With this committee working here and the coal sub-committee at Cumberland, Md., freight conditions in the Pittsburgh district are expected to be very much better within a short time. Some Pittsburgh manufacturers, in order to relieve the freight congestion, are advocating a plan of shutting down all the manufacturing plants of the country for a period of two weeks, or from Saturday, Dec. 22, 1917, until Monday, Jan. 7, 1918. Two holidays are in these two weeks and it is figured that such a shutdown would allow the railroads to clean up congested freight, the manufacturers to ship out goods piled in stock awaiting cars, and would also allow a large supply of coal and coke and other products to be hauled to the mills and furnaces to provide against future possible shortages. The plan has been advocated so strongly that a meeting of manufacturers who are members of the local Chamber of Commerce has been called to be held in this city on Friday, Dec. 7, to take action on the matter. However, it is a question whether plants running on war materials—and practically all Pittsburgh manufacturing plants are doing so—would be allowed to shut down for two weeks as the loss in output would be too great. General conditions in the steel trade show no important change. The amount of new business being placed with the mills is relatively small and for two reasons. One is that the mills are sold up for months and cannot take care of new orders, and, in addition, under present conditions in freight movement and fuel supply, they are unable to ship out material as fast as it should be moved. They believe that it is best not to take on more new orders until these two very unsatisfactory features of the market have been greatly improved. The Government prices on fuels, pig iron, semi-finished and finished steels are being quoted on all new inquiries, but buyers find it is almost impossible to get any material for prompt delivery.

Pig Iron.—Predictions are made that were it not for the Government prices ruling in the pig iron market since September, basic and Bessemer pig iron would be selling at $100 per ton or more. All the large steel companies are still trying to find pig iron, but with very little success. The shortage in supply of coal and coke is cutting down output of pig iron very materially and the situation is likely to get worse before it is better. This, in turn, is restricting output of steel just at a time when it is so badly needed. On Dec. 1, the Carnegie Steel Co. had a number of blast furnaces banked for lack of coke, these including one Clairton, one Duquesne, two Edgar Thomson and one Isabella stack. There have been no large sales of either Bessemer or basic iron, simply for the reason that they cannot be had. A moderate amount of foundry iron is being sold, and the scarcity in supply is causing some consumers to try to cover their needs of pig iron for the first half of 1918. Several large consumers of foundry iron have bought fairly large lots for first half delivery, but furnaces are selling very

cautiously not knowing what they may be up against in the near future as regards supply of coal and coke. One sale of 1200 tons of No. 2 foundry is reported at $33, Valley furnace, equal deliveries over first six months of next year.

We quote as follows: Basic pig iron, $33; Bessemer, $36.30; gray forge, $32; No. 2 foundry, $33; No. 3 foundry, $32.50, and malleable Bessemer, $33.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being 95c. per ton.

Billets and Sheet Bars.—The new demand for billets and sheet bars is very active, but intending buyers find it almost impossible to find any mills that will sell steel for fairly prompt delivery. In fact, two of the larger steel companies are actively scouring the market trying to find ingots, slabs or billets, and say they will be glad to buy steel in any form, and practically in any quantity to help out. Dealers have been offered commissions on any purchases they can make, but report they cannot find it. The Carnegie Steel Co. is taking care of its regular customers in billets and sheet bars to the best of its ability, but has not sold any steel in the open market for some months.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $47.50, sheet bars $51, and forging billets $60 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Ferroalloys.—The new demand for ferroalloys of all kinds is quiet, consumers feeling there is no incentive to contract ahead, as they will be able to obtain what they need from time to time instead of making contracts for six months or a year ahead, as has been the custom in the past. We continue to quote 80 per cent domestic ferromanganese at $240 to $250 for any delivery, and 18 to 22 per cent spiegeleisen at about $60 delivered. We quote 50 per cent ferrosilicon for prompt shipment at $150 to $160, while on contracts, prices are $140 and higher, depending on the quantity wanted.

We now quote 9 per cent Bessemer ferrosilicon at $51.70, 10 per cent $55, 11 per cent $58.30, 12 per cent $61.60. We quote 6 per cent silvery iron $40, 7 per cent $42, 8 per cent $44.50, 9 per cent $47, 10 per cent $50. Three dollars per gross ton advance for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, these furnaces having a uniform freight rate of $2 per gross ton, for delivery in the Pittsburgh district.

Structural Material.—No large inquiries are out in this district, and the amount of new work being placed for non-Government work is very small. The Pittsburgh-Des Moines Steel Co. has taken 250 tons for buildings at the Langely aviation field in Virginia. Neither of the two local structural mills is quoting for prompt delivery, both being filed up for some months. We quote beams and channels up to 15 in. at 3c. at mill.

Steel Rails.—The new Government prices on light rails announced two weeks ago apply not only on new light rails rolled from billets, but also on rerolled light rails, prices on both grades being the same. Both the new and rerolled light rail mills are filled up for months and new inquiry is light.

We quote light rails, 25-lb. and heavier, at 3c. per lb.; 16-lb. and 20-lb., 3.45c.; 12-lb. and 14-lb., 3.90c., and 8-lb. and 10-lb., at 4.25c. for full carload lots, f.o.b. Pittsburgh; for less than carload lots, down to and including five gross tons, 0.045c. extra, and small lots under five gross tons, 0.09c. extra, all per lb., f.o.b. Pittsburgh.

Plates.—Recently Government orders for 50,000 to 60,000 tons of universal plates were placed with the mills in the Youngstown district. Local plate mills are running largely on Government orders, and since its new Liberty plate mill at Homestead was finished, the Carnegie Steel Co. has been furnishing 60,000 tons or more of plates per month to the Government. Here and there a small plate mill can be found that can ship out plates fairly promptly, and some business is being placed with these mills at the regular Government price. We quote ¼ in. and heavier sheared plates at 3.25c. Pittsburgh.

Sheets.—The new demand for sheets from domestic consumers is heavy, and most mills have covered their large trade for first quarter and first half of next year, except on galvanized sheets, sales of which are being restricted to first quarter. The Government continues to place heavy orders for sheets, and a recent inquiry was closed for 10,000 to 12,000 tons, most of which is being shipped abroad. The demand for sheets from the automobile trade is very dull, and this will release to other consumers a large quantity of sheets that otherwise would have gone to this trade. It is said that the average output of sheets of all grades at present is probably not over 70 per cent of capacity. This is due to the shortage in steel, cars and also labor. It is also true that some concerns which have sheet and tin plate mills are concentrating their efforts to getting out a maximum output of tin plate. Leading makers of sheets say that they do not desire any change in prices made, as they believe it will be unwise to open the price question again, as it would have the effect of unsettling the trade. While the 6.25c. price on galvanized sheets is regarded as low it is likely that present Government prices on all grades of sheets may stand for the next year or more. Detail prices on sheets are given on page 1391.

Tin Plate.—Mills have covered their trade on tin plate for first half of 1918, and in some cases have taken contracts for second half, the prices to be adjusted later, and if no change is made in the Government price of $7.75 for first half, this price will also stand for second half of next year. The export demand is active, but most concerns are refusing to quote on export business. There still remain some contracts for tin plate for export taken as long ago as late in 1915 and during 1916, which have not been cleaned up, and shipments on some of these contracts are still going forward. Leading tin plate makers say they are absolutely confident that the output this year will not only be large enough to fully meet the demand for containers of non-perishable foods, but will also be large enough to take care of the heavy buying expected by the Government for shipment to our allies. The present output of tin plate is estimated at close to 95 per cent of capacity in spite of the shortage in cars, steel and the often trouble in getting pig tin promptly. We quote coke plate at $7.75 per base box f.o.b. Pittsburgh for Bessemer or open hearth stock. Prices on terne plate, output of which next year will no doubt be relatively small, are given on page 1391.

Iron and Steel Bars.—The new civil demand for iron and steel bars is only fair, but mills are sold up for some time, and have not material to offer for prompt delivery. Consumers whose stocks are low, and who are trying to buy either iron or steel bars for prompt shipment, say they cannot find mills that will accept their orders. The demand for reinforcing steel bars is dull, due to the large falling off in building operations all over the country. We quote steel bars at 2.90c. and refined iron bars 3.50c. in carloads, f.o.b. mill, Pittsburgh.

Wire Rods.—The domestic and export demand for wire rods is active, and several mills are practically sold up and are not seeking new orders. On a recent inquiry for about 500 tons of soft Bessemer or open-hearth rods for shipment to Canada $75 per ton, or higher, was quoted. Prices of rods for export are arbitrary, the mills quoting whatever they see fit. On domestic orders all mills are quoting the $57 price for soft rods, and the supply available is limited. The demands of the Government on the steel mills are so heavy that some concerns rolling rods and wire products are running light in these departments, diverting more of their raw steel to other products, on Government orders. Prices on rods are given in detail on page 1391.

Wire Products.—The new demand for wire and wire nails is reported by mills to be active, and some mills have their output well under contract over first quarter of next year. There is still a feeling in the wire trade that Government prices were lower than they should have been, and there is some agitation for a change to a higher basis about Jan. 1, but it is not believed this will be effective. The conservative element in the trade believes it would be wrong to stir up the matter of prices and make a change, as this would have the effect of unsettling trade conditions again. Small mills that buy rods and pay $57 for them claim they cannot draw wire and make wire nails and average a fair profit. The export demand for wire and wire nails is fairly heavy, and the Government is plac-

ing fair-sized orders for its own use and also for the Allies. Mills report that on any export shipments of wire and wire nails they are able to make they realize much higher than domestic prices. Recently wire nails for export were sold at very close to $4.75 base, per keg, f.o.b. dock New York City. It is very probable the output of wire and wire nails will be more or less restricted over the next three or four months, as concerns are badly in need of steel for Government orders. Prices on wire and wire nails being quoted by all the mills are given on page 1391.

Nuts and Bolts.—Most of the new orders being taken by local makers of nuts and bolts are either direct or indirect Government business, new buying by domestic consumers being light. Some contracts for nuts and bolts placed some time ago were readjusted to the basis of the new Government discounts, while others were not changed. Makers report that steel is coming in promptly, and output of nuts and bolts at the present is running very close to 100 per cent of capacity. The Government discounts, which are standard on all orders, are given on page 1391.

Rivets.—Makers report the civil demand is very dull, while Government orders, both direct and indirect, are heavy and constitute nearly all the new business that is being placed. As noted before, contracts for rivets placed sometime ago at higher than the Government prices have been readjusted to the new Government basis, so that all buyers are receiving their rivets at the same price. We quote structural rivets at $4.65 and cone-head boiler rivets at $4.75 base, in carloads, f.o.b. Pittsburgh.

Hoops and Bands.—At the time the Government prices on hoops and bands were given out, mills were sold up six to eight months or longer, with the result that the new demand is quiet. Any mills that may be in position to furnish hoops or bands promptly are quoting the Government price of 2.90c. on steel bands, extras as per the steel bar card, and 3.50c. on steel hoops, f.o.b. Pittsburgh.

Shafting.—The Government is doing really all the new buying in shafting, the demand from domestic consumers being very dull. Makers report that the screw stock machine and the automobile trades are buying practically no shafting, and shipments on contracts made some time ago with automobile builders are being held up. It is estimated that the Government is taking 50 per cent or more of the entire output of shafting at present, which is much lighter than usual owing to the fact that the plants of three makers have been closed for some time due to labor troubles. The discount of 17 per cent on shafting makes the base price $4.15 per 100 lb. on 2-in. to 3-in. rounds. We quote cold rolled shafting in large and small lots at 17 per cent off list, f.o.b. Pittsburgh.

Cold Rolled Strip Steel.—Makers report the new demand fairly active, and the large consuming trade is pretty well covered over the next 60 to 90 days. As before noted, some consumers who had made contracts at 9c. per lb. had these readjusted to the basis of 7c., this being the price quoted by makers of cold rolled strip steel prior to the time the Government prices came out. It is not believed there will be any change in prices on cold rolled strip steel on Jan. 1, as the present price of $6.50 per 100 lb. is held by manufacturers and consumers to be eminently fair.

We quote cold rolled strip steel at $6.50 and hot rolled at $4.50 per 100 lb., f.o.b. Pittsburgh, terms 30 days, less 2 per cent off for cash in 10 days, when sold in quantities of 300 lb. or more.

Hot Rolled Strip Steel.—Makers report they are adhering absolutely to the new Government price of $4.50 per 100 lb. on hot rolled strip steel, but it is claimed this price is none too firm.

Railroad Spikes.—Makers report the new demand for railroad spikes from railroads as being very dull, but from the jobbing trade as fairly active. We now quote standard sizes of railroad spikes at 4.50c.; ½-in. railroad spikes, 5.50c. base; ⅝-in. and 7/16-in., 6c. base; 5/16-in., 7c. base, per lb., f.o.b. Pittsburgh.

Wrought Pipe.—On lap weld iron and steel pipe mills are sold up for some months, but on butt-weld sizes can make fairly prompt shipments. The new demand for butt-weld pipe all over the country is dull owing to the large falling off in building operations. The Government is a fairly large buyer of steel pipe, through the subcommittee on tubular products, and those orders are being filled and shipped promptly. It is very gratifying to state that the iron and steel pipe mills have given their utmost support to the Government in turning out and shipping its orders for pipe promptly. Very little lap-weld pipe is available for delivery before the second half of next year.

Discounts on iron and steel pipe are given on page 1391.

Boiler Tubes.—Nearly all the new buying in boiler tubes is on Government direct or indirect orders. One leading maker of boiler tubes and seamless steel tubing is turning over 75 per cent or more of its output to the Government and has many thousands of tons of boiler tubes on its books for the new Government ships being built at the various yards. It is said none of the boiler tube mills can take on new orders for delivery before late next year. Discounts on iron and steel tubes are given on page 1391.

Coke.—The car supply in the coke regions last week was very little better and is still very far from being satisfactory. The recent action taken by the railroads in appointing a general committee of vice-presidents of eastern roads, which has its offices in the Union Arcade building, this city, and also the sub-committee on coal and coke movement which has its offices in Cumberland, Md., it is expected will soon put the movement of coal and coke on a better basis. All the blast furnaces in the Pittsburgh and valley districts are suffering for lack of coke and on several days last week some coke producers did not get more than 10 to 15 per cent of the number of cars they needed. The new demand for furnace coke for prompt shipment is very active, but only a limited amount is available and it is almost impossible to get cars in which to ship it. We quote furnace coke at $6; foundry, $7, and crushed coke over 1-in. size $7.30, all in net tons at oven. The output of coke in the upper and lower Connellsville regions for the week ending Nov. 24 was 316,017 tons, an increase over the previous week of 9777 tons.

Old Material.—Following the recent purchases of heavy steel scrap by the Carnegie Steel Co. and the Sharon Steel Hoop Co. the local scrap market has again quieted down and very little material is being sold by dealers to consumers. In fact, dealers say they would just about as soon not do any business under the present unsatisfactory railroad conditions. They also say it is almost impossible to pick up scrap and make shipment of it, and sell it at the prices fixed by the Government and realize a profit. The railroads are practically refusing to furnish cars for shipments of scrap, even when it is shown that the scrap is to be used in making steel for Government purposes. All the railroads have embargoes on, and are refusing to receive loaded cars of scrap from other roads. There were no important sales of scrap the past week.

Dealers quote for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$29.00 to $30.00
No. 1 foundry cast	27.00 to 28.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	36.00 to 37.00
Hydraulic compressed sheet scrap	24.00 to 25.00
Bundled sheet scrap, sides and ends, f.o.b. consumer's mill, Pittsburgh district	22.00 to 23.00
Bundled sheet stamping scrap	20.00 to 22.00
No. 1 railroad malleable stock	26.00 to 27.00
Railroad grate bars	18.00 to 19.00
Low phosphorus melting stock	39.00 to 40.00
Iron car axles	42.00 to 43.00
Steel car axles	43.00 to 44.00
Locomotive axles, steel	50.00 to 51.00
No. 1 bushelling scrap	24.00 to 25.00
Machine shop turnings	18.00 to 19.00
Cast-iron wheels	32.00 to 33.00
Rolled steel wheels	34.00 to 35.00
*Sheet bar crop ends	34.00 to 35.00
Cast-iron borings	18.00 to 19.00
No. 1 railroad wrought scrap	35.00 to 36.00
Heavy steel axle turnings	23.00 to 24.00
Heavy breakable cast scrap	24.00 to 25.00

*Shipping point.

Chicago

CHICAGO, Dec. 3.

While miscellaneous inquiry is active, actual orders for finished steel products, from both the Government and private sources, have been lighter, as was to be expected after the heavy Government requirements booked last week. Meanwhile, specifications are good. November proved to be a more productive month with some of the mills than was October. Consumers probably will be forced to proceed in a hand-to-mouth manner, so far as their steel supplies are concerned, for some time, in view of Government absorption, the scarcity of cars and the tendency of the mills to avoid committing themselves too far ahead. Producers are faced with uncertainty as to how far their capacities will be taken by Government needs, and they wish to avoid commitments which they may not be able to meet, it being considered not improbable that demand in some directions may be so great that output in other directions will be curtailed. In the week, the Union Pacific placed 3500 cars, and fabricating jobs involving 2000, 1138, 250 and 175 tons were placed, the largest amount being for a theater in Chicago, to be supplied by an Eastern mill. Bolts and nuts are extremely active. The leading independent has sold its full quota of sheets for the first quarter. Pig iron has been lively, especially for malleable and high silicon iron, basic also being in demand, and altogether the probability of a shortage is looming up bigger. It is predicted that practically every foundry will soon be engaged on war work. Inactivity in some trades may somewhat ease the iron situation, the makers of sanitary products and cast-iron pipe not having much business in sight. Old material is firm, and there is an apparent scarcity. The earnings of brokers are being restricted to a degree which has suggested that they be paid by the consumers on a commission basis. There also is talk of extending fixed prices to all grades of scrap, instead of confining them to the four items now affected. Coke continues extremely hard to obtain.

Ferroalloys.—Sales of 80 per cent ferromanganese have been made at $250, and this is regarded as the minimum. Inquiries are fairly numerous. Bessemer ferrosilicon is hard to find, but, if sold, would take the Government prices: $55 for 10 per cent; $58.50 for 11 per cent and $61.60 for 12 per cent, all furnace.

Pig Iron.—Inquiry is heavy and buying has been active for all grades, although that part of the demand which calls for malleable and high silicon iron is the heaviest. Production is proceeding at a good rate, but there is growing uneasiness as to whether there will be sufficient iron to go round, despite the fact that production will be augmented by at least one new furnace in this district early next year. Work on furnace No. 5 of the Iroquois Iron Co. is progressing favorably, and it is expected to be in operation in the early part of 1918. Some relief may come from the falling off in demand for sanitary products and cast-iron pipe, which already is being experienced by their makers. On the other hand, it is predicted that as soon as foundries complete their present contracts they will be filled with Government work, one such requirement, immense in itself, being the castings which will be required for engines and other parts of the steamships which the Government is now building or has planned to build. Iron for this year is exceedingly difficult to find, unless the buyer will accept low silicons. The scarcity of standard analysis grades is causing melters to pay more attention to mixing with a view of utilizing the grades which are offered. The silveries are well nigh unobtainable from either the Ohio or Tennessee makers, most of whom are unwilling to sell further into next year, the former because of uncertainties of production. Basic is extremely scarce also. An illustration of the degree to which the market belongs to the sellers, in all save price, lies in the fact that one seller of southern iron cannot accept an order for more than 1000 tons without submitting the business to his principal. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 2 to 5	$37.50
Lake Superior charcoal, No. 6 and Scotch	40.00
Northern coke foundry, No. 1	33.50
Northern coke foundry, No. 2	33.00
Northern coke foundry, No. 3	32.50
Northern high-phosphorus foundry	33.00
Southern coke No. 1 foundry and 1 soft	38.50
Southern coke No. 2 foundry	37.00
Malleable Bessemer	33.50
Basic	33.00
Low-phosphorus (copper free)	53.00
Silvery, 7 per cent	44.54

Plates.—Since placing the large orders of a week ago, the Government has not been so conspicuous as a buyer. While plates can be had at 3.25c., Pittsburgh, or 3.465c., Chicago, most of the mills have none to offer for industrial consumption. There is a disposition to reserve everything for the Government, the indications being that it will need even more than was estimated. An Ohio mill is running practically 100 per cent on Government orders.

For material out of warehouse the quotation is 4.45c.

Bars.—Inquiry for mild steel bars is fairly lively, and sales are being made from time to time on the basis of 2.90c., Pittsburgh, or 3.115c., Chicago. Rail carbon bars have been a little more active, sales having been made around 3.25c., Chicago. The makers are awaiting the fixing of an official price, the discussion of which has been going on for several weeks. In bar iron, at 3.50c., Chicago, there has been some business, but not a great deal.

We quote warehouse prices for Chicago delivery as follows: Soft steel bars, 4.10c.; bar iron, 4.10c.; reinforcing bars, 4.10c.; base, with 5c. extra for twisting sizes ½ in. and over and usual card extras for smaller sizes; shafting, list plus 10 per cent.

Structural Material.—Not much change is to be noted in structural shapes, although in the week two fairly good contracts were awarded, one for 2000 tons and another for 1138 tons. Contrary to expectations, a theater project has progressed to the letting point, although the steel was cut down a few hundred tons. The Union Pacific has placed 3500 cars, of which the Cambria Steel Co. got 1000 gondolas, the Pullman Co. 1000 hoppers, the American Car & Foundry Co. 1000 stock-cars and the Bettendorf Co. 500 flat cars. The same company has 50 cabooses and 200 oil tank cars, but its inquiry for 1000 logging trucks has been cancelled. The Illinois Central is inquiring for 1000 hoppers and 300 flat cars, and there also is under inquiry 2000 cars for South America, presumably for Chile. Armour & Co. will build 500 refrigerator cars, which are largely of wood, in its own shops. From Eastern sources shapes can be had at 3c., Pittsburgh, or 3.215c., Chicago. For material out of warehouse, jobbers quote 4.20c.

The following lettings are announced:

Columbia Steel Co., extension to present plant, Pittsburg, Cal., 250 tons, to Pacific Rolling Mill Co.

Western Vaudeville Association, State and Lake Theatre Building, Chicago, 2000 tons, to Bethlehem Steel Co.

Great Northern Railway Co., renewal of inner 160 pockets, Ore Dock No. 3, Allowez, Wis., 1138 tons, to American Bridge Co.

Utah Copper Co., structural steel for new rigger shed, Magna, Utah, 175 tons, to Kansas City Structural Steel Co.

Sheets.—So heavy has been the demand for sheets that the leading independent has booked orders to the limit of its capacity over the first quarter of next year. Beyond March it is not selling, finding it preferable to keep within that period in preparation for any change in Government attitude or demands. Another producer has no black or galvanized to offer, but can commit itself further on blue annealed. Despite the situation, there is still a goodly volume of unsatisfied inquiry. Government mill prices follow: No. 28 black, 5c.; No. 10 blue annealed, 4.25c., and No. 28 galvanized, 6.25c., all Pittsburgh.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 5.45c.; No. 28 black, 6.45c.; and No. 28 galvanized, 7.70c.

Cast-Iron Pipe.—Winnipeg, Man., has postponed until Dec. 14 the taking of bids on 4500 tons, this being the second postponement. Jackson, Mich., has taken

bids on 167 tons, but has made no award. The market is quiet and prices without change.

Quotations per net ton, Chicago, are as follows: Water pipe, 4-in., $58.50; 6-in. and larger, $55.50, with $1 extra for Class A water pipe and gas pipe.

Wire Products.—That specifications are good comprises the report on wire. We quote as follows, per 100 lb. to jobbers:

Nails, $3.50, Pittsburgh; plain fence wire, $3.25; painted barb wire, $3.65; galvanized barb wire, $4.35; polished staples, $3.65, and galvanized staples, $4.35.

Rails and Track Supplies.—Light rails are in active demand and in limited quantities available at the recently fixed Government prices, the base being 3c. per lb. for 25 to 45-lb. in carload lots. We quote:

Standard railroad spikes, 4.50c. to 5c., base; small spikes, 4.75c. to 5.50c., base; track bolts with square nuts, 5.50c. to 6c., all in carloads, Chicago; tie plates, $70 to $80 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38 base (nominal); open hearth, $40 (nominal). For prices of light rails see finished iron and steel, Pittsburgh report.

Old Material.—There is some buying from day to day, but the volume cannot be called large, partly because there is no great amount of scrap to sell and further because, with the prices of the leading items fixed, there is no need for precipitate action. Steps have been taken to fix prices for every grade of scrap, also to have the brokers placed on a commission basis, whereby they would receive a fixed amount per ton from the mills for the transactions they negotiate. It is argued that the consumers look to the brokers and dealers for material, and if, in consequence, the brokers take care of their customers, it is right that they should be compensated. Yet on a number of items they are likely to be asked to pay the full Government price—all that they can charge their customer. This is true of No. 1 railroad wrought, for which the railroads are getting $31.25, per net ton on track. This is equal to $35, gross ton, the maximum price which the Government fixed. It follows that the brokers cannot pay $31.25 and, in turn, sell it to the mills for that amount. A commission from the consumers would rectify this situation and supply the incentive for the broker to perform his function—locate material and arrange for its transfer. Under present conditions, there is no motive for speculation on the part of the broker and there would be none under the commission arrangement. The Pennsylvania Lines West and the Lake Erie both have extensive lists before the trade. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$37.00 to $38.00
Relaying rails	50.00 to 55.00
Old carwheels	30.00 to 31.00
Old steel rails, rerolling	35.00 to 36.00
Old steel rails, less than 3 ft	33.50 to 34.50
Heavy melting steel scrap	28.00 to 29.00
Frogs, switches and guards, cut apart	28.00 to 29.00
Shoveling steel	27.00 to 28.00
Steel axle turnings	23.00 to 24.00

Per Net Ton

Iron angles and splice bars	$36.50 to $37.50
Iron arch bars and transoms	37.50 to 38.50
Steel angle bars	26.00 to 27.00
Iron car axles	45.00 to 46.00
Steel car axles	41.00 to 42.00
No. 1 railroad wrought	31.25 to 32.25
No. 2 railroad wrought	29.00 to 30.00
Cut forge	28.50 to 29.00
Pipes and flues	22.00 to 23.00
No. 1 busheling	24.00 to 25.00
No. 2 busheling	17.50 to 18.00
Steel knuckles and couplers	32.00 to 33.00
Coil springs	38.00 to 39.00
No. 1 boilers, cut to sheets and rings	19.00 to 20.00
Boiler punchings	31.50 to 32.50
Locomotive tires, smooth	33.00 to 34.00
Machine-shop turnings	16.50 to 17.50
Cast borings	16.50 to 17.00
No. 1 cast scrap	23.50 to 24.50
Stove plate and light cast scrap	19.00 to 20.00
Grate bars	19.00 to 20.00
Brake shoes	19.50 to 21.00
Railroad malleable	27.00 to 28.00
Agricultural malleable	23.25 to 24.25
Country mixed scrap	18.00 to 19.00

Bolts and Nuts.—Inquiry is piling in on the makers whose greatest problem now is finding material wherewith to manufacture their product. Some of the current orders come from firms having Government contracts and therefore must have precedence. One large manufacturer has revised all contracts on his books, making them conform with the recently announced Government prices. No change has been made in the price of lots out of store. For prices and freight rates see finished iron and steel, Pittsburgh, page 1391.

Store prices are as follows: Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to ⅞ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to ⅞ x 6 in., 40-2½; larger sizes, 30-5; hot pressed nuts, square, $2, and hexagon $2 off per 100 lb.; lag screws, 50 per cent off.

Philadelphia

PHILADELPHIA, Dec. 4.

The railroad congestion is the most trying situation the iron and steel industry has faced in many years. There is no perceptible relief as yet in the coal and coke shortage and many open-hearth furnaces in this district are out because of lack of sufficient supplies of gas coal, while blast furnaces are making a poor record of production through lack of coke. It seems as if all of the troubles which handicap the production of iron and steel are directly traceable to the inability of the transportation systems to cope with present heavy shipments. Effective and permanent relief seems out of the question as long as the present inadequate supply of locomotives and cars, complicated by labor shortage and a confusion of priority shipments, continues. Despite efforts of the Government to facilitate the movement of freight by various measures, the congestion threatens to last throughout the winter, and will surely become more serious when winter snows fall, in spite of anything that can be done. It is certain that manufacturing consumers who are not engaged on war work will suffer the greatest from lack of coal, coke and pig iron. Shortage of pig iron grows more serious and will become a factor to be reckoned with during the next few months. It is becoming impossible to ship pig iron on some of the railroads except to war contractors, and some sellers of iron now decline to enter into contracts with consumers who cannot produce a Government order number. Moreover, there is a tightening of the shipping regulations so that it is not so easy for companies furnishing Government order numbers to obtain iron. Railroads which carry iron from the Virginia furnaces have found that a general embargo against all but shipments for Government work has not proved effective in curtailing shipments; so now every shipment of pig iron must be consigned to an officer of the United States Government or the bill of lading must be accompanied by a special envelope giving information to the railroad as to the character of the war work the consignee is doing and the amount of iron required. The effect of this will probably be to prevent consumers from obtaining shipments of iron larger than the quantity actually required for the Government work. Present conditions point unmistakably to the fact that many foundries will find themselves in a serious predicament when their present stocks of iron are gone. Unless they are very largely on Government work, they will not be able to get iron, and undoubtedly many will be obliged to suspend operations. A general embargo has been issued by the railroads against shipment of pig iron and all steel products to seaboard for export. This embargo is a sweeping one and until lifted will cut off all export shipments. Exceptions are to be made to this in the case of our Allies when ships are available to move the present accumulation of freight at seaboard. The Pennsylvania Railroad has declared an embargo on Philadelphia and all eastbound shipments from Pittsburgh and other points West must be routed so as to avoid Philadelphia. Congestion of freight in this city is so serious that shipments cannot be made from one end of the city to the other, and this works a particular hardship in the case of iron and steel scrap.

Pig Iron.—Present conditions point to an alarming shortage of pig iron for next year. The demand for basic iron is large and insistent. There are many inquiries in the market for the first half of 1918 which cannot be satisfied. In a few instances, steel mills have contracted for Bessemer iron at $36.30, furnace, to

take the place of their basic requirements. Practically all furnaces are sold up for the first quarter and many have no iron to sell for the first half. Selling is now general for the third quarter and at the present rate of contracting it will not be long before the entire furnace production for 1918 will have been contracted for, if the furnaces are willing to make commitments that far ahead. Although the demand for basic iron is the largest, there is also considerable demand for low phosphorus iron, one inquiry calling for 15,000 tons for first half. Inquiries for foundry iron are also numerous and make a large aggregate. Some sellers decline to quote even to good customers who cannot assure the seller that they will be able to produce Government order numbers before time of shipment. It is the opinion of a majority in the trade that it will soon be impossible for iron consumers who are not on war work to obtain shipments, even if they have iron under contract. With a scarcity of all grades of iron and many war contractors clamoring for supplies, it is certain that after the war requirements are satisfied, there will be little or no iron left for those not engaged on war work. Practically all of the steel makers are so heavily engaged in manufacturing for the Government that their wants will be taken care of so far as possible, but many foundries are utilizing only a minor part of their capacity for war work and they will not long be able to obtain a supply sufficient to provide for non-government work along with their war work. Obviously, a foundry which is engaged only 10 or 20 per cent on war work cannot continue to operate without loss unless it can obtain sufficient iron to provide for other work as well. Instances are cited of foundries having war orders for, say, 25 tons of castings which have obtained 200 or 300 tons of pig iron, using the surplus on private work. Restrictions on shipping point clearly to the conclusion that this practice will not be possible much longer. Virginia railroads have not succeeded in materially curtailing shipments of iron by declaring a general embargo against all but Government orders, so have tightened shipping restrictions by requiring the furnace to consign the iron to an officer of the United States Government or to file with the bill of lading a special envelope containing specific information as to the shipment. The effect of this new order will be to prevent so-called non-essential industries from obtaining iron and to curtail shipments even to essential industries to actual requirements for Government work. One of the large inquiries for foundry iron in the market is from a radiator company, which wants 12,000 tons throughout 1918. A sales office here is offering a fair tonnage of washed metal for delivery during the first half. Washed metal is being successfully used in some instances as a substitute for low phosphorus pig iron. It analyzes 0.025 in phosphorus, 0.025 in sulphur and contains no silicon, manganese or copper. The price is based on the fixed price for low phosphorus iron, but is considerably higher. A question has arisen between buyers and sellers in a few instances as to whether there should be a premium for reductions in the sulphur content of low phosphorus iron below 0.04, the point fixed for the $53 grade. Provision was made for the addition of $1.50 for each 0.005 reduction in phosphorus below 0.04, but nothing was said as to sulphur in the price agreement. In one instance, the matter has been submitted to authorities in Washington for adjustment. We quote standard grades of pig iron as follows at furnace, to which should be added the freight to destination:

Eastern Pennsylvania No. 1 X	$34 50
Eastern Pennsylvania No. 2 X	32 50
Eastern Pennsylvania No. 2 foundry	32 00
Virginia No. 2 X	32 50
Virginia No. 2 foundry	32 00
Basic	32 00
Gray forge	32 00
Bessemer	36 20
Standard low phosphorus	58 00
Low phosphorus (copper bearing)	50 00

Coke.—Scarcity of coke continues one of the most serious factors in production of pig iron. Foundries are also suffering severely and their melt has been considerably reduced because of inability to obtain coke as needed. Foundries which are on war work have in many instances used more coke than they expected to, and the deliveries on contracts do not satisfy their requirements. Hence they are continually short and are asking the producers to anticipate deliveries. We quote blast furnace coke at $6, ovens, and 72-hr. foundry coke at $7, ovens, with none for prompt delivery to be had.

Ferroalloys.—Ferromanganese shows weakness, now being quoted at from $235 to $245. The business done is principally in carload lots. Spiegeleisen is also slightly weaker and $60, furnace, can now generally be done for any delivery. Notwithstanding the belief of producers of ferromanganese that imports of manganese ore are likely to fall short of requirements, and thereby cause a shortage later on of ferromanganese, buyers do not seem to be in any hurry to place contracts for forward delivery. Some fairly large contracts have been placed, but there are many steel mills which have not covered for next year.

Semi-Finished Material.—There would be a tremendous demand for billets and slabs if there appeared any likelihood of mills being willing to accept contracts for next year. The steel mills of eastern Pennsylvania will require all of the billets and slabs they will produce for their own finishing mills, and it seems unlikely that any large quantities will be offered in this market for some time. A fair tonnage of Bessemer rerolling billets, which an eastern Pennsylvania mill had to offer for prompt delivery, was quickly taken and no more orders will be accepted in the immediate future. This mill had a part of its Bessemer steel capacity available for the next few months and has accepted contracts for sheet bars aggregating about 25,000 tons, deliveries to be spread equally over the next three months.

Sheets.—Contracting for first quarter continues fairly active, especially in blue annealed sheets. A peculiar situation exists with regard to warehouse prices on sheets. Although the prices agreed upon with the Government permit the jobbers to charge 5.435c., Philadelphia, for No. 10 blue annealed, which is mill cost and freight, plus a profit of 1c. per pound, they have not in a great many instances been able to obtain this price because the sheet mills have had fair-sized lots to offer from their stock sheets, and the mills charge only 50c. per 100 lb. above the mill base price for less than carload shipments. As a result, the warehouses have frequently been selling blue annealed sheets at the mill price, 4.25c., Pittsburgh, and their only profit has been the cash discount, which the mills give them for cash within 10 days. We quote No. 10 blue annealed, 4.25c., Pittsburgh; No. 28 black at 5c. and No. 28 galvanized at 5.25c.

Finished Iron and Steel.—Inquiry for structural material for building purposes, except for the Government, has fallen off practically to nothing. Railroad congestion is no doubt a contributing factor, buyers realizing that if they were able to place orders for non-Government work they might not be able to obtain satisfactory deliveries owing to the already overcrowded condition of the freight transportation systems, and the disposition of railroads to accept nothing but material essential for war purposes. The Bethlehem Steel Co. will establish a warehouse and will sell shapes, plates and other finished steel at the recognized warehouse prices. Rollers of shapes are receiving large specifications from the Emergency Fleet Corporation, principally for shipment to fabricators which are doing work for the American International Shipbuilding Corporation and the Submarine Boat Corporation. Some of the material is being shipped to points as far distant as Minneapolis, Minn., and Canada, there to be fabricated into sections and returned to the shipyard at Hog Island. It has doubtless been necessary for the American International Shipbuilding Corporation to utilize all of the available fabricating plants in the country, regardless of location, to complete their gigantic shipbuilding program, but steel mills look upon the long haul and back haul of this material as something which, if possible, should have been avoided in view of present transportation difficulties. The Submarine Boat Corporation, which was the first to place its contracts with fabricators, is said to have obtained the services of practi-

cally all of the Eastern fabricating plants, leaving the American International Shipbuilding Corporation no alternative but to go farther West. The situation on plates is, of course, the same. About 200,000 tons of plates and shapes will be required for the second lot of 70 ships to be built at Hog Island. Bids for fabricated work are now being taken. The decision of the War Industries Board to make Chicago a basing point continues to disturb Eastern steel producers, and it is apparent that, except on Government order, steel will not be sold under existing conditions for delivery west of Pittsburgh. If a Western consumer is not able to place his orders with mills in Pittsburgh or west, he will probably be obliged to do without steel, unless he has a war contract and can obtain deliveries through the Government. Fewer plates are now being sold. One company, which has been taking orders for the past two months, is now practically out of the market, the Government having given it orders which will take a large part of its capacity. The same is true of another plate mill, which recently sold a number of small tonnages of universal plates. When the Government authorities learned that its universal mill was available, orders for Government work were forthcoming, and this company has also withdrawn from the market. Shipments of shapes and plates are very largely for Government work. A shape mill in this district shipped fully 50 per cent during November for Government work, and expects that in January and February this will be increased to 75 per cent. A plate mill last week shipped its entire output on Government order, and it expects to continue doing this for several weeks, at least. The new plate mill of the Lukens Steel Co., Coatesville, Pa., will be in operation in February and will greatly increase this company's output. The situation as to steel bars is virtually unchanged. An Eastern mill will soon accept contracts from its regular customers for first quarter delivery of plates, shapes and bars at the Government prices. Finishing mills have been able to make a fair rate of production during November by utilizing stocks of cold ingots. Ingot production has been decreased probably 25 per cent in some plants by lack of sufficient gas coal for open-hearth furnaces. A few of the largest steel companies, which are self-contained in coal and coke supply, have made a record rate of production in November, but this condition is not general. We quote shapes at 3c., plates at 3.25c. and steel bars at 2.90c., Pittsburgh.

Bar Iron.—Contracts for first quarter delivery are now being taken at the new fixed price, which is generally quoted as 3.50c., Pittsburgh base, for Eastern delivery, and 3.50c., f.o.b. mill, for Western delivery. This makes the delivered price in Philadelphia and vicinity 3.685c. Some of the bar iron mills in eastern Pennsylvania are operating at greatly reduced capacity, and one plant is closed down entirely owing to shortage of raw materials.

Rails.—An Eastern mill has received a Government order for 5000 tons of standard Bessemer rails for shipment to France.

Wire Nails.—The American International Shipbuilding Corporation has placed an order for 20,000 kegs of wire nails at 3.25c. Pittsburgh.

Steel Tubes.—An eastern Pennsylvania steel mill has available capacity for making prompt deliveries of lapwelded steel tubes in practically all sizes at the agreed prices.

Old Material.—A scarcity of iron and steel scrap is developing from the fact that the small dealers throughout the country do not seem to understand the import of fixed prices and are accumulating stocks in the belief that higher prices will be obtainable later. If there is any change in scrap prices by the Government, it is more likely to be downward than upward. Jobbers have in many instances tried vainly to persuade the small dealers to sell. Under normal conditions, higher prices usually follow heavy snowstorms because of congestion on railroads caused thereby. The small dealers think that such will be the case this year, and it has been difficult to educate them to see that prices cannot go higher without the consent of the Government. Such misinformation does not extend exclusively to the small dealer, however. A jobber here cites the case of a large producer who did not know until told a few days ago that any scrap prices had been fixed by Government order. Pittsburgh steel mills have largely satisfied their requirements for melting steel, but fair tonnages continue to be placed on the basis of $30, Pittsburgh, while sales for delivery in eastern Pennsylvania are generally about $27. There have been a few violations of the fixed price schedule, and it is probable that an announcement will be made soon that will clarify the fixed price arrangement and make trading less difficult. We quote as follows for delivery in eastern Pennsylvania:

No. 1 heavy melting steel	$27.00 to $28.00
Steel rails, rerolling	38.00 to 40.00
Low phosphorus heavy melting	36.00 to 38.00
Old iron rails	38.00 to 40.00
Old carwheels	34.00 to 36.00
No. 1 railroad wrought	35.00
No. 1 yard wrought	32.00 to 34.00
No. 1 forge fire	22.00 to 23.00
Bundled sheets	22.00 to 23.00
No. 2 busheling	15.50 to 16.50
Steel turnings (for blast furnace use)	15.50 to 16.00
Machine shop turnings (for rolling mill use)	18.00 to 19.00
Cast borings (for blast furnace use)	15.50 to 16.00
Cast borings (clean)	20.00
No. 1 cast	31.00 to 33.00
Grate bars	21.50 to 22.50
Stove plate	22.00 to 23.00
Railroad malleable	30.00 to 32.00
Wrought iron and soft steel pipes and tubes (new specifications)	30.00 to 32.50

Buffalo

BUFFALO, Dec. 3.

Pig Iron.—Inquiry is of large proportions for foundry, malleable and basic, but particularly for foundry grades, far in excess of ability of furnaces to supply, and few sales are made in comparison to the number of inquiries received. In many instances, furnaces have been obliged to decline to accept orders for deliveries desired by buyers late next year, as they are sold up for at least through the third quarter of 1918 and many uncertainties are connected with later delivery. A considerable portion of the inquiries received are for steel making iron for munitions and other war order work. We continue to quote as follows, f.o.b. furnace, Buffalo:

No. 1 foundry	$34.50
No. 2 X	33.50
No. 3 foundry	32.50
Gray forge	32.00
Malleable	33.50
Basic	33.00
Lake Superior charcoal, f.o.b. Buffalo	39.75

Finished Iron and Steel.—There has been greater inquiry during the week for nearly all classes of finished products than for a considerable period recently, the larger portion representing material required in connection with Government contracts; although considerable inquiry developed for special bar material for regular consumption. Wire rod inquiries also are before the market from Canadian sources, and plate orders are seeking placement from the same market. Billets for export are in strong demand and good-sized tonnages are going forward to Italy and France on recent orders. Manufacturers of bolts, nuts and rivets, and sales agencies for same, state that the Government price for these commodities fixed recently by the bolt and nut division of the American Iron and Steel Institute by request of the War Industries Board is having the effect of bringing out increased specifications, for the reason that purchasers now know what to expect in the way of definite prices and more business is developing.

Old Material.—Demand is exceedingly active from both local and outside sources and prices are extremely strong and firmly held, due to a large extent to the scarcity of many of the listed commodities. This scarcity is caused very largely by inability of dealers to get materials in yards properly classified on account of the great difficulty in securing sufficient labor for sorting and also on account of scarcity of cars for loading. The price is held very firmly at the maximum allowed by law—$30. There is a strong demand for

low phosphorus at $40 per ton; also for No. 1 railroad wrought, and prices have advanced on a number of commodities. We quote dealers' asking prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$29.00 to $30.00
Low phosphorus	40.00 to 42.00
No. 1 railroad wrought	34.00 to 35.00
No. 1 railroad and machinery cast	30.00 to 31.00
Iron axles	45.00
Steel axles	45.00
Carwheels	32.00 to 33.00
Railroad malleable	29.00 to 30.00
Machine shop turnings	18.00 to 18.50
Heavy axle turnings	26.00 to 27.00
Clean cast borings	19.00 to 20.00
Iron rails	37.00 to 38.00
Locomotive grate bars	20.00 to 21.00
Stove plate	21.00 to 22.00
Wrought pipe	26.00 to 27.00
No. 1 busheling scrap	26.00 to 27.00
No. 2 busheling scrap	17.00 to 18.00
Bundled sheet stamping scrap	19.00 to 20.00

Cincinnati

CINCINNATI, Dec. 4.—(*By Wire.*)

Coincident with the increasing shortage of steel making irons, there is a rapidly growing demand for them. The inquiry for basic is not only from nearby consumers but Eastern mills are also trying to locate a future supply. The southern Ohio melter whose inquiry for 10,000 tons was mentioned last week has not yet been able to place the order for the iron wanted. Malleable is also very scarce, but the demand for it is not quite so urgent. The South continues to be the main source of supply for foundry iron and while inquiries are light, numerous small sales have been made both locally and through southern Ohio and Indiana. All of this iron is wanted for shipment in the first half of next year. Virginia foundry iron has almost ceased to be a factor in this market with the exception of a few odd lots that are offered from time to time and readily sold. Hanging Rock furnaces are so far behind in shipments on former contracts that they are unwilling to take any further future business. A curtailment in the production of Ohio silvery iron has added to the scarcity of high silicon iron and only occasional car loads have been available for sale lately. The insufficient furnace coke supply has almost reached the danger line. Based on freight rate of $2.90 Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, prices as follows:

Southern coke, No. 2 foundry and 2 soft	$35.90
Southern Ohio coke, No. 2	34.26
Basic, Northern	34.26

Finished Material.—With no exceptions, the jobbers report business as being quieter. At the same time, the demand for reinforcing concrete bars is much better than usual at this season of the year. Contractors at Dayton, Ohio, have drawn from local stocks to complete additions to plants now under way, and while the orders sent are not for any large-sized tonnage, the total makes a very fair showing. Wire nails are held at higher figures by wholesale houses and shipments from stock are not now made under $4.10 per keg base, and $4.20 is the asking price. In spite of the numerous embargoes, shipments from the mills are coming through in time to replenish stocks of nearly all kinds of finished material. The mill price of No. 28 black sheets is 5.18½c., and No. 28 galvanized 6.43½c. f.o.b. Cincinnati or Newport, Ky. We quote store prices as follows: Plain iron and steel bars, 4.08c.; twisted steel bars, ¾ x 1¼-in., 4.23c.; ⅞-in., 4.33c.; ½-in., 4.43c.; ⅜-in., 4.63c., and ¼-in., 4.88c. Structural shapes, 4.18c.; plates ¼-in. and heavier, 4.43c.; cold rolled shafting 10 per cent discount from list, and No. 10 blue annealed sheets 5.45c.

Coke.—Both Connellsville and Wise County operators are taking on some foundry coke contracts at the Government price of $7 per net ton at oven. However, contracting has been somewhat lighter due to the inability of the producers to look very far ahead on account of the uncertain coal supply. Complaints are more frequent as to delayed shipments from all districts due to the car shortage situation that is now a more serious reality. Furnace coke cannot be had for either prompt or forward shipment, as the producers have all they can do to take care of their old contracts. Both New River and Pocahontas operators are still out of the market with exceptional small lots of foundry coke that can be disposed of, most of which is for nearby shipment.

Old Material.—Price conditions are unchanged with a probable tendency toward lower figures on prompt shipment material. It is still a very difficult matter to send forward shipments intended for the larger consumers in the Pittsburgh district, and there is no indication that this situation will improve at any early date. Cast scrap is probably firmer than wrought scrap, but this is looked on as a temporary condition. The following are dealers' prices f.o.b. cars, southern Ohio and Cincinnati.

Per Gross Ton

Bundled sheet scrap	$17.50 to $18.00
Old iron rails	32.00 to 32.50
Relaying rails, 50 lb. and up	44.00 to 44.50
Rerolling steel rails	33.00 to 33.50
Heavy melting steel scrap	25.00 to 25.50
Steel rails for melting	24.50 to 25.00
Old carwheels	27.00 to 27.50

Per Net Ton

No. 1 railroad wrought	$29.00 to $29.50
Cast borings	13.00 to 13.50
Steel turnings	13.00 to 13.50
Railroad cast	18.50 to 19.00
No. 1 machinery cast	24.50 to 25.00
Burnt scrap	13.00 to 13.50
Iron axles	40.00 to 40.50
Locomotive tires (smooth inside)	33.50 to 34.00
Pipes and flues	15.50 to 16.00
Malleable cast	19.50 to 20.00
Railroad tank and sheet	14.50 to 15.00

Birmingham

BIRMINGHAM, ALA., Dec. 3.

Southern pig iron manufacturers are selling their product right along, mainly to regular customers, but in small lots, not having a very large amount of the probable make for the first half of the coming year left. There is no inclination in this section to sell beyond July 1, though there have been a few thousand tons disposed of covering the entire year. Inquiries are numerous, and even districts that have furnaces of their own are making inquiry as to the earliest time iron can be shipped, offering to pay the freight rates in addition to get the iron. Production and delivery are being given all attention in this section, the sales being accomplished without effort. The Republic Iron & Steel Co. has shut down two of its Thomas blast furnaces here as result of fire destroying the tipple and coal washer of the Sayreton mines last week, reducing the coke supply. Iron production is reduced not less than 500 tons daily. Sales in small lots are beginning to aggregate fair tonnage.

Shipments of pig iron show a little improvement recently, but old contracts in hand for iron can hardly be cleared off until the middle of summer. All sales now are f.o.b. furnaces, $33 per ton, No. 2 foundry, even home consumers not being given concession. Prominent iron men of the South visited other sections recently and found that demands for iron were such that there were no reasons for fears as to future production being too great. Some of the larger consumers who placed orders the first of the year and are behind in getting what is due them still have representatives in Birmingham trying to get the iron out. Confidence is expressed that the iron market in the South will be strong all through the coming year.

Coal and Coke.—Coal production in the South is greater now than it ever was, but the demand has increased to such an extent that there is just as much shortage as ever before. Federal control, nationally and locally, is in effect, even to the retailing of the product, yards dealing out fuel by the ton and within sight almost of the mines being without stock. Contentions are on between operators and union miners, but expectations are that there will be arbitration of some kind, and not a dark spot is to be noted on the horizon. A conference will be held between the two interests and the National Fuel Administrator, Dr. H. A. Garfield, in Washington next Thursday. Coke production is good in this section, but none too much. Small lot sales are being made at $7 per ton, foundry coke, and $6 for furnace. Contracts made some time ago at higher prices are on the wane.

Old Material.—The scrap iron and steel market in the South is stronger. There is scarcity of old material, and difficulty is being experienced in getting cars with which to make shipments. Many inquiries for scrap have been received recently, but embargoes in the East prevent any of the business being accepted. The Government schedule of prices on scrap iron and steel has not yet been reached in the South. Some few changes were made in the quotations for the week. Scrap prices follow:

Old steel axles	$32.00 to $33.00
Old steel rails	26.00 to 28.00
Heavy melting steel	22.50 to 25.00
No. 1 wrought	26.00 to 28.00
No. 1 cast	22.50 to 25.00
Stove plate	17.50 to 18.00
Old car wheels	25.00 to 30.00
Tramcar wheels	20.00 to 25.00
Machine shop turnings	17.00 to 18.00
Cast iron borings	13.00 to 15.00

British Steel Market

Pig Iron Quotations Higher—Ferromanganese at $270 for American Trade

(*By Cable*)

LONDON, ENGLAND, Dec. 5.

Cleveland pig iron makers are now asking 95s. for the home trade and 116s. 6d., f.o.b., for the Allies, subject to official sanction. American semi-finished steel is idle. Tin plates are quieter at 31s. 3d., including tin allowance. Ferromanganese is nominal, with sellers asking $270, c.i.f., for forward shipment to North Atlantic ports. We quote as follows:

Tin plates, coke, 14 x 20; 112 sheets, 108 lb., f.o.b. Wales, 31s. 3d.

Ferromanganese, $270 c.i.f. nominal for export to America.

Ferrosilicon, 50 per cent, c.i.f., £35 upward.

On other products control prices are as quoted in THE IRON AGE of July 19, p. 171.

St. Louis

ST. LOUIS, Dec. 3.

Pig Iron.—The call for pig iron continues incessantly with no improvement in the prospect of supplying those in need of the metal. Inquiries still pending in the market include a heavy tonnage of foundry iron, running probably to an aggregate of 20,000, while three large consumers of basic are in the market for an aggregate of about 50,000 tons for first half delivery, but are unable to place the contracts. Both Northern and Southern basic are wanted and the quantities of each depend upon the ability to place the orders, although ordinarily the inquirers would take about half of each. In malleable there is an inquiry still out for 1500 to 3000 tons for third quarter delivery, but it also remains unplaced. Sales during the week aggregated about 4000 tons for all deliveries accepted with the individual tonnages running from 500 tons down.

Coke.—The buying of coke during the past week has been as heavy as the capacity of the ovens represented here would permit, which means that the aggregate of sales was much lower than it would otherwise have been. A considerable number of sales were made, probably 5000 tons in the aggregate. Inquiries for probably ten thousand tons ranging from 1000 ton lots downward are still unfilled.

Finished Iron and Steel.—Practically no material is available and consumers with contracts are getting delayed deliveries. Movement out of warehouse continues up to the capacity of the warehouses to fill, but the prices are being maintained at the Government figures. We quote for stock out of warehouse as follows: Soft steel bars, 4.17c.; iron bars, 4.17c.; structural material, 4.27c.; tank plates, 4.52c.; No. 8 sheets, 5.47c.; No. 10 blue annealed sheets, 5.52c.; No. 28 black sheets, cold rolled, one pass, 6.52c.; No. 28 galvanized sheets, black sheet gage, 7.77c.

Old Material.—In the scrap market the dealers and others have still further readjusted themselves to the Government prices, but because only so few of the items have been listed there is still a great deal of uncertainty which is leading to a decided disinclination to buy, sell or speculate. The consuming interests are also keeping out of the market either because they are expecting lower prices or for some other reason and in consequence very few transactions are being recorded. A considerable quantity of relaying rails is reported coming on the market. In consequence, relayers are easier. We quote dealers' prices, f.o.b. consumers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	$35.00 to $35.50
Old steel rails, re-rolling	36.50 to 37.50
Old steel rails, less than 3 ft	37.00 to 37.50
Relaying rails, standard section, subject to inspection	60.00 to 75.00
Old car wheels	29.50 to 30.50
No. 1 railroad heavy melting steel scrap	27.50 to 28.50
Heavy shoveling steel	26.00 to 26.50
Ordinary shoveling steel	25.00 to 25.50
Frogs, switches and guards cut apart	28.00 to 28.50
Ordinary bundled sheet scrap	19.00 to 20.00
Heavy axle and tire turnings	19.00 to 19.50
Per Net Ton	
Iron angle bars	$34.50 to $35.00
Steel angle bars	27.00 to 27.50
Iron car axles	43.50 to 44.00
Steel car axles	41.00 to 41.50
Wrought arch bars and transoms	38.00 to 39.00
No. 1 railroad wrought	31.00 to 31.50
No. 2 railroad wrought	29.50 to 30.00
Railroad springs	32.50 to 33.00
Steel couplers and knuckles	29.50 to 30.00
Locomotive tires, 42 in. and over, smooth inside	31.50 to 32.00
No. 1 dealers' forge	21.75 to 22.75
Cast iron borings	17.00 to 18.00
No. 1 busheling	23.50 to 24.00
No. 1 boilers, cut to sheets and rings	20.00 to 20.50
No. 1 railroad cast scrap	23.50 to 24.00
Stove plate and light cast scrap	17.00 to 17.50
Railroad malleable	25.50 to 26.00
Agricultural malleable	21.50 to 22.00
Pipes and flues	21.00 to 21.50
Heavy railroad sheet and tank scrap	19.50 to 20.00
Railroad grate bars	18.00 to 18.50
Machine shop turnings	17.00 to 18.00
Country mixed scrap	18.50 to 19.00
Uncut mixed railroad scrap	21.00 to 21.50

San Francisco

SAN FRANCISCO, Nov. 27.

The fear of a strike of the shipbuilders has faded and the dominant feature of the local market is the Government control of the trade and the effect of the Government prices put in force Nov. 6. These have resulted in putting the iron and steel business on a war basis rather than a commercial basis. Outside of Government orders there is no big business in sight. The Pacific Coast Shipbuilding Co., of which Henry T. Scott, formerly of the Union Iron Works, is sponsor, has begun to erect its plant at Bay Point and will rush it to completion. It is stated that this new company has contracts from the Government to build ships valued at $10,000,000. Machinery valued at about $1,000,000 has already been ordered in the East, and through Government assistance it will have no difficulty in finding cars for bringing out this machinery. The Schaw-Batcher Co. has already laid the keels for eight ships in its yards in South San Francisco, but these two plants, working as they do entirely on Government contracts, have no effect on the local commercial aspect of the trade. There is plenty of foreign demand, and large shipments could be made for the export trade. The embargo, however, is being rigidly enforced, and permits are impossible to obtain. In this connection, an unusual condition has arisen in scrap from Mexico, whence several good-sized shipments have arrived in bond for Japan. Other scrap from Mexico has been sold on this market at good prices. One shipment of more than 400 tons of steel scrap that once was a part of Mexican railroads reached this port a few days ago consigned to a local firm.

Bars.—The market for bars was the most sensitive to Government regulations and the first to reduce its price. This was mainly because the local mills roll bars but not the heavier shapes. The mills reduced their price at once to conform with Government regulations, and the jobbers reduced their price to about 5c. The jobbers' quotations are unstable, and a further reduction is looked for.

Structural Material.—Shapes followed bar in conforming with the Government prices. There is very little of this material on hand, and the demand is light except for Government purposes. What sales have been made have been about 5c.

Plates.—The price of plates both at the jobbers and at the mills show a marked reduction. From stock they are selling at about 5c., while the rolling mills are adhering strictly to Government prices.

Sheets.—Like bars and plates, sheets show a decided slump in the jobbing market, due to the Government regulations. No. 28 gage is quoted 1c. lower than before the Government prices went into effect. The prevailing price is 9.50c. compared with 10.50c. before Nov. 6.

Wrought Pipe.—There is a considerable demand for wrought pipe in the shipbuilding plants on the northwest, but otherwise the situation is quiet. The Government prices are prevailing. A considerable demand has developed among the jobbers in butt weld sizes, which are quoted at 4.50c. for the ¼-in. size and 7.70c. for the ¾-in.

Cast Iron Pipe.—An advanced charge is being made for cast iron pipe, and still higher prices are expected after the first of the year. These increases were made on account of the increased cost of labor and raw material, and they seem to have had the effect of stimulating the market. The new price, based on Class B or heavier, is $50.

Pig Iron.—The Government price is approximately $46 in San Francisco on a basis of No. 2 foundry. Most of the trade has contracts covering the first six months of next year. The furnaces are offering pig freely at the Government prices, but they are requiring all specifications where immediate shipments are requested. There is practically no future buying, and on account of the general car shortage deliveries are very hard to make. There is plenty of foreign demand, but the embargo prevents all business of this kind.

Coke.—All the local furnaces are well supplied with coke and most of them could go several months without additional supply. Nevertheless the demand is good, as the car shortage makes the local users feel that they should get on hand as large a supply as possible. Very little is being offered at the price established by the Government.

Old Material.—The supply of scrap has increased materially since the Government embargo went into effect, and there is plenty on hand at present. The supply has been added to materially by several shipments recently received from Mexico. Heavy cast iron scrap is selling about $33 and plate at from $25.50 to $26.

New York

NEW YORK, Dec. 5.

Pig Iron.—Interest centers in the plan of pooling all shipments by railroads in the Central West and East under the direction of committees of railroad men. The process has already been started and many permits to ship pig iron have been revoked with the intention of issuing new permits as soon as the plan is fully arranged. While this action causes some temporary embarrassment, pig iron men regard the situation as hopeful for the reason that the men in charge of the pooling understand their business and are not politicians. Hence it is hoped that the new plan will be speedily worked out in a successful manner. The demand for pig iron is very strong. Another Buffalo steel company, in addition to the one mentioned last week, has been a heavy seller for the last half, having disposed of a considerable tonnage, of which about two-thirds was basic and one-third foundry. There is a decided scarcity of basic and negotiations are now pending for the shipment of a fair tonnage from Birmingham to the Pittsburgh district, a very unusual movement. All kinds of pig iron are scarce and it is believed that if the Government had not reduced the price, as high as $75 would now prevail. For early delivery we quote as follows, tidewater:

No. 1 X	$35.25
No. 2 X	34.75
No. 2 Plain	33.75
No. 2 Southern (rail and water)	$28.75 to 29.25
No. 2 Southern (all rail)	29.15 to 29.65
No. 2 X Virginia	37.90 to 37.25

Ferroalloys.—It is reported that, as a result of the President's embargo on certain imports, including ferro-alloys, steps are being taken to place the receipts of imported ferromanganese in the hands of some central body or committee, as in the case of tin. This authority will then regulate the disbursement of such receipts in accordance with the needs of the steel industry as judged by the War Industries Board. Since imports of this alloy have averaged but little over 2000 tons per month recently and as they will probably be still less as time goes on, the task is not formidable nor its effect far-reaching. As bearing on the general domestic situation, it is to be noted that there is talk in the trade of as high as $3 per unit on manganese ore to stimulate domestic output. The domestic ferromanganese market is steady at $240 to $245, furnace. Sales of 2000 to 3000 tons have been made for this and next year's delivery at $240, and some has brought $245. Inquiries are fairly numerous, aggregating about 3000 tons for both prompt and first quarter delivery. There is one inquiry for 600 tons for first quarter and another for 500 to 600 tons for shipment this month. Spiegeleisen is firm at about $60, furnace. Demand is fair. A sale of 1200 tons for delivery in 1918 is noted. Ferrosilicon, 50 per cent, is scarce and the demand here and from abroad is urgent. The market is quoted from $150 to $175 per ton for December and next year, depending on the producer. Sales for December delivery have been made at $175. An interesting development is the production and sale at $85 per ton of 10 to 12 per cent ferrosilicon, low in phosphorus and made electrolytically. One new American producer of the 50 per cent alloy reports its product well sold up for 1918.

Finished Iron and Steel.—The most interesting transaction was the closing on Dec. 1 for 2500 tons of rails for a domestic road at $73 per ton for delivery mostly in January and February. Otherwise business is still chiefly for the Government, and in this connection some complaint is heard of consumers attempting to place entire lots with a single company on A-1 priority business, involving a volume and variety difficult to supply within the time supply. Mills sometimes return such offerings with the suggestion that a distribution among different mills should be made by the priority board. Round lots of bars, chiefly of the smaller sizes, have been sold to jobbers; deliveries on these will be in the first quarter. In plates the talk now is that by April the Government will take all sheared plates ¼ in. and heavier. Meanwhile, business has been done on plates chiefly for jobbers, in some cases for the first quarter and others for the first half, but with the stipulation that supplies will not be forthcoming if Government needs intervene. The largest new project in the fabricating field covers the new nitrating plant for the Government in Alabama, this being a reappearance of the request for tenders. Bids will be taken on Friday for a part of the work, which involves in all over 6000 tons, by Westinghouse Church Kerr & Co. Bids were taken Dec. 3 on 950 tons of crane runways and bids are again asked on Washington Navy Yard work, 400 tons, some 1200 tons for foundry additions, however, being about ready for award. The Levering & Garrigues Co. has been awarded 400 tons for work at the submarine base at New London and it appears will supply a 480-ton structure at the Hog Island shipyard, the Belmont Iron Works taking seven and not eight of the buildings. We quote mill shipments of steel bars at 3.095c., New York; shapes 3.195c., plates 3.445c. and bar iron 3,695c., New York. Out of store prices are 1c. higher and to all must be added 3 per cent of the freight charge for the transportation tax.

Cast-Iron Pipe.—Conferences of manufacturers and Government officials in regard to the price of cast-iron pipe have continued and it has been expected from day to day that notice of an agreement would be announced. Pending action on prices, the market is very quiet and nominal quotations continue at $56.50 for 6-in. and heavier and $59.50 for 4-in.

Old Material.—The old material market during the past few days has been characterized by very active demand which dealers and brokers have been unable to meet fully on account of the impossibility of getting

the much-coveted permits for shipment. The rules in regard to permits seem to be becoming more strict and the movement of scrap is slow. There is extraordinary demand for relaying rails and some fancy prices are being paid. The market has advanced at least $10 over recent quotations and in some cases on very desirable heavy sections $70 has been paid. This extraordinary condition is attributed to the impossibility of obtaining new rails. The demand for foundry scrap is active in all grades except malleable and has advanced at least $1 per ton. We quote prices of brokers as follows to New York producers and dealers, per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$24.00 to $25.00
Old steel rails (short lengths) or equivalent heavy steel scrap	25.00 to 26.00
Relaying rails	55.00 to 60.00
Rerolling rails	35.00 to 36.00
Iron and steel car axles	41.00 to 42.00
No. 1 railroad wrought	32.00 to 33.00
Wrought-iron track scrap	28.00 to 30.00
No. 1 yard wrought long	28.00 to 30.00
Light iron	9.00 to 10.00
Cast borings (clean)	16.50 to 17.50
Machine-shop turnings	15.00 to 16.00
Mixed borings and turnings	14.00 to 15.00
Wrought-iron pipe (1 in. minimum diameter), not under 2 ft. long	27.00 to 28.00

Dealers in New York City and Brooklyn are quoting as follows to local foundries, per gross ton, but for delivery to cupola platforms of Brooklyn foundries about $3 more is quoted:

No. 1 machinery cast	$28.00 to $29.00
No. 1 heavy cast (column, building materials, etc.)	23.00 to 24.00
No. 2 cast (radiators, cast boilers, etc.)	23.00 to 24.00
Stove plate	20.00 to 21.00
Locomotive grate bars	17.00 to 18.00
Malleable cast (railroad)	27.00 to 28.00
Old carwheels	29.00 to 30.00

Cleveland

CLEVELAND, Dec. 4.

Iron Ore.—Lake ore shipments during November amounted to 7,331,804 gross tons, a decided gain over the corresponding month last year, when the movement was 5,715,452 tons. Weather conditions were very favorable during the month, there being no serious storms to delay the movement of boats. Because of the favorable conditions and efforts of shippers to move as much ore as possible, the November shipments broke all records for that month. Total shipments for the season until Dec. 1 were 61,585,402 tons, a decrease of 2,262,896 tons as compared with the same period of 1916. In the opinion of the ore men, the heavy November movement removes all danger of a shortage this winter as consumers are assured enough ore to cover their minimum requirements until the opening of the season of navigation. With favorable weather, December shipments started out well, and it is expected that 1,500,000 tons of ore will be brought down this month, bringing the Lake movement for the season well over 63,000,000 tons as compared with 64,734,198 tons in 1916. Grain shipments have fallen off and some boats, recently diverted to the grain trade are now carrying ore cargoes. Shippers plan to keep their ore boats moving until about the middle of next week provided cold weather does not put a stop to shipments sooner. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, $5.95; old range non-Bessemer, $5.20; Mesaba Bessemer, $5.70; Mesaba non-Bessemer, $5.05.

Pig Iron.—The scarcity of pig iron is becoming more acute, this being particularly noticeable in foundry and basic grades. There is a great deal of inquiry for foundry iron for the first half which cannot be supplied by producers in this territory. Some are taking on no additional tonnage, and others are booking contracts for their regular trade for much less than their requirements. Some additional tonnage has been taken for the last half of next year. The scarcity of Northern foundry iron has finally forced consumers to buy Southern grades, as has been predicted. We note the sale of four lots of Southern foundry iron aggregating 1900 tons in Cleveland, the buyer in each case purchasing the Southern iron because he was unable to secure Northern. Figuring out a delivery price for each grade, the Southern iron costs the consumer $3 more per ton for Tennessee, and $3.70 more for Alabama iron than for Cleveland iron delivered in Cleveland. Various other inquiries are pending for Southern iron from consumers who have been unable to secure Northern grades. A new basic inquiry has come from a north central Ohio steel plant for 15,000 tons for the first half. Another inquiry for 15,000 tons of basic from southern Ohio is still pending and a northern Ohio consumer is still in the market for 10,000 tons for the second quarter, having purchased only one-half of the 20,000 tons inquired for. The Stewart-Warner Speedometer Corporation is inquiring in this market for 2500 tons of malleable iron for first half for shipment to Beloit, Wis. The Government has placed 600 tons of malleable iron with Cleveland selling agencies. Apparently no Ohio silvery iron is to be had for the first half. Many foundries are crowding furnaces for shipments, and no requests have come from foundries engaged largely in automobile work to hold up shipments. One of the largest Michigan foundries engaged in making automobile castings has advised furnaces that it is willing to have shipments delayed for a short time, but wishes to take every ton of iron contracted for before July 1. We quote delivered Cleveland, as follows:

Bessemer	$37.25
Basic	33.30
Northern No. 2 foundry	33 30
Southern No. 2 foundry	37.00
Gray forge	32.30
Ohio silvery, 8 per cent silicon	46.12
Standard low phos., Valley furnace	50.00

Coke.—The scarcity of foundry coke has become more acute. Some brokers have been able to cover their regular trade with contracts, but have no more coke to offer, and there is a large volume of inquiry for contracts for the first half and full year. Consumers fear that they will be forced to shut down their plants for lack of fuel, and many would buy a large supply of spot coke and store it were they able to obtain it. We quote standard Connellsville furnace coke at $6 per net ton at oven, and foundry coke at $7.

Finished Iron and Steel.—New demand for steel for Government work continues heavy. With the cleaning up of some of the high-priced tonnage by the mills, buyers are having less trouble in securing steel for early shipment. The Midvale Steel & Ordnance Co. and the Cambria Steel Co. are now offering for early shipment steel bars in a wide range of sizes, mostly in Bessemer steel, Bessemer billets and sheet bars and light plates. There is a great deal of inquiry for sheet bar contracts for the first quarter, but the supply is scarce. We note the sale of a 3500-ton lot to a Northern Ohio consumer for December-January shipment. We also note the sale of 4000 tons of steel bars to Cleveland jobbers. Consumers, largely in the automobile field, are still urging mills to cancel high-priced contracts, and one independent mill is cancelling these contracts, provided the consumer accepts the cancellation of an equal tonnage of low-priced steel. If the mill has none of the latter on its books, cancellation is refused. The manufacturers of automobile parts are being seriously affected by the reduction in the manufacture of pleasure cars and have held up considerable steel tonnage which they wish to have cancelled. Some bolt and rivet manufacturers are still trying to get readjustments of high-priced contracts. The demand for plates is heavy, and the prices quoted by mills having high-priced slab contracts continues to ease off. Plates are now being generally quoted at 4.25c. by a Cleveland mill, although small lot sales at 5c. have not disappeared. The Emergency Fleet Corporation, which recently purchased a round lot of boilers for wooden vessels is now taking bids for 420 water tube boilers for steel vessels. These will require 10,000 to 12,000 tons of steel including the tubes. One Eastern mill that has been selling Universal plates at the Government price for early shipment is now filled up and has withdrawn from the market. Hard steel bars are quiet and are quoted at 3.25c. at mill. The demand for sheets continues very active, much of the tonnage being for Government work. Some of the sheet mills are sold up for the first quarter. Some contracts are being taken

for the first half. Jobbers are now finding little opportunity to take car lot orders for sheets and other steel products, as mills insist on selling direct at the Government price instead of allowing the jobber the usual $1 commission on these orders. Cleveland jobbers are now quoting uniform stock prices taking the full amount allowed by the Government, instead of cutting off the 3½c. per 100 lb. that has been done by some since the price regulation. We quote warehouse prices as follows: Steel bars, 4.03½c.; plates, 4.38½c.; structural material, 4.13½c.; No. 10 blue annealed sheets, 5.35c.; No. 28 black sheets, 6.35c.; No. 28 galvanized sheets, 7.60c.

Bolts, Nuts and Rivets.—There is a heavy demand for bolts, nuts and rivets. Railroads and other consumers are buying bolts and nuts freely for the first half, and a great deal of business is coming out for Government work. An Eastern shipyard has placed 15,000 tons of rivets, 10,000 of these going to a Cleveland manufacturer. An inquiry for 3000 tons is pending from a Southern shipyard and a large amount of business is expected to be placed shortly by other shipyards. We quote rivets at 4.65c., Pittsburgh, for structural and 4.75c. for boiler rivets.

Old Material.—The market has stiffened up considerably, and while it has continued quiet during the week, there are indications of increasing activity. Some consumers are inquiring for scrap, and it is expected that there will be an active market during the latter part of the month, as shipments on contracts to many mills will be cleaned up by the end of December. Dealers are paying somewhat higher prices for heavy melting steel to cover short sales, and this grade is reported to have sold as high as $30, or the maximum price fixed by the Government. Cast scrap is firmer and in somewhat better demand because of the scarcity of pig iron. The first transactions in busheling reported in this market for some time were made during the week, two mills taking 750 tons at $24. We quote f.o.b., Cleveland, as follows:

	Per Gross Ton
Steel rails	$26.00 to $27.00
Steel rails, rerolling	36.00 to 37.00
Steel rails, under 3 ft.	30.00 to 31.00
Iron rails	35.00 to 36.00
Steel car axles	45.00 to 46.00
Heavy melting steel	29.00 to 30.00
Cast borings	18.00 to 18.40
Iron and steel turnings and drillings	18.25 to 18.75
No. 1 railroad wrought	34.00 to 35.00
Hydraulic compressed steel scrap	24.00 to 25.00
Carwheels	26.50 to 27.50
Relaying rails, 50 lb. and over	50.00 to 60.00
Agricultural malleable	22.00 to 23.00
Railroad malleable	27.00 to 28.00
Steel axle turnings	22.00 to 23.00
Light bundled sheet scrap	20.00 to 20.50
Per Net Ton	
Iron car axles	$44.00 to $45.00
No. 1 busheling	24.00
No. 1 cast	23.50 to 24.50
Railroad grate bars	17.25 to 17.75
Stove plate	17.25 to 17.75

The Central Division of the American Board of Scrap Iron Dealers, recently formed in Cleveland, completed its organization at a meeting held last week. A. J. Bialosky was named as permanent chairman, M. A. Cohen, vice-chairman, and Morris Friedman, secretary. Thirty leading dealers in Cleveland, Youngstown and other Ohio cities and Detroit are represented in the organization which will co-operate with the Eastern Division at Philadelphia and the Western Division at Chicago. It is the intention to establish an Inspection Bureau.

Large Forging Plant at Gary

Significant in connection with the expansions of capacity in various metal working lines to take care of Government demand, is the decision of the United States Steel Corporation, just announced, to build a large forging plant at Gary, Ind.

A meeting of the stockholders of the Liberty Steel Co., Warren, Ohio, will be held Dec. 14 to take action on a proposal to increase the capital stock from $500,000 to $600,000.

IRON AND INDUSTRIAL STOCKS

Public Holds Off and Waits for Gage of Congress' War Policy

NEW YORK, Dec. 5.

Rather unfavorable news developments the past week tended to force price levels slightly lower. The Russo-German truce and the Lansdowne letter more than offset the optimistic influence of the successful British offensive before Cambrai. A general desire to await the opening of Congress, in order to get a more definite idea of the Government's war policies, has also cut down transactions. Securities, however, displayed a strong resistance to a rather generally adverse situation.

Slight declines were recorded in most cases, although some industrials showed small advances: American Car & Foundry, com., ¼; Baldwin Locomotive, com., ¼; International Harvester of New Jersey, com., 4. The falling off in steel stocks was: Bethlehem Steel, com., 2½, and Class B, 2; Colorado Fuel & Iron, com., ½; Crucible Steel, com., 1⅝; Lackawanna Steel, com., ½; Midvale Steel, com., 1¾; Superior Steel, com., 2½; United Alloy Steel, com., ½; U. S. Steel, com., ½, and pref., 1.

The range of prices on active iron and industrial stocks from Tuesday of last week to Wednesday of this week was as follows:

Allis-Chalm. com.	17⅛ - 19¼	Int. Har. of N. J. pf.	110
Am. Can com.	32⅜ - 37	Lack. Steel	79⅞ - 80⅞
Am. Can pf.	96 - 97	Lake Sup. Corp.	11½ - 12
Am. Car & Fdry. com.	65 - 66¼	Midvale Steel	41 - 44
Am. Car & Fdry. pf.	105	Nat.-Acme	26¼
Am. Loco. com.	50 - 54	Nat. En. & Stm. com.	36½ - 38½
Am. Loco. pf.	97½	N. Y. Air Brake	108⅛-109
Am. Ship com.	92 - 93	Nova Scotia Steel	65 - 66¼
Am. Steel Fdries.	54¾ - 56½	Pitts. Steel pf.	87 - 90
Bald. Loco. com.	54 - 55⅞	Press. Steel com.	50½ - 54
Beth. Steel com.	75 - 81	Press. Steel pf.	94
Beth. Steel, Cl. B.	74⅜ - 81¼	Ry. Steel Sp. com.	40¼ - 42
Beth. Steel pf.	85 - 85½	Republic com	74¼ - 78½
Cambria Steel	116	Republic pf	94¾ - 95¾
Cent. Fdry. com.	29⅜ - 30	Sloss com.	36 - 38¼
Cent. Fdry. pf.	41	Superior Steel	33½ - 36¼
Char. Iron com.	7⅜	Superior Steel 1st pf.	96⅞ - 98½
Chic. Pn. Tool	45 - 49	Un. Alloy Steel, 1st pf.	36½ - 37
Colo. Fuel	33 - 35	U. S. Pipe com.	12 - 12⅝
Crucible St. com.	52¼ - 56¼	U. S. Pipe pf.	46 - 46¾
Crucible St. pf.	91½	U. S. Steel com.	87⅞ - 97½
Deere & Co. pf.	95	U. S. Steel pf.	107½-109¼
Gen. Electric	126½-130⅜	Va. I. C. & Coke	52¾
Gt. No. Ore. Ct.	26 - 27½	Warwick	8⅝
Gulf States Steel	84⅞ - 88	Westingh. Elec.	37⅞ - 39¼

Dividends

The American Can Co., quarterly, 1¾ per cent on the preferred, payable Jan. 2, and 3.7157 per cent, being the final payment of accumulated dividends on the preferred, payable Dec. 20.

The Charcoal Iron Co. of America, quarterly, 20c. on the common and 30c. per share on the preferred, payable Dec. 31.

The General Electric Co., quarterly, 2 per cent, payable Jan. 15.

The La Belle Iron Works, quarterly, 3 per cent and extra 2 per cent on the common and 2 per cent on the preferred, all payable Dec. 22.

The Moline Plow Co., quarterly, 1¾ per cent on the second preferred, payable Dec. 1.

The Worthington Pump & Machinery Co., quarterly, 1¾ per cent on preferred A and 1½ per cent on preferred B, payable Jan. 2.

The Yale & Towne Mfg. Co., extra 5 per cent, payable Dec. 24.

Industrial Finances

The Wharton Steel Co., Wharton, N. J., has recently called a special meeting of shareholders to increase the capital of the company from $3,000,000 to $10,000,000.

The Solvay Process Co., Solvay, N. J., has called a meeting of the stockholders on Dec. 18, to increase the capital stock of the company from $18,000,000 to $36,000,000.

The Plattsburg Alloys Corporation, Plattsburg, N. Y., has increased its capital stock from $60,000 to $125,000 to provide for plant extensions.

The Yale & Towne Mfg. Co., Stamford, Conn., has declared an extra dividend of 5 per cent, payable Dec. 24 to stock of record Dec. 17.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on iron and steel articles, aside from wrought iron and steel pipe in carloads, per 100 lb., New York, 19.5c.; Philadelphia, 18.5c; Boston, 21.5c.; Buffalo, 11.6c.; Cleveland, 13.5c; Cincinnati, 18.5c.; Indianapolis, 20c.; Chicago, 21.5c.; St. Louis, 27c.; Kansas City, 47c.; minimum carload, 36,000 lb.; St. Paul, 35.5c.; minimum carload, 36,000 lb.; Denver, 79c.; minimum carload, 36,000 lb.; Omaha, 47c.; minimum carload, 36,000 lb.; New Orleans, 30.7c.; Birmingham, 46c.; Pacific Coast, 75c.; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is 90c.; minimum carload, 40,000 lb. and 85c.; minimum carload, 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 40c. per 100 lb., minimum carload 46,000 lb.; to Omaha 40c., minimum carload 46,000 lb., to St. Paul 35.5c., minimum carload 46,000 lb.; Denver 79c., minimum carload 46,000 lb. *A 3 per cent transportation tax now applies.*

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in. angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 3c.

Wire Products

Wire nails, $3.50 base per keg; galvanized, 1-in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1-in., $2.50. Bright basic wire, $3.35 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.25; galvanized wire, $3.95; galvanized barb wire, and fence staples $4.35; painted barb wire, $3.65; polished fence staples, $3.65; cement-coated nails, $3.40 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 47 per cent off list for carload lots, 46 per cent for 1000-rod lots, and 45 per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large rivets ..... $4.65 base
7.15 in. x 6 in. smaller and shorter rivets. 45-10 per cent off list
Machine bolts h.p. nuts, ⅝ in. x 4 in.
Smaller and shorter, rolled threads.... 50-10-5 per cent off list
Cut threads ..... 50-5 per cent off list
Larger and longer sizes..... 40-10 per cent off list
Machine bolts, c.p.c. and t nuts, ⅝ in. x 4 in.
Smaller and shorter..... 40-10 per cent off list
Larger and longer ..... 35-5 per cent off list
Carriage bolts, ⅝ in. x 5 in.
Smaller and shorter, rolled threads..... 50-5 per cent off list
Cut threads ..... 40-10-5 per cent off list
Larger and longer sizes..... 40 per cent off list
Lag bolts ..... 50-10 per cent off list
Plow bolts, Nos. 1, 2, 3..... 50 per cent off list
Hot pressed nuts, sq. blank..... 2.50c. per lb. off list
Hot pressed nuts, hex., blank..... 2.30c. per lb. off list
Hot pressed nuts, sq., tapped..... 2.30c. per lb. off list
Hot pressed nuts, hex., tapped..... 2.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank..... 2.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped..... 2.00c. per lb. off list
Semi-finished hex. nuts.
⅝ in. and larger ..... 60-10-10 per cent off list
9/16 in. and smaller..... 70-5 per cent off list
Stove bolts ..... 70-10 per cent off list
Stove bolts ..... 2½ per cent extra for bulk
Tire bolts ..... 50-10-5 per cent off list

The above discounts are from present lists now in effect. All prices carry standard extras.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $57; chain rods, $65; screw, rivet and bolt rods and other rods of that character, $65. A tentative differential of $10 per ton over soft rods for high carbon rods has been agreed upon.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $5 to $5.50; ¾ in., 7/16 in. and ½ in., $7. base. Boat spikes, $5.25 per 100 lb., f.o.b. Pittsburgh. Track bolts with square nuts, 7c. to 7.50c. to railroads, and 8c. to 8.50c. in small lots for fairly prompt shipment.

Terne Plate

Effective Nov. 7, prices on all sizes of terne plates are as follows: 8-lb. coating, 200 lb., $15 per package; 8-lb. coating, I. C., $15.30; 12-lb. coating, I. C., $16.75; 15-lb. coating, I. C., $17.75; 20-lb. coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.90c. for delivery late this year, and 4.50c. to 5c. from warehouse in small lots for prompt shipment. Refined iron bars, 3.50c. in carload and larger lots f.o.b. mill.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card, as announced Nov. 5 by the Government on steel pipe, those on iron pipe being the same as quoted for some time:

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	44	17½	⅛ and ¼	23	+4
½	48	33½	⅜	24	+3
¾ to 3	51	37½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	44	31½	1¼	18	3
2½ to 6	47	34½	1½	25	11
7 to 12	44	30½	2	26	12
13 and 14	34½	..	2½ to 6	28	15
15	32	..	7 to 12	25	12

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	40	22½	⅛, ¼ and ⅜	22	5
½	45	32½	½	27	14
¾ to 1½	49	36½	¾ to 1½	33	18
2 to 3	50	37½			

Lap Weld, extra strong, plain ends

2	42	30½	1¼	19	4
2½ to 4	45	33½	½	25	11
4½ to 6	44	32½	2	27	14
7 to 8	40	26½	2½ to 4	29	17
9 to 12	35	21½	4½ to 6	28	16
			7 to 8	20	8
			9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots f.o.b. Pittsburgh, announced Nov. 13, as agreed upon by manufacturers and the Government:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.	34	3½ to 4½ in.	12½
2½ to 3¼ in.	24	3 to 3¼ in.	+ 5
2¼ in.	17½	2½ to 2¾ in.	+ 7½
1¾ to 2 in.	13	2 to 2¼ in.	+22½
		1¾ to 1⅞ in.	+35

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton		Per Net Ton	
1 in.	$340	1¾ in.	$220
1¼ in.	280	2 to 2½ in.	190
1⅝ in.	270	2¾ to 3¾ in.	180
1½ in.	220	4 in.	200
		4½ to 5 in.	220

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net or 2 per cent discount in 10 days.

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer	*Cents per lb.*
Nos. 3 to 8	4.20
Nos. 9 and 10	4.25
Nos. 11 and 12	4.30
Nos. 13 and 14	4.35
Nos. 15 and 16	4.45
Box Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21	4.80
Nos. 22 and 24	4.85
Nos. 25 and 26	4.90
No. 27	4.95
No. 28	5.00
No. 29	5.05
No. 30	5.15
Galvanized Black Sheet Gage—Bessemer	
Nos. 10 and 11	5.25
Nos. 12 and 14	5.35
Nos. 15 and 16	5.50
Nos. 17 to 21	5.65
Nos. 22 and 24	5.80
Nos. 25 and 26	5.95
No. 27	6.10
No. 28	6.25
No. 29	6.50
No. 30	6.75
Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16	4.80
Nos. 17 to 21	4.85
Nos. 22 to 24	4.90
Nos. 25 and 27	4.95
No. 28	5.00
No. 29	5.05
No. 30	5.05
Nos. 30½ and 31	5.10

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
		Electro-	New	New	St.	New	St.
Nov.	Lake	lytic	York	York	Louis	York	Louis
28	23.50*	23.50*	80.00*	6.50	6.37½	8.00	7.75
30	23.50*	23.50*	80.00*	6.50	6.37½	8.00	7.75
Dec.							
1	23.50*	23.50*	....	6.50	6.37½	8.00	7.75
3	23.50*	23.50*	80.00*	6.50	6.37½	8.00	7.75
4	23.50*	23.50*	80.00*	6.50	6.37½	8.00	7.75

*Nominal.

NEW YORK, Dec. 5.

The markets have nearly all come to a halt. Copper in unchanged at the controlled prices, both wholesale and jobbing. Tin is unobtainable and is unchanged at nominal quotations. Lead continues inactive but firm at unchanged levels. Spelter is very dull and unchanged at nearly nominal prices. Antimony is more active and higher.

New York

Copper.—With the large majority of copper consumers, especially the large buyers as well as many smaller ones, almost entirely engaged on Government work at controlled prices, there is no market in the accepted sense. There have been no developments since last week and there is nothing to add to what was said then. The Government price of 23.50c. to large buyers and of 24.67½c. for jobbing lots continue to rule under the usual restrictions. It is now generally understood and accepted that jobbers cannot sell their stocks, no matter what they cost, at a higher price than 24.67½c. This eliminates practically all business between small dealers. It is stated that production in November was larger than that of October, but far short of the 1916 maximum, and that the supply for domestic consumption is inadequate with the prospect that it will continue so for some time.

Copper Averages.—In the absence of any sales of Lake or electrolytic copper at the Government or any other price for commercial use in quantities sufficient to establish a market, there is no monthly average based on quotations in THE IRON AGE possible. The Government price of 23.50c. has been quoted regularly as nominal.

Tin.—The market has come to a decided halt. The only news feature is the fact that the tin in warehouses, which was announced as commandeered last week by the Government, has been released except that which was appropriated to Government needs. The metal is again in the hands of the original owners, subject to distribution as determined by the American Iron and Steel Institute. The market is under complete Government control similar to copper. Quotations are entirely nominal at 80c., New York, for spot Straits. The market is extremely quiet with demand very light. Buyers show no interest in any position or any grade, both Banca and Chinese tin being scarce and nominal. Arrivals this week to Dec. 4 inclusive have been 325 tons, with the quantity afloat not reported. The London market for spot Straits continues to soar, it being quoted yesterday at £294 per ton, an advance of £10 in the week.

Lead.—Little or no business is reported, and the market is dull with conditions unchanged in the last week. Prices are firmly held at previous levels, the outside market standing at not less than 6.50c., New York, or 6.37½c., St. Louis. The leading producer continues to ask 6.25c., New York. There is no pressure to sell, and buyers are not anxious to purchase. Lead in transit in carload lots or less has sold recently at 6.75c.

Spelter.—The market for prime Western is still lifeless. Demand is insignificant and sales are of small consequence marketwise. There has been practically no change since last week with prime Western for early delivery still quoted at 7.75c., St. Louis, or 8c. New York, with shading of these levels possible and probable. There are no developments in the price fixing program, with nothing definite made public as to the activities of the new Zinc Committee. The trade in general is waiting to see what action will be taken.

Antimony.—As high as 15c. per lb., duty paid, New York, was bid yesterday for Chinese and Japanese grades. Sales are reported as high as 15.25c. for early delivery. The market has taken a sudden spurt as a result of the probable effect of the President's embargo on imports, including antimony and antimony ore. The new arrangement is expected to limit available spot and nearby supplies.

Aluminum.—The market is inactive. No. 1 virgin metal, 98 to 99 per cent pure, is unchanged at 36c. to 38c. per lb., New York.

Old Metals.—The market is practically unchanged. Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible (nominal)	23.50
Copper, heavy and wire (nominal)	23.50
Copper, light and bottoms	21.00 to 22.00
Brass, heavy	17.25 to 17.50
Brass, light	12.00 to 12.50
Heavy machine composition	23.75 to 24.00
No. 1 yellow rod brass turnings	15.00 to 15.25
No. 1 red brass or composition turnings	19.00 to 19.50
Lead, heavy	6.00
Lead, tea	4.50
Zinc	6.00

Chicago

DEC. 3.—Jobbers in copper continue to lack official guidance as to their selling price for the copper they hold. They understand that the recently announced basis of 23.50c., plus 5 per cent, applies to part carload lots sold by producers, and they are firm in their belief that the Government is willing that they should make a fair profit. While any Government needs, direct or indirect, would be filled at 23.50c., jobbing lots have been sold in the past week at 26c. to 28c., and in the aggregate a fair amount has been disposed of. It is felt that there may be a pinch in copper, in view of there being considerable unsatisfied inquiry, but up to the present time no consumers have found it necessary to suspend operations. In general, the metal market has been quiet. Antimony is a little stronger. The market for old metals is exceptionally quiet. We quote as follows: Castings, Lake and electrolytic copper, 26c. to 28c.; tin, carloads, 81c. to 82c.; small lots, 86c.; lead, 6.25c. to 6.50c.; spelter, 7.75c. to 8c.; sheet zinc, 19c.; antimony, 16c. to 16.50c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 21c.; copper clips, 20c.; copper bottoms, 19c.; red brass, 19.50c.; yellow brass, 14.50c.; lead pipe, 5c.; zinc, 5c.; pewter, No. 1, 40c.; tinfoil, 47.50c.; block tin, 52.50c.

St. Louis

DEC. 3.—The non-ferrous metals have shown some slight changes in price during the week, but there have been no marked incidents to note. The close to-day in carload lots for the Missouri product was: Lead, 6.37½c.; spelter, 7.75c. to 7.87½c. In less than carload lots the close was: Lead, 6.75c.; spelter, 8.50c.; tin, 86c.; copper, 25.12c. (government figure at this point); Asiatic antimony, 18c. In the Joplin district, on account of the shortage of railroad cars there was indifference on the part of buyers with the result that there was a lowering of prices in the bulk of the sales, though the price range stood at $52.50 to $72.50 per ton basis of 60 per cent metal. Calamine was quiet at $35 to $37 per ton basis of 40 per cent metal, with an average for the district for the week of $36 per ton. Lead ore was steady at $75 per ton, basis of 80 per cent metal, and the average for the week for the district was $75 per ton. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 10c.; heavy yellow brass, 14c.; heavy red brass and light copper, 19.50c.; heavy copper, and copper wire, 20c.; pewter, 25c.; tinfoil, 42c.; zinc, 5c.; lead, 5.50c.; tea lead, 5c.

Pittsburgh and Nearby Districts

The Fobewood Coal & Iron Co. recently opened offices in the Farmers Bank Bldg., Pittsburgh, in charge of W. W. Woodruff, president and treasurer, and at 1103 Little Bldg., Boston, in charge of S. D. Fobs, vice-president. Mr. Woodruff also is connected with the Aetna Foundry & Machine Co., Warren, Ohio. The Fobewood company handles furnace and foundry coke, and steam, gas and smithing coal.

In November, the Valley Mold & Iron Corporation shipped from its two plants at Sharpsville and West Middlesex, Pa., 32,617 net tons of ingot molds, the largest output and shipment of ingot molds ever made by this concern in one month. In October, Alice blast furnace of this company at Sharpsville made 9778 tons of basic iron, and in November, 9303 tons. The company recently made shipments of 48 cars of ingot molds in one day, a record shipment for 24 hours.

The Standard Steel Car Co. Pittsburgh works at Butler, Pa., is working on several large Government orders for cars, and has lately bought considerable machine shop equipment, including radial drills, shapers, lathes and boring mills.

The Flood City Mfg. Co., Johnstown, Pa., has increased its capital from $15,000 to $100,000 to provide for plant extensions, including a 4-story steel and concrete factory to be erected. J. E. Hershberger is general manager of the company.

The United Connellsville Coke Co. of Pittsburgh has issued notices to stock holders of that concern that a meeting will be held in the company's offices, Henry W. Oliver Building, Dec. 17, to ratify or reject a proposition to consolidate and merge the following companies: United Connellsville Coke Co., Hillman-Neff Coke Co., Bessemer Coke Co. and the Hecla Coal & Coke Co. It is explained that the move is planned as a means of cutting down overhead expenses and more fully complying with Government regulations with regard to the output of coke.

A foundry war machine shop in Brownsville, Pa., founded in 1837, has been sold by J. Herbertson's Sons to Ira E. Stevens and William P. Walker, Pittsburgh, who will take over the property on Dec. 15.

Manufacturers Sell Coal to Employees

A number of manufacturing plants in the East have been obliged to contend with a peculiar condition, which is eating into their surplus stocks of coal, if they happen to be so fortunate as to possess any surplus. Their employees have frequently been unable to obtain sufficient coal for their homes and have applied to their employers for relief. Even at the risk of entirely exhausting their supply and being obliged to shut up shop, the manufacturers have invariably found it good policy to sell coal to their workmen. The aggregate of such transactions probably is not large, as figured in tonnage, but the handling of this retail business has been a source of additional expense.

The Liberty engine and the reasons for its 12-cylinder design are the subject of an address to be made before the Society of Automotive Engineers, New York, Thursday afternoon, Jan. 10, by Major Jesse G. Vincent, who was largely responsible for the design and who is now in charge of its development at the aviation headquarters in Dayton, Ohio.

Lifting magnets on the European continent are reported to have been wound for some time past with aluminum wire because of the shortage of copper. On account of the lesser conductivity of aluminum it has been found that the expenditure of current is 20 per cent greater to yield the same results.

The Scovill Mfg. Co., Waterbury, Conn., has declared an extra dividend of $5, payable Dec. 1 to stock of record Nov. 25. The company has paid cash dividends of $123 this year and paid a special dividend of 25 per cent in Anglo-French bonds in January of this year.

Women in German Munition Plants

The extent and character of the employment of women in German munition plants is given in a memorandum published in the London *Ironmonger* as issued by the executive committee of the German Metal Workers' Trade Union. In part it is as follows:

Woman labor is used most extensively in the manufacture of shells. In 1912 there were 246 women turners; now (Sept., 1917) there are 5926. Women are employed in all kinds of work, regardless of their physical fitness. Instances of superhuman efforts demanded of women, which have frequently resulted in serious physical injury, are frequent lifting of shrapnel shells weighing about 60 lb., without assistance of any kind, and lifting of projectiles weighing 20 to 75 lb. from floor to breast level. For 3 marks a day a woman must perform this exhausting task from 70 to 100 times and even more. Of a steel works in Upper Silesia it is reported: "Women and girls look like walking columns of dust—lavatories are frequently not provided; the women in the foundries are hollow-eyed and with eyes deeply sunken; their expression is pathetic; all joy in life is lost." For the exhausting work of boiler scaling men are paid extra, but women are not. In the Krupp works at Duisburg and Essen there is neither ventilation nor suction apparatus. The workers themselves have to fix the belts, a dangerous operation for a woman. The working hours, already long, are further lengthened by night and Sunday work. Where the 48-hr. week is in force, as in Berlin, overtime and Sunday work leave little leisure. Over 40 per cent of all the women employees have a 12-hr. day and less than 4 per cent work as short a time as 10 hr. The longest working week is in the government small arms factory in Dantzig, with 78 hours. In one plant at Dresden girls have repeatedly worked from 7 a. m. till 11 p. m., with an interval of one hour, and in another at Leipzig some women worked through the whole of Saturday until 2 or 4 a. m. on Sunday—16 or 18 hours in one shift.

A Warning on Coke Overcharge

Fuel Administrator Garfield has issued an order in view of reports coming to the fuel administration that coke producers in some instances had been selling "72-hour" coke to blast furnaces and taking advantage of the $1 differential allowed on 72-hour selected foundry coke. The order points out that any person guilty of asking, demanding, or receiving higher prices than are allowed under the fuel price regulations shall upon conviction be fined not more than $5,000 or be imprisoned not more than two years, or both.

In making the order the Fuel Administrator established prices on by-product coke produced in New England. New England coke producers will be permitted to charge prices that will cover their increased transportation charges on coal carried to New England by water for use in coke manufacture. The order fixes New England coke prices as follows:

For coke produced in New England, the maximum price for each grade, f.o.b. cars at point of production, shall be the base price for the grade of coke, plus the freight rate from the competing beehive coke district which takes the lowest freight rate to the point where the coke is produced, and plus 7 cents for each advance of 5 cents above 60 cents in the freight charges per ton (2240 lb.) of coal for water transportation on the coal used in the manufacture of such coke. The base prices are as follows: Run of ovens, $6; selected foundry, $7; and crushed over 1-in. size, $6.50.

In Technical Paper 98 of the U. S. Bureau of Mines by S. H. Kratz and H. C. Porter, entitled "Effect of Low Temperature Oxidation on the Hydrogen in Coal and the Change in Weight of Coal on Drying," the authors state that there is a lack of agreement between the weight of water evolved by coal and the loss of weight when dried in an inert atmosphere. The excess weight of the coal may be due to adsorption of gas.

The Portsmouth Solvay Coke Co., Portsmouth, Ohio, made a preliminary test of its new plant last week and 10 ovens are now in full operation.

PERSONAL

Ralph P. Zint, latterly identified with the Federal Export Corporation and the Commercial Iron & Steel Corporation, New York, has been made manager of the steel department of the recently organized Swiftsure Export Corporation, 120 Broadway, New York. This company is owned by the France & Canada Steamship Co., whose officers are also officers of the export subsidiary. J. P. H. Mertens, long identified with the export business, formerly in Belgium and later with the Federal Export Corporation, is general manager of the company. The company has offices in London, Paris, Montreal and Boston. It operates 29 vessels of 141,721 tons carrying capacity.

Vere Brown, formerly assistant general manager of the Allegheny Steel Co., Brackenridge, Pa., has been appointed general manager to succeed W. Lester Walker, who died on Oct. 7. E. P. Perkins, formerly superintendent of the plate mill, has been made assistant general manager to succeed Mr. Brown. Vere Brown was formerly in the metallurgical department of the Dominion Iron & Steel Co., at Sydney, N. S., and went with the Allegheny Steel Co. in January, 1909, in the metallurgical research department. In 1914 he was made assistant general manager to W. Lester Walker. J. G. Rohrman, district sales manager in the Chicago office of the Allegheny Steel Co., 1113 People's Gas Building, has been granted a six months' leave of absence on account of sickness. J. L. Harrison, in the plate mill division of the plant of the Allegheny Steel Co., at Brackenridge, will take care of the duties of Mr. Rohrman during his absence.

McClelland M. Harper, in the order and supply department of the Jones & Laughlin Steel Co., Pittsburgh, has been appointed assistant to J. A. Parker, superintendent of the National Bureau of Exports at Washington.

Roy M. Welch, formerly special agent of the Youngstown Sheet & Tube Co., Youngstown, Ohio, has been named assistant to President J. A. Campbell, to succeed Dudley R. Kennedy, who resigned to become head of the industrial relation department of the American International Shipbuilding Corporation. Mr. Welch had formerly been with the Carnegie Steel Co., but left that concern in 1902 to go with the Youngstown Sheet & Tube Co. He was first connected with the store and purchasing departments, then was secretary to C. S. Robinson, vice-president, and later was made special agent.

Thomas L. Robinson, chairman of the board of the Republic Rubber Co., Youngstown, Ohio, has been granted a six months' leave of absence to engage in Red Cross work in Italy.

W. R. Yagle, formerly associated with the Lawrence Steel Castings Co., Pittsburgh, has become office manager of the Hall Steam Pump Co., of that city.

J. F. Adey, until recently superintendent of the Stone & Webster Corporation at Youngstown, Ohio, has gone to France to head a division of Stone & Webster work on the U. S. Government ordnance buildings in the European country.

Sherwood H. Standish, formerly assistant superintendent of the Northwestern Malleable Iron Co., Milwaukee, has become works manager of the Stowell Co., founder and manufacturer, South Milwaukee.

E. W. Ames and A. G. Dowden, representing the American Steel Export Co., New York, are about to sail for Japan on a business trip. The officers of the company gave a dinner in their honor at the Waldorf-Astoria on the evening of Nov. 28.

R. Gardner Kellogg, vice-president Mechanical Appliance Co., Milwaukee, has enlisted as a private in response to a call for 1200 volunteers from Wisconsin to fill National Guard regiments now in federal service at Camp MacArthur, Waco, Tex.

Allen C. House, of the iron ore department of M. A. Hanna & Co., Cleveland, has received a commission as first lieutenant in the Field Artillery of the United States Army, and Andre T. Chisholm, vice-president of the Chisholm Steel Shovel Works, Cleveland, has been commissioned as captain of infantry. Both attended the recent officers' training camp at Fort Benjamin Harrison, Indianapolis.

At a recent meeting of the Owens Bottle Machine Co., Toledo, Ohio, John G. Biggers, former treasurer, was elected assistant general manager, and J. C. Blair, former controller, was elected treasurer and a member of the board of directors.

Henry J. Fuller, vice-president of Fairbanks, Morse & Co., New York, and president of the Canadian Fairbanks Morse Co., has been elected president of E. & T. Fairbanks & Co., scale manufacturers, St. Johnsbury, Vt. P. C. Brooks, vice-president of the Canadian Fairbanks Morse Co., who has direct charge of the manufacturing operations, has been appointed general manager of E. & T. Fairbanks & Co. and will make his headquarters at the plant at St. Johnsbury.

J. H. Schneider originally with the Lodge & Shipley Machine Tool Co., more recently with the Gurney Electric Elevator Co., Honesdale, Pa., as assistant superintendent in charge of special organization and engineering work, will be head of the efficiency department of the American Tool Works Co., Cincinnati.

R. H. Chapin, assistant general manager and director of sales for the Porter Mfg. Co., Ann Arbor, Mich., resigned to accept a Government position in the inspection section, Detroit district, equipment division of the United States Signal Corps.

B. L. Neis, formerly in charge of the car shipments of the Maxwell Motor Co., is now a lieutenant attached to the ordnance department.

M. R. Bissell, Jr., vice-president of the Bissell Carpet Sweeper Co., Grand Rapids, Mich., has left for Camp MacArthur, Waco, Texas, where he hopes to be assigned to the aviation division.

F. W. Claflin, of the staff of Perin & Marshall, consulting engineers, New York, sailed from Vancouver on Nov. 22 to erect at Sakchi, India, for the Tata Iron & Steel Co. the blast furnace recently dismantled at Battelle, Ala., for erection in India to make ferromanganese.

John T. Nielson, Piqua, Ohio, has been elected secretary of the Greater Dayton Association, Dayton, Ohio, an organization of more than 2000 members, and one that includes all of the principal manufacturers of that city.

E. C. Sickles, recently works engineer of the Hyatt Roller Bearing Co., Newark, has joined the Lackawanna Bridge Co. in connection with the shipbuilding activities of the company at Port Newark, N. J.

William C. Wright, formerly in charge of the track department in the Cleveland district for the Bethlehem Steel Co., and since March 1, 1917, associated with the Read-Rittenhouse Co., Philadelphia, steel merchant, has been commissioned captain in the Ordnance Division of the United States Army.

Emil P. Albrecht, well known in Philadelphia machinery circles, having organized and managed the Machinery Exhibition in the Bourse, has been elected president of the Philadelphia Bourse, succeeding George E. Bartol, who died Nov. 13. Alexander Duncan Chiquone, Jr., who has been assistant secretary, was elected to the secretaryship made vacant by Mr. Albrecht's promotion.

Shipments of Swedish iron ore fell off decidedly in 1916. From the two ports of Narvik, in Norway, and Lulea, in Sweden, 2,668,535 metric tons were exported as compared with 3,584,814 tons in 1915 and 3,310,579 tons in 1914. About 60 per cent of the 1916 exports passed through the port of Lulea.

The National Association of Corporation Schools will hold its next annual convention in Chicago the first week of June, 1918.

PIG-IRON FREIGHT TO CANADA

An Advance Asked from Cincinnati Involves Other Ohio River Points

WASHINGTON, Dec. 4.—The Baltimore & Ohio, Cincinnati, Hamilton & Dayton and the Pittsburgh, Columbus, Cincinnati & St. Louis railroads have filed an application with the Interstate Commerce Commission for permission to increase the rate on pig iron from Cincinnati to Windsor, Sarnia, Hamilton and other points in Ontario from $2.10 per gross ton to $2.46.

Admitting that no pig iron is produced at Cincinnati, they have informed the commission they desire to establish the higher rate to enable them to use it as a "base for rates elsewhere." They have told nothing more about their desire to make rates at points other than Cincinnati and thus far the commission has not required them to make any further disclosure of their plans.

In their application they declare that the $2.10 rate was established from Cincinnati as the result of a misconception which they cannot now explain; that it was intended to be used only as a proportional rate on pig iron coming to Cincinnati from points south of the river, although it was published as a local rate. Now their desire is to limit its application to pig iron coming to that crossing of the Ohio River.

A further declaration is that the existence of a local rate of $2.10 from Cincinnati to that part of Canada that adjoins the Detroit group leads to gross inconsistencies and fourth section violations on pig iron originating at Ashland, Ironton, Wellston and other points on the Ohio River. No explanation is contained in the application as to how there can be violations of the long-and-short-haul clause of the fourth section on a rate applying from Cincinnati, locally, to Ontario points. It is assumed, however, that such violations result from the participation of the Baltimore & Ohio and the Panhandle in rates on pig iron from Portsmouth, Ironton, Jackson and other points in southern Ohio via Columbus to the Ontario destinations.

There have been so many inquiries as to the meaning of the application that the commission is expected to call for more explanation than has been by the petitioners. The declaration that the $2.46 rate is desired for use as a base for rates "elsewhere" is the one that excites curiosity. The $2.46 rate applies on pig iron from Ashland-Ironton, Portsmouth, Wellston and Jackson. Its application to Cincinnati is understandable on the ground that uniformity is desirable at Ohio River crossings. It is, however, not understandable on any other ground, unless there are rates from points north of Cincinnati that are considered to be too low in comparison with those from Ashland-Ironton and the other blast furnace points in southern Ohio. W. L. C.

Nitre Cake for Pickling Steel Sheets

A new use has been found for nitre cake in the steel industry. This is a by-product in the manufacture of commercial nitric acid and before the war was practically of no value. It is an acid sulphate of sodium, $NaHSO_4$, produced from treating Chile saltpetre with sulphuric acid to make nitric acid. It contains always a certain amount of free sulphuric acid which varies in amount from 5 to 30 per cent. It is stated that all the available supply is now regularly and eagerly purchased for use in pickling steel sheets and that it acts as a very acceptable substitute for sulphuric acid, which was formerly used for this purpose. A large automobile company is said to be using all it can buy for pickling its sheets.

The plant of the Champion Tool Works Co., Spring Grove Avenue, Cincinnati, has been acquired by the Greaves-Klusman Machine Tool Co., and will be fitted up for the manufacture of lathes. The Champion Tool Works is moving its equipment to a new plant at Winton Place, which it expects to have in operation within the next 60 days.

EMBARGO ON STEEL EXPORTS

All Products, Including Pig Iron, Placed Under Ban By Railroad Committee

A general railroad embargo on shipments of pig iron and steel products to seaboard for export went into effect last Friday. This is the first step following the pooling of Eastern railroads to work out a solution of the present demoralized condition of freight transportation. The embargo will probably last as long as is necessary to relieve the congestion at seaboard terminals, and it will work no hardship to our Allies because there is already at seaboard more freight for shipment abroad than there are ships to carry it.

Announcement is made of the formation of a committee of railroad executives, which will have its headquarters at 165 Broadway, New York, adjoining the offices of representatives of the allied governments, and the two offices will keep in close touch. The committee will, of course, work in close co-operation with the Railroads War Board, with headquarters in Washington.

The first action of the committee affected pig iron and steel because of the importance of these products in the war program and the necessity of keeping such supplies moving to domestic users.

George D. Ogden, freight traffic manager of the Pennsylvania System, is chairman of the committee. The men have all been relieved from duty by their respective roads to devote their whole time to the export problem. The first formal meeting of the committee was held Tuesday, after which a statement was issued which said:

The first steps toward the organization of a committee to assume charge of the overseas traffic of the Eastern railroads were taken on Saturday, Dec. 1, at a conference held in the offices of the Trunk Line Association, 143 Liberty Street, New York City. At this conference there were present the representatives in America of the British Ministry of Shipping and the respective agents for the purchase and transportation of military supplies of the Russian and French governments. The Railroads War Board was represented by J. G. Rodgers, general agent of transportation at military headquarters; the lines in official classification territory, by George F. Randolph, commissioner, and the Trunk Line Association, by C. C. McCain, chairman. The following railroads were represented individually by their traffic vice-presidents and other officers: Erie, Pennsylvania, Lehigh Valley, New York Central, Delaware, Lackawanna & Western, Baltimore & Ohio, Central Railroad of New Jersey, Western Maryland, Philadelphia & Reading, Chesapeake & Ohio, Norfolk & Western, New York, New Haven & Hartford, Boston & Albany, and Boston & Maine.

At the preliminary conference the situation was fully explained by Mr. Ogden at the request of the general operating committee of the Eastern railroads, and a unanimous agreement was reached between the representatives of the allied governments and of the various railroad companies. The first duty of the new committee will be to administer the general embargo on export iron and steel, billets, bars, plates, scrap and pig iron (except for the United States Government), which all the Eastern railroads have just been ordered to place in effect at once by the general operating committee at Pittsburgh. Assumption of jurisdiction over the other forms of export traffic will follow.

The necessity for embargoing export traffic in the iron and steel products specified resulted from the great accumulation of these products which the railroads have delivered at the North Atlantic ports, and which are now stored on the ground or in cars and are immediately available for export.

The Eastern railroads have thus furnished more transportation service of this character than can be utilized at the time, it was felt, in view of the scarcity of coal and coke in many parts of the United States, and the resulting serious curtailment of industrial production, particularly in western Pennsylvania and Ohio.

The union molders in Cleveland, have decided to demand an increase in wages from $4.50 to $6 a day, and an 8-hr. instead of a 9-hr. day. Their present wage agreement with their employers expires Jan. 1.

The Youngstown Sheet & Tube Co., Youngstown, Ohio, has been allotted $1,625,000 of its $2,725,000 subscription to the second Liberty Loan.

IMPORTANT COURT RULINGS

Review of Late Decisions Specially Affecting Dealers and Manufacturers

BY A. L. H. STREET

Securing Past Due Accounts in Conditional Sale Contracts.—The right of a seller of machinery under a contract reserving title in himself until payment of the price to extend the security to pre-existing indebtedness of the buyer on open account is recognized by the Washington Supreme Court in the case of Union Machinery & Supply Co. vs. Thompson, 167 Pacific Reporter, 95, decided Aug. 29, 1917. In this case two donkey engines were sold under a written contract contained on plaintiff's regular printed form, which contained conditions to the effect that the seller might apply payments either upon the particular contract, any other conditional sale contract of the buyer, or open account due from him; and that title to the engines should remain in the seller until payment of the agreed price, "and all other sums due." When defendant offered to pay the last installment due on the price of the engines, demanding release of the seller's title, there was a balance of $24.90 due on open account. On his refusal to pay this, release of the contract was refused and the engines were replevied by the plaintiff seller. The court upholds the plaintiff's right to reclaim them, under the terms of the contract. It is decided that, as between buyer and seller, they may validly contract that a conditional sale contract shall secure past due and previously unsecured accounts, as well as payment for the property sold under the contract. But the court specially notes that such an agreement might not be valid as against the rights of third parties.

Delivering Railway Company as Warehouseman.—While in custody of freight for the purposes of transportation a railway company is under strict legal responsibility for its safety, being liable for loss of or injury to the goods in the course of transit without proof of negligence, excepting as against losses caused by act of God and certain other unpreventable causes. But after reasonable opportunity has been afforded the consignee to remove the goods on their arrival, this strict responsibility ceases and the railway company becomes a mere warehouseman, who is not liable for injury to goods in his keeping except as he may have been negligent or may have specially insured the safety of the property. This interesting and important distinction was involved in the recent case of United Metals Selling Co. vs. Pryor et al., receivers of the Wabash Railroad, decided July 9, 1917, by the United States Circuit Court of Appeals, Eighth Circuit (243 Federal Reporter, 91). Delivery of a carload of copper ingots was delayed because the consignee's private switch track was crowded with other cars, and the particular car was placed upon a connecting sidetrack, to await switching to the private track. The consignee was duly notified that the car was at its disposition, subject to demurrage charges. The carrier's published tariffs specified that in cases of this kind delivery should be deemed to be made on tender of cars to the consignee, and the bill of lading provided for storage with liability as warehouseman on the consignee's failure to unload within 48 hours. Six days after the car arrived the consignee paid accrued demurrage charges and the shipment was switched to its private track. One of the seals had been broken and part of the copper had been stolen, although the seals had been found to be intact the night before. The court finds from these facts that the railway company's relation to the shipment as common carrier had ceased before the loss occurred, and that the company's continued custody was that of a mere warehouseman. Hence, in the absence of proof that the loss resulted from any negligence on its part, there was no right of recovery against the railway company.

Manufacturing Establishments as Disturbers of the Peace.—One who settled in a neighborhood of a small city before any factories were established there is entitled to enjoin a manufacturer of iron and steel products who afterward established a plant near his dwelling house, from unnecessarily occasioning him discomfort by carrying on work outdoors; by leaving windows and doors of the factory open while carrying on such noisy operations as riveting, hammering, etc.; by carrying on such work in a corrugated iron building, thereby intensifying the noise; and by continuing the work late into the night. Legitimate business should not be hampered; it should be encouraged; but all reasonable means of avoiding unnecessary annoyance to residents of the locality must be adopted. The employment of more men during usual working hours would obviate night work, and the erection of proper buildings, with skylights, would largely do away with other objections. In assessing damages in a case of this kind, diminution in the rental value of property, resulting from the annoyances complained of, is usually the proper measure of recovery, so far as injury to the property is concerned. (New York Supreme Court, Niagara Equity Term; July, 1917. Eron vs. Niagara Steel Finishing Co., 166 New York Supplement, 442.)

Scope of Company Manager's Powers.—One in charge of a business corporation's commercial affairs has implied authority to bind the company by all transactions entered into by him with third persons on the part of the company, so far as the same are within the general usage, practice, and course of the enterprise in which the corporation is engaged, except as such third persons may know of specific limitations on the manager's actual authority. Hence the manager of an iron works company could validly sell supplies previously delivered at an ice plant, although they might have been so delivered in the first instance for storage only. (California District Court of Appeal, July 30, 1917. Cyclops Iron Works vs. Chico Ice & Cold Storage Co., 166 Pacific Reporter, 821.)

Compensating Corporate Officers.—If regularly employed, the director of a corporation may serve in the independent capacity of an officer or employee of the company and receive separate compensation in that capacity. But a vote by a board of directors of excessive salaries to certain of its members, who are also officers or employees of the corporation, even though subsequently ratified at a stockholders' meeting, is reviewable in the courts at the instance of minority shareholders. If a court finds that the salaries are excessive, reasonable compensation may be decreed and the corporation be restrained from paying more. (Pennsylvania Supreme Court, April 16, 1917. Sotter vs. Coatesville Boiler Works, 101 Atlantic Reporter, 744.)

Licensing Junk Dealers.—The Maryland statute which imposes an annual license tax of $30 a year against junk dealers in cities or counties of 50,000 population or more, $20 where the population is between 10,000 and 50,000, $10 in less populous communities, and $250 in Baltimore City, is valid. Being a tax upon an occupation, and not against property, the provision does not infringe a constitutional guaranty of taxation of property according to value. And the legislature acted within its rights in making the classification upon which the license tax is graduated. The imposition of the highest tax in Baltimore must be presumed to have been fixed with reference to the fact that in a large city specially close police supervision is required to minimize opportunities for the disposition of stolen property. Nor is the law invalid for failure to define "Junk dealing," a distinct and well recognized branch of commercial enterprise, consisting in dealing in old iron or other metal, glass, paper, cordage or other waste or discarded material, which may be treated or prepared so as to be used again in some form. (Maryland Court of Appeals, June 27, 1917. State vs. Shapiro, 101 Atlantic Reporter, 703.)

The Griffin Wheel Co., St. Paul, Minn., is building an addition to its office building, which will include an emergency hospital for employees. Office employees will be trained in first-aid treatment. C. H. Fogelberg is manager of the plant.

CAST-IRON BRIQUETTES

Test Data on Foundry Products Using Borings

RESULTS obtained from a series of tests to determine the effect of using briquetted cast-iron borings in the cupola charge on the physical and chemical properties of foundry products, and run with the cooperation of the Southwark Foundry & Machine Co., and the Baldwin Locomotive Works in May of this year by Thomas Gilmore, Jr., chief engineer, General Briquetting Co., New York, were discussed by A. L. Stillman, also of that company, in a paper presented before the American Foundrymen's Association in Boston, Sept. 25.

The cast-iron borings from which the briquettes were made in a Ronay press were medium cut assorted borings made at the foundry of the Baldwin Locomotive Works. The briquettes made were 5 in. in diameter and came out uniformly between 7 and 8 in. high, weighing about 28 lb. each. The density was about 80 per cent the normal density of iron. Two series of tests, one on a mixture for miscellaneous castings and the other on a locomotive cylinder mixture were made. In loading the charge, the briquettes were put on top so that they would not be subject to heavy impact in charging. The melting was satisfactory and proceeded along regular lines. The briquettes melted evenly from the outside. Tests from each of the mixtures were subjected to deflection, transverse and tensile tests. Each test piece was analyzed for combined carbon, manganese, sulphur and silicon. The analyses are as follows:

Analyses of Casts

	Combined Carbon Per Cent	Manganese Per Cent	Sulphur Per Cent	Silicon Per Cent
Regular miscel. mixture..	0.56	0.83	0.061	2.25
Miscel, mixture No. 1....	0.61	0.60	0.093	2.12
Miscel. mixture No. 2....	0.62	0.90	0.084	1.64
Miscel. mixture No. 3....	0.69	0.62	0.087	1.86
Regular cylinder mixture	0.69	0.39	0.106	1.24
Cylinder mixture No. 1..	0.77	0.34	0.108	1.24
Cylinder mixture No. 2..	1.04	0.38	0.103	1.19
Cylinder mixture No. 3..	1.32	0.23	0.097	1.15

The table, he pointed out, shows a perceptible increase in the combined carbon. The free carbon, not shown in the analysis, is considered partly liberated and partly taken up in combination in the melt. This, he said, contributes better structure and stronger iron and may be considered as a benefit due solely to the use of briquettes. The manganese determination he believes not sufficiently definite to warrant any conclusion, although there is a diminution presumably due to oxidation. On the other hand, there is a slight increase in sulphur in the miscellaneous mixture and strangely enough a decrease in sulphur in the cylinder mixture. The increase in sulphur means a more finely granulated structure and in cylinder work would give good service. The decrease in silicon is marked more in the miscellaneous casting than in the cylinder iron. This decrease, he said, has a tendency to produce harder metals. In the test pieces, and especially in the cylinder mixture, a progressive increase in depth of chill was shown, the lowest being the regular mixture and the highest the No. 3 test piece. From the foundrymen's point of view, considering the work for which the iron was designed, he held that the mixtures containing briquettes were as good if not better adapted to that work than the regular mixtures used.

Results of Physical Tests

The transverse tests on the test pieces made resulted as shown in the table. In all cases the deflection at 1000 lb. was the same and there is little difference at 2000 lb., and though mixture No. 3, in each case, shows a greater deflection at 3000 lb. than does the regular mixture, he does not consider this enough to draw a definite conclusion. The rupture in his judgment indicates that the use of briquettes had increased the resistance of the iron progressively in proportion as the briquettes were used, there being a difference of 600 lb. at rupture between the regular mixture and mixture No. 3. On the other hand, the cylinder mixture shows a decrease under the same conditions, although, he pointed out, the average breakage point of the three test pieces is 3930 lb., while that of the regular mixture was 4000 lb., a difference he considers of no great moment.

The results of tensile tests are shown in a table. With the exception of miscellaneous iron test piece No. 2, which failed under comparatively light load, the result was uniform and, he said, indicates, so far as tensile resistance is concerned in these mixtures, that the use of briquettes has little influence one way or the other. He concludes that briquettes of cast iron have a definite and promising future in foundry practice, and that they in no way injure the resulting melt and that their use results in economy.

Materials Used in Test Mixtures

CAST IRON FOR MISCELLANEOUS CASTINGS

	Briquettes		Scrap		Pig Iron		Total Weight of Charge
	Lb.	Per Cent	Lb.	Per Cent	Lb.	Per Cent	Lb.
Regular mixture	..	..	1,800	60	1,200	40	3,000
Mixture No. 1.....	300	10	1,800	60	900	30	3,000
Mixture No. 2.....	300	10	1,500	50	1,200	40	3,000
Mixture No. 3.....	600	20	1,500	50	900	30	3,000

The analysis of the pig iron was as follows: Silicon, 2.6 per cent; phosphorus, 0.08 per cent; and sulphur, 0.03 per cent. The scrap was mostly foreign material; the analysis of this material can be assumed as: Silicon, 1.8 per cent; phosphorus, 0.7 per cent; and sulphur, 0.09 per cent.

CAST IRON FOR LOCOMOTIVE CYLINDERS

	Briquettes		Scrap		Car Wheels		Pig Iron		Total Weight of Charge
	Lb.	Per Cent	Lb.	Per Cent	Lb.	Per Cent	Lb.	Per Cent	Lb.
Reg. cyl. mix. ..	..	..	1,500	50	300	10	1,200	40	3,000
Mix. No. 1...300	10		1,500	50	300	10	900	30	3,000
Mix. No. 2...300	10		1,200	40	300	10	1,200	40	3,000
Mix. No. 3...600	20		1,200	40	300	10	900	30	3,000

Hard and dense West Virginia coke containing 0.8 to 1 per cent sulphur was used. One part of coke to 8 or 9 parts of iron was used. The inside diameter of the cupola was 54 in. and the melting capacity was about 15,000 lb. per hr.

Results of Transverse Tests

	Diam. In.	Deflection at 1000 Lb.	Deflection at 2000 Lb.	Deflection at 3000 Lb.	Rupture Lb.
Miscel. iron, reg. mix..	1.29	0.05	0.09	0.10	3,000
Miscel. iron, No. 1....	1.29	0.05	0.09	0.11	3,400
Miscel. iron, No. 2....	1.31	0.05	0.085	0.10	3,550
Miscel. iron, No. 3....	1.284	0.05	0.09	0.11	3,600
Cyl. iron, reg. mix....	1.291	0.05	0.09	0.11	4,000
Cyl. iron, No. 1.....	1.338	0.04	0.08	0.10	4,400
Cyl. iron, No. 2.....	1.281	0.05	0.085	0.11	3,700
Cyl. iron, No. 3.....	1.28	0.06	0.09	0.12	3,700

Results of Tensile Tests

	Diam. In.	Area Sq. In.	Breaking Strength Lb.	Stress Lb. Per Sq. In.
Miscel. iron, reg. mix....	0.786	0.485	15,100	31,140
Miscel. iron, No. 1.....	0.792	0.493	15,300	31,030
Miscel. iron, No. 2	0.805	0.509	12,100	23,770
Miscel. iron, No. 3.....	0.763	0.457	14,100	30,850
Cyl. iron, reg. mix.....	0.744	0.435	14,300	32,880
Cyl. iron, No. 1.....	0.795	0.496	18,700	37,700
Cyl. iron, No. 2.....	0.776	0.473	16,700	35,310
Cyl. iron, No. 3.....	0.778	0.472	15,600	32,840

Magnesite Production in 1916

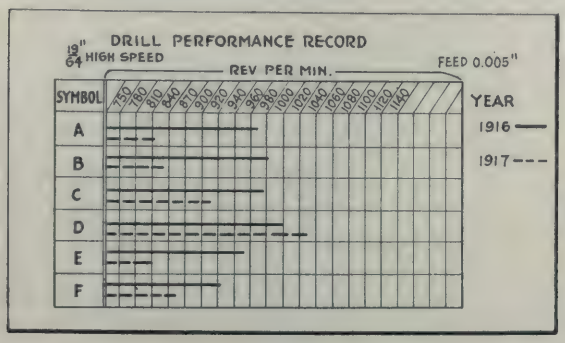
Normally about 6 lb. of magnesite was formerly used for every ton of steel made by the basic open-hearth process, but now not more than ½ lb. is used, and at some steel plants cheaper and less satisfactory refractories have been substituted, says Hoyt S. Gale in a U. S. Geological Survey Bulletin 666-BB on "Magnesite." More raw magnesite was produced in the United States in 1916 than ever before. Last year's output was 158,759 net tons as compared with 30,499 tons in 1915 and 9632 tons in 1913. Imports for consumption of the raw mineral were 75,345 tons in 1916, also exceeding any previous record, but the imports of calcined magnesite were only 9270 tons as compared with 167,094 tons in 1913. The total consumption calculated as calcined mineral in 1916 was 126,322 tons as compared with 66,706 tons in 1915 and 178,530 tons in 1913.

The Victor Talking Machine Co., Camden, N. J., has advanced the wages of all employees at its works receiving less than $30 weekly 10 per cent. This makes a total wage advance at the Victor plant of 36.4 per cent since the commencement of the war.

CORRESPONDENCE

Difference in High-Speed Drills

To the Editor:—The difference in the performance of high-speed drills is much greater to-day than a year ago, according to our own records. At that time the records show a very small margin in the failure point of six certain makes, designated as *A, B, C, D, E* and *F*. We cannot say that of these same drills that we are



buying now. We have eight specific cases to show that it is the drills and not hard castings, as we at first thought, and also that the average variation in the speed in relation to the size is practically the same.

One of these cases is drilling six holes, 19/64 in. in diameter and 4 in. deep, in cast iron 18 per cent steel:

Drill	Failing Speed, R.p.m.	Drill	Failing Speed, R.p.m.
A	810	*D*	1,130
B	825	*E*	809
C	915	*F*	850

In everyday use we are running 4-in. holes at 996 r.p.m., with 0.005-in. feed, and get 84 holes of these between drill grindings and consider this good results. It has been suggested that we run the other drills too fast. We do, but don't see any reason why the speed should be reduced to accommodate an inferior tool as long as good drills are available, especially at same price.

H. M. FITZ.

Davenport, Iowa.

Group Insurance and the Labor Turnover

To the Editor:—Owing to the many employers studying methods for decreasing labor turnover and increasing production, the following description of the group insurance in use at the Cincinnati Planer Co. should be worth while. When this proposition was offered by the insurance companies the first question was, "What good is it?" The answer was this: "It will decrease the labor turnover, and at the same time you will get greater and better production from the employees." This insurance, being in use only since October, 1917, it is too early to state positively whether these results will be forthcoming. It will be easy enough to tell if the labor turnover decreases. If it does, group insurance will be credited with its share of the improvement. If carefully studied, the value in dollars and cents can be closely estimated. If the labor turnover is low, or improving, and production is high or improving, group insurance will be credited accordingly, in proportion to its share. It would be a mistake to say that turnover or production is entirely controlled by any one factor, but if a satisfactory improvement can be shown the money will be considered well spent. The average cost of this insurance is about $4 per year per employee (less than 2 cents per day), depending upon age and length of service of the 600 employees covered. It is hard to figure this as a losing proposition. It is almost sure to pay for itself.

A letter was typewritten on the regular company letter head, made up neatly, plain, short and with the idea of conveying a personal touch directly from the manager to the home, thereby making a good impression on that powerful factor in human engineering, namely home influence. The letter was written in plain machine shop English, and mailed on a Friday so that it would be received on a Saturday, which was considered a psychological time, giving the family an opportune time to talk it over on Saturday and Sunday.

In the employment department an immediate increase in the number of applications was noticeable. It can be seen that here is a good talking point for the employment manager and also for superintendent, foremen, etc. Any employee who is indifferent to this plan would best be discharged from the organization.

One part of this proposition which received considerable study was the question of whether this insurance should be based on wages or length of service. It was decided that the latter plan was the simplest and most efficient, for several reasons. In the first place, sooner or later many machine shops will adopt group insurance and if it is based on wages there will be nothing to hold the employee. As long as employees can change from one shop to another without an actual direct personal loss, they will do so in spite of increased wages, welfare work or almost anything else. If two shops in same locality both have insurance based on income, an employee insured for say $1,000 would have no incentive for remaining with the old organization if he could get the same insurance in the new shop. However, it is understood that a certain percentage of employees are not inclined to change as long as they get good pay and a square deal. If all employees were of this class insurance would be unnecessary and instead a higher rate of pay would be more effective. Another advantage in basing insurance on length of service is that it is very simple and leaves no room for doubt. Insurance based on wages would require considerable figuring in these days of premium, piecework, bonuses and so forth. It would also probably create dissatisfaction among some employees after policy comparisons are made and John finds Bill "is making more money 'cause his insurance is bigger."

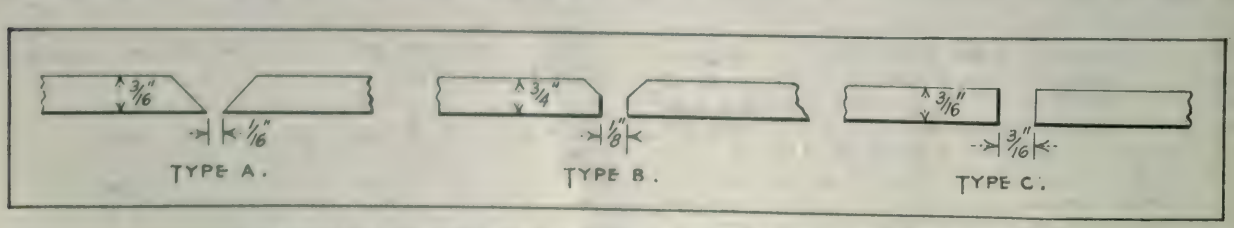
The work required in connection with this insurance is very simple, and requires very little time, say about two hours a week. A record card giving a complete record of each employee must be filled out, stating name in full of company and employee, birthday, address, beneficiary, etc. After this is filled out no work is required unless the employee leaves the service or dies, excepting checking of invoices and reports, which has been boiled down to a simple system.

Cincinnati. C. J. SCHNEIDER.

Influence of Current on Arc Welds

To the Editor:—I was much interested in the extract of Mr. Wilson's remarks on arc welding presented to you by Myron F. Hill, in THE IRON AGE of Nov. 8. Although we agree in many things, there is one point on which our experience seems to differ widely.

To study the effect of current on the strength of



Diagrams to Illustrate Effect of Current on Welding Different Types of Joints

weld and penetration of fusion, I made tests with three types of joints, shown in the illustration, and welded each of these joints with 80, 90, 100, 110, 120 and 130 amp. The pieces were welded as near flush as possible and machined to the thickness of the plate before pulling. The table gives the results of the tests which were made by the Pittsburgh Testing Laboratories. In the full bevel where the arc played directly on the surface the welds were better than the original material. In the half bevel and square joints

Results of Pulled Tests on Welded Specimens

Test	Type	Amp.	Yield Strength, Lb. per Sq. In.	Breaking Strength, Lb. per Sq. In.	Location
1	A	80	31,540	51,040	Material
2	A	90	45,400	59,440	Material
3	A	100	41,790	54,680	Material
4	A	110	45,500	59,770	Material
5	A	120	34,790	56,310	Material
6	A	130	42,490	56,190	Material
7	B	80	37,700	57,590	Weld
8	B	90	32,290	51,440	Weld
9	B	100	29,000	40,790	Weld
10	B	110	43,910	43,830	Weld
11	B	120	30,940	49,650	Material
12	B	130	32,430	51,980	Material
13	C	80	31,170	49,840	Weld
14	C	90	39,580	40,690	Weld
15	C	100	43,130	57,270	Material
16	C	110	31,960	52,800	Weld
17	C	120	41,780	57,120	Material
18	C	130	39,160	57,780	Material
37	A	Gas	28,360	38,390	Weld
38	B	Gas	.....	38,260	Weld
39	C	Gas	34,200	50,310	Weld

the low currents failed to cause sufficient penetration to fuse the thick edges of the joint through the full section, and therefore some of these broke at the joint; while where the current was sufficient to fuse through they all broke outside of the joint. No decided critical point such as described by Mr. Wilson is noticeable.

OTIS ALLEN KENYON,
Electrical Engineer, Arc Welding Machine Co., Inc.

OBITUARY

WILLIAM D. KEARFOTT, well known as marine engineer and president of Kearfott Engineering Co., New York, died Nov. 12, aged 53 years. He began work with the Morton Poole Co., Wilmington, Del., and prior to the formation of the Kearfott Engineering Co., two years ago, was associated with the International Navigation Co., the Worthington Steam Pump Co. and the Warren Steam Pump Co. Mr. Kearfott's avocation was the study of small moths, of which he possessed a collection said to be the second largest known. He was a resident of Montclair, N. J., and a member of the Machinery Club of New York, the Society of Naval Architects and Marine Engineers, and the American Society of Mechanical Engineers.

JOB T. PUGH, Philadelphia, head of the business of Job T. Pugh, Thirty-first and Ludlow streets, manufacturer of augers and edge tools, died at his home at Swarthmore, Nov. 25, after a month's illness, at the age of 53 years. He was treasurer of the Association of Centenary Firms, and a member of the Manufacturers' Club, Philadelphia. The concern of Job T. Pugh was established by an ancestor in 1774, and is one of the oldest tool-making firms in the world.

ROY A. WILLIAMS of the R. A. & W. M. Williams Co., vessel agents, Cleveland, died Nov. 23, aged 38 years. He was at one time connected with the lake traffic department of the Carnegie Steel Co., and after the organization of the United States Steel Corporation was in the traffic department of the Pittsburgh Steamship Co. several years. He organized the North American Steamship Co. in 1910 and managed the boats of that fleet and other vessels.

LEICESTER P. SIDNEY, second lieutenant King's Royal Rifles, attached to the Royal Flying Corps, was recently killed in a battle in France. He studied metallurgy in the National Physical Laboratory, Teddington, under Dr. Rosenhaim and F. W. Harbord, later serving with the Ebbw Vale Iron, Steel & Coal Co. When the war broke out he was employed by Bell Brothers, Middlesborough, Eng.

JOHN DICK, aged 59 years, died at his home in Braddock, Pa., Nov. 30. For some years he was foreman of millwrights at the Edgar Thomson Steel Works of the Carnegie Steel Co., and later was head of the mechanical department in the blooming mills in the same plant. In 1892 he was transferred to the Homestead Steel Works of the Carnegie Steel Co., and was connected with that plant at the time of his death.

D. R. LEAN, for many years engaged in the engineering and contracting business for the erection of blast furnaces and steel plants, the firm being known as Lean & Blair, Pittsburgh, died at his home in that city on Thursday, Nov. 29. In his early life Mr. Lean did a large amount of furnace work for the old firm of Carnegie, Kloman & Co.

HENRY GAUL, for about 25 years connected with the Ajax Mfg. Co., Cleveland, died Nov. 19, aged 68 years. He had for many years been in the service department of the company and in that capacity was widely known among forge men in railroad, locomotive car building and industrial forge shops. He was an expert of rare ability.

WILLIAM A. SAXE, of New York, secretary and treasurer of the Standard Concrete Steel Co., was instantly killed Nov. 28 in Baltimore when hit by an automobile driven by a 17-year-old boy. The automobile is said to have skidded in the snow, striking Mr. Saxe while he was standing on the street waiting for a street car.

RICHARD HENNING, president Cream City Boiler Works, Milwaukee, died Nov. 28 at the age of 55 years. Mr. Henning was born in Milwaukee and was one of the founders of the concern of which he was president. His only son, Lawrence, is now serving in the American Expeditionary Forces in France.

HANBURY KEKEWICH, Captain Sussex Yeomanry, son of L. P. Kekewich, and partner in Morrison, Kekewich & Co., metal brokers, London, was recently killed in action. Of Mr. Kekewich's four sons three have now been killed, and the fourth seriously and permanently injured.

ROBERT S. SMITH, aged 57, died at his home in the East End, Pittsburgh, Nov. 30. Mr. Smith was born in Pittsburgh, and was president of the McGinness-Smith Co., the oldest firm of heating and ventilating engineers and contractors in that city.

Heavy Gain in Exports

WASHINGTON, Dec. 4.—A heavy gain in exports was made in October, the total for the month being $542,000,000, an increase of $86,000,000 over September, according to figures compiled by the Bureau of Foreign and Domestic Commerce. The exports for the 10 months ended with October of this year amounted to $5,149,000,000, as against $4,443,000,000 for the corresponding period last year.

October imports are placed at $221,000,000, a falling off of $15,000,000 compared with September. For the ten-month period ended with October, the imports into the United States were valued at $2,504,000,000, as compared with $2,010,000,000 for the first ten months of 1916. Seventy-six per cent of the October imports entered free of duty.

A patent (U. S. 1,231,499) has been granted to Joseph Crossley, Trenton, N. J., for a continuous mixing mill, having special reference to mills for mixing the material used for making pottery vessels such as crucibles. Its object is the reduction in cost and saving in time in preparing the material for the molds.

SPEEDING WAR WORK

Preferential Shipments for Coal, Coke, Steel and Other Necessary Products

WASHINGTON, Dec. 4.—The first definite step of the Government to discriminate between essential and non-essential industries with a view to speeding up war work has just been taken by Fuel Administrator Garfield, who has requested all coal operators east of the Rocky Mountains to establish an order of preference in which coal needs are to be filled. The requests directed to some 5000 producers contemplate preferential shipments for 30 days for Government orders, railway fuel, domestic requirements, public utilities, steel plants, by-product coke ovens, and munition plants. The requests are not in the form of direct orders but, as they are designed to insure the fulfilling of the requirements of those coal users which are essential to the military and economic efficiency of the nation in the conduct of the war, it is expected that the fullest co-operation will be accorded the Government.

Confronted by a coal shortage of 50,000,000 tons, due to an increased consumption of 100,000,000 tons, the fuel administrator took up with the War Industries Board the question of the course to be pursued to insure an adequate supply of fuel for the railroads, the munition plants and other industries necessary to the general welfare of the nation. During the conferences that followed, the suggestion, originally made by the railroad war board, to cut off supplies from non-essential industries was renewed, but was promptly rejected by Dr. Garfield on the ground that it would work unnecessary hardship upon a large class of manufacturers, merchants and consumers, in many cases entailing absolute ruin. The issuance of an order absolutely denying fuel to any specified list of industries would immediately destroy the credit of manufacturers engaged therein and would cripple financially all the concerns employed in the distribution of their products. Believing that the coal shortage will be made up within a few weeks, Dr. Garfield decided that it was the wiser policy to insure a full supply of coal to those industries necessary to the prosecution of the war and for domestic requirements and to permit any surplus to be distributed as heretofore without governmental interference. In this way the dealing of a direct blow at the non-essential industries has been avoided, and it is believed that when the 30-day preferential regulation has expired, the equilibrium between consumption and supply will have been restored to such an extent that few, if any, of the so-called non-essential industries will be seriously affected.

A decided improvement in the fuel situation is looked for as the result of the action taken by Dr. Garfield, and it is believed that a greater measure of relief will be obtained through the voluntary co-operation of the producers than as the result of a drastic peremptory order. Munition plants, especially, will be speeded up under the new system of distribution, and many large concerns now running on half time will be enabled to resume maximum output.

Dr. Garfield's action with respect to coal will soon be supplemented by an order from the priorities committee of the War Industries Board covering preferential treatment of raw materials for munition manufacturers, the railroads, shipyards, etc. This order presumably will cover shipments of iron and steel and other metals, lumber, materials for explosives, etc. The development of the War Industries Board's policy in this regard will probably be progressive and will ultimately grant priority to all products essential to the conduct of the war and to the necessaries of life.

President Wilson has approved a recommendation of the fuel administrator for a general increase of 35 cents a ton in the price of anthracite coal at the mines. This increase is designed to meet and absorb a proposed wage increase for anthracite miners and is immediately effective. It is estimated that it will add more than $30,000,000 annually to the nation's coal bill.

Information received by the fuel administration indicates that the agreement upon a higher price for anthracite coal has already served to stimulate output and Dr. Garfield expresses the opinion that all necessary requirements, both industrial and domestic, will be reasonably met.

The shortage of coke cars is becoming increasingly severe. During the week ended Oct. 20, the loss attributed to this cause amounted to 8.7 per cent of the rated capacity. In the week ended Nov. 17 the loss was 16.2 per cent.

Steel Fabricators' War Organization

Ninety per cent of the steel structural plants, bridge steel plants and those supplying structural materials for the shipbuilders were represented at the meeting at the William Penn Hotel, Pittsburgh, on Tuesday, Nov. 27, and an organization known as the Steel Fabricators of the United States was formed to offer the Government co-operation during the war, as briefly stated in THE IRON AGE of Nov. 29. A committee was formed to keep the Government posted on the material that is available. C. Edwin Michael of the Virginia Bridge Co., Roanoke, Va., heads the war service committee, which includes the following: John Sterling Deans, Phoenixville Bridge Co., Phoenixville, Pa.; George P. Bard, Petroleum Iron Works, Sharon; Thomas Earle, Bethlehem Steel Bridge Corporation; Howard A. Fitch, Kansas City Structural Steel Co.; J. L. Kimbrough, Indiana Bridge Co., Muncie, Ind.; C. D. Marshall, McClintic-Marshall Co., Pittsburgh; Lewis D. Rights, Shoemaker Co., Pottstown, Pa.; H. A. Wagner, Wisconsin Bridge and Iron Works, Milwaukee. Mr. Michael was chosen permanent president and Mr. Rights, secretary and treasurer of the society, with the war service committee as the board of directors. The terms of office will be for the period of the war.

Acquires Cannonsburg Plant

E. W. Edwards, president, Edwards Mfg. Co. and Cincinnati Can Co., Cincinnati, heads a party of capitalists that has acquired the plant of the Cannonsburg Iron & Steel Works, Cannonsburg, Pa. The purchasers will retain the company's old name, will operate under its present charter and will roll sheets as heretofore. While the company will have no official connection with the Edwards Mfg. Co., it is understood that the mill was bought with the idea in view of supplying that company with black and galvanized sheets. About 350 men are employed at the present time at the Cannonsburg plant and it is understood that as soon as equipment can be obtained the capacity of the mill will be increased. There will be no change in the management, J. M. Watson continuing as general manager.

The Electric Furnace in Japan

According to an article in the *Far Eastern Review*, electricity is now coming into use in the manufacture of special steels in Japan. The Wakamatsu Iron Works and the Fujitagumi Steel Works at Kirokawa, Inawashiro, are now equipped for this purpose. The latter plant employs 3000 kw. of electricity and produces chiefly ferrosilicon, and at Osaka Harbor also tungsten and chrome alloys. Some other companies are engaged either in trials or in the manufacture of the special products mentioned. At Yasuki and Yoneko ores prepared from iron sands are being treated in electric furnaces.

The Minneapolis Malleable Foundry Co., Minneapolis, Minn., capital $100,000, is equipping a plant of 6000 tons yearly capacity and a part of the foundry is now ready to start up. The company is installing power squeezers exclusively and is specializing in light malleable castings for which aluminum match plate patterns are used. Melting and annealing will be with fuel oil exclusively. F. C. Hughes is president of the company and E. W. Williams, secretary and treasurer.

TO RELIEVE SHORTAGE

Committee of Railroad Experts Will Deal with Coal Situation

The general operating committee of the Eastern Railroads has opened offices in the Frick Arcade Building, Pittsburgh. At a recent meeting of this committee further steps were taken to relieve as far as possible the severe coal shortage that now exists in nearly all parts of the country. A sub-committee of railroad experts has been appointed that will sit at Cumberland, Md., and deal directly with the coal situation, which, it is admitted, is restricting the war efforts of the country and is also acting as a depressing factor on business everywhere. This sub-committee is as follows: F. E. Blaser, Baltimore; A. C. Needles, Roanoke, Va.; J. A. Tongue, Chambersburg, Pa.; S. Ennes, Hagerstown, Md., and J. A. Turk, Camden, N. J. This committee will open offices at Cumberland at once and will conduct the work of moving coal as promptly as possible for the following railroad lines, all of which are East, but not including the Pittsburgh terminal territory, and east of Parkersburg, W. Va.: Baltimore & Ohio, Cumberland Valley, Philadelphia & Reading, Pittsburgh & Lake Erie, Western Maryland, Norfolk & Western and the Cumberland & Pennsylvania Railroad.

The sub-committee was instructed to secure information covering the exact transportation situation throughout the territory described, to agree upon and put into effect measures for the immediate relief of congested points, keeping the general committee constantly advised, and to pay particular attention to Government freight and to the movement of raw materials for blast furnaces.

The sub-committee was further directed to agree upon and make recommendations to the general committee when any situation is of such magnitude that it cannot be reached by local treatment.

The general operating committee wishes to advise the public that in placing restrictions on any class of traffic, "proper provision will at all times be made for foodstuffs for human and animal consumption."

Reading Steel Casting Co. Adds an Open-Hearth Furnace

The Reading Steel Casting Co., Reading, Pa., which for some years has been operating a large converter plant, installed recently a 10-ton open-hearth furnace, oil-fired. It is located in a lean-to, 40 x 150 ft., off the main molding floor, which is 70 ft. wide and which was also lengthened 200 ft. Already 350 heats have been made in the furnace and the first heat was tapped in just 60 days from the time the foundation was started. Its installation necessitated additional crane and ladle equipment, railroad sidings, fuel oil and raw material storage as well as an increase to the pattern storage, cleaning equipment and other buildings. The capacity of the foundry has been increased to between 1200 to 1500 tons per month. The four large converters, with a capacity of about 1000 tons of small castings per month, are also in regular continuous operation. One object in installing the open-hearth furnace was to place the company in a position to make both large and small castings. The original converter plant in its entirety was described in THE IRON AGE, Sept. 23, 1915.

It is proposed to change the name of East Youngstown, Ohio, where the plants of the Youngstown Sheet & Tube Co. are located, to Campbell in honor of J. A. Campbell, president of that company. The matter will come up at the next meeting of the Council in East Youngstown in January.

Hall blast furnace of the Republic Iron & Steel Co. at Sharon, Pa., has been blown out on account of the coke shortage. It will be relined.

UNDER NAVAL CONTROL

Ships Carrying Munitions Will Be Carefully Protected

WASHINGTON, Dec. 4.—For the protection of ships carrying munitions, iron and steel and other cargoes of war essentials an agreement is being perfected between the United States Shipping Board and the Navy Department under which all American vessels operating in the foreign trade will be placed under the control of the Navy, commanded by naval officers and subjected to strict naval discipline. This agreement, which will probably be promulgated in a few days, is the result of an investigation of conditions prevailing in the trans-Atlantic merchant marine which have made it possible for the German submarines to sink more than one large ship loaded with valuable cargo. The Navy is now ready to supply 750 naval reserve officers every four months for these vessels and to take over their navigation immediately.

Official reports of inquiries recently made indicate that ships loaded with munitions and other valuable cargo are being daily sent to sea, manned in large part by aliens who are not even seamen. Whatever qualifications are required to obtain seamen's certificates appear to be ignored and it is said to be entirely practicable for anyone to purchase or forge them and ship as "able-bodied," presumably to obtain the high wages and the 50 per cent bonus for service in the war zone, which brings the average pay up to $90 per month, or $15 more than the pay of sub-junior officers. It is even asserted that some of the finest ocean liners in the world are leaving New York on every voyage dangerously undermanned with crews composed in part of men who have never been to sea before. These conditions are said to be general on the best mail steamers, while on the tankers and freighters they are even worse.

In escaping the submarine peril speed is a vital factor, but, according to official reports, on nearly every ship, except the few transports under naval control, there is impaired engine-room efficiency to which more than one lost vessel is to be attributed. An utter lack of discipline also prevails and this condition has been bolstered by the regulations of the seamen's union. It is said that recently an abandoned ship drill was held on a vessel when passing through the war zone, as required by law and also by the Bureau of War Risk Insurance, but as it happened to be Sunday it was necessary to pay the crew while participating in this drill 40 cents per hour overtime, as required by the union rules. A similar overtime charge was levied by men for assisting a gun crew in passing through the war zone.

The plan of the Navy is to use its own and the Naval Reserve officers and to convert into reserves as many competent merchant officers as possible and to weed out gradually the aliens who at present constitute from 60 to 70 per cent of the crews of our merchant ships. The Shipping Board, which originally opposed the transfer, has become convinced that it is vitally necessary for the protection of ships and cargo, and it is believed the final formalities will be concluded within the coming week. As a part of the compromise agreement that has been reached no change will occur in the pay of sailors or of the conditions of living on shipboard. It is believed that this arrangement will be satisfactory to organized labor. W. L. C.

Grecian Magnesite Exports in 1916

Magnesite exports of all grades from Greece in 1916 are given as 176,383 tons. Of raw magnesite the United Kingdom took 60,511 tons; the United States, 56,504 tons; France, 24,607 tons; Italy, 3100 tons; the Netherlands, 320 tons. Of the caustic and calcined mineral the United Kingdom took 13,127 tons, the United States 9514 tons, and the Netherlands 730 tons. Of the dead burned grade, the United Kingdom took 3975 tons and France 3462 tons.

WAR CHANGES IN INDUSTRY

A Tariff Commission Inquiry—Getting Germany's Foreign Trade

WASHINGTON, Dec. 4.—A survey of the industries of the United States to determine the extent and the specific causes of their disturbance by the war and the steps that should be taken to reduce this disturbance to a minimum and to restore normal conditions as soon as possible when the war is over is about to be undertaken by the United States Tariff Commission. A preliminary inquiry in the leading industrial and commercial centers is already being made by expert special agents, and for the purpose of receiving information and suggestions from representatives of industry and commerce hearings will be held in this city beginning Dec. 6, when a committee of prominent business men, to be designated by the United States Chamber of Commerce, will appear before the commission at its offices. At later dates representatives of large importing and exporting interests will be heard and will be followed by a number of labor leaders. The commission believes that the information developed at these hearings will assist both private interests and the Government in meeting the present needs of the country and in planning constructively for the future.

The commission will endeavor to ascertain the extent to which normal conditions of supply have been disturbed by the war and what new sources of supply exist, including the character and origin of imports. The inquiry will extend to definite information concerning facts now apparent and tendencies developed in particular lines of industry; new plans and extension of old plans because of war demands; changes in processes and methods due to war conditions; the more or less permanent character of such changes, and the steps to be taken to minimize the demoralizing effect of the enforced return to the more conservative standards of business after a long period of war inflation.

Webb Bill Prospects

It is understood that one of the subjects that will be discussed at the coming hearings is the importance of the early passage by Congress of the Webb bill legalizing combinations of manufacturers and dealers, made for the purpose of expanding our export trade. President Wilson is strongly in favor of the passage of this bill, which he regards as a war measure for the reason that its enactment will assist American manufacturers in retaining after the war business which they have built up during the past three years and in further expanding their export trade. The Webb bill was passed by the House at the special session held last summer, has been favorably reported by the Senate Committee on Interstate Commerce and was made the "unfinished business" of the Senate before the adjournment last October. The measure was opposed in the Senate by a coterie of Senators, led by La Follette of Wisconsin, who declares that the practical effect of its enactment would be to emasculate the Sherman anti-trust law and that, under the guise of promoting foreign trade, it would permit the exploitation of domestic trade in defiance of the provisions of both the Sherman and Clayton anti-trust acts.

The managers of the Webb bill have received a definite promise from President Wilson that he will use his influence without reserve to assist in putting the bill through the Senate. It is an unfortunate circumstance that it was found necessary to amend the measure in the Senate Committee on Interstate Commerce, for although the modifications made are comparatively unimportant they make it necessary to send the bill back to the House for concurrence, and in all probability this will mean the reference of the diverse provisions of the House and Senate drafts to a Conference Committee for final adjustment. Notwithstanding these complications, however, the managers of the measure confidently predict its final passage during the session just begun.

Not to Copy but to Know Germany

The administration is scrutinizing carefully the German preparations for trade after the war, the details of which are being closely followed by experts in the Bureau of Foreign and Domestic Commerce. Since the war eliminated Germany from world trade, the United States has improved its position in foreign markets in spite of the shipping shortage and other abnormal restrictive factors. Department officials point out that the future development of our foreign trade will depend in part on the loss of Germany's good will in practically all important foreign markets and in part upon American ability to maintain our newly obtained prestige. American business men must not make the mistake of seeing only one side of this situation and thus underestimating the German capacity for securing business when the energy, application and craft with which German business will address itself to the task of regaining favor in markets in which it once prospered.

The Bureau of Foreign and Domestic Commerce has already published an important report on the subject of German foreign trade organization and is now planning to issue a supplemental bulletin about Jan. 1. In order to understand the significance of the information on German trade moves that will be made public from time to time, Secretary Redfield counsels not imitation of, but familiarity with the German theories of foreign trade and the artful and formidable organization that, with Government aid at every turn, has been built up in Germany during the last 20 years to dominate the world's markets. The large correspondence with business men in all parts of the country which the Department of Commerce has developed on this subject during recent months is taken as a clear indication that the American manufacturer is making after-war preparation of his own.

W. L. C.

Norway to Make Electrodes

Carbon and graphite electrodes are to be made in a new plant at Frederick, Norway. The capacity is to be 4000 tons of carbon or 1000 tons of graphite electrodes a year and the works are expected to be in operation by the end of 1917. Carbon electrodes will be the first manufactured. American engineers have been engaged and the machinery is almost exclusively of American manufacture. The plant is to work in cooperation with the Norwegian government. The company will use power from the great waterfall of Sarpsfall on the Glommen River but, in anticipation of its present plant becoming inadequate, it has purchased the rights to the entire power from the waterfall near Kristiansund.

Pipes of Electrolytic Iron in France

The electric steel works of Bouchayer & Viallet, Grenoble, France, are now manufacturing pipes of large sizes from electrolytic iron. They are 13 ft. long, 3⅞ in. to 7¾ in. in diameter, and about 1/16 in. thick, and are used for water, steam or compressed air. A tube of electrolytic iron is said to possess the same strength as one of cast iron 20 times as thick.

The Dominion Bridge Co., Montreal, has received another order for 10,000 tons of fabricated steel from the American International Corporation. Some two weeks ago orders from the same source for 40,000 tons were announced.

Machinery Markets and News of the Works

ARSENALS LARGE BUYERS

Government Purchases Heavy for Ordnance Work

International Arms & Fuze Co., Inc., Is Placing Orders Which Will Aggregate $1,500,000 or More

The Government is buying heavily for its arsenals. The Rock Island Arsenal, Rock Island, Ill., has completed purchases aggregating about $2,000,000 for the manufacture of 3-in. French hydro-compression guns and is now in the market for equipment to cost at least $1,500,000 for making 4-ft. 7-in. guns with recoil mechanisms. About 150 lathes are included in the new list. The Watertown Arsenal, Watertown, Mass., and the Watervliet Arsenal, Watervliet, N. Y., continue to buy. The Stone & Webster Engineering Corporation has placed additional orders for American gun repair shops in France.

Purchases of the International Arms & Fuze Co., Inc., Bloomfield, N. J., is placing large orders for lathes and turret lathes for shell work. One machine-tool company is reported to have received an order for 100 26-in. lathes. The purchases will total in value $1,500,000 or more. A Philadelphia company, which is about to close a shell contract, will, it is reported, need 400 lathes for the work it has planned.

The Standard Ordnance Corporation, Hamilton, Ohio, has issued a large list of tools required for gun work. The Crane Co., Chicago, has placed orders in the East for tools to be used for manufacturing cartridge containers. The International Harvester Co., Chicago, has placed orders in the East. The Dominion Steel Products Co., Brantford, Ont., has bought tools in New York for work on a $4,000,000 gun mount contract received from the United States Government.

New buying for airplane engine work is not so active, but some buying has been done during the week by the F. B. Stearns Co., Cleveland, which has a Government contract for motors. The Duesenberg Motor Co., Newark, N. J., has received a contract to build 500 Liberty airplane motors. Equipment for the new Duesenberg plant was purchased several months ago.

Dodge Bros., Detroit, have placed additional orders in Cleveland for drilling and milling machines for work on gun recoil mechanisms. Other large orders placed with Cleveland companies include one for $30,000 from Dayton, Ohio, and one for $24,000 from a Cleveland manufacturer.

Scarcity of machine tools, especially those needed for gun work, grows more pronounced and the Government is taking more interest in second-hand equipment. A large order of second-hand tools, boxed and ready for shipment to Russia, was held up in New York last week. Export licenses are not being granted for shipment to Russia. Scarcity of motors is a serious factor.

Sales of traveling cranes continue on a large scale. The Federal Shipbuilding Co. has not closed as yet on 20 cranes, for which specifications have been issued. The Milwaukee Electric Crane & Mfg. Co. received an order for several cranes for the new shops of the Erie Forge Co., Erie, Pa. The William Cramp & Sons Ship & Engine Building Co., Philadelphia, has bought six cranes from the Bedford Foundry & Machine Co., Bedford, Ind. The Merchants' Shipbuilding Corporation, Bristol, Pa., has contracted for a 60-ton fitting-out crane with the Heyl & Patterson Co., Pittsburgh. The American Brass Co. has bought four cranes for its Buffalo plant. Other crane orders are reported in the local market reviews.

Locomotive crane business is now thoroughly under Government control and all of the output of the American plants, totaling 108 cranes per month, has been commandeered by the Government until March 1 or possibly later.

Locomotive crane builders have received an inquiry from the Bureau of Supply and Accounts of the Navy Department for 60 locomotive cranes. The order for three hammer-head cranes, to cost more than $2,000,000, for which bids were recently received, has not yet been placed.

New York

NEW YORK, Dec. 4.

Government requirements, direct or indirect, continue to absorb the attention of the machine-tool trade. Large orders have been placed by the International Arms & Fuze Co., Inc., Bloomfield, N. J., for 6 in. shell work. Purchases will aggregate $1,500,000 or more. A considerable number of large lathes have been purchased from second-hand dealers because of the inability of builders to make deliveries by next February or March.

The Standard Ordnance Corporation, which is affiliated with the Mosler Safe Co., Hamilton, Ohio, has issued a list of several hundred tools it will buy for its plant in that city, which will manufacture 75 mm. guns for the United States Government.

Large orders for turret and engine lathes have been placed in New England by the Crane Co., Chicago, which has received a Government contract for cartridge containers. The International Harvester Co., Chicago, has also bought a number of new tools in the East.

A great many of the orders of the Rock Island Arsenal at Rock Island, Ill., have come to Eastern plants. It is said that the purchases of the arsenal will total $2,000,000 for making 3 in. French hydro-compression guns.

The Dominion Steel Products Co., Brantford, Ont., has received a $4,000,000 contract from the United States Government for gun mounts and has bought new equipment in this market.

Watervliet Arsenal and Watertown Arsenal continue to buy for gun shops.

The Hall Printing Press Co., Dunellen, N. J., which has a contract for printing presses for the Army in France and for boring lathes, is buying a few more tools.

Crane business continues active. A new list of the Federal Shipbuilding Co. is as follows: Two 50-ton, 4-motor cranes and four 5-ton, 3-motor cranes for the machine shop; one 15-ton, 3-motor crane for the forge shop; two 20-ton, 4-motor cranes for the foundry, and two 10-ton double-trolley cranes for the plate and angle shop. These cranes are in addition to 16, for which a list was issued several weeks ago. The Whiting Foundry & Equipment Co. has received an order for three cranes from the Blake & Knowles plant of the Worthington Pump & Machinery Corporation at

East Cambridge, Mass. The Milwaukee Electric Crane & Mfg. Co. was awarded an order for several cranes for the new plant of the Erie Forge Co., Erie, Pa. The General Electric Co. is reported to have closed for a 10-ton, a 20-ton and a 50-ton crane for its West Lynn., Mass., plant. The order for the 50-ton was reported recently as having been taken by the Northern Engineering Co., Detroit. The American Brass Co., Waterbury, Conn., has bought four cranes for its Buffalo factory.

The United States Government has placed an order with the Buffalo Gas Engine Co., Buffalo, for $50,000 worth of gas engines for shipment to France.

The Duesenberg Motor Co., which has completed a new factory in Newark, N. J., has obtained a contract from the Government for 500 Liberty airplane motors. Its equipment was purchased several months ago.

The Government is unable to find enough new tools to meet demands and is taking a keener interest in second-hand tools. Second-hand dealers have been asked to send lists to Washington of all tools on order for export, except to England, France, Italy and Japan. A large number of tools, boxed and ready for shipment to Russia, have been held up.

A story is going the rounds, which may not be true, but which, nevertheless, illustrates present conditions. A second-hand dealer bought a large planer for $12,000 and offered it to the Government for $15,000. The Government purchasing agents thought the price excessive and offered $13,000. The dealer refused to sell, whereupon the Government agents commandeered the tool and paid $12,000 for it. The dealer's excessive zeal for profit caused him the loss of $1,000.

Scarcity of motors is becoming a serious factor. Many of the new plants have been built on the assumption that it would be possible to install individual motor-drive machines. The large motor manufacturers have not been able to meet the tremendous demand for motors and as a result belt-driven machines are being used in many instances where motor-driven would be preferred. There has not been a sufficient demand, however, for belt-driven machines to absorb all supplies, and a New York dealer is now offering 125 heavy duty lathes, 16 to 26 in., swing, belt-driven, for prompt delivery. All of these lathes are new. The beds range from 8 ft. to 18 ft.

Locomotive cranes are now thoroughly under Government control. A committee of which A. C. Brown, vice-president of the Brown Hoisting Machinery Co., Cleveland, is chairman, is handling the business now largely from Washington. The total output of locomotive crane shops in the country is now 108 per month and the Government has taken all that the companies will make until March 1, or possibly later. Several propositions were made to the Government by other companies for manufacturing locomotive cranes, but upon the assurance of the present crane builders that all Government demands would be promptly met no encouragement was given to new proposals. The private contractor will have no chance of placing orders for locomotive cranes unless he is willing to accept delivery some time next spring. Even then his order will be subject to delay if the Government requires more cranes than are now contemplated.

James Shewan & Son, Brooklyn, have had plans prepared for an additional story to their machine shop, foot of Twenty-seventh Street.

Brooks & Co., New York, have been incorporated with a capital of $12,000 to manufacture metal boxes. S. E. Ferris, E. J. and C. C. Jenkins, 631 Quincy Street, Brooklyn, are the incorporators.

The Leslie-Stevens Co., New York, has been incorporated with a capital of $10,000 to manufacture electrical goods and general engineering supplies. E. A. Leslie, C. H. Stevens and W. P. Faendler, 618 Eleventh Street, Brooklyn, are the incorporators.

The Way Cleanse Corporation, New York, has been incorporated in Delaware with a capital of $5,000,000 to manufacture machinery for cleaning streets, car tracks, etc. George V. Reilly, Samuel B. Howard and Arthur W. Britton, 65 Cedar Street, are the incorporators.

Thomas Paulson & Son, Inc., Brooklyn, operating a brass foundry at 97 Second Avenue, has increased its capital from $30,000 to $100,000.

The Breeze Air Craft Co., New York, has been incorporated with a capital of $10,000 to manufacture airplanes. J. A. Preville and A. D. Weeken, Jr., 52 William Street, are the incorporators.

Ira S. Bushey & Sons, operating a shipyard at the foot of Court Street, Brooklyn, will build a one-story shop addition, 35 x 70 ft., on Clinton Street.

Anderson & Jacobsen, 722 Court Street, Brooklyn, operating a foundry, have had plans prepared for a one-story plant, about 52 x 80 ft., at Hoyt and Fourth streets, to cost $7,000.

The Wall-Stieh Co., New York, has been incorporated with a capital of $20,000 to manufacture fountain pens. A. Stieh, J. Wahlheimer and J. Wall, 1739 Seventh Avenue, are the incorporators.

The Federal Resilient Wheel Corporation, New York, has been incorporated with a capital of $500,000 to manufacture wheels, automobiles and airplanes. J. D. Anglin, Z. W. Commerford and J. Feinbloom, 78 West Eighty-second Street, are the incorporators.

The I. X. L. Machine & Tool Co., 180 Lafayette Street, New York, has increased its capital to $10,000.

The Bureau of Yards and Docks, Washington, D. C., has had plans prepared for a new power plant at the Brooklyn Navy Yard. It has also taken bids for the construction of a new shipbuilding yard to cost about $300,000.

The Fidelity Metal Co., 196 Diamond Street, Brooklyn, has increased its capital from $50,000 to $250,000.

Mason & Moore, New York, has been incorporated with a capital of $100,000 to manufacture printing and bookbinding machinery. G. Chapman, W. A. Moore and W. O. Mason, 51 Chambers Street, are the incorporators.

The American Machine & Foundry Co., Fifty-sixth Street and Second Avenue, Brooklyn, will build a new five-story and basement plant, 100 x 185 ft., on Fifty-fifth Street, to cost about $250,000. Contracts have been awarded.

The Bradley-Ellis Motor Co., New York, has been incorporated in Delaware with capital of $200,000 to manufacture automobiles. C. M. Bradley, James B. Ellis and Harold Nicolai, all of New York, are the incorporators.

The M. J. Wohl Co., 211 Fulton Street, Brooklyn, has been incorporated with capital of $30,000 to manufacture electrical specialties. M. J. Wohl, M. and B. Mayer are the incorporators.

E. D. Giberson & Co., New York, have been incorporated with a capital of $50,000 to manufacture iron and steel products. The incorporators are E. D. and M. F. Giberson and R. D. Whiting, 370 Wadsworth Avenue.

The Edison Electric Appliance Co., New York, has been incorporated with a capital of $2,650,000 to manufacture electrical specialties. C. E. Patterson, H. C. Houck and A. H. Jackson, Schenectady, N. Y., are the incorporators.

The Shavelight Corporation, New York, has been incorporated with a capital of $10,000 to manufacture special razors. C. G. Campbell, F. J. Kent and S. S. Newton, 73 Cortlandt Street, are the incorporators.

The Presto Snap Fastener Co., New York, has been incorporated with a capital of $10,000 to manufacture metal fasteners. H. Perlman and R. Hirshman, 110 West 114th Street, are the incorporators.

The High Speed Tools Corporation, 71 Broadway, New York, has been reorganized with a capital of $100,000.

The Commercial Research Co., 18 East Forty-first Street, New York, manufacturer of platinum goods, has acquired about 248 x 315 ft. on Myrtle Avenue, Flushing, L. I., adjoining its works, for expansion. Byron E. Eldred is president.

Kahn Brothers, 785 Humboldt Street, Brooklyn, are building a one-story addition, 145 x 240 ft., to their metal works to cost about $18,000.

The Alloy Foundry & Machine Co., New Rochelle, N. Y., has been incorporated with a capital of $10,000. A. C. Wakeling, G. C. Pansegrau and W. E. Wollheim, 2467 Valentine Avenue, are the incorporators.

Otto P. Weismann, Inc., Mt. Vernon, N. Y., has been incorporated with a capital of $50,000 to manufacture precision thermometers, etc. M. Hertz, H. Weismann and E. K. Noll, 44 Court Street, Brooklyn, are the incorporators.

A new one-story power plant, 60 x 70 ft., will be constructed by the American Smelting & Refining Co. at its works at Maurer, near Perth Amboy, N. J.

The Edison Storage Battery Co., Valley Road, West Orange, N. J., has increased its capital from $3,500,000 to $5,000,000.

The Sprague Electric Works of the General Electric Co., Watsessing, Bloomfield, N. J., manufacturer of motors, etc., will build a one-story addition, 52 x 100 ft., to cost about $10,000.

The R. S. Christie Co., operating a foundry at 150 Broadway, Elizabeth, N. J., has been incorporated with a capital of $50,000 to manufacture anvils, castings, etc. Robert S.

Christie and James S. Ramsay, Elizabeth, are the incorporators.

The National Lock Washer Co., 65 Johnson Street, Newark, N. J., has filed plans for alterations and extensions to its machine shop.

The L. M. Simmonds Co., Newark, has been incorporated with a capital of $25,000 to manufacture jewelry. S. D. MacPherson, D. F. Sherman and James F. Dempster, all of Providence, R. I., are the incorporators.

The American Can Co., 120 Broadway, New York, has awarded a contract for the construction of its new plant on Elizabeth Avenue, Newark, to the American Concrete Steel Co., 27 Clinton Street, Newark. The proposed works are estimated to cost over $500,000 and will consist of a three-story factory, 100 x 240 ft.; one-story forge shop, and two-story office building. Excavation work is now under way and the contract calls for completion by April 1. It is said that the new plant will give employment to about 400.

The Hudson County Boulevard Commission, Jersey City N. J., is planning for the extension and improvement of the county electric power plant at Snake Hill, including the installation of considerable new equipment, at a cost of about $150,000.

William Ames & Co., Communipaw Avenue, Jersey City, manufacturers of railroad spikes, bolts, etc., are having plans prepared for the erection of a three-story addition, 50 x 125 ft., at Communipaw Avenue and Woodward Street, to cost $10,000.

The Co-operative Engineering Co., 239 Washington Street, Jersey City, has been incorporated with a capital of $100,000 to manufacture special machinery. Herbert C. Gilson, Jersey City; Claude Smith, 140 West 104th Street, New York, and Edward d'Amour, 2307 Avenue D, Brooklyn, N. Y., are the incorporators.

The Turner Automatic Fan & Mfg. Co., Jersey City, has been incorporated with a capital of $125,000. George W. Turner, James P. Strickland and Archie V. Jones, Jersey City, are the incorporators.

Catalogs Wanted

The American Sales Co., 311 West Fifty-ninth Street, New York, desires catalogs, specifications, data and prices of large presses suitable for the stamping of pressed steel brake drums and full steel wheels for automobiles and motor trucks. Blueprints will be furnished. Also machines and equipment for the manufacture of triangular files.

New England

BOSTON, Dec. 3.

While there is little new demand for machine tools originating in New England, the volume of orders coming to makers from other sections is pushing deliveries far into the distant future. Virtually all the demand is for machinery for war industries and only A-1 priorities can be given any assurance of delivery in the near future. There is much pessimism in regard to the effect of the next draft. Government pressure for machine tools is so great that the labor shortage, which is compelling many plants to operate much below capacity, is the chief topic of discussion at every gathering of employers. Many plants are planning to employ women workers but definite steps in that direction are few, most manufacturers seeming to be awaiting more definite knowledge of the working out of the new draft plan.

Munitions plants are adding largely to their working forces and tool making shops are receiving greatly increased inquiries and orders. Manufacturers of drills, reamers, milling cutters and similar tools are getting further behind on deliveries, the average time set on orders for drills now being about eight months' delivery. It is still possible to get prompt delivery on some kinds of small machine tools but large tools are so scarce that almost any second-hand machine tool of the larger sizes brings a fabulous price. A weeding out of enemy alien help is going on all over this section, particularly in the Connecticut factories and this is affecting the supply of unskilled labor to some degree.

The United States Machine Co., Boston, has been incorporated, with authorized capital stock of $500,000, to manufacture firearms.

The Norwood Brass & Aluminum Co., Norwood, Mass., has been incorporated with authorized capital stock of $10,000. Arthur J. Brissette is president and treasurer.

The United States Airplane & Engine Co., Bridgeport, Conn., has abandoned its plan to erect a plant in Bridgeport and has purchased the old Yale & Towne factory, Branford, Conn., which will be altered to suit the plans of the new owners.

The Metal Specialty Co., New Britain, Conn., has bought the equipment and contracts of the A. S. Ford Co., Bristol, Conn., and has removed the machinery to its New Britain plant.

The Eagle Pocket Knife Co., New Haven, Conn., has increased its capital stock from $12,000 to $25,000.

The Economy Ignition Co., Springfield, Mass., has been incorporated with authorized capital stock of $50,000. Lewis J. Tetlow is president and treasurer; John T. Glancey and Wilson Goodrich, directors.

The Burgess Co., Gregory Street, Marblehead, Mass., manufacturer of hydroplanes, is building a two-story machine shop addition at its works.

Dutee W. Flint, Allen Avenue, Providence, R. I., operating an automobile plant, will build a new two-story and basement factory, 100 x 150 ft., at Bridgeport, Conn., to cost about $10,000.

Buffalo

BUFFALO, Dec. 3.

The Crucible Steel Co. of America, 104 Magnolia Avenue, Syracuse, N. Y., has completed plans for the erection of two additions to its works on Emerson Avenue.

The Oneida Textile Co., Fultonville, N. Y., has been incorporated with a capital of $50,000 to manufacture textile machinery. E. Van Brocklin, J. M. and E. J. Bennett, Fultonville, are the incorporators.

The Cravier Foundry Co., Rochester, N. Y., has been incorporated with a nominal capital of $5,000. J. T. Cravier, L. C. Graves and T. Hanlon, Jr., are the incorporators.

The Trebert Airplane Motor Co., Rochester, has been incorporated with a capital of $25,000 to manufacture airplane motors, etc. E. W. Cummings, J. S. Poyen and H. L. F. Trebert, Rochester, are the incorporators.

The Auto Body & Demountable Top Co., Buffalo, has been incorporated with a capital of $10,000 to manufacture automobile bodies and allied specialties. C. F. Otto, E. Lindner and E. Friedfeld, Buffalo, are the incorporators.

The Erie Aircraft Co., Erie, Pa., has been incorporated with a capital of $25,000 to manufacture airplanes. George Minnig, Erie, is the principal incorporator.

The American Sterilizer Co., Twelfth and Plum streets, Erie, Pa., manufacturer of scientific instruments, will build a one-story addition, 50 x 70 ft., to cost about $10,000.

The Howes Co., Silver Creek, N. Y., capitalized at $250,000, has been incorporated to manufacture machinery and tools. A. C., M. L. and M. A. Barbau are the incorporators.

An addition to cost $30,000 is to be made to the shops of the Erie Railroad at Rochester.

The Commonsense Mfg. Co., Buffalo, is building an addition to its plant at Niagara Street and West Delavan Avenue for repairing and shipping machinery and metals.

Philadelphia

PHILADELPHIA, Dec. 4.

Crane business in this territory is active. The William Cramp & Sons Ship & Engine Building Co. has closed with the Bedford Foundry & Machine Co., Bedford, Ind., for six small cranes and has issued another inquiry for four 7½-ton and one 20-ton cranes.

The Merchants Shipbuilding Corporation, Bristol, Pa., has ordered a special 60-ton fitting-out crane from the Heyl & Patterson Co., Pittsburgh, through J. N. Kinney, New York. This crane will be used for placing masts in vessels.

War work is the cause of practically all machine-tool demand in this market. The Baldwin Locomotive Works will be a large buyer for shell work. Its requirements of lathes, it is reported, will number about 400.

The William Cramp & Sons Ship & Engine Building Co., Philadelphia, is planning for the erection of a one-story addition to its brass foundry, about 143 x 143 ft., at Adams and Thompson streets.

The Economy Service Corporation, Philadelphia, has been incorporated in Delaware with capital of $300,000 to manufacture fireless cookers, etc. Wray C. Arnold and M. Elliott, Philadelphia, are the incorporators.

The Wright Roller Bearing Co., Spring City, Pa., has commenced the removal of its works to property recently acquired at Twentieth Street and Indiana Avenue, Philadelphia, and is planning for an increase in its former capacity.

The United States Jack Co., Philadelphia, has been incorporated in Delaware with a capital of $50,000 to manufacture jacks and other lifting apparatus. F. R. Hansell, Philadelphia, and S. C. Seymour, Camden, N. J., are the incorporators.

M. L. Bayard & Co., Philadelphia, will make improvements and alterations in their machine shop at Twentieth Street and Indiana Avenue to cost about $5,000.

The National Galvanizing Co., Philadelphia, has acquired property at 1609-13 North Front Street, about 51 x 110 ft., for its works.

The Camden Auto Radiator Repair Co., 507 Arch Street, Philadelphia, will build a two-story extension to its works, about 20 x 45 ft.

The Aluminum Brazing Co., Chester, Pa., has had plans prepared for the construction of a one-story addition to its plant, 35 x 60 ft., at Third and Tilghman streets.

The Mahoning Foundry & Machine Co., Punxsutawney, Pa., has been incorporated with a capital of $30,000. V. A. Gillespie is the principal incorporator.

The Pressed Steel Co., North Penn Avenue, Wilkes-Barre, Pa., will build a one-story, concrete addition to its plant, about 40 x 60 ft.

The Keystone Automobile & Machine Co., Latrobe, Pa., has been incorporated with a capital of $15,000 to operate a machine works. Benjamin Ratner is the principal incorporator.

The Benjamin Iron & Steel Co., Hazelton, Pa., is operating in its new works, recently erected on the site of the Hazelton sheet steel plant. The plant will be used for the production of mine cars, boilers and other equipment for coal mines.

Harris Brothers, Chicago, have acquired the machine repair shops of H. S. Kerbaugh, Inc., Bellwood, Pa., and will establish works to specialize in the repair of locomotives and kindred equipment. It is planned to commence operations Dec. 15. About 100 will be employed.

Arnold Brothers, Inc., Ridgway, Pa., has been incorporated with a capital of $35,000 to manufacture automobiles. William B. Arnold is the principal incorporator.

The board of education, Chester, Pa., will build a new four-story and basement school building to cost about $300,000 to be used as a manual training department for the Chester High School. Contracts for construction have been awarded.

The Harrisburg Mfg. & Boiler Co., Nineteenth and Derry streets, Harrisburg, Pa., will enlarge its works and install new equipment to handle a Government contract for gun carriages, averaging from 30 to 35 lb. each. It is said that the contract totals about $1,000,000. Samuel F. Dunkle is president.

Daniel J. Driscoll, operating iron and steel works at Auburn, Pa., has completed the construction of a new foundry at Hamburg to specialize in the production of steel billets. The plant will be operated in conjunction with the Auburn works.

The Individual Fire Escape Co., Atlantic City, N. J., has been incorporated with a capital of $100,000 to manufacture automatic fire escapes. L. Leslie Headly, George Muller and Robert J. Elliott, all of Atlantic City, are the incorporators.

Baltimore

BALTIMORE, Dec. 3.

The American Propeller & Mfg. Co., 233-49 East Hamburg Street, Baltimore, will erect a one-story building, 156 x 200 ft., at a cost of about $37,000.

The Bartlett-Hayward Co., Scott and McHenry streets, Baltimore, will build a one-story blacksmith shop at Ramsay and Parkin streets, 49 x 140 ft., at a cost of $115,000. Morrow Brothers, Fidelity Building, have the contract.

The Bureau of Yards and Docks, Washington, D. C., has taken bids for the construction of a new four-story brick and concrete pattern shop at the Washington Navy Yard, 138 x 320 ft., to cost about $440,000. It will also build a new ice manufacturing and cold storage plant at Hampton Roads, to cost $300,000.

The Maryland Shipbuilding Co., Sparrows Point, Md., will build a one-story brick addition, 40 x 100 ft.

The J. Henry Smith Co., Baltimore, is making rapid progress in the erection of new shipbuilding works at Curtis Bay, which consist of a machine shop, mill buildings, joiner shops, blacksmith shop and mold works. Most of the equipment will be electrically operated. It is said that about 400 men will be employed.

A one-story power plant, 50 x 64 ft., will be constructed by the St. Marys Light & Power Co., St. Marys, W. Va. Earnest Mulloney is general manager.

A. Lee Knowles and J. H. Bryan, Staunton, Va., are organizing a company to establish a plant for the manufacture of automobile tires and other rubber goods.

The Marine Repair Corporation, Newport News, Va., recently incorporated, with a capital of $50,000, will operate a marine repair plant. R. T. Pullen is president.

The Hampton Roads Shipbuilding & Dry Dock Co., Norfolk, Va., recently incorporated, with a capital of $1,000,000, has acquired 150 acres for the construction of its proposed shipbuilding plant. It is said that the initial works will cost about $800,000. R. B. Wallace is general manager.

Chicago

CHICAGO, Dec. 3.

Having closed against the large list of tools required for the manufacture of 75-mm. gun carriages, the Rock Island Arsenal is again in the market for at least $1,500,000 worth of machines to be used in making 4-ft. 7-in. guns with recoil mechanism. About 150 lathes, as well as many other tools, figure on this list. Large lathes are tighter than ever in the matter of deliveries, but small ones are easily obtainable, there not having been much demand for them. Boring mills are so scarce that some of the work ordinarily done on them is being done on big lathes, the work being clamped to the lathe face plate.

Dealers are becoming apprehensive over the extent to which deliveries of standard tools, already far behind, will be further delayed by the action of their principals in taking on the manufacture of special machines required for gun-boring, recoil parts, etc. Of course, it is to be understood that it is for the welfare of the Government and necessary to the prosecution of the war that these special machines be manufactured, and no shops are better qualified to make them than are those in which machine tools are built. The machine-tool builders had little choice in the matter. They must help the Government to the utmost and are pledged to do it. They are trying to prevent any interference with the production of their regular lines, also needed for war work, but are facing a difficult task. The building of machines new to a factory is bound to upset the routine, and prevents the concentration of labor. The fact is that prior to the war there were few plants specializing in gun-making machines, and these machines are now wanted quickly and in large numbers.

The Stone & Webster Engineering Corporation, Boston and New York, which is building and equipping a repair depot in France, has placed a few additional orders in this market. The number of Eastern buyers who have found their natural market over-sold is steadily increasing in this territory, but they are not finding much solace here. It has been remarked that greater dependence than ever will have to be placed on second-hand machines, but the question is where good second-hand machines are to be found. The Monon Route is inquiring for three or four machines, including a planer and a couple of large lathes, and is asking for prices on second-hand tools, recognizing the impossibility of getting new machines. Industrial buying is light, but outfits of small tools are being sold here and there. The Goss Printing Press Co., Chicago, is working on gun mounts, and the Otis Elevator Co. is doing similar work at some of its plants.

New factory construction work is rapidly coming to low ebb, except where some war purpose is to be served.

McCord & Co., railroad supplies, 847 West 120th Street, Chicago (West Pullman) have been granted a permit for the construction of a one-story foundry, 72 x 214 ft., to cost about $30,000, a transformer room to cost $2,300, and a one-story blower house, 12 x 30 ft., to cost $1,700.

Plans have been revised, and new bids are to be taken by W. T. Branitzky, architect, 64 West Randolph Street, Chicago, for a two-story factory, 120 x 200 ft., on Ravenswood Avenue near Montrose Avenue, for the H. G. Saal Co., maker of tools and hardware specialties. It will cost about $100,000.

N. P. Severin, general contractor, 82 West Washington Street, Chicago, has started the construction of a one and two-story factory, 100 x 600 ft., for the International Airship Corporation, Gary, Ind. It will be of brick, concrete and steel and cost about $200 000 with three hangars.

George P. Nichols & Bro., manufacturers of railroad machinery, 614 South Canal Street, Chicago, have purchased a plot, 124 x 300 ft., at Fulton and Leavitt streets, on which they will erect a one-story factory.

The machine shop of the Chicago, Wilmington & Southern Railroad at its coal mine at Thayer, Ill., was recently destroyed by fire, with an estimated loss of $15,000.

The A. F. Meyer Mfg. Co., Morton, Ill., manufacturer of metal buckets, is contemplating an addition to its plant, 75 x 130 ft.

In a fire which did damage estimated at over $100,000, the factory building at Monmouth, Ill., occupied by the Maple City Mfg. Co., the Boss Mfg. Co. and the Monmouth Acety-

lene and Electric Co., was destroyed. Much machinery, which will be difficult to replace at this time, was ruined.

The Combined Motors Corporation, Chicago, has been chartered under the laws of Illinois, to combine the business of the Bour-Davis Motor Car Co., Shadburne Bros., Chicago; the Dixie Motor Car Co., Louisville, Ky., and the Collins Body Co., St. Louis. Offices have been established in Chicago and St. Louis. The officers and directors are: B. L. Craig, president Collins Body Co., president; L. A. Shadburne, Shadburne Bros., vice-president; H. P. Brown, treasurer; William Ewald, assistant secretary; Alexander Hoyt, chairman executive committee; C. J. Bour, F. D. Hartman, W. L. Shadburne and Elmer F. Adams, directors. Large, well-equipped factories are now in operation at Frankfort, Ind., Louisville, Ky., and St. Louis, Mo. Another plant has been secured at Benton, Ill., and will soon be in operation. The company has in view a rubber company as part of its organization.

Milwaukee

MILWAUKEE, Dec. 3.

Despite a noticeable slackening in general local industrial activity outside of plants engaged on Government work, machine-tool manufacturers report many new orders. It would appear from the extent and urgency of the requirements of tool users that only a small part of their demands have been filled. The transition of the metal-working industry to a war basis is rapidly being completed, and even the smaller shops now are engaged on sub-contracts from Government contractors. In this manner the entire industry is being kept busy at maximum capacity.

The Racine Motor Truck Co., Racine, Wis., incorporated several months ago, with a capital stock of $500,000, to develop the Piggins Bros. motor-truck manufacturing interests, will locate its headquarters at Appleton, Wis. A site has been purchased at Spencer and Story Streets, and preparations are being made for the erection of a one-story concrete, brick and steel machine shop, 60 x 300 ft. The product will be motor trucks in 1¼, 2½, 4 and 6-ton capacities. Sixty-five men will be employed at the start. The officers are: President, Ira L. Miller; vice-president and works manager, Charles Piggins; secretary and treasurer, B. F. Henline. It is expected that the corporate style will be changed to the Reliance Motor Truck Co.

The Northern Casket Co., Fond du Lac, Wis., operating factories in Fond du Lac, Sioux City, Iowa, and Denver, Col., has completed arrangements for the manufacture of a non-corrosive sheet-steel and statuary-bronze casket. Pending the erection of a metal-working shop addition to its Fond du Lac plant, production of the steel coffin will be carried on in temporary departments in its other factories. The company has purchased a site, 95 x 114 ft., adjacent to the Fond du Lac plant, and another, 120 x 150 ft., adjoining its Sioux City Works, for the erection of additional production facilities the coming year. William Mauthe is president and general manager; Elwood L. Russell, manager at Sioux City, and R. F. Bloedel, manager at Denver.

The Kiel Woodenware Co., Kiel, Wis., is taking bids for furnishing a 250-kw. motor-generator set and ten motors from 5 to 50 hp. capacity, for a power-plant addition and a new factory, 80 x 320 ft., under construction. Charles A. Cahill, 1426 First National Bank Building, Milwaukee, is consulting engineer.

The Milwaukee Ice Machine Co., Milwaukee, has an authorized capital stock of $500,000, instead of $50,000, as reported. It will lease or build a factory for the manufacture of ice and refrigerating machinery, and will specialize in a small unit for residences. The officers are: President, Harvey Marggraff; vice-president, Paul G. Dorow; secretary and treasurer, Fred Marggraff, 1008 First National Bank Building, Milwaukee.

The Janesville Electric Co., Janesville, Wis., is contemplating the installation of an additional 150-hp. water turbine unit in its hydroelectric plant on Rock River.

The Milwaukee Reliance Boiler Works, 1102 Thirty-second Street, Milwaukee, has broken ground for a forge and smithing-shop addition, 40 x 75 ft. John E. Sharp is president and general manager.

The Eagle Mfg. Co., Appleton, Wis., manufacturer of farm tractors and other farm machinery, has increased its capital stock from $200,000 to $500,000 and elected the following officers: President, Frank Saiberlich; vice-president, Oscar Saiberlich; secretary and treasurer, Edward Saiberlich; general manager, Charles H. Hagen; directors, A. W. Priest; August H. Meyer and Fred Peterson. Work on the new shop already is under way.

Charles H. Anderson, Marinette, Wis., manufacturer of brick and tile-making machinery and conveying equipment, has moved his foundry and machine shop to the former plant of the Engineering Works of Marinette, on Cook Street. This permits of an increase of 25 to 30 per cent in the capacity.

The Laursen Automatic Pump Co., Menominee, Wis., at a special meeting of stockholders adopted a resolution assigning its assets to J. R. Meyers, Chicago, for the amount of the liabilities. The company will be reorganized under the direction of Mr. Meyers, and the present stockholders will be given an opportunity to participate in the new corporation. L. A. Laursen, founder of the company, retired several months ago, and now is manager of the United States Gear Shift Co., Eau Claire, Wis.

The Northwestern Ordnance Co., Madison, Wis., expects to occupy its new plant, 300 x 325 ft., about Dec. 15, and begin the manufacture of 4.7-in. guns for the Government. About 300 men will be employed in day and night schedules. Forgings and castings will be furnished by the Government. The company is financed by the Gisholt Machine Co., Madison, which is providing part of the lathe equipment.

The Summers Mfg. Co., Detroit, Mich., manufacturing machinery and equipment for milk condenseries, is reported to have decided upon the removal of its business from Detroit to Milwaukee on March 1, and will operate a plant at Thirtieth and Galena streets, and employ from 100 to 125 men.

The Stegeman Motor Car Co., 606 Linus Street, Milwaukee, which has been in process of reorganization for several weeks, will be succeeded by the Hercules Motor Truck Co., with a capital stock of $100,000. No details of future plans are available. Arthur Davidson of the Harley-Davidson Motor Co., Milwaukee, is a stockholder. Lynn S. Pease, 1301 Majestic Building, is attorney.

The Ajax Forge Co., Chicago, announces that its new plant at Superior, Wis., will be confined to the manufacture of frogs, switches and railroad track material only and no forgings of any kind will be produced.

Detroit

DETROIT, Dec. 3.

The bettering of general manufacturing conditions has stimulated the machinery market, which has been unusually active the past week. Jobbers are complaining of deliveries, many of which are set from six to eight months ahead.

The Ecorse Foundry & Machine Co., Detroit, is making additions to its plant representing an outlay of $100,000. Approximately seven acres of land have been purchased. Two buildings are being completed, with two more planned for early construction.

The Ford Motor Co., Detroit, has received an order for 5000 Liberty motors from the Aircraft Production Board. It is now largely engaged in the manufacture of airplane cylinders and is about to begin the production of ship fittings.

The Triangle Motor Truck Co., Clinton, Mich., has begun work on its new plant, and expects to be making trucks early in 1918.

The M. & S. Electric Co., capitalized at $50,000, and the Auto Supply & Service Station, capitalized at $10,000, have been incorporated at Flint, Mich., by Paul Schagane, Lillian Carey and DeHull N. Travis.

The Ex-Cell-All Products Co., Alma, Mich., will immediately start the construction of one unit of its plant and in the spring will add other buildings. It specializes in hardware supplies.

The Big Rapids Tractor Co. will build an addition to its plant in the spring.

The Union Cap Screw Co., Detroit, has increased its capital stock from $5,000 to $25,000.

The Baker Tractor Corporation, Detroit, has been incorporated in Delaware, with a capital of $1,250,000,, to manufacture tractors, plows, etc. Benjamin F. Mortenson, Frank E. and George J. Baker, Detroit, are the incorporators.

It is reported that the Jeffrey-Dewitt Co., Detroit, maker of spark plugs and other automobile specialties, will establish a branch plant at Huntington, W. Va.

Cleveland

CLEVELAND, Dec. 4.

The volume of machine-tool business being placed for Government work shows no falling off. The American Shipbuilding Co., which has recently taken an order for 36 boats for the Emergency Fleet Corporation, was a heavy buyer of machinery the past week for a machine-shop extension to its Cleveland plant. The F. B. Stearns Co. purchased considerable equipment for making airplane motors. **Dodge Bros., Detroit, placed orders with a Cleveland machinery house for drilling and milling machines aggregating**

about $50,000. Other round-lot orders for machinery for Government work placed with Cleveland dealers include one from Dayton for $30,000 worth of machinery, and another from a Cleveland company aggregating $24,000. New inquiry for lots up to five or six machines is very plentiful, but no large list developed in the week. Machine-tool manufacturers are becoming so crowded with Government work that deliveries are being set further ahead. One manufacturer cannot promise shipments on large planers within 12 months unless the buyer has a priority order. Some of the machine-tool manufacturers have found it necessary to discontinue the making of some sizes of machines in order to devote their entire attention to making other types, usually of the larger sizes, to supply Government demands. Several makers have made slight price advances on smaller types of machines, including small lathes and bench milling machines. Some Eastern dealers are looking over this territory in search of good second-hand machinery, but are not finding much available, local demand being more than sufficient to absorb the entire supply.

The Chisholm & Moore Mfg. Co., Cleveland, is adding about 25 per cent to the capacity of its machine shop by the erection of an extension 39 x 130 ft. Some additional machinery will be required.

The Vichek Tool Co., Cleveland, maker of mechanics' tools and automobile kits, has been reorganized, and its capital stock has been increased from $300,000 to $900,000. F. J. Vichek remains as president and W. J. Hunkin of the Hunkin-Conkey Construction Co., Cleveland, has been made vice-president, and F. S. Macourek, long connected with the Peerless Motor Car Co., has been made secretary. The company contemplates enlarging its plant and eventually to manufacture all the tools contained in an automobile kit.

The Portage Rubber Co., Barberton, Ohio, has increased its capital stock from $3,000,000 to $10,000,000, and contemplates making some extensions to its plant.

The Johant Foundry & Heating Co., Akron, Ohio, has been organized, with a capital stock of $100,000, by H. F. McGill, P. B. Treash and others.

The Wilson Rubber Co., Canton, Ohio, has commenced the erection of an addition, 44 x 120 ft., three stories.

The Marion Die, Tool & Machine Co., Marion, Ohio, has purchased the W. T. Johns Building in that city. It is a four-story structure 50 x 150 ft. The company has also purchased an adjoining site for other factory buildings as needed. E. W. Owen is president and general manager.

The Youngstown Auto Top Co., Youngstown, Ohio, has been incorporated, with a capital stock of $10,000, by Charles L. McCoy, Edwin J. McCoy, and others. It will manufacture bodies for motor trucks, automobile tops, and similar products.

Cincinnati

CINCINNATI, Dec. 3.

New lists issued for machine tools, that would in normal times cause a great deal of comment, are now almost looked on with indifference. Usually a manufacturer picks out the machines on which he can make delivery within a reasonable time, but no orders can be accepted now with the promise of shipment within the time desired by the purchaser. Practically all business is confined to Government work either directly or indirectly. Second-hand tools, especially the larger sizes, are almost as hard to obtain for prompt shipment as are new machines. Boring mills seem to be scarcer than any other kind of machine tools, although the larger sizes of lathes are also hard to obtain.

Machine-tool builders have only been delayed to a very small extent on account of slow deliveries of castings from the foundries. Locally not much apprehension is felt as to any serious delays on this score, but shipments of other supplies cause some inconvenience. High-speed steel cannot be included in this, as shipments are coming forward promptly.

The forging plant of the Poliak Steel Co. at Carthage, a Cincinnati suburb, will be enlarged at an early date. No details as to the sizes of the buildings to be constructed are yet available.

The car repair shops of the Baltimore & Ohio Southwestern Railroad Co., Sixth and Evans streets, Cincinnati, were badly damaged by fire Nov. 27. Inquiries will be sent out in a few days for machinery to replace damaged equipment.

McWilliams & Schulte, Cincinnati, box manufacturers, have acquired the plant of the Union Distilling Co. on Gest Street, and also an adjoining site, on which it is rumored a wood-working plant will be erected.

The L. Eid Concrete Construction Co., Cincinnati, has been awarded contract for building a garage and repair shop at Ninth and Sycamore streets, for the Schlear Motor Car Co., Cincinnati.

The American Blower Co., Detroit, is inquiring in this market for a new 26-in. upright back-geared drilling machine with power feed.

The Thomas Mfg. Co., Dayton, Ohio, has increased its capital stock from $25,000 to $300,000, and will install machinery for manufacturing small electric motors for phonographs, and other specialties.

The Thomas & Armstrong Co., manufacturer of sheet-metal specialties, London, Ohio, will erect two reinforced concrete buildings, 80 x 200 ft.

The Van Wert Foundry Co., Van Wert, Ohio, is completing an addition, 64 x 116 ft., of brick and steel. J. W. Longwell is president. It has increased its capital stock from $15,000 to $50,000.

The Leidecker Tool Co., Marietta, Ohio, will build a new plant in Westview, a suburb. Building details are not yet available.

The Niles Tool Works, Hamilton, Ohio, is having plans prepared for an addition. Harris & Richards, Fifth and Chestnut streets, Philadelphia, are the architects.

The Recording & Computing Machines Co., Dayton, Ohio, has purchased the building of the Dayton Body Co., which it will equip to manufacture optical instruments for the Government.

The Vaile-Rentchler Co., Hamilton, Ohio, recently increased its capital stock to $100,000. The company was formed over a year ago to manufacture farm tractors and is adding equipment to its plant.

Indianapolis

INDIANAPOLIS, Dec. 3.

The Logansport Machine Co., Logansport, Ind., has increased its capital stock from $50,000 to $150,000.

The Universal Portland Cement Co., Gary, Ind., has increased its capital stock from $1,000,000 to $3,500,000.

The Frankfort Carbureter Co., Frankfort, Ind., has been incorporated, with $250,000 capital stock to manufacture carbureters. The directors are Milton T. McCarty, Richard S. Voorhees, Carl W. Sims, William H. Spencer, and Eugene O. Burget.

The Edison Electric Construction Co., Gary, Ind., has been incorporated, with $10,000 capital stock, to manufacture electrical equipment. The directors are Steven Blaner, Clarence Rockney and Charles Martin.

The Hidika Fluid Gauge Co. has been incorporated at Fort Wayne, Ind., with $25,000 capital stock. The directors are Thomas F. Hilkert, E. B. Dill and P. T. Kavanagh.

G. A. Bartholomew, Kendallville, Ind., will establish a plant for the manufacture of automobile heating devices.

The Ross Gear & Tool Co., Lafayette, Ind., is building an addition to its plant that will greatly increase its capacity.

Remy Bros., Kokomo, Ind., are adding equipment for the manufacture of farm tractors.

The Central South

LOUISVILLE, KY., Dec. 3.

More inquiries and a much larger volume of business are reported by local machine shops. Sub-contracts on war orders have been placed in considerable numbers. Implement manufacturers are handicapped by shortage of skilled labor and will not be able to make deliveries in full. Elevator manufacturing establishments are booking numerous orders. Agents of Eastern companies have been in this territory seeking labor.

New machinery is being installed by the Illinois Central Railroad in its shops at Paducah, Ky. Included is a drill press, two lathes and a pipe machine, all motor-driven. J. F. Walker, master mechanic, stated that the Government has taken over some equipment ordered for the shops.

The American-Metallic Packing Co., Lexington, Ky., is asking for prices on a second-hand 100 to 150 kw., 250 or 500-volt generator in first-class condition.

The Kentucky Solvay Coke Co., Ashland, Ky., has authorized an increase in its capital stock from $270,000 to $520,000.

The Cochran Bros. Corporation, Maysville, Ky., has been incorporated with capital of $100,000 by R. A., J. H. and A. M. J. Cochran to operate an electric power plant, now nearing completion.

The Ayrshire Coal Co., Oakland City, Ind., is in the market for a four-valve capacity, 250 volt engine generator set of 150 to 200 kw.

The Southern Engine & Boiler Mfg. Co., Jackson, Tenn., will increase its capital stock from $50,000 to $800,000.

The John G. Duncan Co., Knoxville, Tenn., is asking dealers' prices on a double-cylinder, double-drum hoisting engine and boiler, 8½ x 10-in. cylinders, approximately 30-hp. Also for a similar engine, 5½ x 7, or 6½ x 8 in.

The Dixie Planing Mill Co., Dickson, Tenn., will rebuild its plant, recently burned with a loss of $150,000.

The French Coal Co., Hartland, W. Va., is in the market for electric hauling locomotives. M. McD. Price is manager.

R. P. Johnson, Wytheville, Va., is equipping a sawmill and is asking for dealers' prices on a second-hand outfit in first-class condition, to include 300-hp. in boilers; a 6-ft. band sawmill, two small locomotives, log trucks, planer, flooring machine, molder, resaw, ripsaw, swing cut off, lumber trucks, 125-hp. engine and an engine for driving planing-mill machinery.

The Bristol Door & Lumber Co., Bristol, Tenn., is planning to establish a plant to manufacture aeroplane parts, propellers, gunstocks, etc.

The Tubular Bucket Mfg. Co., Attalla, Ala., recently organized, is contemplating the erection of a plant for the manufacture of tin packing cans. The first unit will be one-story, about 60 x 220 ft., and will be equipped to provide for a production of about 75,000 cans daily. Bids for machinery will be asked during December. Webster B. Heidt is president.

The Keystone Graphite Co., Ashland, Ala., recently incorporated with a capital of $150,000, is contemplating the construction of a new plant to cost about $60,000. A. A. Allen is vice-president.

St. Louis

ST. LOUIS, Dec. 3.

The Domestic Electric Lighting Co., Gillette Building, Tulsa, Okla., is reported in the market for about $5,000 of machinery.

John A. McNeely, Abbott, Ark., will install equipment for a general blacksmith, machine shop and wood-working plant.

W. W. Wood will rebuild his blacksmith and machine shop at El Dorado, Ark., requiring about $4,000 of machinery.

The Brooks Burner Stove Co., Ardmore, Okla., incorporated with a capital stock of $30,000, by Wilson Newman, W. L. Brooks, and others, will equip a foundry and machine shop.

The Dixie Engineering Co., Enid, Okla., P. H. Shaklee, president, is preparing specifications for a plant for the manufacture of feed mills and other machinery.

The Neupro Refining Co., Henryetta, Okla., will equip an oil refinery to cost about $80,000 exclusive of the building.

The Wizard Producing & Refining Co., Oklahoma City, Okla., has been incorporated, with a capital stock of $250,000, by D. K. Pope, R. L. Morehouse and others.

Leonard & Baynes, Metropolis, Ill., will install about $15,000 worth of sawmill and wood-working machinery at Mariana, Ark.

The Omaha Lead & Zinc Co., Okmulgee, Okla., has been incorporated, with a capital stock of $350,000, by E. J. Dick and J. S. Moore of Okmulgee and E. M. Cowherd of Boynton, and is in the market for mining and power-plant equipment.

The Missouri Pacific Railroad Co., E. A. Hadley, St. Louis, Mo., chief engineer, will install additional machinery in its shops and roundhouses at Hoxie, Ark., and Texarkana, Ark.

The Unit Portable House Co., Gulfport, Miss., O. W. Rosenthal, president, will equip a plant for the manufacture of portable houses for shipment to France.

The Mississippi Veneer Co., Sandersville, Miss., G. W. Headley, Jr., president, capital $50,000, will equip a mill of 25,000 ft. daily capacity. Bids for the machinery are being taken.

The Machinery Exchange Co., New Orleans, La., is in the market for 2000-hp. boilers, 1500-hp. condensing engine, and other machinery.

The Liberty Systems Corporation, Edwardsville, Ill., has been incorporated in Delaware, with a capital of $1,000,000, to manufacture accounting machines. S. F. Lloyd, L. A. Watters and E. L. Reel, Edwardsville, are the incorporators.

The St. Louis Aircraft Corporation, St. Louis, has been incorporated in Delaware, with a capital of $400,000, to manufacture airplanes. M. M. Clancy, Wilmington, Del., and Clement M. Egner, Elkton, Md., are the incorporators.

Texas

AUSTIN, Dec. 1.

The Southwestern Graphite Co. will install additional machinery and enlarge its refining plant near Burnet.

A. O. Thompson will install an irrigation pumping plant near Hereford.

The Galveston, Harrisburg & Santa Fe Railroad will develop water supplies and install pumping plants at Loco Marathon and Marfa.

W. L. Spence, El Paso, will build a saw mill near Alamogordo, N. M., which will have a daily capacity of 15,000 ft.

The Grayburg Hardwood Co., Grayburg, recently incorporated with a capital stock of $40,000, will build a lumber mill. W. F. Wallace is a stockholder.

The plant of the Tofte Boiler & Sheet Iron Works, Beaumont, which was recently destroyed by fire with a loss of $80,000, will be rebuilt. More than $60,000 worth of new machinery will be installed.

California

LOS ANGELES, Nov. 27

The San Pedro, Los Angeles & Salt Lake Railroad Co., Pacific Electric Building, Los Angeles, is having plans prepared for the construction of a one-story building, 65 x 80 ft., and two wings, each 65 x 220 ft., to its local repair shops.

The Los Angeles Shipbuilding & Drydock Co., Los Angeles, will build a one-story addition, 100 x 300 ft., to its works at San Pedro.

The Bennett-Montgomery Hardware Co., Los Angeles, has been incorporated, with a capital of $50,000, to manufacture hardware. Val F. Montgomery and L. A. Childs, Los Angeles, and B. B. Bennett, Pasadena, are the incorporators.

The American Aircraft Co., Los Angeles, recently incorporated, has increased its capital from $10,000 to $50,000.

The Central Machinery Mfg. Co., Los Angeles, will build a one-story machine shop, 41 x 122 ft., at 1629 San Pedro Street, near Sixteenth Street, to cost about $5,000.

The Cousins Tractor Co., Hanford, Cal., has been incorporated, with a capital of $100,000, to manufacture tractors. It will build a shop on East Seventh Street to specialize in repair work. H. R. Cousins and A. D. Ferguson are the incorporators.

The San Joaquin Light & Power Co., Fresno, Cal., is planning for the construction of a new hydroelectric power plant on the upper Kings River, near Hanford, to cost about $1,500,000. A. G. Wishon is general manager.

George Storey, El Centro, Cal., has acquired property at First and Main streets, Yuma, Ariz., and will establish works to specialize in automobile repairs. M. H. Powell is also interested in the enterprise.

The Pacific Northwest

PORTLAND, ORE., Nov. 26

With the settlement of the more important industrial strikes, an increased demand for marine engines and other machinery is noted. Notwithstanding the season, the logging and lumber industries are growing steadily. The placing of additional orders for steel vessels by the Shipping Board has led to the expansion of several shipyards, and the difficulties in getting machinery and parts from the East have caused an increase in manufacturing, particularly in the making of parts. The scarcity of cars is becoming more pronounced.

The Columbia River Shipbuilding Corporation, Portland, has petitioned the City Council for the vacating of Wood Street, preliminary to building an addition to its plant.

The Pocatello Engineering & Machinery Co., Pocatello, Idaho, has increased its capital stock to $100,000.

The White Pine Lumber Co., Bend, Ore., has completed plans for the erection of a lumber mill at Pringle Falls, with a daily capacity of 80,000 ft., at a cost of $140,000. A hydroelectric power plant of 2250 hp. will also be built.

The Sumner K. Prescott Co., Seattle, has succeeded to the business of the Hendricks Mfg. Co., and will install a department for the manufacture of trucks and attachments.

Olympic-Portland Cement Co., Bellingham, Wash., contemplates converting its oil-burning plant to a coal burner, and will install coal-pulverizing machinery.

The Seattle Veneer & Box Co., Seattle, is completing plans

for its proposed new plant on the Duwamish Waterway, the main building to be 80 x 200 ft.

The Martinoloch Shipbuilding Co., 308 California Building, Tacoma, which is building a plant at Quartermaster Harbor, reports that it has contracts for three auxiliary wooden vessels, each to be 250 ft. long.

The H. N. Rothweiler Co., Seattle, is establishing a factory, at an expenditure of $20,000, for the manufacture of the Rothweiler barrel pump and to turn out machined screw parts for machine and shipbuilding work.

It is reported that the shops of the Chicago, Milwaukee & St. Paul Railway Co., Tacoma, Wash., are to be enlarged. Electrification of the Milwaukee lines to Puget Sound will soon be completed.

The Astoria Marine Iron Works, Astoria, Ore., has started work on the first unit of its proposed new plant. The main machine shop will be 90 x 110 ft., and the foundry 60 x 110 ft., each two stories. It recently placed an order with an Eastern company for 300,000 lb. of forgings, which will be machined at the Astoria plant.

J. C. Corbin, Arcade Building, Seattle, consulting engineer, has been retained by a Canadian firm to design changes in their refrigerating plant in Victoria, at a cost of $25,000. It will be converted to electric drive and the capacity increased. Special motors and machinery will be installed.

Canada

TORONTO, Dec. 1.

The plant of the Alabastine Co., William Street, Paris, Ont., was destroyed by fire on Nov. 25 with a loss of $35,000.

The blacksmith and fitters plants owned by the Grand Trunk Railway at Brockville, Ont., which were destroyed by fire Nov. 25 with an estimated loss of $50,000, will be rebuilt. Machinery will be required to replace that destroyed by fire.

The Saskatchewan Co-operative Elevator Co., Port Arthur, Ont., will build an elevator at a cost of $450,000. The unloading capacity will be 12 cars per hr. and shipping capacity to the boats 45,000 bu. per hr.

The Canadian Northern Elevator "B" at Port Arthur, Ont., will be rebuilt at a cost of $500,000.

The T. H. Taylor Co., Ltd., Chatham, Ont., is in the market for a complete outfit of Jones underfeed stokers for two boiler installations, including engine, fan, etc.

The Canada Machinery Corporation, Galt, Ont., will dismantle and re-erect in Galt a brick and steel building owned and used by it in Hamilton, Ont.

The Ker-Carb. Ltd., Toronto, has been incorporated with a capital stock of $20,000 by James H. Spence, 46 King Street West, and others, to manufacture electrical apparatus, etc.

The Renfrew Refrigerator Co., Ltd., Renfrew, Ont., has been incorporated with a capital stock of $100,000 by Robert Handley, Alexander Blue, and others, to manufacture refrigerator machinery, etc.

The Auto-Printing Register Co. of Canada, Ltd., Toronto, has been incorporated with a capital stock of $50,000 by John Schiappacesse, Detroit, Mich.; Alexander M. Snyder, Toronto; Henry D. Petrie, Hamilton, and others, to manufacture printing, vending and recording registers.

The Grand Trunk Railway, Montreal, will erect a machine shop at Lindsay, Ont., to cost about $40,000.

The Dominion Bridge Co., Montreal, proposes to install a plant at Lachine, Que., for the manufacture of marine forgings, etc.

The St. Clair Foundry Company's plant on the Esplanade, Toronto, was damaged by fire with a loss of about $10,000.

The McLean Brothers' shipyard at Mahone Bay, N. S., has been leased to Montague Mahaffy and is being extended so that three ships can be built. A new mill is being erected and heavier machinery and air compressors for driving pneumatic tools will be added.

The ratepayers of Whitby, Ont., have carried a by-law to loan $25,000 to the United Rubber Mfg. & Reclaiming Co. of Toronto. The company will commence at once the erection of a factory, 60 x 160 ft., to cost $15,000. It is reported that $25,000 worth of machinery will be installed.

The plant owned by the Cranbrook Sash & Door Co., Cranbrook, B. C., destroyed by fire with a loss of $40,000, will be rebuilt. New machinery will be purchased.

The Imperial Munitions Board, Ottawa, has received instructions from the British Government to issue contracts for shrapnel, 4.5-in., and 6-in. shells to Canadian firms properly equipped.

The International Engineering Co., Amherst, N. S., will build an addition to its molding shop to cost $4,000.

The Canadian Swift Packing Co. will build a plant at Maillardville, B. C., to cost $750,000.

The Dominion Cement Co., Ltd., 92 Notre Dame East, Montreal, will build a plant to cost $100,000. J. A. Vinet, 92 Notre Dame East, is secretary and treasurer.

The Polson Iron Works, Frederick Street, Toronto, will build a galvanized-iron pattern mill and joiner shop to cost $10,000.

The Adams Brothers Harness Mfg. Co., 204 King Street East, Toronto, will build an addition to its factory to cost $60,000.

Sproatt & Rolph, 36 North Street, Toronto, have prepared plans for a foundry for W. H. Banfield & Sons, 372 Pape Avenue, Toronto, to cost $4,000.

The Canadian Copper Co., Copper Cliff, Ont., is having plans prepared for a one-story brick machine shop at Creighton Mines, Ont., to cost $10,000. J. G. Agnew is manager.

The foundry owned by Charles Lake, 46 West Street, Brantford, Ont., was destroyed by fire Nov. 30 with a loss of $50,000.

NEW TRADE PUBLICATIONS

Steel Sash.—David Lupton's Sons Co., Weikel and Westmoreland streets, Philadelphia. Pamphlet entitled, "Air, Light and Efficiency." Pertains to the part played by building design and the installation of various types of sash in securing the maximum output from a plant. After a brief general discussion of this subject, numerous installations are illustrated and described. A description of the several types of the sash and the devices employed for their operation is included.

Pressure and Draft Recorders.—Bacharach Industrial Instrument Co., 422 First Avenue, Pittsburgh. Catalog D. Explains the design and construction of the Hydro pressure and draft recorders with illustrations of the different types. Mention is made of the application of the recorder in different fields of industry and specimen records are included.

Ball Bearings.—S. K. F. Ball Bearing Co., Hartford, Conn. Pamphlet. Refers to the use of ball bearings in woodworking machinery. A concise statement of the reasons leading to the use of these bearings chief of which was the ability to get higher speeds is given, followed by a brief description of the bearing and its application to different types of woodworking machinery. Only the machines in general use such as band and circular sawing, planing, surfacing, jointing, shaping and grinding machines and lathes are covered. In each case a short statement of the advantages of the bearings for that particular machine is given, the text being supplemented by numerous halftone engravings of the machines themselves and line drawings showing the way in which the bearings have been installed.

Metal Cutting Saws.—Simonds Mfg. Co., Fitchburg, Mass. Booklet entitled "Saws Sammy Showme Saw." Is a series of 12 advertisements showing the various uses to which metal cutting saws of different styles can be put. These include the production of shells, the cutting of forgings, bar stock, rails, etc., slotting screws and cutting-off structural shapes. Illustrations of the blades in use are presented in every case with brief descriptions of the work that is being done and the time required to do it.

Thread Milling Fixture.—Hall Gas Engine Co., Inc., Bridesburg, Philadelphia. Pamphlet. Calls attention to a fixture for producing threads by the milling process on automobile, gas engine, aircraft, talking machine and small ammunition parts, thin tubing, etc. The work which the fixture will do and the way in which it does it is described in considerable detail, the text being supplemented by numerous illustrations.

Wood Boring Machines.—Oliver Machinery Co., Grand Rapids, Mich. Circular. Describes a universal vertical and horizontal wood boring machine which can also be employed for drilling holes in metal and for doing the work of routing, shaping, buzz planing or sanding machines. The construction is gone into at some length and the text is supplemented by a number of views of the different driving arrangements that can be employed. Mention is made of a line of cutters for use on a boring or profiling machine for working out small core boxes, making fillets and routing. A number of views of the work that has been done by the cutters are included.

THE IRON AGE

New York, December 13, 1917

ESTABLISHED 1855

VOL. 100 : No. 24

Cutting the Cost of Cupola Charging

What the Modern Foundry Co. Has Accomplished with an Electric Elevating Platform Truck Equipped with a Beam Scale

As a general rule operating costs inside a foundry have heretofore received almost exclusive attention, while the question of the saving to be effected on the outside has been given comparatively scant consideration. The Modern Foundry Co., Oakley, Cincinnati, has lately made some experiments with a view to reducing its yard expense. One of these is the employment of an electric elevating platform truck built by the Automatic Transportation Co., Buffalo, and redesigned by its Cincinnati sales engineer, C. E. Ogden, who added a scale attachment.

A sufficient number of platforms are provided and in charging the cupolas the operator of the truck picks up an empty one, conveying it to the scrap or pig-iron pile, where the requisite amount of material is loaded. With a beam scale on the truck it is only necessary for the operator to set the scale for the desired amount of metal, and as soon as this is loaded on the platform it is conveyed to an elevator that carries it to the cupola platform. A Stuebing hand-lift truck is used on the charging platform for removing the load from the elevator and conveying it to the charging doors of the cupola. This arrangement does away with the necessity for the electric truck to remain on the elevator to remove the load at the top.

The labor saving effected in the yard is estimated around 50 per cent over the former method of handling pig iron and scrap. The foundry company also states that a great advantage of the system is that the proper proportion of pig iron and scrap is obtained without the usual delays in weighing the material. A small electric light is provided to assist the operator in making a correct reading of the truck load on the scale beam when the truck is used at night. The necessary current is supplied from the storage batteries that operate the truck. The batteries are charged at night or at any other time when the truck is not in use.

The truck is the four-wheel type with a wheelbase of only 51 in., so that it can be turned in a very small amount of space. The lifting mechanism is operated by an individual motor. The truck has a



The Use of an Elevating Platform Storage Battery Industrial Truck Equipped with a Scale Beam Capable of Reading from ½ to 4200 Lb. Is Claimed to Have Effected a Material Reduction in the Cost of Cupola Charging at the Plant of the Modern Foundry Co.

capacity of 2000 lb. and can be operated at a speed of from 7 to 8 miles per hr. The scale is capable of weighing from ½ to 4200 lb. The truck has also been found convenient in handling castings and conveying them to different parts of the foundry where wanted.

LABOR CONSCRIPTION

Secretary Wilson Does Not Believe That It Will Be Necessary

WASHINGTON, Dec. 11.—The possibility of labor conscription to render more effective the prosecution of the war, the policy of the Government in the treatment of disputes during the war, and the attitude which employers and employees should assume toward each other with a view to minimizing all forms of labor disturbance, are the leading topics discussed in the annual report of Secretary of Labor Wilson, which has just been made public here. The Secretary defends the right of wage earners to organize and deprecates the efforts of employers to prevent such organization, declaring that if workers were not prevented from uniting, labor disturbances could be better controlled through the pacifying influence of conservative and responsible leaders.

Mediation Under War Conditions

"The number of labor disputes calling for Government mediation increased suddenly and enormously with the beginning of the war," says the Secretary. "A majority of the employers and employees involved in industrial controversies evinced a keen desire to secure the good offices of the Department of Labor through its conciliators and to take advantage of the machinery created under that section of the organic law of the department the purpose of which in this field of its activities has been the fostering of industrial peace on a basis of industrial justice. During the four years the Division of Conciliation has been in existence, the foundation has been laid to aid materially in the quick adjustment of such disputes. It had been demonstrated that the intervention of an impartial third party in the person of a conciliator approved by the department invariably has expedited the settlement of a dispute which had culminated in a strike or a lockout. In a large number of instances, the conciliators have been able not only to bring about agreement in cases of existing differences—often arising from misunderstandings—but to avert the threatened strike altogether.

The magnitude of the conciliation work from the beginning of the war to the date of this report is shown by the fact that, since war was declared on April 6, 1917, the Department of Labor had assigned "commissioners of conciliation in 521 new cases made up of 281 strikes, 212 disputes that threatened a suspension of work, and 28 lockouts. It has been successful in satisfactorily adjusting 323 of these; has been unable to adjust 43; has 104 cases pending, a comparatively small number of which have reached the strike stage; and in 51 cases its commissioners found on their arrival that the matters in dispute had been settled or that the plant was in operation and the former employees had secured work elsewhere. The number of employees directly affected in the labor disputes settled by the department's conciliators or pending and in process of adjustment since the declaration of war—April 6, to Oct. 25, 1917—total 572,029, while approximately 380,954 were affected indirectly.

Organization of Labor

With the coming on of the war, traditional cleavages between employers and wage earners were accentuated. Rights of wage earners to organize, which some employers have conceded, others have opposed, although Secretary Wilson declares that this opposition has subsided as war conditions have developed.

"The explanation of those who oppose labor organization," the report continues, "is to the effect that if labor organization were permitted in their establishments, excessive and unreasonable demands would follow. To this it is replied that if workers were not prevented from organizing abuses of organization could be better controlled."

Conscription Not Necessary

Concerning conscription of labor, the Secretary says: "Should industrial conscription become really necessary in order effectively to prosecute the war, a policy less likely to be considered one-sided would be desirable. It would seem—that is, if workers were to be conscripted for industrial purposes—that the working opportunities to which they were assigned ought to be commandeered, so as to make such workers not coerced servants of employers but employees of the Government itself

"There is, however, no reason for apprehending a necessity for any kind of labor conscription in order to settle or prevent disputes between employers and their employees which may interfere with a vigorous prosecution of the war. In every case in which responsible representatives of disputing employers are willing to negotiate considerately with responsible representatives of conservative labor organizations which represent their disputing employees in the spirit in which they would negotiate with business competitors, labor disputes can be settled speedily, effectively, and without friction through the mediation service of the Department of Labor. By simple and fair systems of collective bargaining between the Government, labor organizations, and business organizations, all labor disputes prejudicial to an effective prosecution of the war can be promptly eliminated from war problems. Not only can this be done, but it can be done to the satisfaction of all concerned and in harmony with every patriotic purpose.

"Our greatest need is the spirit of self-sacrifice for the common good—a sacrifice of our pride, sacrifice of our prejudices, sacrifice of our suspicions against each other, sacrifice of our material comforts, sacrifice of our lives, if need be—to carry on unimpaired the democratic institutions handed down to us by our fathers."

Largest Lake Ore Shipments for November

Iron-ore shipments down the Lakes from the Lake Superior region in November were the largest ever recorded for that month. The total was 7,333,828 gross tons as compared with 5,715,452 tons in November, 1916, an increase of 1,618,376 tons or 28.31 per cent. The Duluth and Two Harbor ports and the Great Northern dock all made large gains over November last year. The following table gives the November and season shipments by ports, and the corresponding figures for 1916 in gross tons:

	November, 1917	November, 1916	To Dec. 1, 1917	To Dec. 1, 1916
Escanaba	838,096	772,417	7,000,870	7,279,899
Marquette	327,113	273,801	3,197,213	3,820,452
Ashland	900,241	665,339	7,503,479	7,935,185
Superior	1,516,162	1,132,642	13,769,433	12,626,473
Duluth	2,583,620	1,982,872	20,270,617	21,455,345
Two Harbors	1,168,596	888,381	9,845,814	10,530,944
Total	7,333,828	5,715,452	61,587,426	63,648,298
1917 increase	1,618,376	.....	.....	.....
1917 decrease	.....	.....	2,060,872	.....

To Dec. 1 this year the total of 61,587,426 tons is 2,060,872 tons, or 3.23 per cent less than the record total of 63,648,298 tons to Dec. 1, 1916. The Duluth percentage of the total to Dec. 1 was 32.91 per cent, as compared with 33.71 per cent a year ago. That of the Great Northern Dock, however, was 18.50 per cent this year, or greater than its 17.20 per cent share of the total by 1.30 per cent.

A fleet of 22 White trucks are operated for general freight haulage between New York and Philadelphia and to other cities by the Beam-Fletcher Corporation, Philadelphia. They leave Philadelphia at 8 o'clock at night to reach New York at 6 a. m. and another group leaves New York at 5 p. m. due to reach Philadelphia at 3 a. m.

Combination Bolt Washer and Locknut

A new type of locknut that is a combination of a bolt, washer and nut, is being placed on the market by the Permanent Prdoucts Co., Engineers' Building, Cleveland. Among the important features claimed for this nut are its simplicity in construction and application, and that it does not require an extra length of bolt or an extra nut. The bolt is similar to a standard bolt except that it has tapered grooves on opposite sides, these grooves gradually lessening in depth from the end of the bolt and extending to a point slightly above the threaded portion. The washer has two inner lugs that fit the grooves on the bolt. The nut has a chuck on each of its lower edges.



Tapered Grooves in the Sides of the Bolt Receive the Internal Lugs on the Washers of a New Combination Locknut and Avoid Engagement with the Threads for Locking

In application the washer is slipped on the bolt to a point where the inner lugs come in contact with the base of the tapered grooves. The nut is then applied and this comes in contact with the washer, which is forced back, if necessary as far back as the end of the threaded portion of the bolt. The tapered grooves cause the washer to bind equally in the base of the grooves on both sides thus anchoring the washer without engaging the threads, and allowing the nut and washer to be applied in complete contact with the parts being bolted regardless of any variation in the thickness of the bolted parts and to be locked in that position. The nut is locked by upsetting the outer edge of the washer into any one of the chucks on the nut with a chisel. The nut can be easily unlocked by forcing back the upset portion of the washer.

Eight Thousand Men Wanted for Navy's Air Service

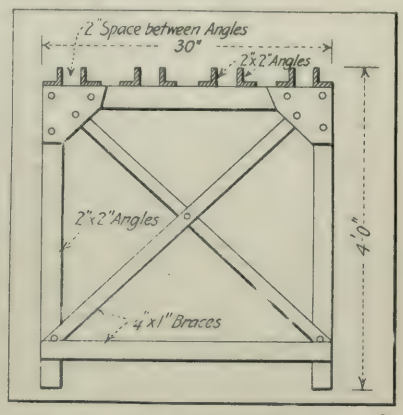
For the further extension of the aviation branch of the United States Navy, Secretary Daniels has authorized the enlistment of 8000 young men and in doing so has opened up most attractive opportunities in this new and unusually appealing service. There is an important and immediate need for mechanicians for Naval aviation for the ratings of machinists' mates, carpenters' mates, quartermasters, coppersmiths and blacksmiths. These men will not be enlisted for pilot's duties but coming into the service with a general mechanical turn and a liking for the work they will receive a special and unusual training for the building, handling, repairing and overhauling of the Navy's air craft. Succeeding in this they will be used as the ground personnel of the flying corps.

The requirements for enrollment will be the same as those for the regular service of the United States Navy. Training for machinists' mates and quartermasters will last about three months. Carpenters' mates will train for approximately six weeks. On completion of training course the provisional landsmen, after examination, will be rated first or second class petty officers on the basis of examination and all around ability. After getting a rating, they will be eligible for promotion to the next higher grade if they show fitness and pass the necessary examination.

The Philadelphia Foundrymen's Association held its monthly meeting at the Manufacturers' Club, Philadelphia, Wednesday evening, Dec. 5. D. S. Apeldorn of Apeldorn & Beatty, representing a gas engine manufacturing company, talked on gas for power, lighting and drying cores. The Electric Furnace Construction Co., Finance Building, Philadelphia, was proposed for membership.

Rack for Hammers, Cutters and Sledges

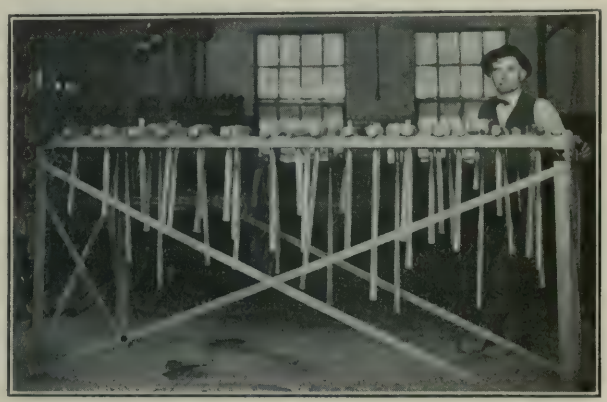
In the plant of the Youngstown Sheet & Tube Co., Youngstown, Ohio, hammers, cutters and sledges when not in use are kept in a rack that is made of angle iron. The rack was developed by the rigger foreman who has charge of these tools. Only tools which are safe to use are kept in the rack, and emphasis is laid upon the importance of arranging the tools in an orderly fashion.



An End View of the Rack, the Dimensions of Which Can Be Varied If Desired

The maintenance of this rack, according to J. M. Woltz, safety director of the company, has eliminated to a great extent accidents resulting from the usage of improper cutters and hammers. Tools that have mushroomed heads or dull edges are kept in a separate pile and taken to the shop to be redressed before being placed in the rack. Other advantages resulting from the installation of the rack are the ability to pick out readily any special kind of cutter, diamond point or sledge that may be required, thus enabling the output of the plant to be increased by just that much. Inspections of the tools by the shop foreman or tool boss can also be made thoroughly and at frequent intervals.

The dimensions shown in the end view, while those of the rack of the Youngstown plant, are merely suggestions, it being possible, of course, to make the rack wider or longer should conditions in another shop render this desirable and the spaces between the angles supporting the tools can be varied to accommodate different sizes.



An Angle Iron Rack for Hammers, Cutters and Sledges Insures an Orderly Arrangement of These Tools and Facilitates Their Inspection and the Elimination of Those Having Mushroomed Heads or Dull Edges

Improving Cast Iron with Uranium

By alloying uranium with cast iron or semi-steel the strength and toughness of the metal is increased, as well as the fluidity, according to a patent (U. S. 1,247,252—Nov. 20, 1917) granted to Joseph M. Flannery, of Pittsburgh, and assigned to the Standard Chemical Co. of that city. The quality of the iron for machinery is claimed to be enhanced and the resistance to wear increased. The new alloy is made by adding uranium to the molten iron as uranium metal or as ferrouranium, so that the finished product will contain from 0.05 to 1 per cent of uranium. The addition of this element is said to deoxidize and denitrogenize the metals, increasing the tensile strength and producing a fine-grained product.

WAR ORGANIZATION

Centralization of Administrative Authority Advocated—Grave Condition Demanding Leadership

AT a meeting of the Taylor Society, organized to promote the science of management, held at Washington, Dec. 8, an address was made on the special need at this time to win the war of a co-ordinated working organization. It was made by Henry P. Kendall, member storage committee, War Industries Board, Council of National Defense; treasurer Plimpton Press, Norwood, Mass.; president Lewis Mfg. Co.; treasurer Slatersville Finishing Co., and the following is an abstract:

The problem of mobilizing and training a fighting organization is not an industrial problem except as to general principles of organization. The rapidity of the mobilization and training, however, depends very largely on the thoroughness with which the industrial aspects are handled.

Auxiliary Departments

The plan must provide for the complete organization of every unit, and the co-ordination of units without overlapping, and must bring the control of the different divisions and their sub-divisions and auxiliary departments directly to the desk of the Secretary of War. By auxiliary departments, I refer to such things as the formulation and control of standards, the control of transportation and purchasing, of finance and accounts, of priority, statistics, labor, personnel, etc. Such departments would tend to standardize and co-ordinate their particular kinds of work in each regular division, such as a supply division like the engineers or the signal corps. An auxiliary department would carry on the super-planning and control of what in each supply division would correspond to an independent function.

It is obvious, for instance, that the purchasing of food supplies for the quartermaster's department should be handled by men expert in that line who would be a part of the quartermaster's department, but because purchasing involves transportation and priority, it should have a super-control in an auxiliary department. This does not weaken the effectiveness of any supply division, but serves to co-ordinate it.

How They Would Bring Results

The men handling the auxiliary divisions should be men with the broadest kind of experience and vision who understand and work with the general principles rather than with specific commodities. The same principle would hold true of transportation and of the other auxiliary functions. Standard practices should be worked out, but a compromise with existing practices effected where necessary. The transportation system of the country will be taxed to its limit. The movement of goods and troops will require the most careful scheduling.

The storage facilities of the country are already overtaxed. Great assembling depots at industrial centers, to act as reservoirs, from which through car and train-load shipments could be made to the terminal ports, with assembly stations at these points, should be placed under such control that full cargoes could be assembled at the wharves for the steamer before its arrival. There should be such centralized control, including the scheduling of the steamers and their cargoes for all ports, that the military has simply to requisition from the various supply divisions according to their needs with the knowledge that their requisitions will be promptly filled.

Transportation and storage require perhaps the largest new organization developed in the war and because these two form the neck of the bottle, they become two of the most important problems. They are auxiliary departments. Each supply division and subdivision should be completely manned and completely organized under functional control. The auxiliary departments should control these for the purpose of coordination and interrelation.

It is obvious that in the quartermaster's department, men buying textiles should be familiar with the textile industry and market practices and conditions. It is obvious at the present time different supply divisions should not compete through their separate purchasing departments on cotton duck. The equipment of the country has already been scheduled and is under control. It is obvious that the purchase of munitions is highly technical and requires men of special training. The purchase of drugs and medical supplies is also a specialized field. The transportation, storage, finances, and accounts, and standards of the supplies common to all must be subject to interdepartmental control. The same principles would also apply to building contracts, the sources and supply of labor, wages, and the selection of the personnel for the rapidly growing governmental departments. Such a combination of functional responsibility within each division and sub-division, all building up to a final control, requires imagination, experience, vision, and great wisdom now. Such work cannot be entrusted to any but the ablest minds of demonstrated capacity.

No Time for Democratic Evolution of Organization

In time of a hurricane at sea, even when the signs have been recognized and all possible preparation made, there comes a time when the accumulated experience of a lifetime on the part of the captain, the officers and men of the crew is put to a crucial test. This accumulated experience may never before have been given a test in the lives of any, but there can be no faltering. There must be a constant and effective control. Each function must work properly and no time can be allowed for training, coaching or trying experiments.

To-day, the signs of three years have been wrongly interpreted. The hurricane has broken. We have abundant men on deck and below decks to form a perfectly working crew to handle every rope and every gear. We have no time for the bumping along and arriving at organization through the previous methods of a democratic evolution. Strong men of vision must be put into the controlling positions. The spirit of the crew, thanks to democracy, is fine. They will take responsibility. To organize them will call for the finest spirit of democracy with the keen insight of science of organization to determine the one best way. If the plan is not soon made, our men may be holding to the life lines to be kept from being washed overboard at the time when they should be manning the ship. The spectacle of the men who are to-day carrying the loads in Washington and elsewhere is a great tribute to democracy. The best of democracy with the best organization which an autocracy can plan, which the spirit of science will work out, must be developed.

The first electrically driven reversing mill installed in South Wales, according to the *Iron and Coal Trades Review*, London, has recently been put in operation at the Monmouthshire Steel & Tinplate Co.'s works. The mill is designed for a maximum output of 40 tons per hr. of tin-bars, 8 by 7/16 in., weighing 12 lb. per ft., this bar being rolled from a 1600 lb. ingot 11¾ x 9½ in. in section, 10 passes being taken in the blooming mill and five in the finishing mill. The maximum rated intermittent capacity of the reversing motor is 5300 hp. with variable speed up to 180 r.p.m. in either direction. The flywheel set is driven by a 1800-hp. motor at a speed of 500 r.p.m.

The general offices of the U. S. Reduction Co., whose works are at East Chicago, Ind., have been moved from Chicago to East Chicago. The change was made with the idea of having the plant and offices in the same location. The company will still maintain a local sales office in Westminster Building, Chicago.

The Carroll Steel Co. has moved from 120 Broadway to larger quarters in 15 Park Row. Andrew T. Hines, formerly purchasing agent of the General Vehicle Co., Long Island City, and the Steel Producers Export Co., New York, is general manager of the New York office.

Organization of the Western Electric Co.*

Ideal Is Highly Developed Functional Management with Adequate Central Control—Units in 41 Different Cities

BY H. A. HALLIGAN

LOOKING back over the life of the business of the Western Electric organization, now in its forty-sixth year, we see that it has been a steady growth and evolution away from decentralized control toward functional management with a central control. With a decentralized scheme of control, it is undoubtedly possible to carry on a large volume of work with an untrained force. As the force becomes better trained, specialists find their way to the front. Recognizing their ability, the executive looks about for the widest possible use in his organization for the services of these experts. Here is the beginning of a trained personnel which may lead to a staff and line organization or to a pure functional organization. In either event, there must be a central control of the executive work in order to attain that greater economy and efficiency which is the goal of our ambition. A management may be so decentralized that there is little or no relationship or co-ordination among the parts themselves and between the parts and the executive. On the other hand, I have seen control so centralized that the units cannot even buy a pound of tacks or a paper of pins in an emergency.

Delegating and Defining Authority

For our own organization, we believe in central control over departments divided according to their respective functions, but with authority for action within the departments delegated to responsible subordinates as many steps down the line as possible.

We adopted the general theory that the responsibility and the authority of each executive must be clearly established. For this reason, we have our organization record, which is a statement of the duties, scope and functions of each general department. It includes charts for each department, showing the names of those in charge and their lines of authority and responsibility. In certain cases the descriptions of duties are supplementary, and in some cases they explain advisory relations and relations not involving direct authority and responsibility. Similar records exist within the departments, so that each individual in the employ of the company may have his place and may know what his relations should be to those about him.

Having thus located the persons making up the organization in their places in the plan, we undertook to define broadly the policies of the company as a guide for action to the executives throughout the country. This is in line with our policy that executives must be thoroughly grounded in the fundamental policies as a basis for forming sound judgments which they must make upon their individual responsibility. To carry out this purpose we have what is known as a series of general instructions, which set down our policies on such subjects as:

Employment and leave of absence.
Employees' pensions, disability and death benefits.
Employees' changes in rates of pay.
Standards of service.
Complaints and claims.
Reports required.
Execution of contracts and bonds.
Matters requiring action of board of directors.

Next, it is of equal importance to safeguard the relations with employees. The employee must be sure of a square deal. He must be certain that promotion is based on efficiency. There must be neither nepotism nor favoritism, and the best man must invariably get the job.

We believe that the trained employee is the best investment to the company. To that end we select our people with the greatest care, having a highly organized plan for this purpose. Recognizing that a sound body is a prerequisite to skill in any form of work, we subject each applicant to a physical examination. Having qualified for a position and been assigned to one, we then afford these young men and women many opportunities for self-improvement through the company's educational facilities.

General Scheme of the Organization

The organization itself is one with a general executive department, with the work subdivided among seven functional departments, namely: Sales, engineering, purchasing, manufacturing, accounting, treasury and legal. These departments control their respective functions throughout the company and delegate authority for action down the line. This plan is applied to a working force of 30,000 employees, of which the largest units aggregating about 20,000 employees are located at one place. The remainder are located in 41 of the principal cities and elsewhere throughout the United States.

The sales department is responsible for the execution of the commercial policy of the company, for the kind and quantity of articles manufactured and the quantity of merchandise bought for resale. It determines the selling prices, has charge of the advertising and renders service to customers from its warehouses throughout the country.

The engineering department is responsible for the design of all apparatus manufactured by the company, and also has the final responsibility for the quality of the product manufactured.

The purchasing department oversees all purchases and conducts the company's relations with its principal suppliers.

The manufacturing department is in charge of the company's manufacturing plant and its operation.

The comptroller has oversight over the accounting work of all departments and acts as auditor of the funds placed with the treasurer.

The treasury department has charge of the funds of the company and the credits and collections from customers.

The legal department guides the company's course of business in accordance with the requirements of the law and is in charge of all matters of contracts and taxation.

Relation of Sales to Other Departments

The sales department is organized on a staff and line basis. The general executive of the sales department is surrounded by a staff of sales specialists, experts in the marketing of the articles which we sell. He also has reporting to him an administrative assistant who is the executive of the line organization composed of the sales offices and distributing warehouses throughout the country. This executive has a staff of specialists in the different branches of his work, who are occupied in devising improved methods of work, teaching the personnel of these local houses and inspecting the results of their performances from time to time.

The line organization of the sales department is made up of these sales offices and distributing warehouses, each in charge of a manager responsible for

(*Continued on page* 1467)

*From a paper read before the Taylor Society, Washington, Dec. 8. The author is vice-president of the Western Electric Co.

Trade Commission for Contract Abrogation

Would Overturn the Steel Industry in Particular and Give Control of Prices to the President—More Industrial Investigations

WASHINGTON, Dec. 11.—An urgent recommendation for the passage of the Pomerene bill specifically authorizing the President to fix prices in the iron and steel industry and, if necessary, to control the distribution of its products is contained in the forthcoming report of the Federal Trade Commission, coupled with an expression of belief that the public welfare demands the abrogation of many of the existing contracts. The commission also urges the importance of a permanent record of the work now being done by the semi-official advisory committees representing the various industries, one of the chief functions of which is the arranging of purchases of war material. An appropriation to enable the commission to secure detailed information concerning the operations of corporations engaged in the production of basic materials is asked, and it is suggested that if an adequate sum be granted much data of value to the consuming public could be collected and distributed.

Cost Investigations in Iron and Coal

"Just before the close of the fiscal year ended June 30, 1917," the commission says in referring to its investigation of the iron and steel industry, "the President called upon the commission for assistance in ascertaining the costs of production of various materials for the Government in the prosecution of the war. Only a little work on this subject was done before the end of the fiscal year, which was chiefly in connection with the costs of steel and lumber for shipbuilding and of coal for the Navy. Since then the work has been greatly expanded and has been made to cover practically entire industries whether all the producers were engaged in supplying the Government or not. This was due to the policy of the Government, in insisting on reasonable prices for its own purchases, to procure them also for the public. In the case of fuel, particularly coal, the establishment by law or agreement of a general price regulation for such commodities has made this course necessary.

"In the ascertainment of costs of production of coal and with respect to other data regarding the coal industry, the commission has worked in close co-operation with the Fuel Administration. For most products, however, the prices are not fixed by law but by voluntary agreements with the producers. In respect to such products the commission has ascertained and is continuing to ascertain costs and other data for the use of the President, but has not been charged with the duty of negotiating prices. Among the chief commodities for which costs have been and are being currently obtained are coal and coke, iron ore, iron and steel products of numerous kinds, various petroleum products, particularly fuel oil and gasoline, lumber, especially for shipbuilding, cement, firebrick, copper, lead, zinc, aluminum, nickel and certain other metals or alloys, including in some cases finished manufactures thereof, and certain food products required by the Army and Navy, especially certain canned food products.

For Government Control of Steel Prices

"The experience of this Government in the question of fixing prices is one that has been carefully followed by the commission, which has furnished extensive data for this purpose to the Fuel Administration and to the War Industries Board. The commission has also had under consideration the experience of other countries in this matter, and particularly England and her colonies, France and other Allies. It is convinced that price fixing by authority of law will have to be extended to other products than food and fuel, and that such authority is preferably exercised with respect to the iron and steel industry, for which a bill has already been introduced in the Senate. Equally important, in its opinion, with the fixing of reasonable prices is the regulation of the distribution of the raw materials and intermediate products in the industry affected and of the distribution of the final products to the consumer. In this connection also should be considered the question whether bona fide contracts made prior to the passage of a price-fixing law should be allowed to be enforced. This commission is of the opinion that the exact merits of the proposition might differ somewhat in different industries. With respect to the iron and steel industry, however, it believes that the greatest public advantage would be attained by not allowing such contracts to be fulfilled, at least over long periods of time. In the case of coal, it is the opinion of the commission that the continued fulfillment of long-term bona fide contracts of sale made prior to the enactment of the law would militate against the most successful operation of price fixing by the Government."

To Check Intercompany Stockholding

An interesting statement is made in the report, of the scope of the investigation which has been planned pursuant to a provision of the Clayton act containing certain prohibitions against intercompany stockholding and interlocking directorates. The law charges the commission with the enforcement of these provisions, but no adequate appropriation for the purpose has been made. In urging that Congress provide the funds necessary for this work the commission says:

> While the commission has in some instances intervened to prevent suspected projects in violation of these provisions, it is obvious that unless some systematic investigation is made of the conditions many violations of law will escape observation or detection. The commission therefore directed that a preliminary investigation should be made of the general situation in so far as the available published sources of information were concerned as a basis for a more thorough study of this matter. Comprehensive and up-to-date information on this subject is hardly attainable without a systematic requirement for corporation reports covering these relations followed by a careful study of such data to determine whether the relations so discovered bring the parties in question within the prohibitions of the statute.
>
> In the case of intercompany stockholding, it should be noted, the prohibition applies to cases "where the effect of such acquisition may be to substantially lessen competition between the corporation whose stock is so acquired and the corporation making the acquisition, or to restrain such commerce in any section or community, or tend to create a monopoly of any line of commerce." A similar rule is made against a holding company acquiring the stock of competing corporations. With respect to interlocking directorates the prohibition applies only to certain corporations where any one of them has a capital stock, surplus, and undivided profits aggregating more than $1,000,000, and then only in case the companies so related "are or shall have been theretofore, by virtue of their business and location of operation, competitors, so that the elimination of competition by agreement between them would constitute a violation of any of the provisions of any of the anti-trust laws."
>
> It is evident, therefore, that in addition to a very comprehensive survey of these relations between corporations it would be necessary to examine particular cases with great care, both economically from the standpoint of their com-

petitive situation and legally from the standpoint of the applicability of the anti-trust laws under the circumstances found to exist. This work, therefore, is large in extent and would involve a greater expenditure than the funds hitherto available to the commission would make possible in view of the various other duties imposed upon it by law. Adequate provision for the enforcement of these provisions of law is obviously necessary.

To Sift Out Overdone Industries

The desirability of a comprehensive general survey of the operations of corporations and of a more particular examination of those which are engaged in the important and basic industries of the country is urged by the commission. With respect to a general survey of corporations the commission points out that it would be of great utility to the Government and to the general public, including the business world, to have a more complete record of the financial results and conditions in each industry. Accurate data, for example, regarding the extent of investment and the average profits in the various industries, the commission believes, would tend to prevent the undue development of those in which profits are unreasonably low and to encourage investment in those in which they are inordinately high. Such a result would be of great benefit not only to the business world, but to the public generally. At the same time data should be obtained regarding the output of each concern and its relations with other companies which would be of assistance in the investigations of intercompany stockholding and interlocking directorates.

Data on Particular Industries

An unsuccessful attempt has been made by the commission during the past year to obtain on a voluntary basis brief reports from manufacturing concerns classified by industries. It was intended after compiling these returns to send to each concern reporting a statement of the combined results of the inquiry with respect to the industry in which the reporting concern was interested. While the questions asked were such that, in the commission's opinion, every manufacturing concern should be able to answer them without difficulty and with little or no labor the returns were disappointing. In a large proportion of cases they were incomplete and in frequent instances of doubtful accuracy. In view of these facts the commission felt constrained to withhold the issuance of the combined statements originally planned. The work proved to be of considerable value, however, as indicating the desirability of more intelligent accounting methods in business and also proved that if the commission attempted to organize any system of reports from corporations generally it would have to begin on a very modest scale as to the scope of information required, and that if for particular basic industries it was desired to have really comprehensive data it would be necessary to organize the work slowly and after going carefully over the whole plan with the producers themselves. To carry this work further will require a considerable appropriation which the commission urgently recommends.

In this connection it suggests the desirability of amending the Federal Trade Commission act in those provisions which relate to the power of the commission to require reports in such a manner as to make it explicit that reports may be demanded from individuals engaged in commerce as well as from corporations.

New Limit on Interlocking Directorates

Since the convening of Congress on Dec. 3 the Judiciary Committees of both the Senate and House have decided to report with a favorable recommendation resolutions postponing until Jan. 1, 1919, the effective date of section 10 of the Clayton act which forbids interlocking directorates of railroads and manufacturing concerns. The effective date of this section has been postponed twice, and, in the absence of further legislation, it would go into force Jan. 8, 1918. The matter is of very general interest to the readers of THE IRON AGE, as a number of the railroad directorates aimed at by the Clayton act are made up in part of leading men in the iron and steel industry. It is probable that the resolutions will be finally passed before the holiday recess. W. L. C.

MILLIONS FOR WAR

Very Large Appropriations Will Be Asked—Heavy Guns for France

Estimates submitted by the Secretary of the Treasury at the beginning of the new session of Congress last week call for appropriations of more than $13,500,000,000 for the fiscal year beginning July 1, next, of which more than $11,000,000,000 in round figures will be required for actual war purposes, an amount $2,000,000,000 in excess of the corresponding appropriations for the current fiscal year. Inasmuch as the total appropriations for all purposes for the current year have exceeded $18,000,000,000, it is altogether probable that supplemental allotments aggregating several billion dollars will be requested during the new fiscal year.

The war estimates include no less than $6,615,936,000 for the military establishment, $3,504,918,000 for fortifications, and $1,014,077,000 for the navy. The enormous appropriation for the military establishment contemplates the maintenance of an army of 1,500,000 men whose pay will aggregate $1,804,000,000. Under the head of the Ordnance Department are included the following large items: General ordnance stores, $25,500,000; manufacture and purchase of ammunition for small arms, $390,000,000; manufacture and purchase of ammunition for practice and instruction, $75,200,000; manufacturing, procuring and repairing small arms, $50,000,000; repairing ordnance and stores, $93,400,000; purchase, manufacture and repair of automatic machine rifles, $237,144,000; purchase, manufacture and repair of armored motor cars, $75,550,000. These figures are considerably in excess of the appropriations for the current fiscal year.

The estimates covering the manufacture and purchase of heavy guns for use in France are carried under the general head of "fortifications" although they are disbursed under the direction of the Chief of the Ordnance Bureau. They include the following items: Purchase and manufacture of mountain, field and siege cannon, $2,897,000,000; purchase and manufacture of seacoast cannon for coast defense, $12,200,000; purchase and manufacture of ammunition for seacoast cannon and for modernizing projectiles on hand, $6,060,000; for alteration of mobile artillery, including the purchase and manufacture of machinery, tools, and materials, $310,500,000; purchase and manufacture of ammunition, sub-caliber guns and their accessories for mountain, field and siege artillery, $93,000,000. The total estimates for fortifications represent an increase of $1,155,000,000 over the appropriations for the current year.

The enormous appropriations made last summer for the navy, which have not yet been expended, have enabled the Navy Department to reduce certain of its estimates, although some of the largest items show big increases. The total amount estimated for the pay of the navy for the fiscal year beginning July 1, next, is $213,239,000 as against $126,532,000 for the current year. The estimate for expenditures on account of naval aviation calls for $94,000,000, an increase of more than $30,000,000. Other important items include the following: procuring ordnance material, $25,594,000; machinery and equipment for gun shops for the Washington naval gun factory, $2,500,000; new batteries for ships of the navy, $38,309,000; ammunition for vessels, $32,686,000; torpedoes and appliances, $1,000,000; reserve ordnance supplies, $33,000,000; ma-

chinery for war vessels, $50,000,000; completion of vessels now building, $60,000,000, coal and other fuel, $48,400,000.

Under the heading of public works, the Navy Department asks the following appropriations for various yards and stations: Portsmouth, N. H., $489,000; Boston, $75,000; New York, $1,600,000; Philadelphia, $2,400,000; Washington, $40,000; Norfolk, Va., $3,450,000; Naval Academy, $2,275,000; marine recruiting station, Port Royal, S. C., $100,000; Charleston, S. C., $1,400,000; Key West, $25,000; New Orleans, $450,000; Mare Island, Cal., $1,200,000; Puget Sound, Wash., $200,000; Tutuila, Samoa, $50,000; Guam, $100,000; Guantanamo, Cuba, $200,000; naval magazine, Hingham, Mass., $30,000; Indian Head, Md., proving grounds, $160,000; Iona Island, N. Y., $18,000; Fort Lafayette, N. Y., $26,000; torpedo station, Newport, R. I., $250,000; additional torpedo and ordnance stations (new) $250,000; training station, Newport, $110,000; training station, San Francisco, $75,000; training station, Great Lakes, $35,000; marine barracks, Peking, China, $25,000; marine barracks, San Diego, Cal., $1,500,000; fuel depots, $750,000; operating base, Hampton Roads, $2,500,000.

Butterfield & Co., Rock Island, Que., have recently completed the erection of a complete plant for the production of small tools and are now in a position to take orders for all kinds and styles of twist drills and milling cutters, in high-speed or carbon steel. They are especially equipped to handle orders for drills, milling hobs, etc., used in the making of shells and other munitions.

The name of McLain's System, Inc., 906 Goldsmith Building, Milwaukee, has not been changed to the McLain-Carter Furnace Co. as announced in THE IRON AGE of Nov. 29. The latter company is a separate organization which will market the oil burning open-hearth furnace formerly sold by McLain's System.

Tin Plating with Coke Oven Gas*

An installation of 22 furnaces utilizing coke oven gas having a heating value of about 525 B.t.u. has been made by the Surface Combustion Co., Long Island City, N. Y., at the Baltimore sheet and tin plate plant of the Bethlehem Steel Co., Sparrows Point, Md. In the process of coating steel or iron with tin the raw material consists of black sheets usually about 20 x 28 in. in size and varying in thickness from No. 26 to No. 33 gage. These are pickled in dilute sulphuric acid to remove the scale and stored under water in portable steel tanks from which they are taken as needed and fed into the tin bath.

The furnace employed for the purpose consists of a firebrick setting built around a rectangular cast-iron pot or bath of special design. This measures approximately 5 x 9 ft. and when filled to the working depth of 11 in. contains 11,000 lb. of tin. A partition extending the full length of the pot divides it into halves and has a slot near the bottom extending throughout its entire length. One compartment is filled with molten tin covered with a flux of zinc chloride through which the sheets are fed into the bath, while the other compartment, the sides of which are higher, contains palm oil through which the sheets emerge from the bath. A set of gear driven rolls are provided for drawing the sheets through the tin as they are fed in by the operator.

All of the burners employed in the furnaces operate on the high-pressure system with single-valve control and one pipe for distribution. The gas is supplied to the plant at a pressure approximately of 10 lb. per sq. in., which eliminates all blowers and compressors. The burners are of the impact type and heat refractory beds in the combustion chamber. This chamber is located under that portion of the pot where the cold sheets are fed into the bath and the burners supply all the heat needed for normal operation. The arrangement of the burners and the chamber is shown in the right portion of the left

*From information obtained from William J. Harris, Jr., engineering department, Surface Combustion Co., Long Island City, N. Y.



980 Lb. of Steel Sheets Was Coated with Tin in One Hour in a Furnace Employing Coke Oven Gas to Keep the Tin in a Molten Condition



The Left Compartment of the Tinning Pot Contains Palm Oil and in the Adjoining One Tin Covered with a Flux of Zinc Chloride Is Kept in a Molten State; at the Right the Construction Has Progressed Further and the Supply Pipe for the Burner Which Warms up the Pot when Work Is Started for the Week Is Shown

section of the group engraving. The passage of the sheets through the outlet side of the bath is relied upon to supply all the heat required under ordinary conditions. When the pot is being warmed up at the beginning of the week, it is necessary to apply heat to the outlet compartment, and for this purpose a single large burner of the non-refractory bed type is provided at the left end of the combustion chamber. This will be noticed in the right portion of the group illustration underneath the set of rolls which have been removed from the bath.

In a test made of the installation 7850 lb. of steel sheets was coated at a temperature of 650 deg. Fahr. in 8 hr. The amount of gas consumed was 5376 cu. ft. having a heating value of 525 B.t.u. This was at the rate of 980 lb. per hr. with a gas consumption of 672 cu. ft.

Labor Turnover Records

A paper was presented at the meeting last week in New York of the American Society of Mechanical Engineers by Richard B. Gregg, New York, on labor turnover records. From it the following notes have been taken:

By measurement and analysis we can determine, or at least approximate, the cost of losing a worker in a particular position and training another. These costs may be roughly divided into overhead costs and operating costs.

Among the overhead costs there are:

1 More rapid depreciation of machinery because of ignorance or lack of skill of new workers.

2 Extra floor space and extra machines to provide against idleness of a certain amount of machinery due to shifting labor.

Operating costs may include any or all of the following:

1 Time of increased superintendence or office work, including:
- *a* Time spent by foremen or superintendent in discharging a worker where that is the way the vacancy occurred.
- *b* Time spent by foreman or other workers in training the new employee.
- *c* Time spent by clerks on additional payroll or other records.

2 Machine costs, covering:
- *a* Time machinery is idle when a new worker cannot be obtained immediately.
- *b* Idle machinery for temporary stoppages due to ignorance or lack of skill of new worker.
- *c* Repairs to machines or renewals of tools broken for the same reason.

3 Material costs, including:
- *a* Waste or damaged material due to ignorance or lack of skill of new worker.
- *b* Difficulties in subsequent processes due to poor work by new employees in previous processes.
- *c* Lower production while new employee is working up to his best skill.

4 Additional accident cost due to higher rate of accidents among new employees.

These two kinds of overhead costs and four groups of operating costs, while not exhaustive, serve to illustrate the method of observation, recording, measurement and analysis which is just as helpful in this aspect of the matter as elsewhere. With knowledge so obtained the factory manager is in a position to estimate more truly the importance of this problem and to judge whether he can afford to take certain steps to reduce the turnover.

As is probably well known, those who have made the most careful studies of this question find that it costs about $10 to replace an ordinary laborer, and as much as $300, and perhaps more, to replace skilled workers. The cost varies of course with the nature of the position. The total losses are, of course, enormous. Magnus Alexander, in his well-known study, estimated the losses in a group of twelve metal working factories in a single year at not less than $831,000. The annual loss from high labor turnover in a particular textile mill employing about 2000 workers is estimated as at least $20,000. These instances could be multiplied.

It should be remembered, moreover, that none of these estimates include the losses to the employees or the community. What frequent job shifting means to the employee and his family in terms of frequent house moving, ill-feeling, discouragement, bitterness, decrease of skill, lowering of pride and self-respect, we have no means of measuring. What it means to the community and nation in terms of underemployment and unemployment, increased pauperism and drinking, inefficiency, and social friction, we cannot even estimate.

Production of Fluorspar in 1916

The production of fluorspar in the United States in 1916 was larger than in any previous year. The output was 155,735 net tons as compared with 136,941 tons in 1915 and 115,580 tons in 1913, according to Ernest F. Burchard in a U. S. Geological Survey Bulletin 666-CC on "Fluorspar." Prior to 1905 the production was less than 50,000 tons per year. Up to 1908 it fluctuated, but in 1909 it began to increase, owing to the more general recognition of its value in making open-hearth steel. The 1916 imports were only 12,323 tons as compared with 22,682 tons in 1913. American fluorspar deposits have proved ample to supply more than the mineral needed to make up for the decrease in imports.

Two hundred employees of the American Car & Foundry Co., at Terre Haute, Ind., are on strike for a 40 per cent increase in wages.

Fixing of Prices for Naval Contracts

Secretary Daniels Discusses Important Topics—Policy as to Plant Additions—Demand for More Yards—Labor Questions

WASHINGTON, Dec. 11.—The fixing of prices for naval contracts and the determination of fair methods of cost accounting constitute features of the forthcoming annual report of the Secretary of the Navy that will be examined with interest by all manufacturers. The problem of modifying cost-plus-profit agreements so as to protect the Government without imposing hardship on the contractor has received special attention at the hands of the department and a plan has been worked out that has operated very satisfactorily as to a number of important transactions. In the purchase of material, however, the department at times has invoked the somewhat arbitrary method of fixing the prices it will pay, demanding the delivery of the material and giving the seller the option of accepting payment in full at the department's figure or 75 per cent thereof with the privilege of bringing suit in the Court of Claims for the remainder.

More than a year ago, the Secretary says, it became evident that it would be very difficult to place reasonable contracts at stipulated prices for a number of battle cruisers authorized by Congress because of the size of the contracts, the time over which they would extend (three years or more) and the uncertainty of labor and material costs. Congress had authorized the Secretary of the Navy to contract for these vessels on the basis of "actual cost plus a reasonable profit to be determined by him." As none of the important shipyards would undertake the work at an upset price or within the limit of the appropriation, Congress granted additional money and thereafter contracts for these vessels were let on a cost-plus-profit basis.

The Department's Definition

For the purpose of determining actual cost, as to which hardly any two accountants would agree exactly, the department adopted a definition embracing the following items:

(a) The cost of raw materials entering into the manufacture;

(b) Running expenses, including rentals, cost of repairs and maintenance, heat, power, insurance, management, salaries and wages;

(c) Interest paid within the taxable year on debts or loans contracted to meet the needs of the business, and the proceeds of which have been actually used to meet such needs;

(d) Taxes of all kinds paid during the taxable year with respect to the business or property relating to the manufacture;

(e) Losses actually sustained within the taxable year in connection with the business of manufacturing such articles, including losses from fire, flood, storm or other casualty, and not compensated for by insurance or otherwise; and

(f) A reasonable allowance according to the conditions peculiar to each concern, for amortization of the values of buildings and machinery, account being taken of the exceptional depreciation of special plants.

To insure the correct ascertainment of cost and to guard against extravagance the department organized a compensation board composed of distinguished officers of the navy whose function it was to pass finally upon all expenditures under these cost-plus contracts. Cost inspection officers were ordered to all of the private yards engaged in naval construction the operations of which have been followed with minute attention. No large expenditures for material can be made until the price has been approved by the compensation board and the inspection system of the department is such that it is believed that no large extravagance or misdirection in labor can escape detection and correction.

Plant Additions

The compensation board has another very important function. It was necessary, under the conditions, for many contractors to increase their plants in order to undertake the work required, with the expedition necessary. They claimed—and with much justice—that these extensions were not warranted by their business, would cost much more under present conditions than in a normal market, and might be valueless to them when the emergency has passed. It was impossible to make stipulated-sum contracts in connection with these necessary extensions which would be fair to all concerned, in view of the uncertainties existing. The department's policy has been in such matters to provide the necessary facilities, either of a temporary or permanent nature. Special temporary facilities, movable tools, etc., have been usually provided at the cost of the Government, the tools to remain the property of the Government, and the salvage value of the temporary facilities also to belong to the Government. Permanent improvements and extensions of plant have been financed up to various percentages by the Government, but upon termination of the contract, settlement is to be made upon the basis of the then value to the contractor of such improvements in his plant, the result being that in the end the Government would pay the extra cost necessitated by providing these improvements now, and the contractor would pay the actual value to him of the improvements when the contract has been terminated and the work done.

Naturally the question of this value may be expected to be a somewhat controversial one. The department has insisted, in all improvements having to do with building ships—except in a few special cases—that this final value shall be ascertained and determined by the compensation board, composed wholly of naval officers. It is believed that all contractors will be treated fairly by the board of distinguished officers who will pass upon such matters, and the department much prefers that its own officers should have this determination, as it will undoubtedly avoid much complication.

Contracts Modified

Since March 1, 1917, a number of contracts previously made at stipulated sums have been modified to the cost-plus-profit basis. This has been done for one of two reasons: either it was necessary to accelerate the progress upon construction or to delay certain vessels to enable other vessels to be speeded up. In either case, the action necessary made such a radical change in conditions under which work was to be carried out that it seemed advisable to change the basis of the contract. As a general rule, the percentage of profit has been fixed at 10. In some of the latest vessel contracts, however, a somewhat different plan has been adopted, a fixed sum being allowed for profit, which is slightly under 10 per cent on the present estimated cost of the vessels; should the final cost fall below the estimated cost, the contractor and the Government divide the saving. Expenditures under these contracts also are strictly under the control of the compensation board.

While the contracts for new vessels have probably involved more difficult problems than any others, there have been more or less difficulties with other contracts, such as for provisions and supplies for the fleet, and material of all kinds for the work carried on in navy yards. In many cases, the proposals received for supplies have appeared unreasonable, even considering the conditions of the market. Contracts for such materials and supplies do not usually involve long periods in production between the time of placing the order and the delivery of supplies, so that there is a better opportunity for contractors to ascertain costs and bid at fixed prices. Moreover, conditions at the works producing such materials and supplies were not such that the department could ascertain for itself the exact cost, as

it does in shipyards, without prohibitive expense and delay.

Awards at Stipulated Prices

The policy of the department has been in all such cases to adhere as far as possible to awards at stipulated prices. When bids appear too high, investigations have been carried on to determine reasonable costs to contractors and reasonable prices under the conditions. Prices have been fixed accordingly and orders placed under the authority vested in the President by the naval appropriation act approved March 4, 1917, and the urgent deficiency act approved June 15, 1917.

In this way supplies have been secured at prices deemed generally satisfactory under present conditions and it is hoped that the complications and uncertainties involved in cost-plus-profit contracts can be avoided. Such contracts are not to be made except in emergencies, and even then only when contracts at a fixed price are impracticable. The department has sought in every possible way to safeguard the contracts on this basis, which necessity impelled.

Navy Yard Policy

Referring to the work of the special board appointed with Rear Admiral Helm as chairman to investigate and report as to the desirability of expanding existing navy yards, to enable all of them to build warships. The Secretary says:

"The study of this commission, composed of able officers, is convincing proof of the wisdom of utilizing all the navy yards and stations which have been constructed in former years, and of the necessity of providing still others if our Navy is to expand. A careful reading of the report will be a complete answer to the propaganda waged for years for abandoning all the navy yards hitherto established except two on the Atlantic, and to establish an entirely new one on the Pacific, abandoning those already in use. Every navy yard that can not be profitably used and is not needed should be abandoned, but this war has taught us that we cannot depend, for so wide a coast line as the Atlantic for example, upon two yards."

During the past year, the Navy has greatly increased its force of skilled labor and the drafts that have been made upon the labor market of the country on this account may be gathered from the fact that the number of civilian employees under the direct pay of the Government has increased in the various navy yards from 35,650 to 60,866. The department has had the co-operation of the Civil Service Commission, the Department of Labor, and the American Federation of Labor and various international unions in the procurement of skilled workmen.

After extended conferences with representatives of the men employed and with the assistance of organized labor, a new scale of wages was put into effect on Nov. 1, and it has been agreed that this scale shall continue in force for one year. Increased compensation was provided in every navy yard to practically every trade employed.

Concerning the department's project for naval construction for the coming year, the Secretary calls attention to the three-year program adopted pursuant to the act of Aug. 29, 1916, embracing 167 vessels to be begun prior to July, 1919, and recommends that Congress at the present session authorize the completion of that program, which will include three battleships, one battle cruiser, three scout cruisers, nine fleet submarines, two fuel ships, one transport, one destroyer tender, one ammunition ship and one gunboat.

W. L. C.

The reorganization of the Stegeman Motor Car Co., Milwaukee, truck manufacturer, involves the following changes in the official personnel: Adam J. Mayer has been elected president to succeed Oscar Stegeman, who resigned. Lynn S. Pease has been elected secretary-treasurer to succeed L. G. Schertl, resigned. E. M. McLean, formerly advertising manager Four Wheel Drive Auto Co., Clintonville, Wis., has been appointed sales manager. The company will continue to build six-cylinder, worm-driven trucks exclusively.

THE SMALL TURBINE SITUATION

Standardization to Reduce Costs—Performance Guarantees Not Important

SPECIFICATIONS customarily applied to small non-condensing turbines used for driving auxiliary machinery were deprecated by W. J. A. London, steam turbine department, General Electric Co., West Lynn, Mass., in a paper presented before the American Society of Mechanical Engineers at its annual meeting in New York last week, as being unnecessarily severe and entailing production costs which necessitate higher selling prices than would obtain if less rigid, but in his opinion equally satisfactory performance requirements were demanded. A commercial analysis of the Terry, Westinghouse, Curtis and Kerr types of small turbines leads him to believe that standardization of specifications, including consumption, regulation and overload guarantees, will eliminate many of the misunderstandings which now arise between manufacturer and customer, reduce the selling price and increase the popularity of the turbine driven unit. A review of his paper follows:

Steam Consumption and Speed Regulation

For small non-condensing turbines driving auxiliary machines, high thermal efficiency is in many cases unnecessary because of utilization of exhaust steam. Also the class of labor employed to look after auxiliaries, together with the adverse conditions under which these usually operate, make simplicity and durability more important than efficiency. The turbine manufacturer to-day builds one line of machine. Any machine sold subject to a witness-test is necessarily one of a lot of these machines. If this meets its guarantee of steam consumption it is only fair to assume that the others cannot be far off the mark. The witness test clause in specifications is, therefore, frequently unnecessary and its elimination would reduce the cost.

A speed-regulation guarantee is necessarily important in such work as generator drive, but is of no importance when the speed of the turbine is primarily governed by a pressure regulator as in the case of a boiler-feed pump or forced-draft set controlled in a similar manner. Yet the manufacturer usually puts in his 2 per cent clause. Even with the generator drive the average clauses are too exacting for the good of the customer. The compensated-wound generator can give flat compounding with a large speed variation and a reasonably large speed variation means stable governing, whereas a sensitive governor means instability and a tendency to hunt. To obtain close variation on test means delicate fitting and adjustment of the governor valve. The valve must shut absolutely tight, and any valve built this way is subject to cutting in service; whereas, if a wider speed variation were permissible a more durable valve could be installed.

Load Ratings and Limitations

There is a tendency to introduce the maximum-rated standard of load requirements into small turbine specifications and it is the only proper competitive basis. Experience shows that it is not feasible to order a turbine without an overload margin to take care of reasonably expected errors in estimating the capacity of a pump. The turbine builder knows this and frequently finds that the addition of another jet above that necessary to meet the contract is a good investment. This does not lead to fair competition among turbine makers. The worst feature is that in some cases in a cut-price job the pump maker relies on the overload capacity of the turbine to give him full load at the pump. The adoption of the maximum-rated standard by all turbine makers and rigid adherence to it would in a great measure solve this problem.

The limitations of the turbine must be impressed on the customer. As long as he thinks it can be loaded up to the breaking-down point, like a motor, there will be dissatisfaction if the machine fails to carry full load when the steam pressure drops. With a condensing machine, considerable variations in initial steam pressure can

take place without materially affecting the output, but in a non-condensing machine a multiplicity of small deviations from the contract conditions, each insignificant in itself, can have a very marked effect on the output, as indicated in the table:

	Steam Press, Lb.	Quality, Per Cent	Back Press, Lb.	Hp.
Specified conditions	150	100	0	100
Operating conditions	140	98	2	83

Responsibility for Operating Performance

There is a deplorable lack of co-operation between the average turbine builder and many of the pump and blower builders. If a unit after erection is reported unsatisfactory and the report goes to the pump builder, he almost invariably assumes the trouble is in the turbine and calls upon the turbine maker to send a man to remedy it before he makes an investigation as to the performance of his own apparatus, and vice versa if the original report goes to the turbine maker. This state of affairs encourages the purchaser to buy from firms manufacturing composite units.

One of the hardest propositions confronting the manufacturer is the collection of expenses when the trouble has been entirely due to the operating engineer's neglect. If this engineer knows at the outset that investigational expense of trouble caused by his own negligence is to be charged against him, he will make sure of his ground before he risks the displeasure of his superiors by showing his incompetence to adjust the machine or by running up unnecessary bills in his department.

Alignment Problems

As a factor in the performance of the composite unit alignment of the turbine with the driven machine is important. Where the unit is built in one shop the designer has a distinct advantage, inasmuch as he can design both ends to make one rigid unit. The average socalled flexible coupling will not satisfactorily take care of misalignment. The bedplate cannot be commercially designed so it will stay true from test floor to foundations, and, no matter what care has been taken in the shops, realignment after erection is necessary. Various methods have been advanced to eliminate this, such as the three-point support and the three-bearing unit with the elimination of the flexible coupling. The latter is practicable where one firm builds the whole unit, but otherwise, up to the present, it has not worked out satisfactorily. To overcome this trouble, the Steam Motors Co. has recently developed a turbine supplied with only one bearing and a solid coupling for connecting to the driven apparatus. By taking a standard pump or blower and removing one bearing and fitting a solid coupling to the shaft, the combination of steam motor and pump becomes a two-bearing unit, with a shorter bedplate and the elimination of misalignment troubles.

Discussion

O. D. H. Bentley, manager, engineering turbine department, B. F. Sturtevant Co., Hyde Park, Mass., agreed with Mr. London that a flexible coupling cannot take care of misalignment and that the bedplate will not stay true from test floor to foundations. Realignment after erection is necessary, but when this is properly done it will be maintained indefinitely, provided a suitable foundation is used. Engineers, he said, seem to agree that a turbine rotor mounted between two bearings is preferable to the overhung type. The overhung type is cheaper and will occupy less space, but is more likely to give trouble.

A. G. Christie, associate professor, mechanical engineering, Johns Hopkins University, expressed his opinion that the days of cheap coal are past, that in the future economizers will be more extensively used, and that this will make desirable high efficiencies from auxiliaries. Turbines, he believes, can be improved to give better economies without increasing manufacturing costs. He agrees with Mr. London's statement that engineers are frequently unreasonable in their guarantee specifications, but believes this due to the reluctancy with which manufacturers give out data pertaining to operating performances under various conditions.

C. P. Crissey, New York, stated that one guarantee point is sufficient. He believes that good results can be obtained from a two-bearing unit having a small overhung turbine wheel, but that these should be manufactured by makers of combined units. He advises customers to guard against two or three-bearing units that have not been operated with the same distances between bearings, the same diameter of shaft and the same loads on the shaft. He believes that a code should prohibit bearing temperatures of 250 deg. Fahr.

Dimensions of Open-Hearth Furnaces

V. Grum-Grzhimailo, a prominent Russian metallurgist, has published in a recent issue of the *Journal* of the Russian Metallurgical Society a table of the increased dimensions he suggests for open-hearth furnaces used for making steel by the ore process as compared with those used in the scrap process. Basing his calculations on data furnished by Mr. Pavlov in a previous issue of the same journal, he arrives at the dimensions shown in Table 1 (converted into English equivalents) for furnaces used in the scrap process. The type of hearth adopted for his calculations is rectangular in shape, with a bottom width of 1.2 m. (about 4 ft.), and with slopes forming an angle of 26½ deg. with the horizontal. The initial depth of the bath is assumed to be 40 cm. (about 15¾ in.). While in the scrap process the bath only increases about 1½ times in volume, in the ore process, owing to the more vehement ebullition, the bath increases as much as from 2 to 2½ times in volume. Consequently, to save undue wear of the sides and roof of the furnace, provision has to be made for an increase of about 17 to 18 per cent in the surface of the bath, as shown in Table 2. The author gives cross sections for two 30-ton furnaces. Up to a level of ½ m. (about 1 ft. 8 in.) the two sections are alike, but in the case of the hearth for the ore process provision is made for an extra depth of 0.2 m. (about 8 in.) for the bath, and the angle of the slopes in this portion is made 45 deg., giving a top width of 3.6 m. (about 11 ft. 10 in.), as against 3.2 m. (10 ft. 6 in.) in the hearth for the scrap process. The increase in width of the surface of the bath works out at from 17 to 18½ per cent.

Table 1—Scrap Process

Capacity of Furnace, Tons	Dimensions of Bath, Ft.	Surface Area of Bath Sq. Ft.	Height of Roof from Bath, Ft.	Cubic Contents of Combustion Space, Cu. Ft.
15.....	21.32 × 8.52	181.70	5.25	954
20.....	23.45 × 9.18	215.29	5.91	1,271
25.....	26.25 × 9.84	258.35	6.15	1,589
30.....	27.89 × 10.50	290.64	6.56	1,907
40.....	31.00 × 11.48	355.22	6.56	2,543
50.....	34.45 × 12.46	430.57	7.15	3,178
60.....	36.74 × 13.12	484.39	7.87	3,814

Table 2—Ore Process

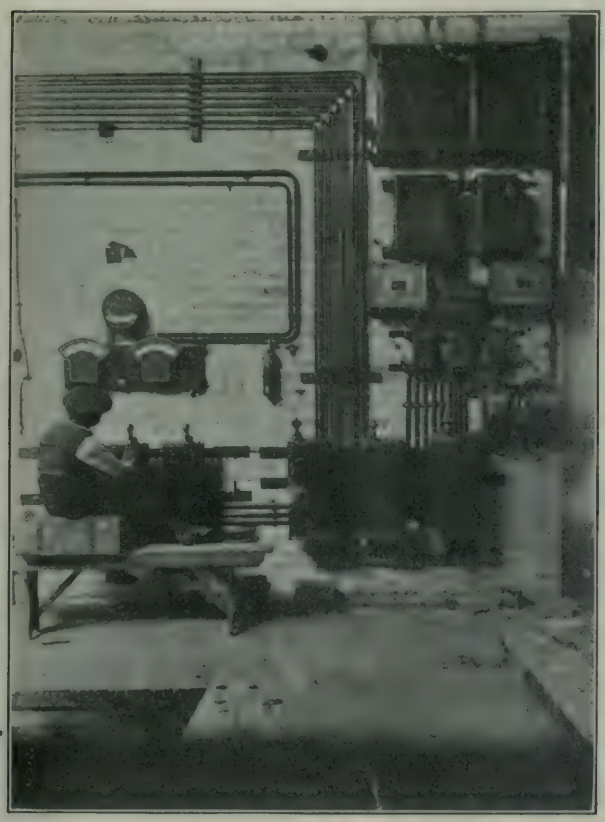
Capacity of Furnace, Tons	Dimensions of Bath, Ft.	Surface Area of Bath Sq. Ft.	Height of Roof from Bath, Ft.	Cubic Contents of Combustion Space, Cu. Ft.
15.....	22.37 × 9.57	215.29	4.43	954
20.....	24.61 × 10.33	254.04	5.00	1,271
25.....	27.47 × 11.07	304.63	5.21	1,589
30.....	29.20 × 11.81	344.46	5.53	1,907
40.....	32.41 × 12.89	417.66	6.09	2,543
50.....	35.96 × 13.98	502.69	6.32	3,178
60.....	38.39 × 14.76	566.20	6.73	3,814

The Toronto plants of the Canadian Fairbanks-Morse, Ltd., are preparing to turn out a new order recently received by the company from the American Government for 1,500,000, 75 mm. shells, which have been ordered from a number of Canadian concerns within the past month. The plant is now being prepared to turn out the new order as expeditiously as possible. The company is also engaged upon filling an order for 300,000, 6-in. shells for the Canadian Government. These two orders will keep the plants of the company engaged until next fall.

The Ingersoll-Rand Co. has commenced the employment of female labor at its works at Phillipsburg, N. J. About 30 women are now employed to operate drill presses and shapers.

Electric Steel Furnace Operated by a Boy

The photograph reproduced below comes to THE IRON AGE as an illustration of the human interest side of steel making. It was taken recently during



The Hand Operation by Boys and Girls in England of Greaves-Etchells Electric Steel Furnaces

the production of a 2-ton nickel-chrome-vanadium steel heat in a 2-ton Greave-Etchells electric furnace at the plant of Thomas Andrews & Co., Ltd., Sheffield, England. From the standpoint of electrical equipment the illustration is of little interest. The furnace, however, is entirely hand-operated by means of a tramway type of control worked in conjunction with recording ammeters, and the point of special interest is the furnace operator, particularly his size. A boy runs the furnace regularly. Other furnaces of this type in England are being operated similarly, but at present mostly by girls owing to the shortage of male labor. Such results, it is suggested, would have been ridiculed only a few years ago. The three controllers on the right represent the electric crane control for the ladle, etc.

To ascertain the value of army motor trucks as a means for rushing out details of men for patrol or skirmish duty at points too remote to be quickly reached by cavalry, or when the call is too urgent to await the assembly of railroad cars, a test was recently made on the Dixie highway between the cantonments at Atlanta and Chattanooga. The truck beat the time of the fastest train between the two points. A White truck with a body designed by Lieut.-Col. Hugh J. Gallagher, depot quartermaster at Atlanta, was used. The troops sit back to back lengthwise of the body and their rifles, when not immediately needed, may be stored in rifle chests built between the backs of the seats. The foot rails and arm rests protect them from being swayed or thrown off when rounding corners at high speed or moving rapidly over rough roads. The footrail is hinged and lowered to serve as a step when mounting. Each man's personal equipment is carried in lockers under the seats. Special lockers are provided for 500 rounds of ammunition for each man. In the rear is a compartment holding three days supply of the non-perishable components of rations.

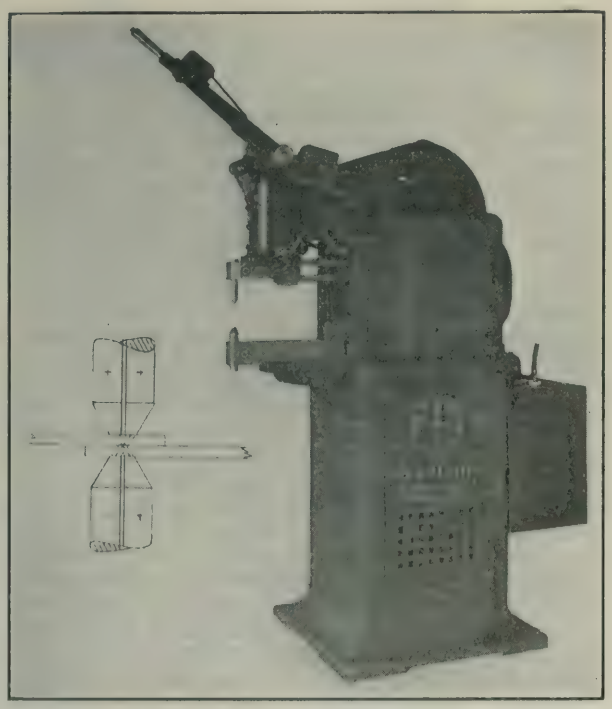
New Machine for Heavy Spot Welding

Under a patent granted to A. C. Taylor, the Taylor Welder Co., Warren, Ohio, is manufacturing a new electric welding machine. The operating principle differs somewhat from the machines now on the market in the employment of split rather than solid electrodes. This arrangement enables heavier work to be handled as well as permitting the machine to operate on polyphase current without unbalancing the line.

The lower horn and the upper point holder, together with the welding electrodes themselves, are split and insulating material is interposed between each piece. This, it is pointed out, permits the electrodes to be separated and steel pressure dies placed between them. It is thus possible to pass two or more separate currents of high amperage in a bias direction through the metal and when a welding temperature has been attained additional pressure may be applied with the dies to complete the weld. The copper electrodes are not subjected to any more pressure than is required to make a good electrical contact, being used only to carry the current and not to sustain the heavy pressure required to force the material together and complete the weld. In this way it is possible to spot weld material, particularly that which exceeds ¼ in. in thickness.

In addition to separating the electrodes the leads from the secondary of the welding transformer are also split and are crossed where the connection is made to the lower horn. This, it is explained, causes the current to be crossed as illustrated by the dotted lines in the sketch at the left of the machine.

The ability to use the machine on polyphase circuits without unbalancing the line, it is emphasized, is an advantageous feature since spot welding machines generally require single-phase current for their operation. It is further explained that when machines of this kind are



The Use of Split Electrodes in a New Spot Welding Machine Enables Material ¼ In. and Heavier to be Handled

operated on polyphase circuits there is a tendency to unbalance the line which is objectionable if the liens are heavily loaded or the generator employed is of small capacity.

Plans for the new plant which the Niles-Bement-Pond Co. will build at Kearny, N. J., are being prepared by Harris & Richards, architects, Drexel Building, Philadelphia. Preliminary estimates fix the cost of the buildings and equipment at $2,000,000 to $3,000,000. There will be several buildings, which are to be used for the manufacture of machinery and machine tools,

Mechanical Engineers Discuss War Work

Effect on Profession, Employment of Women, Conservation of Fuel and Inspection of Munitions Are Topics of Annual Meeting

ENGINEERS can no longer restrict themselves to their technical profession but must prepare to assume new and greater industrial and social obligations. This was the keynote of the thirty-eighth annual meeting of the American Society of Mechanical Engineers held in New York last week, expressed by Dr. Ira N. Hollis, the outgoing president, in an address before a section of the society devoted exclusively to the discussion of topics relating to the public duties of engineers in times of crises. Public service, he emphasized, is the first duty of the engineer; a duty which under present conditions is particularly urgent, and which, continuously expanding, is likely to embrace, as a permanent part of engineering, Government work requiring a knowledge of the humanities as well as technical training. The engineer, he said, must study history, the science of government and the problems of labor that he may grow to the maximum of his possibilities. Professor Dexter S. Kimball of Cornell University, speaking on the relation of industrial management to engineering brought out a co-ordinate thought. He said that engineering is broadening to include fields formerly not considered related to the profession and its ramifications are now so extensive that redefining the aims of the society would be appropriate. Industrial management, he emphasized, is a legitimate part of engineering work.

Engineers in Government Work

Regarding the needs of the Government for the co-operation of engineers and their influence on its activities, Dr. Hollis pointed out that a large part of the business of the country relates to industries, transportation and engineering enterprises, and yet, he said, there is hardly a man in Congress who has a grasp of engineering matters. As an instance of what can be accomplished by putting a trained man at the head of a department, he cited the case of Mr. Hoover. Mr. Scott at the head of the War Industries Board and Mr. Coffin at the head of the industrial survey, were other examples to which he referred of what the engineering profession may contribute to the success of the Government. Dr. Hollis further pointed out that forces antagonistic to freedom are likely to develop. The war, he said, will create many millionaires and will strengthen trade unions into autocratic groups with powers to define what each individual shall be permitted to do and what wage he shall receive. He urged that the engineers co-operate to counteract any such tendency.

Gano Dunn, chairman of the Engineering Committee of the Council of National Defense, pointed out, as an indication of the willingness of engineers to give their services to the Government, that there is not yet on record a single case of an engineer failing to serve promptly and faithfully the Government after having been requested to do so. He said that engineers stand ready to respond by severing their business connections and sacrificing their incomes.

Technical Education as Affected by War

Interest was manifested in technical education as affected by the Government's enforcement of draft regulations, discussed by Dr. Charles S. Howe, president of Case School of Applied Science. He emphasized that if present methods are carried out there will be no teaching of engineering in colleges in a few months and that this phase of the question is of vital importance both from the Government's and industry's point of view. Colleges, he said, have lost from 20 to 30 per cent of their students, and cannot supply one-quarter of the engineers needed to-day. He urged that something be done before Dec. 15 as the ruling of the Government that after this date students may not voluntarily enlist has created a feeling of uneasiness which is tending rapidly to deplete the colleges of men. Students, he pointed out, naturally fall in Class A, and, he believes, are all likely to be taken in the next draft. If all men over 21 years of age are to be taken from the colleges he urged that adequate consideration be given to the possibilities of training sophomores and freshmen for particular services by changed methods and curricula.

The Coal Problem

One session of the convention was devoted to the study of power plant problems. In this session the preventable waste of coal in the United States was discussed by David Moffat Myers, consulting engineer, Griggs & Myers, New York, and a commercial analysis of the small turbine situation was presented by W. J. A. London, steam turbine department, General Electric Co., West Lynn, Mass. The latter paper is reviewed elsewhere. Mr. Myers pointed out that the large plants which are consuming fuel wastefully, in many cases, he believes, more wastefully and carelessly than ever before, are needlessly causing a large part of the existing car shortage and are counteracting other measures of efficiency in production and distribution. By employing proper operating methods in boiler plants he believes it easily possible to save over 10 per cent of the coal used in this work which, he said, would mean a saving of 50,000,000 tons a year. This, he estimates, would release cars for other important service equivalent to the entire coal carrying capacity of the Pennsylvania lines east of Pittsburgh and with coal at $5 a ton would mean a direct money saving to the industries of a quarter of a billion dollars.

W. N. Polakov, consulting engineer, New York, discussing this question, suggested that of two methods proposed for lessening the waste of fuel, namely, Government coercion and education, the use of coercion is the more feasible. He believes that the Government should give priority in coal deliveries to those indispensable industries consuming fuel efficiently, thereby increasing their output and stimulating the less efficient consumer of fuel to improve his plant and establish better economy. This he pointed out may involve the rating of plants of indispensable industries by experts on fuel consumption. He believes that organization of a properly trained boiler-room force will in many cases bring about an effective saving in fuel without further capital investment.

Albert A. Cary, consulting mechanical engineer, New York, emphasized that the problems involved in establishing efficient consumption of fuel center around the proper design of the furnace for the coal being used. The choice of refractories, he said, is also important, and this, he pointed out, should not be left to the mason contractor. He believes that permanent results can only be obtained by reaching the man who shovels in the coal. These men, he said, are usually antagonistic to endeavors to change their methods of working, and he believes that the proper method of solving this problem is to license firemen. Government inspectors could then make recommendations to plants wasting fuel, and, if these recommendations are not followed, the licenses of the firemen may be removed. This, he believes, will weed out inefficient firemen, stimulate better firing and will improve both the plant operation and the condition of the men. He referred to two plants in which substantial improvements in boiler economy were made. In one plant of 7000 boiler-hp. capacity, changing from hand-fired to machine-stoked equipment enabled the plant to operate at 50 per cent over its normal rating, yet consuming no more coal than it formerly did at two-thirds that load. The Tennessee

Copper Co. redesigned its furnaces, adapting them to the coal used and substituting automatic stokers for hand-fired grates, and succeeded in obtaining with 64 per cent of the fuel formerly used an equal output.

L. P. Breckenridge, professor mechanical engineering, Yale University, urged that coal must not only be saved but must be saved immediately. Sixty-seven per cent of all coal produced, he said, goes for steam making, and this field offers the best opportunity for immediate results. Industries should work in conjunction with fuel administrators of states and each administrator should know how the particular coal consumed in his district is properly burned. He referred to the work being done by the states of Illinois and Connecticut. In New Haven, he said, the Chamber of Commerce undertook the teaching of firemen by presenting to meetings of firemen lectures on proper methods of firing coal. Much interest was manifested by the men, and he suggested that the engineers of the country co-operate by organizing committees to carry on similar work in other states. The Connecticut plan provides for expert firemen to visit plants and demonstrate to the men proper firing methods.

Shop Costs on Idle Machines

H. L. Gantt, industrial engineer, New York, discussing manufacturing costs, stated that the expense of maintaining a machine while idle cannot legitimately be charged to work done on it, and should be put in a separate account. Those people who include in their costs expenses which do not contribute to production are simply trying to recover from the public, through a higher selling price, expenses resulting from inefficiency. The segregation of overhead expenses attached to idle machines from those of productive machines, appears to him to be the only way of avoiding an intolerable situation, which he believes will otherwise arise from the Government's method of giving contracts on a "cost-plus" basis.

In opening the discussion on this paper, Frederick A. Alden, consulting engineer, Cambridge, Mass., indorsed the statements made in the paper and stated that idleness of machinery was due to the use of single-operation machines as distinguished from those upon which a number of operations might be performed by slight readjustments of tools, feeds, speeds, etc. Machinery which to a certain extent had outlived its usefulness was also a cause of idleness on the part of machines, and he recommended that all obsolete stock and machinery be either junked or sold.

Frank B. Gilbreth, industrial management engineer, New York, warmly commended the paper and described the board which he had devised for indicating the status of various orders that had been received and the condition of the different machines in the shop.

Henry Hess, Philadelphia, took exception to the statement made in the paper that costs must be considered by engineers alone, and said that both engineers and financiers should consider the question of costs jointly. The cost of idle machinery would in any event be passed on to the ultimate consumer, in his opinion.

Adolph L. De Leeuw, mechanical engineer, Singer Mfg. Co., Elizabethport, N. J., considered that work along the line of Mr. Gantt's paper was highly desirable, but pointed out that the problem of costs was a great one due to the fact that there were so many variables which entered into it.

Arthur L. Williston, principal Wentworth Institute, Boston, said that confusion in accounting was caused by the fact that costs were not constant, although they were so considered.

Inspection in the Machine Shop

The machine-shop session on Thursday afternoon, Dec. 6, had a distinctly martial flavor imparted to it by the presence of a number of army officers, some of whom participated in the discussions. There were three socalled introductory discussions.

The first, on "The Logic of Inspection," was given by Adolph L. De Leeuw, who stipulated that manufacturing methods depend on division of labor, measuring devices and inspection. Products of all kinds, as a rule, are interchangeable as regards function or design, and machine tools may be interchangeable as to uses but not necessarily as to their component parts. Full interchangeability was, however, made possible by inspection work. The development of machine-tool building from the time when a single man was both a designer and builder was traced through a system of manufacturing in shops by contracts and progressive inspection of the previous operator's work to the present system of inspection where this is done as a part of the shop routine.

While it is unquestionably true that inspectors sometimes lack intelligence, it is his opinion that as a rule this condition exists because the salary paid is not sufficient to attract a man with brains. Specifications are the great problem in inspection, and the aim of the manufacturer is to get a perfect product as the result of a series of processes that are not perfect. The inspector should not be looked upon as a trouble maker, but rather as a useful member of society, although the problem of inspection is still in the dark due to the lack of standards to guide the inspector.

Mr. De Leeuw stated that the allowances made for variation were not so large as might be convenient in a number of cases, and recommended that dimensions be inspected in the drawing room before the work goes to the shop. The causes of failure of inspection are the fact that it is a repetition operation, there are no standards to guide the inspectors and there is as a rule no checking of the inspection. He considered it very desirable that workmen with high ideals should be trained as inspectors with one of the inspection force an engineer, who is broadminded enough to decide whether the product might be used or not rather than whether it conformed strictly to the specifications. He advocated the placing of limits on the gages used as well as on the pieces gaged with master gages to check the gages themselves, and that a combination of accepted and rejected pieces should be reinspected from time to time.

The second of the discussions dealt with "The Relation of Inspection to Products," and was given by F. A. Waldron, industrial engineer, New York. He stated that after having been on both sides of the inspection proposition it was his opinion that the chief trouble lay first with the designer and then with the manufacturer. Rigid inspection is a good thing in the long run, he asserted, although sometimes rather hard at first, from a financial point of view, on the manufacturer. The inspector is continually coming in contact with manufacturers who have no idea of accurate dimensions. He considered it necessary that reasonable tolerances be made with reference to the final functioning of the article manufactured since close tolerances increase the cost of tools, jigs, fixtures, gages, etc. The production of gages in the United States is now as big an industry as the productiveness of the country before the war. In concluding his discussion, Mr. Waldron stated that the inspection department should be brought in closer touch with the designing end of the plant.

The third of the discussions dealing with "The General Principles of Government Inspection and the Relations Between Inspectors and Manufacturers," was presented by Major Erdman, ordnance department U. S. Army. He outlined the method of placing, handling and inspecting Government orders, and said that the most important difference between Government and civil contracts is the fact that the manufacturer cannot sue the Government, and must satisfy the inspector besides being prepared to substantiate thoroughly any charges that he might make against the inspector. The Government inspector was not interested in the completion of the contract so much as in seeing that the quality of the product was maintained. Government inspection is a check on a 100 per cent inspection by the manufacturer, and is carried out only as far as necessary to insure compliance with the specifications.

A Complaint Board of Engineers

Sir Charles Ross, president Ross Rifle Co., Quebec, Canada, suggested as a solution of the inspection problem that an independent body should be formed of rep-

resentatives of the engineering societies of the country to hear complaints of the manufacturers and give advice to both the manufacturers and the inspectors and report to the secretaries of war and navy. This plan, he believed, would secure co-operation and approval of the Government, and, at the same time, would settle the differences which arose from time to time between the manufacturer on one hand and the inspector on the other. He considered that such differences of opinion were a good thing, but regretted that at the present time there was no means available for the inspection department to have matters explained by an impartial third party. Later on in the session a resolution referring the question of the formation of such a body to the Council for attention was passed.

Questionnaire on Inspection and Interchangeability

A questionnaire giving suggestive subjects for discussions was sent out to a number of interested members and non-members before the meeting and served as the basis for the general discussion which followed. The subjects covered were inspection and interchangeability and the questions, five in number under each head, are given below:

Inspection

1. How closely can quality be held to the set standard in inspection of munitions?

2. Is it a practical quantity-production proposition to meet the tolerances prescribed by the Government on munitions drawings? If not, what is necessary?

3. How is your inspection department organized? Do you use the following inspections? And if so, in what way: first piece, operation, selective, final? To whom is the inspection department responsible?

4. How is the responsibility for quality divided between the inspection and manufacturing departments

5. How do you inspect or check the work of inspectors?

Interchangeability

6. How would you define the term interchangeability as applied to a machine or a mechanism?

7. To what extent should interchangeability be attained in munitions manufacture?

8. To what extent should interchangeability be attained in machines used in warfare? (as, for example, aeroplane motors).

9. Considering the conditions under which munitions of warfare are used, should the greater attempt at exact interchangeability be placed upon the units of which the complete mechanism is made or upon parts used in making up the units?

10. Is interchangeability of parts of value in field use, or is it mainly for assembling units?

The general discussion which followed divided the meeting into two groups, one of which believed that the specifications should be rigidly adhered to, while the other insisted that the inspector should be permitted to waive provisions of the specifications which in his judgment were unnecessarily harsh. R. F. Bryant, Yale & Towne Mfg. Co., New York, in opening the discussion stated that the trouble went back to the designing of gages and the fixing of tolerances on individual parts. He believed that care in writing specifications would help production and eliminate trouble in inspection. In the munition contracts which his company had filled the parts were given a preliminary inspection at the machines with a 100 per cent inspection at a central point to serve as a check. This was followed by an inspection by the Government representatives, this last varying from 100 per cent in some cases to a comparatively low figure in others, according to the nature of the part and the average proportion of rejections. This inspection was of the random type. Progressive inspection for single operations prior to assembling was also employed, the work passing along in front of the shop force. This single-operation inspection, he stated, was very rapid, and was supplemented by a final Government inspection after assembly before packing.

Prof. Raymond H. Danforth, Case School of Applied Science, Cleveland, dwelt upon the necessity for material inspection as contrasted with gage inspection. In a number of cases he stated that specification requirements could not be met because the physical and chemical requirements did not have sufficient leeway.

Standardization of Inspection

Henry L. Huston, chief engineer A. M. Lockett & Co., New Orleans, La., stated that standardization of the product was expected from inspection and now standardization of this inspection was sought. In his opinion, the proper place to start was with the specifications and not with the inspector, as close limits cause a needless expenditure of energy. Common sense played a large part in inspection, and the inspector should not be hidebound by the specifications, it being better for him to point out why the work was right rather than where it was wrong. Both the elements of material and men had to be dealt with, and the inspection should not be too intensive. What would be permitted in one place would not do in another.

Forrest E. Cardullo, chief draftsman Pierce-Arrow Motor Car Co., Buffalo, stated that specifications could not be drawn to cover all cases, and that the inspector must have authority to waive the provisions of the specifications in some cases, the question of useability of the part being the deciding factor. The purpose of inspection was to keep up the quality of the product to a satisfactory point, and any form of inspection which reduced the volume of production was radically wrong.

H. A. Staples, superintendent raw materials department, Bridgeport Brass Co., stated that there were marked differences in the specifications sent out by the various departments of the Government for the same article and suggested that a standard set of specifications for each article be prepared by the Bureau of Standards.

Closer Limits Than at Beginning of War

Chester B. Hamilton, Jr., manager Hamilton Gear & Machine Co., Toronto, Canada, stated that the Canadian manufacturers are beginning to realize the nicety of barrage fire and the necessity for conforming strictly to the provisions of the specifications. At the present time work that was formerly considered "good enough" would not do. The shop inspection in his plant was the same as that given the work by the government and the earlier operations were held to closer limits than the Government requirements and the tolerances increased progressively, this care in first operations bringing back results in secondary operations as the rejections were materially reduced. He censured the steel makers for carelessness in the matter of the kind of material shipped, and stated that the specification writer knew what was wanted better than the manufacturer. The limits were closer now than at the beginning of the war and would be even more so next year.

Major Erdman said that the contractor was expected to live up to the specifications, co-operate with the Government and call attention to any changes that might be desirable.

C. E. Coolidge thought that something might be said on both sides of the question. The first consideration was the protection of the men at the front, then the Government, and last the manufacturer. This could be accomplished by co-operation, especially if the Government and shop-inspection corps were considered as one body and inspectors were placed at each machine and instructed to co-operate with the operators.

Charles E. Davis, Walco Mfg. Co., Providence, R. I., said that co-operation between the manufacturers and the army inspectors was necessary and reduced rejection of the product. It was necessary to establish the vital functioning points of the finished product first. After this the limits could be fixed and when once established should be rigidly adhered to. The manufacturer must, he said, get together with the Government and the designer.

Women in Machine Shops

A discussion on the employment of women in the metal working industries was introduced by John W. Upp, General Electric Co., Schenectady, N. Y. What he offered was in part as follows:

We have been much surprised at woman's strength

and endurance and are now willing and ready to assign her to duties which were until recently assumed to be entirely beyond the scope of her ability. We have found, however, that it is necessary to recognize some fundamental difficulties if women are employed in these unusual occupations. The carrying trays are so constructed that it is impossible for a woman to obtain a load that is greater than 50 lb., except where the size of an individual piece makes such a limit impossible. Stools or chairs are provided where possible and short rest periods are found advantageous in many cases.

Careful attention must be given to the character of the women employed and more thorough investigation must be made of their references than in the case of men, for the employment of one undesirable woman will frequently destroy the usefulness of a large department. All the women working in any section must be acceptable to the other women or resignations with or without explanation will be apt to take place rapidly.

We also found early in our experience that women between the ages of 18 and 31 are more adaptable and learn more quickly than those who are younger or older.

We have not made any attempt to discriminate between unmarried and married women, except that we have investigated every acceptable applicant with minor children to assure ourselves that she had means of having her family taken care of while at work in the factory.

We never add many women to a department at one time, as we have found it impossible for an instructor to give to each of many new employees sufficient attention to obtain satisfactory results, and usually nearly all those who have not been given the undivided attention of the instructor during the early days of their employment, resign, apparently having reached the decision that they could never learn. We attempt to instruct two women at one time on each machine tool, giving them alternate opportunities to operate the machine tool themselves.

Surprising Results on Screw Machine Work

We find it difficult to teach women to operate screw machines, but when they learn their work is as satisfactory as that of men; and on the lighter screw-machine work we are having the remarkable experience of finding their work more productive than that of men. We do find it difficult to teach women how to operate milling machines and we have had many failures, yet we have women operatives on milling machines doing high-grade work as efficiently as it can be done by men. We have found it difficult to teach women to operate lathes, but now have good women lathe operators in our employ. It has never been difficult to teach women to operate light punch presses, and although we have always considered heavy-punch-press work a man's job we now have women operating heavy punch presses in an entirely satisfactory manner. We have always considered the assembly work on some of our more important operations as being essentially the work of the man who had been trained as a mechanic; but we now find that when properly instructed women can do this work in a way that is entirely satisfactory to us.

It has been necessary to more closely supervise and inspect the work turned out by the women than by our regular run of men employees, for few women have any conception of the importance of dimensions or any judgment as to mechanical strength or requirements. But you can be sure that once a woman employee is taught how to use a gage or learns what constitutes satisfactory work, the good work produced in the afternoon will be exactly the same as that produced in the morning.

We have found it very difficult to teach women the difference between a dull and a sharp cutting tool.

As a rule, the best results are obtained when the supervision of work is under the direction of men, although as immediate superiors of the women other women can be used to advantage.

More attention must be paid to the appearance of the manufacturing departments when women are employed, for women are much more susceptible to surroundings than men. In shops where women work, the machines and floors are kept cleaner than in sections where men only work.

Shop Clothing

Difficulty with the clothing of women engaged in shopwork has been one of the most important problems we have had to solve. To settle the question once for all, the matter was submitted to the workers in a certain department for their own decision. We had had a few minor accidents due to loose sleeves, uncovered hair and loose skirts, and it was evident that in order to protect our workers it would be necessary to adopt some type of clothing which would remove that industrial risk. We arranged for a conference with our employees in the department mentioned and left to them the selection of the clothes which they should wear. We explained to them the reason we were increasing the number of women, that it was necessary to have these women to take the places of men, that we intended to employ more and more women in the future, but that we could not forgive ourselves if we permitted their employment to result in accidents which might ruin their usefulness in future years. The conference was a most interesting one and the results were surprising; for of those who attended, 98 per cent voted, after a half-hour's consideration, to adopt a uniform factory costume. This has taken its place among other conventions and now receives no special attention. The stockkeepers are exempt from the regulation if they so desire. Many of them, however, have adopted the regulation costume voluntarily.

Segregation of Women Workers

The segregation of operatives has been given a great deal of attention. We now arrange to have our women employees quit their work a few moments earlier than the men so that the women can leave the factory without confusion, but we are making no attempt to separate them from the men in the manufacturing departments. They of necessity work on adjacent machines, for when the man who operates one of a line of machines is called to military duty we cannot move that one machine from its desirable location, but we can train a woman to operate it. Where the number of women in a department is relatively small, the desirability of segregation is most evident, and if it were possible we would segregate operations; but it has not been difficult to entirely control the situation by proper supervision, and now that our men are becoming used to women workers the interruptions and confusion have practically disappeared.

It might be well to say that the men have not objected to women working in the machine shops. While we feel sure that there would have been objections raised last year, this year the men are giving the most helpful assistance in the training of women to do the work properly, for all recognize the importance of carrying on the industrial undertakings by women, as men are required for military work.

We have not been able to impress women with the importance of being on hand every day. Many seem to feel that it will be perfectly satisfactory to be absent occasionally, particularly if they have any household duties to finish, and for this reason we have been careful to select those women who can be entirely relieved of such responsibilities if they enter our employ. Our record of absences of women is as a rule about 20 per cent greater than among men.

We have carried on a most successful experiment in the employment of women in one of the estimating departments. A group of college women are taking up the work heretofore carried on by the younger technical graduates. These young women had no technical training, but we selected those who had specialized in physics, chemistry, or other work of this character. The activity and interest of this group of young women is all that could be desired.

Chester B. Lord, general superintendent Wagner Electric Mfg. Co., St. Louis, emphasized that to maintain the greatest degree of contentment among women workers they should not be allowed too great liberty of

(*Continued on page* 1460)

Machinery Exports Again Make Record

Shipments of Last September Exceeded—Movement of Semi-Finished Steel Extremely Heavy—Imports Show Decline of 50 Per Cent Compared with Last Year

WASHINGTON, Dec. 11.—Exports of machinery in October again broke all records, exceeding the tremendous shipments of last September. Manufactures of iron and steel by values fell but slightly below the record total of last June, but tonnage commodities showed a substantial decline. The grouping of these figures would suggest that the gain in machinery exports in October was due to higher prices, but an examination of the statistics showing aggregated units indicates a substantial increase in volume as well as in value.

The total exports of manufactures of iron and steel by values in October gained 40 per cent over the same month of 1916 and fell but 4 per cent short of last June's phenomenal record. Shipments of tonnage iron and steel fell 7 per cent below those of October, 1916, but exceeded by nearly 15 per cent the average exports of the past ten months. The exports of machinery rose 55 per cent above the level of October, 1916, and surpassed the record total of September of this year by slightly less than 2 per cent. Shipments of machine tools, which having declined somewhat erratically throughout the past year, gained 13 per cent over October, 1916, but fell substantially below the average of the past 12 months.

For the 10 months ended October, gains were recorded in all classes except metal-working machinery. Exports of iron and steel by values gained 46 per cent over the corresponding period of 1916, which, in turn, exceeded by 140 per cent any previous 10 months. Tonnage commodities surpassed the 10 months of 1916 by the narrow margin of 2.5 per cent, but the 1916 total was 80 per cent in excess of any previous corresponding period. Machinery rose 77 per cent over 1916, but machine tools declined 2 per cent.

Exports of Iron and Steel

	October		Ten Months	
	1916, Gross Tons	1917, Gross Tons	1916, Gross Tons	1917, Gross Tons
Pig iron	101,756	.....	404,260	377,094
Ferromanganese	.....	3,406	.....	4,545
Ferrosilicon	.....	255	.....	4,584
All other pig iron	.....	43,539	.....	176,746
Scrap	19,994	6,031	178,346	142,342
Bar iron	4,512	4,823	63,705	44,384
Wire rods	13,927	26,554	132,304	142,128
Steel bars	64,133	46,771	652,886	517,549
Billets, ingots and blooms, n.e.s.	162,679	204,724	1,220,788	1,677,364
Bolts and nuts	2,919	2,502	24,835	207,657
Hoops and bands	3,369	5,638	37,415	47,333
Horseshoes	222	812	7,265	7,229
Cut nails	541	329	4,213	3,349
Wire nails	13,202	13,660	127,912	87,881
Wood screws	.....	217	.....	1,073
All other nails, including tacks	1,558	1,659	9,322	16,225
Cast-iron pipes and fittings	9,064	4,350	58,995	59,532
Wrought pipes and fittings	13,617	10,042	124,855	108,219
Radiators and cast-iron house heating boilers	247	249	2,105	4,673
Railroad spikes	1,032	2,507	21,172	17,920
Steel rails	52,752	48,531	444,202	422,453
Galvanized iron sheets and plates	7,892	7,156	69,667	72,190
All other iron sheets and plates	4,317	4,767	38,622	49,069
Steel plates	26,399	50,225	222,893	448,205
Steel sheets	10,315	15,537	88,102	120,439
Ship and tank plates, punched and shaped	.....	a2,861	.....	a9,821
Structural iron and steel	25,342	20,776	237,211	243,222
Tin and terne plates	14,177	15,318	193,302	143,374
Barb wire	37,615	10,616	379,534	149,520
All other wire	18,512	18,035	230,078	164,682
Total	610,096	571,893	4,968,285	5,097,764

a Not separately enumerated prior to July 1, 1917.
b Six months ending June 30, 1917.

Exports of Machinery

	October		Ten Months	
	1916	1917	1916	1917
Adding machines	$129,896	$192,668	$1,170,382	$1,881,335
Air-compressing machinery	74,050	77,034	706,783	865,459
Brewers' machinery	1,138	6,230	12,867	103,129
Cash registers	109,082	26,157	1,377,140	694,479
Parts of	12,946	4,892	121,832	65,645
Concrete mixers	.....	a57,757	.....	a105,663
Cotton gins	8,842	5,316	82,546	74,471
Cream separators	12,243	58,040	382,692	526,016
Elevator and elevator machinery	108,256	200,225	1,482,675	1,871,617
Electric locomotives	129,768	10,625	517,858	363,997
Gas engines, stationary	48,547	64,755	319,041	728,720
Gasoline engines	679,935	2,246,155	12,029,208	20,127,933
Kerosene engines	.....	a378,319	.....	a1,041,265
Steam engines	764,002	5,178,632	9,042,245	28,003,238
All other engines	412,659	140,681	4,338,943	3,209,465
Parts of	1,794,338	.....	9,654,055	b9,287,245
Boilers	.....	a419,448	.....	a1,288,426
Boiler tubes	.....	a1,789,970	.....	a3,395,762
All other parts of engines	.....	a1,747,336	.....	a5,884,335
Excavating machinery	.....	a103,257	.....	a283,035
Milling machinery, flour and grist	96,308	32,960	1,904,287	678,631
Laundry machinery, power	13,005	47,265	254,528	367,100
All other	29,314	23,259	227,773	224,820
Lawn mowers	13,740	24,046	195,922	190,609
Metal-working machinery (including metal-working tools)	5,292,802	.....	68,511,004	b44,604,259
Lathes	.....	a1,787,379	.....	a7,340,010
Other machine tools	.....	a961,216	.....	a3,522,817
Sharpening and grinding machines	.....	a669,108	.....	a2,283,312
All other metal-working machinery	.....	a2,565,367	.....	a9,288,485
Meters, gas and water	16,415	58,773	306,254	1,107,764
Mining machinery, oil well	113,519	129,276	1,655,839	1,144,617
All other	892,048	476,240	5,842,025	8,659,019
Paper-mill machinery	286,158	160,661	893,171	1,641,330
Printing presses	189,398	67,450	1,619,442	1,376,529
Pumps and pumping machinery	484,135	523,429	4,556,914	5,100,202
Refrigerating and ice-making machinery	37,896	176,983	582,506	1,012,127
Road-making machinery	.....	34,100	.....	125,764
Sewing machines	387,432	646,396	4,597,137	6,572,038
Shoe machinery	103,348	198,326	889,519	1,386,041
Sugar-mill machinery	1,593,401	1,734,054	5,795,566	6,929,636
Textile machinery	245,496	538,826	2,855,481	3,379,082
Typesetting machines	81,294	219,951	959,475	1,051,483
Typewriting machines	789,635	787,770	9,033,015	7,987,080
Windmills	47,364	125,182	855,841	955,932
Woodworking machinery, saw mill	31,676	49,662	353,028	490,694
All other	67,459	77,320	744,642	890,494
All other machinery and parts of	3,381,562	3,665,921	32,363,280	34,405,216
Total	$18,479,007	$28,488,426	$186,234,917	$232,216,326

a Not separately enumerated prior to July 1, 1917.
b Six months ending June 30, 1917.

Imports of Iron and Steel

	October		Ten Months	
	1916, Gross Tons	1917, Gross Tons	1916, Gross Tons	1917, Gross Tons
Ferromanganese	8,114	2,035	65,588	40,910
Ferrosilicon	615	682	5,686	8,489
All other pig iron	6,100	2,156	40,351	18,831
Scrap	11,748	4,894	59,520	172,120
Bar iron	220	2	6,965	2,099
Structural iron and steel	32	591	1,113	4,646
Steel billets without alloys	472	2,506	8,771	31,031
All other steel billets	2,009	610	13,482	6,657
Steel rails	493	668	24,931	7,068
Sheets and plates	73	78	1,380	1,111
Tin and terne plates	110	.....	937	124
Tin scrap	.....	694	.....	6,797
Wire rods	183	3	3,467	518
Total	30,169	14,919	233,191	300,401

The value of all exports of iron and steel products in October was $114,196,743, as compared with $82,010,972 for the same month of 1916 and $119,141,972 for June of this year, which is still the record total. For the 10 months of 1917 the total was $1,025,623,521, as compared with $701,052,410 for the corresponding period of 1916 and $294,519,465 in 1915. Exports of machinery in October were valued at $28,488,426, as compared with $18,479,007 for the same month a year ago. The largest previous month's exports of machinery were made in September of this year, when the total was $27,947,134. For the 10 months the exports of machinery were valued at $232,216,526, as compared with $186,234,917 for the same period of 1916. Shipments of metal-working machinery aggregated $5,983,070, as against $5,292,802 for the same month of 1916. For the 10 months of 1917 the exports totaled $67,038,833, as compared with $68,511,004 for the corresponding period of 1916. Details of the exports of machinery in October in 1916 and 1917 and for the two 10 months' periods are given in the accompanying table.

Exports of iron and steel for which quantities are given aggregated 571,893 gross tons in October, 1917, as compared with 610,096 tons for the same month of 1916. The exports of semi-finished material were extremely heavy, being 204,724 tons, compared with 162,679 in October, 1916, and 148,932 in September, 1917. The record total of exports of tonnage commodities, 643,763 gross tons, was made in September, 1916. For the 10 months ended October, 1917, these shipments aggregated 5,097,764 gross tons, as against 4,968,285 tons for the same period of 1916. The accompanying table shows the exports for October and for the 10 months ended October, 1917, as compared with 1916.

The imports for October showed a decline of more than 50 per cent as compared with those of 1916, decreases being noted in receipts of ferromanganese, other pig iron, scrap and alloy steel billets. W. L. C.

A New Electromagnetic Alloy

A new alloy of cobalt, iron and silicon is offered in a patent (U. S. 1,247,206—Nov. 20, 1917) awarded to Frederick M. Becket, of Niagara Falls, N. Y., and assigned to the Electro Metallurgical Co. of that city. The iron and cobalt are said to be present approximately as indicated by the formula Fe_2Co_2 associated with from 2 to 6 per cent of silicon. Typical alloys, according to this invention, analyze as follows:

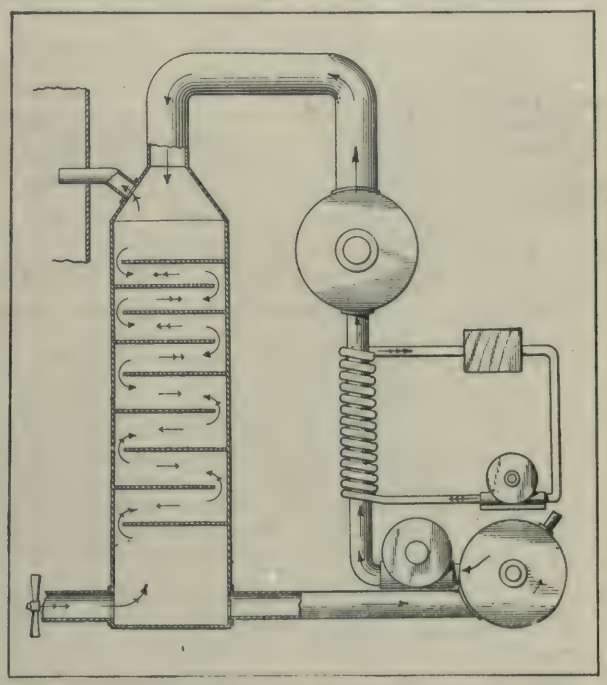
	Per Cent	Per Cent
Iron	60.60	62.93
Cobalt	37.00	32.05
Silicon	3.06	4.69
Carbon	0.09	0.33

It is claimed that the hysteresis value of these alloys is very low and that their magnetic saturation is very high. Within certain limits these properties are said to increase with an increasing silicon content and as large an amount as possible of this element should be incorporated without destroying the malleability. Its advantages are emphasized in connection with transformers, dynamos and other electromagnetic apparatus.

Drying Blast-Furnace Air by Calcium Chloride Brine

IN a paper contributed a few months ago to the Engineers' Society of Western Pennsylvania, Leon Cammen, engineer, 29 West Thirty-ninth Street, New York, described a process of drying air for blast furnace use by passing it through a highly concentrated solution of calcium chloride maintained at a low temperature. Cold brine enters the top of the drier, shown in the illustration, and flows countercurrent to the air entering at the bottom. Leaving the drier the brine passes through an evaporator where its initial concentration is restored, after which it is cooled to a temperature proper for use by a stream of water supplemented by a countercurrent of cold brine going to the evaporator. In the evaporator only a concentration of the brine and not drying of the salt is effected as comparatively low temperatures must be used.

When the brine enters the air drier it is calculated to have a temperature of approximately 16 deg. Fahr. and a concentration of 40 per cent. By the time it



Cold Brine Enters the Top of the Drier and Flows Counter to the Air Entering at the Bottom. Leaving the drier the brine passes through an evaporator, after which it is cooled

leaves contact with the incoming air, it has a temperature of say 25 deg. Fahr., and a concentration of 30 per cent. The incoming warm and moist air is first met by the comparatively warm brine, and as brine at 25 deg. Fahr. and 30 per cent concentration is capable of taking out a large amount of moisture from air at say 80 deg. and a content of seven grains of water per cubic foot, the air is partially dried. This partially dry and fairly cool air will, in its last stage of motion, pass through a layer of 40 per cent brine at 16 deg. Fahr., which is intensely hygroscopic and able to take out all moisture desirable to remove. The brine of 30 per cent concentration and a temperature of 25 to 30 deg. has to be raised to say 180 deg. in the concentrator, but Mr. Cammen explained the actual range of temperature of heating is considerably less with the proper use of the countercurrent principle of operation.

Though the work is several years behind because of strikes and other difficulties, it is probable there will be a further suspension of activity on the new $50,000,000 Union Station in Chicago. Conferences on the subject have been held by the Chicago Home Defense Committee and the State Council of Defense of which Samuel Insull is chairman. The State Council advises that the work be held up for the duration of the war because of the shortage of steel and other material, as well as of railroad cars and labor.

Important Changes in Tariff Proposed

Commission Makes Recommendations and Congressman Fordney Proposes Immediate Upward Revision—Free Ports May Be Created

WASHINGTON, Dec. 11.—Recommendations of far-reaching importance to the industries of the country, relating both to the tariff and the internal revenue, are contained in the first annual report of the United States Tariff Commission which has just been forwarded to Congress. The commission evidently anticipates an upward revision of the tariff in the near future as well as further increases in internal taxes and lays great stress upon the importance of special legislation in the nature of the "padlock" laws of certain European countries intended to prevent anticipatory importations and withdrawals from bonded warehouses made for the purpose of evading impending higher tax rates. Another extremely interesting suggestion by the commission contemplates the creation of a number of free ports or free zones in which imported merchandise may be received, examined, manipulated, repacked, and re-exported without the payment of customs or internal revenue taxes. The suggestion opens a wide field of trade possibilities and, if adopted by Congress, would no doubt materially assist in the development of our foreign commerce.

Revenue Pending Legislation

The commission makes public for the first time the substance of a series of recommendations it has already transmitted to the Ways and Means Committee in response to a request from its chairman for suggestions concerning the protection of the revenue, pending legislation on the subject. Conforming to this request, the commission called attention to "possible methods of protecting the public treasury against loss and securing what is in effect an increase of revenue during the periods when Congress has under consideration legislation for raising customs duties and internal-revenue taxes." During such periods of legislative deliberation, styled by the commission "interim periods," loss of revenue has been repeatedly incurred. In anticipation of the impending advances in duties, there are unusual importations—both direct importations and active withdrawal of goods from bonded warehouses. Similarly there are large withdrawals from warehouse of articles subject to internal revenue taxes.

The commission suggested that Congress should take steps analogous to those which other countries have taken and which go by the name "padlock laws" in some parts of continental Europe. Increases in duties and taxes could be made to go in effect provisionally, as they do in other countries, subject to the definitive enactment of the pending measures and to ultimate adjustment under the provisions of the measures as enacted. More specifically, it was suggested by the commission that where a bill proposing increases of such taxes was introduced in the House of Representatives by the Committee on Ways and Means, the date of such introduction might be fixed as that on which liability for the new or increased taxes should begin. In view, however, of the difference between American and European legislative and constitutional systems, it was suggested that no actual collection of taxes should take place in advance of the enactment of legislation, but that bonds should be given the Secretary of the Treasury by importers and others liable for the tax, collection to be made eventually at the increased rates as settled on enactment. The constitutional power to deal with the matter in this way, the commission declares, is not open to serious dispute. Congress has the power to make its taxes effective at such dates as it deems expedient.

Judging from Experience

The commission in its report to the Ways and Means Committee called attention to the length of time—usually several months—which elapses between the first stage of the legislative consideration of revenue laws and their final enactment, and to the probability that interims of this sort are likely to recur in the future. The course of events during the extra session of 1917 has indicated that the same conditions will continue to be experienced whenever important revenue legislation is pending. The war-tax act of 1917 was reported to the House of Representatives by its Ways and Means Committee on May 9, 1917; it became a law on Oct. 3. Nearly five months elapsed between its introduction in the House and its enactment—approximately the same period which had been required for deliberation upon the revenue laws of 1897 and 1913. During these months of 1917, increased customs duties as well as increased internal-revenue taxes were seriously considered. As it happened, no changes in customs duties were finally made; but large increases were made in the internal-revenue taxes. As regards both, the commission asserts the expediency of a permanent system for dealing with interim conditions was again apparent.

Spanish War Legislation

Some effort in the direction of the commission's recommendation has been made by Congress in the past and was made with reference to the act of October 3, 1917. Certain provisions incorporated in the Spanish War revenue act of 1898 provided for the partial collection of increased taxes on goods which had been withdrawn from warehouse under the old rates, but had not yet been completely removed from the channels of trade—the so-called "floor tax." The war revenue act of 1917 contained provisions for the same purpose and by the same method.

These provisions, however, in the opinion of the commission, seem to but partly meet the situation. Much potential revenue collectible under a general statute similar to the European "padlock" laws will always fail to be collected by the mere process of following the goods into the channels of trade. No attempt has heretofore been made to reach smaller retail stocks for the obvious reason that the accruing revenue would not compensate for the expense of collection. Even as regards the stocks of large retailers and of wholesalers the process of collection by this method would be both uncertain and expensive. Investigation by the commission indicates that the collection of floor taxes after the passage of revenue laws would usually result in securing less than half the amount obtainable if the anticipated increases in taxes could be applied to imported goods at the custom houses or to goods subject to internal taxes before leaving the factories. Moreover the process of thus following the commodities into the channels of trade suddenly imposes great burdens and responsibilities on the Government, calling for the organization of a large force for gathering and investigating an enormous number of returns, many of them involving small amounts and this for a temporary purpose only.

Important Considerations

The commission, therefore, earnestly recommends to Congress the enactment of a law dealing with this problem systematically and providing in some way for the safeguarding of the revenue during interim periods. The precise mode in which this may best be accomplished is doubtless a matter for careful consideration. The commission has suggested that bonds shall be required for the payment of such increased duties as may be eventually levied, and that these bonds be required from some fixed date preceding final enactment. The examples, reviewed in the commission's special report, from England, France, Italy, and other foreign countries, where such changes in taxes when proposed by

the Government became almost instantly effective; the evidence available as to the loss of revenue in times past during interim periods; the possibility that large demands for new revenue may be made at an early date; and the certainty that in the more or less distant future increases in tax rates will again be made—all these considerations lead the commission to ask once more the attention of Congress to the desirability of some systematic method of dealing with the problem.

A Possible Difficulty

The commission further calls attention to another aspect of the problem, and to a possible difficulty concerning which it has gathered additional evidence. It is conceded that an objection likely to be raised to the whole proposal is that any provisional collection of duty or any requirement of bonds for the final payment of duties proposed but not yet enacted, will lead to uncertainty and disturbance in business conditions. It appears to the commission, however, that uncertainty of this sort is inevitable under any system; and, moreover, that the business community finds it possible to adapt itself without serious embarrassment to such uncertainty. During several months of 1917, from May until August, increases of customs duties were under consideration in Congress on a considerable scale under the revenue bill as passed by the House, and also, though not so comprehensive, in the bill as considered in the Senate. During this time, importers and other business men had to face the possibility of changes in duties and had to accommodate their sales and purchases to that possibility.

Inquiry by the commission among leading importers disclosed a widespread adoption of protecting clauses in contracts for future delivery. These contracts provided that all increases in duties pending delivery should be borne by the purchasers. The commission has in its files forms of contracts containing clauses which were thus inserted, providing for the modification of contracts and it believes the insertion of such clauses in future contracts will doubtless become an established practice. Their use became customary with little friction between customers and importers and with trifling disturbance of business, if any. It appears also that for several years clauses of this sort have been inserted in contracts affecting various commodities.

Uncertainty as to Prices

The uncertainty as to final prices which was necessarily occasioned by pending changes in tariff legislation, the commission declares, appears to have caused no substantial business complications. The signatures of vendees on contracts protecting vendors against possible customs increases were for the most part obtained without difficulty. It may be fairly inferred that if importers or other vendors had to give bond for the final collection of pending duties and taxes, clauses providing for corresponding advances in prices by vendors, in case the duties or taxes were definitely enacted, could be carried into execution with no great difficulty.

Still a further question arising in connection with increases of duties relates to outstanding contracts. The commission suggests that persons who before the date fixed for the coming into effect of the new legislation, in good faith had made contracts for the delivery of goods, should be in some way safeguarded. This could be done either by placing on the vendee the burden of unanticipated increases of duties or taxes, or by allowing refunds to the vendors from the Treasury on satisfactory proof of contracts made in good faith before the prescribed date. The former method obviously is the more advantageous for revenue purposes. It is the method which was adopted long ago by Congress, in the revenue act of 1864; then vendors were allowed to collect from vendees whatever increased taxes the vendors had been unexpectedly called upon to pay. To some extent the same method was adopted by Congress in the war revenue act of October 3, 1917, as applying to sales of automobiles, sporting goods, mechanical musical instruments and a considerable variety of other articles. In anticipation of the objection that such a practice of calling upon vendees to pay newly levied and unexpected taxes would cause uncertainty and disturbance of current business operations, the commission expresses confidence that the business community would adapt itself to such a condition without serious hardship.

Free Zones Proposed

The recommendation of the commission for the creation of free ports or free zones which, it is understood, are to be located at New York, San Francisco and New Orleans, will be examined by business men with the liveliest interest. In this connection, the commission says:

> The administration of bonded warehouses and the system of granting drawbacks, in connection with re-export of foreign goods, at once suggests the alternative of free ports, or, more accurately free zones in ports. In briefest outline a free zone in a port is an inclosed and guarded area where imported goods may be landed and held without custom-house inspection or charge. They may there be stored, mingled, repacked, manipulated, and even manufactured. Such goods as are re-exported may be loaded and shipped without payment of duties or custom-house interference. Goods having a destination in the country in which the free zone is located pass through the custom house to their destination, subject to all checking inspection and custom charges, just as if passing through the regular present channels. Thus the free zone, while practically a warehouse duly guarded to protect the customs revenues of the home country, affords an open trade route for foreign commerce.
>
> There are obvious advantages in a system which by eliminating the delay necessarily incident to checking and accounting in the custom house, shortens the demurrage of foreign-bound cargoes and ships and evades the complications of the bonded warehouse and drawback systems. In some foreign countries, notably in the experience of Hamburg and Copenhagen, the free-zone system has proven of great value.
>
> A careful survey must be made before it would be safe to assume that the plan would be successful or workable in the United States. In this connection the commission is endeavoring to ascertain in detail, first, foreign methods, practices, and results and the specific advantages which merchants and carriers would expect to result from the privilege; second, the requirements that should precede the granting of the privilege, such as present and prospective commerce, trade routes, natural advantages, connecting transportation, the facilities that should be furnished by the local communities, the benefits that might be expected to accrue to the aggregate of the national commerce, and also the objections that might be urged.
>
> To the end of securing such information, investigations are under way in three large importing cities situated, respectively, on the Atlantic, the Gulf, and the Pacific.

The commission announces that as the result of an elaborate investigation it has prepared a tentative draft of a proposed revision of the customs administrative laws designed to eliminate obsolete provisions and to bring inconsistent requirements into harmony and to render this entire body of laws more responsive to the requirements of our growing foreign trade. Confidence is expressed that if this proposed statute can be speedily enacted by Congress, clearness and simplification in the form and substance of the customs administrative laws will be combined with increased efficiency, greater convenience for the public, and a substantial saving in Government expenditures.

Upward Revision of the Tariff

The Tariff Commission's recommendations respecting legislation to prevent anticipatory importations and withdrawals are given additional interest by declarations made since the reconvening of Congress by Chairman Kitchin and Representative Fordney, the ranking Republican member of the Ways and Means Committee. Mr. Kitchin, in an interview, foreshadows further taxing legislation at the present session, declaring that the length of the war will be measured by the patience of the American people under the impending burden of taxation which, he says, will be increased "until it hurts."

Representative Fordney strongly advocates an immediate upward revision of the tariff so as to secure between $200,000,000 and $400,000,000 additional revenue from this source. W. L. C.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

Owned by the United Publishers Corporation, 243 West 39th Street, New York. H. M. Swetland, *Pres.* Chas. G. Phillips, *Vice-Pres.* W. H. Taylor, *Treas.* A. C. Pearson, *Secy.*

BRANCH OFFICES—Chicago: Otis Bldg. Pittsburgh: Park Bldg. Boston: Equitable Bldg. Philadelphia: Real Estate Trust Bldg. Cleveland: Guardian Bldg. Cincinnati: Mercantile Library Bldg. San Francisco: 320 Market Street.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

Proposed Revision of the Tariff

From the very beginning of the great war, it has been evident that some steps toward the revision of the tariff should be taken before the restoration of peace. No man, no matter what his convictions as to free trade and protection, could predict with any degree of certainty what would happen at the end of the war. The one thing that could be called certain was that conditions would be far different and that the tariff systems of all countries would likely be revised.

The United States Tariff Commission has found that its duties are very different from what they were expected to be when the commission was created; but it is showing a disposition to adapt itself to war conditions and has submitted a valuable report to Congress, which is reviewed elsewhere in this issue by our Washington correspondent. It is a notorious fact that whenever an upward revision of the tariff is pending, large quantities of imports are brought in and heavy withdrawals from warehouses take place. The commission proposes that Congress shall take steps similar to those of other countries to prevent losses by the Government on account of increased importation and withdrawal from warehouses. This task is beset by many difficulties, but the commission has gone into the subject thoroughly and promises to do much in helping Congress to pass satisfactory legislation. The suggestion of the creation of free ports or free zones at New York, San Francisco and New Orleans is highly interesting and will arouse no little discussion.

In connection with the recommendations of the commission, the general subject of tariff revision has come up, and the proposal to bring about immediate increases to obtain from $200,000,000 to $400,000,000 additional revenue ought to appeal very forcibly to members of Congress. Such a step would be in harmony with the time-honored tariff for revenue policy of the party now in power and it would also afford some degree of protection against a sudden increase in importations at the close of the war. Official figures prepared by the Treasury Department show that for the fiscal year 1917 the United States collected in import duties only $2.20 per capita, while England collected $7.78. At a time when the demands upon the Government for many kinds of expenditures are tremendous, the people of the United States might well be willing to pay an indirect tax of say $5 per capita if it has been found practicable in England to raise over 50 per cent more.

The Country's War Organization

Poorly organized for war, the country is rushing the development of its war machine with slight chance of a much closer approach to the ideal organization for a good many months to come. Such is the impression obtained from a meeting in Washington last week of the Taylor Society, which aims at the promotion of scientific management, having a number of its members in Government service on organization work and otherwise. Apparently very slow progress is being made in co-ordination among departments, so that, for example, when a given ship is known to be approaching the coast the cargo for that ship is not gathered on the wharf ready for rapid loading. The chaotic condition of railroad transportation is of course the result of no singleness of head; but even were authority centralized, there is no advisory authority which, with advance knowledge of what is to be moved and the when and where, can do the planning. Admitting the mushroom growth which has necessarily marked all departments, with the natural result that many men are engaged in work for which they have had little previous training—due of course to a demand exceeding the supply—there is nothing to tie the departments together even after they become, as some of them already are, independently proficient. The inaccessibility of the President of the United States is regretted, having reference in particular to the fact that he has little contact with even the leading boards. He fails to realize, in the opinion of at least one speaker at the Washington meeting, that while an effective manager is a man an effective adviser is a board.

A vast deal is apparently being done to develop a highly effective organization, tied together at the top by advisory boards, and it is reassuring that men well tried in organization work are spending all their time at Washington to make sure that these bonds are tightened.

P. P. Claxton, United States Commissioner of Education, is giving some very sound advice to high school and college men, especially those taking

technical courses. After saying that the universities of the warring nations are losing students rapidly and those in this country have also lost to some extent, he urges students to remain at their studies instead of enlisting. He points out that there will be plenty of time for them to help their country and that the United States after the war will be badly in need of trained men to help in rebuilding the devastated areas of Europe as well as in carrying on engineering projects in this country. It is natural for boys to be governed by the "gang" spirit and to rush into places where excitement prevails, but now more than ever is the time for cool heads and hard work in the colleges of the country. The Secretaries of War and Navy are discouraging the wholesale enlistment of college men, and it is to be hoped that all the sound advice that is being given will have a deterring effect.

Future Status of the Railroads

Whether one likes it or not, the special report made to Congress last week by the Interstate Commerce Commission is in essence a criticism of the treatment that has been given the railroads. The report, it is true, centers around two propositions, whether the Government should take over the railroads, for operation by the President, or should provide that the railroads form one pool for the whole country, under their own management. The circumstances leading up to the necessity for advocating an immediate choice between these two alternatives and no other show that there was already something wrong with the system before the war started.

Although the railroads have made sacrifices, in foregoing the handling of some profitable freight, and the traveling public has been forced to make sacrifices through the annulment of a considerable volume of passenger service, the railroads are unable to handle expeditiously all the traffic that is offered them. This condition is commonly attributed to the fact that we are at war, but more simply and directly it is because the country is busy. The country has a right to be busy, and as busy as it is now, in time of peace. Railroad facilities ought to be adequate for such a condition.

Furthermore, it is stated that it is difficult if not impossible for the railroads to secure additional equipment because men and materials are scarce. Such a condition could also occur in time of peace. Mention is made of the fact that it would be difficult for the railroads to borrow money at this time. In time of peace scarcity of men and materials also arises, and there are also times when the railroads cannot borrow money. The Interstate Commerce Commission has used the term "vicious circle" with reference to alternate advances in freight rates and in wages, but that opprobrious term can as well be applied to the familiar condition that when labor and materials are cheap, for extensions, the railroads cannot borrow, and when they can borrow, labor and materials are scarce and high priced.

There cannot be complete acquiescence, therefore, with the view that the railroad crisis has occurred solely because the country is at war. Likewise there cannot be complete acquiescence with the rather common view that it is one of the misfortunes of war that radical action must now be taken to put the transportation facilities of the country upon a new and better basis. It is a blessing, and one without much disguise. It is true that some of the misgivings are due to fears of what may occur after the war; that what is done now may furnish a basis for trouble afterwards. But if we can wage this war successfully, we should be fully equipped for handling the problems that arise thereafter. It has been well said that nothing matters much now but winning the war. Equally well it may be said that if after being tried by fire we are found wanting nothing will matter much afterwards.

It is a good thing, not a misfortune, that the war has brought the country face to face with this problem of the railroads. The solution will necessarily to some extent savor of war time expediency; but there should be the advantage of most of the steps taken being in the right direction, with the further advantage that experiments that result unfavorably will furnish information, yet the expense of making them can be charged to the account of the war.

The greatest fear of Government operation of railroads has been politics. It is both unsafe and unwise at any time to seek to minimize this menace, but it would be equally unwise to ignore the fact that politics is likely to be quite different after the war. In the first place, the politicians are learning lessons as to what can be done by co-operation and are given a great opportunity to see that the business men of the country are really in the main very reputable persons, full of patriotism, energy and ability. In the second place, the voter is learning a great deal. Both by precept and force of circumstances he is learning to economize. He has learned a great deal about negotiable securities and the value of credit behind them. It is not conceivable that the voter in future will support politicians of the stripe that has been so common in the past.

Politics is not likely in the future to be as great a menace to a closer working between the Government and the railroads as it has been hitherto. The admission that competition as a means of improving railroad service has broken down is complete. We are ready for the adoption of a new policy, and the emergency of war requires that the solution be found promptly. In form the solution will be temporary, but in it there will be some permanent and important substance. It will not be a case of adopting an emergency program and then after the war going back entirely to former conditions.

The war may bring into existence some things that it will be necessary and at the same time difficult to get rid of afterwards. But the condition with respect to the railroads was such that practically any substitute was welcome. It was a case of there being everything to gain.

There is one unfortunate thread running through the whole incident of the Interstate Commerce Commission making this special report to Congress and calling upon that body to take action. This action of the commission was taken just as it had before it the reopened 15 per cent rate advance

case. On one basis or another for years past the commission has refused to grant rate increases which the railroads and many reputable thinkers outside the railroads felt should be granted. The cynical might say that the commission found its supply of arguments gone, in dealing with the officials representing the various railroad companies, and as the opportunity was afforded embraced this new means of avoiding a rate decision favorable to the railroads.

How Congress will approach this matter, how many propositions it will develop from the situation of having before it two clear-cut alternatives from which to make a choice, cannot well be predicted. It is interesting to note that meanwhile the General Operating Committee, to which was entrusted the operation of the limited pool decreed by the Railroad War Board on Nov. 24, is proceeding energetically with its work as already marked out and giving no official attention to the new phase of the railroad situation presented by the Interstate Commerce Commission's special report to Congress. The committee's work has already borne some fruit, and this week it has proceeded farther in pooling operations, directing that primary and terminal coal pools be formed to relieve the Michigan fuel situation.

Secretary Daniels' discussion of the fixing of prices for naval contracts and the determination of fair methods of cost accounting, in his report to Congress, is extremely interesting. Much care has been taken to avoid extravagance, but probably the weakest point is that relating to labor. The Secretary states that no large expenditures for material can be made until the price has been approved by the compensation board, and the inspection system of the department is such that it is believed "no large extravagance or misdirection in labor can escape detection and correction." It is well known, however, that in many cases exorbitant wages have been paid for labor under the cost-plus system at cantonments and elsewhere, and the result has been that manufacturers in the neighborhood have lost many of their employees and have often been compelled to raise wages more than other employers not competing with the Government were compelled to do. This is manifestly unjust, and Government officials should spare no pains to curb the practice.

CORRESPONDENCE

Freight Handling Methods Greatly Need Betterment

To the Editor: The "Eastern Railroad Pool" editorial in the current number of THE IRON AGE is most interesting. Much is being written these days about the work that is facing the railroads and the great improvements that have been made in the service. One feature that is most important, to my mind, seems to have been overlooked to a considerable extent.

It is surprising that railroads, the masters of transportation and freight haulage, should still employ the old "husky" with the hand truck on freight platforms and in terminal sheds when power is available for this work and can be used at a great saving of time, labor and money. At the same time cars and boats can be freed from loading and unloading delays in terminals more quickly and kept in active service a much larger part of the time.

Bulk freight such as coal and ore is being handled at the big terminals by power at a very small cost per ton and very quickly. The same class of freight in smaller centers is still handled by the man and shovel method. Simple machines can be had for this work that will materially reduce the time required to unload cars at these points.

If only one man is eliminated from this work at a terminal, an investment will be warranted that will far exceed the cost of the machinery to do the work. Wages are high and are going higher. Men are scarce and are going to be scarcer. More and more freight is going to be offered as time goes on. The railroads should realize that demands on them will be heavy long after peace is declared.

L.c.l. freight is being moved about terminals, into cars and from cars by the same methods that were in vogue at the time the first shed was erected. What excuse can be offered for neglecting this branch of railroad work? Every other department has constantly been improved. Machines are available that will reduce the manual labor required to handle this freight with remarkable savings and at the same time materially shorten the length of time that cars must be held for loading and unloading.

A short time ago the Railway War Board bulletin stated that the railroads were short 45,000 cars. This shortage, I believe, is largely due to the methods of handling freight at the "necks of the railroad bottles," namely, the terminals and unloading yards. It is reasonable to expect that by speeding up loading and unloading methods much of the congestion and car shortage can be eliminated.

A liquid can be poured from a bottle, yes; but it flows more rapidly from a pail or from a bottle if there is a suction on the bottle or a pressure back of the liquid. I suggest that a suction by means of mechanical freight handling and trucking methods be put to work in the terminals and transfer points.

I am sending herewith examples of what has been done at one freight terminal. [Illustration of electrically driven trucks in freight houses.—ED.] While they only illustrate the use of one style of freight handling equipment, they can be taken as indicative of what may be expected from improved methods. No one type of equipment will solve the problems of all terminals any more than one medicine will cure all the ills of the human family.

The writer is not interested in the sale of any of this class of equipment and the information given has resulted from an extensive investigation that led him into many of the largest and most important terminals east of the Mississippi River. Everywhere the lack of mechanical handling equipment was wofully evident.

F. C. MYERS,
Society for Electrical Development, Inc.
New York, Dec. 8, 1917.

Small Decrease in Steel Corporation Orders

Unfilled orders on the books of the United States Steel Corporation on Nov. 30 were 8,897,106 tons, a decrease of 112,569 tons from those reported for Oct. 31. This decline contrasts with one of over 800,000 tons in October and of about 570,000 tons in September. The November report shows the smallest aggregate since Feb. 29, 1916, when the unfilled orders were 8,568,966 tons, and the seventh successive monthly decline. The following table gives the unfilled tonnage at the close of each month since January, 1914:

	1917	1916	1915	1914
January	11,474,054	7,922,767	4,248,571	4,613,680
February	11,576,697	8,568,966	4,345,371	5,026,440
March	11,711,644	9,331,001	4,255,749	4,653,825
April	12,183,083	9,829,551	4,162,244	4,277,068
May	11,886,591	9,937,798	4,264,598	3,998,160
June	11,383,287	9,640,458	4,678,196	4,032,857
July	10,844,164	9,593,592	4,928,540	4,158,589
August	10,407,049	9,660,357	4,908,445	4,213,331
September	9,833,477	9,522,584	5,317,618	2,787,667
October	9,009,675	10,015,260	6,165,452	3,461,097
November	8,897,106	11,058,542	7,189,489	3,324,592
December	.....	11,547,286	7,806,220	3,836,643

Labor Shortage Survey in New York State

WASHINGTON, Dec. 11.—To determine whether there is actually a labor shortage in the United States and why there exists, in some places, an apparent dearth of employment along with this labor shortage, the Department of Labor, through its employment service, is conducting a survey of labor conditions in the State of New York. The survey, when completed, will show what proportion of women is replacing men in industries. To date, the survey has covered 37 cities in New York State.

The war order firms scheduled in 29 cities employ 168,446 people. Some 23,048 additional workers, or a number which is less than 14 per cent of the existing labor force in those industries, are definitely necessary. One firm which is pushing to rapid completion a new plant covering 40 acres has requested 13,323 workers.

Schedules also show that of the calls for extra employees 1400 of the 23,000 were obviously not warranted or at least of doubtful validity because of business conditions or because of the existence of labor disputes. About one-fourth of the 500 firms, 128, are represented in these calls and measured by the number of their employees the call for additional help is equal to about a third of the force already on the rolls of the establishments.

The industries making the largest calls for labor are, in the order named, airplanes and seaplanes (the call from which constitutes 57 per cent of all the labor asked by the 128 firms); ordnance and ammunition; iron and steel castings and forgings; machinery; scientific instruments and optical supplies; knit goods; electrical apparatus and supplies; chemicals, and trucks and motor vehicles. To date no industry scheduled has called for as many as 300 workers and many are asking for smaller numbers.

Employment of Women

As yet there are comparatively few women—only about 300—called for on the schedules to take the places of men. These are confined practically to the Rochester instrument and tool-making firms. Even there the call is for "men or women." The wages offered the women cannot be compared with those offered men, except by a test, as men are paid on a time basis and women are offered piece rates.

One Elmira firm, although it does not appear in the schedules as calling for women to take men's places, actually has substituted 400 women, and by advertising cards has announced its intention of substituting 1100 more very soon. This firm's action has called forth a vigorous protest from organized labor in Elmira, because of lower wages reported to be paid to the women.

Unrest in War Order Plants

At this stage of the survey, it appears that there is more unrest in establishments working on direct war orders than in plants otherwise engaged, owing to the conviction of organized labor that the direct war order firms are taking excess profits.

A remarkable fact revealed by the schedules is that those firms which are calling for extra employees and those which are either not taking on extras or laying off workers are frequently within the same industry, the exceptions being a few cases where a firm has completed large orders and is waiting or making adjustments for new orders. Factories making gears and other machinery for pleasure automobiles are laying off help while the makers of trucks and other service machines are calling for more labor. W. L. C.

The Imperial Munitions Board, Ottawa, Ont., has placed orders with the Coughlan's Shipyards, Ltd., Vancouver, B. C., amounting to $7,254,000, and provides for the construction of 4 additional, 8800 ton steel freight steamers, turbine propelled, similar to the six already under construction at the company's yards. The Coughlan Shipyards have now building contracts to the value of more than $15,000,000.

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Organizing to Cause Strike Is Illegal

Important Decision by the Supreme Court of United States Severely Condemns Malicious Acts of Unions—Three Justices Dissent—Gompers Protests

WASHINGTON, Dec. 11.—In one of the most notable opinions handed down by the United States Supreme Court in a case involving the rights of labor, Mr. Justice Pitney, with the concurrence of the chief justice and four of his associates, holds that an attempt to unionize the employees of a non-union establishment for the purpose of bringing on a strike or otherwise injuring the owners thereof is "malicious in the law" and may be enjoined, and that it is erroneous to assume that all measures which may be resorted to in the effort to unionize a non-union establishment are lawful if they are peaceable, because any violation of the owner's legal rights, contrived for the purpose of inflicting damage, or having that as its necessary effect, is as plainly contrary to law as if it involved a breach of the peace. Justices Brandeis, Holmes and Clarke dissented from the opinion of the court.

The case ruled upon was a suit in equity brought by the Hitchman Coal & Coke Co., owner of a coal mine in the Panhandle district of West Virginia, against certain officers and members of the United Mine Workers of America. At the time the suit was commenced, and for a considerable time before, the mine was operated "non-union," under an agreement between the Hitchman company and its men to the effect that the mine should be run on a non-union basis, that the employees should not become connected with the union while employed by the company, and that if they joined it their employment with plaintiff should cease.

The general object of the suit was to obtain an injunction to restrain the defendants from interfering with the relations existing between the Hitchman company and its employees in order to compel the company to unionize its mine. It was brought in the United States District Court for the Northern District of West Virginia, where the decision was in favor of the plaintiff. The Circuit Court of Appeals reversed this decree and ordered the bill of complaint to be dismissed. The case was then brought to the Supreme Court by writ of certiorari.

Facts of the Case

The facts of the case were that the Hitchman company, after running its mine for three years under a closed-shop agreement with the union, during which time it had three costly strikes, established the mine on a non-union basis, under individual agreements with the men that they should not be members of the union while employed by the plaintiff; and that defendants, having full notice of this working agreement, acting as representatives of the United Mine Workers' Union, and in order to subject plaintiff to such participation by the union in the management of the mine as would result from the making of a new closed-shop agreement, sent an agent or organizer, named Hughes, to the mine, who proceeded, without physical violence, but by persuasion accompanied with deceptive statements as to the attitude of the mine management, to induce plaintiff's employees to join the union, keeping secret the number and the names of the men who agreed to join, and permitting them to remain at work in the mine, with the object of securing the consent of a sufficient number of the men, so that by stopping work in a body they might compel the closing of the mine, and thus cause the company, by fear of losses through the stoppage of operations, to "recognize" the union and make a closed-shop agreement with it.

Similar efforts were made at the same time to organize other non-union mines in the Panhandle district, with the result that defendants succeeded in shutting down one of these mines, and had made considerable progress at two others (including the Hitchman mine), when they were stopped by restraining orders issued by the United States District Court.

Company Entitled to Protection

The Supreme Court holds that the plaintiff was acting within its lawful rights in employing its men upon the terms that they should not be members of the United Mine Workers of America; that, having established this working agreement between it and its employees with the free assent of the latter, plaintiff is entitled to be protected in the enjoyment of the resulting status as in any other legal right; that the fact that the employment was terminable by either party at any time made no difference, since the right of the employees to strike or to leave the work gave no right to defendants to instigate a strike; that plaintiff was and is entitled to the good-will of its employees precisely as a merchant is entitled to the good-will of his customers, although they are under no obligation to continue to deal with him; that the value of the relation lies in the reasonable probability that by properly treating its employees and paying them fair wages and avoiding reasonable grounds of complaint plaintiff will be able to retain them in its employ, and to fill vacancies occurring from time to time by the employment of other men on the same terms; and that defendants could not be permitted to interfere with these rights without some just cause or excuse.

By way of justification or excuse, defendants set up the right of workingmen to form unions and to enlarge their membership by inviting other workingmen to join. The opinion of the court freely concedes this right, provided the objects of the union be proper and legitimate, which is assumed to be true, in a general sense, with respect to the United Mine Workers of America. But the court holds that it is erroneous to assume that this right is so absolute that it may be exercised under any circumstances and without any qualification; that, in truth, like other rights that exist in civilized society, it must always be exercised with reasonable regard for the conflicting rights of others, according to the fundamental maxim "So use your own property as not to injure the rights of another." Hence, assuming defendants were exercising the right to invite men to join their union, nevertheless, since they had notice that plaintiff's mine was run non-union, that none of the men had a right to remain at work there after joining the union and that the observance of this agreement was of much importance and value both to plaintiff and to its men who had voluntarily made the agreement and desired to continue working under it, defendants were under a duty to exercise care to refrain from unnecessarily injuring plaintiff; yet they deliberately and advisedly selected that method of enlarging the union membership which would inflict injury upon plaintiff and its loyal employees, by persuading man after man to join the union, and, having done so, to remain at work, keeping the employer in ignorance of their number and identity, until so many should have joined that by stopping work in a body they could coerce the employer and the remaining miners to organize the mine, and that the conduct of defendants in so doing was unlawful and malicious.

Union Claim Set Aside

To the suggestion that under the existing contract an employee was not called upon to leave the mine until he actually joined the union, and that the organizer only tried to get the men to agree to join, and did not attempt to induce them to break their contracts by remaining at work after actually joining, the Supreme Court holds that in a court of equity, which looks to the substance and essence of things and disregards matters of form and technical nicety, to induce men to agree to join the union for the purpose of shutting down the mine was the same, for practical purposes, as

if they actually became members of the union; that it needed no formal ritual or taking of an oath of membership to constitute them such; their uniting with the union in the plan to subvert the system of employment at the Hitchman mine, to which they had voluntarily agreed and upon which their employer and their fellow-employees were relying, was sufficient to constitute them members for practical purposes.

But the court further holds that what the defendants were endeavoring to do at the Hitchman mine and neighboring mines was not a *bona fide* effort to enlarge the membership of the union, since the new members were not desired or sought except as a means to the end of compelling the owners of the mines to change their methods of operation.

The court further holds that defendants were not pursuing their object by lawful means; that the question of their *bona fide* intention entered into the question of malice; that the intentional infliction of damage upon another without justification or excuse is malicious in the law, and that the excuse set up by defendants could not be regarded as a just cause or excuse because it was based upon the assertion of a conflicting right that was sought to be obtained by unfair methods and for the very purpose of interfering with plaintiff's rights, of which defendants had full notice.

Not Necessarily Peaceable

The court declares that it is erroneous to assume that all measures which may be resorted to in the effort to unionize a mine are lawful if they are peaceable—that is, if they stop short of physical violence or coercion through fear of it; the court holding that any violation of plaintiff's legal rights contrived by defendants for the purpose of inflicting damage, or having that as its necessary effect, is as plainly contrary to law as if it involved a breach of the peace, and that a combination to procure concerted breaches of contract by plaintiff's employees constituted such a violation.

That defendant's acts cannot be justified by analogy to competition in trade; that if a competing trader should endeavor to draw custom from his rival not by offering better or cheaper goods, employing more competent salesmen, or displaying more attractive advertisements, but by persuading the rival's clerks to desert him under circumstances rendering it difficult or embarrassing for him to fill their places, a court of equity would grant an injunction to restrain this as unfair competition.

Summing up the matter, the court holds that the purpose of defendants to bring about a strike at the mine in order to compel plaintiff through fear of financial loss to consent to the unionization of the mine as the lesser evil, was an unlawful purpose, and that the methods resorted to by the organizer—the inducing of employees to unite with the union in an effort to subvert the system of employment at the mine by concerted breaches of the contracts of employment known to be in force there—were unlawful and malicious methods, not to be justified as a fair exercise of the right to increase the membership of the union. And that since plaintiff was threatened with danger of an immediate strike and irreparable damage as the result of defendants' efforts, it was entitled to be protected by an injunction, and for that reason the decree of the Circuit Court of Appeals must be reversed.

Gompers' Comment

Samuel Gompers, president of the American Federation of Labor, in a statement last night characterized the decision as "far-reaching and unwarrantable." He said:

"To hold that the United Mine Workers of America is an unlawful organization or that it is a conspiracy is to hark back to the days when employers were monarchs of all they surveyed and their employees were servants or slaves. The miners' union undertook by perfectly lawful methods and means to reach the unorganized and underpaid miners of West Virginia so that they might be treated as men and as citizens, with the responsibility of maintaining families upon an American standard." W. L. C.

FINALLY DISSOLVED

Council of National Defense Pays Handsome Tribute to Business Men

WASHINGTON, Dec. 11.—In an announcement finally dissolving the original trade committees appointed to co-operate with the Advisory Commission, the Council of National Defense pays a handsome tribute to the services of the hundreds of business men who have performed valuable work as members of the various committees. The council suggests that new committees chosen by the industries themselves will be able to carry on the work already on foot and promises hearty co-operation.

"The Council of National Defense," it is stated, "was established to bring about the co-ordination of industries and resources for the national security and welfare. Previous to the entrance of this country into the war, steps were taken by the council so to mobilize the industries of the country that they could render effective assistance to the nation in its hour of need. The crisis made imperative the necessity for prompt action. Since instant steps were necessary, the Council of National Defense authorized the formation, under its direction, of co-operative committees of industry, to be composed of men representative of their respective lines.

"These committees have given faithful, patriotic and invaluable assistance to their country. Many of the individuals serving on them have done so only at great personal and financial sacrifice. The thanks of the entire country are due to these men, who unhesitatingly and unselfishly responded to the Government's appeal for aid.

"Technically, however, this necessary emergency machinery set up by the council was not in the administrative sense ideal as a means for making permanent the mobilization of industry in a democracy at war. Practically it was effective, but the committees were placed before the public in a position unfair both to themselves and to the Government. The council and its War Industries Board, after giving this matter serious thought for some weeks, have concluded that it is now possible to arrange for meeting the Government's needs through the appointment of highly qualified individuals as Government employees and expert advisers, and also to meet the needs of industry as well as to assist the Government by representative committees created not by the Government, but by the industries themselves.

"It, therefore, has become feasible to discontinue the embarrassing situation wherein the members of the present committees are apparently called upon to act both as Government agents or advisers and at the same time as representatives of the industries. In dissolving the present co-operative committees of industry, the action is taken only with the highest praise and thanks for their splendid and indispensable work, and at the same time with the hope that representative committees of the industry will be formed by the industries themselves at the earliest possible moment.

"The establishment of such committees, formed so as to entitle them to speak for their entire industries, will render immediately available valuable sources of information upon which the Government can draw in connection with the countless business and industrial problems attendant upon the conduct of the work necessary for the prosecution of the war."

Frame barracks under construction in the vicinity of the plant of the Nash Motors Co., Kenosha, Wis., for the accommodation of from 150 to 200 officers and enlisted men of the United States army, were destroyed by fire last week when practically completed. The fire is believed to have resulted from the explosion of small cans of roofing cement. New buildings already are under way. The Nash company is manufacturing motor trucks for the army and the barracks will be used by soldiers who are acting as inspectors and also those being trained in the construction, maintenance and repair of army vehicles.

Iron and Steel Markets

FEW CHANGES IN PRICES

Present Schedule Likely to Remain

Freight Troubles Increased by Snow—Government Needs Are Growing

The Washington conference between the Government and steel makers and the more serious turn in the railroad situation due to snow and zero weather have largely occupied the iron and steel trades and business has been secondary.

Contrary to expectation, the Washington meeting was called with no definite proposal in the minds of the Government representatives. There was no discussion of specific prices, but the situation was canvassed with reference to the latest data obtained from the manufacturers by the Federal Trade Commission showing increased cost of production. The commission's findings will now be gone over with the manufacturers at Washington, Dec. 14, and later the War Industries Board will appoint a meeting with the Steel Committee before Jan. 1. Indications are that few if any changes will be made in the present price schedule and that it will continue after Jan. 1.

The pendency of the Pomerene bill for full Government control of the steel industry is an important reason in the minds of the Government's representatives for not disturbing the market at this time, though a portion of the Federal Trade Commission still favors reductions in basic products.

With no authority which can give assurance of stable prices, consumers are cautious in buying. This is true particularly in lines of product in which Government wants are not dominating. As to plates, shapes, bars and forging steel the average buyer appreciates that contract deliveries are entirely subject to war priorities.

Saturday's blizzard made havoc of the plans of the general operating committee of Eastern railroads at Pittsburgh. A better movement of coke had helped Youngstown blast furnaces to start up, but the coal situation again became desperate. At Cleveland nine plants of the American Steel & Wire Company have been shut down since Saturday for lack of coal, five blast furnaces being banked.

Specifications for Government steel are going to the mills faster than has been counted on, and some classes of mills are more fully occupied on war account than seemed likely two months ago. Yet there are gaps due to lack of team work. For example, Canadian plants having contracts for American shells complain of the slowness with which orders for the steel are sent out from Washington to the makers here.

The pig-iron market is working steadily toward a condition in which consumers without war orders will find it well nigh impossible to secure iron. Philadelphia continues to lead in the volume of new buying. About 60,000 tons was bought there in the week, 30,000 tons being basic for delivery over the first half of 1918. For Pencoyd, Pa., and Worcester, Mass., steel works it is expected that basic iron will be brought from Alabama furnaces of the Steel Corporation.

Pittsburgh and Valley steel works, unable to buy pig iron to make up shortages, are using more scrap, but even so the steel-ingot output is only 75 to 80 per cent of capacity, and the ingot output for the year is now estimated at 42,600,000 tons, as against 41,400,000 tons last year.

Hundreds of thousands of tons of steel for Europe are held up at Atlantic ports and elsewhere by freight congestion. For Italy alone, 82,000 tons is awaiting steamers at one port.

In wire products, sales are being made to the manufacturing trade for delivery in the first quarter of the new year, and considerable foreign demand is still coming up. One 27,000-keg contract for nails is being placed by a single Eastern shipyard for new buildings.

Government orders for tin plate since September have run up to 400,000 to 500,000 boxes, of which about half is for the Allied governments. Practically all the tin-plate output of the first half of 1918 is now under contract.

Upper Lake shipping ports have sent down their last iron-ore cargoes, and the Lake movement for the season is now estimated at 62,300,000 to 62,400,000 tons, December yielding rather a smaller total than seemed probable after the extraordinary performance in November.

The problem of scrap prices is still a serious one, but the Steel Committee has not yet acted on the proposal to establish maximum prices for all old material by groups. Railroads, to get maximum prices for their scrap, would have to sell to iron and steel companies. That would eliminate the scrap dealer, unless some scheme of commissions could be worked out.

The steel industry would be hard hit by any sweeping order affecting Austro-Hungarian subjects, and that is probably a guarantee that the order will not be sweeping. Steel companies have made earnest representations on this subject to Washington, and it is probable that manufacturers must plan for a closer oversight of working forces in which Austrians predominate.

Pittsburgh

PITTSBURGH, Dec. 11.—(*By Wire*).

The general operating committee of the Eastern railroads, which has its headquarters in the Frick Arcade Building in this city, has made up a program of how it intends to clear up the congested railroad situation, as follows: Arrange for organization of the work of the committee and for co-ordination with other bodies where necessary to secure progress; utilize existing railroad facilities to fullest extent for war purposes; expand railroad facilities where necessary for war purposes; obtain full information as to essentials for war

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Dec. 12, 1917.	Dec. 5, 1917.	Nov. 14, 1917.	Dec. 13, 1916.
No. 2 X, Philadelphia...	$34.25	$34.25	$34.25	$29.50
No. 2, Valley furnace...	33.00	33.00	33.00	31.00
No. 2 Southern, Cin'ti...	35.90	35.90	35.90	25.90
No. 2, Birmingham, Ala..	33 00	33.00	33.00	23.00
No. 2, furnace, Chicago*.	33.00	33.00	33.00	30 00
Basic, del'd. eastern Pa..	33.75	33.75	33.75	30.00
Basic, Valley furnace....	33.00	33.00	33.00	30 00
Bessemer, Pittsburgh....	37.25	37.25	37.25	35.95
Malleable Bess., Ch'go*..	33.50	33.50	33.50	30.00
Gray forge, Pittsburgh..	32.75	32.75	32 75	29.95
L. S. charcoal, Chicago..	37.50	37.50	37.50	31.75

Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	....	....	....	$38.00
O.-h. rails, heavy, at mill	....	....	....	40.00
Bess. billets, Pittsburgh.	$47.50	$47.50	$47.50	55.00
O.-h. billets, Pittsburgh..	47.50	47.50	47.50	55 00
O.-h. sheet bars, P'gh...	51.00	51.00	51.00	55.00
Forging billets, base, P'gh	60.00	60.00	60.00	80.00
O.h. billets, Phila.....	47.50	47.50	....	60.00
Wire rods, Pittsburgh...	57.00	57.00	57.00	70.00

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	3.685	3.685	3 685	3.159
Iron bars, Pittsburgh....	3.50	3 50	3.50	3.25
Iron bars, Chicago.....	3.50	3.50	4.50	2.75
Steel bars, Pittsburgh...	2.90	2.90	2 90	3.00
Steel bars, New York...	3.095	3.095	3.095	3.169
Tank plates, Pittsburgh..	3.25	3.25	3.25	4.25
Tank plates, New York..	3.445	3.445	...	4.419
Beams, etc., Pittsburgh..	3.00	3.00	3.00	3.25
Beams, etc., New York..	3.195	3.195	3 195	3.419
Skelp, grooved steel, P'gh	2.90	2.90	2.90	2.85
Skelp, sheared steel, P'gh	3.25	3.25	3.25	3 00
Steel hoops, Pittsburgh..	3.50	3.50	3.50	3.25

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Dec. 12, 1917. Cents.	Dec. 5, 1917. Cents.	Nov. 14, 1917. Cents.	Dec. 13, 1916. Cents.
Sheets, black, No. 28, P'gh	5.00	5.00	5.00	4.25
Sheets, galv., No. 28, P'gh	6 25	6.25	6.25	6.00
Wire nails, Pittsburgh..	3.50	3.50	3.50	3.00
Cut nails, Pittsburgh....	4.50	4.50	...	2 95
Fence wire, base, P'gh...	3.25	3.25	3.25	2.95
Barb wire, galv., P'gh...	4.35	4.35	4.35	3.85

Old Material, Per Gross Ton:				
Iron rails, Chicago.....	$37.00	$37.00	$35.00	$29.00
Iron rails, Philadelphia.	38.00	38.00	38.00	27.00
Carwheels, Chicago	31.00	30.00	27.75	22.00
Carwheels, Philadelphia..	34.00	34 00	29.00	22.50
Heavy steel scrap, P'gh.	30.00	30.00	29.00	27.00
Heavy steel scrap, Phila.	28.00	27.00	26 00	24.00
Heavy steel scrap, Ch'go.	28 00	28.00	28.00	23.50
No. 1 cast, Pittsburgh...	29.00	28.00	26.00	23 00
No. 1 cast, Philadelphia	31.00	31.00	30 00	21 00
No. 1 cast, Ch'go (net ton)	23.50	23.50	22.50	16.50
No. 1 RR. wrot. Phila...	35.00	35 00	35.00	27.00
No. 1 RR. wrot, Ch'go(net)	31.25	31.25	31.00	26.00

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	$6.00	$6.00	$6.00	$7 50
Furnace coke, future....	6.00	6.00	6.00	4.00
Foundry coke, prompt...	7.00	7.00	7.00	8 00
Foundry coke, future....	7.00	7.00	7.00	6.00

Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York..	23.50	23.50	23.50	35.50
Electrolytic copper, N. Y.	23.50	23 50	23.50	35 50
Spelter, St. Louis.....	7.50	7.75	7.75	11.50
Spelter, New York.....	7.75	8.00	8 00	11.75
Lead, St. Louis.....	6.37½	6.37½	6.37½	7.80
Lead, New York.....	6.50	6.50	6.50	7.90
Tin, New York.....	80.00	80.00	73 00	43.00
Antimony (Asiatic), N.Y.	15.25	15.25	13.75	14.00
Tin plate, 100-lb. box, P'gh.	$7.75	$7.75	$7.75	$6.50

purposes, quantity, origin, destination and relative importance; obtain full information as to available vessel tonnage, present and prospective, for United States Government and Allies, separately; obtain an adequate supply of efficient labor. The subjects are listed in the order of their importance, based on what the committee can accomplish promptly by its own independent action. Their true importance, from a military standpoint, is in the reverse order.

This general operating committee has arranged for a joint meeting with presidents of several of the leading steel companies, pig iron interests, coke producers and heads of other interests to be held in its offices here Friday morning, Dec. 14. The committee believes that by holding a joint conference with the heads of the various interests named that have full power to act, it will be able to make faster progress in its efforts to clear up the present congested railroad situation, much the worst ever known in the history of the railroads or in the steel business. Operating conditions among the blast furnaces and steel plants in the Pittsburgh, Youngstown and other districts are not any better than last week, and, if anything, are worse. It is probable that good progress would have been made this week by the general operating committee of the Eastern railroads in clearing up the congested railroad conditions, but on Saturday night, Dec. 8, a blizzard set in and there has been zero weather ever since. This naturally retarded more than ever the movement of cars and added to the troubles of the railroads, so that conditions to-day are probably worse than at any time. However, in the Youngstown district the railroad situation is said to be somewhat better and there has been a freer movement of coke to the blast furnaces than for some time. The two Ohio stacks of the Carnegie Steel Co. that were banked have again been started, the banked stack of the Youngstown Sheet & Tube Co. has been put in blast and also the Hubbard stack that was banked for lack of coke. The coal situation is not any better and all the plants at Youngstown are running very short of fuel. A movement started here last week to establish a two weeks' shutdown of manufacturing plants in the Pittsburgh district, or from Dec. 22 to Jan. 7, has collapsed. A meeting of the committee on mining and manufacturing of the Chamber of Commerce was held here last week, but it was decided that the imperative demands of the Government for materials for war purposes were such that the proposed shutdown would be unwise and the matter was dropped. It is claimed, and it is probably true, that 75 to 80 per cent. of the output of Pittsburgh manufacturing plants is for war purposes on either direct or indirect Government orders. The amount of new business being placed for iron and steel products by other consumers is very light. The agitation started for a revision of Government steel prices on Jan. 1 to a lower basis has no doubt unsettled the trade and consumers are not buying a pound of material they can do without. In addition, this is stock-taking period, when all consumers buy as little material as possible. It is very difficult to find any mills that will sell anything at Government prices for delivery before Jan. 1, and consumers are indifferent about buying for delivery beyond that period until conditions are more settled. As yet no advices have been received here as to what action was taken at the conference in Washington, Monday and Tuesday, between the general committee on iron and steel and the War Industries Board. It is the general opinion that a revision of steel prices on Jan. 1 would be a detriment to the steel trade and make conditions even worse, as regards new buying, than they are now.

Pig Iron.—It is the old story in pig iron, every consumer trying to buy, and practically no pig iron to be had. There would be no trouble in selling promptly 100,000 tons or more of Bessemer or basic iron to consumers in this district, and it might be double that amount, but there is no iron being offered. Many open hearth steel plants, unable to get pig iron as fast as

needed, are changing their mixtures, and using more scrap. The output of pig iron in the last three or four days has been materially cut down by the cold weather, which has held up shipments of coke, and in addition on very cold mornings the number of men that report to work is cut down a good deal, and this interferes with operations. A fair amount of foundry iron is being sold for delivery in first quarter and first half of next year at the regular price of $33 for No. 2. The Carnegie Steel Co. has at present 18 or 19 blast furnaces banked for lack of coke, but expects to start some of these this week.

We quote as follows: Basic pig iron, $33; Bessemer, $36.30; gray forge, $32; No. 2 foundry, $33; No. 3 foundry, $32.50, and malleable Bessemer, $33.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being 95c. per ton.

Billets and Sheet Bars.—It is almost as difficult to find any surplus steel in billets or sheet bars for sale in the open market as it is to find pig iron. All the large steel mills are short of steel, due to scarcity of pig iron, and output has been cut down very considerably in the past three or four days on account of the blizzard. Some of the larger steel companies are selling very little open-hearth steel in the open-hearth market, desiring to conserve as much of their output as they possibly can for the Government. It is a fact that four or five of the larger open-hearth steel companies are selling 75 to 80 per cent of their entire output of steel to the Government and practically the same percentage of other products. The mills are taking care of customers on contracts for billets and sheet bars in pretty fair shape, but none of the mills is seeking new business, and, in fact, they would much prefer to buy steel if they could find it, than to sell it.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $47.50, sheet bars $51, and forging billets $60 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Ferroalloys.—The new demand for the different grades of ferroalloys is heavier than for some time, and prices are very firm, on some grades being slightly higher. We now quote 80 per cent domestic ferromanganese at $250, delivered, and 18 to 22 per cent spiegeleisen at $62 to $65, delivered. Prices on 50 per cent ferrosilicon are higher, and we now quote for prompt delivery $165 to $170, delivered. One leading maker of Bessemer ferrosilicon is reported sold up for first half of next year and for delivery in second half of next year is quoting 9 per cent at $51.70 at furnace, while another maker that will accept orders for delivery in first quarter and first half of next year is quoting 9 per cent at $54 at furnace.

We now quote 9 per cent Bessemer ferrosilicon at $54.00, 10 per cent $55, 11 per cent $58.30, 12 per cent $61.60. We quote 6 per cent silvery iron $40, 7 per cent $42, 8 per cent $44.50, 9 per cent $47, 10 per cent $50. Three dollars per gross ton advance for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, these furnaces having a uniform freight rate of $2 per gross ton, for delivery in the Pittsburgh district.

Structural Material.—The two leading local steel fabricators say that practically all the new business they are taking is for the Government either on direct or indirect orders, and no details regarding these contracts are given out. The amount of industrial structural work that is being placed by domestic customers, other than those working on war materials, is very light, due to high costs of steel and labor, and the long delay that will be experienced in having their orders filled, Government business taking priority over all other contracts. We quote beams and channels up to 15 in. at 3c. at mill, but none of the structural steel mills has any material to sell for delivery before the middle of next year or later.

Steel Rails.—The amount of new business being placed in light rails and standard sections is very light. The mills rolling light rails from billets, and also the rerolling light rail mills are filled up for some months.

We quote light rails, 25-lb. and heavier, at 3c. per lb.; 16-lb. and 20-lb., 3.45c.; 12-lb. and 14-lb., 3.95c. and 8-lb. and 10-lb., at 4.35c. for full carload lots, f.o.b. Pittsburgh; for less than carload lots, down to and including five gross tons, 0.05c. extra, and small lots under five gross tons, 0.09c. extra, all per lb., f.o.b. Pittsburgh.

Plates.—The supply of plates available in the open market for early delivery at the Government price seems to be growing less, due no doubt to the fact that Government demands for plates are getting steadily heavier. One Youngstown mill, that formerly sold a fair amount of plates in the open market, has retired as a seller, its entire output now going to the Government with the exception that a small part of it is used in its pipe mills. No new orders for steel cars are being placed in this district, and the steel car companies report that deliveries of plates by the mills are not any better and are only 40 to 50 per cent of normal requirements. About 75 to 80 per cent of the output of plates of the two leading mills in this district is going to the Government. We quote ¼ in. and heavier sheared plates at 3.25c. at mill, f.o.b. Pittsburgh.

Sheets.—Most of the mills have covered the needs of their larger customers for the first half of 1918 in sheets, except on galvanized, which so far are being sold only for first quarter. As noted last week, the new demand for sheets from the automobile trade has fallen off very much, and this will allow a considerable tonnage of sheets that otherwise would have gone to the builders of pleasure cars to be diverted to the manufacture of other products. Some consumers of sheets are not showing much eagerness to cover ahead, not knowing whether they will be able to operate their plants in the near future, as they are not making materials regarded as essential to the conduct of the war. It is said that as high as 10c. per lb. has recently been paid in this market for sheets rolled from puddled iron. Prices in effect on all grades of sheets are given in detail on page 1447.

Tin Plate.—Fairly heavy Government orders for tin plate are still being placed. One order for 40,000 boxes came out last week, mostly for shipment to France and Belgium. It is estimated that in the past two or three months the Government has bought a total of 400,000 to 500,000 base boxes of tin plate, probably half of which was for shipment to our Allies. There are still some export orders in the market, and a recent Government decision is that contracts made prior to Government rulings are exempt from these rulings and licenses are issued for such contracts. A recent Government ruling is that all inquiries for overseas shipment must be submitted to the War Board before manufacturers are allowed to quote. All the tin plate that will be made in the first half of 1918 is practically under contract, but a few consumers have not yet covered. Some mills covered their trade for all of next year, the price for the second half of the year to be fixed later. More tin plate is now being made from Bessemer stock than for a long time, the Government requirements for open hearth steel being so heavy that the steel mills are diverting every pound of open hearth steel possible to Government work and using Bessemer for making tin plate and other products, for which it is just as suitable as open hearth steel. Some tin plate mills are using all Bessemer steel, being unable to get open hearth bars from their regular sources of supply. The current demand for small lots is fairly active, and stock items are moving out freely. We quote coke plate at $7.75 per base box, f.o.b. Pittsburgh, for Bessemer and open hearth stock, and our prices on terne plate are given on page 1447.

Iron and Steel Bars.—Consumers of iron and steel bars are not able to find any mills that will take their orders for prompt shipment at the regular ruling prices, the mills stating their obligations are such that their entire output is sold up for some months. The new demand for both iron and steel bars is not very active, and from some consumers, notably wagon builders and implement concerns, is quiet. The demand for reinforcing rods for building purposes is also dull. Specifications against contracts are fairly active. We quote steel bars at 2.90c., and refined iron bars at 3.50c. in carloads, f.o.b. Pittsburgh.

Wire Rods.—The domestic demand is quite active, and there is also considerable foreign inquiry. One inquiry from Canada for 1000 tons of soft rods came out last week. No differentials were fixed by the Government for high carbon rods, and the mills are quoting on these, whatever prices they see fit. One

leading producer is charging a differential of about $10 per ton for high carbon rods over ordinary rods, and another maker is asking close to $20 advance. Local makers of rods report they are pretty well sold up for the next few months, but can take some business for delivery late in the first quarter. There is a growing scarcity in the supply of open hearth rods, due to the fact that the Government is taking so much open hearth steel for war purposes. Prices on rods are given in detail on page 1447.

Wire Products.—The Government is still a fairly heavy buyer of wire and wire nails on direct and indirect orders, one order coming out last week from the International Shipbuilding Corporation for 12,000 to 13,000 kegs of wire nails for prompt shipment. There is also a fair amount of foreign demand for both wire and wire nails, but it is very difficult to get cars and even harder to get Government licenses for export shipment. Makers of wire nails are watching closely the conference of the steel manufacturers and the War Industries Board at Washington, and still believe that there should be at least a slight advance in prices on all wire products. The demand for wire and wire nails is fairly active, and stocks are said to be lighter than usual. A good deal of steel, particularly open hearth that was formerly used in the manufacture of wire and wire nails, is now going into Government material, and some makers of wire products are cutting down their output very considerably for this reason. Prices on wire and wire nails being quoted by the mills are given in detail on page 1447.

Nuts and Bolts.—Makers report that only a small amount of new civil business is being placed, fully 80 to 90 per cent of new orders coming from the Government or from concerns doing Government work. Deliveries of steel by the mills are reported better than for some time, and the output of nuts and bolts is running very close to capacity. Specifications against contracts are fairly active, and the regular Government discounts are given on page 1447.

Rivets.—General buying is very light, but the Government is placing heavy direct and indirect orders for rivets, which the makers are turning out and shipping promptly. It is said that fully 90 per cent of the new business in rivets is coming from the Government. We quote structural rivets at $4.65, and cone head boiler rivets at $4.75 base, in carloads, f.o.b. Pittsburgh.

Hoops and Bands.—It is not likely that any mills rolling hoops and bands are able to take new orders for shipment within three to four months or longer. The leading maker of hoops and bands is sold up for at least the first half of 1918, and has heavy obligations for second half of next year. The Government price on steel bands is 2.90c. and extras as per the steel bar card, and 3.50c. on steel hoops f.o.b. Pittsburgh.

Shafting.—New buying from the general trade is very dull, but the Government is placing heavy direct and indirect orders, and it is estimated that fully 90 per cent of the new business in shafting is for such work. There has been a heavy falling off in orders from the automobile and screw stock machine trade for shafting, and specifications on contracts are quiet. The Government is using very large quantities of shafting for adaptors and large quantities are also being used by the nut and bolt people, and also in the manufacture of small turnbuckles for airplanes. We quote cold rolled shafting in large and small lots at 17 per cent off list, f.o.b. Pittsburgh.

Cold Rolled Strip Steel.—The non-Government trade is dull, and many fairly heavy users of cold rolled strip steel are holding back placing orders, not knowing whether they will be able to operate their plants steadily, particularly those concerns making products not regarded as essential to carrying on the war. It is also true that there is no incentive for consumers to make contracts and makers are discouraging this as much as they can. Most of the new business being placed is on Government direct or indirect orders. The demand from the automobile trade and other trades has fallen off very materially, and all makers of cold rolled strip steel are in position to take orders for fairly prompt shipments. It is not expected that prices on cold rolled strip steel will be changed, as they are regarded as fair by both makers and consumers.

We quote cold rolled strip steel at $6.50 and hot rolled at $4.50 per 100 lb., f.o.b. Pittsburgh, terms 30 days, less 2 per cent off for cash in 10 days, when sold in quantities of 300 lb. or more.

Hot Rolled Strip Steel.—Makers report the new demand quiet, but state the Government price is very firm, and no material is being sold at a lower figure. We quote hot rolled strip steel at $4.50 per 100 lb. f.o.b. Pittsburgh.

Railroad Spikes.—The new demand is dull, but jobbers are buying freely; in fact, most of the new business for some time has come from this source. Railroads have not been in the market actively for spikes.

We quote standard sizes of railroad spikes at 4.50c.; ½-in. railroad spikes, 5.50c. base; ⅝-in. and 7/16-in., 6c. base; 5/16-in., 7c. base, per lb., f.o.b. Pittsburgh.

Wrought Pipe.—The Philadelphia Co.'s annual inquiry came out last week and was closed for about 20,000 tons of tubular material, consisting of line pipe, casing, tubing and plain-end pipe. The company will buy either iron or steel, but it is doubtful whether it will be able to get very much of this material in iron. The new demand for iron and steel pipe from the domestic trade is quiet, but the Government is still placing fair sized orders right along, which the mills get out and ship very promptly. Some of the larger mills rolling steel pipe are filled up for practically all of next year on lapweld sizes, but on buttweld pipe can take orders for fairly prompt shipment. The demand for buttweld pipe is dull, especially for sizes used for building purposes. Discounts on iron and steel pipe are given on page 1447.

Boiler Tubes.—Practically the entire output of the leading maker on seamless tubing and boiler tubes is going to the Government, and other makers are also filling large Government orders. On boiler tubes, most of the mills are not in position to take orders for delivery before second half of next year. Now that the shipbuilding program of the Government is under way, the demand on the mills for boiler tubes will likely become more urgent. It is said that every mill making iron or steel tubing is sold up for some time. These discounts are given on page 1447.

Coke.—Operating conditions in the coke trade are very unsatisfactory. The supply of cars is bad, labor is scarce, and the cold snaps of the last three or four days cut down output very much just at the time when it was needed most. Monday and Tuesday of this week the Pennsylvania Railroad Co. furnished almost no cars, the B. & O. about 30 per cent, and the P. & L. E. possibly about 50 per cent. During the very cold weather, many coke workers at beehive ovens failed to report for duty, and the output of coke was cut more than 50 per cent. A committee of brokers in coke is in Washington to-day (Tuesday) conferring with the Fuel Administrator, trying to get authority to charge a commission of 50 cents a ton, or at least 25 cents for handling coke. It is not believed, however, that the Government will grant this. It is said by several large coke operators that the scheme proposed by the railroads for pooling coke shipments is not feasible. There are too many grades of coke, and too many other conditions entering into this problem. Practically every coke plant makes a certain grade of coke, different from the others, and it is pointed out that a 500-ton blast furnace can use say 75 per cent of high grade coke, and then work in 25 per cent of a lower grade. The car supply is expected to be better the latter part of this week, as the cold weather is moderating. No contracts for furnace and foundry coke are being made, but on Jan. 1 a number of contracts for high grade blast furnace coke made prior to the time the Government fixed the price of $6 on furnace coke will go into effect. These contracts were made with four or five of the large steel companies, and call for blast furnace coke at prices ranging from $8 to $9 per net ton, and it is said one large contract was made at $9.50 per net ton. It is claimed that all coke producers are now adhering firmly to Government prices on all their sales. We quote furnace coke at $6, foundry $7, and crushed coke from

1-in. size $7.30, all in net tons at oven. The output of coke in the upper and lower Connellsville regions for the week ending Dec. 1 is given by the *Connellsville Courier* as 295,316 tons, a decrease over the previous week of 20,702 tons. This is the smallest output in one week for some time, and it is not unlikely that the output for the week ending Dec. 8 will be still less.

Old Material.—Dealers report that railroad conditions are steadily getting worse, and are so bad that they are indifferent about doing business. Conditions are such that it is almost impossible to get cars, and when a car of material is rejected, the dealer often suffers a severe loss in trying to have it moved to some other consumer. Conditions in the scrap trade as regards prices are also very unsatisfactory to dealers. They claim they cannot buy material at Government prices and handle it with a profit. In some cases, it is known that consumers, in order to get heavy steel scrap and other old material they badly need, are paying a commission to dealers to get it, this allowing the dealers a profit. A largely attended meeting of scrap dealers was held in the Woolworth Building, New York, last week to consider the present unsatisfactory conditions existing in the scrap trade, but up to this time it is not known whether any definite plan was worked out. The scarcity of pig iron is helping the scrap market a good deal, and prices on nearly all grades are higher. There have been sales in the past week of heavy steel scrap at the full Government price of $30, and also of borings and turnings at the Government price of $20, delivered. The entire market this week on all grades of scrap, not controlled by Government prices, is from $1 to $2 per ton, higher. Dealers quote for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$30.00
No. 1 foundry cast	$29.00 to 30.00
Rerolling rails, Newark and Cambridge, Ohio, Cubmerland, Md., and Franklin, Pa., and Pittsburgh	38.00 to 39.00
Hydraulic compressed sheet scrap	26.00 to 27.00
Bundled sheet scrap, sides and ends, f.o.b. consumer's mill, Pittsburgh district	24.00 to 25.00
Bundled sheet stamping scrap	21.00 to 22.00
No. 1 railroad malleable stock	37.00 to 38.00
Railroad grate bars	19.00 to 20.00
Low phosphorus melting stock	38.00 to 40.00
Iron car axles	42.00 to 43 00
Steel car axles	43.00 to 44.00
Locomotive axles, steel	51.00 to 52.00
No. 1 busheling scrap	19.00 to 20.00
Machine shop turnings	19.00 to 20.00
Cast-iron wheels	33.00 to 34.00
Rolled steel wheels	36.00 to 37.00
*Sheet bar crop ends	37.00 to 38.00
Cast-iron borings	19.00 to 20.00
No. 1 railroad wrought scrap	37.00 to 38.00
Heavy steel axle turnings	25.00 to 26 00
Heavy breakable cast scrap	26.00 to 27.00

*Shipping point.

Philadelphia

PHILADELPHIA, Dec. 11.

There is some anxiety among iron and steel producers that the Government may seek to bring about a revision of the prices which are in effect until Jan. 1. It is generally conceded that any change, either upward or downward, would be disturbing, and it is understood that representatives of the Eastern Pennsylvania steel industry who attended the meeting in Washington Monday advocated a continuation of the present schedules after the first of the year. The feature of trading in this market continues to be the large demand for pig iron, and it is estimated that upward of 60,000 tons were sold during the past week. A large part of this was basic iron for delivery during the first half of the year. The pig iron trade is rapidly working toward a condition where it is going to be almost impossible for any but concerns engaged on war work to obtain iron. A slight improvement is noted in the coke supply and fewer blast furnaces are banked. Railroad congestion, however, is serious.

Pig Iron.—Another buying flurry in this market during the past week resulted in the booking of orders for about 60,000 tons of iron, of which more than 30,000 tons was basic iron for delivery over the first half of next year. One lot of 5000 tons was sold for January-February delivery to an eastern Pennsylvania structural mill. Steel companies have by no means satisfied their requirements. The American Bridge Co. wants more basic for its Pencoyd works at Trenton, N. J., and the American Steel & Wire Co. wants basic for its Worcester, Mass., plant. It is probable that this iron will be brought from Southern furnaces. There is also a large demand for low phosphorus iron, and about 12,000 tons of the copper free was sold for delivery in the second half. There is practically none to be had for first half. Two lots of copper bearing low phosphorus iron were taken by an eastern Pennsylvania company, 3000 tons for prompt delivery and 7500 tons for delivery next year. A radiator company has had difficulty in placing orders for 12,000 tons of foundry iron for delivery over next year because of its inability to show that all of the iron is to be used on Government work. The demand for foundry iron is so insistent that purchasers are willing to waive analysis and take any grade they can obtain. There have been requests for prompt delivery foundry iron, which could not be satisfied. For next year a fairly large number of orders is being placed. The question of priority is as disturbing to sellers as it is to buyers. Several sellers have written to their customers, asking them to state the character and quantity of war work in which they are engaged, and the answers reveal the fact that practically every company is working to some extent on direct or indirect Government business. Inasmuch as there will probably not be enough iron next year to satisfy all requirements, some must go without or their supply will be materially reduced. The Government authorities show a disposition to permit the pig iron makers to take care of demands with as little disturbance to contracts as possible, but sellers of iron maintain that they cannot be placed in the position of choosing which of their customers shall receive iron. Some contracts are being placed with the understanding that the iron will be shipped provided that the output of the furnace is up to expectations and that the Government does not disturb deliveries by commandeering. Consumers who are not getting enough iron are sending their complaints to Washington, with the result that the Government authorities are requesting the makers to increase their deliveries. This cannot be done in some instances without taking iron away from some other consumer who probably needs it as badly as the consumer who makes the complaint. It is becoming more apparent that the Government will eventually be obliged to commandeer iron to provide its war contractors with a sufficient supply, and when this process begins deliveries on existing contracts will, of course, suffer considerable delay. A case in point is the inquiry of the Tacony Ordnance Corporation, Tacony, Pa., for 5700 tons of low phosphorus iron for delivery from February to June. This company is building a plant for the Government for making gun forgings, and its requirements must, of course, be met, but as the low phosphorus iron output is well sold up for the first half, it is not unlikely that a commandeering order will be necessary to procure it. We quote standard grades of iron at furnace as follows, to which should be added the freight rate to destination:

Eastern Pennsylvania No. 1 X	$34.50
Eastern Pennsylvania No. 2 X	33.50
Eastern Pennsylvania No. 2 foundry	33 00
Virginia No. 2 X	33.50
Virginia No. 2 foundry	33.00
Basic	33.00
Gray forge	32.00
Bessemer	36.30
Standard low phosphorus	53.00
Low phosphorus (copper bearing)	50.00

Coke.—Deliveries of coke are slightly better and blast furnace operators have hope that there will be a continued improvement. Fewer blast furnaces are banked. There has been a more successful handling of priority shipments. We quote blast furnace coke at $6, ovens, and 72 hr. foundry coke at $7, with none being sold here for prompt delivery.

Ferroalloys.—The market for ferromanganese is firmer and quotations now range from $240 to $250, whereas a week ago there were numerous sales around $235. Two ferromanganese blast furnaces are banked

and this has had some effect upon the situation. Some of the vessels carrying ore from Brazil have been taken over by the Government. The Tacony Ordnance Corporation wants 250 tons of ferromanganese for delivery beginning in February; also 25 tons of ferrosilicon and 25 tons of spiegeleisen. A great scarcity of ferrochrome has developed, due to scarcity of ships for bringing the chrome ore from New Caledonia and South Africa. In sympathy with ferromanganese, spiegeleisen shows a firmer tone, the minimum now being quoted as $60 at furnace.

Billets.—There is nothing being done in this market in billets, producers requiring all that they make for their own finishing mills. The market is nominal at the Government price of $47.50, Pittsburgh, for rerolling billets.

Sheets.—A fair amount of business is being done for first quarter delivery. The Pennsylvania Railroad Co. has placed a large order for new freight cars now building at its shops. We quote No. 10 blue annealed at 4.25c., Pittsburgh; No. 28 black at 5c., and No. 28 galvanized at 6.25c.

Structural Material.—Except for Government buildings, the demand for structural material is nil. A structural steel company which has made a canvass of building projects which have been reported during the past few months has found that all of these have been shelved pending a more favorable situation. We quote shapes at 3c., Pittsburgh.

Plates.—The American International Shipbuilding Corporation is now giving out orders for the fabrication of plates and shapes into sections for the 70 troopships which it will build at Hog Island. These ships will require about 200,000 tons of finished material. A new plate mill is soon to be built in eastern Pennsylvania. Details will be announced later. Shipments of plates continue to be almost entirely for Government work. It is reported that some of the new shipyards have hundreds of tons of plates on the ground with no machinery shipped as yet for doing the fabricating work. We quote plates at 3.25c., Pittsburgh.

Iron and Steel Bars.—Very little is being done in steel bars, most of the mills declining to consider new business. A few are taking care of their regular customers for first quarter, but the allotments, in some instances, will fall short of consumers' requirements. Bar iron mills are taking business largely for shipment at their own convenience. This sometimes means fairly prompt deliveries if rollings of the required sizes are being made. We quote steel bars at 2.90c., Pittsburgh, and bar iron at 3.50c., f.o.b. mill or Pittsburgh.

Old Material.—There is a disposition on the part of many small dealers to refuse to sell at the prices which are now being offered for delivery in eastern Pennsylvania. Heavy melting steel was sold last week for delivery at Coatesville, Pa., at $28 per ton. No. 1 railroad wrought is scarce at the fixed price of $35 and No. 1 yard wrought is being substituted in a great many cases, dealers now obtaining $33 to $35 for the latter grade. No. 1 forge fire and bundled sheets are also higher. We quote as follows for delivery in eastern Pennsylvania:

No. 1 heavy melting steel	$28.00 to $29.00
Steel rails, rerolling	38.00 to 40.00
Low phosphorus heavy melting	36.00 to 38.00
Old iron rails	38.00 to 40.00
Old carwheels	34.00 to 36.00
No. 1 railroad wrought	35.00
No. 1 yard wrought	33.00 to 35.00
No. 1 forge fire	23.00 to 24.00
Bundled sheets	23.00 to 24.00
No. 2 busheling	15.50 to 16.50
Steel turnings (for blast furnace use)	15.50 to 16.00
Machine shop turnings (for rolling mill use)	18.00 to 19.00
Cast borings (for blast furnace use)	15.50 to 16.00
Cast borings (clean)	20.00
No. 1 cast	31.00 to 33.00
Grate bars	21.50 to 22.50
Stove plate	22.00 to 23.00
Railroad malleable	30.00 to 32.00
Wrought iron and soft steel pipes and tubes (new specifications)	30.00 to 32.50

Buffalo

BUFFALO, Dec. 10.

Pig Iron.—The market situation is summed up in the statement that while inquiries are numerous and insistent, furnaces are obliged to disregard them in a large measure, because of their inability to accept more than very limited additional business under present disabilities in the way of coke and labor shortage and other uncertainties and cannot in consequence quote definitely on future commitments, or promise deliveries. This week the situation is made worse by severe weather conditions, deep snows and high winds, which have clogged railroad yards, disrupted railroad traffic and brought freight movement almost to a standstill. One producer reports two inquiries of 10,000 tons each for basic on which it was obliged to decline to quote. Some furnaces are not selling anything, even for last half, owing to sold up conditions for first half and uncertainties regarding supplies of raw materials later on. One selling interest states that its inquiries, which are of considerable volume, would be larger were it not for the fact that its regular buyers and others know that it is sold to the limit and is out of the market. In foundry coke, the situation is a little easier and heavy buying of foundry coke orders is reported. We continue to quote as follows, f.o.b. furnace, Buffalo:

No. 1 foundry	$34.50
No. 2 X	33.50
No. 3 foundry	32.50
Gray forge	32.00
Malleable	33.50
Basic	33.00
Lake Superior charcoal, f.o.b. Buffalo	39.75

Old Material.—The market continues to show great strength, and the demand for heavy melting steel, particularly, is very heavy. The shortage in this commodity is becoming exceedingly pronounced, only small tonnages now being obtainable, and many yards of dealers are entirely depleted of this class of stock on account of the pressing demand. Stocks of many other grades are also becoming much contracted, as railroad scrap lists are light; rolling stock being operated as long as possible without renewals, and making scrapped materials of much smaller volume than usual. Dealers have been notified this week of embargoes placed on some additional consuming points, and owing to the increasing difficulties in shipping caused by embargoes and by tied up conditions in freight movement in this vicinity this week resulting from severe weather and heavy snows, the transaction of business has been seriously hampered; in fact, some dealers are not attempting to do any business on account of these conditions. There has been no change in the prices of any commodities on the list this week, and we continue to quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$29.00 to $30.00
Low phosphorus	40.00 to 42.00
No. 1 railroad wrought	34.00 to 35.00
No. 1 railroad and machinery cast	30.00 to 31.00
Iron axles	45.00
Steel axles	45.00
Carwheels	32.00 to 33.00
Railroad malleable	29.00 to 30.00
Machine shop turnings	18.00 to 18.50
Heavy axle turnings	26.00 to 27.00
Clean cast borings	19.00 to 20.00
Iron rails	37.00 to 38.00
Locomotive grate bars	20.00 to 21.00
Stove plate	21.00 to 22.00
Wrought pipe	26.00 to 27.00
No. 1 busheling scrap	26.00 to 27.00
No. 2 busheling scrap	17.00 to 18.00
Bundled sheet stamping scrap	19.00 to 20.00

Finished Iron and Steel.—Practically all lines of finished materials show good demand. Considerable interest is being expressed by iron and steel users as to the results of the meeting scheduled to take place at Washington looking to the fixing of steel commodity prices for the first part of 1918. There is a feeling on the part of some selling agencies that prices on at least some of the commodities will be higher than the present schedule, due to increased costs. One local maker of billets reports that it is out of the market for one year, the United States Government and some of the allied Governments having taken

all of its product for that period of time, and a maker of wire rods states that it is contracted ahead for its entire production for between six and seven months.

Cincinnati

CINCINNATI, Dec. 11.—(*By Wire.*)

Pig Iron.—Latest reports show that there has been no general shutdown of furnaces in either the Hanging Rock district or in the South due to the shortage of coke on account of the severe weather of the past few days. However, one Jackson County, Ohio, furnace producing silvery iron has been compelled to bank, thus adding to the scarcity of high silicon iron. Steel making irons are exceedingly scarce and one prominent firm is authority for the statement that if basic iron could be obtained, over 100,000 tons could be disposed of immediately. Malleable is needed by only comparatively few firms, but its scarcity is almost as marked as that for basic. The foundries are engaged now in trying to obtain sufficient shipments of coke to carry them through the year. This situation is more serious with the furnaces and iron production will doubtless be cut down more than usual on account of the holiday season that will last longer than usual, partly due to the independent attitude of laborers in different coke and pig iron producing districts. Inquiries for foundry iron are scarce. Shipments en route have been delayed indefinitely. Government requirements are receiving first attention, but even priority orders have not relieved the situation as far as basic iron is concerned. Based on freight rate of $2.90, Birmingham, and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, prices as follows:

Southern coke, No. 2 foundry and 2 soft	$35.90
Southern Ohio coke, No. 2	34.26
Basic, Northern	34.26

Coke.—The movement of all freight is in a snarl on account of the blizzard that struck the Central West the latter part of last week. Prompt deliveries of coke are of course out of the question. Iron furnaces in the Hanging Rock district were able to operate until to-day, but unless a further supply of coke is received shortly, some of them may be compelled to bank temporarily. Foundry coke consumers are also very anxious and are making every effort to obtain a future supply. They are also using sparingly what coke they have on hand. The transportation heads of different firms are deluged with requests from customers to locate cars already en route, but so far this week they have been very much handicapped.

Finished Material.—Business continued to drop off with the jobbers last week, but the blizzard Saturday has almost completely tied up all operations and only the most urgent out-of-town shipments are made. Shipments from the mills are also delayed with not much chance that the situation can be cleared up within the next few days. The jobbers have now added the full freight rate from Pittsburgh instead of quoting even figures as heretofore with the usual jobbers' differential added.

Old Material.—Business is at a complete standstill and scrap that was loaded on cars for shipment to the Pittsburgh district early last week is still somewhere en route. The following are dealers' prices f.o.b. cars, southern Ohio and Cincinnati.

	Per Gross Ton	
Bundled sheet scrap	$17.50 to	$18.00
Old iron rails	32.00 to	32.50
Relaying rails, 50 lb. and up	44.00 to	44.50
Rerolling steel rails	33.00 to	33.50
Heavy melting steel scrap	25.50 to	26.00
Steel rails for melting	24.50 to	25.00
Old carwheels	27.00 to	27.50
	Per Net Ton	
No. 1 railroad wrought	$29.00 to	$29.50
Cast borings	13.00 to	13.50
Steel turnings	13.00 to	13.50
Railroad cast	18.50 to	19.00
No. 1 machinery cast	25.00 to	25.50
Burnt scrap	14.00 to	14.50
Iron axles	40.00 to	40.50
Locomotive tires (smooth inside)	33.50 to	34.00
Pipes and flues	15.50 to	16.00
Malleable cast	19.50 to	20.00
Railroad tank and sheet	14.50 to	15.00

Birmingham

BIRMINGHAM, ALA., Dec. 11.—(*By Wire.*)

Two furnaces of the Republic Iron & Steel Co., which were out because of coke shortage caused by fire which destroyed the washer at the Sayreton mines, are again in operation. The Sloss Sheffield Steel & Iron Co. has blown out a furnace at Sheffield for repairs, but has completed a new furnace at the same place and will start it. The end of the week iron market is the same as last week, with production off and small lot sales being made for delivery the first half of next year. Soil pipe plants are shutting down indefinitely. They have no business. There is a little apprehension owing to the report that the Government proposes a downward revision of prices Jan. 1.

British Steel Market

Pig Iron for Export Advanced—American Orders for Ferromanganese Held Up

(*By Cable*)

LONDON, ENG., Dec. 12.

Cleveland hematite pig iron for export to the Allies has been advanced to 147s. 6d. but for the home trade is unchanged at 122s. 6 d. American semi-finished steel is in poor demand. Wire rods for January & March shipment are quoted nominal at about £21 c.i.f. Ferromanganese is steady with American orders in abeyance. We quote as follows:

Tin plates coke, 14 x 20; 112 sheets, 108 lb., fo.b. Wales, 31s. 3d.
Ferromanganese $270 c.i.f. nominal for export to America.
Ferrosilicon, 50 per cent, c.i.f. £35 upward.
On other products control prices are as quoted in THE IRON AGE of July 19, p. 171.

Revision of Maximum Pig-Iron Prices—Large Tin Plate Orders for France

(*By Mail*)

LONDON, ENGLAND, Nov. 20.—Further developments in regard to a revision of official prices are still in abeyance but an announcement may be made any day. The position is full of complexities, hence the delay which is causing considerable inconvenience. Various rumors have been afloat as to the outcome of the new conditions created by the recent rise in fuel, but nothing reliable is known as to the result of the conference on the adjustment in pig-iron prices. It is suggested that the authorities are disposed to grant a subsidy to smelters rather than interfere with the maxima in force, and producers seem to favor this. A readjustment of the whole position both of pig iron and finished material is imperative.

New business in Cleveland common foundry iron is small, applications for this month's deliveries having already been dealt with. Consumption is on a big scale, but deliveries are delayed by car shortage, and it is hoped that the arrears will be made up next month. For new orders makers' terms are subject to any official change enforced. General export business is quiet, although a fair tonnage has been arranged for Italy, both of Cleveland foundry iron and hematite. The latter shows no sign of becoming easier, but sufficient metal is available to keep home users' early requirements covered. The allocation of supplies is strictly controlled, and it is hoped that the prospect of an enlarged output over the year-end will materialize. There is a brisk demand for coke at the new maximum rates, the price for good medium furnace material being 35s. 6d. delivered at works.

The open market in semi-finished steel remains very bare, owing to the quantities requisitioned on Government account. The placing of orders for Welsh sheet bars and billets is extremely difficult, and American material remains lifeless, buyers being reluctant to avail themselves of the few offers of wire rods through merchants at around £26 c.i.f. Liverpool for near shipment.

Pending an official adjustment in raw material,

manufacturers are merely looking on, the negotiation of new orders in order to retain old customers being subject to any revision. Amid the prevailing unsettlement the pressure of working, however, is intense, the steel mills being faced with a big accumulation of Government work, while the calls made for shipbuilding are greater than ever. Ordinary mercantile work stands aside. The market in uncontrolled material rules strong, with a ceaseless active demand for mild steel bars, which are selling up to £19 delivered net for early delivery. Steel strip is dearer at £28 delivered net for early delivery. Steel hoops rule slow, but there is big inquiry for bar iron.

Very little American material is finding its way to this side, and this chiefly consists of second-hand lots for which freight is difficult to secure. Steel bars were recently sold at £35 c.i.f. for early shipment to India and at £24 f.o.b. New York.

The feature in tin plates has been the placing of further big orders for France direct with makers for November-December delivery, the total being about 150,000 boxes, and additional quantities are required for December-January. There is more activity in the home trade, and the works, being already well booked over the year-end, insist on the full maximum basis of 30s. net for cokes 20 by 14. Making allowance for the higher cost of tin in accordance with the regulations, to-day's quotation is 30s. 10½d., with business done thereat. For some time past makers' stocks in certain descriptions of wasters have accumulated owing to the restrictions imposed in regard to use outside of war work, but this is now being remedied by the issue of permits for various mercantile purposes for which facilities were heretofore withheld. It is likely that the ruling maximum basis may be raised shortly to cover higher costs.

The Ferromanganese Situation

There has been a further material drop in ferromanganese lately, which, however, has not been accompanied by any revival of business, and the market is very unsettled. The current c.i.f. quotation for American North Atlantic ports is now about $275 for the next half year, at which a small order has been placed for Canada. American buyers held aloof lately, but seem again to operate. The demand from Allies and neutrals is again moderate, with small lots reported sold at about £60 for loose f.o.b. Conferences have been going on with the authorities regarding a revision of the home trade price of £25, which is considered far too low in view of the high costs, and as compared with export terms. It was rumored recently that the figure of £40 would be adopted, but no decision has yet been come to. Freightage as regards Indian manganese ores is extremely difficult and chiefly a matter of Government accommodation, while costs have risen very high.

New York

NEW YORK, Dec. 12.

Pig Iron.—If any progress has been made in the regulation of shipments by railroads it is not manifest in improved conditions. If there is any change it is for the worse on account of the extremely cold weather for the past two or three days. It is hoped, however, that unless heavy snows fall there will be improvements soon. The scarcity of all kinds of pig iron is pronounced, and it is very difficult to place orders for shipment prior to next July. Negotiations are still pending for the shipment of about 6000 tons of basic from Birmingham to the Pittsburgh district. In the case of foundries having Government work, special effort is being made by sellers to satisfy requirements. For early delivery we quote as follows:

No. 1 X	$35.25
No. 2 X	34.25
No. 2 Plain	33.75
No. 2 Southern (rail and water)	$38.75 to 39.25
No. 2 Southern (all rail)	39.15 to 39.65
No. 2 X Virginia	37.00 to 37.25

Ferroalloys.—The domestic ferromanganese market is quiet but firm at $240 to $245, delivered. Inquiry is less than last week and sales have been fewer. A transaction involving 500 tons for delivery in the first half is reported at $240, with smaller lots at the quotations noted. With production at a decidedly less rate in November than in October and with the October exports much in excess of the general estimate, the available supply has been materially lessened. There is some prediction of a scarcity in the coming months, especially if reports are true that manganese ore shipments from Brazil are being curtailed. Spiegeleisen is quiet at $60 to $65, furnace, for any delivery with sales of moderate amounts reported. Ferrosilicon, 50 per cent, continues strong at $150 to $175, depending on conditions and delivery.

Cast-Iron Pipe.—On 835 tons of cast-iron pipe, ranging in size from 4 in. to 24 in., bids were received Tuesday by Jersey City and were as follows: R. D. Wood & Co. (low bidder), $46.95, net, all sizes; John Fox & Co., $48.40, net, all sizes; United States Cast Iron Pipe & Foundry Co., all sizes except 4 in., $56.15; 4 in., $59.50; Warren Foundry & Machine Co., 24 in. and 20 in., $48.49; 12 in., $48.55; 6, 8 and 10 in., $48.59; 4 in., $53.25. A considerable tonnage of large pipe was involved and the business was considered attractive. Nominal quotations continue at $56.50 for 6 in. and heavier, and $59.50 for 4 in.

Old Material.—Active demand for heavy melting steel and some other grades continues and dealers are finding it extremely difficult to obtain permits to make deliveries. For this reason the volume of business transacted is not large. There is still some talk about prices being fixed by the Government, but no definite information is obtainable. If there is any change in the market it is in a slight improvement in the heavy steel situation in eastern Pennsylvania. We quote prices of brokers as follows to New York producers and dealers, per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania	$25.00 to $26.00
Old steel rails (short lengths) or equivalent heavy steel scrap	25.00 to 26.00
Relaying rails	55.00 to 60.00
Rerolling rails	35.00 to 36.00
Iron and steel car axles	41.00 to 42.00
No. 1 railroad wrought	32.00 to 33.00
Wrought-iron track scrap	28.00 to 30.00
No. 1 yard wrought long	28.00 to 30 00
Light iron	9.00 to 10 00
Cast borings (clean)	16.50 to 17.50
Machine-shop turnings	15.00 to 16.00
Mixed borings and turnings	14.00 to 15.00
Wrought-iron pipe (1 in. minimum diameter), not under 2 ft. long	27.00 to 28.00

Dealers in New York City and Brooklyn are quoting as follows to local foundries, per gross ton, but for delivery to cupola platforms of Brooklyn foundries about $3 more is quoted:

No. 1 machinery cast	$28.00 to $29.00
No. 1 heavy cast (column, building materials, etc.)	23.00 to 24.00
No. 2 cast (radiators, cast boilers, etc.)	23.00 to 24.00
Stove plate	20.00 to 21.00
Locomotive grate bars	17.00 to 18.00
Malleable cast (railroad)	27 00 to 28 00
Old carwheels	29.00 to 30.00

Finished Iron and Steel.—New business has been small in volume. The railroad chaos on top of the license difficulties has clearly discouraged export movements and the general uncertainty of the country, both in respect to the demands of the Government and the fixing of prices, has chilled interest for the moment on the part of domestic consumers. In spite of the overflowing condition of the United States Treasury, Government contracting goes on slowly, the result, it is believed, of the mushroom growth of departments and the difficulty thus of completing designs and expediting business. Betterment is not expected until uncertainties of prices and transportation are somewhat clarified. Makers of bolts and nuts are finding it possible to make much better deliveries than recently, owing to a reduced demand in the last few weeks, but how far this may be taken to indicate a general diminished demand in the last few months is difficult to state. One mill which resists making contracts has sold 2000 tons of steel bars on definite specifications, thus making the order one at the mill's convenience without specific statement as to the period which the order covers. A

maker of plates has emphasized that on any future sales it must be specifically indicated that deliveries are contingent on priority on account of Government needs and the sales are not subject to readjustment with any new schedule of prices. An inquiry for 2300 tons of universal plates, 10 to 24 in. in width, for France, is noted. Also 27,000 kegs of nails for the American International Shipbuilding Corporation. To hasten the closure of contracts for fabricated steel work, as for shipbuilding, the fabricating interests are planning to open an office in Washington. Meanwhile demand for fabricated steel work is dull, about the only fresh inquiry being 300 tons for the Southern Railroad. Contract awards include 650 tons for the brass foundry at the Washington Navy Yard and 300 tons for the Morse Dry Dock Co., Brooklyn, both awarded to the American Bridge Co.; and 950 tons for crane runways in Washington and 425 tons for buildings at Lake Denmark, both placed with the McClintic-Marshall Co. We quote mill shipments of steel bars at 3.095c., New York; shapes 3.195c., plates 3.445c. and bar iron 3.695c., New York. Out of store prices are 1c. higher and to all must be added 3 per cent of the freight charge for the transportation tax.

IRON AND INDUSTRIAL STOCKS

Market Unresponsive and Public Shows No Inclination to Buy or to Sell

The market last week reacted but briefly to both adverse and favorable influences. A drop in quotations, caused by President Wilson's reference in his message to Congress to further price fixing, was followed by a marked trend in the other direction, due to a generally favorable interpretation of the Interstate Commerce Commission's recommendation for unification of the railroads and to the statement by the Secretary of the Treasury that further taxation would be avoided if possible. Toward the end of the week transactions fell off steadily, and on Saturday less than 100,000 shares changed hands, the lowest aggregate sales for the short session in a long time. The public continues to stay out of the market.

Steel stocks showed a much sharper decline than in the preceding week. Of the active issues the only advances were Midvale Steel, com., ⅜ and Superior Steel, com., ½ point. Small sales of the preferred stocks of Crucible Steel, American Car & Foundry, and a few of the smaller companies were at slightly higher levels. U. S. Steel, com., declined 5¼ points and pref., 1 point; Bethlehem Steel, com., 5⅞, class B, 5⅜, and pref., ½; Republic Iron & Steel, com., 2¼, pref., 1⅜.

The range of prices on active iron and industrial stocks from Tuesday of last week to Wednesday of this week was as follows:

Allis-Chalm. com.	16	- 18½	Int. Har. of N. J. pf.	92	- 95
Allis-Chalm. pf.	70	- 72	Int. Har. Corp. pf.		93
Am. Can com.	32	- 34⅞	Lacka. Steel	77½	- 80⅞
Am. Can pf.	96	- 97½	Lake Super. Corp.	11	- 11⅝
Am. Car & Fdry. com.	63½	- 67	Midvale Steel	40¾	- 43⅞
Am. Car & Fdry. pf.		102¾	Nat. En. & Stm. com.	33	- 36½
Am. Loco. com.	49	- 52¼	N. Y. Air Brake	101	-108
Am. Ship com.	90	- 91¾	Nova Scotia Steel	63	- 65
Am. Steel Fdries.	53½	- 55	Pitts. Steel pf.	89½	- 89⅞
Bald. Loco. com.	52½	- 55½	Press. Steel com.	50	- 51¾
Beth. Steel com.	7[illegible]	- 76	Ry. Steel Spring com.	41	- 42
Beth. St., Class B	72½	- 75⅝	Republic com.	72¼	- 76⅜
Beth. Steel pf.		90	Republic pf.	94	- 94¾
Cent. Fdry. com.	30	- 30½	Sloss com.	37½	- 38
Cent. Fdry. pf.		41½	Superior Steel	32	- 35½
Chic. Pneu. Tool		45	Un. Alloy Steel	35½	- 36
Colo. Fuel	32	- 33¼	U. S. Pipe com.		11½
Cruc. Steel com.	50	- 54	U. S. Steel com.	85	- 90
Cruc. Steel pf.		88	U. S. Steel pf.	105⅝	-108⅜
Deere & Co. pf.	95	- 95⅜	Va. I. C. & Coke		50
Gen. Electric	122¼	-129¼	Warwick		8½
Gt. No. Ore Ctf.	25¼	- 26¼	Westingh. Elec.	36½	- 38½
Gulf States Steel.	84	- 86			
Int. Har. of N. J. com.	108	-110			

Dividends

The Allis-Chalmers Mfg. Co., quarterly, 1¾ per cent and extra ¾ per cent on account of accumulated dividends on the preferred, payable Jan. 15.

The American Car & Foundry Co., quarterly, 1 per cent and extra 1 per cent on the common, and quarterly, 1¾ per cent on the preferred, payable Jan. 1.

The American Locomotive Co., quarterly, 1¾ per cent on the common, payable Jan. 3, and 1¾ per cent on the preferred, payable Jan. 21.

The American Steel Foundries, quarterly, 1¾ per cent, payable Dec. 31.

The General Fireproofing Co., quarterly, 1¾ per cent on the common and preferred, payable Jan. 1.

The Ingersoll-Rand Co., 3 per cent on the preferred, payable Jan. 1.

The Steel Co. of Canada, quarterly, 1½ per cent on the common and 1¾ per cent on the preferred, payable Feb. 1.

The Yale & Towne Mfg. Co., quarterly, 2½ per cent, payable Jan. 2.

Industrial Finances

The November record of business insolvency reported by R. G. Dun & Co. emphasizes the underlying strength of business, and commercial failures in the United States for the year to date disclose a numerical reduction of 19 per cent and a contraction of 6 per cent in the amount from the relatively light mortality of 1916. The November defaults, 981, are the smallest in number, excepting the 963 reverses of September, this year, of any month back to September, 1911, and fall below those of November of all years since 1909. Comparing with last year, there appears a decrease of 270, or more than 20 per cent, and from the high point for the period, 1815 insolvencies in November, 1914, there is a similar difference of 834 failures, or fully 45 per cent. Moreover, last month's liabilities of $13,635,605, while larger than in October, September and May and April of this year, are less than in any November back to 1910, though the improvement over the figures of a year ago is only about $500,000. But when comparison is made with November, 1914, a decline of nearly 50 per cent is shown.

The Wabash Valley Electric Co., Clinton, Ind., has issued $150,000 preferred stock, making its total capitalization $400,000.

The reduction of the capital stock of the Howard Shipyards & Dock Co., Jeffersonville, Ind., from $800,000 to $400,000 is said to be one of the steps in a reorganization of the company, with the purpose of obtaining backing to build oceangoing ships.

The Kentucky Solvay Coke Co., Ashland, Ky., has increased its capital stock from $2,500,000 to $5,000,000. No further improvements for the organization are contemplated other than those already mentioned. Eaton Rhodes & Co., First National Bank Building, Cincinnati, are sales agents for the company's product.

The rapid growth of the automobile tire industry the past year is indicated by the annual report of the Goodyear Tire & Rubber Co., Akron, Ohio. Its sales for the year ended Oct. 31 amounted to $111,549,522, a gain of 74.37 per cent over the previous year.

A meeting of stockholders of the Liberty Steel Co. will be held at Warren, Ohio, on Friday, Dec. 14, to discuss the matter of increasing its capital stock. Edward F. Clarke is president, and the company contemplates making some additions to its plant now under way.

The East Ohio Gas Co. has filed a certificate with the secretary of state of Ohio, increasing its capital from $20,000,000 to $45,000,000.

A fourth and final dividend of 6 per cent, amounting to $16,079 was declared and ordered paid to creditors of the Milwaukee Motor Co. at the final meeting to close up the affairs of the bankrupt estate. Total dividends paid amount to 41 per cent of proven claims of $267,993. The company was adjudged bankrupt on June 30, 1913.

The Pennsylvania Railroad has increased the wages of employees at its machine and repair shops, Altoona, Pa., 10 per cent in the price paid for piece-work, effective December 1. The advance in certain classes of work will average as high as 20 per cent.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on iron and steel articles, aside from wrought iron and steel pipe in carloads, per 100 lb., New York, 19.5c.; Philadelphia, 18.5c.; Boston, 21.5c.; Buffalo, 11.6c.; Cleveland, 13.5c.; Cincinnati, 18.5c.; Indianapolis, 20c.; Chicago, 21.5c.; St. Louis, 27c.; Kansas City, 47c.; minimum carload, 36,000 lb.; St. Paul, 35.5c.; minimum carload, 36,000 lb.; Denver, 79c.; minimum carload, 36,000 lb.; Omaha, 47c.; minimum carload, 36,000 lb.; New Orleans, 30.7c.; Birmingham, 46c.; Pacific Coast, 75c.; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is 90c.; minimum carload, 40,000 lb. and 85c.; minimum carload, 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 40c. per 100 lb., minimum carload 46,000 lb.; to Omaha 40c., minimum carload 46,000 lb., to St. Paul 35.5c., minimum carload 46,000 lb.; Denver 79c., minimum carload 46,000 lb. *A 3 per cent transportation tax now applies.*

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in. angles, 3 to 6 in. on one or both legs, ¼ in thick and over, and zees 3 in. and over, 3c.

Wire Products

Wire nails, $3.50 base per keg; galvanized, 1-in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1-in., $2.50. Bright basic wire, $3.35 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.25; galvanized wire, $3.95; galvanized barb wire, and fence staples $4.35; painted barb wire, $3.65; polished fence staples, $3.65; cement-coated nails, $3.40 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 47 per cent off list for carload lots, 46 per cent for 1000-rod lots, and 45 per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large rivets	$4.65 base
7.15 in. x 6 in. smaller and shorter rivets	45-10 per cent off list
Machine bolts h.p. nuts, ⅜ in. x 4 in.	
Smaller and shorter, rolled threads	50-10-5 per cent off list
Cut threads	50-5 per cent off list
Larger and longer sizes	40-10 per cent off list
Machine bolts, c.p.c. and t nuts, ⅜ in. x 4 in.	
Smaller and shorter	40-10 per cent off list
Larger and longer	35-5 per cent off list
Carriage bolts, ⅜ in. x 5 in.	
Smaller and shorter, rolled threads	50-5 per cent off list
Cut threads	40-10-5 per cent off list
Larger and longer sizes	40 per cent off list
Lag bolts	50-10 per cent off list
Plow bolts, Nos. 1, 2, 3	50 per cent off list
Hot pressed nuts, sq. blank	2.50c. per lb. off list
Hot pressed nuts, hex., blank	2.30c. per lb. off list
Hot pressed nuts, sq., tapped	2.30c. per lb. off list
Hot pressed nuts, hex., tapped	2.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank	2.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped	2.00c. per lb. off list
Semi-finished hex. nuts.	
⅝ in. and larger	60-10-10 per cent off list
9/16 in. and smaller	70-5 per cent off list
Stove bolts	70-10 per cent off list
Stove bolts	2½ per cent extra for bulk
Tire bolts	50-10-5 per cent off list

The above discounts are from present lists now in effect. All prices carry standard extras.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $57; chain rods, $65; screw, rivet and bolt rods and other rods of that character, $65. A tentative differential of $10 per ton over soft rods for high carbon rods has been agreed upon.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $5 to $5.50; ¾ in., 7/16 in. and ½ in., $7, base. Boat spikes, $5.25 per 100 lb., f.o.b. Pittsburgh. Track bolts with square nuts, 7c. to 7.50c. to railroads, and 8c. to 8.50c. in small lots for fairly prompt shipment.

Terne Plate

Effective Nov. 7, prices on all sizes of terne plates are as follows: 8-lb. coating, 200 lb., $15 per package; 8-lb. coating, I. C., $15.30; 12-lb. coating, I. C., $16.75; 15-lb. coating, I. C., $17.75; 20-lb. coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.90c. for delivery late this year, and 4.50c. to 5c. from warehouse in small lots for prompt shipment. Refined iron bars, 3.50c. in carload and larger lots f.o.b. mill.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card, as announced Nov. 5 by the Government on steel pipe, those on iron pipe being the same as quoted for some time:

Butt Weld

Steel: Inches	Black	Galv.	Iron: Inches	Black	Galv.
⅛, ¼ and ⅜	44	17½	⅛ and ¼	23	+4
½	48	33½	⅜	24	+3
¾ to 3	51	37½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	44	31½	1¼	18	3
2½ to 6	47	34½	1½	25	11
7 to 12	44	30½	2	26	12
13 and 14	34½	..	2½ to 6	28	15
15	32	..	7 to 12	25	12

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	40	22½	⅛, ¼ and ⅜	22	5
½	45	32½	½	27	14
¾ to 1½	49	36½	¾ to 1½	33	18
2 to 3	50	37½			

Lap Weld, extra strong, plain ends

2	42	30½	1¼	19	4
2½ to 4	45	33½	½	25	11
4½ to 6	44	32½	2	27	14
7 to 8	40	26½	2½ to 4	29	17
9 to 12	35	21½	4½ to 6	28	16
			7 to 8	20	8
			9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots f.o.b. Pittsburgh, announced Nov. 13, as agreed upon by manufacturers and the Government:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.	.34	3½ to 4½ in.	12½
2½ to 3¼ in.	.24	3 to 3¼ in.	+ 5
2¼ in.	17½	2½ to 2¾ in.	+ 7½
1¾ to 2 in.	.13	2 to 2¼ in.	+22½
		1¾ to 1⅞ in.	+35

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton		Per Net Ton	
1 in.	$340	1¾ in.	$220
1¼ in.	280	2 to 2½ in.	190
1⅝ in.	270	2¾ to 3¾ in.	180
1½ in.	220	4 in.	200
		4½ to 5 in.	220

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net or 2 per cent discount in 10 days.

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer	*Cents per lb.*
Nos. 3 to 8	4.20
Nos. 9 and 10	4.25
Nos. 11 and 12	4.30
Nos. 13 and 14	4.35
Nos. 15 and 16	4.45
Box Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21	4.80
Nos. 22 and 24	4.85
Nos. 25 and 26	4.90
No. 27	4.95
No. 28	5.00
No. 29	5.05
No. 30	5.15
Galvanized Black Sheet Gage—Bessemer	
Nos. 10 and 11	5.25
Nos. 12 and 14	5.35
Nos. 15 and 16	5.50
Nos. 17 to 21	5.65
Nos. 22 and 24	5.80
Nos. 25 and 26	5.95
No. 27	6.10
No. 28	6.25
No. 29	6.50
No. 30	6.75
Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16	4.80
Nos. 17 to 21	4.85
Nos. 22 to 24	4.90
Nos. 25 and 27	4.95
No. 28	5.00
No. 29	5.05
No. 30	5.05
Nos. 30½ and 31	5.10

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
Dec.	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
5	23.50*	23.50*	85.00*	6.50	6.37½	8.00	7.75
6	23.50*	23.50*	85.00*	6.50	6.37½	8.00	7.75
7	23.50*	23.50*	84.50*	6.50	6.37½	7.87½	7.62½
8	23.50*	23.50*	....	6.50	6.37½	7.62½	7.62½
10	23.50*	23.50*	86.00*	6.50	6.37½	7.75	7.50
11	23.50*	23.50*	86.00*	6.50	6.37½	7.75	7.50

*Nominal.

NEW YORK, Dec. 12.

Government fixed prices for both lead and spelter are a probability, thus placing all the markets under control. In the meantime business is of small proportions. Copper continues unchanged. Tin is again nominally higher. Lead is dull and firm. Spelter is lifeless and lower. Antimony is steady and inactive.

New York

Copper.—Negotiations, or at least consultations, are in progress regarding the price of copper for all of 1918, or for a certain period of the year. Whether any change will be made in the 23.50c. price of the Government is mere guess work. It is stated that it is hard for some producers to make money now, and it is also understood that recent cost inquiries by officials have been disappointing rather than otherwise in that they revealed a higher level than expected in some cases. The general feeling seems to be that if any change at all is made, it will be upward. Copper is flowing smoothly to consumers having old contracts or Government contracts. It is being sold at the fixed price to the general trade for the first quarter, while small consumers are receiving metal from jobbers at 24.67½c. for any delivery.

Tin.—There is a strong movement on foot to set aside all import restrictions regarding tin as superfluous and to have its distribution and control in the hands of the American Iron and Steel Institute, which really took control of the market on Monday of this week without official announcement. Considerable of the present confusion may thus be eliminated. It is becoming increasingly evident that many consumers, some of them large ones, are short of tin. One large consumer, however, has parted with some Banca tin for spot delivery to needy buyers, turning down all others. Lack of offers has made a dull market with nominal prices continually rising to 86c., New York, yesterday, for spot Straits. Cables are very much delayed, hindering business. There has been a moderate inquiry for prompt shipment from England and a little business was done at 71c. to 72c., subject to license. Arrivals to date have been 460 tons, with 4840 tons afloat. The London market continues to advance, spot Straits being quoted yesterday at £299 per ton, an advance of £5 in the week.

Lead.—The market has been dull and without interest, but remains firm at 6.50c., New York, or 6.37½c., St. Louis, for early delivery in the outside market, with the quotation of the leading interest still at 6.25c., New York. There has been activity here and there, but the quantities disposed of have not been large. Most producers are entirely sold up for December and largely so for January. Rumors have been current of larger domestic and export transactions or negotiations. It is understood that the Government has closed for its needs for 30 days, but the quantity and price are not known. It is generally expected that a maximum price for lead will be established soon.

Spelter.—There has been no demand and the market has continued to weaken until now prime Western for early delivery is quoted at 7.50c., St. Louis, or 7.75c., New York. Production is constantly getting less, but to what extent it has been curtailed is not known. Some place it at 30 per cent; others at 50 per cent, but probably 40 per cent is a fair estimate. Nothing has been decided apparently in the price fixing matter nor has any announcement been made as to the Government's probable needs. The entire situation is discouraging and a turn for the better is not expected until supply and demand reach a balance. Some think this condition is near at hand.

Antimony.—The market is again quiet after some display of life as a result of the expected effect of the embargo on imports. Available brands are quoted at 15.25c. to 15.50c., New York, duty paid.

Aluminum.—Demand is small and the market is inactive at 36c. to 38c., New York, for No. 1 virgin metal, 98 to 99 per cent pure.

Old Metals.—The market is practically unchanged. Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible (nominal)	23.50
Copper, heavy and wire (nominal)	23 50
Copper, light and bottoms	21.00 to 22.00
Brass, heavy	17.25 to 17.50
Brass, light	12.00 to 12.50
Heavy machine composition	23.75 to 24.00
No. 1 yellow rod brass turnings	14.50 to 14.75
No. 1 red brass or composition turnings	19.00 to 19.50
Lead, heavy	6.00
Lead, tea	4.50
Zinc	6.00

NEW TRADE PUBLICATIONS

Gear Shaping Machine.—Fellows Gear Shaper Co., Springfield, Vt. Booklet entitled "Design of Splines and Clutch Teeth." Size, 6 x 9 in.; pages, 22. Is a collection of suggestions relating to the use of the involute curve in the design of splines and clutch teeth. A number of typical illustrations serve to supplement the text matter in which particular reference is made to the use of a gear shaping machine for their production. Condensed specifications of two gear shaping machines are included.

Tool Grinding.—Norton Co., Worcester, Mass. Pamphlet. Illustrates and describes the machinery and methods employed for grinding cutters, reamers, drills, taps, dies and lathe planing machine tools. The important points to be observed in connection with each class of tools are brought out, the text being supplemented by numerous line and half-tone illustrations. Recommendations as to the grains and grades of wheels to be employed are included in a number of cases.

Turret Lathes.—Gisholt Machine Co., Madison, Wis. Bulletin entitled "Standardizing in the Machine Shop." Points out the advantages to be derived from the standpoint of increased output and lowered production cost by the use of the company's turret lathe. This is done by a series of illustrations of parts that have been produced together with views of the machine equipped for handling the different pieces and brief descriptions of the work that was done. In a number of cases dimensioned drawings are presented and in each instance the time required to complete the work is featured.

Motor-Driven Speed Lathe.—Oliver Machinery Co., Grand Rapids, Mich. Circular. Illustrations and descriptive matter explain the operation of a motor-driven woodworking speed lathe employing either direct or alternating current motors. The construction of the lathe is described at some length and a number of illustrations showing the various features are included.

Pneumatic Tools.—Keller Pneumatic Tool Co., Fond du Lac, Wis. Three pamphlets. Mention a line of chipping and riveting hammers and a sand rammer. In the first two the construction of the hammers is explained in some detail with illustrations of the various styles that can be supplied and their component parts. In the last bulletin the advantages of pneumatic ramming in foundries and for other work is touched upon with illustrations of the different types available.

Toolroom Specialties.—Taft-Peirce Mfg. Co., Woonsocket, R. I. Catalog No. 2. Describes a line of toolroom specialties which includes bench plates, boring equipment, gages of all kinds, knees, parallels, sine bars and V-blocks. Each specialty is given a single loose leaf with an illustration, brief description and in some cases tables of the various sizes that can be supplied. A feature of the catalog is its paging according to the style numbers of the various articles covered. Mention is also made of the work which the company is prepared to do in the design and manufacture of special gages, fixtures or tools.

Fence Wire Corrosion and Its Causes

Short Life of Present-Day Barb Wire as Compared with the Older—Influence of Copper—Corrosion Under Trees and Bushes

BY OLIVER W. STOREY

ABOUT 15 years ago the U. S. Department of Agriculture received many complaints from farmers stating that wire fences corroded rapidly. As a result of these complaints an investigation was begun at that time by the U. S. Department of Agriculture to bring about, if possible, an improvement in the corrosion-resisting qualities of fence wire. Notwithstanding this investigation, the preliminary results of which are embodied in Farmers' Bulletin No. 239, there appears to have been made but slightly better wire since that time. Farmers continue to complain of the short life of the present-day wire as compared to the older wires, some of which are still in service. This paper gives the results of an investigation which has determined the cause of the longevity of the older steel wires.

A study of the analyses of a large number of fence wires has resulted in the conclusion that the presence of a sufficient amount of copper in steel wire determines whether that wire is resistant to rapid corrosion. The results have without exception shown that where two steel wires have been subjected to identical corroding conditions the wire with an appreciable percentage of copper has shown the lesser corrosion. In the light of recent extensive investigations on the corrosion of iron and steel, especially copper steels, these results, covering a corroding period of from 20 to 30 or more years, are of much significance in that they confirm the results obtained in corrosion tests covering a short period of time.

The general complaints of the users of wire fences, given in Farmers' Bulletin No. 239, was that the recently manufactured fence wire corroded rapidly, lasting but a few years, while some of the old wire which had been erected on their farms 30 years before was still in service. As a result of these complaints A. S. Cushman made an investigation in which he came to the following conclusions:

> That modern Bessemer and open-hearth steel rusts much more rapidly than iron wire.
>
> That manganese, especially if it is unevenly distributed in the steel, is at least in part the cause of the trouble.

Since that time Cushman has been an advocate of low manganese pure irons wherever resistance to corrosion is desired and recently has also contended that copper does not increase their resistance to corrosion.

Obtaining of Reliable Data

In making a study of corroded fence wire it is difficult to obtain reliable data on the length of service of wire and it also is difficult to obtain comparative specimens which have been subjected to identical corroding conditions. Where fences have been erected for more than a few years it is almost impossible to obtain an accurate history of them. In the case of barb wires, strands in good condition are usually salvaged from the old fence where it is replaced and this adds to the complications. Therefore, in comparing different strands of barb wire great care must be used to determine the history of each strand.

However, it is possible in some cases to approximate the age of fence wire, especially wire that has been erected for a long period. Occasionally wire fences are nailed to trees and the depth to which the wires are imbedded in the growing tree gives a basis for estimating their age. Much of the barb wire erected 20 to 30 or more years ago had barbs of peculiar patterns that were made only during that period. The age of these wires may be approximated.

The rate of corrosion of iron and steel varies with the location. Not only does this hold true with reference to conditions as influenced by the topography of the region and the presence of industrial corroding gases, but also to the position of the wire on the fence; whether it is the bottom or top strand, whether shaded, covered with brush, next to a post or tree, or in the open.

A careful inspection of a wire fence shows that the bottom strands generally are in much better condition than the top strands. This is also true of the wire lying next to a post or a tree and also where the wire is covered or protected by trees and shrubbery. Since the different strands of wire on the same fence are subject to varying corrosive action, great care must be used in comparing them.

The nearest to the ideal condition for a corrosion test is found in a strand of barb wire made by twisting together two wires of different compositions. Even here the galvanizing on one wire may be slightly different from the other. While this influences a short-time corrosion test, it is not of moment in a test covering 25 or 30 years, provided that the galvanizing is of the usual grade found on barb wire.

The objection will also be raised that electrolytic action between the two wires will influence the results appreciably. A careful study has shown that the influence of electrolytic action on the corrosion of two dissimilar wires in a strand of barb wire is practically nil. There are few points of contact between the two wires and the potential difference between the two wires is necessarily minute. The work of Aston, together with some research by C. F. Burgess and also by the writer along the same lines, indicates that the electrolytic action of rust on the surface of iron and steel is far more important than any minute difference in potential due to slight differences in composition. Many samples were found where the two wires in a strand of barb wire were not in contact over a distance of an inch or more, but the corrosion at these places did not vary from the points where the wires were in contact, though the two wires were dissimilar in composition and corroded at different rates. These observations led to the conclusion that the two wires of a strand of barb wire that has been in service for 20 to 30 years may be compared and conclusions based on any difference in composition.

Data on Fence Wire

At Mineral Point, Wisconsin, and at several other points in the same State, strands of barb wire were found in which the two wires were corroding at a dissimilar rate. In some cases the difference in corrosion was slight while in one case one wire had practically corroded entirely away while the other was but slightly corroded. Fortunately the age of most of these wires could be approximated.

Much of the barb wire made previous to 1892 was made by small manufacturers who did not control the sources of supply of raw material, but merely bought the wire and fabricated the strands. Under such conditions it is not surprising that many strands of barb wire were built up of two wires that corroded at unequal rates.

Many of the fences, when erected, had been fastened to oak trees. These barb wires, in some instances, are embedded to a depth of four inches. The barbs are mostly of the obsolete two-point Lyman, and other similar patterns which were generally discontinued at the expiration of the Glidden patents in 1892.

*From a paper presented at the thirty-second general meeting of the American Electrochemical Society, Oct. 5, 1917, at Pittsburgh. The author is research engineer, C. F. Burgess Laboratories, Madison, Wis.

Many of the barb wires obtained were probably erected in the period from 1885 to 1892 or 25 to 30 or more years ago.

Not all of the barb wire was of the type in which one wire corroded more rapidly than the other. This was a characteristic of the older wires. Many specimens were obtained in which the two wires corroded at equal rates. The barb wires of more recent manufacture generally do not show any difference in the rate of corrosion between the two wires composing the strand.

A close examination of barb wire fences at various places in southern Wisconsin shows that there is available much wire in which the two wires composing the strand corrode at dissimilar rates. A close inspection is necessary to note this difference, since the twisted wires confuse the eye. Often it is necessary to untwist a small section and flake off the adhering rust.

One old woven wire fence showed a difference in the rate of corrosion of the various horizontal wires. Care has to be taken in selecting woven wire specimens, since most woven wire fencing is of more or less recent origin and there is a decided difference in the durability of the galvanizing on the various horizontal wires. The top strands also corrode at a much higher rate than do the lower strands in the same fence.

The appearance of the rust varies depending upon the locality and upon the resistance of the specimen to corrosion. Where the atmosphere is relatively pure and the corrosion rate low, the rust on all fence wire, after several years' exposure, is a deep brown in color and adheres tightly to the wire. When the iron is first exposed to the atmosphere, after removal of the galvanizing or adhering rust, the rust is bright red in color. The color appears to change gradually to a deep brown.

Wherever the atmosphere becomes more corrosive, due not only to the presence of industrial gases, but also to excessive moisture as in river valleys and swamps, and during the moist warm spring and summer months, there is a marked difference between those wires that are highly resistant to corrosion and those that are easily corroded. The rust on those wires that resist corrosion is a deep brown and adherent, while the rust on those wires that show small resistance to corrosion is yellow or light red in color, is flaky and may be easily removed. Also, the less resistant wires are deeply pitted, while the more resistant wires corrode more or less uniformly.

Table of Analyses of Fence Wires in Wisconsin

Location	No.	Kind of Metal	Copper	Carbon	Manganese	Phosphorus	Sulphur	Silicon
Mineral Pt.	1a		0.18	0.07	0.42	0.021	0.055	0.03
Mineral Pt.	1b	Basic O-H	0.087	...	.....	.....	.....	.....
Mineral Pt.	1c	Steel	0.041	...	.....	.....	.....	.....
Mineral Pt.	1d		Trace	...	.....	.....	.....	.....
Mineral Pt.	2a	Bess.	0.017	0.05	0.45	0.077	0.072	.....
Mineral Pt.	2b	steel	0.16	...	.....	.....	.....	.....
Mineral Pt.	3a	Bess.	0.22	0.10	0.31	0.090	0.069	0.13
Mineral Pt.	3b	steel	0.018	...	.....	.....	.....	.....
Mineral Pt.	4a	Bess. steel	0.11	0.06	0.49	0.098	0.120	Trace
Mineral Pt.	5a	Wrought iron	nil	0.03	0.10	0.136	0.010	.....
Mineral Pt.	6a	Bess.	nil	...	0.25	0.060	.....	.....
Mineral Pt.	6b	Bess.	nil	0.07	0.29	0.043	0.085	.....
Mineral Pt.	6c	Bess.	0.15	0.09	0.64	0.152	0.048	.....
Mineral Pt.	7a	Bess.	0.023	0.13	0.62	0.114	0.066	0.01
Mineral Pt.	8a	Bess.	nil	0.05	0.25	0.129	0.098	.....
Mineral Pt.	8b	Bess.	0.24	0.07	0.45	0.116	0.097	.....
Mineral Pt.	9a	Steel	0 038	...	.....	.....	.....	.....
Mineral Pt.	9b	Steel	0.088	...	.....	.....	.....	.....
Mineral Pt.	10a	Steel	Trace	...	.....	.....	.....	.....
Mineral Pt.	10b	Steel	0.06	...	.....	.....	.....	.....
Mineral Pt.	11a	Steel	0.16	...	.....	.....	.....	.....
Mineral Pt.	11b	Steel	0.097	...	.....	.....	.....	.....
Mineral Pt.	12a	Steel	0.120	...	.....	.....	.....	.....
Mineral Pt.	13a	Steel	0.397	...	.....	.....	.....	.....
Mineral Pt.	14a	Steel	0.11	...	.....	.....	.....	.....
Mineral Pt.	14b	Steel	0.04	...	.....	.....	.....	.....
Mineral Pt.	15a	Steel	0.06	...	.....	.....	.....	.....
Mineral Pt.	15b	Steel	0.224	...	.....	.....	.....	.....
Mineral Pt.	About 15 to 20 barb wires, both new and old and heavily corroded, contained less than 0.03 per cent copper.							
Cuba City	16a	Steel	0 07	...	.....	.....	.....	.....
Cuba City	16b	Steel	0 13	...	.....	.....	.....	.....
Cuba City	Ten barb wires, both new and old and heavily corroded, contained less than 0.02 per cent copper.							
Madison	17a	Steel.	0.15	...	.....	.....	.....	.....
Madison	17b	Steel	0.097	...	.....	.....	.....	.....
Madison	18a	Wrought iron	0.01	...	.....	.....	.....	.....
Madison	18b	Steel	0.063	...	.....	.....	.....	.....
Madison	19a	Steel	0 031	...	.....	.....	.....	.....
Madison	19b	Steel	0.015	...	.....	.....	.....	.....
Madison	20a	Steel	0.130	...	.....	.....	.....	.....
Madison	20b	Steel	0 008	...	.....	.....	.....	.....
E. Milwaukee	21a	Steel	0.148	...	.....	.....	.....	.....
E. Milwaukee	21b	Steel	0.005	...	.....	.....	.....	.....
E. Milwaukee	22a	Steel	0.233	...	.....	.....	.....	.....
E. Milwaukee	22b	Steel	0.005	...	.....	.....	.....	.....
E. Milwaukee	23a	Steel	0.01	...	.....	.....	.....	.....

A study of these analyses shows that there is no relation between the percentage of any element and the amount of corrosion with the exception of copper. These analyses also show that all of the barb wire is made of Bessemer steel, excepting one which is made of wrought iron. The woven wire fence (Pittsburgh Welded Steel) is made of basic open-hearth steel. Many different kinds of barb wire have been examined, but only one made of wrought iron wire has been found.

In view of the work of Burgess and Buck and various other investigators who have shown that copper when present in small amounts in iron and steel decreases the rate of atmospheric corrosion to a marked extent, it seemed certain that the copper was the cause of the high resistance to corrosion of the wires that had been analyzed. Therefore, the copper content of a large number of wires used in barb wire fences was subsequently determined. The results are given in the table.

[The author gives at this point complete data of the history of each piece of wire, discussing conditions in each case.]

Conclusions

The data obtained show conclusively that copper steel is highly resistant to corrosion and that the older steel fence wire containing copper is much more durable than that free from copper. The resistance to corrosion is independent of the percentage of manganese in the steel.

[The author discusses at length Farmers' Bulletin No. 239 and gives a review of copper steel investigations.]

Origin of Copper in Steel Fence Wire

The data presented show that much of the Bessemer steel made 25 or 30 years ago contained copper, while most of that made more recently and at the present time contains but a trace. The presence of copper in open-hearth steels is easily explained, as it comes largely from the copper contained in the scrap iron which is used in that process. Since metallic copper was not purposely added to the Bessemer steel made 25 or 30 years ago, it must have had its origin in the iron ore used in producing the pig iron.

A study of the ores of the United States shows that the Lake Superior ores produce a steel containing at most but a trace of copper. However, the ores obtained in the eastern United States contain varying amounts of copper, the Cornwall ores of eastern Pennsylvania sometimes producing an iron or steel analyzing as high as 1 per cent copper. Some of these ores are treated for their copper content.

About 25 to 30 years ago the Lake Superior ore district had not assumed the important part in the metallurgy of iron and steel that it now occupies, while the iron ores of the eastern United States formed an important part of the output of this country. In addition to this, 200,000 to 300,000 tons of copper-bearing iron ores were imported in some years from Cuba.

While such cupriferous steel and wrought iron was made previous to 25 or 30 years ago, the character of the ore used for making Bessemer steel in this country has changed, so that at the present time little cupriferous steel is made by that process. This is confirmed by the results of the copper analyses made on a large number of fence wires. With one exception all of this wire is of steel and probably Bessemer steel. Most of the older barb wires contained copper in varying amounts, while the wire of recent manufacture contains but a trace, less than 0.02 per cent. Two samples of wrought iron fence wire were analyzed. These two

strands were made by the same firm and contained little copper.

Apparently the present-day wrought iron is likely to have copper in it. This has been demonstrated by several analyses of wrought irons of recent manufacture brought to the attention of the writer, and also by the report of Committee A-5 on Corrosion of Iron and Steel of the American Society for Testing Materials. The committee reports with reference to the analysis of the wrought iron sheets to be used in the extensive corrosion tests of roofing sheets:

> It is interesting to note that the puddled irons have a high copper content, probably due to the use of eastern Pennsylvania ores, and an effort will be made to secure a genuine puddled iron substantially free from copper.

The present open-hearth steel contains varying amounts of copper, as shown in the woven wire fence analyses of the table. Analyses of open-hearth steels show that the amount of copper present varies over a considerable range in successive heats, depending upon the nature of the scrap used. Where open-hearth steel is used for fence wire this variation in the different heats will show up in a difference in the rate of corrosion of the different strands of wire. This is apparent in the table, where the copper content of the horizontal strands of a woven wire fence made of basic open-hearth steel varied, the strand low in copper showing the greatest corrosion.

Corrosion Under Trees, Bushes, Grass, Etc.

The writer's observations on the corrosion of galvanized wire next to the ground, in bushes, etc., confirm in part the findings of Cushman. It was found that wherever galvanized wire was in contact or covered with weeds, brush, bushes, under trees or adjacent to the points where stapled to trees or posts, the galvanizing was found to be much more durable than where it was in the open and subjected to the wind and sunshine. Some wires that evidently had been in service from 20 to 25 years were found with the galvanizing in good shape. Even where sulphur dioxide fumes caused rapid corrosion, this protective effect was observed.

The galvanizing, when found intact under such conditions, was usually coated with a hard white film, probably a basic carbonate of zinc. The effect of this salt as a positive agent, and the conditions under which it forms, have not been studied, but it may have an important bearing on the corrosion of zinc.

The effect of sunlight also may be a factor. This is suggested by Friend's work, in which he finds that sunlight accelerates the rusting of iron in the presence of water.

While the galvanizing under such unfavorable conditions is much more durable than under apparently favorable conditions, it does not appear that iron or steel shows the same characteristics. Many observations have been made on woven wire fences that have been erected for such a period of time that the galvanizing has been entirely removed. The bottom portion of the fence which has been in contact with the wet grass and weeds has been badly corroded, while the upper portion is in much better condition. It was observed that the steel in contact with the grass was covered with a loose, yellow flaky rust, while that further up was covered with a deep-red adherent rust.

These observations cannot be considered conclusive and more work on this point is necessary. In many places the burning of the dry grass has caused conditions which make any observations worthless. If it can be definitely proved that iron and steel corrode at an accelerated rate at the bottom of a fence or in brushes and weeds, and that the galvanizing is much more durable under those conditions, Cushman's hypothesis, that the corrosive electrolytic action is diminished by keeping the wires electrically neutral through frequent connections to the earth, is untenable.

Summary

It has been definitely established that the durability of old steel fence wire is due to the presence of copper.

Manganese does not increase the corrosion of steel, and its absence does not decrease the corrosion.

The copper in the early steel and wrought irons came from the copper-bearing ores of the eastern United States and imported ores. The proportion of copper steel made decreased with the increasing importance of the copper-free Lake Superior ores.

Steel fence wire containing copper is as durable as wrought iron.

Present-day steel fence wire usually does not contain copper and therefore corrodes rapidly.

Under ordinary atmospheric conditions zinc corrodes more slowly under conditions favoring rapid corrosion of iron, and vice versa, iron corrodes more slowly under conditions favoring rapid corrosion of zinc.

The life of fence wire is dependent upon the quality of both the galvanizing and iron or steel base. Since the galvanizing is usually thin, the life of the fence depends principally upon the iron or steel base, which should be highly resistant to corrosion.

War on Austria Has Little Effect

CINCINNATI, Dec. 10.—The declaration of war with Austria will have very little effect on the labor market in Cincinnati and vicinity. Very few Austrians that are not naturalized are employed in different manufacturing plants and none in those making war munitions. The manufacture of non-essentials is gradually being reduced, thus releasing labor in these plants for more important work in machine shops. Lately a large toy manufacturing concern in the Central West has closed its plant temporarily, as it is not able to make shipments to eastern points. Second hand machine tools are very scarce, especially larger sizes of lathes and boring mills. Makers of machine tools have enough business in hand to keep them operating several months ahead and are not able to take on much new business. The Standard Ordnance Co., Hamilton, Ohio, has issued a new list of machine tools, but as far as known they have not yet been able to purchase on it.

Attempts at profit sharing go back nearly 100 years, according to W. A. Grieves, assistant secretary Jeffrey Mfg. Co., Columbus, Ohio, in 100 per cent. Of 300 such plans in operation in England since 1838, 133 still survive. Of the 56 per cent which failed, 59 were due to apathy of employees and consequent dissatisfaction of employer with the results. Twenty-nine schemes failed because of low profits, 25 because of abandonment of the business enterprise, 22 because of changes in or transfer of the business, four on account of the dissatisfaction of employees, four because the job was finished, and four for miscellaneous reasons. Eight gave no return, and eight substituted increased wages or shorter hours.

A case of war time efficiency is noted in the experience of the Electrical Apparatus Co., Ltd., Vauxhall Works, Lambeth Road, London. Although the staff during twelve months numbered 263, as against 319 in 1913, the output was just twice as great. This is the more notable since, in the spring of 1913, the directors had come to the conclusion that the output could not be increased without enlarging the works, complete plans for which had, in fact, been prepared. Overtime was, moreover, the rule in 1913, and to-day many qualified men have been replaced by boy and girl labor. The improvement is in part attributed to a simplification of designs.

A report of the Louisville city building inspector shows that 51 power boilers and 34 low pressure boilers were installed in Louisville in 1917 at an estimated outlay of $75,000, against 66 power boilers and 44 low pressure boilers the year before, at an estimated outlay of $94,000.

The Galvanizing Corporation of America, Inc., 244 Eagle Street, Brooklyn, N. Y., has taken over the business of the Metal Treating & Equipment Co., and will carry on the business of job galvanizing and the installation of electrogalvanizing plants.

PRICE CHANGES UNLIKELY

Conference at Washington with Steel Manufacturers' Committee

WASHINGTON, Dec. 11.—A conference between the members of the War Industries Board, the Federal Trade Commission and a large committee of steel men was held at the headquarters of the Council of National Defense yesterday to consider the general status of the iron and steel industry with reference to war preparations and the question of the possible revision of the schedule of controlled steel prices which, pursuant to agreement, will expire on Jan. 1. The officials present were Daniel Willard, chairman; Judge R. S. Lovett, B. M. Baruch, R. S. Brookings, Hugh Frayne, Lieut.-Col. Palmer E. Pierce and H. P. Bingham, of the War Industries Board; A. H. Legge, general manager of the purchasing commission and J. Leonard Replogle, director of steel distribution, Council of National Defense; Commissioner Joseph E. Davies, Dr. Francis Walker and W. W. Wooster, of the Federal Trade Commission; W. A. Blauvelt and F. J. Herman of the Fuel Administration. The representatives of the steel industry were: Judge E. H. Gary, chairman; James A. Farrell, president, and W. J. Filbert, comptroller, United States Steel Corporation; Charles M. Schwab, chairman, and E. G. Grace, president, Bethlehem Steel Co.; A. C. Dinkey, president Midvale Steel & Ordnance Co.; E. A. S. Clarke, president Lackawanna Steel Co.; Willis L. King, vice-president Jones & Laughlin Steel Co.; John A. Topping, chairman Republic Iron & Steel Co.; A. F. Huston, president, and F. H. Gordon, general sales manager, Lukens Steel Co.; Karl G. Roebling, general sales manager John A. Roebling's Sons Co.; James A. Burden, president Burden Iron Co.; W. Vernon Phillips, president F. R. Phillips & Sons Co.; F. N. Beegle, president Union Drawn Steel Co.; W. S. Horner, president National Association of Sheet and Tin Plate Manufacturers; Eli Joseph of Joseph Joseph & Brothers Co., and James B. Bonner, representing the American Iron and Steel Institute. Roy A. Rainey and Scott Stewart of the Rainey Coke Co. were also present.

Trade Commission Conference This Week

While the steel men were invited to Washington to "review the prices for their products agreed upon through previous conferences between the War Industries Board and the industry," the price question received but little attention. Chairman Willard of the War Industries Board stated that the Federal Trade Commission was engaged in the preparation of a detailed report upon costs of production and that until the data contained therein were in the possession of the board it would not be practicable to discuss the details of any revision of existing prices that might be deemed necessary. As the result of the discussion of this phase of the subject it was decided that the steel men should return to Washington on Dec. 14 for a conference with the Federal Trade Commission.

In discussing the general situation in the iron and steel industry the steel men assured the members of the War Board that the heartiest co-operation on the part of the entire trade was being accorded the Government and that production was keeping well abreast of demand. Certain suggestions were made to the board relative to allotments of orders and methods of distribution which Chairman Willard received with evident favor. The conference then adjourned without the fixing of any date for the return of the committee to meet the War Board.

No Material Price Changes

The impression is gaining ground here that there will be no important readjustment of prices on Jan. 1. This is based on a number of considerations. In the first place, the publication of detailed schedules of controlled prices on basic materials, with appropriate differentials and extras, has served as a general trade stabilizer and any radical changes would have a demoralizing effect. Secondly, the War Industries Board has no information indicating that changes are necessary and is not disposed to disrupt an arrangement that is working very satisfactorily. In the third place, the Federal Trade Commission is not likely to be ready to submit its final conclusions in time for a readjustment of prices by Jan. 1, if any readjustment should be deemed desirable. Finally, there is a disposition to adhere to the present iron and steel price schedules until it has been determined what course Congress will pursue with respect to price fixing legislation and especially as to the fate of the Pomerene bill. Summarizing the situation, therefore, it is the best opinion here that the existing schedules will remain in force for a considerable period after Jan. 1, probably as the result of a formal extension on that date.

W. L. C.

Carnegie Veterans' Annual Dinner

The annual dinner of the Carnegie Veterans' Association, composed of the surviving 35 partners of Andrew Carnegie in the Carnegie Steel Co., Pittsburgh, when it was taken over by the United States Steel Corporation, was held Friday evening, Dec. 7, in the home of George Lauder, in the East End, Pittsburgh, Mr. Lauder having been an early business partner of Andrew Carnegie when he started in the steel business. Owing to the condition of his health Mr. Carnegie was not present at the dinner, but sent a telegram of warm felicitation. Among those also absent from the dinner were Col. Millard Hunsiker, who is in Paris; John G. A. Leishman, former Ambassador to Germany; Ambrose Monell, now a colonel in the Army Aviation Corps, and John A. Potter, superintendent of the Homestead Steel Works, at the time of the noted strike there. Others absent were W. E. Corey, now chairman of the Midvale Steel & Ordnance Co., also W. L. Abbott, formerly president of Carnegie, Phipps & Co., who is now living in Philadelphia. All former dinners of the Carnegie Veterans' Association have been held in New York City. There were addresses by a number of former partners of Mr. Carnegie, and at the close of the dinner officers that have served since the organization was formed were re-elected as follows: Andrew Carnegie, president; Charles M. Schwab, vice-president, and Charles L. Taylor, secretary.

Fuel Administrator Garfield has announced that the authorized advance of 35 cents per ton in the price of anthracite coal will not be allowed on coal in the hands of jobbers or retailers when the increase was made effective Dec. 1. A temporary increase of 25 cents per ton has been granted to coal operators in various counties in the Jellico region of Kentucky and Tennessee by reason of the fact that apparently the operators of this region failed to understand the rulings of the administration regarding the filing of cost sheets as a preliminary to applications for change of price.

The regular monthly meeting of the Association of Iron and Steel Electrical Engineers will be held in the Hotel Chatham, Pittsburgh, Saturday, Dec. 15. G. E. Stoltz of the Westinghouse Electric & Mfg. Co. will present a paper entitled, "Fly Wheels on Steel Motors." The January meeting of the Pittsburgh session will be a joint meeting with the American Institute of Electrical Engineers. Papers will be presented on generation, distribution and consumption of power, as well as power factor correction.

Pittsburgh and Nearby Districts

The first license allowing a German-owned concern to continue business under the supervision of the alien property custodian, was granted at Washington, D. C., on Thursday, Dec. 6 by the War Trade Board to the Orenstein-Arthur-Koppel Co., Koppel, Pa. A. Mitchell Palmer, alien property custodian, appointed T. H. Given, president of the Farmers Deposit National Bank of Pittsburgh, as his representative to direct the company's operations. The company, which is entirely owned by German capital, is engaged in the manufacture on a large scale of transportation facilities and equipment for use in industrial plants.

At the urgent request of the United States Navy Department, the Carnegie Steel Co. is now operating the plant of the Alloy Steel Forging Co., at Carnegie, Pa., near Pittsburgh. For some time this plant has been making steel forgings for small naval guns. The Alloy Steel Forging Co. was incorporated in Delaware in 1911, with an authorized capital stock of $1,000,000, of which $500,000 is outstanding. W. S. Potter is president and B. L. Beck, secretary.

The Cambridge Foundry & Machine Co. has been organized at Cambridge, Ohio, with a capital of $50,000 to do a general foundry and machine business.

The Brownsville Foundry & Machine Co. has been formed at Brownsville, Pa., and has taken over the foundry and machine shop formerly operated by J. H. Herbertson's Sons. The new company will engage in the manufacture of mine cars, and will buy considerable new machinery and other equipment.

The Davis Break Beam Co. plans to make large additions to its plant at Johnstown, Pa., for which considerable new equipment will be needed.

The Schlieper Engineering Co., Pittsburgh, is in the market for a considerable number of single-purpose lathes.

The Penn Mold and Mfg. Co., Canal Dover, Ohio, is in the market for an 18 or 24-in. lathe or planer.

The Savage Arms Corporation, Sharon, Pa., has an inquiry out for a large shear and a lifting magnet.

Edgar E. Brosius, contracting engineer, Pittsburgh, is furnishing the Brosius automatic mud gun equipment for seven new blast furnaces now being built in this country. This Brosius gun is entirely automatic in its operation, requiring no one near the furnace while the hole is being stopped. This feature entirely eliminates the possibility of accident to the workmen, and permits the employment of less skilled labor to operate the gun.

At a meeting of the board of governors of the Traffic Club of Pittsburgh, held last week, it was decided unanimously to do away with the annual dinner of the club, which has been held early each year for many years. The action was taken as a conservative war measure.

The Manufacturers' Light & Heat Co. of Pittsburgh, supplier of natural gas, has filed notice with the Public Service Commission that on and after Jan. 1, next, it will discontinue the service of natural gas to all manufacturing plants that it is now supplying, desiring to conserve its entire production of gas for domestic consumers. This notice follows similar notices filed by other natural gas companies, furnishing gas to manufacturing plants in Western Pennsylvania, Eastern Ohio and West Virginia, against which protests have been filed by a number of manufacturers.

The regular monthly meeting of the Pittsburgh Foundrymen's Association will be held in the Fort Pitt Hotel, Monday evening, Dec. 17. A program of entertainment has been prepared in keeping with the holiday spirit. W. S. Diggs, chairman of the Pittsburgh 4-minute men, will make an address on "Co-operation." W. S. Sanderson, Pittsburgh representative of the Carborundum Co., is chairman of the entertainment committee. Bayard Phillips continues as acting secretary of this organization, no successor having yet been appointed to succeed F. H. Zimmers, deceased.

L. A. Green, Park Bldg., Pittsburgh, representative in that district of the Bedford Foundry & Machine Co., Bedford, Ohio, recently sold six 7½-ton and one 20-ton electric cranes to the Wm. Cramp & Sons Shipbuilding Co., Philadelphia; four 7-ton cranes to the Hampton Roads Shipbuilding & Dry Dock Co., Norfolk, Va.; two 10-ton cranes to the Pittsburgh Foundry & Machine Co., Pittsburgh; one 50-ton and two 10-ton cranes to the Nagle Steel Co., Pottstown, Pa.; one 8-ton crane to the Leetsdale Foundry & Machine Co., Leetsdale, Pa.; one 5-ton crane to the Massillon Steel Castings Co., Massillon, Ohio, and one 20-ton crane to the Phoenix Iron Works, Phoenixville, Pa.

Wages of Men and Women in Germany

Wages of both men and women in German industrial lines have largely increased as a result of the war. According to returns obtained by the Imperial Statistical Office, in the case of men the average earnings for a day's work in all trades combined fell about 1 per cent between March and September, 1914, but by September, 1916, it had risen 46 per cent above the level of March, 1914. The period of greatest increase (14.8 per cent) was during the first winter of the war. From March, 1915, to September, 1915, there was an advance of 11.4 per cent, in the next six months an increase of 6.7 per cent and from March, 1916, to September, 1916, an increase of 7.8 per cent. In the case of women workers there was a drop of 15.3 per cent in daily earnings between March and September, 1914, but by September, 1916, their earnings had risen to a figure 54.1 per cent above that of March, 1914. The greatest increase in women's wages occurred between September, 1915, and March, 1916, the rise in this period being 18.3 per cent. No reference is made to the question as to how far increased earnings may be due to the working of overtime.

Ferromanganese Sales—Plates for Government

CHICAGO, Dec. 12.—(*By Wire*).—Transactions in 80 per cent ferromanganese have been made at $240 with the freight allowed, although some sellers quote $250.

Practically all the plates which the local mills are producing are going in the direction of the Government. They can be had in limited quantity, principally in the East, at 3.25c. Pittsburgh.

American Steel & Wire Co. Plants Closed

CLEVELAND, Dec. 12.—(*By Wire*).—The nine Cleveland plants of the American Steel & Wire Co. have been shut down since Saturday night because of scarcity of coal. Only two small open hearth furnaces are in operation. The five blast furnaces are banked. No relief is in sight.

Market Reports Delayed

Owing to storms raging in the Central West, it has been impossible to obtain the usual market reports of THE IRON AGE from Chicago, Cleveland and St. Louis by either telegraph or mail.

Reports received through Sweden state that the quantity of iron ore available in Germany is insufficient to meet the demand, according to the London *Iron and Coal Trades Review*. Production has been greatly hampered also by the scarcity of railroad cars. The military authorities have formed a plan for the distribution of raw materials among the various works with the object of preventing some furnaces having a surplus, while others have inadequate supplies.

The B. A. Wesche Electric Co., Cincinnati, maker of electric generators and motors, has commissioned the Reliance Engineering Co., Cincinnati, to draw up plans for a new factory building to be erected on Reading Road, near Ryan Avenue. The company's present location is at 327 East Sixth Street.

The Buffalo-Springfield Roller Co., Springfield, Ohio, has increased its capital stock from $125,000 to $500,000, and will increase the capacity of its present plant.

PERSONAL

W. L. Saunders, chairman Ingersoll-Rand Co., New York, spoke at the ceremonies to welcome the American Society of Civil Engineers into the Engineering Societies Building, New York, on Dec. 7. He told how advisers of the President had succeeded in placing an engineer upon the proposed list of members of district boards created to determine exemptions under the draft law. This was regarded as reasonable in view of the fact that the present war is to so large an extent a clash of industries and many men engaged in industrial work might render greater service at home than in the trenches. These lists were sent to the governors of states and when the lists were returned to the President more than 90 per cent of the engineers were scratched off to give place to lawyers and others. He regarded this circumstance as a logical result of the fact that the engineering societies are not organized for civic service and he urged, as he has done before, the getting together of engineers as technical men doing work as citizens.

Antonio C. Pessano, who has been president and general manager of the Great Lakes Engineering Works, Detroit, since its organization in 1902, having been elected recently chairman of the board of directors, will hereafter have his office in the Hanover Building, New York, instead of at Detroit. John R. Russel, Detroit, was elected president to succeed Mr. Pessano; H. W. Hoyt, vice-president and treasurer; John A. Ubsdell, vice-president and general manager, and F. G. Morley, secretary. The changes indicated were made on Mr. Pessano's recommendation in view of the great expansion in the company's operations. He will take up his residence in New York to be in constant touch with the interests from which the Great Lakes Engineering Works secures its large oversea business. The company's entire program of shipbuilding under contract is for ocean service, and these contracts will average one ship every two weeks for delivery in 1918.

W. H. Hundt, who has been connected with Luria Brothers & Co., old material dealers, New York, for the past seven years, has enlisted in Battery E, 305th Field Artillery, and is now stationed at Camp Upton, Yaphank, Long Island.

R. Ried, of the United Export Bureau, 239 West Thirty-ninth Street, New York, will start this month on an extended tour of Central and South American countries. His plan is to spend two or three weeks in every important city. Readers of THE IRON AGE who would avail themselves of Mr. Ried's acquaintance with South American trade condition to secure information that may develop in connection with his trip may communicate with him at the above address.

J. W. White, formerly with the Pittsburgh office of the Westinghouse Electric & Mfg. Co., and later with the Allis-Chalmers Mfg. Co., has returned to the Westinghouse Co., as manager of the power and railway division of the Detroit office of the company.

Paul Wick, assistant manager of sales for the Trumbull Steel Co., Warren, Ohio, has resigned and will enter the Navy.

Harry Resnick, formerly with the Fairbanks Co., Pittsburgh, and for 13 years its credit manager and assistant sales manager, but who resigned some time since to become assistant manager of Luria Brothers & Co., dealers in iron and steel, Park Building, Pittsburgh, has been appointed manager of that concern, succeeding David L. Wilkoff, who has resigned. Harvey M. Clymer, formerly with the Lebanon Valley Iron Co., Lebanon, Pa., has been made assistant manager of the Pittsburgh office of Luria Brothers & Co.

David L. Wilkoff, formerly manager of the Pittsburgh office of Luria Brothers & Co., has resigned, and will become a member of a new concern to be known as the Wilkoff-Stein Co., dealer in old material, and which will open offices in the First National Bank Building, Pittsburgh, about Dec. 15.

H. C. Gable, formerly general sales agent of the American Iron & Steel Mfg. Co., Lebanon, Pa., (now a part of the Bethlehem Steel Co.), and until recently associated in a consulting and advisory capacity with a group of New York capitalists, has with H. T. Gerdes, Gerdes & Co., manufacturing and contracting engineers, New York, organized the Atlantic Steel Corporation, with offices at 30 Church Street, New York. The company intends to buy and sell steel in such forms as bars, sheets, plates, bolts, nuts and tin plate. It is already engaged in business, although time has not yet allowed for the granting of the charter for which application has been made at Albany.

G. F. Matteson, who has specialized for some years in munitions manufacture, part of the time at the Frankford Arsenal in Philadelphia, and more recently in a consulting capacity for different munition manufacturers, has been appointed department superintendent at the Watertown Arsenal, Watertown, Mass.

David O. Holbrook, Pittsburgh secretary of the National Gas Association of America, has been named to direct the distribution of natural gas for industrial purposes in the United States in connection with the priority committee and the War Industries Board. His work will be to see that munition factories get preferential service by gas companies. Mr. Holbrook will spend three days a week in offices to be opened for him in the Council of National Defense Building in Washington. His Pittsburgh offices are in the Oliver Building.

Frank H. Hitchcock, postmaster general of the United States in President Taft's cabinet, has been made president of the Vulcan Steel Products Co., 120 Broadway, New York, succeeding Otto Kafka, who resigned on Nov. 15. Gen. T. Coleman du Pont assumed control of the company on Aug. 1. G. A. Callanen, formerly with the Allis-Chalmers Mfg. Co. and the Westinghouse Electric & Mfg. Co., has been appointed head of the machinery and engineering division; R. D. Chipp, formerly purchasing agent of the Brazil Railways, is assistant to the president, and F. M. Welsh, formerly identified with the Republic Iron & Steel Co., at Pittsburgh, has been appointed assistant purchasing agent.

S. L. Napthaly, manager of the Los Angeles Shipbuilding & Dry Dock Co., has just returned from the East, where he bought a number of machines for his plant. This corporation has contracts for eighteen 8800-ton vessels.

John A. McGregor, Pacific Coast representative of the Bethlehem Shipbuilding Corporation, has returned from a three months' visit to the East. Mr. McGregor says that extensions, the nature of which cannot at present be disclosed, will be made in the Union Iron Works at San Francisco.

H. M. Lane of the H. M. Lane Co., Detroit, addressed the Associated Foundry Foremen of New York and vicinity on "The Relation Between Economical Production of Castings and Foundry Design," at the meeting of the association held Dec. 8 at the Hotel Chelsea, New York.

Charles T. Bragg will become works manager of the Michigan Smelting & Refining Co., Detroit, Jan. 1. He was chemical engineer of the Ohio Brass Co., Mansfield, Ohio, for six years, and for four years technical director for Berry Bros., Detroit. He is the past president of the Detroit Section of the American Chemical Society.

Howard Emery, general manager of the Manitowoc, Wis., foundries of the Aluminum Castings Co., Cleveland, for several years, has been notified of his promotion to the position of general manager of the company's works at Detroit, effective Jan. 1. His successor at Manitowoc has not been named.

C. B. Krueger, sales manager Stamping & Tool Co., La Crosse, Wis., for the last two years, has resigned to engage in another line of work at Keokuk, Iowa.

A. H. Jameson, now connected with the Malleable

Iron Fittings Co., Branford, Conn., has been elected vice-president and general manager of the Bayonne Steel Casting Co., Bayonne, N. J., and will assume the duties of his new office Jan. 1.

L. B. Moses has become connected with the Walter A. Zelnicker Supply Co., St. Louis. Mr. Moses joins the Zelnicker organization as second vice-president, in charge of the rail department, with headquarters at the company's main offices in St. Louis. He has been associated with the rail trade since 1903, when he resigned as assistant to the president of the Kansas City Southern Railway. Since 1911 he has been sales manager of the Kettle River Co., Minneapolis.

G. A. Schneider, formerly of the Western Electric Co.'s San Francisco sales organization, has been appointed manager at Buffalo, succeeding J. W. Tabb, who has been tranferred to the New York office.

David F. Noble has resigned from the E. L. Essley Machinery Co., Chicago, and associated himself with the David W. Wright Machinery & Equipment Co., Chicago.

Harry H. Pinney, vice-president in charge of the Remington Bridgeport Works, Remington Arms-U. M. C. Co., has been granted an indefinite leave of absence and will shortly go to California to recuperate after two years of arduous but successful work to put the big rifle plant on a paying basis.

Readjustments of Freight Rates in Central Territory

WASHINGTON, Dec. 11.—Shippers of iron and steel articles over the rails of the Buffalo, Rochester & Pittsburgh Railroad, either as an originating or a delivering carrier, will not remain on the old basis of rates, although that carrier was not mentioned in the blanket fifteenth section order of the Interstate Commerce Commission, issued Nov. 15, authorizing the railroads in Central Freight Association territory and carriers taking iron and steel articles into or out of that district to readjust their rates in accordance with its decisions in the Central Freight Association class scale case. A special permit has been issued in behalf of that railroad authorizing it to bring its rates up to the new fifth class basis. Its name was unintentionally left off a list sent to the commission by the tariff filing agent of the Central Freight Association lines.

The Baltimore & Ohio, Chesapeake & Ohio, Norfolk & Western, and Detroit, Toledo & Ironton railroads have been specifically authorized to publish rates from Ohio River crossings on iron and steel on the basis allowed in the Central Freight Association class scale case, namely, fifth in carloads and fourth in less than carloads. The object is to put the Ashland-Ironton group on as high a level as Youngstown. That shipping point, owing to the commission's decision in the Pollak iron and steel case, had to be raised because the carriers elected to raise the Cleveland and Youngstown level rather than bring Chicago and Cincinnati down so that the rates from those markets would bear the same relation, on iron and steel, to rates from Pittsburgh, that rates on commodities, other than iron and steel, bear to the New York-Chicago scale.

Rates from the Portsmouth and Ashland-Ironton groups have been made on the basis of observing the rates from Youngstown to points on and west of the Hocking Valley rails, as maxima.

The International Trade Press, Inc., Monadnock Block, Chicago, announces that it has purchased the Cement Era Publishing Co. and that the *Cement World*, the *Cement Era* and *International Trade* will be consolidated in the *Engineering and Cement World* which will appear semi-monthly beginning Jan. 1. C. A. Tupper is president and treasurer of the purchasing company.

The Huntington Steel Products Co., Huntington, W. Va., is considering enlarging its plant.

OBITUARY

DAVIS S. MATHIAS, consulting superintendent of the south works plant, Illinois Steel Co., died at his home in Chicago, Dec. 5, after a short illness, aged 73 years. He was a native of Wales and from the age of 12 until his death was actively connected with the steel business, starting at South Works in 1884. He became superintendent of the rail mill, then general superintendent and more lately consulting superintendent, although virtually on the retired list. Mr. Mathias was recognized by all steel men as an expert authority on the making of steel and especially in the designing and operation of rolling mills. He was a member of the American Iron and Steel Institute, a director of the South Chicago Savings Bank, a member of the Old Settlers' Association, a local organization, of Calumet Commandery No. 62 Knight Templars, the Sinai Chapter 185 R. A. M. and other Masonic bodies. He leaves a widow, two daughters and three sons. The sons are all engaged in the steel business. David R. is general superintendent of the Joliet works of the Illinois Steel Co., William G. is general superintendent of the Tennessee Coal, Iron & Railroad Co. at Ensley, Ala., and Thomas H. is assistant general superintendent of the Lackawanna Steel Co., Buffalo. Mr. Mathias was a man much loved by all who knew him and his death caused deep regret. The funeral Dec. 7 was attended by a large number of both his older and younger associates.

FREDERICK E. SAWARD, editor and publisher of the *Coal Trade Journal*, New York, died Dec. 4, aged 71 years. As a youth Mr. Saward was identified with the coal trade of New York and continued in that connection until he conceived the idea of a trade journal devoted to coal. He founded the paper 48 years ago and has conducted it ever since, for 40 years publishing an annual statistical review of the coal trade of the United States. At the Paris Exposition in 1900 he directed the preparation of the American coal exhibit. He had served one term as president of the New York Trade Press Association. His son F. W. Saward has been for some years general manager of the *Coal Trade Journal*.

THOMAS EVANS, Lebanon, Pa., died at his home in that city on Dec. 2, at the age of 86 years. In 1881 he founded the Lebanon Rolling Mills, retiring in 1901. Prior to that, in 1859, he established the first iron mill at Shelby, Ala., which also was first in that State. During the Civil War he engaged at Newport, Ky., in charge of steel production for United States monitors used during the war. He leaves a widow.

SIMON FLORSHEIM, chairman of the board of directors of the Independent Pneumatic Tool Co., Chicago, and president Aurora Automatic Machinery Co., died Dec. 7, aged 80 years. He leaves a widow, a daughter and four sons. Mr. Florsheim was a native of Germany.

The Last Pig Iron Warrant

Recently the American Pig Iron Storage Warrant Co., New York, canceled its last warrant calling for iron in store on furnace yards. Commenting on this fact the Matthew Addy Co., Cincinnati, says: "This means that the reserve stock of iron piled for a rainy day has been exhausted and the country is now dependent for the iron it uses on the day by day output of the furnaces. It is a serious situation, for never was there such an absolute need of iron. And the worst of it is that there is no remedy. We have no other way now of providing for the enormously increased uses of iron than by speeding up the furnaces to their utmost capacity. This is easily said. But saying and doing are two different things. And instead of speeding up, the furnaces have been compelled to slow down; this because of the transportation, labor and coke shortages. There is no prospect of an early termination of these troubles. On the contrary, the winter weather will probably intensify them."

Broader Field for Export Organizations

They Must Be Able to Design and Equip Complete Manufacturing Plants Abroad—How New Demands of Foreign Buyers Are to Be Met

BY G. A. HARRIS*

MANY articles have appeared in the public press covering export trade expansion. They have dwelt mainly upon the desirability of developing this business, but the suggestions made have been more or less vague.

At the beginning of the war, the European countries did not have the time or inclination to plan for after-war conditions, as their efforts were of necessity confined to war preparations and to meeting the abnormal conditions with which they were confronted. It is only recently that they have begun to think of the future and these requirements. European nations, both Allies and neutrals, are now beginning to realize that they must call upon the United States for a large portion of their wants, especially for machinery and industrial plants. They are further beginning to realize that it is advisable for them to modify their specifications and requirements to conform as far as possible to the United States standards; otherwise, American makers would be compelled to develop special patterns, tools, etc., and train their workmen on new products, entailing longer deliveries and high or prohibitive prices.

Now that the foreign buyer is disposed to modify his requirements and specifications to conform to American standards, it becomes necessary for him to familiarize himself with these standards. The logical way of doing this is to send inquiries to this country for the material or equipment desired with the expectation of receiving proposals and specifications on standard American equipment which will furnish the information he requires. Of course, it is appreciated that in certain cases special specifications and designs will have to be met so as to turn out products or commodities peculiar to the country to which the machinery or equipment is to be shipped. This may necessitate departures from American standard practice, a condition American makers must of necessity meet. In other words, a spirit of co-operation and a desire to meet each other half way must prevail.

Treatment of War-Time Inquiries

Inquiries are now being received from practically all foreign countries covering various types of equipment and these are coming at a time when American manufacturers are overburdened with orders for standard equipment that can be put through their plants with a minimum amount of trouble. At first glance these inquiries from abroad do not appeal to the average manufacturer because of the special requirements involved, and the inclination is to reply that it is impossible to quote because of the great amount of work on hand and the impossibility of making earlier deliveries, etc. This is a typical reply from American manufacturers nowadays. But is it a wise reply?

In many cases, the object of these inquiries is not to obtain a firm price and an absolute delivery, because conditions existing prohibit the placing of the business immediately, rather to obtain specifications, drawings and other data, to enable the foreign buyer to familiarize himself with American equipment and standards, and to get a rough idea of costs and deliveries, so that when conditions will allow him to place the business, he is in the position to draw up his final inquiry or specification to conform with American standards.

True, it is difficult under existing conditions for a manufacturer whose desk is covered with emergency orders to push these aside and devote his time to the details of proposals and specifications covering equipment that he does not hope to realize on for some time to come, but he must do this missionary work in the light of insurance against future falling off of home trade.

Many of these foreign buyers have been dealing heretofore with Germany and have become accustomed to German methods and service, which were of a high order. America, therefore, if it expects not only to obtain this business but afterward to hold it, must furnish a service equal if not superior to that which Germany has supplied.

Naming Prices for Foreign Delivery

Let us look at the matter, first, from the foreign buyer's point of view—one which every successful exporter must train himself to adopt. The foreign buyer who wants to buy or manufacture something is interested primarily in the cost of the article or plant delivered ready to operate at its final destination; the costs in America, either at works or at seaboard, are merely incidental. Therefore, in normal times, the first essential on the part of the American manufacturer is that he be able to present his offer to the foreign buyer covering the cost of equipment at destination. It is also naturally desirable that his proposition be presented to the prospective customer or buyer in the buyer's language. This means that the proposal, blueprints, catalogues, specifications, etc., should be submitted in the language of the buyer. The average American manufacturer is not in a position to do this.

The result in the past has been that a majority of American manufacturers have quoted f.o.b. cars at works or f.o.b. steamer at some American seaport, they have submitted their quotations, specifications, drawings and other exhibits in English, and, in many cases, have not given shipping specifications or data so that if the customer were able, he has not sufficient information to figure out what it would cost to get the material to him. This has been one of the big faults in the past of the American manufacturer and something that must absolutely be overcome and corrected if we are to be successful in the future.

Going a little further into the matter and assuming that business has been placed and the manufacturer has been given orders for certain equipment. The foreign buyer usually has special requirements covering packing, marking, invoicing and the making up of certain documents which, to many manufacturers, seem entirely unnecessary, extremely complicated and not worth the trouble. Hence, in very many cases in the past, these instructions have not been carefully followed or have not been followed at all, resulting in the equipment arriving at destination in poor condition or incorrectly marked and the papers arriving incorrect or late, entailing untold trouble and dissatisfaction on the part of the foreign buyer.

Contracting for Plants Complete

Let us consider the case of the foreign buyer who is in the market for industrial plants of various kinds, especially where he wishes to manufacture a commodity which requires equipment and machinery from various manufacturers. In Germany, a large number of manufacturers of certain classes of machinery were willing, in order to sell their equipment, to design the complete plant, contract for and furnish the complete equipment, buying such machinery or equipment that they did not make themselves from other makers, but eventually delivering to their customer the complete plant ready for operation. If we are to obtain this business and hold it, similar service must be offered and rendered.

*Chief engineer American Steel Export Co., Woolworth Building, New York.

The average American manufacturer does not want to contract for a complete plant or equipment of which his own forms only a part, and to a certain extent his position is a correct one.

Here is our opportunity to meet the German system and improve upon it. Here is the opportunity for an organization to be developed through which the various manufacturers whose equipments enter into a plant of this kind can work, so that a proposition can be made on the complete plant, the same as the Germans did, not by a manufacturer who is interested in only part of the plant, but by a central organization that is interested in the entire unit. This calls for organizations that are thoroughly equipped to handle this situation.

An Outline of Organization

The essential features of such an organization should be as follows:

First, a thorough knowledge of the export business and the customs. It must contain in its organization trained export men who are capable of looking at matters from the foreign customer's point of view, who will study his interests and present his proposition in a clear manner to the manufacturer, and educate the latter to endeavor to meet the foreign buyer's desires. The organization must have men who are familiar with the packing requirements of the various foreign countries; who understand the importance of proper marking; who can advise the manufacturer how to assemble machinery and pack it to minimize ocean freight and to insure safe arrival at destination; who can make out the documents to conform with the various requirements and who can satisfactorily and efficiently attend to the many other export details.

The organization must contain, in addition, a high grade technical corps—specialists in the various classes of machinery or equipment which are being handled, who can intelligently take the offer of the various manufacturers, f.o.b. cars at works, and expand and develop it, adding various other details which go to make it a complete offer for delivery at destination. There should be men capable of receiving an inquiry for a complete plant and dividing it up at this end among the various manufacturers; laying out the complete plant if necessary; drawing up the specifications to the various manufacturers so that the different parts will fit and properly work together; supplying any missing links; presenting to the various manufacturers inquiries which will develop proposals of a nature that will satisfy the special wants of the buyer.

The organization should be able to estimate upon the ocean freight and other delivery charges to destination and if necessary the erection costs, so that finally it is able to make an offer on the plant complete and, if necessary, erected at destination.

There is a great advantage in the way outlined over that of Germany where the manufacturer designed and laid out the plant in order to sell his portion of the machinery and naturally favored his own part, while the remainder received minor consideration. On the other hand the organization described is not interested in any particular make of machinery but designs the plant in accordance with the best practice and the requirements of the country or customer for whom it is intended. The result is an all-around efficient plant rather than a one-sided plant.

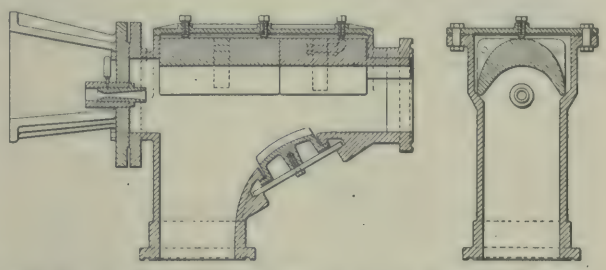
Manufacturers' Co-operation

A number of our large manufacturing companies have their own export departments in which they have endeavored to meet as far as possible the above ideas of an export organization, but only a few have sufficient business to warrant such a department. Most of our manufacturers must look to an independent organization such as described above. A number of such organizations have been formed and in the short time they have been operating the results have proved conclusively the correctness of the idea. The manner in which their story has been received in foreign countries shows how badly they are needed. However, they cannot be as successful as they should be without the hearty co-operation and backing of the manufacturers. To a certain extent they are fighting the battle of the manufacturers and the sooner the latter appreciate this and give their hearty support and co-operation, the sooner will our foreign relations and trade be understood and established.

Steam-Jet Ash Conveyor

A steam-jet ash conveyor is a recent production of George J. Hagan Co., furnace and combustion engineer, Pittsburgh. In connection with this conveyor system is used the patented signal elbow shown in the illustration. Ashes are conveyed by air drawn in by the velocity of the steam from the steam nozzle. This nozzle is equipped with a whistle which is blown when wear of 1/16 in. at the nozzle's throat takes place, thereby indicating that the nozzle should be replaced. By this means, it is pointed out, approximately constant steam consumption is maintained. A special flared air intake is used, which the company claims allows 98 per cent of the theoretically determined amount of air to pass through the pipe, contrasting this to an ordinary pipe opening for which he says this factor is 62 per cent.

The signal elbow has a two-piece wearing back. The lower half of this is reversible, while the upper half has a lip extension protecting the pipe joint. The elbow flange which rests on a pedestal base and the flange of the pedestal base are faced and drilled to insure self-centering and aligning of the steam nozzle.



The Signal Elbow Stands Upright on the Pedestal Bast Containing the Steam Nozzle. The lower half of its two piece wearing bank is reversible. The nozzle has a whistle which is blown when wear of 1/16 in. occurs at the throat

The elbow may be swung to clear obstructions and access to inside parts is obtained by removing the hand hole plug and rear cover plate.

When auxiliary steam-jet fittings are required in a straight run of pipe converging signal nozzles are used to centralize the flow of ashes and prevent undue wear on each side of the pipe. Also, elbows are provided with reversible wearing backs and with hand hole plugs for inspection.

Steel Ingot Output in November

Returns from 29 companies, which in 1916 made 88.14 per cent of the steel ingot production of the United States, have been compiled by the American Iron and Steel Institute, and based on these the estimate is made that steel ingot production in November was 3,166,257 gross tons, against 3,351,935 tons in October. There were 27 working days in October, making the daily average in that month 124,146 tons, while in the 25 working days in November it was 126,650 tons. As with pig iron, the daily output of ingots in November averaged slightly above that in October, contrary to the general belief. The institute figures, in gross tons, for the two months named, also for the first half of the year and for the third quarter, are as follows:

	Total First Six Months.	Third Quarter, July-Sept.	October.	November.	Total Eleven Months.
Open-hearth	13,681,483	6,599,048	2,475,754	2,384,218	25,140,503
Bessemer	5,164,139	2,411,108	870,494	772,489	9,218,230
Other	55,198	24,435	5,687	9,550	94,870
Total	18,900,820	9,034,591	3,351,935	3,166,257	34,453,603

The American Iron and Steel Institute continues its estimate, made in October, of a total steel ingot output for the United States in 1917 of 42,600,000 gross tons.

RUSHING NEW CONSTRUCTION

Youngstown Sheet & Tube Co. Salesmen Inspect Plant—Successful Meeting

One of the most successful sales conferences in the history of the Youngstown Sheet & Tube Co. was held in its home offices in Youngstown, Ohio, Tuesday and Wednesday of last week, Dec. 4 and 5. About 40 salesmen and managers of branch offices were present, one or more from each district. Tuesday, the salesmen, under guidance of J. A. Campbell, president; W. C. Reilly, general superintendent; R. J. Kaylor, publicity manager, and other officials, were taken through the works and given an opportunity to see the immense amount of new construction in progress, and also to note the rapid work that is being done in the construction of the new 120-in. plate mill, which is being built for the company by the Mesta Machine Co., Pittsburgh, and which is being rushed as fast as possible to supply plates for the Government, which are so badly needed at this time. The salesmen were especially interested in the production of shell steel, large quantities of which are being turned out by this company for the Government. Other extensions that are nearly completed were also inspected, and some time was spent in the tube mills, and also in the new 9-in. and 12-in. steel bar mills erected at Struthers, Ohio, for the company by the Morgan Construction Co., of Worcester, Mass. An illustrated description of the 9-in. mill appeared in THE IRON AGE, issue of April 5, 1917, and of the 12-in. mill in the issue of Oct. 11, 1917. Both these mills are now running on heavy Government orders.

First Liberty Loan		
May, 1917		
Subscriptions to loan by company	$3,275,000.00	
Subscriptions to certificates of indebtedness, issued Aug. 10, 1917, by company	2,000,000.00	
Subscriptions to loan by employees	581,000.00	
Total for First Liberty Loan		$5,856,000.00
National Red Cross Campaign		
June, 1917		
Company's subscription to Red Cross Fund	$100,000.00	
Subscription by employees (all departments)	55,368.00	
Total subscription to fund		$155,368.00
Second Liberty Loan		
Oct. 18-24, 1917		
Subscriptions to loan by company	$2,375,000.00	
Subscriptions to Government certificates by company	5,000,000.00	
Subscriptions to loan by employees	1,065,000.00	
Total for Second Loan		$8,440,000.00
Y. M. C. A.—War Work Fund		
Nov. 12-15, 1917		
Subscription by the company	$10,000.00	
Subscriptions by employees	20,479.43	
Total subscriptions		$30,479.43
Appropriated for Sheet & Tube ward in Paris Hospital	$6,000.00	
Total of all subscriptions		$14,487,847.43
Men in Service		
Number of men in Naval and Military Service (estimated)	800	

Luncheon was served in the works office restaurant, and some time devoted to seeing pictures showing many operations in the works, as well as the extensive welfare and safety work being done, including the erection of several hundred modern homes for workmen. The evening was devoted to a dinner, at which addresses were made by a number of the executives and others. The feature of these addresses was the disclosure of the activities of the company in the matter of furnishing steel to the Government and the Allies for war purposes, as well as in subscriptions to Liberty bonds and other movements connected with war work. It was shown that the corporation and its employees have invested in these funds the astonishing total of almost $15,000,000. The fact was also brought out that the extensions completed and begun during the present year, largely for the purpose of increasing the output of projectile steel and meeting other Government requirements, will involve the expenditure of approximately $16,000,000. Wednesday was devoted entirely to discussion of sales problems in which, under the leadership of W. E. Manning, vice-president and general manager of sales, and Walter E. Watson, assistant manager of sales, almost all the salesmen and heads of departments participated. These problems concerned chiefly such a distribution of the company's products as will best serve its customers, under the policy which gives to Government orders priority over all others.

A dinner at the Hotel Ohio closed the conference, which was declared to be the most interesting and helpful the visiting salesmen had ever attended. A statement of the record of activities of the Youngstown Sheet & Tube Co., in war subscriptions and donations up to Dec. 1, 1917, is presented in the accompanying table.

Increased Activity in Metal Working Lines in Canada

TORONTO, ONT., Dec. 11.—The British Government has instructed the Imperial Munitions Board, Ottawa, to issue without delay, to Canadian metal working plants, equipped for the work, contracts in volume covering the steel, forging and machining of 18-lb. shrapnel, 4.5-in. and 6-in. high explosive shells, which will insure steady employment both for men and machines for a period extending well into the new year. Munitions making in Canada has been for several months ebbing, and until recently had the appearance of becoming a negligible quantity. Realization of such a possibility was little relished by our business interests. Investigation of the position disclosed the fact that financing of munitions orders was the chief obstacle in the way, hence efforts were at once directed to satisfactorily overcoming the trouble. Canada's great Victory Loan was closed Dec. 2, in which upward of $410,000,000 was subscribed by the people of the Dominion. This money will be spent in Canada on war munitions, supplies, etc. The decision to place further large shell orders in Canada, coming as it does in the wake of the distribution of large contracts from the United States Government for 75 and 155-mm. shells; the placing of huge contracts for fabricated steel for American ship construction, and the receipt by a Toronto firm of a contract to supply aeroplane engines to the value of some $5,000,000 to the Imperial Government, it may be said that at no period in the Canadian industrial history has the business outlook in the metal trades been so promising.

British Steel Exports to France

Iron and steel exports from Great Britain to France, according to *L'Usine*, for the first seven months of 1915, 1916 and 1917 have been as follows respectively: 1,795,163 metric tons, 2,138,853 tons and 1,491,785 tons. The largest movement in any of the three periods was 389,740 tons in May, 1916. The peak was evidently reached in 1916.

The Eastern Steel Co., New Glasgow, N. S., is in liquidation, proceedings having started under judgments obtained by a number of creditors. Half of the plant was destroyed by fire a short time ago. It is understood that the bondholders of the company were prepared to furnish funds to enable it to proceed in business if they could obtain assurance that orders for shells would be forthcoming. They could have obtained orders from the American Government at a paying figure, but the Imperial Munitions Board intervened. As the company had been engaged in machining 4.5-in. shells previous to the fire, it is highly probable that the Imperial Munitions Board will place some of the orders now available with it.

The "Preparation of Ferrouranium" is the title of Technical Paper 177 of the U. S. Bureau of Mines by H. W. Gillett and E. L. Mack. It is a part of the investigations of the bureau relating to radium, uranium and vanadium, and the results are presented in the belief that they will be of aid in developing the use of this alloy in the manufacture of special steels.

HIGHER LIGHTERAGE CHARGES

New Schedule at New York Approved by Interstate Commerce Commission

WASHINGTON, Dec. 11.—Proposed increased charges for delivering heavy articles, chiefly structural iron and steel, by lighter at New York are justified in an opinion by the Interstate Commerce Commission, vacating the order by which a new schedule was suspended until Dec. 15, 1917. The result of the decision will be to subject to an additional charge of 40 cents per ton for lighterage delivery pieces weighing from three to 20 tons which constitute a large percentage of the shipments of structural iron and steel to New York and vicinity.

What is known as the New York rate group embraces not only the city of New York, but the northern part of the state of New Jersey, points along the Hudson River almost as far north as Albany, N. Y., and points on Long Island as far as Jamaica. As a general rule, the rail carriers serving this territory will deliver freight at any point in the rate group without imposing any charges in addition to the New York rates. Because of the peculiar terminal conditions at New York it is necessary for the railroads serving the port to employ lighters and car floats in transferring freight from their terminals to the various points of delivery along the shore of the harbor. With certain important exceptions, delivery by lighter or car float is made without any additional cost to the shipper. The rail carriers own and operate lighters and car floats, but not in sufficient numbers to handle all the tonnage offered, and it is their practice to employ independent lighterage companies commonly referred to as "outside companies," to deliver part of the traffic. For delivering the general run of lighterage traffic, the outside companies have for years received from the rail carriers a published allowance for this service, usually 60 cents per ton, and the eastern carriers deduct that amount from the through rates to cover the terminal service before prorating with their western connections.

The Extra Charges

The extra charges at present imposed upon shippers for the lighterage delivery of articles weighing more than three tons are as follows: Pieces weighing from 3 to 20 tons, 40 cents per ton; from 20 to 30 tons, 65 cents; from 30 to 35 tons, $1.15; from 35 to 40 tons, $1.90; from 40 to 45 tons, $2.40; and from 45 to 50 tons, $2.90. These charges are superimposed upon the New York rates.

Under the terms of the suspended tariff the 65 cent rate is raised to $1.40, the $1.15 rate to $1.40 and the $2.40 rate to $2.90, while the $1.90 rate is reduced to $1.40.

The protestants have finally agreed to accept the new rates but have objected strongly to the cancellation of the following exception in the present tariff:

An Important Exception

"When a lighterage order from one shipper or consignee covers delivery of 50 tons or more at one time from one harbor point for one harbor destination, or when the freight charges on a shipment from one shipper to one consignee are assessed on a minimum of 50 tons, no extra charge will be made for single pieces weighing 20 tons or less; otherwise the foregoing rates will apply."

By virtue of the above exception shipments of structural iron and steel to New York which are almost invariably made in lots of more than 50 tons to one consignee, the individual pieces weighing less than 20 tons, have escaped payment of all extra charges. The cancellation of the exception would subject shipments of these commodities, regardless of the quantity offered, to the additional charge prescribed in the tariff of 40 cents per ton for the lighterage delivery of pieces weighing from 3 to 20 tons. The proposed tariff makes no change in this 40-cent charge, but applies it uniformly by canceling the exception regardless of the size of the shipment.

Elimination Justified

After full investigation the commission holds that the proposed elimination of the exception is justified and makes a significant observation concerning the absorption of a part of the cost of lighterage out of the transportation rates, saying:

"Not even the protestants contend that the lighterage service can be performed at a cost even approximately as low as that figure. In addition to this sum, there is paid to the outside companies the additional sum of 60 cents absorbed by the respondents out of the New York rates, making the total allowance $1 per ton. Inasmuch as this allowance is now being paid by several of the respondents, they are now absorbing $1 per ton on all traffic to which the exception applies. The respondents ask, in effect, that they be required to absorb only 60 cents of the allowance, and that 40 cents be borne by the shippers. The protestants ask, on the other hand, that the whole allowance of $1 be borne by the rail carriers. In the light of the evidence of record in this proceeding the conclusion cannot be reached that this whole burden should fall upon the respondents, nor can it properly be contended that the carriers are unreasonable in asking the shipping public to bear 40 per cent of the terminal cost. This statement is not to be interpreted as meaning that it is incumbent upon the respondents to continue the absorption of 60 cents per ton out of the transportation rates, for that question is not presented for determination upon this record."

Experienced observers of the work of the commission see in the closing sentence above quoted a suggestion to the carriers to place upon the shippers at least a part of the 60 cents per ton now absorbed by the railroads.

Larger British Output of Basic Pig Iron

The imperative need of making the best use of native British iron ores has resulted in a notable change in steel manufacture in that country, says the *Engineer*. Before the war the output of acid steel, Bessemer and open-hearth was about twice as great as that of basic steel—4,860,000 tons against 2,800,000 tons; but now in order that the poor and phosphoric ores may not be wasted, furnaces have been turned on to basic. To meet this change the Stanton Iron Works Co., Ltd., not long since relined two of its blast furnaces with basic material, and on Oct. 20 lighted up a third, so that now three out of the nine blast furnaces, each with a capacity of about 300 tons per week, is making basic pig largely from local ores but with the addition of a small quantity of manganese ore. The company employs about 1000 men at its iron mines.

India's Manganese Ore Output

Manganese ore output in India in 1916 was 50.20 per cent greater than in 1915, or 568,032 tons against 378,172 tons in 1915. The shortage of ship tonnage was to some extent relieved by special arrangements for shipment. Prices continued to advance and the average per unit was 2s. 5¼d.

The Milwaukee branch of the National Association of Sheet Metal Contractors of the United States has elected the following officers: President, John Bogenberger, vice-president Consolidated Sheet Metal Works. vice-president, E. B. Tonnsen, president-treasurer E. B. Tonnsen Co.; secretary, O. A. Hoffmann, secretary-treasurer Biersach & Niedermeyer Co.; treasurer, J. M. Hollits, of Hollits & Bogenberger. The association will entertain the fourteenth annual convention of the national body in Milwaukee in June, 1918.

"Iron Ore Occurrences in Canada" is the title of a new publication, in two volumes, by the Canadian Department of Mines. It is compiled by E. Lindeman and L. L. Bolton.

Mechanical Engineers Discuss War Work

(*Continued from page* 1427)

action. Definite rules were essential and if they are enforced impartially, the women will obey almost any rule. He showed pictures to indicate how in the Wagner plant machinery is painted a white enamel, which makes for cheerfulness of the surroundings and helps to maintain a generally clean condition. Efficiency, he said, was very much dependent on the mental attitude and this was helped by the surroundings with the added fact that women have a decorative instinct. His investigations led him to believe that there is no relation between wages and morality, but instead that immorality was found where there was too great clothes consciousness, in which case the work was not of a high class. He urged the use of a uniformity of apparel in the shop, though giving some chance for individuality. He favored for the material something with an unfadable blue. The uniform includes a waist of identical design for all women. The operatives are given an option as to wearing these on Saturday, partly as a recognition of the Saturday half holiday for which they may be prepared before coming to work. Only girls who are somewhat masculine don overalls and these he regarded as a dangerous element in that they lack sex consciousness.

John W. Higgins, president and treasurer Worcester Pressed Steel Co., Worcester, Mass., told how women are engaged in press work in the manufacture of cartridge cases and helmets and do gaging and assembling work. He advocated the establishment of classes for girls in trade schools.

L. W. Wallace told of the employment of women in the plant of the Diamond Chain & Mfg. Co. Of the employees, 30 per cent are now women, and they are doing all forms of machine work. They are now engaged in the engineering department, a woman has charge of the bonus department and a university graduate is engaged in the cost department. The plan is to put a woman to interview all men for employment as well as women. A woman university graduate has been engaged as director of mutual service, as the position is termed, and her job is to direct discipline, consider disputes and pass on discharges. Men and women are working together, but with a general scheme of control, and the company is having no trouble in attracting high types of young womanhood.

Arthur C. Jackson, general superintendent Miller Lock Co., Philadelphia, said that at its works 42 per cent of the employees were now women. They were engaged among other things in the cost department and on payroll work. He emphasized the desirability of a trained nurse as the most effective means of communication between employer and employee. A matron is on duty in every toilet as a controller, if nothing more, of the language or conversation. The women are engaged on drill presses and on milling work and all the milling of keys is done by women.

E. J. Poole, Carpenter Steel Co., Reading, Pa., advised on the mixing up of nationalities and suggested also the need of larger lockers for women employees. He finds exceedingly good work by women in grinding.

Business Session

The address by the retiring president, Ira N. Hollis, on "The Activities of the Society for 1917" was presented at the business meeting on Thursday morning. Among the points touched upon were the increasing part played by the society in State and national affairs at the present time, with particular reference to the adoption of the boiler code by a large number of States and cities and the progress that was being made toward its adoption by the remaining ones. The influence of the power test code on the design of power stations was also mentioned. The time had come, he believed, for the society to establish commercial standards in the mechanical engineering field the same as the Society of Automotive Engineers had done for the automobile industry. At the present time, Dr. Hollis stated, 10 per cent of the membership of the society was in active service and a number of others were giving their services in connection with different committees and boards of the Government.

A number of amendments to the constitution were presented by F. R. Hutton, chairman of the committee on the constitution and by-laws. These related to changes in the personnel of the council and also in the policy of the society to permit subjects of public interest to be discussed at the meetings and the approval of standards by the society. These were ordered to be submitted to the membership by letter-ballot in the customary way.

Walter M. McFarland, Babcock & Wilcox Co., New York, presented a bust of the late Rear Admiral Benjamin F. Isherwood, U. S. N., to the society. This was a gift of a number of members who had been associated with the admiral in the naval service and was unveiled by a grandson and namesake.

Cockerill and Other Belgian Steel Plants Dismantled

Nearly the entire plant of the famous Cockerill Works, at Seraing, Belgium, has been destroyed or confiscated, according to a statement of Reuter's Agency based on a Belgian source. The destruction of works in the Liège district is being completed. Gangs of men have been put on to destroy the Cockerill blast furnaces. Besides this, all the machinery has been taken away as well as all raw materials and stocks, and the central works are being taken to pieces in order to remove all the copper from them. At Ougrée preparations have been made to pull down three blast furnaces; two are already destroyed. Seven rolling mills out of nine have been removed. At Angleur everything has disappeared. At Grivegnée everything has gone except the steel works, where the Germans are making ingots. At the Espérance works at Longdoz, as soon as the first requisition papers arrived, the Germans immediately began to destroy or to take away the blast furnaces, steel works, rolling mills, foundry and machine shops. Everywhere the Germans are taking away the papers and plans from the drawing offices. The situation is practically the same all over the country. The important works of La Providence at Haumont, province of Hainaut have been completely destroyed, as well as the power station of the same firm at Marchienne.

Manganiferous Ores in New Mexico for Spiegel

Over 31,000 gross tons of manganiferous iron ore has been shipped from mines near Silver City, N. M., since April, 1916. The ore averages about 16 per cent manganese, 35 per cent iron, 6 per cent silica and 0.012 per cent phosphorus, and has been sent to the Colorado Fuel & Iron Co., at Pueblo, Col., for conversion into spiegeleisen. Dr. J. B. Umpleby of the U. S. Geological Survey in a report says that "in this district there are more than 500,000 tons of ore available, apparently of a grade similar to that already shipped from the area. It is apparent that a very large quantity of ore suitable for spiegeleisen can easily be developed in the Silver City area."

The Algoma Steel Corporation, Sault Ste. Marie, Ont., will make considerable additions and improvements to its plant, including the installation of 25 by-product coke ovens, with by-product equipment. Construction will be started immediately and it is expected that the plant will be completed by the middle of 1918. The contract for the installation of the coke ovens has been awarded to the Wilputte Coke Oven Corporation, New York.

The Edison Supply, United States Navy, 1218 Edison Building, Chicago, is constantly in the market for engineers' mill and contractors' supplies, building hardware and tools for use in the naval training station, Great Lakes, Ill. Among the articles to be purchased are steel, nails, screws, wire rope, sheet metal, bolts, rivets, saws, files and welding apparatus.

MORE PLANTS ON WAR WORK

Conversion of Several Industries Beginning

New Demand for Machine Tools Shows Somewhat of a Falling Off in All Markets, Though Small-Lot Business Continues Fairly Good

Conversion of factories in various industrial lines to war work constitutes one of the interesting features of new machine-tool demand. While as yet none of these new war contractors has appeared as a large buyer, there is a fair inquiry for small lots of tools. It is probable that no very large demand will come from this source, as companies are bidding on such work as they can do with their present equipment.

Perhaps the greatest transition is to be noted in the automobile industry. Detroit plants are being rapidly converted into war material producers. Among Government orders placed there during the past week was one for 50,000 mine anchors, which was divided among several automobile makers. An Akron, Ohio, tire manufacturer is reported to have taken an order for 450,000 gas masks and a large order for masks is said to have gone to another Akron company. The F. B. Stearns Co., Cleveland, which will make Rolls-Royce airplane motors, is still buying equipment and will need about 100 more tools. Lansing, Mich., automobile plants are said to be assured of war contracts. The Reo Motor Co. will probably make shrapnel cases and the Auto Body Co. will make ambulance bodies.

Grand Rapids, Mich., furniture manufacturers have mobilized their facilities for the manufacture of airplanes. The Grand Rapids Airplane Co. has been organized with a capital of $200,000 paid in and will serve as an operating company to distribute Government contracts among the manufacturers.

Manufacturers of so-called luxuries will be or already have been included in the war program. A talking-machine company in New Jersey is making time fuses and one in New England is at work on aircraft cameras. Even piano manufacturers may be called upon to furnish war material, probably airplane parts.

There has been somewhat of a lull in all machine-tool markets the past week so far as large lists are concerned. However, there has continued a fair average of small-lot inquiry. The American Can Co. is expected to buy about 150 new tools for its Edgewater, N. J., plant, where a contract for 4,000,000 75-mm. shells will be executed. About 50 tools have been commandeered in New York for Dodge Bros., Detroit. The International Arms & Fuse Co., Inc., Bloomfield, N. J., has about concluded its buying. The Standard Ordnance Corporation, Hamilton, Ohio, has purchased a part of its requirements for work on 155-mm. gun carriages. The Federal Shipbuilding Co. has issued a partial list of its machine-shop requirements. It is reported that the Continental Motors Corporation, Detroit, has received a contract for 40,000 Liberty motors for Army trucks.

New England business continues active. The Liberty Ordnance Co., formerly the Bridgeport Projectile Co., Bridgeport, Conn., is undertaking large shell-forging contracts, and is to greatly increase its output of 5-in. naval guns. The rifles and cartridge plants of the Remington Arms U. M. C. Co. are increasing production. The new gun plant of the Bullard Engineering Corporation, Bridgeport, is nearing completion. The Colt's Patent Firearms Mfg. Co., Hartford, Conn., is equipping its newly acquired plant in Meriden. The Marlin Arms Co. is converting half of its Mayo radiator plant in New Haven, Conn., for rapid-fire machine gun manufacturing. The Sterling Motor Co., Brockton, Mass., is buying new equipment for munitions work, and is building addition to take care of orders for shells and gun sights.

Buying for the Rock Island Arsenal is the feature of present machine-tool demand in Chicago. Cleveland reports inquiry from the Government for tools to equip army repair trucks, which are to be used behind the lines in France.

An order for about 30 cranes of various sizes has been placed with the Chesapeake Iron Works, Baltimore, Md., by the Stone & Webster Engineering Corporation. The cranes will be used in the United States gun-repair shop in France.

New York

NEW YORK, Dec. 11.

There has been a lull during the past week in new demand for machine tools. There continues, however, a fair average of small-lot business, mostly from recent large buyers, who are rounding out their requirements.

The American Can Co. is expected to buy about 150 new machines for its Edgewater, N. J., plant, where a Government order for 4,000,000 75-mm. shells will be fulfilled.

The Federal Shipbuilding Co. has issued a list of a part of its requirements for its machine shop at the Hackensack Meadows shipyard.

The American Shipbuilding Co., Cleveland, has been trying to find tools in New York for equipping additions to its plants on the Great Lakes.

About 50 tools have been commandeered in New York for Dodge Bros., Detroit. These tools are among the lot recently catalogued by the Machine Tool Section of the War Industries Board, having been found in export warehouses ready for shipment abroad. All of them were held for the needs of American manufacturers.

The Standard Ordnance Corporation, 115 Broadway, New York, has placed a part of its orders for equipping its plant at Hamilton, Ohio, where 155-mm. gun carriages will be made. The International Arms & Fuse Co., Inc., has placed the bulk of its large orders for 6-in. shell work.

It is reported here that the Continental Motors Corporation, Detroit, has received a contract for 40,000 motors for Liberty motor trucks from the United States Army. A large part of the order will be filled in the company's Muskegon, Mich., plant.

The Du Bois Machine Shop, Inc., Albany, N. Y., has purchased a few new tools for making gun reamers for Government contractors.

The Chesapeake Iron Works, Baltimore, is reported to have received a contract for 30 cranes from the Stone & Webster Engineering Corporation for the gun-repair shops which this Government will build in France. The William Cramp

& Sons Ship & Engine Building Co., Philadelphia, is reported to have ordered additional cranes from the Bedford Foundry & Machine Co., Bedford, Ind. The Government wants several cranes for new shops at the Washington Navy Yard and a 250-ton gantry crane for the Sandy Hook Proving Ground, bids for which are now being taken.

There is little new in the export situation, except that export permits for Italy are easier to get, this Government coming to the assistance of its ally to supply her with whatever she needs. Export regulations except to our allies are very strict and comparatively little in the line of metal-working machinery is now going out.

The French Sheet Metal Works, New York, has been incorporated with a capital of $10,000 to manufacture sheet metal goods. J. Cohen, M. M. Alpert and H. Coppel, 18 West 108th Street, are the incorporators.

The Imperial Metal Mfg. Co., Long Island City, N. Y., has been incorporated with a capital of $175,000 to manufacture metal sprinkler bottle tops. The incorporators are S. Messner, C. Bomeister and O. Sondheim, Long Island City.

The Micropho Detector Co., 26 Cortlandt Street, New York, manufacturer of electrical devices, has increased its capital from $150,000 to $1,190,000.

The E. W. Bliss Co., Adams and Plymouth streets, Brooklyn, has had plans prepared for the construction of a six-story addition, 200 x 300 ft., to its projectile works at Fifty-third Street and First Avenue.

The Vogel Stamping Co., Brooklyn, has been incorporated with a capital of $10,000 to manufacture metal goods. E. N. Helff, A. R. Ulrich and P. Suau, 24 East Thirteenth Street, are the incorporators.

The Pellegrino Coal Emptier Machine Co., New York, has been incorporated with a capital of $10,000 to manufacture coal-handling machinery. M. Pellegrino, C. Caggiano and N. Selvaggi, 320 Broadway, are the incorporators.

The Wire Wheel Corporation of America, New York, has leased property, about 100 x 100 ft., at 829-35 Eleventh Avenue, for the establishment of new works.

The Taylor Gun Co., New York, has been incorporated with a nominal capital of $5,000. S. McG. Pierce, W. B. Cowen and F. Blauvelt, 400 West 160th Street, are the incorporators.

The Production Equipment Co., New York, has been incorporated with a capital of $20,000 to manufacture boilers and foundry supplies. W. J. Forster, W. W. Gibbons and S. M. Morey, 50 Church Street, are the incorporators.

The Procter & Gamble Mfg. Co., Port Ivory, Staten Island, will build a new machine shop, 60 x 120 ft., and other buildings, including producer and generator house, to cost about $40,000. Construction has begun.

The Independent Aetna Sprinkler Co., New York, has been incorporated in Delaware with a capital of $1,000,000 to manufacture sprinkler devices for fire protection. Roger H. Anderson and Edward W. Shaw, New York, are the incorporators.

The Hunoff Machine Works, 45 Mills Street, Astoria, L. I., has had plans prepared for the construction of a new one-story, brick machine shop, 20 x 50 ft., to cost about $25,000.

The Union Air Craft Co., New York, has been incorporated with a capital of $20,000 to manufacture airplanes. The incorporators are W. A. Callahan, B. Towles and W. E. Winne, 2 Rector Street.

The Independent Filter Press Co., New York, has been incorporated with a capital of $25,000. J. E. Hagstrom, W. T. and G. F. Miller, 1486 Lexington Avenue, are the incorporators.

The Motor Starter Corporation, Long Island City, has purchased property on Jackson Avenue, near Skillman Place, for the erection of a new plant.

Fire Dec. 3 destroyed a portion of the shipbuilding plant of the Morse Dry Dock & Repair Co., Fifty-fifth to Sixtieth streets and waterfront, Brooklyn, with loss estimated at $500,000. Four buildings were destroyed, including machine shop, pattern and joiner works, and carpenter shop.

The Gulf Shipbuilding Corporation, New York, has been incorporated in Delaware with capital of $1,000,000. George V. Reilly, Arthur W. Britton and S. B. Howard, 65 Cedar Street, New York, are the incorporators.

The Auto Traffic Safety Appliance Co., New York, has been incorporated with a capital of $100,000 to manufacture traffic safety devices. A. Farese and C. Pergola, 141 Hester Street, are the incorporators.

A new reinforced-concrete power plant, 80 x 120 ft., will be erected at the State Hospital, Central Islip, L. I., at a cost of about $150,000. Contract has been let.

The Utica Steam Engine & Boiler Works, Utica, N. Y., will build a plant at Whitesboro Street to cost $80,000.

The Power Specialty Co., 111 Broadway, New York, manufacturer of superheaters, etc., will build a new factory on Locust Avenue, Bloomfield, N. J., to cost about $31,000.

The American Can Co., 449 Communipaw Avenue, Jersey City, N. J., has filed plans for the construction of an addition to its plant to cost about $42,000.

The Hudson Welding Co., Jersey City, N. J., has been incorporated with a capital of $50,000 to manufacture welding apparatus. W. J. Wurkowski and Leonard Galewski are the incorporators.

The General Electric Co., Newark, N. J., has acquired the former plant of the Henry Lang Co., Seventeenth Avenue, Lillie and Boyd streets, Newark, which it will use for extensions.

The Upson-Walton Co. of New York, 462 Riverside Avenue, Newark, manufacturer of wire rope, will build a one-story addition to its works, 28 x 125 ft., to cost about $10,000.

The Federal Real Estate Co., Newark, will build a new one-story machine shop, 25 x 90 ft., at 41 Bryant Street.

The Russell-Schwartz Co., 109 Frelinghuysen Avenue, Newark, has had plans prepared for the erection of a two-story addition, 49 x 83 ft., to its cabinet works, to cost about $12,000.

The Splitdorf Electrical Co., 98 Warren Street, Newark, manufacturer of spark plugs, magnetos, etc., will build a two-story extension to its works.

Fire December 6 caused a damage of about $20,000 at the plant of the Allegretti Mfg. Co., South Exchange Street, Geneva, N. Y., manufacturer of razor strops, etc.

The Rochester Nash Co., Rochester, N. Y., has been incorporated with a capital of $25,000 to manufacture internal combustion engines and automobile specialties. J. E. Clifford, L. M. Sanford and M. T. Dubel are the incorporators.

The H. C. Leyden Co., Syracuse, N. Y., has been incorporated with a capital of $25,000 to manufacture dental equipment. J. A. Norton, F. J. Starr and E. Leyden, Syracuse, are the incorporators.

New England

BOSTON, Dec. 10.

New England is beginning to swing into a faster stride on direct war work. In Bridgeport the Liberty Ordnance Co., which recently succeeded the Bridgeport Projectile Co., is undertaking large shell forging contracts and is to greatly increase its output of 5-in. naval guns. The rifle and cartridge plants of the Remington Arms U. M. C. Co. are rapidly increasing their production, and several other plants are adding largely to thier working forces. The new gun factory of the Bullard Engineering Corporation is nearing completion and will be producing early in the year. The Colt's Patent Fire Arms Mfg. Co., Hartford, Conn., is increasingly busy and is filling up its newly-acquired plant in Meriden. Every department of the Winchester Repeating Arms Co., New Haven, Conn., is showing the result of the large accretions being made in the number of employees, which is now about 16,000. The Marlin Arms Co., New Haven, is converting half of its Mayo radiator works for rapid-fire gun work and is pushing the organization and production of its plant at Norwich.

It is reported that several companies in the Connecticut valley, both in Connecticut and Massachusetts, expect to take on shell contracts and have been making inquiries about equipment. Matters are moving apace at the Watertown Arsenal, Watertown, Mass., and shops all over New England are busy on contracts for parts, mechanisms and tools for the arsenal. Things are in equally good condition at the Springfield Armory, Springfield, Mass. The Fore River Works, Bethlehem Shipbuilding Corporation, Quincy, Mass., is not only taking on hundreds of workmen but also has many plants busy on subcontracts. The destroyer plant at Squantum is coming ahead on schedule time and will be one of the busiest of New England plants in the early months of next year. The Osgood Bradley Car Co., Worcester, Mass., is organizing a working force to carry out its large gun carriage contract and is being aided by a voluntary movement on the part of other Worcester plants to furnish a sufficient number of skilled mechanics to provide a strong nucleus for the working force.

Machine tool plants everywhere are strengthening themselves to meet the huge business being offered. No one plant can be easily picked as busier than the others for virtually all of them have so many Class A priorities that they are booked up for months ahead on war work alone. Gun, shell, and aeroplane plants are equally anxious to secure machines in a hurry, and the call for tool room equipment is assuming a much livelier tone. The comparative quiet of the fall months in the contract tool and gage shops has been succeeded by rush of business even greater than was the case when America first embarked in munitions work for the Allies.

Most of the buying of machine tools in New England is on a small scale to balance up equipment to meet new conditions. The Sterling Motor Co., Brockton, Mass., is one of the companies buying new equipment for munitions work, and it is building an addition of some size to care for new orders for shells and gun sights.

The Robust Motor Co., Boston, has been incorporated with authorized capital stock of $100,000 to manufacture engines. William P. Ross is president and Henry W. Foster, 118 Pearl Street, Boston, treasurer.

The Sterling Motor Co., Brockton, Mass., is building two one-story additions, 24 x 250 ft. and 24 x 280 ft.

The Bridgeport Machine & Tool Co., Bridgeport, Conn., has been incorporated with authorized capital stock of $10,000 by Joseph Martin and others.

Landers, Frary & Clark, New Britain, Cofin., are not only building several additions but have also leased from the American Hardware Corporation the building recently occupied by the Eastern Motors Co.

The Pilgrim Machine Co., Pawtucket, R. I., has been incorporated with authorized capital stock of $20,000 by Arthur M. Allen, Frederick W. Tillinghast and James J. McGovern.

The C. H. Smith Co., Springfield, Mass., machinery, has been incorporated with authorized capital stock of $50,000 by Walter G. Trotman, West Springfield; Charles H. Smith, Springfield, and others.

George A. Leighton, 136 Concord Street, Manchester, N. H., will build a one-story addition to his foundry on Silver Street, about 60 x 80 ft., to cost $8,000.

Philadelphia

PHILADELPHIA, Dec. 11.

A one-story, brick and concrete power plant, 45 x 50 ft., to cost $12,000, will be erected by the Tacony Ordnance Co., Tacony.

A new one-story brick machine shop, 44 x 140 ft., to cost about $29,000, will be erected by the Espen-Lucas Machine Co. at Front Street and Girard Avenue, Philadelphia. Contract has been awarded.

The American Briquet Co., Twenty-fifth and Washington streets, Philadelphia, has increased its capital from $200,000 to $4,000,000.

The N. Z. Graves Co., 22-24 South Third Street, Philadelphia, has acquired a two-story foundry and pattern shop at Chestnut and Thirtieth streets for expansion.

The Quaker City Iron Works, 3003 Richmond Street, Philadelphia, has filed plans for the construction of a second-story addition, 16 x 50 ft., and other alterations and improvements.

The Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., specializing in the production of iron and steel castings, is planning for the erection of a one-story foundry addition.

The Standard Boiler Works, Lebanon, Pa., has been acquired by Mader Brothers & Co., who will operate the plant.

The Light Railway Equipment Co., Chester, Pa., manufacturer of railroad supplies, has acquired three acres at Ridley Park for the erection of a new plant. Contract for the initial structures has been awarded and it is expected to have the plant ready for occupancy in about six months. The company proposes to move its present works to the new location. Headquarters are in the Commerce Building, Philadelphia.

The Standard Car Construction Co., Sharon, Pa., has increased its capital from $1,000,000 to $2,000,000.

The Milton Mfg. Co., Milton, Pa., is planning for the operation of its shell department at full capacity to handle a Government order for shrapnel cases. It is expected to increase the number of employees to 600 within the next month.

The Peerblow Mfg. Co., Leetsdale, Pa., has been incorporated with a capital of $10,000 to manufacture blow torches. F. P. Schmidt is treasurer.

The Chester Shipbuilding Co., Chester, Pa., is planning for the erection of a new punch shop, joiner works and other buildings to cost about $250,000. It is also contemplating the construction of a first-aid hospital for employees.

Rogers-Gillen, Inc., Corry, Pa., has been incorporated with a capital of $20,000 to manufacture hardware. J. S. Rogers is the principal incorporator.

A new power house will be erected by the Youngstown Sheet & Tube Co., Youngstown, Ohio, at its coal properties near Masontown, Pa.

The American Wire Fabrics Co., Mount Wolf, Pa., manufacturer of wire products, has inaugurated a night shift at its works to increase the output.

Baltimore

BALTIMORE, Dec. 10.

A. Weiskittle & Son Co., Lombard Street, Highlandtown, Md., is planning to rebuild three buildings of its stove and enamelware manufacturing plant, recently destroyed by fire with loss of about $50,000.

M. M. Davis & Son, Solomons, Md., recently incorporated, has taken over the shipbuilding plant formerly operated under the name of M. Mitchell Davis & Son, and are planning to increase the capacity. M. M. Davis is president and Clarence E. Davis, vice-president and manager.

The Riter-Conley Co., Pittsburgh, Pa., is making additions to its shipbuilding plant on the Patapsco River, Fairfield, Md. The property was formerly owned by the Ellicott Machine Corporation and consists of about 18 acres. A new building, 50 x 300 ft., is being constructed to be used for plate work.

The Lummus Machinery Co., Spartanburg, S. C., is planning for the erection of a new machine shop and assembling works.

The Hendersonville Treenail Co., Hendersonville, N. C., recently incorporated with a capital of $150,000, will establish works for the manufacture of pins for wooden vessels, etc. Howard Bennett heads the company.

The Powhattan Brass & Iron Works, Charleston, W. Va., will build a one-story addition to its foundry.

The Kerr Brothers Machine Co., Pennsboro, W. Va., will build a new one-story machine shop, 35 x 60 ft., for the manufacture of oil-well tools and equipment.

The Piedmont Motor Car Co., Lynchburg, Va., will build a one-story extension to its plant, 50 x 150 ft., for the manufacture of automobile bodies.

The Virginia Forging & Mfg. Co., Richmond, Va., has been organized to manufacture bronze forgings and high-grade brass and composition castings. It has purchased the equipment of the Richmond Scale Co., manufacturer of computing scales, and will continue the business. A new and larger plant will be occupied and such additional equipment as is necessary will be purchased.

P. Kennedy, Charles and Wells streets, Baltimore, will build a one-story foundry, 80 x 80 ft., to cost $15,000.

The Autogeneous Welding & Machine Co., 1219 Maryland Avenue, Baltimore, has been incorporated with $100,000 capital stock by John J. Kernan, William T. Hudgins, William A. Norton, Robert C. Shipley and Joseph W. Brooks.

The Penn-Seaboard Steel Corporation is said to have decided to build an addition to its plant on the Delaware River near Wilmington, Del., at a cost of about $2,000,000. The improvements will also include a power house to cost $300,000.

Chicago

CHICAGO, Dec. 10.

In the past week the Rock Island Arsenal closed for about 100 machines, the list including 68 engine lathes of 20 to 24-in. swing and 10 to 24-ft. bed. Of the number, 22 were 24-in. by 20 ft., and 32 were 24-in. by 24 ft. Otherwise the list consisted of miscellaneous tools. It is understood that its requirements for equipment to manufacture guns with recoil mechanism have not yet been satisfied except for odds and ends of tool-room equipment.

Except for the arsenal business, which was well distributed, the market has been quiet with most sellers, some of whom are not attempting to do much aside from caring for war demands. More business is being done with Eastern buyers, mainly through correspondence, but like all purchasers they must claim deliveries on priority orders. Occasional conflict of class A priority certificates continues, but in these cases Government ruling must be had before deliveries are made. There is no abatement in the demand for heavy machines—the trouble is to get them. Tool-room equipment is active.

The Scharmer Construction Co., 139 North Clark Street, Chicago, has the general contract for a one-story brick and mill construction addition, 102 x 226 ft., for the Chicago Bearing Metal Co., 2216 to 2228 West Forty-third Street, which is to cost about $25,000.

Sub-contracts have been let for a one-story factory extension, 75 x 120 ft., of steel and concrete, for the Templeton Kenly Co., Ltd., railroad supplies, 1020 South Central Avenue, Chicago.

A permit has been issued to James W. Stevens, 10 South La Salle Street, Chicago, for the construction of a five-story

garage, 80 x 181 ft., at 215 to 221 Washington Street, Chicago, to cost $175,000. It is to be used by a taxicab service.

The Western Electric Co., Chicago, will erect at Cicero a brick manufacturing building, 37 x 249 ft., adjacent to a six-story building recently completed.

The Pullman Couch Co., Chicago, has purchased a plot of 63,500 ft. in the central manufacturing district on which it will erect a building at a cost of $300,000 to $500,000 to conform with its present plant on adjoining property.

The Woodruff & Edwards Co.'s foundry, Elgin, Ill., was recently destroyed by fire involving a loss of about $150,000. It was necessary to use dynamite to raze buildings to prevent the spread of the fire.

The Green Engineering Co., East Chicago, Ind., will erect a manufacturing building, 60 x 80 ft., to cost about $11,000.

The Standard Metals Reduction Co., Chicago, has been incorporated in Delaware with a capital of $2,000,000. James H. Aye, T. T. Watson and J. E. Harper, Chicago, are the incorporators.

Milwaukee

MILWAUKEE, Dec. 10.

The local machinery market continues broad and urgent, machine-tool production being constantly enlarged, but hardly sufficient measure to enable manufacturers to catch up on deliveries. This is also true of crane manufacturers, pressure upon whom grows daily. Although foundries meet increasing difficulty in obtaining coal and coke supplies, every available furnace in Wisconsin is said to be in active service and foundry owners who find it possible to do so are enlarging their capacities. The congestion of transportation in this section is less serious than east of Chicago.

The George H. Smith Steel Casting Co., 500 Clinton Street, Milwaukee, has awarded a contract to Klug & Smith, consulting engineers, Mack Block, for the erection of a brick and steel foundry addition, 45 x 100 ft., and a four-story brick office building and pattern storehouse, 75 x 100 ft. A new 3-ton open-hearth furnace has been installed. The foundry addition will be equipped with a 10-ton crane, already contracted for. The plant capacity will be increased to 750 tons per month by these improvements. F. E. Hinners is secretary and treasurer.

The Menominee Electric Mfg. Co., Menominee, Mich., maker of electric fans and other appliances, has acccepted the proposition of business men at Cairo, Ill., to remove its business to that city about Feb. 1. It will be reorganized with a capital stock of $600,000, of which over $250,000 has been subscribed for in Cairo. A fireproof plant, including a foundry, will be erected on a three-acre site. The plant at Menominee will be continued in operation at least eight months longer. Henry Tideman is president and general manager.

The United States Gearshift Co., manufacturer of hydraulic gear-shifting mechanisms for motor vehicles, Eau Claire, Wis., has awarded general contract to R. L. Rickman, Eau Claire, for construction of the first unit of its new four-story plant, 65 x 80 ft., of reinforced concrete, steel and brick, with a separate office building, 20 x 65 ft. The brass and aluminum foundry will be located on the fourth floor and will be equipped with gas furnaces. The machine shop will occupy the third floor and the assembling and finishing departments the second floor. Pending the completion of the new plant, manufacturing operations will be conducted under contract with the Eau Claire Mfg. Co., which has started its foundry and machine shop recently completed. L. A. Laursen is general manager.

The Gardner Machine Co., manufacturer of disk grinders, etc., Beloit, Wis., has awarded general contract to the Newton Engineering Co., 185 Mason Street, Milwaukee, for the erection of a pattern storage and general warehouse costing about $40,000.

The Badger Brush Co., 3417 Vliet Street, Milwaukee, has taken over a three-story building, 40 x 80 ft., and will remodel it for its own purposes at a cost of $15,000.

The Chippewa Foundry & Machine Co., Chippewa Falls, Wis., has increased its capital stock from $100,000 to $250,000, to provide funds for financing its increased business.

Harry Gifford, Ellsworth, Wis., is building a machine-shop and smithy, 40 x 60 ft., to be ready Jan. 1. It will cost about $5,000 equipped.

The Western Steel & Mfg. Co., DePere, Wis., manufacturer of steel barn equipment and agricultural castings, is contemplating additions to its plant and power house, estimated to cost $25,000.

The Humane Stanchion Works, Baraboo, Wis., are being enlarged by the erection of a three-story brick shop addition, 40 x 40 ft.

The Northern Foundry Co., Marinette, Wis., commenced operations in the former plant of the Marinette Iron Works Dec. 6. It is occupying 19,000 sq. ft. of floor space and the output will be 10 tons of agricultural and automobile castings daily, to be increased to 15 tons as soon as more labor is available. Practically the entire production is taken by the J. I. Case Threshing Machine Co., Racine, Wis.

The Joseph Schlitz Brewing Co., Milwaukee, sustained an estimated loss of $30,000 to $40,000 through the collapse of the electric traveling crane employed in its Commerce Street coal dock. Reconstruction will be undertaken at once. Joseph E. Uihlein is general manager.

Detroit

DETROIT, Dec. 10.

Increased industrial activity has unusually stimulated inquiry for machinery, although but few large orders were placed the past week. The market is distinctly on an upward trend, and jobbers believe that each week will see an increased demand for tools. Deliveries on most standard machines are set for from six to eight months ahead.

Money is beginning to flow back into Detroit and bankers predict that it will soon be more readily obtainable for building purposes. This is expected to stimulate the machine-tool market. Skilled labor is in great demand and many plants are handicapped by their inability to secure expert workmen. Detroit manufacturers, as well as those of the State, are turning more and more to the manufacture of munitions.

The furniture manufacturers of Grand Rapids have mobilized their plants for the manufacture of airplanes. The Grand Rapids Airplane Co. has been organized and more than $200,000 capital stock subscribed. It will serve as an operating company and will distribute contracts from the Government among its member manufacturers. The officers are Samuel D. Young of the Grand Rapids Show Case Co., president; F. Stuart Foote of the Imperial Furniture Co., vice-president; J. Hamilton Hoult of the Luce Furniture Co., treasurer; C. C. Kusterer of the Stickley Bros. Furniture Co., secretary.

Lansing, Mich., automobile plants are now undergoing a period of readjustment, presumably in preparation for munition contracts. It has been reported that the Reo Motor Co. has been assured some shrapnel case contracts and to that end certain changes in machinery are being made. The Auto Body Co. is reported about to receive a contract for ambulance car bodies.

The Lincoln Motor Co., Detroit, which is erecting a new plant for the manufacture of Liberty airplane motors for the Government, has the main part under roof and expects to start operations about Feb. 15. The main building is a four-story ell-shaped brick and steel structure, 80 x 1200 ft. Other buildings include a one-story warehouse, 80 x 500 ft.; a power house, and an 800-ft. building for testing motors. Construction of a large administration building has just been started. The plant occupies a 70-acre site at Warren and Livernois streets. Henry M. Leland, formerly head of the Cadillac Motor Car Co., is president. The company has purchased about $2,500,000 worth of machine tools for this plant and the one that is now in operation.

Dodge Bros., Detroit, are rushing work on their new plant for the manufacture of recoil devices for the Government and expect to have it ready for operation early in the spring. The main building is of brick and steel, 578 x 818 ft.

The Federal Motor Truck Co., Detroit, has let contract for the construction of a brick and steel addition which will greatly increase its floor space. With the completion of this structure the company's facilities will have been doubled in the past year.

The Northwestern Glass Co., Saginaw, Mich., is remodeling the plant of the old Michigan Glass Co. and equipping it. Officials announce that operations will start Jan. 1.

The Sonora Phonograph Co., Saginaw, Mich., is reported planning extensive building operations and an addition in the number of its employees.

The Saginaw Shipbuilding Co., Saginaw, Mich., is rushing work on its new plant and expects to start work this month on the first of six ships already contracted for by the Government. Its capitalization has been increased to $500,000. F. W. Weeler is president; George H. Hannum, vice-president; W. C. Hill, treasurer, and C. W. Stiver, secretary.

The Four Drive Tractor Co., Big Rapids, Mich., will erect an addition to its plant.

Indianapolis

INDIANAPOLIS, Dec. 10.

The F. W. Spacke Machine & Tool Co., Indianapolis, has obtained a contract from the Government for the manufacture of 4,275,000 hand grenades. The company was recently reorganized and the factory purchased from Spacke Bros., who had been operating the plant several years. The Government will furnish much of the material for the contract and the grenades will be loaded elsewhere.

The Standard Pattern & Mfg. Co., Richmond, Ind., has changed its name to the Richmond-Standard Mfg. Co.

The Maxwell Motor Co., Newcastle, Ind., has booked a Government order and increased its running schedule from eight to ten hours.

Fire at the plant of the Columbia Mattress Co., South Bend, Ind., Dec. 5, caused a loss of $25,000.

The Superior Concrete Machine Co., North Judson, Ind., has been incorporated with $60,000 capital stock to manufacture silo block machines. The directors are Charles W. Weninger, Perry H. McCormick, Frank J. Vessely, Albert Fisher and Chester A. McCormick.

The Power Supply Co., Terre Haute, Ind., has been incorporated to manufacture machinery. The directors are Ray J. Diekemper, R. D. Heer and B. Heer.

The Standard Steel Car Co., Hammond, Ind., has taken out a permit for an 800-ft. building to cost $250,000.

The Delta Electric Co., Marion, Ind., has received a Government contract for 20,000 electric lanterns of special type for the navy.

The Standard Steel Car Co., Hammond, Ind., has been granted a permit for a building, 280 x 500 x 24 ft., and an addition to an old one, 280 x 600 x 24 ft., at a cost of $250,000. The company has a war contract which, it is reported, will require about 10,000 additional employees.

Cleveland

CLEVELAND, Dec. 11.

A large volume of inquiry for small lots of machine tools developed the past week, practically all for Government work. Among new inquiries are some directly from the Government for small lots of machines for equipping army repair trucks. More Government work has been placed, and a large amount is being figured upon. Some Detroit automobile companies are particularly interested in this, as Government orders will keep plants busy that would otherwise be forced to run on a very limited capacity. Many of the leading automobile plants in that city are already being rapidly transferred into war material plants. Among Government orders placed last week was one for 50,000 mine anchors, which was divided between two Detroit automobile manufacturers. An Akron tire manufacturer is understoood to have taken orders for 450,000 gas masks, and another large order for masks is reported to have also been placed with an Akron company. The F. B. Stearns Co., Cleveland, is still in the market for about 100 additional machines for manufacturing Rolls-Royce airplane motors. Although unofficial reports have come from Washington that the Government has decided to change its airplane program and use Liberty motors only for scout machines and not for fighting planes, this reported change has not affected the large orders for airplane motors that were recently placed with Detroit plants.

The Marvel Accessories Mfg. Co., St. Clair Avenue and East Seventy-third Street, Cleveland, is in the market for about $20,000 worth of machine tool equipment, including one 20-in. boring mill and a number of small tools, mostly lathes and hand milling machines.

The Austin Co., Cleveland, has taken a contract to erect a sulphuric acid plant at Forcite, N. J., for the Atlas Powder Co. of Wilmington, Del. It will consist of an absorber house, 92 x 110 ft.; a burner and purification house, 94 x 110 ft.; a blower house, 28 x 30 ft., and a preheater and convertor house, 62 x 126 ft. The Austin Co. has the contract for the buildings, the electrical work and foundations for equipment, and will install equipment furnished by the owners, including preheaters, tanks, filters, etc. The plant is to be ready for operation March 1.

The American Shipbuilding Co., Cleveland, will make extensions to the plant of its Detroit subsidiary, the Detroit Shipbuilding Co. They will include a gray iron foundry, brass foundry, boiler shop, and miscellaneous buildings.

The Wellman-Seaver-Morgan Co., Cleveland, has taken an order from the Chile Copper Co. for a 12-ton ore bridge for use in connection with leaching vats, and for a gantry crane for the Pennsylvania Railroad for use in trimming cars at South Buffalo.

The Pittsburgh & Conneaut Dock Co., Conneaut, Ohio, has placed a contract with the Frazer & Sheal Co., Cleveland, for an ore-handling bridge to replace one blown down last summer. A 10-ton bucket for this bridge will be furnished by the Wellman-Seaver-Morgan Co.

Plans for a new machine-shop foundry to be built by the Toledo Machine & Tool Co., Toledo, Ohio, are being prepared by Langdon & Hohly, architects, Toledo. It will be one-story, 150 x 379 ft.

The Acklin Stamping Co., Toledo, Ohio, has placed a contract for the erection of a factory addition.

Plans are being made for the establishment of a plant in Lima, Ohio, for the manufacture of rivets of a special type, designed by G. B. Phillips, head of the boiler department of the Lima Locomotive Works. It is the intention to organize a company with a capital stock of probably $300,000 to place the rivets on the market.

The Star Tractor Co., Findlay, Ohio, has placed contracts for the construction of a one-story factory building, 50 x 160 ft., for the manufacture of farm tractors.

The American Crayon Co., Sandusky, Ohio, is planning the erection of a plant for manufacturing picric acid for the Government.

The Phoenix Electric Co., Mansfield, Ohio, has commenced the erection of a new plant, 50 x 100 ft.

The Cleveland Controller & Mfg. Co., Cleveland, has been incorporated with a capital stock of $200,000 by L. A. O'Neil, L. C. Spieth, and others.

California

SAN FRANCISCO, Dec. 4.

Large-sized tools are very scarce. Some manufacturers' representatives find them impossible to get, and have ceased quoting them. Shipments, where orders are accepted, are very slow, from nine to 12 months' time being usually demanded. Orders for parts to be used in gun-making and torpedo-boat destroyer construction are taking precedence over all other orders, even over some other Government work. The demand for smaller tools and machines is good, and the supply is improved.

The Pacific Coast Shipbuilding Co., San Francisco, of which Henry T. Scott, formerly of the Union Iron Works, and John T. Scott of the Moore-Scott Iron Works are the promoters, has now been fully financed and has broken ground for its plant at Bay Point. It is planned to spend a large sum in laying out the 2100 acres which the company has secured. A town site has been surveyed and plans made to house its employees. A large amount of machinery has been ordered in the East and, with Government assistance, prompt deliveries have been arranged for. The company has signed a contract with the Government to construct ten 9400-ton steel freight steamships. It is understood that all arrangements for engines for these vessels were completed before the contract was signed. Work on the first ship will begin March 1, 1918, and it is to be ready to launch by October. After that one ship is to be launched each month.

The Union Construction Co., Oakland, has secured an option on 48 acres of waterfront land and will erect a shipbuilding plant.

Baker & Hamilton, San Francisco, jobbers in farm implements and vehicles, and the Pacific Hardware & Steel Co., dealer in heavy engineering machinery, San Francisco, will merge their interests Jan. 1. Details have not yet been worked out.

The Rosenberg Iron & Metal Co., San Francisco, has purchased an entire block of land in Oakland and will establish a scrap yard, equipped with spur tracks and a locomotive crane.

The Pacific Coast Can Co., San Francisco, has purchased five acres in Oakland as site for a plant of 1,500,000 cans per day capacity, to cost in all $1,000,000.

The Grant Motor Corporation, Cleveland, Ohio, is building two additions to its factory at Santa Cruz, Cal., 160 x 647 ft., and 160 x 400 ft.; also a two-story office building, 40 x 160 ft.

Fred Ballister of Oakland and others have practically completed plans for the establishment there of a large malleable iron foundry. It will be situated on the waterfront on a site already secured by lease. Oakland and San Francisco capital are reported behind the project.

The Columbia Steel Co., Pittsburg, Cal., is building an addition, 60 x 120 ft., to its main foundry and a building 60 x 300 ft., in which will be placed two 30-ton and one 10-ton traveling cranes. A new 15-ton locomotive crane will also be added. Preparations are being made to house and feed 200 additional employees. Improvements are to be completed March 1. The output of the plant will be increased 60 to 70 per cent.

The Dow Pump & Engine Co., Oakland, is enlarging its foundry to a capacity of 16 tons of iron and 8 tons of brass per day. An additional cupola is being built for the iron foundry.

The Byron Jackson Iron Works, San Francisco, is moving into its new factory in West Berkeley, and will be in complete running order Jan. 1. All heavy work will be taken care of in the new factory, the old plant being utilized for lighter work. Practically all tools requred were ordered a year ago.

The Southern Pacific Railroad Co. announces a building program at Sacramento to include an $80,000 plant for work on switches, crossing frogs and other railroad track accessories.

The Los Angeles Shipbuilding & Drydock Co., Los Angeles, has filed plans for the construction of a pattern shop, 50 x 75 ft.; forge and blacksmith shop, 60 x 100 ft.; pipe shop, 16 x 130 ft., all one-story, and warehouse, 100 x 160 ft., at its plant on Smith's Island.

The Herberts Machinery & Supply Co., Los Angeles, has been incorporated with a capital of $20,000 to manufacture machinery, etc. The incorporators are Curtis A. Herberts and Alfred C. Pferdner, Los Angeles, and Benjamin C. Flanagan, San Gabriel.

The National Compressed Air Machinery Co., Los Angeles, has been incorporated with a capital of $50,000 to manufacture compressed air equipment. Frank A. Hartford, Benjamin Schonfeld and William A. Chisholm, are the incorporators.

The Fulton Shipbuilding Co., Los Angeles, will build a new one-story assembling works, 48 x 125 ft., at its plant on Mormon Island, Wilmington district.

The McEvoy Well Strainer Co., Los Angeles, has been incorporated with a capital of $100,000 to manufacture oil well strainers and allied products. Frank L. A. Graham and George A. Howk, Los Angeles, and M. J. Trumble, Alhambra, are the incorporators.

The United Power Co., Los Angeles, has acquired the former properties of the Electric Power Co., in the San Gabriel Canyon, and contemplates the construction of a new power plant at Iron Fork.

The Safetyford Starter Co., Los Angeles, has been incorporated with a capital of $10,000 to manufacture automobile starters. Charles Trephagen, Fred C. Stillwell and Richard A. Jocqson, are the incorporators.

The Pacific Northwest

SEATTLE, Wash., Dec. 4.

The Barnes & Fischer Co., Seattle, has started operations in its new plant, 810 First Avenue South, which will specialize in the manufacture and repair of mill machinery.

The Schaake Machine Co., New Westminster, B. C., will move its general machine shop to Vancouver in January. Its shell making plant will be left in New Westminster and will be kept ready for any further Government orders that are available. The Vulcan Iron Works, New Westminster, will also keep its munition plant intact.

Plans have been completed for the second structure for the Erickson Engineering Co., Seattle. It will be 80 x 360, two stories, and cost $20,000.

T. Danielson, Vancouver, Wash., will erect a plant to construct small boats.

Gold Hill, Ore., plans to expend $25,000 in developing its water system, in connection with the Grants Pass-Gold Hill irrigation project.

Bert Moore, Toledo, Ore., plans the installation of a tie mill, to manufacture ties and ship knees.

Canada

TORONTO, Dec. 10.

The Eagle Smelting & Refining Works, Ltd., Montreal, has been incorporated with a capital stock of $40,000 by Peter Bercovitch, Ernest Lafontaine, Nathan Gordon and others to manufacture, refine and smelt babbitt, solder, brass, lead and other metals.

The Dominion Bridge Co., Montreal, is manufacturing marine boilers, and is now engaged on a contract for one of the Allies. It will also manufacture turbines for steam power plants. The company has obtained a controlling interest in the International Engineering Works, Ltd., Montreal and Amherst, N. S., and will carry on the business as a subsidiary. Additions will be made to the Amherst plant and new equipment will be installed. Tenders for the work will be called in the near future.

The Colonial Lumber Co., Pembroke, Ont., will rebuild its lumber mill, recently destroyed by fire with a loss of $75,000, and will purchase new equipment.

The Marine & Stationary Engine Mfg. Plant, Ltd., St. John's, Newfoundland, will erect a plant to cost about $75,000.

The Bond Engineering Works, Toronto, is calling for tenders for an addition to its foundry on Villiers Street, to cost $8,500.

P. H. Secord & Son, Sydenham Street, Brantford, Ont., have been awarded the contract for the erection of an addition to the foundry of the Canada Machinery Corporation, Galt, Ont., to cost $30,000. The company is in the market for a 25-ton crane.

The Ontario Wind Engine & Pump Co., Liberty Street, Toronto, is building an addition to its plant to cost $8,000.

Bienville, Que., is receiving prices on a hydraulic pump with a daily capacity of 250,000 gal.

The Hydro Electric Power Commission, Toronto, Sir Adam Beck, chairman, has decided to construct extensions to the plant of the Ontario Power Co., calling for an expenditure of over $1,000,000. The extensions will make 25,000 hp. additional available by July next and another 20,000 hp. within the next three or four months. All contracts will be made through the Ontario Power Co. for the Hydro Electric Power Commission.

The Polson Iron Works, Toronto, was damaged to the extent of about $200,000 by fire Dec. 6. The pattern shops, mill and pattern storage warehouse and a number of other buildings were totally destroyed and considerable damage was caused to ships under construction. It will not be necessary to suspend operations. That portion of the plant destroyed will be rebuilt without delay and new equipment will be purchased.

Government Purchases

WASHINGTON, Dec. 10.

The Bureau of Yards and Docks, Navy Department, Washington, will receive proposals until Dec. 17 for furnishing and delivering two 300-kw. motor-generator sets and switchboards at the Navy Yard, New York; four 300-kw. motor-generator sets and switchboards at the Navy Yard, Philadelphia; four 300-kw. motor-generator sets and switchboards at the Navy Yard, Norfolk, Va., and three 500-kw. motor-generator sets at the Navy Yard, Washington. Drawings and specifications No. 2711 may be obtained on application to the commandants of the navy yards named or to the Bureau of Yards and Docks.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, for furnishing three turret lathes for Philadelphia, schedule 2434½, opening date Dec. 17.

Bids were received at the Bureau of Supplies and Accounts, Navy Department, Washington, on Nov. 30 for furnishing material and supplies for the naval service, as follows:

Schedule 2288½; steam engineering; class 11; various deliveries—220 motor generator sets—Bid 6, $70,697 and $62,977; 10, $85,084.50; 17, $57,867; 18, $65,412; 24, $33,256.50; 28, $78,375.55; 42, $66,566; 50, $57,870; 63, $56,511.07.

Schedule 2295½; steam engineering; class 47; Norfolk—25 circulating pumps—Bid 61, $15,650. Class 48; Norfolk—50 feed water pumps—Bid 51, $10,512.50; 61, $12,700. Class 49; Norfolk—25 oil lubricating pumps—Bid 61, $6,250. Class 50; Norfolk—50 fuel-oil service pumps—Bid 61, $9,875. Class 51; Norfolk—25 radoget air pumps—Bid 58, $19,825.

Names of the bidders and the numbers by which they are designated in the above list follow:

Bid 6, Burke Electric Co., Erie, Pa.; 10, Crocker-Wheeler Co., Ampere, N. J.; 17, Diehl Mfg. Co., Elizabeth, N. J.; 18, Elevator Supplies Co., Inc., Hoboken, N. J.; 24, General Electric Co., Schenectady, N. Y.; 28, Holtzer-Cabot Electric Co., Boston; 42, National Electric Supply Co., Washington; 50, Roth Brothers & Co., Chicago; 63, Robbins & Myers Co., Milwaukee; 61 Worthington Pump & Machine Corporation, New York; 51, Scranton Pump Co., New York; 58, C. H. Wheeler Mfg. Co., New York.

On Dec. 4 the following bids were received by the Bureau of Supplies and Accounts, Navy Department:

Schedule 1569; steam engineering; class 41; Brooklyn—one heavy-duty engine lathe, direct-current motor—Bid 15, $27,436; 22, $19,869; 29, $22,035; 36, $1,100, $1,150, and $1,200. Alternate bid A. Do, alternating current—Bid 15, $26,545. Alternate bid B. Do, belt driven—Bid 15, $24,424; 22, $18,150; 27, $16,000.

Schedule 1567; ordnance; class 51; Hingham, Mass.—one horizontal boring and drilling machine, motor driven—Bid 29, $6,060.

Names of the bidders and their numbers follow:

Bid 15, I. H. Johnson, Jr., Co., Inc., 337 North Fifteenth

Street, Philadelphia; 22, Manning, Maxwell & Moore, Inc., New York; 29, Niles-Bement-Pond Co., New York; 36, Taylor Machine Co., Boston; 27, C. H. McCarthy, Inc., New York.

THE GERMAN STEEL TRADE

Plant Deterioration and Additions—Importance of the Briey Ore Deposits

SPEECHES delivered by prominent German steelmakers at recent annual meetings of German companies contain many interesting statements. Some of these have been recently published in the London *Iron and Coal Trades Review* and extracts from them are as follows:

"Mr. Springorum, in addressing the shareholders of the Hœsch Iron & Steel Works Co., pointed out the unusually great depreciation in the company's machinery and plant owing to war work, and especially on account of the inferior lubricating materials available and the lack of skilled workmen. It would be necessary either entirely or partly to renew the plant as soon as possible. It had been almost wholly impossible during the war to proceed with the urgently necessary work for the extension and completion of the company's departments. Further large expenditure would be required after the war for other purposes, concerning which it was deemed premature to give any information at present.

"Mr. Hilger, manager of the Ver Königs und Laurahütte, informed the shareholders that the new steel works at the Königshütte was completed and a new 50-ton steel furnace would be finished at the Laurahütte in December. Great value was attached to the utilization of all the supplies of minette ore. The Laurahütte was supplied with Swedish ore and unconditional safety was obtained by the faithful observance of contracts by their Swedish business friends, where an export veto was not to be expected. The supply of Germany with ore from her western neighbor could very probably be carried out by means of long-term contracts, all the more so as the Germans had good experience of the business adherence to contracts by the French. Austrian manganese ore also, as well as the ore which would be obtainable in very considerable quantities from South Russia after the war, would afford substitutes for the possible refusal of deliveries by the Rio Tinto Co.

The Briey Ore Regions

"Mr. Beukenberg, speaking at the annual meeting of the Phœnix Steel Co., referred to the probable situation after the war. He stated that the efforts manifested at the Economic Conference in Paris had received great additional support by the entrance of the United States in the war and by the attitude of some of the countries in South America. The object was to cut off Germany from supplies of raw materials and to render the export trade difficult, if not impossible, through the customs policy of foreign countries, and by special measures in regard to shipping, etc. By means of a victorious war, however, the Germans must prevent the conclusion of such agreements or secure their revocation, but even then trouble would be experienced in regaining the old markets.

"The question of the future supply of iron ore for the industry was of special importance, and the speaker hoped that the ore region of Briey would be retained. The immense value of that basin had been shown during the war. It would have been impossible to carry on the war with such results if the basin had not been occupied immediately on the outbreak of hostilities. The mines there were soon set in operation and had furnished an abundance of ore to the German industry. The occupation of the basin was also an important protection for the German Lorraine industry, which otherwise would have been overrun and paralyzed. France could not utilize the ore, because of the lack of adequate coal supplies, and it was for this reason that the French demanded the absorption of the coal districts of Saarbrucken. If the Briey basin were obtained, the vitality of the German iron industry would be prolonged by 100 years, and the present production of pig-iron could be maintained for 40 to 50 years. If the outlook after the war was not quite favorable, there was a reverse side to the question, as the Germans would be able to exchange for food products and raw materials part of their production of coal, potash, iron and steel manufactures and machinery."

Organization of the Western Electric Co.

(*Continued from page* 1415)

all the activities of the house, and each a complete organization in itself, comprising departments for business getting, warehouse service and collection of accounts. These managers report up to the head of the sales department to whom they are responsible for results.

But the other general departments have a measure of responsibility for the performance of their functions at the houses.

To illustrate, the comptroller prescribes the form of accounts and the accounting methods to be followed, and, through inspections by his own staff, sees that his instructions are followed.

The treasurer lays out the methods for the work on credits and collections and inspects this work.

The head of the purchasing department does the same kind of work with reference to the purchasing function. If he finds that some or all of the houses are buying the same class of material and that by combining the purchases an economy would be effected, an arrangement is made according to an established routine by which this article is added to the list of principal purchases, all of which are bought by the general purchasing department.

The experts of the manufacturing department inspect the warehouses for fire hazards and general upkeep. They also determine whether manufacturing work shall be carried on in the repair shops, which are a part of the local warehouse organizations, or in the general manufacturing department at Hawthorne, Ill. The purpose of this is to see that the manufacturing plant is built only at such places where the work can be done to the best advantage from the point of view of the whole company.

A manager is surrounded by a ring of advice and protective measures, but, at the same time, he is held strictly accountable for the results of his house. He makes the periodical reports on the condition of this business, such as the volume of sales, the amount of stock on hand, the amount of accounts receivable. Suppose his accounts receivable were to run an average of fifteen days higher than the standard set. It would be the treasury department that would call his attention to this variation, seek from him an explanation therefor, and, in the event that the situation responsible for it was one calling for expert assistance to the manager, the treasury department would very likely furnish from its staff a man competent to help the manager correct the situation. In this fashion the functional organization works, not to embarrass the distributing house man, but to assist him.

The Working of a General Committee

Under the general instructions a series of directions are issued by the heads of the general departments covering the functions for which they have a company responsibility, and such directions are mandatory throughout the organization. Such instructions would lead to a lack of team work if all of the departmental executives were not working on a common plan. These common understandings and unity of action are obtained through the meetings of a general committee which is composed of the executive heads of the seven general departments mentioned.

The members of this general committee discuss questions of policy, questions of internal management arising in their departments, appropriations for increases of plant or investment, appropriations for expense, and consider such other important company matters as may be brought to their attention. The purpose of this committee work is to arrive at conclusions

which will represent the combined judgment of its members and to develop a uniform company policy in all departments.

In turn, each department large enough to justify it has a departmental committee for the same purpose, and they have proved to be of great value in bringing about common understanding of company policies and a singleness of purpose in the work.

Each year we prepare budgets to cover the sales estimated for the coming year and the expenses of each department incident to handling this volume of business. The complete budget also contains all of the other items of expense not directly related to the current sales, so that at the beginning of each year a standard is set for the work of each unit of the organization. As an administrative measure this is of the greatest importance. The result desired is definitely known. Plans for securing it are made in advance, and the doubtful or weak spots in our defenses are marked out for special attention. Oftentimes, the personnel changes. One man is not fitted to do just the work of his predecessor and the load must be adjusted to his capacity. At other times the importance of the work changes so that jobs must be divided or combined. These considerations make it necessary to modify our ideal organization, but under such stress and strain we try never to lose sight of our ideal, which, to our minds, is a highly developed functional organization with an adequate central control.

CONSERVATIVE POLICY

Preference for Essential Industries, but Others Will Be Handled Carefully

WASHINGTON, Dec. 11.—An important advance in the Government's policy to discriminate in favor of industries contributing to the war and against those roughly classed as non-essentials was made during the past week when the priority officer of the War Industries Board issued a sweeping order giving preference in transportation to war material, fuel for certain specified purposes, and food products. This action was supplemented by the appointment of George N. Peek, vice-president of the Deere Mfg. Co., Moline, Ill., as the head of the new Bureau of Manufacturing Resources, the function of which will be to concentrate the industrial equipment of the country upon the conduct of the war. Further developments will follow as soon as time has been afforded for the organization of the new bureau, but the Council of National Defense makes the reassuring statement that an extremely conservative policy will be followed in the treatment of the so-called non-essentials and that the guiding principle of the new bureau will be intelligent discrimination in favor of war industries rather than drastic discrimination against the non-essentials.

Carefully Considered

Priority Order No. 5, promulgated by Judge Lovett Dec. 7, was under consideration by the War Industries Board for a fortnight before it was issued. It is characteristic of the conservatism of the board that, although the preferences embodied in the order are vitally necessary to speed up war work, Judge Lovett and his colleagues were reluctant to make any comprehensive order binding upon the carriers lest the general industries of the country should be demoralized as the result of the discrimination in freight treatment that would follow. With regard to fuel, the most vital of all war supplies, the board decided to defer issuing a peremptory order until the effect of a formal request for preferential treatment in the distribution of coal made by Fuel Administrator Garfield on Dec. 1 could be tested. Both producers and carriers responded promptly to Dr. Garfield's requests, but conditions did not improve to the desired extent and the efforts made to give preferential treatment to certain shipments of coal promised to interfere seriously with the transportation of iron and steel and other forms of war material. After waiting a week, therefore, the War Industries Board decided to issue a general order above referred to, the paragraphs relating to military supplies being as follows:

3. (a) Shipments of military supplies when consigned direct to the United States Government or the authorized officers of the United States Army, Navy or Shipping Board, or to the Allies or the proper representatives thereof, destined to any cantonment, port or encampment, to any point of export for movement thence to Europe, to any arsenal or navy yard, or material to any shipbuilding plant under contract to the United States Shipping Board for the sole purpose of constructing vessels for that Board.

(b) Other shipments for the United States Government, as the same may be authorized from time to time by the undersigned as necessary in particular cases, but only upon request of the United States Army, United States Navy or United States Shipping Board, through a designated officer or representative of the respective departments, located in Washington.

Clearing Up Congestion

Advices received here from the committee of railroad executives now engaged in managing the unified eastern railway systems indicate that excellent progress has been made in clearing up congestion east of Chicago. The routing of exports via southern lines and ports of exit has materially reduced the burden of the carriers serving munition plants east of Pittsburgh and several of the largest steel mills report increasing output as the result of a larger car supply. The release of large numbers of cars unloaded during the week has supplied increased rolling stock for the west-bound freight movement and the general distribution of food and other necessary commodities has steadily improved.

The Council of National Defense is seeking to allay the apprehensions of those interested in so-called non-essential industries concerning the policy that will be pursued by the recently organized Bureau of Manufacturing Resources. George N. Peek, just appointed chief of the bureau, has been designated as the "industrial representative" of the War Industries Board and, for the present, at least, the bureau organization will be held in abeyance, as it is intended to co-ordinate Mr. Peek's work closely with that of the board which exercises supreme authority over the industries contributing to the war. It will probably be a fortnight or more before Mr. Peek's staff will be selected and in the meantime his activites will be suggested by the developments in the enforcement of the preferential treatment outlined in Judge Lovett's latest priority order.

Special emphasis is placed by the Council of National Defense upon the fact that the policy of the new bureau will not contemplate an attack upon the industries of the country of minor importance from a war standpoint and that the project embodied in the recent recommendation of the railroad war board for an embargo upon some 500 products classed as non-essentials has been peremptorily rejected and will not be revived.

An important feature of the work of the Bureau of Manufacturing Resources will be the changing over of manufacturing plants from non-essential to essential lines of product. In the main, such changes will be entirely voluntary and already the Council of National Defense has on file applications from a large number of manufacturers who desire to take on war work in place of producing non-essential goods. It will require many weeks to survey these plants and devise methods for utilizing their facilities and in the meantime little progress is likely to be made in any other direction.

When changes now being effected by the new interests in the Pittsburgh Rolls Corporation of Pittsburgh are completed the company's plant will have a monthly capacity of 2000 tons of rolls. The plant is now running at the rate of 1300 tons monthly as compared with an average for the 10 months ended Oct. 31, last, of 1102 and an average for 1916 of 1048 tons.

The Jeanesville Iron Works, Hazleton, Pa., has issued a notice covering the discontinuance on Dec. 15 of the 10 per cent wage bonus system now operative. The employees will receive a flat advance in its stead.

THE IRON AGE

New York, December 20, 1917

ESTABLISHED 1855

VOL. 100: No. 25

Full Steel Production of First Importance

Trade Commission Makes It the Chief Factor in Price Fixing—Contract Abrogation Not an Issue—Pomerene Bill Will Wait

WASHINGTON, Dec. 18.—The Federal Trade Commission does not intend to be held responsible for the failure of the War Industries Board to revise the schedule of controlled prices of iron and steel which will expire on Jan. 1. In order that the war board may have the matter entirely in its own hands extraordinary efforts have been made to complete the investigation of costs undertaken in August, and the final report, based on data covering conditions in the industry up to Oct. 31, has been finished and will be transmitted to the board forthwith. Notwithstanding the expeditious manner in which the commission has completed this important work and the fact that its cost sheets were submitted during the past week to the accounting experts of a number of the largest of the steel manufacturing concerns, the impression is gaining strength here that there will be no important revision of the existing schedules on Jan. 1. It has also become an absolute certainty that the Pomerene steel control bill cannot become a law by Jan. 1 and it is more than likely that it will not reach the Senate before February, even should the Committee on Interstate Commerce decide to report it favorably.

The session between the trade commissioners and the chief accountants of the steel men held on Dec. 14 proved fairly harmonious. There was no discussion whatever of prices and very little concerning the effect which the cost findings of the commission's experts might have upon the standing schedule promulgated in September. In order that there might be no misunderstanding regarding the purpose of the meeting and especially that it might be fully comprehended that no extraordinary efforts are being made by the commission to bring about a revision of the existing prices, Commissioner Davies made a formal statement regarding the conference.

Commission's Meeting with Steel Accountants.

"The Federal Trade Commission," he said, "upon the direction of the President, made an exhaustive investigation into the costs of production of iron ore, coke, pig iron, steel and numerous steel products for the first half of the year 1917, including the months of June and July. These cost figures were furnished to the War Industries Board for consideration in connection with the agreement on prices which the War Industries Board made with steel companies early in the autumn, and which prices under that agreement were to continue until Jan. 1, 1918. The commission has continued its investigations of steel costs since that time. The most recent available records at the present time are for the month of October, which were not generally available until the end of November. The work of compiling these costs is enormous, requiring as it does consideration of some 8,000 cost sheets.

"The meeting with the steel producers' accountants was held pursuant to the general practice of the commission. Prior to the findings of its costs upon lumber, cement, copper, oil, and other commodities, in each instance the commission has held a hearing with the industry involved for a critical discussion of its findings before submitting the results to the price fixing body. The meeting with the steel men was for the purpose of general discussion of costs and the increases or decreases in costs shown in contrast to the months of June and July, and was of a general character. Invitation was extended to those engaged in the steel industry to confer with the commission with reference to costs disclosed in the records or any other considerations affecting costs which they might desire to present at that time."

Steadily Rising Steel Costs

As the result of developments the details of which have not yet been fully disclosed, the commission's views concerning several phases of the steel price fixing question have undergone important modifications since the completion of its cost sheets embodying the October returns obtained by its experts. The data gathered by the commission show steadily mounting costs of production, month by month, throughout the period from April 1 to date and covering practically every item of expense with the exception of such materials as nonintegrated concerns have been able to purchase at controlled prices since the September schedule was issued. These increases have not been uniform by months nor have they affected uniformly all steel producers. Since September the controlled prices have exercised an important influence upon all producers obliged to buy their own coke, pig iron, billets, or other raw or basic materials; and while there has been complaint of the small "spread" between pig and plates and shapes, nevertheless the influence of the fixed prices has been potent. In its report to the War Industries Board the commission will freely acknowledge the general upward tendency of costs since last spring. Whether it will attempt to draw any conclusions therefrom remains to be seen, although the commissioners assert very positively that their function has nothing whatever to do with price fixing and that their reports as to costs are absolutely colorless and made without accompanying suggestion of any kind.

Another development in the situation is a marked change in the commission's attitude with respect to the reasonableness of the schedule of controlled prices promulgated in September. Up to a very recent date these

figures have been sharply criticised by members of the commission, not only as being too liberal but as not being justified by the costs of production as determined in the commission's preliminary report transmitted to the President and laid before the War Industries Board as the basis of its original conferences with the steel men. One member of the commission recently expressed the opinion that the commission's figures were wholly ignored by the War Industries Board and that the steel men scored a decided victory in the contest with the board. The suggestion was also made that the relation of prices in the September schedule was distinctly favorable to the big producers.

Full Production More Important Than Prices

All this is now changed. Any reference to the previous attitude of the commissioners is met with an emphatic disclaimer and it is declared that "the Federal Trade Commission and the War Industries Board are doing good team work in the task of winning the war." No further criticisms of the September schedule are heard. It is perhaps significant, especially with reference to the work of the commission in "winning the war," that commissioners are now emphasizing the fact that any form of price fixing must be a failure that "does not accomplish the Government's purpose of developing maximum production." In this connection attention is being called to the fact that the well integrated concerns can furnish material of all kinds at prices that cannot be met by smaller concerns, especially those which must buy their pig iron. The fact that a living price to the small producer must necessarily involve a very generous profit to the completely integrated concern appears now to be accepted by the commission with a fair degree of philosophy.

The commission's original attitude, as expressed by Mr. Davies before the Senate Committee on Interstate Commerce, in favor of the abrogation of outstanding contracts made at prices differing materially from the controlled schedule, has also undergone revision. In fact, members of the commission are now disposed to contend that Mr. Davies' statement to the Senate Committee did not go so far as to constitute a definite recommendation for the cancellation of contracts. This modified position is probably due to two causes. The first is the fact that the bulk of the contracts referred to by Mr. Davies in his statement to the Senate Committee, covering a period of six months, will expire in the near future, thus reducing the issue to an academic question that will speedily work itself out.

The other reason, however, is more significant. Some time ago the commission sent out a circular to a large number of producers and consumers of steel products asking views as to the advisability and the probable effect of abrogating existing agreements. Many answers to these inquiries have been received, but in spite of every effort that has been made to classify and digest them the commission finds itself unable to draw any conclusions therefrom except that each individual replying is moved solely by his personal interest, according as he is or is not at present the beneficiary of a favorable contract. It is not even possible to deduce from the replies received whether the abrogation of existing agreements would assist or injure the majority of the producers and consumers either taken as a single group or as two separate interests. Under these circumstances it is not surprising that the commission should place no special emphasis at this time upon Commissioner Davies's former remarks on this subject.

The Pomerene Bill's Prospects

The prediction recently made in this correspondence that the Pomerene bill would not be passed before Jan. 1 has now been practically fulfilled. Congress today will take the usual holiday recess, reconvening on Jan. 3. During the two and a half weeks of the session since convening on Dec. 3 the Senate has devoted its time chiefly to the consideration of the Webb export trade bill reported from the Committee on Interstate Commerce in the custody of Senator Pomerene and all the leading members of that committee have given it their undivided attention, as the result of which it has been passed by a decisive majority. This work has precluded the giving of any time to the consideration of the steel control bill and the subcommittee having it in charge is understood to have deferred devoting any time to it until after the holiday recess. Appropriation bills will then demand almost continuous consideration and it will require vigorous work to bring the Pomerene bill into the Senate. Its place on the calendar will necessarily be unfavorable but that disadvantage would be fully offset should the President determine that the passage of the measure is an essential part of the war program. The eyes of all interested parties therefore are on the White House and any conferences the President may hold with the War Industries Board on this matter will be followed with the deepest interest.

W. L. C.

Steel Specialties Companies Are Consolidated

The Edgar T. Ward's Sons Co., with offices in Boston, New York and other cities, has been incorporated under the laws of Massachusetts with an authorized capital of $2,500,000 and the following officers: Edgar Ward, Newton, Mass., president; John Ward, Lynnfield, Mass., treasurer; Herbert W. Lockwood, South Orange, Mass., secretary; James S. Winn, Evanston, Ill., vice-president; Leslie Edgcomb, Philadelphia, vice-president; Arthur J. Lockwood, Glenridge, N. J., chairman; E. P. Hall, Collingswood, N. J., assistant treasurer; William E. Adams, Boston, clerk; Frank K. Biggs, New York, director; E. B. Lapham, Evanston, Ill., director. The company is a consolidation of the following concerns: George Nash Co., New York and Chicago; Field & Co., Inc., Philadelphia; Dilworth-Lockwood Co., New York and Newark, N. J.; Edgar T. Ward's Sons, Boston, and Boston Steel & Wire Co., South Boston, Mass. Offices and warehouses are still maintained at the former addresses, but the entire business is under one name and management with head office at Boston. Stocks include a wide range of steel specialties, including tubing, shafting, tool steel, electric sheets and alloy steel.

Abell-Howe Co. Expanding

The Abell-Howe Co., 565 Washington Boulevard, Chicago, distributor of American high speed chain, Howe tongue elevated trucks, electric cranes and hoists, has established branch offices at 30 Church Street, New York, in charge of J. R. Shays, Jr.; at 5086 Jenkins Arcade, Pittsburgh, in charge of C. W. Wheeler and Wayne Paulin, and at 803 Ford Building, Detroit, in charge of H. G. Bates. The company is also represented, in connection with the sale of Howe trucks, at Boston by the Boston Steel & Mfg. Co., and in the Atlantic Coast States, Pittsburgh and Cincinnati territory by the Howe Scale Co. and J. S. McCormick Co. In addition it is represented in New England by the Watkins Engineering Supply Co., Boston, and in the Northwest by Frank J. Rose Co., Minneapolis, for the sale of American high speed chain.

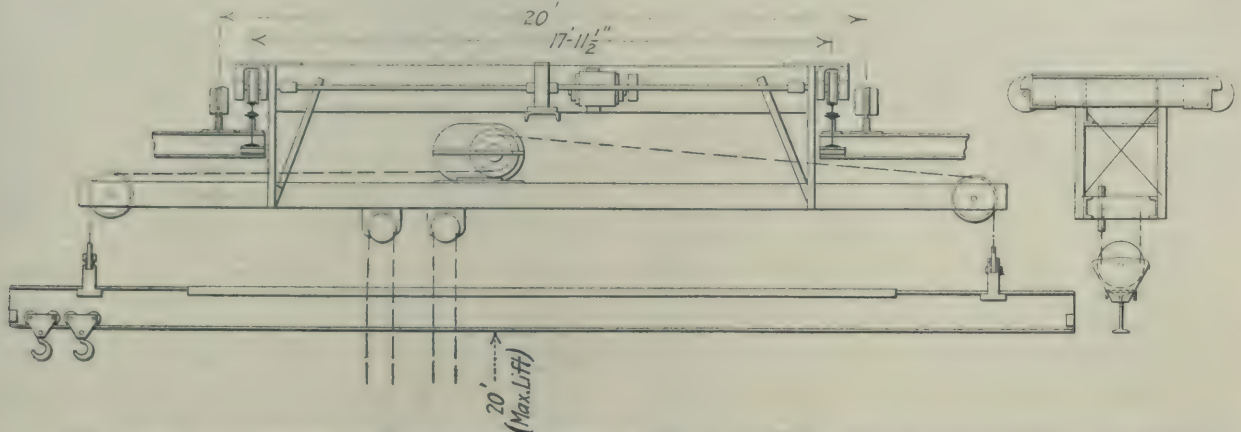
Nine ships, aggregating 45,115 tons, were launched during September in Japanese yards, constituting a record. These are part of a program for building shipping amounting to 300,000 tons during the fiscal year ending with April, 1918, of which 35 vessels aggregating 154,727 tons have already been launched.

The Nagle Corliss Engine Works of Erie, Pa., builder of air compressors, vacuum pumps and engines, has opened an office in the Bourse Building, Philadelphia.

CRANES FOR FLEXIBLE LOADS

Auxiliary Girder Supports Carrying Beam—Transverse Travel on Roof Trusses

CRANES designed to handle long, flexible pieces of steel requiring supports at various points and to travel crosswise of the shop have been installed in the new fabricating shop of the Ferguson Steel & Iron Co., Buffalo. They were made by Pawling & Harnischfeger Co., Milwaukee, and are of the type illustrated. They ride rails supported by the roof trusses and the spacing of these limits the bridge spans to 17 ft. 11½ in. The

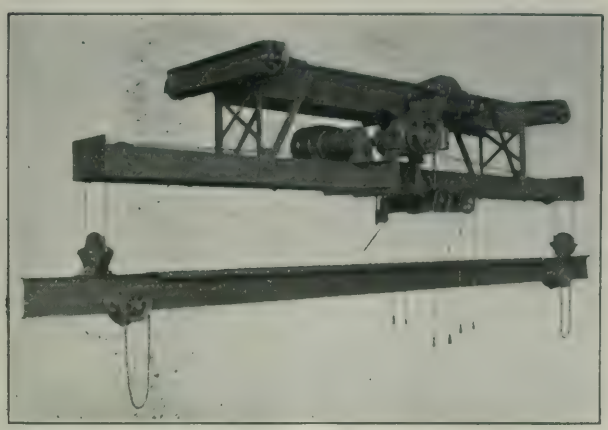


The Cranes Are in Alternate Bays and Travel Across the Shop on Rails Supported by Roof Trusses. The carrying beams have sufficient span to serve adjoining bays

length of material handled, however, makes desirable a spread between pick-ups of approximately 33 ft. and this is accomplished by an additional box girder suspended from the crane bridge and supporting the carrying beam. On the girder are mounted the hoist mechanism and controllers, which are operated from the floor, one being for the trolley and the other for the bridge. As many trolleys as necessary can be mounted on the carrying beam. When picking up a load the beam and trolley are lowered so that chains can be passed beneath the load and hooked to the trolley. The cranes are located in alternate bays and are of 3 and 5-ton capacity.

One side of the assembling end of the shop is equipped with two traveling jib cranes for handling riveters, and also for handling material from the buggies or trucks. These traveling jib cranes have reversible motors operated from the floor. Their runway is 160 ft. in length. Cantilever cranes for various punches and other machines are located along both sides of the shop. These and the jib cranes were made by the Ferguson Steel & Iron Co.

Longitudinal movement of material is by buggies which run on 3-ft. gage tracks extending the full length of the shop. The tracks are laid with a down grade from the warehouse to the assembly shop, so that the loaded trucks go down grade and the empty trucks up grade. The trucks are fitted with roller bearings and move along easily when fully loaded.



On the Auxiliary Girder Below the Bridge Are the Hoist and Bridge Motors. This girder also supports the control apparatus which is operated from the floor

Strength of Oxy-Acetylene Welded Joints

A series of tests of the strength of oxy-acetylene welded joints in mild steel plates has been completed by the Engineering Experiment Station of the University of Illinois under the direction of H. F. Moore, research professor of engineering materials, and is described in its Bulletin No. 98. For joints made with no subsequent treatment after welding, the joint efficiency for static tension was found to be about 100 per cent for plates ½ in. in thickness or less, and to decrease for thicker plates. For static tension tests, the efficiency of the material in the joints welded with no subsequent treatment was found to be of not greater than 75 per cent. The joints were strengthened by working the metal after welding and were weakened by annealing at 800 deg. C. For static tests and for repeated stress tests, the joint efficiency sometimes reached 100 per cent; the efficiency of the material in the joint was always less. This, the bulletin points out, indicates the necessity of building up the weld to a thickness greater than that of the plate. The impact tests indicate that oxy-acetylene welded joints are decidedly weaker under shock than is the original material. For joints welded with no subsequent treatment, the strength under impact seems to be about half that of the material.

In general Professor Moore believes that the test results will tend to increase confidence in the static strength and in the strength under repeated stress of carefully made oxy-acetylene welded joints in mild steel plates.

Life Insurance at Electric Controller Plant

The Electric Controller & Mfg. Co., Cleveland, has presented policies of life insurance to some 330 men and women in its employ. These policies range from $300 to $3,000 and all employees as soon as they have been in the employ of the company for six months will be insured with the Travelers Insurance Co., Hartford, for an amount equal to one-half year's pay. This increases by one-eighth of the annual pay every year until at the end of four and one-half years the policy has a face value equal to a full year's pay. These policies are not intended to take the place of any bonus payments on the part of the company or payments due under the workmen's compensation laws for accidents.

A remarkable array of posters was recently issued by the National Association of Manufacturers, and copies may be had by addressing the industrial publicity department of the association at 30 Church Street, New York. They have to do with the conservation of American industry and in that connection unwise labor agitation, and are designed to inform all classes of citizens as to their true relation to industry and the effect of the movement on their own prosperity.

Crozier Tells of Great Progress Made

Despite Delays and Many Obstacles, Preparedness Has Advanced Further than Investigators Expected—Detailed Report of Testimony Taken by Senate Committee

WASHINGTON, Dec. 18.—There is a distinct note of optimism in the comment of Congressional leaders as the result of the disclosures made during the first week of the comprehensive investigation now being conducted by the Senate Committee on Military Affairs into the war preparations of the Ordnance Bureau, which will be speedily followed by inquiries into the progress made by the Quartermaster General's Office and other important branches of the War Department. The testimony of Maj. Gen. William Crozier, Chief of Ordnance, which has occupied four days, partly spent in executive session, and which began under the spur of pointed, if not actually hostile, questioning by members of the committee, has developed an advanced state of preparedness as to the provision of small arms, machine guns, light and heavy artillery and ammunition that even the most sanguine member of the committee had not dared to hope for.

The inquiry has made it plain that the basic fallacy underlying most of the criticism of the Ordnance Bureau—even that of experienced officers of the regular army—is the impression that appropriations by Congress can be transmuted into vast quantities of available war material in much the same way that single typical articles may be procured. As a matter of fact, it has been made to appear that the Ordnance Bureau had no funds of substantial amount, nor authority to make contracts, until the country actually became involved in the war. Owing to the niggardly policy of Congress, the arsenals were running at low speed, or were closed down, with organization disbanded, and the requests of the Chief of Ordnance for money with which to equip private plants to co-operate with the Government's manufacturing establishments had repeatedly been rejected.

Great Lesson of the War

The great lesson of the European war early recognized by General Crozier and his aides, and pointed out in their official reports published during the past two years, was the stupendous utilization of artillery and machine guns, which was undreamed of in any previous war. Realizing what the United States would be called upon to meet, the Ordnance Bureau planned for quantity production on a huge scale and in accordance with the most advanced methods of modern manufacturing practice. Opportunity was afforded for these preparations because of the time which must necessarily elapse in the training of a large force to be sent overseas, and because there were on hand half a million rifles of the best-known model for the equipment of the regular army and National Guard contingents first to go to France; and further, because the British and French governments were turning out a large surplus of machine guns and three and six-inch field guns with which they had offered to provide all the troops that could reach France before the spring of 1918.

The work of the Ordnance Bureau began with the standardization of material to secure the best possible results and the smallest practicable number of types, interchangeability being kept constantly in mind. The next step was to interest the largest possible number of private establishments in the work of manufacturing standardized rifles, machine guns, and all forms of artillery, from the 3-in. field gun to the largest howitzer. Any manufacturer will readily appreciate the difficulties of this problem, especially in view of the fact that no contract of any kind could be made until Congress had appropriated the money therefor, and will know how to appraise correctly the results obtained, as reflected in the following summary of the present status of the ordnance preparation:

Summary of Things Done

(a) Every soldier sent to France has been provided with a Springfield rifle of the most approved model, and has been trained in the use thereof, including ample target practice. Each of the cantonments where the men of the National Army are now being trained has been supplied with 10,000 serviceable Krag-Jorgensen rifles and 11,000 of the latest model Lee-Enfield rifles, chambered to use Springfield ammunition, thus giving each infantryman a good rifle. Three large establishments formerly making Lee-Enfield rifles for the British government are turning out approximately 6000 per day of the U. S. model Enfield, accurately standardized, and the rate of production will soon reach 10,000 per day, insuring that every soldier sent to France will be provided with an Enfield rifle, the ammunition of which is interchangeable with the Springfield and with all the machine guns that will be sent to France. Ample reserves and spare parts are included in these calculations.

Supplied by French Government.

(b) The American troops in France have been fully supplied by the French Government with machine guns of the heavy Hotchkiss type and the light Chauchat type. The National Army men in cantonments have been furnished a considerable number of machine guns for training purposes, and this equipment is being rapidly increased. A large number of Vickers and Lewis machine guns have been purchased, and will be used for both training purposes and for fighting in France. The great factor in machine-gun equipment, however, will be the new Browning gun, of both heavy and light types, an American invention, declared by the leading ordnance experts to be the best gun in existence, for the manufacture of which half a score of large private establishments have been fitted. Quantity production on an unprecedented scale will begin early in April, and will proceed at a rate that will keep pace with the transporting of troops to the theater of war.

Co-operation of Allies

(c) The American troops in France have been provided, through the co-operation of the British and French governments, with a full equipment of 75-mm. and 155-mm. field guns, corresponding roughly to the 3-in. field piece and the 6-in. howitzer of U. S. models. The surplus capacity of the British and French factories will supply all these guns needed until next spring. In the meantime, the Ordnance Bureau, as heretofore announced in THE IRON AGE, has enormously increased the capacity of the Watervliet and Watertown gun factories, and in addition has financed the equipment of more than a dozen large private establishments for forging, treating, machining and assembling some 16,-

000 guns, ranging in size from the 3-in. field piece to the 9.5-in. howitzer. Large deliveries of these guns are promised for the early spring, and production thereafter will be on a very large scale.

While carefully seeking to avoid criticizing even the incomprehensible course of Congress in postponing the making of adequate appropriations until months after the United States became involved in the war, General Crozier, when pressed as to why deliveries of material were not forthcoming at earlier dates did not hesitate to declare that the results desired could only have been obtained had Congress provided the money at least two years before. He also frankly placed upon the Secretary of War responsibility for such delay as occurred in selecting a type of machine gun, a responsibility which Secretary Baker has since cheerfully assumed. The Secretary's unqualified indorsement of General Crozier's course is indicated by the fact that immediately after the Chief of Ordnance made the statements referred to his renomination for another four years' tour of duty at his present post was sent to the White House and promptly transmitted by the President to the Senate for confirmation.

Mistakes Are Admitted

That some mistakes have been made, and that delays could have been avoided had more businesslike methods prevailed in all branches of the War Department, General Crozier freely admitted. There has been some extravagance through the operation of cost-plus-profit contracts, but this has been minimized so far as possible, and adequate steps taken to protect the Government. Time has also been lost because the War Department has had no authority to use war appropriations for the housing of labor in the vicinity of private munition factories. Inadequate laws have permitted the enticing of workmen away from Government arsenals and private munition plants, and much precious time has been lost in building up organizations in the arsenals, previously running at part capacity or closed down for lack of appropriations. All these drawbacks, however, are now in a fair way to be overcome, and highly satisfactory progress is now being made in the production of all forms of war material.

It is understood that General Crozier's testimony will be followed by a statement, possibly in executive session, by Secretary Baker. The Senate committee is safeguarding the interests of the Government by keeping secret certain important facts that would be of value to the enemy through the disclosure of the War Department's detailed plans, but the feeling is strong that the public should have as much knowledge of the war preparations as possible, and everything that can be given out with propriety will be freely published. It is probable that the information obtained from the officials of the War Department will be supplemented by an inquiry conducted by the Senate committee into the activities of the Council of National Defense and the Advisory Commission.

Object of the Investigation

At the opening of the investigation, Senator Chamberlain, chairman of the committee, announced that its object was to ascertain from the War Department the progress that had been made in the matter of providing for ordnance, small arms, munitions, etc., for the present war and to determine the further needs of the Government with respect thereto. At the instance of the Secretary of War, the chairman said, General William Crozier, chief of the Ordnance Bureau, had first been summoned and would make a general statement concerning what has been accomplished in the way of war preparation and with special reference to the manufacture of small arms.

In beginning his testimony, Gen. Crozier reminded the committee of the situation at the time the United States became involved in the war. Under the terms of the act of June 3, 1916, known as the National Defense Act, Congress had taken the position that nothing should be done with reference to the immediate participation of the United States in the war. In that act, there was adopted a program for the raising and equipment of a force of 1,000,000 men in a period of five years with a corresponding project covering armament and reserve supply, all of which would be ready when the troops were ready, which meant that both men and equipment should be procured in annual increments.

"Now, it is apparent," continued Gen. Crozier, "that a program contemplating getting ready in five years was not contemplating the present war, because nobody would have assumed that we would have until 1920 to get ready to do anything with reference to the European war. That was the situation that confronted us when war was declared by our Government in April some ten months after the passage of the National Defense Act."

General Crozier then reviewed briefly the protracted hearings before the House and Senate Military Committees upon the estimates prepared by the War Department immediately after the declaration of war and which resulted in such delay that it was not until June 15, 1917, that the first emergency appropriation for carrying on the war was actually passed. He continued:

Appropriation Insufficient.

"When we got to work and gave more thought to it, it immediately became apparent that the program of that appropriation contemplating the supplying of a million men only was insufficient. We all knew that before the supplies could be procured much greater quantities than those for a million men would be needed and we set to work at once to place orders justified by the funds that had already been appropriated and to make new estimates so as to place more orders and start the manufacturing for the additional number of troops that we knew would be needed. This particularly related to artillery, which requires a long time for its manufacture.

"The program for artillery for a million men, considering the length of time it takes to manufacture artillery, was no program at all to start the war with; we had to have a very much larger one because we knew that we could not complete it before 1919, and that then we would have more than a million men. So another set of estimates was made up and submitted in detail for an appropriation to be made for the additional supplies that we knew would be needed. That estimate, particularly as it related to artillery, was ready in my department in the early part of June and before the act of June 15 passed. It then had to be considered by the other agencies of the War Department, by the War College, and by the Department itself.

"There was no obstruction anywhere, no failure to agree, no lack of harmony, and no antagonistic discussions. There was good will throughout, but there was a necessity for showing first one agency and then another and another, and the necessity for getting the estimates of all the bureaus of the department together, with the result that our final set of estimates did not get before Congress until about Aug. 1. Then began again the process of explaining the estimates, and those of us who were concerned in getting them up and who were the only ones having the necessary knowledge of them were successively called before the committee and made our statements. Everything was well received. There was no disposition to be captious or not liberal. There was acquiescence in the very large sums that we asked, but the process took such a length of time that that second appropriation bill did not become a law until Oct. 6, just about two months ago.

Did Everything Possible

"Now, as we believed that Congress would appropriate the money, for there was no sign of any indisposition to do so, we proceeded as early as we could to do everything possible to get the manufacturing

establishments of the country going on war material in anticipation of the appropriation of the funds, and we met with a great deal of good will and a great willingness on the part of the manufacturers of the country to take what little risk was involved. But we met something else which was more of an obstacle. The manufacturers did not care to actually expend money out of pocket and in many cases they found difficulty in securing loans and otherwise in financing the spending of money in advance of the actual passage of the appropriation bill, which meant in advance of the possibility of making contracts or of receiving any money.

"Now, the President, when in his judgment it is necessary, can take a certain risk. It is not lawful, but he has many times done it in placing an order for the execution of which there are no funds appropriated, but he cannot insure the payment of a single penny out of the Treasury on such an order. Now, as to all the many cases in which the contractors would need money to go on with their work, we were helpless and they were helpless, for the money could not be paid in advance of the appropriation and mere confidence that the appropriation would be made did not meet the situation. That, of course, was the cause of very considerable and very serious delays.

"There were also delays owing to the fact that we had to make our purchases in accordance with a different system from that which we normally employed. In normal times we make known our wants and we dip into the resources of the country as an inexhaustible reservoir to supply them. The different departments of the Government do not have to take any particular care to keep out of one another's way, because there is enough capacity to supply our wants, and we are protected as Government officers handling public funds by the acceptance of the lowest bid in a competitive situation. But with the expenditures that have had to be made for this war, that situation was changed. In the first place, there was no time for competition other than of the most informal kind. There was no time for competitive bidding and the public opening of bids.

The General Munitions Board

"Now, partly for the purpose of protecting the Government officers in handling public funds under these circumstances and partly to secure a broader judgment, a board was appointed called the General Munitions Board, one of the functions of which was to pass judgment as to whether the prices that were proposed to be paid for materials purchased in accordance with the existing method were reasonable and proper. The necessity, therefore, for first negotiating purchases and then for submitting them to the judgment of another body, which naturally wanted to be informed, occasioned additional delay in the placing of orders. The instructions were that if supplies had to be had immediately, such as rations, etc., the Chief of Staff of the Army could go ahead and get them, but all of the large and important orders for material were submitted to the General Munitions Board to secure their business judgment as to whether the terms were reasonable. I do not remember any case where an adverse determination by that board resulted in the order not being placed, but there were cases in which a difference of opinion resulted in a good deal more discussion and negotiation."

At this juncture, General Crozier called attention to the fact that the committee was sitting in open session with numerous press representatives present and added that later on when he came to discuss figures showing the supply and prospective supply of war material, he would prefer to proceed in executive session.

"I think," he said, "the Kaiser would pay a good deal for such knowledge. It is the kind of information we would like to have in regard to the enemy and presumably the enemy would like to have it in regard to ourselves."

General Crozier then told the committee of another condition that confronted the Department at the outbreak of the war, namely, the slender personnel for carrying on the business of procuring equipment and supplies. At the outbreak of the war he had in his office 10 assistants; to-day, in his office in Washington, there are more than 600 ordnance officers. A few of these additional men were brought to Washington from other stations in the service, but 95 per cent of the increase has come from civil life.

Splendid Body of Men

"They are a splendid body of men," General Crozier continued. "Of course they had to learn the business, for we had selected business and professional men, mechanical engineers, chemical engineers, and lawyers, for even lawyers were required in the drafting of contracts and to handle the legal phases of our great business. It would have been impossible to find these men in the service, and besides we could get practically nobody from the army. The line of the army itself had a tremendous problem of taking new forces and training them and getting them in shape and it was like getting blood out of a stone to get an army officer detailed from the line into the staff.

"I had to create in my office a great supply division for taking custody of this enormous amount of materials, as they began pouring in, and to take such account of it that it could be most advantageously placed in the hands of the troops. That division alone now comprises 140 officers and more than 600 clerks. In charge of that division I have placed a regular ordnance officer, and gave him as one of his principal assistants a man who had been the manager of a great mail-order house accustomed to dealing with miscellaneous articles and getting them manufactured, stored and distributed on mail orders. He gave up a salary of $15,000 a year to come to us for the pay of a major, which, including allowances, means about $3,500. We have a number of instances of that kind.

"My total force of officers, both in Washington and at the arsenals, and on private inspection duty on other kinds of work at the outbreak of the war, was 85. That force is now over 2100 and these people are working day and night and find it impossible to keep up with the work. Everybody goes to bed every night, and many of them late at night, leaving a great deal that he would like to do that night if he could stay there. Many of them have not had a Sunday to themselves since the outbreak of the war. This is not a complaint, for there is no complaint in these divisions. These men are doing their work cheerfully and I only mention this to indicate what we have to do and the tremendous expansion that has been necessary in order to do it."

Contracts for Material

General Crozier then took up the subject of the contracts made for material and discussed the reasons for the policy adopted by the department. He said:

As another illustration of the kind of work that had to be provided for in the absence of ability to fix prices for things in a changing market, with labor and materials leaping in every direction so that nobody could predict what they would be, your attention should be drawn to the fact that it was almost impossible for manufacturers to state what they would make things for. This resulted in very many instances in contracts of the cost-plus type where the Government pays the actual cost plus a profit which was sometimes fixed as a percentage and in other cases as a specified sum to be paid per unit. In certain instances there was a provision for increased or decreased compensation dependent upon whether the actual cost would fall below or go above the estimated figure with part of the advantage of economies going to the contractor and part to the Government, but with the penalty for greater cost falling upon the contractors.

Cost-Plus Plan

Replying to a question as to the experience of the department with the cost-plus contract, General Crozier said:

It has worked fairly well in a number of cases. It is not as good as the fixed price method where there are sufficient means of forming a judgment as to what a reasonable price should be. I feel that it should not be used except in cases of emergency, as in this instance, where we have absolutely been driven to it because nobody could fix a price

(Continued on page 1510.)

Eliminating the Switch Engine

An interesting application of the small caterpillar type industrial tractor built by the Cleveland Tractor Co., Cleveland, and illustrated in THE IRON AGE, July



Spotting a Carload of Pig Iron Having a Total Weight of 45,000 Lb. with a Small Caterpillar Type Industrial Tractor

26, 1917, was recently made. One of these tractors, which is in use at the plant of the Enterprise Company, Columbiana, Ohio, has replaced the switch engine or a gang of workmen with pinch bars for spotting or switching cars. As the engine is railroad property it is available for only a comparatively short time each day, while the tractor, which is always on the premises, can be utilized at all times. Some idea of the power developed is apparent from the statement that the car which is being spotted contains pig iron and weighs 45,000 lb. together with its load.

The tractor, which is of the conventional caterpillar type so extensively employed for agricultural purposes, was originally designed as a substitute for narrow gage industrial railroads operated in connection with large plants. It does not travel on wheels, but lays its own track and consequently can pass over obstacles and move material from one department to another without marring the surface over which it travels. The over-all width of the tractor is 50 in. and it is but 2 in. more in height, so that it can pass through ordinary sized factory doors easily. In addition to transporting material between the different buildings of a plant, the tractor may also be used for bringing material from the factory to the shipping room or to cars that are to be loaded. Another application is the unloading of incoming shipments.

A New Type of Chain-Driven Concrete Mixer

A chain-driven concrete mixer has been placed on the market by the T. L. Smith Co., 1125 Thirty-second Street, Milwaukee. The chain runs underneath the drum instead of passing entirely around it as was formerly the case. The length of chain is thus materially decreased and the weight of the drum resting upon the chain keeps it taut at all times. The number of teeth in contact with chain is small, and the likelihood of the chain riding off the teeth, it is pointed out, is eliminated. The mixer is furnished with the builder's power loading arrangement or a low charging platform. The discharge chute is of the self-locking type which tends to eliminate any tendency of the chute to flip, due to the weight of the concrete falling on that portion of the chute which extends inside the drum. This is accomplished by a system of toggles which automatically lock as soon as the chute is inserted.

Manganese ore exports from India for the fiscal year ended March 31, 1917, were 631,083 gross tons as compared with 472,563 tons in the same period in 1916. Great Britain is credited with having received 459,150 tons; United States, 63,912 tons; France, 61,940 tons; Italy, 28,400 tons, and Japan, 17,480 tons.

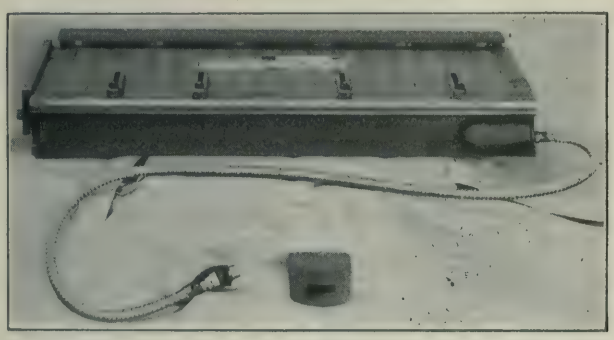
Magnetic Chuck with Rectangular Top

A magnetic chuck equipped with a removable rectangular faceplate has been brought out by the Heald Machine Co., Worcester, Mass. In addition to this feature it is also possible to shift the chuck between 110 and 220 volts direct-current circuits at the will of the user. Large holding power and low power consumption are two advantages claimed for the chuck.

The top plate of the chuck is attached to the body by closely spaced cap screws which are relied upon to draw the plate tightly down to the chuck body. These screws enter the plate from beneath, thus eliminating screw holes in the working surface through which it might be possible for water or grit to work into the interior. The front edge of the plate has a T-slot for the reception of straps, fingers, etc., according to the class of work to be handled, and adjustable side and end stops are also provided. The removability of the top plate makes it possible to replace an old plate that has become worn with a new one and use the old body and a complete set of coils, thus considerably reducing the chuck expense. In this connection, it is emphasized, however, that the top plates are comparatively thick, so that a long life can be secured from one before it has to be removed. The working surface of the chuck measures 15⅜ x 40½ in. and the holding power is about 200 lb. per sq. in.

In the body of the chuck there are two cores and two coils to each pole piece in the working surface and the coils are made up of large gage wire with enamel insulation, it being pointed out that this provides a longer life than would be possible with silk-covered wire. With a view to reducing the possibility of short-circuits as much as possible a large space is provided in the interior of the chuck between the coils. This arrangement also eliminates any necessity for ventilation so that the chuck can be used either wet or dry without change. The coils are wound on the unit system which, in addition to giving great holding power with small power consumption, approximately 300 watts, is also relied upon to give a practically uniform pull over the entire magnetic surface.

At the right end of the chuck a volt box which enables the user to change the voltage of the supply circuit from 110 to 220 or vice versa without returning the chuck to the factory forms an integral part of the body. Access to the box is provided by removing the pipe bushing, which is screwed in place after the change



A Recently Developed Magnetic Chuck with a Rectangular Top Has a Receptacle That Enables It to Be Used on Either 110 or 220 Volt Circuits

in the voltage has been made, this arrangement being relied upon to give a waterproof connection. The lead wires are protected by a heavy armored conduit and the end of the cable terminates in a standard attaching plug. A special form of demagnetizing switch is provided.

J. C. James, Lancaster, Ohio, is interested in a firm that has purchased the former plant of the Kylr Mfg. Co., that will be fitted up for making auto trucks.

The Bowlus Mfg. Co., Springfield, Ohio, will add to its present lines a building and hardware specialty for which some special equipment will be required.

Opens the Way for Foreign Commerce

Webb-Pomerene Bill to Permit Combination of Manufacturers to Engage in Export Business Passes Senate—Will Probably Reach President This Month

WASHINGTON, Dec. 18.—The Webb-Pomerene bill, exempting from the operation of the anti-trust laws combinations of American manufacturers and merchants made for the exclusive purpose of extending their foreign trade, was passed by the Senate Dec. 12, and, having passed the House last June, was immediately referred to a conference committee to consider the Senate amendments and harmonize the diverse provisions of the House and Senate drafts. While the modifications in the House bill insisted upon by the Senate were not of great importance, their adoption has had the effect of postponing the final enactment of this important measure, although it is believed it will reach the President for his signature before the end of the current calendar year.

As the result of securing the advantageous position of the "unfinished business" of the Senate at the special session held last summer, the Webb bill was promptly taken up when Congress reconvened Dec. 3, and was kept continuously before the Senate until its passage. The measure was vigorously opposed by the same small but industrious coterie of Senators, led by Cummins of Iowa and Reed of Missouri, who succeeded in preventing its passage at the special session notwithstanding the fact that it had run the gantlet of the House and had been unqualifiedly approved by the President. While Senator Reed's opposition to the bill took the form of a direct attack on the ground that it would emasculate the Sherman and Clayton anti-trust laws, Senator Cummins adopted more insidious but not less effective tactics, urging in the form of a so-called amendment a complete and comprehensive substitute hedging the measure about with such restrictions and qualifications as would have rendered it valueless for the purpose for which it was designed. The object of Senator Cummins' substitute was fully recognized by his colleagues, however, and after several days' debate, his so-called amendment was decisively defeated by the vote of 43 to 18.

Trust Fighter Favors Bill

The Cummins substitute having been disposed of, the bill as amended by the Senate Committee on Interstate Commerce was then strongly urged by Senators Pomerene, Myers of Montana, Weeks of Massachusetts, Saulsbury of Delaware, Townsend of Michigan, Poindexter of Washington and Kellogg of Minnesota. The appearance of Senator Kellogg as a champion of the measure was of special significance in view of the fact that he has on more than one occasion been employed as a special assistant to the Attorney General in the prosecution of cases brought by the Government against various corporations under the Sherman anti-trust law. Mr. Kellogg made a convincing argument as to the necessity for the passage of the bill, emphasizing the fact that even if, as has been contended, the Sherman law does not specifically prohibit combinations in the foreign trade, the difference of legal opinion and the uncertainty of the situation are such as to make it highly important that Congress should clear up all doubts by the enactment of an affirmative measure that will guarantee the desired privilege and enable exporters to secure the necessary financial support to develop their projects on a large scale.

Export Trade Defined

The Webb bill as passed by the Senate defines the term "export trade" in the first section, but modifies this provision as adopted by the House as follows, the language inserted being shown in italics while that stricken out appears in brackets:

That the words "export trade" wherever used in this Act, mean solely trade or commerce in goods, wares, or merchandise exported, or in the course of being exported, from the United States or any Territory thereof to any foreign nation; but the words "export trade" shall not be deemed to include the production, manufacture or selling for consumption *or for resale*, within the United States or any Territory thereof, of such goods, wares, or merchandise, or any act in the course of such production [or] manufacture, *or selling for consumption or resale.*

The essential provision of the bill exempting export combinations from the operation of the Sherman act is contained in the second section which, as amended by the Senate, reads as follows:

Sec. 2. That nothing contained in the act entitled "An act to protect trade and commerce against unlawful restraints and monopolies," approved July 2, 1890, shall be construed as declaring to be illegal an association entered into for the sole purpose of engaging in export trade and actually engaged solely in such export trade, or an agreement made or act done in the course of export trade by such association, provided such association, agreement, or act is not in restraint of trade within the United States, and is not in restraint of the export trade of any domestic competitor of such association; and provided further, That such association does not, either in the United States or elsewhere, enter into any agreement, understanding, or conspiracy, or do any act which artificially or [intentionally and unduly] *the natural effect of which* enhances *or depresses* prices within the United States of commodities of the class exported by such association.

Under the terms of the third section, it is provided that nothing in the Clayton anti-trust act "shall be construed to forbid the acquisition or ownership by any corporation of the whole or any part of the stock or other capital of any corporation organized solely for the purpose of engaging in export trade, and actually engaged solely in such export trade, unless the effect of such acquisition or ownership may be to restrain or substantially lessen competition within the United States."

Important Provisions

The prohibition against "unfair methods of competition" contained in the act creating the Federal Trade Commission is extended by the terms of section 4 of the Webb bill to "unfair methods of competition used in export trade against competitors engaged in export trade, even though the acts constituting such unfair methods are done without the territorial jurisdiction of the United States."

Carefully formulated restrictions are imposed upon the operations of export combinations by the terms of section 5 of the bill, which prescribes the conditions under which associations may be formed and clothes the commission with power to take drastic action to prevent abuses. This section is as follows:

That every association now engaged solely in export trade, within 60 days after the passage of this act, and every association entered into hereafter which engages solely in export trade, within 30 days after its creation, shall file with the Federal Trade Commission a verified written statement setting forth the location of its offices or places of business, and the names and addresses of all its officers and of all its stockholders or members, and if a corporation, a copy of its certificate or articles of incorporation and by-laws, and if unincorporated a copy of its articles or contract of association, and on the first day of January of each year thereafter it shall make a like statement of the location of its offices or places of business and the names and addresses of all its officers and of all its stockholders or members and of all amendments to and changes in its articles or certificate of incorporation or in its articles or contract of association. It shall also furnish to the commission such information as the commission may require as to its organization, business, conduct, practices, man-

agement, and relation to other associations, corporations, partnerships, and individuals. Any association which shall fail so to do shall not have the benefit of the provisions of section 2 and section 3 of this act, and it shall also forfeit to the United States the sum of $100 for each and every day of the continuance of such failure, which forfeiture shall be payable into the Treasury of the United States, and shall be recoverable in a civil suit in the name of the United States, brought in the district where the association has its principal office, or in any district in which it shall do business. It shall be the duty of the various district attorneys, under the direction of the Attorney General of the United States, to prosecute for the recovery of the forfeiture. The costs and expenses of such prosecution shall be paid out of the appropriation for the expenses of the courts of the United States.

Whenever the Federal Trade Commission shall have reason to believe that an association or any agreement made or act done by such association is in restraint of trade within the United States, or in restraint of the export trade of any domestic competitor of such association, or that an association either in the United States or elsewhere has entered into any agreement, understanding, or conspiracy, or done any act which artificially or intentionally and unduly [affects] *enhances or depresses* prices in the United States of commodities of the class exported by such association, it shall summon such association, its officers and agents, to appear before it, and thereafter conduct an investigation into the alleged violations of law. Upon investigation, if it shall conclude that the law has been violated, it may make to such association recommendations for the readjustment of its [business, in order that it may thereafter maintain its organization and management and conduct its business in accordance with law] *organization, business, conduct, practices, or management, in order that they may comply with the law.* If such association fails to comply with the recommendations of the Federal Trade Commission, said commission shall refer its findings and recommendations to the Attorney General of the United States for such action thereon as he may deem proper.

In addition to the authority specifically conferred upon the commission by the section above quoted, it is further provided that it shall have all the powers granted to it by the statute under which it was created.

It is understood that as soon as the Webb bill becomes a law, the commission will organize a new Division of Export Trade, the function of which will be to supervise the operations of all associations seeking to take advantage of the Webb law. W. L. C.

Women Replace Men in Inspection Department

The scarcity of labor because of the war caused the Burroughs Adding Machine Co., Detroit, recently to place women in its inspection department. The company now has about 120 women employees engaged in the work of inspecting small parts of adding machines, which was formerly done entirely by men. The women are employed at day rates and are engaged in such inspection work as is done with test jigs, plug and thread gages and straight edges. Experience has shown that the women learn the work quickly, do it accurately, and keep at it steadily, excelling the men employees in the latter particular. On some of the larger work they have not proved as efficient as the men, doing the work somewhat slower, but it is stated that on the average they are proving superior in speed to the former male employees in doing this class of inspection work.

No previous experience in inspection work is required of a woman seeking employment in this department, and there are no restrictions as to age. While most of the employees are girls, quite a few are women beyond the middle age. The work permits the women to remain seated all the time and probably requires less muscular effort than the operation of a typewriter. The company has also substituted girls for young men as factory and time clerks in most of its departments, and finds that they are filling these positions satisfactorily.

The Richter Brass Co., Cincinnati, maker of plumbing specialties, has been incorporated with $35,000 capital stock by John H. Richter and others. The company's plant at Ninth and Main Streets will probably be enlarged at an early date.

Squirrel Cage Motor Starting Switch

Protection for the motor and safety for the operator are the two features claimed by the Cutler-Hammer Mfg. Co., Milwaukee, Wis., for a new starting switch for squirrel cage motors. The sliding panel which incloses the contacts and the fuses interlocks with the switch mechanism so that the fuses are always dead and the switch cannot be closed when the panel is lowered. When the fuses and contacts are covered there is, of course, no interference with the operation of the starting lever, this arrangement being relied upon to safeguard the operator at all times since he cannot come in contact with a current carrying part while operating the switch or when the fuses are being inspected or renewed. The motor, it is pointed out, is protected against overload and unexpected restarting after the circuit has been interrupted or the voltage failed as either of these causes the switch to open, and before the motor can be started, the operating handle must be moved to the proper position.



The Sliding Panel Inclosing the Contacts and Fuses of a New Safety Starting Switch for Squirrel Cage Motors Is Interlocked with the Operating Handle to Guard Against Accidental Shock to the Operator and Overloading or Sudden Starting of the Motor

Three moving contact fingers comprise the interior parts of the switch. When the starting lever is moved to the extreme upward or starting position, these fingers bear against three stationary contacts and connect the motor directly to the supply line. After the motor has reached its normal speed, the hand is removed from the starting lever and the fingers slide into engagement with the running contacts, the change being made without opening the motor circuit. The fuses are not in the circuit when the motor is started but when the starting handle reaches the running position after the motor has come up to speed, they are automatically cut into the motor circuit. In this way the capacity of the fuses need only be sufficient to protect the motor windings.

The standard switch is made for use with a 3-hp., 100-volt motor or a 5-hp. motor wound for 220 volts.

Instruction School Established for Trainers of Shipyard Workers

To hasten the shipbuilding program a training center for instructors, who will serve as trainers of men in shipbuilding occupations, has been established at the Newport News Shipbuilding & Dry Dock Co. under the direction of the Emergency Fleet Corporation. Its object is to have the work of these instructors bear the same relation to the promotion of shipbuilding as the training of teachers in normal schools bears to the promotion of general education.

Four lines of instruction are given. These include what teachers commonly know as determination of content, organization of content, methods of instruction and class management. Put in every day language it covers what the men are going to teach, where and how. It is intended that those who are to be taught will not be withdrawn from productive work, but will have brought to them by these trained mechanics the special instruction needed to make them experts in their particular work.

The Industrial Training Section of the Emergency Fleet Corporation is in charge of E. E. McNary. Charles R. Allen is local manager, and associated with them on these organizing staffs are James E. Neary, for five years in charge of apprenticeship training at the Fore River shipbuilding plant, and H. C. Waugh, formerly industrial instructor at Seattle.

Automatic Control of High Temperatures*

Some of the Instruments Recently Developed for Use in Steel Plants and Other Industrial Establishments

BY R. P. BROWN†

FOR even greater precision in temperature measurements than is secured with the high-resistance millivoltmeter, I have developed a new instrument which we call the Brown heat meter. This instrument is suitable for either measurement or automatic control of temperature. With our standard millivoltmeter of high resistance, we supply an ordinary dry cell and furnish rheostats to reduce the voltage of the dry cell from approximately 1½ volts to a range from 0 to 60 millivolts, the voltage produced as a maximum by the thermocouples. A rheostat is supplied in the meter of 15 ohms, which permits of adjusting the indications for a total change of line resistance equivalent to 15 ohms, or a circuit of two copper wires almost a mile long.

Briefly, its operation is as follows: In the first operation we oppose the voltage developed by the thermocouple to the reduced voltage of the dry cell, and when the pointer stands on zero, it indicates that the voltage from each source is equal. In the second operation we cut out with a switch the voltage of the thermocouple and read the voltage of the dry cell circuit by direct deflection. This eliminates the line resistance entirely as in a potentiometer. We have now a deflection, indicating the actual temperature developed by the thermocouple at the moment of reading the instrument, but fluctuations in the temperature of the thermocouple will not be indicated, as we are reading the voltage from the dry cell. In the next operation we connect the thermocouple to the meter instead of the dry cell circuit and we note whether the indications are the same. By switching back and forth quickly, the voltage of the thermocouple circuit or of the dry cell circuit can be noted. If excessive line resistance has caused the indications of the millivoltmeter to be lowered as compared with the dry cell circuit, a rheostat is operated to bring up the indications of the thermocouple circuit to that shown when we are reading the voltage of the dry cell circuit.

We now leave the instrument indicating on the thermocouple circuit and the errors, if any, which might be due to line resistance or changes in temperature of the line have been eliminated. Thus we have a direct-reading millivoltmeter, indicating the correct temperatures. The temperature coefficient of the meter has been eliminated by furnishing a copper resistor in the meter equivalent to the copper or aluminum of the coil. Hence in balancing the voltage from the dry cell against that of the thermocouple we also automatically eliminate errors due to the temperature coefficient of the meter itself.



The Heat Meter Which Employs the Potentiometer method for the Control or Measurement of Temperatures Is a Direct Reading Instrument Capable of Adjustment as Often as May Be Desired

There is now left only one possible source of error, the change in the actual indications of the meter due to sticking of the pointer, abuse of the instrument, spring fatigue, etc. To obviate this source of error the instrument can be supplied with a standard cell and suitable resistors, and in the same manner as a meter can be tested by the potentiometer method we can check this meter. Where a meter is calibrated for 60 millivolts, resistors equivalent to a deflection of 20, 40 or 60 millivolts on the scale are furnished, and after balancing the standard cell against a part of the voltage of the dry cell, through these resistors we can note whether the pointer swings to 20, 40 and 60 millivolts respectively on the scale. If it does not, the error can be noted and the actual error in calibration is detected.

This instrument is a direct reading one which can be adjusted once every day or oftener if desired, for the actual line resistance with which it is used, and in the surrounding atmospheric conditions. The meter will then indicate correctly throughout the whole scale range, and the furnace man has the instrument to guide him without hand manipulation, and an inspector can daily check the calibration of the instrument.

Automatic Temperature Control

Attempts have been made in the past to operate switches and valves electrically by permitting the pointer of the pyrometer to come in contact with adjustable contact arms on each side of it. Unfortunately the millivoltmeter, used with the thermo-electric pyrometer, has an exceedingly weak control for the pointer. One is easily able to blow the pointer across the scale with the breath. Consequently, simply permitting the pointer of such a pyrometer to move into contact is not sufficiently positive to be satisfactory for automatic control work.

The automatic control pyrometer which we have developed has a thermocouple formed of a nickel chromium alloy installed in the electric furnace, the temperature of which is being controlled. Below the pointer of the high-resistance millivoltmeter, which is actuated by this thermocouple, and adjustable throughout the whole scale range, is a table carrying two contact pieces, separated by a thin piece of insulating material 1/32-in. thick. The depressor arm driven by a small electric motor, or by a clock if preferred, depresses the pointer at regular intervals, usually every 10 sec., and in doing so the pointer forces together the two contact pieces below.

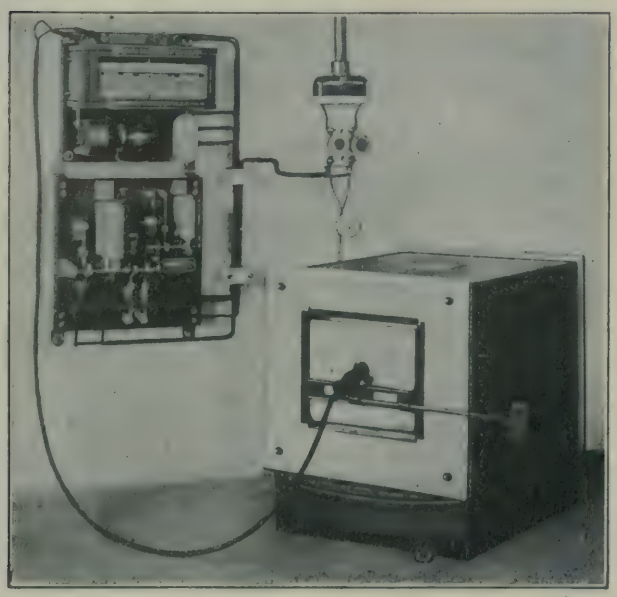
Assuming the pyrometer controller is required to control the furnace at a temperature of exactly 1400 deg. Fahr., the knob on the left of the instrument is turned until the index in front of the scale stands at 1400 deg. This index corresponds to the position of the thin insulating material which separates the high and low contacts. The switch connecting the furnace in the line is closed and the pointer slowly swings across the scale as the temperature of the furnace rises. As the switch is already closed, when the pointer is depressed on the low contact, the switch continues to remain closed, and no change occurs until the pointer passes over the neutral insulating piece and is depressed on the high contact. The switch indirectly operated by a solenoid and relay is now instantly actuated and the circuit opened. The temperature of the

*From a paper prepared for the Faraday Society, London.
†President Brown Instrument Co., Philadelphia.

furnace begins to fall slowly, and when the pointer is again depressed on the low contact the circuit is again closed. This operation continues as long as the furnace is to be operated.

When the switch opens and closes the main circuit, the current in consequence is either full on or off, and the fluctuations are continuous within narrow limits of some 10 to 20 deg. Fahr. These continuous risings and fallings of temperature can be largely reduced and closer control can be procured by the use of two rheostats in the furnace line. The solenoid operated automatic switch is then used simply to cut the second rheostat in and out of circuit. Assuming it is desirable to maintain 1400 deg. Fahr. continually in the electric furnace, irrespective of fluctuations of voltage, the two rheostats are set so that with only one in the circuit the temperature will rise to approximately 1500 deg. Fahr., and with the second rheostat in the circuit the temperature drops to 1300 deg. Fahr. When we now use the solenoid operated switch to cut in and out the second rheostat, we naturally control the temperature only between 1500 and 1300 deg. Fahr., and we do not have the rapid surges or ups and downs in temperature, and maximum control is secured.

It is realized that the same form of switch can be used to operate a valve to control a gas or oil furnace. We have found it desirable to use an automatic valve in a by-pass so as simply to control a portion of the

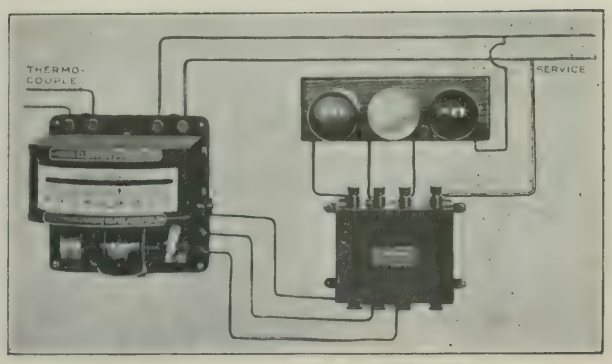


Automatic Control of the Temperature of an Electric Furnace Is Secured by a Special Type of Pyrometer

gas or oil supply, and in the same manner as in the electric furnace control eliminate the maximum fluctuations caused by the complete opening and closing of the switch or valve. Assuming that we have a 2-in. supply pipe for the gas to the furnace it is customary for us to by-pass this and use a ½-in. automatic valve, which gives us approximately 25 per cent control. This is sufficient to control the usual fluctuations in gas supply and secure very satisfactory control. This method also eliminates the difficulty which would occur where the gas is completely shut off and then turned on in full, as would occur without the by-pass control.

Temperature-Signaling Pyrometer

In addition to an instrument to control furnace temperatures automatically, there has been a demand for an instrument to signal automatically by lights whether the temperature is too high, correct or too low in any particular furnace. It has been common practice in plants in the United States, where there are a number of heat-treating furnaces, to maintain an operator at a central pyrometer, and by colored electric lights at the furnace to signal whether the temperatures are right or not. It is common practice to locate three lights



Signaling the Furnace Attendant by Colored Lights when the Temperature Is Too High or Too Low Is Also Possible

above each furnace, red, white and green. The red light burns when the temperature is too low, the white light when the temperature is within, say, 20 deg. Fahr. of the correct temperature, and the green light burns when the temperature is too high. The fireman who operates the furnace is guided entirely by the lights and a central pyrometer is used to control the temperatures.

We have been able to develop an instrument to signal automatically whether the temperature is correct or not by lights, and in this way the services of the operator at the instrument are eliminated. The same form of instrument is used for this purpose as we use to control the furnace temperatures automatically, and the pointer is depressed at intervals of every 10 sec. on the contacts corresponding to the red, white and green lights. No special battery or source of current other than an ordinary service line is required to operate these lights.

The supply may be 110 or 220 volts, and the current which lights the lamps does not flow through the instrument, but the circuit is made and broken by an auxiliary device containing the necessary mechanism. A high resistor is in series with the circuit connected with the pyrometer, which reduces the current flowing through the contactors within the instrument to less than 0.07 amp. This prevents sparking at the contactors and errors due to the heating effect of a current of higher amperage. The lamps may be any reasonable distance from the pyrometer; in fact, they are operative at a mile or more if desired.

The various thermocouples in each furnace are connected successively to the instrument through a switching mechanism, and at the same time another switching mechanism connects the various sets of lights at each furnace. We have constructed an instrument of this character to take care of the signal lights at 12 furnaces automatically. This form of equipment gives the fireman or operator of the furnace an indication by lights which he can easily understand, and he adjusts the valves or fires the furnaces accordingly. It is a simple method to instruct a man to keep the white lights burning and to explain what the red and green lights mean, and a less experienced workman can control the furnaces in this manner than where one is required who can read temperatures on a pyrometer scale. This newly developed instrument also eliminates the man to read the temperatures at the central pyrometer.

I do not doubt but that the next few years will see further improvements in pyrometers and temperature control. There will always be room for improvement, and the co-operation of the industrial works and the pyrometer manufacturers will largely hasten the development of practical instruments for the measurement and control of high temperatures.

The Bridgeport Brass Co., Bridgeport, Conn., has inaugurated a system of group life insurance which includes benefits for accidents and sickness. Under the Bridgeport company's plan, any employee may receive half of his wages up to a certain maximum for a period not to exceed 26 weeks for disability or sickness and a maximum life insurance policy of $1,000.

WASTED IN BOILER ROOM

Conservation of Coal Is Discussed by the Bureau of Mines

WASHINGTON, Dec. 18.—That the production of coal for the calendar year 1917 will show a net loss in efficiency as compared with the output of 1916, notwithstanding the fact that 50,000,000 more tons will be mined, is the disquieting statement made by Director Manning of the Bureau of Mines in a statement in which he discusses the general need of fuel conservation in boiler rooms.

"There is," he says, "one phase of the present coal situation which may put an entirely different light on the supposed increased production of coal of the present year. In round numbers, there was produced 600,000,000 tons of fuel last year. Statement has been made that 50,000,000 more tons will be mined this year. The preparation of this increased quantity of coal has not been as good as in times past. Analyses of samples show in many cases a greatly increased quantity of ash. Repeated cases are brought to the attention of the Bureau of Mines, where coal which would run from 6 to 8 per cent ash in normal times is running from 12 to 18 per cent of ash in these abnormal times.

Much More Ash

"Complaint about the preparation of coal is very general and it is not at all improbable that 5 per cent more ash is included in this year's coal than in previous years. If such a figure is true, it means that 32,500,000 tons of the estimated output of 650,000,000 tons is nothing but increased ash. If we can imagine over 600,000 carloads of ash being added to the present burden of transportation, the evident effect on car supply and transportation troubles would be seen. If this were the end of the matter, it would not be so bad, but there is another factor well known to engineers which is apt to be overlooked by the non-technical user.

"The extensive experiments carried on by the Government at the St. Louis Exposition showed that with the coals used there was a decrease of about 1½ per cent in efficiency for each 1 per cent addition to the ash content of the coal—that is to say, the inclusion of more ash with the coal decreases the value of the fuel not only the amount equal to the useless ash, but it makes the remaining good coal less effective to the extent of 1½ per cent for each 1 per cent of ash. The inclusion of 5 per cent more ash in the fuel, therefore, means a reduction in efficiency of the remaining good coal of about 7½ per cent, which, added to the 5 per cent useless ash, makes a total reduction in effectiveness of 12½ per cent.

An Actual Decrease

"According to this point of view, although 650,000,000 tons may be produced in 1917, its effectiveness as compared with previous years is probably about seven-eighths of this, and equivalent to a production of normally prepared coal of about 570,000,000 tons. We have then, instead of an increased production as compared with last year, an actual decrease of effective coal of about 30,000,000 tons. If this is added to the estimated increased needs, due to our accelerated activities, of 100,000,000 tons, we have a deficiency of the equivalent of 130,000,000 tons, instead of 50,000,000 tons to make up by good engineering and true fuel conservation in the boiler room."

In its campaign in aid of fuel conservation, the Bureau of Mines calls attention to the fact that, while an organized effort to bring about efficiency in the production and distribution of coal is being made, no parallel measures have been adopted to bring about a normal and practicable efficiency in its use. The needs of large plants, which are consuming fuel wastefully, in many ways, it is said, more wastefully and carelessly than ever before, are directly and needlessly causing a large fraction of the existing car shortage.

The preventable waste of fuel in the boiler furnace of one steel mill is said to have amounted to 40,000 tons per year, which at $5 a ton would cost $200,000. This was a comparatively modern plant. The efficiency of boilers and furnaces in a 14-day test was 55 per cent. The load factor was unusually favorable to high efficiency and could readily be raised to 70 per cent or over. This is only one example and there are many more extreme cases. In one hand-fired plant the evaporation was raised from 6 to 9 lb. in a few days of instruction, and continuously kept close to this higher mark with the help of coal and water measurements which were inaugurated. The saving was due exclusively to instruction and consequent better operation.

The Bureau of Mines estimates that one-half of the 600,000,000 tons of coal mined in 1916 was used for industrial boiler plants, and that one-fourth of this amount might have been saved by more efficient methods of consumption. The saving of this quantity would have a tremendous effect upon the transportation situation, as it represents the use of 1,500,000 50-ton freight cars.

HYDRAULIC FORGING PRESSES

Compilation of Literature on the Machinery Used in Plastic Metal Deformation

A bibliography of the most important books and articles describing and analyzing hydraulic forging presses and accessory machinery, such as accumulators, intensifiers and valve-gear, has been made by E. C. Buck, New York. Patent literature is for the most part intentionally excluded from this preliminary list. This compilation supplements another by the author on "Plastic Metal Deformation," published in THE IRON AGE of Nov. 1, 1917.

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(*Continued on page* 1522)

WILL FAVOR TAXPAYERS

Ingenious Rulings to Be Made to Avoid Appeal to Congress

WASHINGTON, Dec. 18.—The Treasury Department has decided to eliminate the ambiguities, uncertainties and absurdities of the excess profits tax by a series of arbitrary rulings and thus avoid the necessity of seeking legislation at the hands of Congress to clarify this extraordinary statute. Reduced to plain English, the department proposes to assume the responsibility of legislation by regulation and to take the risk that the courts may overturn its construction of the law.

This important decision has been reached as the result of a report received by the Commissioner of Internal Revenue from the Board of Excess Profits Tax Advisers which suggests a series of ingenious rulings under which the bureau, by more or less stretching of the plain terms of the law and bridging over its numerous defaults, can so construe the statute as to enable the Internal Revenue Bureau to proceed with the collection of the tax. For several weeks the board has debated the practicability of this solution of the problem, but having finally decided that legislation can be dispensed with at this time, the Commissioner of Internal Revenue is now proceeding to sound the keynote of the bureau's campaign with as much assurance as if there had been at no time any doubt as to the proper construction of the law.

The frequently repeated statement that the excess profits advisers have declared this section of the law to be "crude, unworkable and impossible of administration," Commissioner Roper now proceeds to deny in an official bulletin given out by the bureau. "No such statement has been given out by the excess profits advisers and no such conclusion has been reached by them," says the commissioner. "On the contrary, the excess profits advisers report to me they feel that few features of the law will require legislative redress and that they are confident equitable administration can be effected through constructions not out of accord with the revealed intent of Congress. To this end several Treasury decisions are now in course of preparation with a view to submitting them to the Secretary of the Treasury. With these decisions in force and others which will follow soon, the bureau will be able quickly to prepare and promulgate the regulations necessary to the administration of the law."

Of course, anyone at all familiar with revenue legislation and with the departmental procedure commonly necessary to its construction and enforcement will need nothing more than Mr. Roper's statement to prove that everything that has been said about the excess profits tax law is true. Mr. Roper makes the damaging admission that a "few" features of the law "will require legislative redress," which is all that anyone has ever charged concerning it. He further concedes that the "constructions" to be made by the bureau are not the obvious ones, as should always be the case in a taxing statute, but are merely "not out of accord with the revealed intent of Congress." Mr. Roper, therefore, makes it perfectly plain that the bureau is preparing to construe the law from the standpoint of expediency, its sole care being to keep within what it believes it can defend as the "intent" of Congress. The commissioner also begs the whole question when he admits that a voluminous series of arbitrary decisions will be necessary, not for the administration of the law, but as a basis for the regulations under which the law is to be executed. Never before, it is believed, has the Treasury Department been reduced to such an extremity in the effort to avoid its plain and businesslike duty of applying to Congress for the prompt revision of a statute under which it is proposed to raise hundreds of millions of dollars from the leading industries of the country.

As an illustration of the lengths to which the bureau is prepared to go in the way of distorting the plain language of the excess profits tax to avoid legislative amendment, a decision just promulgated concerning the treatment of exemptions and deductions may be cited. If there is one thing that is perfectly plain in the letter of the law it is that the exemption provided by the act must be deducted under the first "bracket," or rate of tax, or cannot be deducted at all. The fact that this would work a great hardship to the taxpayer in many cases is merely another way of saying that the statute should be promptly amended. The bureau, however, proposes to circumvent this difficulty by arbitrarily holding that if the exemption cannot be deducted from the first bracket, it may be applied to the second and to succeeding brackets, if necessary, until the full deduction has been taken. The ruling in question is as follows:

The method of allowing the deduction authorized by sections 203, 204, 205 or 210 of the act of Oct. 3, 1917, will be as follows:

In any case in which the deduction provided for in sections 203, 204, 205 or 210 is greater than 15 per cent of the invested capital and therefore cannot be fully allowed under the first rate or bracket of section 201, then in that event any remaining portion of the deduction will be allowed under the second bracket, and continued, if necessary, into the succeeding bracket or brackets until the entire amount of the deduction is allowed.

Illustrations.

An individual or partnership engaged in the manufacturing business with a capital of $30,000 and a net income of $12,000 for the taxable year, an average pre-war net income of 9 per cent, or $2,700, and a total deduction of $8,700:

Bracket	Rate (Per Cent)	Amount Taxable Under Each Bracket	Tax
1	20	.....	.....
2	25	.....	.....
3	35	.....	.....
4	45	$1,200	$ 540
5	60	2,100	1,260
Total			$1,800

A corporation engaged in the manufacturing business with a capital of $30,000 and a net income of $12,000 for the taxable year, an average pre-war net income of 9 per cent, or $2,700, and a total deduction of $5,700.

Bracket	Rate (Per Cent)	Amount Taxable Under Each Bracket	Tax
1	20	.....	.....
2	25	$ 300	$ 75
3	35	1,500	525
4	45	2,400	1,080
5	60	2,100	1,260
Total			$2,940

Attorneys for corporations liable to the excess profits tax will no doubt suggest that the Treasury Department will find itself in an awkward position should the courts on appeal by taxpayers fail to uphold these forced constructions. The answer is interesting. In the first place, it is intimated that the arbitrary rulings of the bureau are to be so favorable to the taxpayers that there will be no incentive to contest them. In the second place, the decision not to apply to Congress to amend the law relates solely to the operations of the first taxable year under the new statute. It is a foregone conclusion that additional taxing legislation will be framed by the present Congress, and in all probability at the present session, and when this is attempted an effort will be made to straighten out the excess profits tax tangle. To do so in time to have the revision apply to the taxable year 1917, however, would necessitate such haste as would give any small band of obstructionists in either house a tremendous leverage with which to force extraneous matters into the amendatory bill; hence the plan to revise the law immediately has been abandoned. W. L. C.

The total production of bituminous coal, including coal coked, according to estimates of the United States Geological Survey, was at the rate of 1,855,537 net tons per day in the first eight days of December, as compared with 1,887,534 tons, the daily average for the week of Nov. 17. This indicates that production fell but little below the high level of November.

ESTABLISHED 1855

THE IRON AGE

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CHARLES S. BAUR, *Advertising Manager*

Published Every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

Owned by the United Publishers Corporation, 243 West 39th Street, New York. H. M. Swetland, *Pres.* Chas. G. Phillips, *Vice-Pres.* W. H. Taylor, *Treas.* A. C. Pearson, *Secy.*

BRANCH OFFICES—Chicago: Otis Bldg. Pittsburgh: Park Bldg. Boston: Equitable Bldg. Philadelphia: Real Estate Trust Bldg. Cleveland: Guardian Bldg. Cincinnati: Mercantile Library Bldg. San Francisco: 320 Market Street.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

Inexperience at a Premium

That this nation's sins of unpreparedness for war would be visited on its head was inevitable. Yet that blanket must not be stretched to cover every blunder and every case of incapacity in responsible places. Investigations are coming thick and fast and resignations and readjustments are the order of the day. The United States was to profit by the grievous mistakes of Great Britain; but there seems to be that about war which makes even the largest experience of others of little value, even in the face of conditions almost identical. And at Washington there was this distinct difference from any European situation—that for years the Government had been antagonizing the men and the industries whose help was indispensable to the effective conduct of the war. These men and these industries have made a magnificent response to the calls made upon them in the past nine months; but they have been hampered by the inexperience of those who have acted for the Government in dealing with them. The paramount and continuing blunder has been the selection of men for places of authority because of their well known capacity in lines entirely apart from those with which they would have to deal on behalf of the Government.

It takes a great stretch of the mind to conceive of a fuel situation as bad as to-day's resulting from the management of a man of lifelong experience in coal and transportation. It has never happened that one man knew more about a given thing in government or industry than all the men who had had most to do with that thing. But granting that dictatorships are a war necessity, why make men dictators who are utterly without experience in the complicated matters they must handle and unused to administration on the scale of the needs of a hundred million people?

The war has been full of mistakes. Germany has had her share; her autocracy and even efficiency have given no exemption. While the counsel and cooperation of our Allies will be of vast help to the United States, our part in the great conflict will inevitably be marred by shortcomings all our own. But the country has a right to expect that when weaknesses have been disclosed the remedy shall be applied and that palpable defects in organization shall not be allowed to run on to a condition inviting disaster.

Loyal Foreign Workers

The declaration of war against Austria-Hungary was entirely logical and just, but doubtless it was delayed on account of the very large number of citizens of the dual monarchy living in this country who are not at all in sympathy with the cause of Austria-Hungary in this war and are thoroughly loyal to their adopted country. Hence it is gratifying that the President and the Attorney General have taken a strong position in favor of being lenient with citizens of Austria-Hungary in the United States. The President's proclamation declaring a state of war against Austria-Hungary does not classify the people of those countries living in the United States with German enemy aliens, nor does it require registration or impose any irksome conditions. It gives the subjects of Austria-Hungary an opportunity to show continued loyalty. They have already done this, particularly in Pittsburgh, Youngstown, Gary and other centers, where thousands of them are employed in iron and steel plants. The expressions during the past few days from their leaders indicate that the confidence imposed in them by the high officials of the Government is thoroughly appreciated. It would have been most unfortunate had any steps been taken to alienate the many subjects of Austria-Hungary who have demonstrated their strong loyalty to this country by their faithfulness in industrial work, by the organizing of recruiting committees and by their service in our armies.

Colorado Company Vindicated

In the report of the Industrial Commission of Colorado in the case of the United Mine Workers of America against the Colorado Fuel & Iron Co., which has just been published in pamphlet form, the shallowness of the claims of the union is clearly set forth. The commission finds that with the exception of the demand for recognition of the union, the grievances were nearly all of a trivial and unimportant character and could have been promptly and easily adjusted by the employees

and their employer through the channels provided by the company's industrial plan. As to the recognition of the union, the commission states that the question is one with which it has nothing to do, as the scope of its authority is limited to questions of wages, hours and working conditions. It expresses the opinion that there was no demand on the part of any considerable number of employees of the company for the presentation of the grievances and that the demand for recognition of the union was a matter of petty internal politics promoted for the purpose of advancing the interests of a faction of the United Mine Workers of America. The commission believes that there is no cause for making a demand for recognition during times like the present, when the country is at war and needs the undivided support of all its people, and that had these questions been referred for settlement "to our own citizens" no such demand would have been made. This a thoroughly sound position and in line with the understanding had at Washington months ago, that neither employer nor employee should endeavor during the war to change fundamental conditions in any way.

The report is a high tribute to the earnest effort which has been made by John D. Rockefeller, Jr., and the officers of the company to establish industrial peace and provide an adequate way for the adjustment of all difficulties. It would seem that after such positive findings by a State commission, efforts to trump up other complaints will not soon be made.

Exports of Automobiles

Early in the European war it was noticed that the exports of motor trucks had been greatly stimulated, while the exports of passenger automobiles had diminished. Of late there has been another reversal, the exports of commercial vehicles decreasing somewhat from their high point, while the exports of passenger vehicles have increased. Exports have been as follows, in fiscal years:

Number of Automobiles Exported, Fiscal Years

	Commercial	Passenger
1913	993	24,293
1914	784	28,306
1915	13,996	23,880
1916	21,265	56,234
1917	15,977	64,834

Since July 1 the exports of both commercial and passenger vehicles have been decreasing, but it is too early to determine whether this decrease will be permanent with respect to commercial vehicles, when the ability of the Entente Allies to purchase has been increased by the interest our own Government takes in the matter.

Unfortunately the Government statistics do not show the countries of destination separately for commercial and passenger vehicles; but the distribution of the total, in the past fiscal year, was largely what one might expect in peace times. There was no great preponderance of exports to the countries that are at war The rest of the world, South America, Africa, Asia and Oceania, bought heavily, as did Canada. The assumption is that the trucks went largely to the belligerents and the passenger vehicles to the neutrals. The buying power of the neutrals has evidently greatly increased as the war has been prolonged.

Conservation of Coal

Conserving coal by improving the efficiency of its use is the most satisfactory way of ameliorating the present fuel situation. Two general methods to this end were proposed at the annual meeting of the American Society of Mechanical Engineers. One of these provides a general educational plan for instructing boiler-room firemen and disseminating information on boiler operation. The other would utilize government agencies to coerce wasteful consumers of coal to improve their methods. Priority regulation of coal deliveries and firemen's licenses subject to cancellation on proved incompetency are the agencies suggested.

Both plans are open to adverse criticism. Education is looked upon as slow and inefficient in developing immediate improvement. Coercion is referred to as a drastic use of authority not warranted in democratic institutions. But the question is one of policy and the results obtainable must govern the choice of method. Education may be slow and necessarily inefficient as it depends for results on the initiative of those taught; but it may prove more profitable than the resort to coercion which may develop further confusion rather than ameliorate the situation.

Use of priority power to direct coal to those essential industries using it most efficiently or the issuance of firemen's licenses which subsequently may be recalled from men working in inefficient plants, both of which methods contemplate restriction of the manufacturing processes of plants wasting fuel, will depend for success on two factors. Can the efficiency of fuel utilization in plants be determined equitably to provide, within reasonable time, a classification as a basis for applying coercive measures? Can coercive measures be applied without diminishing the production of essential commodities?

There must be no restriction of essential production. Unless the efficient plants are capable of taking on the burdens of inefficient ones coercion must not be applied. If the present serious coal shortage continues it is likely that a diminution in production will result; and even though non-essential industries be curtailed, it is possible that sufficient fuel to maintain capacity production may not be obtainable. Coercion would then appear to be in order, but its effectiveness would depend on the fairness with which plants can be classified according to their efficiencies.

Thorough inspection of all boiler plants would be a task of great magnitude and would offer many obstacles. Efficiency cannot be determined by mere visual inspection of boiler-room apparatus and methods. Testing all boilers is practically impossible and, as test results are not accurate indications of average operating performance, this method of classification would be altogether undesirable. Data from plant records are

commonly not sufficiently accurate to justify their use. Accurate methods of measuring coal and the equivalent evaporation developed are not in general use. Also, measurements of feedwater do not determine the quantity of steam produced unless the quantity of water blown from the boiler or otherwise lost before conversion to steam is known. In fact, evaporation results based on feedwater measurements may be made to appear better than are actually obtained should the boiler man choose to do this rather than be criticized as inefficient. Load characteristics have an important influence and good performance on the day of inspection does not insure a continuation of such operation. Any plan of inspection must also include the utilization of steam, for a plant with an efficient boiler room may lose its economy through inefficient engines. Such inspection in itself would be a prodigious task.

Government coercion appears quite unnecessary. Shortage of coal is in itself a stimulus. As the coal pile of a plant dwindles, with little prospect of replenishment, the management awakens to the necessity of better utilizing the remaining fuel. Educational means, therefore, may be looked to with good expectation of results. They will be effective, no matter what further means may be used.

It is well to emphasize that coal, ashes and feedwater should be weighed daily so that comparative records of performance may be obtained by the boiler foreman and the plant management. Weighed carloads of ashes and coal will serve for this purpose, when moisture contents are determined, provided more accurate methods are not available. The steel industry also will find saving possible in the utilization of its blast-furnace gas. Boilers burning such gas usually may be improved 10 to 15 per cent in efficiency, equivalent to a saving of approximately 18 tons of coal a day for a 500-ton furnace.

There is no danger of a serious labor shortage in war industries on account of the draft for the army. At least such a view comes from the Provost Marshal General's office. Appeals have been favorably considered in behalf of pattern makers, die makers and highly skilled mechanicians in the machinery trade. A claim for a discharge must be filed with the district exemption board before the fifth day after the mailing by a local board of notice to the person concerned that his name has been certified for service. For this purpose form No. 161 or 161-a must be used. The question in the individual case is: Is the industry in question necessary to the maintenance of the military establishment, or the effective operation of the military forces, or the maintenance of the national interests during the emergency, and does the person for whom discharge is sought occupy such a status in the industry that his place cannot be filled by another without direct, substantial, material loss and detriment to the adequate and effective operation of the particular enterprise? An appeal from a final decision of a district board may be taken to the President.

CORRESPONDENCE

The Electric Arc of the Rennerfelt Furnace

To the Editor: In THE IRON AGE of Nov. 15, 1917, there appeared a very interesting article by Haakon Styri on "Electric Furnaces in Norway's Iron Industry." There are, however, a few statements in this article regarding the Rennerfelt furnace which my experience has shown to be false and to which I take the liberty to object. Mr. Styri says:

> There is very little in the feature claimed as specific to this [the Rennerfelt] furnace, that the arrangement of electrodes serves to throw the arc against the bath. Anyone will find that an arc will play against the molten charge when, with single or polyphase current, the electrodes are placed at an angle to the charge. The arc will follow the path of least resistance; that is, where the gases are hottest between the electrode ends and the bath.

I wish to refer Mr. Styri to an article by C. H. VomBaur in THE IRON AGE of May 4, 1916, which shows an actual photograph of the arc taken *when no charge was in the furnace.* It is hard to explain why the arc should be blown down, as indicated by the photograph, if it was not caused by the magnetic field set up by the current in the vertical electrode, on account of the patented arrangement of the electrodes.

That the deflected arc, as used in the Rennerfelt furnace, has a very beneficent influence on the life of the roof and the lining is a fact well proved in practice. I have records of a basic lined furnace, operating in this country, in which as many as 160 heats of steel have been made without repairs to the silica roof and side walls. The furnace mentioned is subjected to very severe service. Three heats are taken off every day in 10 to 12 hours and the furnace is left to cool off during the night. With acid lined furnaces more than 200 heats have been made without repairs. In the Stassano furnace, which is the only other furnace of any importance using a free-burning arc, results like these would be unobtainable, the reason being that in this furnace the arc is not blown down.

Mr. Styri also states that "when starting to melt down cold scrap the arc is not more steady than it is, for instance, in a 3-ton Heroult furnace." Mr. Styri's opinion in this respect differs decidedly from that of many electrical engineers who have had opportunity to inspect Rennerfelt furnaces in operation. The Rennerfelt furnace is generally considered as running more smoothly than any other electric furnace on the market, the induction furnaces excepted.

I agree, however, with Mr. Styri that the first Rennerfelt furnaces installed in the United States left something to be desired, as far as mechanical strength and shape of the furnace body were concerned. All this, however, has been corrected and improved upon in recent designs.

AXEL PAULSSON,
Metallurgist, Hamilton & Hansell.
New York, Dec. 14, 1917.

Enlistments Stopped

WORCESTER, MASS., Dec. 18.—The action of the Government in stopping enlistments of men from New England plants essential to munitions production without the signed consent of their employers and the returning on conditional discharges of men taken in the first draft has had a reassuring effect as to the stability of the working forces, and employers are hopeful of retaining the skilled men that must be the nucleus of expanded shop crews.

The American Brake Shoe & Foundry Co. is planning to erect houses for 300 families in Erie, Pa., to provide homes for additional employees required by the large extensions to the company's plant.

New Selective Service Regulations

Some of the points of the new army draft regulations emphasized by the Employers' Association of Pittsburgh follow:

The first page of the questionnaire contains a place for the registrant, or other persons for him, to claim exemption or deferred classification, and a place for a waiver, which must be sworn to. All exemptions and discharges made prior to noon on Dec. 15 are revoked. All persons filing a claim for exemption or deferred classification must do so within seven days from date of mailing of questionnaire to the registrant. An extension of time will only be granted in a few instances on a proper showing being made to the district or local board. Claims for deferred classification on the ground of engagement in industry or agriculture, together with supporting affidavit evidence, must be filed with the questionnaire, of which it is a part, with the local board. The district board shall have exclusive original jurisdiction to hear and determine all questions on claims for deferred classification of persons engaged in industries, including agriculture, found to be necessary to the effective operation of the military forces.

All appeals from classification must be filed with the local board within five days from the mailing of the notice. Appeals to the President can only be made by a registrant in Class 1, or in a class more deferred than Class 1, and only when there has been at least one dissenting vote in the district board. In industrial or agricultural cases it must be by the written recommendation of one member of the local board, and by either the Government appeal agent, or the adjutant general of the State, and in dependency cases the same proceedings, with more affidavit evidence required.

Men found disqualified for general military service, but qualified for special and limited military service, are not placed in Class 5, but are subject to induction into the military service only when a special call is made for service for which they are qualified.

Any registrant who is so far distant from his local board as to make it a great hardship for him to respond to its orders may apply to his local board to have all of his future procedure transferred to a convenient local board, supporting the request with such evidence of necessity as he cares to submit.

Experts and men highly skilled in industry or agriculture will be inducted into the military service, when the national interests will be thus better served than by leaving them engaged in industry or agriculture, and when the services of such experts are required the adjutant general will make a call upon the governors of the different States for their quota, and divide the burden equally among the States as far as practicable.

Permits for Ocean Shipments

On shipments due on all Allied Government contracts and under the new regulations made by the Traffic Executive of the Allies, 165 Broadway, New York, and the Export Division of the General Operating Committee of the Eastern Railroads, the shipper must apply for permits for railroad movement to the seaboard to the following members of the Traffic Executive, at the addresses given, for the respective countries:

FRANCE—Capt. R. H. Michel, French Commission, 8-10 Bridge street, New York.

ITALY—A. Palanca, Italian Ministry of Shipping, 291 Broadway, New York.

RUSSIA—C. J. Medzikhovsky, Commercial Attache to the Russian Embassy, 1 State street, New York.

GREAT BRITAIN—Capt. Connop Guthrie, British Ministry of Shipping, 165 Broadway, New York.

On shipments to consumers in neutral nations, the important thing now is to secure a permit of the company operating the ship which it is expected to use and this must be done before mills or railroads can be interested.

New Jersey is the first state in the United States to undertake the organization of its manufacturing industries on a war basis, with the object of assisting the Government, and this step was taken Dec. 19 at the War Convention of the Manufacturers' Council of the New Jersey State Chamber of Commerce, held at the Robert Treat Hotel, Newark. The iron and steel industry was represented by L. S. Ayre, International Motor Co., Plainfield, N. J., and Arthur E. Barlow, Barlow Foundry Co., Newark.

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A Year's Developments in Naval Ordnance

Gun-Making Capacity Largely Increased by the Added Capacity of Private Makers—New Designs and Calibers

WASHINGTON, Dec. 18.—The great assistance which the iron and steel industry of the country has afforded the Government in the manufacture of heavy guns for the Navy is acknowledged in highly appreciative terms by Rear-Admiral Ralph Earle, chief of the Bureau of Ordnance, in his annual report to the Secretary of the Navy. This co-operation has enables the department to meet promptly the very serious problem arising out of the requirement for more than 5000 guns for the protection of merchant vessels in addition to the armaments for naval vessels and for reserve purposes.

Unprecedented Demand for Guns

The present year, Rear-Admiral Earle says, has seen an unprecedented demand for guns of from 3 to 5-in. caliber, a demand entirely beyond the capacity of existing manufacturing establishments to produce. At the outbreak of the present war all spare guns from 6-in. 45 caliber to 3-pounder, inclusive, for which mounts were available, were grouped into reserve batteries and either tentatively or finally assigned to merchant ships. The bureau realized that there was a shortage of these guns, and at the time the war broke out was manufacturing approximately 300 guns to form into additional reserve batteries. The peculiar conditions of this war, however, have required approximately 5000 guns for this purpose. It immediately developed that the forging capacity of the country was entirely inadequate to meet the demands of the Army and Navy, to say nothing of the requirements of both. It therefore became necessary to start new plans in the manufacture of both guns and gun forgings.

The bureau succeeded in enlisting the services of several new firms in the Middle West and has endeavored to give them every assistance in the way of advice from skilled personnel. That more firms could not be interested was due to the fact that money to permit of plant extension was not obtainable. To relieve this situation the bureau, under date of June 5, 1917, drew up a letter to the Secretary of the Navy, requesting that Congress be asked to authorize the payment of advances to contractors, not to exceed 30 per cent of the total amount of their contract, such advance to be covered by suitable bonds. Such advances are now being made.

Nation's Gun-Making Capacity Increased

The Bureau of Ordnance is now assisting in developing increased capacity in output in the plants of the Inland Ordnance Co., Bedford, Ohio; the Taylor-Wharton Iron & Steel Co., Philadelphia, and the Alloy Steel Forging Co., at Pittsburgh. In addition the Midvale Steel & Ordnance Co. and the Erie Forge Co. have made large extensions to their plants.

The following new concerns have undertaken the manufacture of guns: The Root & Vandervoot Co., East Moline, Ill.; the Defiance Machine Works, Defiance, Ohio; the American Radiator Co., Bayonne, N. J.; the Inland Ordnance Co., Bedford, Ohio; and the Poole Engine & Machine Co., Baltimore, Md.

In addition, the resources of the Bridgeport Projectile Co. have been expanded and contracts placed with the Driggs Ordnance Co., the General Ordnance Co., the Savage Arms Co., and the American & British Mfg. Co., to the extent of their capacity. The Bethlehem Steel Co., having been assigned to the Ordnance Department of the Army, this bureau has obtained none of its new forging output. Owing to the length of time that is required for new concerns to prepare for and become accustomed to the processes of gun forging and gun manufacture, the earliest deliveries under these new capacities will not be obtained until January or February, 1918. Until that date there will be a large shortage of guns, but the bureau hopes to be able to meet the large destroyer construction program and to arm all ships being built or taken over by the Shipping Board, with but slight delay.

Progress in Design of Ordnance and Small Arms

The success of the committee on Army and Navy artillery of the Council of National Defense in bringing in new and additional sources of supply for ordnance materials has proved of very valuable assistance to this bureau.

During the past year the bureau has developed a new type of high-powered 6-in. gun, which is to be installed in the scouts. A 16-in. 50-caliber gun is nearly completed at the Washington Navy Yard, and it is anticipated that it will be proved within the next three months. Further, certain designs of new and advanced types of ordnance of a confidential nature have already been carried out.

The bureau has ascertained that the life of the large-caliber guns has been underestimated, a 14-in. 45-caliber gun having been fired a number of rounds far in excess of that considered practicable. The same holds true for the 5-in. 51-caliber gun which it was believed had a very short life. Experiments to determine the material or treatment by which erosion could be lessened have been carried out, but due to the stress of routine work and the fact that the production of standard material is urgently required at present, it had to defer the extensive program of experiments that would otherwise have been desirable.

The Bureau of Ordnance was awaiting with interest the results to be obtained by the Army Machine Gun Board that was to meet in May to determine the most suitable type of machine gun, but the approach of war made it imperative to obtain additional machine guns without waiting for the results of the May tests. With the co-operation of the major-general commandant U. S. Marine Corps, tests were held at the marine rifle range, Winthrop, Md., during April and the early part of May, and urgent orders were placed for the three types of machine guns that were readily procurable. Considerable numbers of these guns have already been delivered and larger quantities will be delivered in the near future to provide for the immediate needs of the Navy and Marine corps.

Sufficient rifles have been procured from the army to provide for the needs of vessels afloat and to partially provide for training camps. The situation regarding pistols is not yet satisfactory.

Contracts were awarded this year for all projectiles for which funds were available. The bureau has projectile contracts with 23 manufacturers. Many of these firms have not previously made projectiles for the Navy. The almost unlimited capacity of the country for projectile making was indicated when 69 firms bid on one proposal and at prices lower than any previous ones. Even with the Navy's demand for shells there are many large and well-equipped shell plants not operating, due to lack of orders.

The rate of production of armor-piercing projectiles has greatly increased and the quality of these projectiles now being delivered is better than it has been in the past. For some months it was a source of much apprehension to the bureau that no firm could deliver high-quality armor-piercing 14-in. projectiles. Difficulties encountered in their manufacture were surmounted during May; deliveries are now well ahead of contract date, and sufficient projectiles of this type are now in reserve. One English firm, Hadfield's, has a contract for such shell, but has made no deliveries to date.

The manufacture of open-hearth steel by the use of cheap unsalable scrap has been further developed, effecting considerable saving over the ordinary practice

of using practically all the heavy and higher-priced melting stock. Notwithstanding the recent increases in the market value of pig iron the cost of liquid steel from the open-hearth furnace has remained practically the same on account of the use of cheap steel scrap, which up until this time had to be sold at prices which amounted to a loss of money to the Government.

Metallurgical practices brought into effect in the bronze and brass foundry during the fiscal year 1916 have been continued with steady improvements. The immense accumulation of scrap metals which existed two years ago has been very materially reduced, and in many instances it is now necessary to resort to the use of new metals on account of the scarcity of scrap metals. On account of the scarcity of red bronze and composition scrap, consistent efforts have been made to increase the use of naval brass and manganese bronze by making a study of the various castings and the substitution of these cheaper grades of materials, for which the present supply of scrap is still more than adequate to meet all of the demands of the foundry for metals, and the use of manganese bronze during the past year has increased from approximately 188.000 lb. to 363,000 lb. per year, and of naval brass from 320,000 lb. to 637,000 lb. per year, while the use of red bronze and composition has been decreased from 908,000 lb. per year to 734,000 lb. per year.

Scrap Brass Converted Into Forging Ingots

In order to utilize the large accumulation of yellow brass scrap resulting from the manufacture of cartridge cases the manufacture of naval brass forging ingots has been further extended, until at the present time practically all the requirements of the forge shop for bronze torpedo forgings are being met by the use of forging ingots manufactured at the gun factory. The recent heavy demand for small-caliber cartridge-case scrap has made possible the developments of the manufacture of cartridge-case slabs in the crucible furnaces in the new experimental plant established under the metallurgical and testing division, which has resulted in a considerable saving to the Government. In this operation crop ends and dirty scrap resulting from the manufacture of large-caliber cartridge cases, and which were formerly considered unsuitable for further use in cartridge-case manufacture, have been melted in natural-draft crucible furnaces, and after careful treatment to free the material from foreign matter, poured into slabs, which have been used with entire success in the manufacture of one-pounder and three-pounder cartridge cases, all of which up to the present time passed proof test satisfactorily.

Operations of the smelting plant at the gun factory have continued with the same satisfactory results as reported during the previous year. Immense quantities of lower grade scrap materials have been reclaimed in the form of usable ingot material for the production of casting and forging ingots, which has resulted in holding the cost of the gun-factory output of non-ferrous castings below the regular market price for similar castings made by outside manufacturers, notwithstanding the increased market value of all non-ferrous metals.

During the past year there has been produced in the smelting plant at the gun factory from scrap metals a total of 1,704,405 lb. of casting ingots, consisting of manganese bronze 703,852 lb., naval brass 468,588 lb., and phosphor bronze or composition 531,965 lb.

Based on the average market value of ingot material of similar characteristics compared with the cost of production of the above ingot material at the gun factory, the operation of the smelting plant has, during the past year, saved the Government approximately $308,775, which amount would have been absolutely lost had this scrap been sold or given to contractors on reworking contracts. With the installation and equipping of the new smelting plant, and the operation of the electric furnace for scrap recovery, it is believed that it will be possible to make still further progress in the reclaiming of scrap materials, such as light yellow brass scrap, manganese bronze turnings, etc., which will effect considerable additional saving to the Government.

W. L. C.

STATE LABOR EXCHANGES

Co-operation with Federal Government in Labor Matters

WASHINGTON, Dec. 18.—The Council of National Defense has asked the State Councils of Defense to institute labor exchanges throughout their States, in co-operation with the Federal Department of Labor, to meet the rapidly increasing war demands for labor. Already many shipyards are in crying need of workers and in the near future the need is likely to be felt equally by munitions, steel, lumber, mining, transportation and all the other essential industries. Filling this demand is one of the most important tasks of the near future, and it is for this reason that the Council of National Defense and the Department of Labor have settled upon the new plan of labor exchanges.

Every State Council of Defense is being asked by the National Council to appoint a committee to take charge of this work under the leadership of some capable man acceptable to both capital and labor. The Department of Labor plans also to extend its system of exchanges through the funds at the disposal of its War Emergency Employment Service. The War Emergency Employment Service, when this plan is carried into effect, will consist of the United States Employment Service, the Public Service Reserve, the Boys' Working Reserve, and the State Labor Exchange. This whole system will be co-ordinated with the new system of exchanges of the State Councils of Defense, by the appointment by the Secretary of Labor of the chairman of each State Council committee as Federal Director of the War Emergency Employment Service. Thus the national and local machinery will be tied firmly together.

Seven States had already been approached by the Council of National Defense and have already appointed their industrial committees. The new request of the Council brings all the other States of the country in on the labor exchange system.

"The Iron Age's" Pamphlet on Prices of Iron and Steel Products

During the past two weeks, THE IRON AGE has received a very large number of requests for copies of the pamphlet showing prices of iron and steel products, as agreed upon by the Government and manufacturers, and has sent out copies as desired, except that it has been necessary to limit the number sent to any one person. Many very kind letters of thanks and commendation are being received, including the following from the Federal Trade Commission, Washington:

"On Nov. 12, this commission requested some copies of a pamphlet on iron and steel prices, in reply to which it received your letter of Dec. 3, stating that you were sending copies of the document under separate cover. These copies have also been received. The commission finds them so valuable in its work that it is now requesting additional copies. If it is not imposing on good nature, six more copies could be used to very good advantage."

The supply of pamphlets has not yet been exhausted and they will be sent to subscribers as long as there are any left.

The Pittsburgh Knife & Forge Co., N. S., Pittsburgh, has recently bought about 40,000 sq. ft. of ground adjoining its plant that was formerly occupied by the plant of the Diamond Forging & Mfg. Co. which will be used for future extensions. The Pittsburgh Knife & Forge Co. has recently installed some new equipment, consisting of 1500 to 1800-lb. hammers, 5-in. and 2½ in. upsetters, and other miscellaneous tools. The company recently nearly doubled its capacity for the manufacture of drop forgings, car forgings, mine forgings and shear knives.

Iron and Steel Markets

HANDICAPS INCREASED

Output Cut Down in Nearly All Districts

Large Government Orders for Structural Steel—Ferroalloy Imports Under Control

The handicaps on pig iron and steel production have been increased in the past week by heavy snows in the East and Central West, causing fresh shortages in coal and coke. The week's steel output in the Youngstown district has been only about half of the capacity; at Cleveland the American Steel & Wire Co.'s plants were closed down for nine days; in eastern Pennsylvania five furnaces were banked; 20 were banked early this week at Pittsburgh and in the two Valleys; and throughout the country the coal situation of iron and steel works has been either worse or unimproved.

At Chicago, the shortage of coal and coke is cutting down the production of some companies, while all are worried by the smallness of the margin of safety. Six blast furnaces of the Illinois Steel Co. are banked, and one furnace and one mill of the Wisconsin Steel Co. are idle. One new South Chicago stack of the Mark Mfg. Co. will go in blast early in 1918.

Following the Federal Trade Commission's cost conference with iron and steel companies at Washington, on Friday, at which the October increases in production cost were emphasized, the impression has gained strength that no important revision of existing price schedules will be made on Jan. 1. The steel manufacturers' committee met in New York Wednesday, Dec. 19, and a meeting with the War Industries Board at Washington is expected to be held next week.

Government requirements are growing, and in the heavier lines seem all-absorbing, with steel output so much reduced. Large lots of plates are given out each week. In the West an army inquiry for 40,000,000 bolts has come up, and in addition to 7500 tons of rivets bought by the Emergency Fleet Corporation, 6000 to 8000 tons for Eastern shipyards is about to be placed. Of the 1,500,000 tons of shell steel on which the Government wants delivery before June 15, about 1,200,000 tons has now been allotted to the mills.

The Government is about to buy more cars for France, and from 3000 to 9000 four-wheel cars are wanted for Italy.

Work has stopped on Russian locomotives, and many of those already built, but not shipped, may yet be converted for use at home. A large program of locomotive and car building for domestic roads, under Government auspices, is being worked out.

General export business is at a low ebb. Harassed by priority interference at mills, by the scarcity of ocean-vessel space, by delays and refusals of cars, and by frequent changes in regulations, exporters are under pressure from buyers abroad, who try for the agreed price scales. The outlook until after the war, or until Government demand is more accurately measurable, is for thin picking in exports. One successful release of plates covers 1500 tons for France, done at 4.75c. A French railroad is willing to pay 5c. at mill for some 300 tons.

The volume of structural-steel business for shipbuilding and other Government needs is surprising, but there is an almost total absence of private building work. The Bridge Builders' and Structural Society reports 138,500 tons of shop capacity put under contract in November, more than in any other month this year. The average for the preceding ten months was 94,250 tons. The monthly average of bridge and building work for 1915 and 1916, however, was 124,000 tons.

An example of the large tonnage called for at private works on Government account is 4000 tons just let for a new ordnance plant at Alliance, Ohio. Later building at the same place will require 3000 tons. The leading fabricator will be busy for most of next year on work already in hand, much of it for shipyards.

Sheet bar and billet buying has quieted down, chiefly because so little steel can be had. Some sheet mills have been unable to contract for bars, but are taking what they can get from week to week.

Pig iron consumers feel the situation tightening upon them. Central Western steel companies find it hard to get iron in the market to make up their shortages, but it is known that one of them recently closed for 22,000 tons of basic iron. Forge iron sales of 15,000 to 20,000 tons are reported at Pittsburgh. In the East, where activity has been greatest, the week has been the quietest in a long time.

Pig iron producers are now reporting each week to the Government, giving full data as to sales, production, destination of shipments and stock on hand. This serves to check up priority orders, which every week seem to be covering a larger proportion of the output.

All imports of ferroalloys or of their ores, by arrangement between the War Trade Board and importing interests, will be handled by the American Iron and Steel Institute. This was decided at a meeting in New York this week, the plan being identical with that now followed in the case of pig tin. Ferromanganese imports have dwindled to a small figure and at the same time domestic production has declined. There is a further complication from the proposal of the Government to commandeer vessels that have been depended on to bring Brazilian manganese ore to this country.

Pittsburgh

PITTSBURGH, Dec. 18—(*By Wire*).

Operating conditions in the Pittsburgh and Youngstown districts, and also in other localities, this week are very bad, probably worse than ever before, due to the shortage of coal, natural gas and cars. In the Youngstown district alone it is estimated that 7000 to 8000 men were idle at the first of the week, on account of so many plants being either closed entirely or running short time because of lack of coal. It is probable that output of steel in the Youngstown district this week will not be much above 50 per cent, if that much. All

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Dec. 19, 1917.	Dec. 12, 1917.	Nov. 14, 1917.	Dec. 20, 1916.
No. 2 X, Philadelphia...	$34.25	$34.25	$34.25	$29.50
No. 2, Valley furnace...	33.00	33.00	33.00	31.00
No. 2 Southern, Cin'ti..	35.90	35.90	35.90	25.90
No. 2, Birmingham, Ala.	33.00	33.00	33.00	23.00
No. 2, furnace, Chicago*.	33.00	33.00	33.00	30.00
Basic, del'd, eastern Pa.	33.75	33.75	33.75	30.00
Basic, Valley furnace...	33.00	33.00	33.00	30.00
Bessemer, Pittsburgh ...	37.25	37.25	37.25	35.95
Malleable Bess., Ch'go*..	33.50	33.50	33.50	30.00
Gray forge, Pittsburgh..	32.75	32.75	32.75	29.95
L. S. charcoal, Chicago..	37.50	37.50	37.50	31.75
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	....	....	....	$38.00
O.-h. rails, heavy, at mill	....	....	....	40 00
Bess. billets, Pittsburgh..	$47.50	$47.50	$47.50	60.00
O.-h. billets, Pittsburgh..	47.50	47.50	47.50	60.00
O.-h. sheet bars, P'gh...	51.00	51.00	51.00	60.00
Forging billets, base, P'gh	60.00	60.00	60.00	80.00
O.-h. billets, Phila.....	47.50	47.50	....	60.00
Wire rods, Pittsburgh....	57.00	57.00	57.00	70.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	3.685	3.685	3.685	3.159
Iron bars, Pittsburgh...	3.50	3.50	3.50	3.25
Iron bars, Chicago.....	3.50	3.50	4.50	3.00
Steel bars, Pittsburgh....	2.90	2.90	2.90	3.00
Steel bars, New York....	3.095	3.095	3.095	3.169
Tank plates, Pittsburgh..	3.25	3.25	3.25	4.25
Tank plates, New York..	3.445	3.445	...	4.419
Beams, etc., Pittsburgh..	3.00	3.00	3.00	3.25
Beams, etc., New York..	3.195	3.195	3.195	3.419
Skelp, grooved steel, P'gh	2.90	2.90	2.90	2.85
Skelp, sheared steel, P'gh	3.25	3.25	3.25	3.00
Steel hoops, Pittsburgh..	3.50	3.50	3.50	3.25

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire,	Dec. 19, 1917.	Dec. 12, 1917.	Nov. 14, 1917.	Dec. 20, 1916.
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh	5.00	5.00	5.00	4.50
Sheets, galv., No. 28, P'gh	6.25	6.25	6.25	6.25
Wire nails, Pittsburgh..	3.50	3.50	3.50	3.00
Cut nails, Pittsburgh....	4.50	4.50	....	2.95
Fence wire, base, P'gh...	3.25	3.25	3.25	2.95
Barb wire, galv., P'gh...	4.35	4.35	4.35	3.85
Old Materials, Per Gross Ton:				
Iron rails, Chicago.....	$37.00	$37.00	$35.00	$29.00
Iron rails, Philadelphia.	38.00	38.00	38.00	27.00
Carwheels, Chicago	**31.50**	31.00	27.75	21.50
Carwheels, Philadelphia..	34.00	34.00	29.00	22.50
Heavy steel scrap, P'gh..	30.00	30.00	29.00	27.00
Heavy steel scrap, Phila.	28.00	28.00	26.00	24.00
Heavy steel scrap, Ch'go .	28.50	28.50	28.00	23.50
No. 1 cast, Pittsburgh....	**30.00**	29.00	26.00	23.00
No. 1 cast, Philadelphia.	31.00	31.00	30.00	21.00
No. 1 cast, Ch'go (net ton)	**24.50**	23.50	22.50	16.50
No. 1 RR. wrot, Phila....	35.00	35.00	35.00	27.00
No. 1 RR. wrot, Ch'go (net)	31.25	31.25	31.00	25.00
Coke, Connellsville, Pet Net Ton at Oven:				
Furnace coke, prompt...	$6.00	$6.00	$6.00	$9.00
Furnace coke, future....	6.00	6.00	6.00	4.00
Foundry coke, prompt...	7.00	7.00	7.00	9.00
Foundry coke, future....	7.00	7.00	7.00	6.00
Metals,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York..	23.50	23.50	23.50	32.50
Electrolytic copper, N. Y.	23.50	23.50	23.50	32.50
Spelter, St. Louis.....	7.50	7.50	7.75	10.00
Spelter, New York.....	7.75	7.75	8.00	10.25
Lead, St. Louis.....	*6.25*	6.37½	6.37½	7.40
Lead, New York.....	*6.40*	6.50	6.50	7.50
Tin, New York.....	*85.50*	86.00	73.00	42.37½
Antimony (Asiatic), N.Y.	*15.00*	15.25	13.75	14.25
Tin plate, 100-lb. box, P'gh.	$7.75	$7.75	$7.75	$7.00

the steel companies there either have plants shut down entirely or are running very shorthanded. The situation in the Pittsburgh district is so bad that local manufacturing plants, other than those making war munitions, are expecting at any time to receive notice from Washington to close their plants, so that the entire supply of coal and electric energy available may be diverted to the plants making war munitions. Robert J. Bulkley of Cleveland, member of the priorities committee of the Council of National Defense, spent four days here recently investigating the situation, and as a result some local manufacturing plants expect to be compelled to close at any time. The Duquesne Light Co. and the West Penn Power Co. sell electric current to a great many manufacturing plants in the Pittsburgh district, and these two companies have notified many of their customers that on certain days the power will be shut off in different localities, in order to conserve as much electric energy as possible for manufacturing plants that are making war munitions. The coal situation is the worst ever known in this district, and on top of this is a deplorable shortage in cars and motive power. Hundreds of thousands of tons of raw and finished steel are piled up in yards and warehouses, waiting cars for shipment. The operating committee of the Eastern railroads is working hard trying to relieve the situation, but so far has not been able to accomplish very much. It is said there is too much conflict in authority and that this had a tendency to hold back the much needed relief in the present railroad congestion. Local conditions in the steel trade show practically no change. Blast furnaces and steel works are working under severe handicaps and output of pig iron and semi-finished steel is being severely restricted. The famine in supply of pig iron is getting worse and it is impossible to find Bessemer or basic iron in any large quantities, particularly the latter. One Youngstown interest was able to secure some 20,000 tons of basic iron, most of it coming from a near-by furnace. There is a fair demand for billets and sheet bars, but with very little steel available. New buying in finished steel is light for two reasons: some mills are not anxious to take on more obligations than they have on their books and, on the other hand, consumers are not willing to buy very far ahead, as they feel that prices on steel products may possibly be readjusted to a lower basis on Jan. 1 or shortly thereafter. It is estimated that 75 per cent or more of the new business in the various lines of finished steel products, particularly shell steel and steel plates, being placed with the mills, is on direct or indirect Government orders. Three or four of the larger open-hearth steel plants in the Pittsburgh and Youngstown districts are conserving nearly 100 per cent of their output of open-hearth steel for Government purposes.

Pig Iron.—The famine in supply of pig iron seems to be getting worse and Bessemer and basic pig iron cannot be had, except in occasional very small lots that are picked up here and there. An exception to this is the purchase recently by an open-hearth steel plant at Youngstown of about 22,000 tons of basic iron, 10,000 tons to be furnished by one furnace and the remainder divided among three or four other sellers. The local steel companies are still combing the pig iron markets everywhere trying to find pig iron, but with little or no success. There have been some fairly large sales of forge iron, probably 15,000 to 20,000 tons recently at the official price of $32 at valley furnace. On the purchase of 22,000 tons of basic iron noted above the regular price of $33, valley furnace, was paid. It is estimated that at present there are 20 or more blast furnaces in the Pittsburgh, Youngstown and New Castle districts temporarily banked waiting for coke. This is cutting down output of coke very materially in a time when it is so badly needed.

We quote as follows: Basic pig iron, $33; Bessemer, $36.30; gray forge, $32; No. 2 foundry, $33; No. 3 foundry, $32.50, and malleable Bessemer, $33.50, all per gross ton at

Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being 95c. per ton.

Billets and Sheet Bars.—The new inquiry for billets and sheet bars has quieted down, largely for the reason that intending buyers of steel became discouraged in their efforts to find it and withdrew their inquiries. Several Youngstown steel mills and also two or three in the Pittsburgh district, are furnishing Bessemer steel nearly entirely on their contracts for billets and sheet bars, desiring to conserve the last pound of open-hearth steel they can on Government war business. The output of steel in the past week or two has not been more than 75 per cent of normal, if that large, due to the shortage in pig iron and also in coal for firing gas producers. Bessemer steel is now being used for some purposes for which open-hearth steel was formerly used nearly altogether.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $47.50, sheet bars $51, and forging billets $60 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Ferroalloys.—Consumers of ferromanganese are getting somewhat worried over the outlook for a full supply in the first quarter and first half of next year, with the result that new inquiry is larger. Prices on 80 per cent domestic ferromanganese range from $245 to $250 delivered, some sellers holding for the higher price. We quote 18 to 22 per cent spiegeleisen at $62 to $65, delivered and prompt 50 per cent Bessemer ferrosilicon at $160 to $165, delivered. Most consumers of Bessemer ferrosilicon are covered by contracts at somewhat lower prices, and are getting fairly good deliveries.

We now quote 9 per cent Bessemer ferrosilicon at $54, 10 per cent $55, 11 per cent $58.30, 12 per cent $61.60. We quote 6 per cent silvery iron $40, 7 per cent $42, 8 per cent $44,50, 9 per cent $47, 10 per cent $50. Three dollars per gross ton advance for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, these furnaces having a uniform freight rate of $2 per gross ton, for delivery in the Pittsburgh district.

Structural Material.—Almost no new private work is being placed in this district. However, local fabricating concerns are receiving very heavy Government orders for steel structures of various kinds for war purposes, but under instructions from the Government are not giving out details of these contracts. An inquiry in the market is for 7000 tons of steel for a new ordnance plant to be built by the Morgan Engineering Co. at Alliance, Ohio, for which the George A. Fuller Co., New York, has the general contracts. Local fabricators are filled up for six months or more and the American Bridge Co. has all the structural work on its books it can turn out over the greater part of next year. We quote beams and channels up to 15 in. at 3c. at mill, this being the Government price, but local concerns rolling structural steel are filled up to next July or longer.

Steel Rails.—Some fairly large sales of re-rolled light rails are being made at regular Government prices, but mills rolling new light rails for billets report they are filled up for a year or more. The Carnegie Steel Co. has not taken any contracts for standard section rails for a long time, and has its light rails and standard section rail capacity engaged for the next year or more.

We quote light rails, 25-lb. and heavier, at 3c. per lb.; 16-lb. and 20-lb., 3.45c.; 12-lb. and 14-lb., 3.90c., and 8-lb. and 10-lb., at 4.35c. for full carload lots, f.o.b. Pittsburgh; for less than carload lots, down to and including five gross tons, 0.045c. extra, and small lots under five gross tons, 0.09c. extra, all per lb., f.o.b. Pittsburgh.

Plates.—As the Government demands for plates are steadily increasing, the supply from the mills available for other consumers is getting smaller. Several mills that were recently selling fair size lots of plates for prompt shipment now state they are practically out of the market for next two or three months. There is some new inquiry for steel cars, but very few actual orders are being placed. The Pressed Steel Car Co. has taken 50 hopper cars for the Michigan Alkali Co. We quote ¼-in. and heavier sheared plates at 3.25c. f.o.b. Pittsburgh, but it would be hard to find any mills that would sell plates for prompt delivery.

Sheets.—The new demand is only fairly heavy, as nearly all of the larger consumers have covered their needs over first half of 1918, except for galvanized sheets, which were sold only for first quarter delivery. The automobile trade covered some time ago for about a year ahead, but for some time has been holding up shipment to a large extent. Recently a good deal of this tonnage in sheets has been released and is now going forward when cars can be obtained. The car situation is very bad and thousands of tons of sheets are being piled up in warehouses of the mills, awaiting cars for shipment, for which the outlook is not very good. It is very probable that within a short time the Government may direct the mills to shut off shipments of sheets to concerns that are not making products essential to the prosecution of the war. Government prices are ruling firm, and these are given in detail on page 1499.

Tin Plate.—Conditions in the tin plate trade are quiet. The mills are now more concerned in getting output to apply on the contracts for this year's delivery not yet completed, and also on contracts taken for first six months of 1918. More and more Bessemer steel is being used in the manufacture of tin plate than ever before. On account of the heavy demands of the Government on all the mills for basic steel to make war products, a number of the larger tin plate mills are now running almost entirely on Bessemer steel that formerly used largely open-hearth. Several large makers of sheet bars have notified tin plate mills which they supply that in the future they will be able to furnish only Bessemer bars. Mills report there is a good demand for stock items of tin plate, which are moving out freely. We quote coke plate at $7.75 per base box, f.o.b. Pittsburgh, for Bessemer or open-hearth stock, prices on terne plate being given on page 1499.

Iron and Steel Bars.—Consumers report they are still unable to find any mills that will take their orders for either iron or steel bars for prompt shipment. On steel bars some mills are sold up for practically a year, while the two or three local mills that roll iron bars are pretty well filled up for first three or four months of next year. The large mills rolling steel bars report that specifications against contracts are only fairly heavy. The Government has been a fairly heavy buyer of both iron and steel bars for some months, and its needs will likely increase right along as the war goes on. The new demand for reinforcing bars is quiet, owing to the dullness in the building trade. We quote steel bars at 2.90c. and refined iron bars at 3.50c. in carloads, f.o.b. Pittsburgh.

Wire Rods.—Local makers report the domestic demand for wire rods as heavy, and export inquiry is also active, particularly from Canada. Several local mills are making fairly heavy export shipments of wire rods to France and Italy and also to Canada. Lately there has been some inquiry for soft rods from the Orient, but it is very doubtful whether Government licenses could be secured for shipments abroad to neutral countries. One local maker is filled up on rods over first quarter of 1918, and states it is not quoting on soft rods, but has a limited amount of high-carbon rods to sell. The Government did not fix prices on high-carbon rods, and differentials on these are arbitrary. One leading maker is said to be quoting $10 above the price of soft rods, but several other makers are quoting much higher figures. Prices on rods are given in detail on page 1499.

Wire Products.—Reports are that the Government recently placed contracts for 76,000 kegs of wire nails among the different mills to be shipped as fast as possible. One local mill took 7600 kegs of this order, while a Youngstown mill is said to have taken 25,000 kegs of the order. The domestic demand for wire and wire nails is active, but the output of wire nails has fallen off to some extent on account of the scarcity of steel. One large maker reports it is diverting all the Bessemer steel possible to its wire mills, conserving its open-hearth steel for Government work. Another concern is quoting on Bessemer wire, and has practically stopped making basic wire. There is also a fairly heavy export demand, but Government permits for export shipments are almost impossible to secure, except where it can be shown that the nails and wire are to

be used for war purposes. The trade here does not believe that the War Industries Board will make any changes in prices on wire products about Jan. 1, as reported. Prices on wire and wire nails quoted by all the mills are given on page 1499.

Nuts and Bolts.—The private demand is quiet, practically all the new business being placed for nuts and bolts being Government direct or indirect orders. The scarcity of cars is holding up shipments, but makers report deliveries of steel are fairly good. Government discounts fixed some time ago are given on page 1499.

Rivets.—Makers report the domestic demand very dull, nearly all the new buying being done by the Government on direct or indirect orders. The car situation is bad and is holding up shipments to a very great extent. There is some export demand, but Government permits are very hard to obtain. We quote structural rivets at $4.65 and iron head boiler rivets at $4.75 in carloads, f.o.b. Pittsburgh.

Hoops and Bands.—None of the mills rolling hoops and bands has any to offer for early delivery, so that the Government prices of 2.90c. on steel bands and 3.50c. on steel hoops are largely nominal. Mills have covered their trade for some months, and specifications are fairly heavy. The Government prices on steel bands are 2.90c., extras as per the steel bar card, and 3.50c. on steel hoops, f.o.b. Pittsburgh.

Shafting.—Makers report there is very little new buying by the general trade, nearly all the new business being placed coming from the Government on direct and indirect orders. It is said that fully 75 per cent of the output of shafting at present is now going to the Government. The output has been materially decreased for some time, owing to labor troubles at two or three of the larger plants that make shafting. We quote cold-rolled shafting in large and small lots at 17 per cent off list, f.o.b. Pittsburgh.

Cold-Rolled Strip Steel.—The new demand from domestic consumers is quiet, and they do not show much desire to contract ahead, feeling that prices will not be any higher, but on the contrary, may possibly be revised to a lower base. On contracts placed some time ago specifications are fairly active. The new demand from the automobile builders is dull, but several makers report that in the past week it has picked up some.

We quote cold rolled strip steel at $6.50 and hot rolled at $4.50 per 100 lb., f.o.b. Pittsburgh, terms 30 days, less 2 per cent off for cash in 10 days, when sold in quantities of 300 lb. or more.

Hot-Rolled Strip Steel.—The new demand is only fair, and makers say that the Government price is being very firmly held. We quote hot-rolled strip steel at $4.50 per 100 lb., f.o.b. Pittsburgh.

Railroad Spikes.—Makers report the new demand from the railroads is very dull, and specifications against contracts placed some time ago are very quiet. Jobbers are buying at a fairly active rate.

We quote standard sizes of railroad spikes at 4.50c.; ½-in. railroad spikes, 5.50c. base; ⅝-in. and 7/16 in., 6c. base; 5/16-in., 7c. base, per lb., f.o.b. Pittsburgh.

Wrought Pipe.—As yet, the Philadelphia Co. has not placed any part of its order for 20,000 tons of iron and steel tubular goods, but states that it expects to divide this order among five or six different mills the latter part of this week. The new demand for iron and steel pipe from the domestic trade is quiet, but the mills are filled up for months on contracts. Shipments are held up very much by the bad car situation, and many thousands of tons of pipe are piled in warehouses awaiting cars for shipment. Two leading makers of steel pipe say that they have obligations on their books, with orders that will come in from their regular trade, practically taking their entire output of pipe over all of next year. The Government is placing some fair sized orders for steel pipe, but has not placed any very large contracts lately. The new demand for butt-weld pipe is dull, owing to the large falling off in building operations. Discounts on iron and steel pipe are given on page 1499.

Boiler Tubes.—Makers of iron and steel tubes and also seamless tubing report that their output is sold up for so many months that they are not able to take on orders for prompt shipments. Demands of the Government on the mills rolling iron and steel tubing have been very heavy for some months, and are likely to get still heavier as the shipbuilding program of the Government develops. Government discounts on iron and steel tubing fixed recently are given on page 1499.

Coke.—The car situation and the labor supply in the coke regions were worse last week than at any time for some months, and the outlook for betterment in the near future is very dark. On Monday and Tuesday of last week the weather in the coke regions was below zero, with the result that hundreds of men did not report for work. On Monday one of the largest coke operators was able to load only four cars of coke. In the latter part of the week the conditions were better, the car supply varying from 30 to 70 per cent. Operators claim they are making plenty of coke to supply the blast furnaces with all they need, if they could only get cars, but it is very rarely that they are able to get more than about 50 per cent of the cars needed, and often the supply is less. Some of the furnace coke is being sold for prompt shipment at the regular Government price of $6 per ton, but very little. One leading coke producer has four or five contracts going into effect on Jan. 1 at $9 per net ton at oven, $3 per ton above the official price. The consumers who made these contracts would be perfectly willing to pay the $9 price if they were sure they would get coke as fast as they need it. One large operator has a contract with an Eastern consumer for coal at $5 per ton, but this expires Dec. 31. Efforts of brokers to induce the Federal Trade Commission to allow the commission of 25 or 30 cents per ton for selling coke have not yet been successful. A large number of blast furnaces in the two valleys and some in the Pittsburgh district are being banked from one to three days per week waiting for coke to arrive, the Carnegie Steel Co. alone having about a dozen furnaces banked awaiting coke. We quote furnace coke at $6, foundry $7 and crushed coke from one inch size $7.30, all per net ton, ovens. The *Connellsville Courier* gives the output of coke in the Upper and Lower Connellsville regions for the week ending Dec. 8 as 307,903 net tons, an increase over the previous week of 12,587 net tons. The output for week ending Dec. 15 will likely be much smaller than for the previous week, owing to the severe cold weather.

Old Material.—The railroad situation is reported by scrap dealers to be steadily getting worse, and leading dealers in this city are almost out of business. The railroads demand the war order number before they will issue a permit for a car to be loaded, and even after this is furnished by the dealer it very often happens that the railroad will not furnish the cars. Railroads under no circumstances will furnish cars for shipping scrap that is not to go into the manufacture of war materials. This condition, which has ruled here for a month or more, has cut down very materially the stocks of scrap in consumers' yards, and they are all running short. Consumers would willingly pay Government prices for scrap, but dealers say they cannot buy it at the Government prices, and they are not trying to do business. Two local open-hearth steel companies are very short of scrap and have had to shut down temporarily some open-hearth furnaces, waiting for scrap to arrive. Dealers claim they are not trying to sell above the Government prices, and if they have to pay these prices to get material, and then sell it at the same figures, they are better off without the business. No sales of scrap of moment have been made in this market for several weeks or more. The committee from the Scrap Dealers' Association that was in session recently with the sub-committee on scrap iron of the American Iron and Steel Institute also was in conference with the War Industries Board at Washington, but no definite action was taken. The scrap dealers believe they should be allowed a commission of say 5 per cent on material sold to consumers at the same prices they pay for it, but no action on this request was taken by the War Industries Board. Some dealers that have scrap sold on old contracts at higher than the Government prices are not delivering according to contract, as they say they cannot buy the material. None of

the grades of scrap on which the Government fixed prices is selling below these prices, and it would bring much higher figures were it not for the Government restrictions surrounding the market. Dealers quote for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$30.00
No. 1 foundry cast	30.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa., and Pittsburgh	38.00 to 39.00
Hydraulic compressed sheet scrap	26.00 to 27.00
Bundled sheet scrap, sides and ends, f.o.b. consumer's mill, Pittsburgh district	24.00 to 25.00
Bundled sheet stamping scrap	21.00 to 22.00
No. 1 railroad malleable stock	37.00 to 38.00
Railroad grate bars	19.00 to 20.00
Low phosphorus melting stock	38.00 to 40.00
Iron car axles	42.00 to 43.00
Steel car axles	43.00 to 44.00
Locomotive axles, steel	51.00 to 52.00
No. 1 busheling scrap	19.00 to 20.00
Machine shop turnings	20.00
Cast-iron wheels	33.00 to 34.00
Rolled steel wheels	36.00 to 37.00
*Sheet bar crop ends	37.00 to 38.00
Cast-iron borings	20.00
No. 1 railroad wrought scrap	35.00
Heavy steel axle turnings	25.00 to 26.00
Heavy breakable cast scrap	26.00 to 27.00

*Shipping point.

Chicago

CHICAGO, Dec. 18.—(*By Wire*).

With some companies the shortage of coal and coke is cutting down production, while with all the margin of safety is so small as to cause worry. For lack of coal, six furnaces of the Illinois Steel Co. are down, two at Joliet, one at Gary and three at South Chicago. In three or four days, only coal enough for one day has been shipped, not because of the lack of coal, but because of the difficulty in moving it, the lack of cars. The Wisconsin Steel Co. banked two furnaces and shut down two mills last week for lack of coal and coke, but one mill and one furnace started again this week. The outlook is dubious, and this despite the fact that the company has war orders.

Pig Iron.—Northern iron is practically sold up for the first half, but two brands of southern can be had in various silicons for future delivery. Some southern producers are out of the market. The scarcity of malleable Bessemer is causing consumers to turn to charcoal iron, of which a little is available. A maker reports inquiries so heavy that were he disposed to care for them, he could sell all he has in a few hours, but he is saving his iron for regular customers. There are charcoal inquiries for last half, but the books have not yet been opened for that period. silveries and almost unobtainable. Stack No. 1 of the Mark Mfg. Co. will go in blast early in 1918. Prices are unchanged as follows:

Lake Superior charcoal, Nos. 2 to 5	$37.50
Lake Superior charcoal, No. 6 and Scotch	40.00
Northern coke foundry, No. 1	33.50
Northern coke foundry, No. 2	33.00
Northern coke foundry, No. 3	32.50
Northern high-phosphorus foundry	33.00
Southern coke No. 1 foundry and 1 soft	38.50
Southern coke No. 2 foundry	37.00
Malleable Bessemer	33.50
Basic	33.00
Low-phosphorus (copper free)	53.00
Silvery, 7 per cent	44.54

Ferroalloys.—Eighty per cent ferromanganese is firm at $240. Contracts for 50 per cent ferrosilicon are being renewed, with carloads quoted around $155 delivered.

Plates.—Government business is large and is placed without warning. Recordable last week was the placing of 5000 tons with the leading independent mill by the Emergency Fleet Corporation. The same mill this week was allotted 5600 tons of plates, shapes and bars by the Fleet Corporation, also a lot of plates. Inquiry calls for 6100 tons of armor plate of alloy steel for tractors or tanks. Eastern mills are selling a few plates. Prices are unchanged. For material out of warehouse, the quotation is 4.45c.

Bars.—This product is more easily obtained than others. The agricultural implement makers are specifying freely and placing some new business. Iron and hard steel bar mills are operating single turn only, though bar iron is a little more active at 3.50c. Hard steel bar prices remain unfixed, but are expected to settle at 3c.

We quote warehouse prices for Chicago delivery as follows: Soft steel bars, 4.10c.; bar iron, 4.10c.; reinforcing bars, 4.10c.; base, with 5c. extra for twisting sizes ½ in. and over and usual card extras for smaller sizes; shafting, list plus 10 per cent.

Structural Material.—Local fabricators are employed on Government work. New projects are few. The Illinois Central has asked for revised bids on 1000 hopper cars. The American Bridge Co. will supply 226 tons for five girder bridges for the M. K. & T. Ry. of Texas. The Illinois Steel Bridge Co. will supply 165 tons for the Deering mines, Eldorado, Ill. United States warehouse addition at San Francisco, requiring 250 tons, goes to concrete. Wendnagel & Co., Chicago, have the contract for 1000 tons for the Englewood High School and also will supply 150 tons for a Chicago theater. Prices are unchanged. For material out of warehouse jobbers quote 4.20c.

Sheets.—The principal local maker has only blue annealed to sell. Another company has black and galvanized for first quarter, but is scanning inquiries closely, and reporting sales to the Government. Government prices prevail

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 5.45c.; No. 28 black, 6.45c.; and No. 28 galvanized, 7.70c.

Cast Iron Pipe.—Winnipeg, Man., postpones the placing of 4500 tons to Jan. 4, making the fourth postponement. Propositions are few and small and some pipe shops are shutting down.

Quotations per net ton, Chicago, are as follows: Water pipe, 4-in., $58.50; 6-in. and larger, $55.50, with $1 extra for Class A water pipe and gas pipe.

Wire Products.—Market active, especially in fencing. There is no change in prices.

Nails, $3.50, Pittsburgh; plain fence wire, $3.25; painted barb wire, $3.65; galvanized barb wire, $4.35; polished staples, $3.65, and galvanized staples, $4.35.

Bolts and Nuts.—A current inquiry calls for 40,000,000 bolts, representing about $1,000,000. For prices and freight rates see finished iron and steel, Pittsburgh, page 1501.

Store prices are as follows: Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to ⅞ x 4 in., 37½ per cent off; larger sizes, 25-5; carriage bolts up to ⅞ x 6 in., 30-2½; larger sizes, 20; hot pressed nuts, square tapped, $1.05 off, and hexagon tapped, 85c. off per 100 lb.; coach or lag screws, gimlet points, square heads, 40 per cent off.

Old Material.—Scarcity of cars is halting shipments, but difficulty in shipping east prevents scarcity in this market. The Steel Corporation is buying heavily, paying the same price for heavy melting, shovelling and frogs, switches and guards. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$37.00 to $38.00
Relaying rails	50.00 to 55.00
Old carwheels	31.50 to 32.50
Old steel rails, rerolling	35.50 to 36.50
Old steel rails, less than 3 ft	33.50 to 34.50
Heavy melting steel scrap	28.50 to 29.00
Frogs, switches and guards, cut apart	28.50 to 29.00
Shoveling steel	28.50 to 29.00
Steel axle turnings	23.00 to 24.00

Per Net Ton

Iron angles and splice bars	$36.50 to $37.50
Iron arch bars and transoms	37.50 to 38.50
Steel angle bars	26.00 to 27.00
Iron car axles	45.00 to 46.00
Steel car axles	43.50 to 44.50
No. 1 railroad wrought	31.25
No. 2 railroad wrought	29.00 to 30.00
Cut forge	29.00 to 30.00
Pipes and flues	22.00 to 23.00
No. 1 busheling	25.00 to 25.50
No. 2 busheling	17.50 to 18.00
Steel knuckles and couplers	32.00 to 33.00
Coil springs	39.00 to 40.00
No. 1 boilers, cut to sheets and rings	19.00 to 20.00
Boiler punchings	31.50 to 32.50
Locomotive tires, smooth	33.50 to 34.50
Machine-shop turnings	16.75 to 17.25
Cast borings	16.00 to 16.50
No. 1 cast scrap	24.50 to 25.50
Stove plate and light cast scrap	19.00 to 20.00
Grate bars	19.00 to 20.00
Brake shoes	20.00 to 21.00
Railroad malleable	27.50 to 28.50
Agricultural malleable	23.75 to 24.75
Country mixed scrap	19.50 to 20.50

Rails and Track Supplies.—Some standard seconds have been placed around $65, and about 500 tons of standard section rails at about $70. Mills are discouraging 1919 inquiries for rails.

Standard railroad spikes, 4.50c. to 5c., base; small spikes, 4.75c. to 5.50c., base; track bolts with square nuts, 5.50c. to 6c., all in carloads, Chicago; tie plates, $70 to $80 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38 base (nominal); open hearth, $40 (nominal). For prices of light rails see finished iron and steel, Pittsburgh report.

Philadelphia

PHILADELPHIA, Dec. 18.

The situation is very acute in this territory among blast furnaces and steel mills because of coal and coke shortage, attributed almost entirely to the congestion of railroad traffic. Several blast furnaces are banked. A large manufacturing plant, that of Henry Disston & Sons, Inc., at Tacony, has been forced to shut down because of lack of coal. The Alan Wood Iron & Steel Co. is on the verge of shutting down its entire plant and already has one of its two blast furnaces and several of its open hearth furnaces out. The Lukens Steel Co. is suffering severely from lack of gas coal and to-day expected to be forced to suspend operations at any time, its coal supply being about sufficient for one day's operation. Railroad embargoes are working a hardship, though intended as a means of relieving the freight congestion. A dozen different factors contribute to decreased production in all branches of iron and steel manufacturing, with no effective form of relief in sight as yet. Supplies of coke to the blast furnaces were beginning to come somewhat more freely when cold weather and snow storms upset all calculations. Effects of the recent cold and snow have been widespread and serious. An eastern Pennsylvania steel company estimates that its December production will be only 60 per cent of its capacity. The larger plants are doing much better than this, of course, but all of the companies which are not self-contained in coal and coke supply are suffering severely and will doubtless continue to do so. During the past week, there has been very little selling of pig iron, aside from one lot of 4000 tons of basic and another lot of 1000 tons of low phosphorus iron, the latter for immediate delivery.

Coke.—No coke is being sold in this market except for delivery late into next year. Coke sellers restrict contracts very largely to old customers. We quote blast furnace coke at $6 and 72-hr. foundry coke at $7, ovens.

Ferroalloys.—Ferromanganese is stronger, its strength being derived largely from the fact that sellers expect ore shipments to decrease, and hence are not disposed to make offerings at the concessions which recently have been easy to obtain. A principal seller in this market announces $250 as its minimum quotation for any delivery, though $245 could possibly be done in some quarters. Spiegeleisen is firm in sympathy with ferromanganese, the minimum being $60 at furnace, but sales of small lots have been made above this figure. Ferrosilicon, 10 to 14 per cent, is very scarce; in fact, prospective buyers have been unable to procure any in this market. The 50 per cent is hard to get and commands a price ranging from $175 to $185.

Billets and Slabs.—There is practically no demand for billets, slabs and blooms, and it would be difficult to find a mill in this territory willing to quote. The market is nominal at the Government price of $47.50, Pittsburgh, per ton.

Sheets.—There continues to be some selling of sheets for first quarter delivery, a single sale of 1000 tons of high carbon sheets having been made last week to a railroad company. A leading sheet producer in this district is selling subject to delays in delivery. We quote No. 10 blue annealed at 4.25c., Pittsburgh; No. 28 black at 5c. and No. 28 galvanized at 6.25c.

Structural Material.—Steel building work, except for the Government, is almost at the vanishing point. The $10,000,000 plant which was to have been erected by the Philadelphia Electric Co. has been abandoned until after the war, according to an announcement appearing in to-day's newspapers. Preliminary construction work had been started by the Stone & Webster Engineering Corporation. The building plans at first provided for steel, then the plans were changed to reinforced concrete. Shapes are being shipped in large tonnages to fabricating plants, which are at work for the American International Shipbuilding Corporation's Hog Island plant. Twenty-five of the first 50 vessels to be built by this shipyard are being fabricated in the shops of the McClintic-Marshall Co. The fabricating contracts given out cover 120 vessels, 50 of which are to be delivered to the Shipping Board by Nov. 1, 1918. This record, however, will probably be exceeded. The second lot of vessels is 70 troopships of special construction. The first keel will be laid at the Hog Island shipyard on Jan. 1, and a keel will be laid about every three days thereafter until the 50 shipways are all busy. The Bethlehem Steel Products Co. has been organized as a subsidiary of the Bethlehem Steel Corporation and will handle its warehouse business, which will be housed in a separate building at South Bethlehem, Pa. We quote shapes at 3c., Pittsburgh.

Plates.—Except for Government work, there is practically no business being done in plates in this market. There is a good inquiry for first quarter delivery, on which mills generally decline to quote unless a priority order from Washington is furnished. Some sellers of plates believe that the War Industries Board may permit a higher price to be charged after Jan. 1, but others think this a forlorn hope. The general opinion is that prices will be left where they are. No one believes that any steel prices will be reduced, and few think it possible that the War Industries Board will agree to any substantial advances. The new plate mill of the Penn Seaboard Steel Corporation, near New Castle, Del., will be ready for operation in four or five months, if present plans are successfully carried out. The Government has given an eastern Pennsylvania steel company an order for 500 gondola cars. Inquiry is also being made for 3000 to 9000 small four-wheel cars for Italy. We quote plates at 3.25c., base, Pittsburgh.

Iron and Steel Bars.—A fair business is being done in bar iron, but sales of steel bars, except occasional lots of concrete reinforcing bars, are practically nil. We quote steel bars at 2.90c., Pittsburgh, and bar iron at 3.50c., f.o.b. mill or Pittsburgh.

Old Material.—Mills are willing to buy and dealers are willing to sell, but very little business is being done because buyers and sellers have not been able to get together as to the price, particularly of heavy melting steel. Eastern Pennsylvania mills a week or so ago were paying $28, and since then sales have been made at $29. Some dealers believe that the mills must eventually pay $30, and they are not anxious to sell now below that price. The strength of the market is due to the great need of scrap by the mills, most of which are short of pig iron. The smaller dealers are holding their stocks for all that they can get. Generally they are not willing to sell at a figure very much below the $30 fixed as the maximum by the committee of the American Iron and Steel Institute and the War Industries Board. Large dealers must therefore accept a very small margin of profit or do no business at all. We quote the following prices for delivery in eastern Pennsylvania:

No. 1 heavy melting steel	$28.00 to $30.00
Steel rails, rerolling	38.00 to 40.00
Low phosphorus heavy melting	36.00 to 38.00
Old iron rails	38.00 to 40.00
Old carwheels	34.00 to 36.00
No. 1 railroad wrought	35.00
No. 1 yard wrought	33.00 to 35.00
No. 1 forge fire	23.00 to 24.00
Bundled sheets	23.00 to 24.00
No. 2 busheling	15.50 to 16.50
Steel turnings (for blast furnace use)	15.50 to 16.00
Machine shop turnings (for rolling mill use)	18.00 to 19.00
Cast borings (for blast furnace use)	15.50 to 16.00
Cast borings (clean)	20.00
No. 1 cast	31.00 to 33.00
Grate bars	21.50 to 22.50
Stove plate	22.00 to 23.00
Railroad malleable	30.00 to 32.00
Wrought iron and soft steel pipes and tubes (new specifications)	30.00 to 32.50

Pig Iron.—Troubles due to shortage of coke are more acute among eastern Pennsylvania blast furnaces than at any time this winter. Several furnaces are banked,

including one at Worth Brothers plant at Coatesville, one at the works of the Alan Wood Iron & Steel Co., and the Macungie, Crane and Topton furnaces in Pennsylvania. The Oxford furnace in New Jersey is running on about one-half capacity. In addition to troubles in production, the furnaces are having difficulty in making shipments, owing to the railroad embargoes. Nearly all of the Eastern roads now limit shipment to consignees who are engaged in making supplies for the United States Government. Many foundries, which are engaged on war work indirectly, are finding it difficult to obtain shipments because they have no Government order number. In nearly all instances, a Government envelope must now be attached to the car in which pig iron is shipped. Full information must be given to the railroad as to what the iron is to be used for. A case is cited of a foundry making application for priority shipment of 100 tons of iron, when, upon investigation, it was found that the actual Government work on hand would take just about one-half ton of iron. The 100 tons was not shipped. It grows more difficult for foundries to supply their private needs through the instrumentality of a Government order. Blast furnaces are now required to send weekly statements to J. Leonard Replogle, Director of Steel Supply, War Industries Board, and a duplicate to James B. Bonner, vice-chairman of the sub-committee on steel distribution of the American Iron and Steel Institute, similar to the reports which have been obtained from steel producers for some time past. These reports give figures as follows: (1) Tonnage brought forward from last week; (2) tonnage received during week; (3) total tonnage; (4) tonnage shipped during week; (5) tonnage cancelled during week; (6) total outstanding tonnage at end of week; (7) tonnage produced last week; (8) stock on hand; (9) total number of furnaces; number in blast; if reduced output, state cause. The report covers basic, Bessemer, foundry, malleable, low phosphorus, Bessemer ferrosilicon, and high silicon grades, spiegeleisen, ferromanganese and all other iron, including off iron. These reports, it is intimated, will assist the Director of Steel Supply in allotting iron to companies engaged on war work which need it badly, or in commandeering iron for the Government when necessary. They will also help to determine whether there is a genuine scarcity of iron, so far as the amount available for actual operations is concerned, or a theoretical scarcity based on the fact that recent demand has been greater than the apparent supply. Pig iron sellers maintain that there will not be enough iron for all users during 1918 and that many plants, particularly foundries, will be obliged to do without, and in many instances shut up shop until supplies can be produced. There is no doubt that the situation might be partially solved if there were immediate improvement in railroad transportation so that coke and other blast furnace supplies would be readily available, but under present conditions it is obvious that for some months the demand for iron will continue to exceed the supply. Practically all furnaces are sold up for the first half of 1918 on all grades of iron. Some foundry iron is available for second quarter. Sales of iron during the week were at low ebb, with the exception of one lot of 4000 tons of basic for next year and a lot of 1000 tons of low phosphorus iron for prompt delivery, negotiations for which were begun the week previous. It is understood that the National Radiator Co. is still unable to procure all of the 12,000 tons of foundry iron it needs for next year because it is not on war work. Requests for priority shipments from Washington are becoming more frequent and shipping schedules of the furnaces are considerably disturbed. In at least a few instances, furnaces still owe iron which was scheduled for shipment last July. As the needs of war contractors for iron grow more acute, further upsetting of shipments on regular contracts is to be expected. We quote the following standard grades of iron f.o.b. furnace, to which freight to destination should be added:

Eastern Pennsylvania No. 1 X	$34.50
Eastern Pennsylvania No. 2 X	33.50
Eastern Pennsylvania No. 2 foundry	33.00
Virginia No. 2 X	33.50
Virginia No. 2 foundry	33.00
Basic	33.00
Gray forge	32.00
Bessemer	36.30
Standard low phosphorus	53.00
Low phosphorus (copper bearing)	50.00

Birmingham

BIRMINGHAM, ALA., Dec. 18.

Pig Iron.—The Southern pig iron market shows very little change. Sales in small lots are still being made with a small portion only of the probable make during the first half of the coming year left to be offered and deliveries being a hard proposition. Car shortage and embargoes on connecting lines prevent furnace companies in this section of the country shipping as much iron as they would like. Accumulated stocks of iron remain about the same as they were four to six months ago. The Federal price schedule is being strictly maintained, even home consumers not being accommodated with concessions. Inquiries are numerous and requests are being made for last half of next year, but no sales are known for that period. As before, attention is being given to production in this territory and with some success. The Republic Iron & Steel furnaces at Thomas are doing well; the Sloss-Sheffield Steel & Iron Co. is repairing its No. 1 Hattie Ensley furnace at Sheffield and the new No. 2 Hattie Ensley is making iron. This furnace will have a daily capacity of 275 tons. The Woodward Iron Co., Alabama Co., Tennessee Coal, Iron & Railroad Co. and others all report production somewhat improved with prospects of last half of month showing gains over the first half, despite the fact that the holiday season always sees more or less lagging on the part of labor.

Coal and Coke.—Coal production is still being maintained well in this state, though there is loud complaint that labor is not doing all it can toward a better production. Federal instructions as to deliveries are interfering a little with the regular business though not in the aggregate production by any means. Satisfaction is expressed over the agreement arrived at between the union miners' organization and the Alabama coal operators' association in conferences at Washington last week and this removes all prospects of trouble between the two interests. Coke production is off a little in this state, said to be caused by uncertainties in coal deliveries. No contracts are being taken by coke producers, though sales are made now and then, mainly in small lots. The belief is held here that there may be an upward revision in the price schedule by the Government before long.

Old Material.—The scrap iron and steel market in the Southern territory is being held back by the car situation. Even country scrap is being gathered and cannot be brought to the dealers' yards. Inquiries are in hand for a large quantity of scrap to go into other districts, but delivery cannot be guaranteed, hence that trade cannot be accepted. Southern consumers of scrap are yet considerably below the Government prices. For instance there is no willingness to pay any more than $22.50 per ton for heavy melting steel, and hardly that price, though the Government fixed $30 as the price, at delivery point. Quotations for scrap iron and steel are about holding their own. Following prices are noted:

Old steel axles	$32.00 to $33.00
Old steel rails	28.00 to 30.00
No. 1 cast	24.00 to 26.00
Machine turnings	17.50 to 18.50
Cast iron borings	13.00 to 15.00
Railroad wrought No. 1	28.00 to 35.00
Old car wheels	25.00 to 30.00
Tramcar wheels	21.00 to 25.00
Heavy melting steel	21.50 to 22.50
Stove plate	18.50 to 20.00

San Francisco

SAN FRANCISCO, Dec. 10.

The situation in this market is one of unrest and uncertainty. Unrest, because although the Government has fixed the price on many raw and fabricated articles, they cannot be delivered in most cases, on account of the unfavorable freight situation and the inability of the Eastern mills to fill orders promptly. Uncertainty, because the jobbers seem to be beyond Government control, and, in some cases at least, are inclined to charge all they can get. Most of the jobbers are adjusting their prices to those established by the Government, but a sale of three cars of coke at $30.00 a ton is reported in one instance. A jobber's price of 4.70c. on bars and structural material has been agreed to and a meeting to be held in a day or two is ex-

pected to fix a price of 8.40c. on sheets and 5.05c. basis on galvanized plates. These prices will probably be generally adhered to as long as the jobbers can get their material at the Government prices. The advance in railroad freight rates on Western shipments will of necessity advance the prices to the consumer. It is not known here when these advances go into effect or what they amount to. The increased freight rate may have a beneficial effect on the local mills, for it should allow them to make a larger profit on rolled steel, bars and shapes, which is about all they handle that would likely be affected by the increase. As an evidence of the seriousness of the freight situation, it may be stated that the Western Pacific Railroad cannot get through a considerable shipment of structural steel for building bridges which has already been fabricated in the East, but cannot be shipped for lack of cars. With the railroads themselves on the "waiting list" the ordinary builder realizes that prompt deliveries are out of the question.

Bars.—Most of the local mills are not quoting bars until after the first of the year. By that time it is expected that the new railroad rates will be in effect. The Eastern representatives are quoting at the Government figure, but cannot promise deliveries under six months or more. The Government price is 3.65c. f.o.b. San Francisco, and the demand is heavy. The principal local dealers have established a jobbing price of 4.70c., which is somewhat lower than two weeks ago.

Structural Material.—The demand for structural material is almost exclusively from the Government or for governmental purposes. There are practically no new buildings requiring structural steel now being planned and what building is going on is mostly of reinforced concrete. The metal for these structures is fabricated in the local mills. Structural steel now in the jobbers' hands is quoted at the same price as bars. Small shapes range up to 5.00c.

Plates.—The market for plates, outside of Government demand, is very uncertain. For domestic use, they are selling from 4.05c. to 4.80c. f.o.b. San Francisco. Jobbers are selling on 5.05c. base.

Sheets.—The lower prices established by the Government for sheets has resulted in bringing about an increased demand. This it is impossible to meet on account of the shortage of freight cars. Nearly all the plate reaching this territory is for Government uses. The jobbers still have a stock which they are constantly trying to maintain. The jobbers' price recently established was 8.60c., but it is expected to be 8.40c. after the coming meeting of the jobbers.

Wrought Pipe.—The situation for wrought pipe in this market is unchanged. The Government is taking practically the entire output and the mill representatives are not catching up on their shortage of stock. The jobbers are selling what little stock they have in strict accordance with the Government prices.

Cast Iron Pipe.—The market for cast iron pipe is quiet. Only one job of material size is in sight. The Department of Public Works of Los Angeles has been receiving bids for 321 tons of 4-in., 8-in. and 10-in. pipe, but has not yet awarded the contract. Phoenix, Ariz., is in the market for 28 tons of 6-in. pipe. There is no demand from private corporations. Prices remain unchanged.

Pig Iron.—The demand for all grades of pig iron remains strong. Some Alabama furnaces are quoting Government prices for deliveries during the first half of next year. For immediate deliveries a little higher price is being offered. Malleable users are asking further supplies, the inquiry for this grade being stronger than for foundry iron. The demand is strong for pig of a higher silicon or manganese content, and the price increases as these contents become greater. Several large orders recently have been given for pig in this market, due to a great extent to the amount of Government work going on about the Bay. As this Government work increases here and in other Pacific Coast foundries the demand for iron of certain analysis to meet the Government requirements will show a corresponding increase.

Coke.—Coke is much in demand in this market and is very hard to obtain in grades satisfactory to the trade. The mills in the Bay region are willing to pay far more than the Government price if they can obtain the quality that they want.

Old Materials.—The market for scrap is heavier and prices, while they were unchanged, show a downward tendency. The supply on hand seems sufficient to take care of all demands. No. 1 machinery scrap brought from $32.00 to $35.00. About once a month 300 or 400 tons of steel scrap arrives from Mexico by steamer. But the quantity coming in this way is not enough to have any material influence on the quotations.

Buffalo

BUFFALO, Dec. 18.

Pig Iron.—It is almost impossible for users to place orders with Buffalo district furnaces for iron for delivery before July 1, and unless the situation respecting the getting in of coke and other raw materials is speedily improved, the outlook is that genuine famine conditions will prevail. A marked curtailment in production has resulted from the serious handicap many furnaces are laboring under from the blocking of transportation facilities. One producing interest reports that it has been practically closed for about a week. It is now barely running and may be obliged to bank again in a day or two if coke does not come forward meantime. Another producer reports a little selling is being done for last half, under special conditions, almost entirely to old customers depending upon this interest for supplies. The aggregate of its sales for the week was about 2000 tons, foundry grades. As a rule, furnaces are not at this time disposed to contract for last half except in a very small and conservative way. There has been no change in prices and we continue the schedule in force for the past few weeks, as follows, f.o.b. furnace, Buffalo:

No. 1 foundry	$34.50
No. 2 X	33.50
No. 3 foundry	32.50
Gray forge	32.00
Malleable	33.50
Basic	33.00
Lake Superior charcoal, f.o.b. Buffalo	39.75

Finished Iron and Steel.—Selling conditions seem to be somewhat chaotic, due to traffic congestion and inability of mills to secure sufficient fuel to keep them operating. There are quite a number of inquiries before the market and some sales of restricted sizes of steel bars are noted. The Government is taking large tonnages of plates and shapes and of large rounds, with the prospect that after the first of the year there will be even heavier demands for plates and shapes than at present. Priority orders are filling up mills to an increasing extent.

Old Material.—As a result of the shortage of pig iron there has been a large increase in demand for cast scrap. This and the activity in demand for heavy melting steel, in which commodity scarcity is becoming a more and more pronounced feature, is causing the whole list to become stronger. Machine shop turnings, heavy axle turnings, bundled sheet scrap and No. 1 busheling, particularly, show more active demand. The inquiry for heavy melting steel is so great that dealers believe the price would speedily reach $50 if left to the ordinary law of supply and demand, freed from the Government price limit. We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$29.00 to $30.00
Low phosphorus	40.00 to 42.00
No. 1 railroad wrought	34.00 to 35.00
No. 1 railroad and machinery cast	31.00 to 32.00
Iron axles	45.00
Steel axles	45.00
Carwheels	33.00 to 34.00
Railroad malleable	31.00 to 32.00
Machine shop turnings	18.00 to 18.50
Heavy axle turnings	26.00 to 27.00
Clean cast borings	19.00 to 20.00
Iron rails	37.00 to 38.00
Locomotive grate bars	20.00 to 21.00
Stove plate	22.00 to 23.00
Wrought pipe	26.00 to 27.00
No. 1 busheling scrap	26.00 to 27.00
No. 2 busheling scrap	17.00 to 18.00
Bundled sheet stamping scrap	19.00 to 20.00

New York

NEW YORK, Dec. 19.

Pig Iron.—Demand continues very active and to a large extent unsatisfied. An illustration of the difficulty with which orders are placed was furnished by an inquiry for 6000 tons of foundry iron which was quietly circulated within the last few days for delivery the first half of next year. The would-be buyer was unable to place the business and many other inquirers for smaller tonnages had similar experience. The American Locomotive Co. is in the market for 3000 tons of various grades, including low and high silicon foundry iron and basic, for delivery first quarter of 1918 at its Richmond plant. Very little Southern iron is being sold, but a few melters who are afraid they will not be able to obtain enough Northern iron to meet their requirements are buying the Southern product. The railroad situation is still unsatisfactory and the snow and cold weather have made the movement of freight trains slower than usual. It is almost impossible to obtain permits for exports. For early delivery we quote as follows:

No. 1 X	$35.25
No. 2 X	34.25
No. 2 Plain	33.75
No. 2 Southern (rail and water)	$38.75 to 39.25
No. 2 Southern (all rail)	39.15 to 39.65
No. 2 X Virginia	37.00 to 37.25

Ferroalloys.—The market for domestic ferromanganese is quiet but firm. While sales of a few small lots have been made in the last week at about $245, it is not believed that further purchases could be made under $250, which is now the general quotation for any delivery. One inquiry has come up for 1200 tons for second and third quarter delivery, besides one for 350 tons for first half. The spiegeleisen market is probably a little firmer, but only moderately active. One consumer is in the market for 1800 tons for delivery in the second and third quarter, while another will probably buy 2000 to 3000 tons for next year. The quotation is $60 furnace. Imports of ferromanganese in November were probably the lowest in any month in two years—less than 1000 tons. It is also reported that domestic production is falling off rapidly due to the shutting down of numerous furnaces. Ferrosilicon, 50 per cent, is strong and active at $150 to $175. The fact that certain European countries are demanding 75 per cent to 90 per cent ferrosilicon for use in making hydrogen gas is seriously interfering with the regular output of the 50 per cent grade in certain localities. Ferrotungsten is quoted at $2.40 to $2.50 per lb. of contained tungsten, New York, with the ore concentrates selling at between $20 to $26 per unit in 60 per cent material, depending on the grade. Ferrovanadium ranges from $4 to $5, Pittsburgh, per lb. of contained vanadium for prompt delivery in small lots. Ferrocarbon-titanium, 15 to 18 per cent, is selling at 8c. per lb. in carload lots, 10c. per lb. in ton lots and 12½c. per lb. in lots less than a ton, f.o.b. Suspension Bridge, New York.

Finished Iron and Steel.—New buying is substantially negligible. Dullness is particularly true of export trade. Added to the uncertainties of securing licenses, and in particular of getting transportation on the railroads, let alone securing ship space, is the special procedure which has to be followed in the case of shipments for Allied Governments, or for a buyer in a neutral country. For the Allied Governments permits for railroad transportation have to be made through one of the foreign representatives of the Traffic Executive, so called, at 165 Broadway, New York, according to regulations made by these representatives and the export division of the general operating committee of the Eastern railroads. In the case of a shipment to a neutral country, the permit of the ship company must be obtained before railroads or mills will consider the business. A recent sale of 1500 tons of plates for use in one of the allied countries is noted at 4.75c., Pittsburgh, and a little over 300 tons for a French railroad has been offered to a mill at 5c. at the mill. Many forms of finished steel are obtainable in round lots in 60 to 90 days, but conditions beyond the control of the mills are a decided check. Increasing quantities of material for Government use appear to be going to the mills and no concern is felt over the diminished demand for private domestic consumption. The surprising figure of 77 per cent for the rate of November fabricating business follows 61½ per cent for October, yet there are no developments in private building work. We quote mill shipments of steel bars at 3.095c., New York; shapes 3.195c., plates 3.445c. and bar iron 3.695c., New York. Out of store prices are 1c. higher and to all must be added 3 per cent of the freight charge for the transportation tax.

Old Material.—The heavy snow has multiplied the troubles of the scrap dealers and the movement of old material during the past few days has been very light. The scarcity of pig iron is reflected in high prices being paid for the various grades of cast-iron scrap. Cast-iron carwheels, particularly, are in demand and considerably higher prices have been paid. For relaying rails there is a wide range of prices, according to the quality of the rail and other considerations, and as high as $75 per ton has been paid. The demand for heavy melting steel is fairly active and prices are somewhat higher. We quote prices of brokers as follows to New York producers and dealers, per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania	$26.00 to $26.50
Old steel rails (short lengths) or equivalent heavy steel scrap	26.00 to 26.50
Relaying rails	60.00 to 70.00
Rerolling rails	38.00 to 39.00
Iron and steel car axles	41.00 to 42.00
No. 1 railroad wrought	32.00 to 33.00
Wrought-iron track scrap	32.00 to 33.00
No. 1 yard wrought long	32.00 to 33.00
Light iron	9.00 to 10.00
Cast borings (clean)	17.50 to 18.00
Machine-shop turnings	17.50 to 18.00
Mixed borings and turnings	14.00 to 15.00
Wrought-iron pipe (1 in. minimum diameter), not under 2 ft. long	28.00 to 28.50

Dealers in New York City and Brooklyn are quoting as follows to local foundries, per gross ton, but for delivery to cupola platforms of Brooklyn foundries about $3 more is quoted:

No. 1 machinery cast	$29.00 to $30.00
No. 1 heavy cast (column, building materials, etc.)	23.00 to 24.00
No. 2 cast (radiators, cast boilers, etc.)	23.00 to 24.00
Stove plate	20.00 to 21.00
Locomotive grate bars	20.00 to 21.00
Malleable cast (railroad)	29.00 to 30.00
Old carwheels	33.00 to 35.00

Cast-Iron Pipe.—The cast-iron pipe market is almost at a standstill, due largely to the failure of Government officials to take any action in regard to prices. Nominal quotations continue at $56.50 for 6-in. and heavier and $59.50 for 4-in.

Cleveland

CLEVELAND, Dec. 18.

The ore shipping season has come to a close with all consumers practically sure that they will have enough ore to last them until the opening of the next season's navigation. The water shipments for the season, 62,498,901 gross tons, were 2,235,297 tons behind last year, but look large when compared with years previous to 1916 when 50,000,000 tons was not reached. The shipments for the season are considerably in excess of what had been expected until a remarkable record was made in November, this being possible because of good weather that lasted through the month. December shipments were 911,475 tons, being far ahead of any previous December except last year, when 1,085,900 tons was moved. The last ore cargoes were shipped from Escanaba Dec. 12. However, navigation was practically brought to a close three or four days earlier by the cold wave, which caused a suspension of movement of boats from Duluth, and compelled some vessels that had gone to Lake Superior ports for cargoes to lay up there for the winter. Shipments of Lake Superior ore to inland blast furnaces in November amounted to 3,562,442 gross tons, making the movement to furnaces for the season up to Dec. 1 34,779,452

tons, as compared with 35,521,229 tons for the corresponding period last year. The amount of ore on dock Dec. 1 is slightly heavier than on that date last year. Lake Erie docks held 10,023,743 tons on Dec. 1, as compared with 9,958,306 tons on Dec. 1, 1916. We quote prices as follows: Old range Bessemer, $5.95; old range non-Bessemer, $5.20; Mesaba Bessemer, $5.70; Mesaba non-Bessemer, $5.05.

Pig Iron.—There is a good demand for foundry and malleable iron for the first half, and an increased volume of inquiry for last half contracts for both grades. Furnaces are taking care of their regular trade as far as they are able to for the first half, and most producers are booking last half orders. The contracts in all cases are not subject to revision should there be a readjustment in prices. There is still a heavy unsatisfied demand for basic iron. Among Government inquiries is one for 2000 to 3000 tons of foundry and malleable iron for the Westinghouse Electric & Mfg. Co. Southern furnaces are well sold up for the first half, and several have no iron to offer for that delivery but are taking on some last half contracts. Several sales of high silicon Southern iron in lots of 500 tons and under were made during the week. Many foundries are using more scrap than usual and desire iron running 4.25 per cent and higher in silicon in their mixture. Little high silicon iron is being produced at present by Northern furnaces. There is considerable inquiry for Ohio silvery iron, which is very scarce, and furnaces are far behind on shipments. The cold weather has interfered with blast furnace operations, and this with the unimproved car situation is making it more difficult for consumers to secure iron as needed. While no foundries are reported as compelled to shut down, some have a very limited supply of iron on hand. The curtailment in the automobile production has affected some of the large malleable foundries that specialize in automobile castings, and these are now looking for Government orders to replace their automobile business. While their melt has fallen off, they expect that they will need all the iron they have purchased, and have notified producers that they wish deliveries to the full amount of their contracts. We quote, delivered Cleveland, as follows:

Bessemer	$37.25
Basic	33.30
Northern No. 2 foundry	33.30
Southern No. 2 foundry	37.00
Gray forge	32.30
Ohio silvery, 8 per cent silicon	46.12
Standard low phosphorus, Valley furnace	50.00

Coke.—There has been no relief in the coke shortage, and some furnaces having Government work have found it necessary to appeal to the fuel administrator to secure small lots for prompt shipment. Brokers have been able for the most part to cover their regular trade with foundry coke contracts, and are receiving numerous inquiries from other sources, but are unable to secure any additional coke to sell.

Finished Iron and Steel.—The demand for steel for Government requirements continues heavy, and consumers are pressing the mills for deliveries on steel for Government work. While there have been a number of suspensions of contracts and some cancellations in the automobile field, a renewal of activity in this field is shown by the placing of specifications for round lot shipments wanted during January by one of the largest automobile manufacturers. There is a large volume of inquiry for semi-finished steel, particularly for sheet bars, but the supply is insufficient to meet the demands. One consumer, who was asking for 2500 tons of sheet bars a month, offered to take any quantity at any time, and a Cleveland mill took the order on that basis. The demand for structural material has improved. This has been very light for some time because of the high prices, and at least one mill is able to take orders for structural shapes for prompt shipments. The George A. Fuller Co. has given the Bethlehem Steel Co. an order for 4000 tons of steel for the new ordnance works of the Morgan Engineering Co., Alliance, and the building program of this company calls for additional structures requiring 3000 tons more. The Navy Department has placed a 350-ton hammer head crane with the McMyler Interstate Co., Bedford, Ohio. This will require 2500 tons of steel. The Government received bids for three of these cranes, but it is understood that the other two will not be placed at present. The John Gill & Sons Co., Cleveland, general contractor, will place contracts shortly for 2500 tons of steel for the Philadelphia Public Library building. The Republic Structural Iron Works Co. was low bidder for 900 tons for an addition to the municipal light plant in Cleveland. Among inquiries pending is one for 1900 tons of structural material for work for the Brier Hill Steel Co. and another for 1500 tons for a municipal bridge in Columbus, Ohio. There is a good demand for steel rails for early shipment, and several small lot sales are reported at $70 to $75. The demand for steel bars for early shipment is active. The demand for plates has quieted down somewhat, and these are now quoted at 4c. to 4.25c. by a local mill that is making sales at higher than the Government price. To replace the wrecking tug Favorite, taken over by the Government, the Great Lake Towing Co., Cleveland, will build a large tug, 200 tons of steel for which will be furnished by several mills. Makers of hard steel bars have reduced prices from 3.25c. to 3c. at mill, which is now being generally quoted. As no extra is charged for twisting, the price of these bars for reinforcing purposes has been brought down to the same basis as soft steel bars without Government regulation. The demand for black and blue annealed sheets continues heavy, and some of the mills are entirely sold up for the first quarter. Galvanized sheets are moving rather slowly. We quote warehouse prices as follows: Steel bars, 4.03½c.; plates, 4.38½c.; structural material, 4.13½c.; No. 10 blue annealed sheets, 5.35c.; No. 28 black sheets, 6.35c.; No. 28 galvanized sheets, 7.60c.

Old Material.—The condition of the scrap market has become very unsatisfactory from the standpoint of the dealer. Owing to the regulation of prices, dealers claim that they cannot do business at a profit on heavy melting steel, borings and turnings. Producers are unwilling to sell heavy melting steel under $30, the Government price, and mills will not pay more than that. As a result, many dealers are making no efforts to do business in the Government regulated grades. Some of the mills would buy steel scrap, but there is no inducement to the dealers to make sales at the Government price, unless they can buy at lower prices. There are some reports, not confirmed, that dealers have paid higher than the Government price for heavy melting steel to cover on high priced short sales. While not active, the market is very firm, and prices on several grades are higher. There is a good demand from steel foundries for low phosphorus melting scrap, sales of which are being made from $38 to $39. Dealers quote, f.o.b. Cleveland, as follows:

	Per Gross Ton	
Steel rails	$26.00 to	$27.00
Steel rails, rerolling	36.00 to	37.00
Steel rails, under 3 ft.	34.50 to	35.50
Iron rails	35.00 to	36.00
Steel car axles	45.00 to	46.00
Heavy melting steel	29.00 to	30.00
Cast borings	18.00 to	18.40
Iron and steel turnings and drillings	18.25 to	18.75
No. 1 railroad wrought	34.00 to	35.00
Hydraulic compressed steel scrap	24.50 to	25.50
Carwheels	26.50 to	27.50
Relaying rails, 50 lb. and over	50.00 to	60.00
Agricultural malleable	22.00 to	23.00
Railroad malleable	28.00 to	29.00
Steel axle turnings	23.00 to	24.00
Light bundled sheet scrap	20.00 to	20.50
	Per Net Ton	
Iron car axles	$44.00 to	$45.00
No. 1 busheling	24.00 to	25.00
No. 1 cast	24.00 to	25.00
Railroad grate bars	18.00 to	18.50
Stove plate	18.00 to	18.50

Bolts, Nuts and Rivets.—There is a heavy demand for bolts and nuts for Government work and for the Allies. Among inquiries pending is one from the Quartermaster's department of the Army for 35,000,000 bolts. A heavy volume of rivet orders is coming out for shipyards. The Emergency Fleet Corporation has placed 7500 tons of rivets for an Eastern shipyard, and two other orders from the East, aggregating 6000 to 8000 tons, are pending. Several other inquiries have come from the United States Shipping Board. We quote rivets at 4.65c., Pittsburgh, for structural and 4.75c. for boiler rivets.

Cincinnati

CINCINNATI, Dec. 18—(*By Wire*).

Pig Iron.—The outstanding feature is the heavy buying of southern basic iron by nearby melters. One contract involves 10,000 tons while another is under negotiation calling for about double that tonnage. This iron is for first half shipment and it is rumored that the recent bookings made by an Alabama furnace have about exhausted its first half supply. Foundry iron sales are confined to off iron that different producing interests can offer. Very little can be had that is not high in sulphur and even this off iron is taken without delay by melters who have to fill in on their first half requirements. A little high silicon iron in the south was offered this week, but the furnace interests having this for sale cannot take on much future business. The foundries are more anxious than heretofore to contract for a last half supply, believing that the present base price of $33 will probably be increased instead of reduced. Selling agencies are not urging purchasers to buy for the delivery named and it is probable that some important transactions may be postponed until after the holidays. Based on freight rate of $2.90, Birmingham, and $1.26 from Ironton, we quote f.o.b. Cincinnati as follows:

Southern coke, No. 2 foundry and 2 soft	$35.90
Southern Ohio coke, No. 2	34.26
Basic, Northern	34.26

Coke.—The situation continues to grow worse and shipments that producers are able to start forward are subject to almost indefinite delays. Connellsville and Wise County operators are the only ones that are now taking on any new business, with the exception of some by-product coke that is available, but the amount is exceedingly limited. The nearby foundries are running very close to shore on a supply and unless shipments are moved more promptly within the next few days a few of them will be compelled to close down.

Finished Material.—The local warehouses have now decided to take full advantage of the 18½c. freight rate from Pittsburgh to Cincinnati, although heretofore they only added 18c. so as to make even figures. The following are jobbers' quotations: Iron and steel bars, 4.08½c. Twisted bars are as follows: ¾ x 1¼-in., 4.23½c.; ⅝-in., 4.33½c.; ½-in., 4.43½c.; ⅜-in., 4.63½c., and ¼-in., 4.88½c. Structural shapes are 4.18½c.; plates, ¼-in. and heavier, 4.43½c.; No. 10 blue annealed sheets, 5.43½c. Cold rolled shafting 10 per cent discount from list. Business is curtailed as few shipments could be made to out-of-town customers on account of the railroad congestion. Local building operations are also temporarily suspended. The warehouse price of wire nails is $4.10 per keg base. The mill quotation on No. 28 black sheets is 5.18½c. and No. 28 galvanized sheets, 6.43½c., f.o.b. cars Cincinnati or Newport, Ky.

Old Material.—Dealers state that there is a good demand for wrought scrap from the rolling mills, but they are still very much handicapped in getting shipments forward. For the past week it was almost impossible to ship anything to the Pittsburgh district, and milder weather has relieved the situation only to a slight extent. Priority orders are of course necessary and these cause considerable delay. The following are dealers' prices, f.o.b. cars, southern Ohio and Cincinnati:

Per Gross Ton	
Bundled sheet scrap	$17.50 to $18.00
Old iron rails	32.00 to 32.50
Relaying rails, 50 lb. and up	44.00 to 44.50
Rerolling steel rails	33.00 to 33.50
Heavy melting steel scrap	25.50 to 26.00
Steel rails for melting	24.50 to 25.00
Old carwheels	27.00 to 27.50

Per Net Ton	
No. 1 railroad wrought	$29.00 to $29.50
Cast borings	13.00 to 13.50
Steel turnings	13.00 to 13.50
Railroad cast	18.50 to 19.00
No. 1 machinery cast	25.00 to 25.50
Burnt scrap	14.00 to 14.50
Iron axles	40.00 to 40.50
Locomotive tires (smooth inside)	33.50 to 34.00
Pipes and flues	15.00 to 15.50
Malleable cast	19.50 to 20.00
Railroad tank and sheet	14.50 to 15.00

Powdered Coal for Malleable Iron Melting

POWDERED coal as a fuel for melting malleable iron is being used only experimentally but should prove adaptable to this service according to views brought out in a paper presented by Joseph Harrington, Chicago, before the American Foundrymen's Association at its annual meeting in Boston, Sept. 25. He said that he knows of but one instance of malleable iron melted with powdered coal on a commercial scale and this, though brief, indicated that had the work been continued economical operation would have been effected.

Sustained high temperatures which he attaches to the use of powdered coal leads him to believe that this form of fuel will reduce the time required for heating the charge to the melting point and for melting it after that point is reached. This he held advantageous, contending that during the heating period combustion is least complete and the loss of fuel greatest and that in the melting period loss of valuable ingredients in the iron is most likely to take place, so that increased rapidity in both events leads to economy.

After all of the iron is liquified and covered with slag it is, he explained, protected from the effects of furnace gases, and the presence of more or less oxygen has no appreciable effect on it, so that excess air can be proportioned to produce high temperatures. He believes that with powdered coal these may exceed 3000 deg. In this connection he said that the flame, using powdered coal, can be controlled so that complete combustion will take place within 5 or 6 ft. of the burner even when it is delivering 500 or 600 lb. of coal per hour. The point of most intense temperature, he added, is about at the end of the flame, and a pile of iron should liquify promptly, as the flame temperature is perhaps as high as 3500 to 4000 deg.

Effect on Furnace Lining

Regarding the effect that the flame of powdered coal may have on the brick of the furnace lining, he contended that this should be no greater than with ordinary methods, as the powdered coal jet does not impinge directly on brick work. Good brick, he believes, should withstand a temperature of 2800 deg. indefinitely and 3000 deg. for moderate periods, and he doubts that these temperatures are frequently reached in malleable furnaces.

Flexing effect, he held, is more serious, but he feels that this can be kept under control. The chemical analysis of furnace slag, he said, does not differ in quality from the analysis of coal ash and the addition of melted coal ash to the bath does not alter anything except the range of its chemical constituents. Should the coal ash bring one element greatly in excess of the others, he suggests that it would be possible to introduce materials to counteract this.

All the evidence which he has been able to obtain from his experience with this fuel in malleable service indicates, he said, that there was an actual diminution in the burning out of carbon to the extent of 2 to 5 per cent, rendering it necessary to decrease the amount of new pig in the charge to that extent in order that the character of the iron be the same.

The Minster Machine Co., Minster, Ohio, is making additions to its plant that will be 30 x 200 ft. and 72 x 150 ft., both one story and of brick and steel construction. Nearly all equipment has been purchased but the company is in the market for an 8 or 10-ton electric crane, floor operated.

The Greaves-Klusman Tool Co., Cincinnati, builder of engine and automatic lathes, has purchased the plant and equipment of the Champion Tool Works, Cincinnati, and will use the property as an erecting plant in addition to its own present works.

The Wharton Steel Co., Wharton, N. J., has again placed its No. 1 blast furnace in operation, following the recent fire which destroyed a section of the works. The rebuilding and repairs were accomplished in 14 days.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on iron and steel articles, aside from wrought iron and steel pipe in carloads, per 100 lb., New York, 19.5c.; Philadelphia, 18.5c.; Boston, 21.5c.; Buffalo, 11.6c.; Cleveland, 13.5c.; Cincinnati, 18.5c.; Indianapolis, 20c.; Chicago, 21.5c.; St. Louis, 27c.; Kansas City, 47c.; minimum carload, 36,000 lb.; St. Paul, 35.5c.; minimum carload, 36,000 lb.; Denver, 79c.; minimum carload, 36,000 lb.; Omaha, 47c.; minimum carload, 36,000 lb.; New Orleans, 30.7c.; Birmingham, 46c.; Pacific Coast, 75c.; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is 90c.; minimum carload, 40,000 lb. and 85c.; minimum carload, 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 40c. per 100 lb., minimum carload 46,000 lb.; to Omaha 40c., minimum carload 46,000 lb., to St. Paul 35.5c., minimum carload 46,000 lb.; Denver 79c., minimum carload 46,000 lb. *A 3 per cent transportation tax now applies.*

Structural Material

I-beam, 3 to 15 in.; channels, 3 to 15 in. angles, 3 to 6 in on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 3c.

Wire Products

Wire nails, $3.50 base per keg; galvanized, 1-in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1-in., $2.50. Bright basic wire, $3.35 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.25; galvanized wire, $3.95; galvanized barb wire, and fence staples, $4.35; painted barb wire, $3.65; polished fence staples, $3.65; cement-coated nails, $3.40 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 47 per cent off list for carload lots, 46 per cent for 1000-rod lots, and 45 per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large rivets ..... $4.65 base
7.15 in. x 6 in. smaller and shorter rivets..45-10 per cent off list
Machine bolts h.p. nuts, ⅝ in. x 4 in.
Smaller and shorter, rolled threads.....50-10 per cent off list
Cut threads ..... 50-5 per cent off list
Larger and longer sizes..... 40-10 per cent off list
Machine bolts, c.p.c. and t. nuts, ⅝ in. x 4 in.
Smaller and shorter..... 40-10 per cent off list
Larger and longer..... 35-5 per cent off list
Carriage bolts, ⅜ in. x 5 in.
Smaller and shorter, rolled threads.....50-5 per cent off list
Cut threads ..... 40-10-5 per cent off list
Larger and longer sizes..... 40 per cent off list
Lag bolts ..... 50-10 per cent off list
Plow bolts, Nos. 1, 2, 3..... 50 per cent off list
Hot pressed nuts, sq. blank..... 2.50c. per lb. off list
Hot pressed nuts, hex., blank..... 2.30c. per lb. off list
Hot pressed nuts, sq., tapped..... 2.30c. per lb. off list
Hot pressed nuts, hex., tapped..... 2.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank..... 2.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped....2.00c. per lb. off list
Semi-finished hex. nuts.
⅝ in. and larger..... 60-10-10 per cent off list
9/16 in. and smaller..... 70-5 per cent off list
Stove bolts ..... 70-10 per cent off list
Stove bolts ..... 2½ per cent extra for bulk
Tire bolts ..... 50-10-5 per cent off list

The above discounts are from present lists now in effect. All prices carry standard extras.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $57; chain rods, $65; screw, rivet and bolt rods and other rods of that character, $65. A tentative differential of $10 per ton over soft rods for high carbon rods has been agreed upon.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $5 to $5.50; ¾ in., 7/16 in. and ½ in., $7, base. Boat spikes, $5.25 per 100 lb., f.o.b. Pittsburgh. Track bolts with square nuts, 7c. to 7.50c. to railroads, and 8c. to 8.50c. in small lots for fairly prompt shipment.

Terne Plate

Effective Nov. 7, prices on all sizes of terne plates are as follows: 8-lb. coating, 200 lb., $15 per package; 8-lb. coating, I. C., $15.30; 12-lb. coating, I. C., $16.75; 15-lb. coating, I. C., $17.75; 20-lb. coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.90c. for delivery late this year, and 4.50c. to 5c. from warehouse in small lots for prompt shipment. Refined iron bars, 3.50c. in carload and larger lots, f.o.b. mill.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card, as announced Nov. 5 by the Government on steel pipe, those on iron pipe being the same as quoted for some time:

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	44	17½	⅛ and ¼	23	+4
½	48	33½	⅜	24	+3
¾ to 3	51	37½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	44	31½	1¼	18	3
2½ to 6	47	34½	1½	25	11
7 to 12	44	30½	2	26	12
13 and 14	34½	..	2½ to 6	28	15
15	32	..	7 to 12	25	12

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	40	22½	⅛, ¼ and ⅜	22	5
½	45	32½	½	27	14
¾ to 1½	49	36½	¾ to 1½	33	18
2 to 3	50	37½			

Lap Weld, extra strong, plain ends

2	42	30½	1¼	19	4
2½ to 4	45	33½	½	25	11
4½ to 6	44	32½	2	27	14
7 to 8	40	26½	2½ to 4	29	17
9 to 12	35	21½	4½ to 6	28	16
			7 to 8	20	8
			9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots f.o.b. Pittsburgh, announced Nov. 13, as agreed upon by manufacturers and the Government:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.	34	3½ to 4½ in.	12½
2½ to 3¼ in.	24	3 to 3¼ in.	+ 5
2¼ in.	17½	2½ to 2¾ in.	+ 7½
1¾ to 2 in.	13	2 to 2¼ in.	+22½
		1¾ to 1⅞ in.	+35

Standard Commercial Seamless—Cold Drawn or Hot Rolled

	Per Net Ton		Per Net Ton
1 in.	$240	1¾ in.	$220
1¼ in.	280	2 to 2½ in.	190
1⅜ in.	270	2¾ to 3¾ in.	180
1½ in.	220	4 in.	200
		4½ to 5 in.	220

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net or 2 per cent discount in 10 days.
[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer	*Cents per lb.*
Nos. 3 to 8	4.20
Nos. 9 and 10	4.25
Nos. 11 and 12	4.30
Nos. 13 and 14	4.35
Nos. 15 and 16	4.45
Box Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21	4.80
Nos. 22 and 24	4.85
Nos. 25 and 26	4.90
No. 27	4.95
No. 28	5.00
No. 29	5.05
No. 30	5.15
Galvanized Black Sheet Gage—Bessemer	
Nos. 10 and 11	5.25
Nos. 12 and 14	5.35
Nos. 15 and 16	5.50
Nos. 17 to 21	5.65
Nos. 22 and 24	5.80
Nos. 25 and 26	5.95
No. 27	6.10
No. 28	6.25
No. 29	6.50
No. 30	6.75
Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16	4.80
Nos. 17 to 21	4.85
Nos. 22 to 24	4.90
Nos. 25 and 27	4.95
No. 28	5.00
No. 29	5.05
No. 30	5.05
Nos. 30½ and 31	5.10

Metal Markets

The Week's Prices

Cents per pound for early delivery

Dec.	Copper, Lake	New York Tin, Electro-lytic	Lead—New York	Lead—St. Louis	Spelter—New York	Spelter—St. Louis
12	23.50	23.50	85.50*	6.50	6.37½	7.75	7.50
13	23.50	23.50	85.50*	6.45	6.30	7.75	7.50
14	23.50	23.50	85.50*	6.40	6.25	7.75	7.50
15	23.50	23.50	85.50*	6.40	6.25	7.75	7.50
17	23.50	23.50	85.50*	6.40	6.25	7.75	7.50
18	23.50	23.50	85.50*	6.40	6.25	7.75	7.50

*Nominal.

NEW YORK, Dec. 19.

The markets are all extremely dull. The copper situation is without feature at the controlled prices. Tin is nominal and scarce. Lead is slightly easier. Spelter is unchanged and in poor demand. Antimony is lifeless.

New York

Copper.—Official information is hard to obtain but it seems certain that there will be no change in the Government price of 23.50c. in the wholesale market and 24.67½c. in the jobbing market for at least the first quarter. These prices are the market levels at which considerable business has been done for prompt and December delivery and for the first quarter, including orders outside of Government work. It is estimated that war needs are not requiring any more than 75 per cent of the total production. Satisfaction in the trade seems to be general as to the manner in which supplies are being regulated.

Tin.—The movement reported last week as on foot to put aside all import restrictions regarding tin has failed. The obtaining of licenses became necessary on Dec. 12 and there has been considerable confusion since. The delays attending the securing of such licenses have been such that docks are burdened with metal as custom houses cannot accept tin until licenses are in the hands of importers. This involves additional expense to importers. There has been no delay in the obtaining of guarantees as to consumers through the American Iron and Steel Institute. The entire market has been extremely quiet the past week. The selling of Banca tin to needy users by a large consumer, referred to last week, has proceeded on a small scale since. There have been inquiries for prompt shipment from England with but little metal available. The market for spot Straits is nominal at 85c. to 86c., New York, with practically none offered in this market. Arrivals to date have been 1015 tons, with 4400 tons reported afloat. The London market is again higher at £305 per ton, or £6 higher than a week ago.

Lead.—The announcement is made that there will be no fixing of a price for lead for the present at least. This is taken to mean that there is sufficient lead to meet all needs and that price-fixing is unnecessary. The decision comes as a surprise because it is contrary to what was generally expected. The Government's purchases are probably to be regulated as in the recent past according to the quotations of a leading trade paper. In the last week domestic business has been very light, with the tone of the market easy. There has been an improvement in inquiry for export. Prices have eased off slightly until yesterday lead was quoted at 6.40c., New York, or 6.25c., St. Louis, for early delivery. The leading interest, continues to quote 6.25c., New York. During the week it is understood that there has been further negotiations with the Government as to additional supplies.

Spelter.—The market continues featureless and very dull. There has been some buying by galvanizers recently but general demand is at a low ebb. It is stated that many producers are operating at a loss at present prices which are 7.50c., St. Louis, or 7.75c., New York, for prime Western for early delivery. Production is gradually diminishing, due to the shutting down of certain smelters, but even at that the supply is still more than equal to the demand. The only factor that keeps the price from going lower is that of cost. Railroad congestion between here and St. Louis is also interfering seriously with the execution of contracts. The Government will receive bids on Friday, Dec. 21, on 1000 tons of grade C spelter which is only a little better than prime Western. The details, if obtainable, are expected to be interesting. Because of the official decision just reached not to fix any price on lead at present, it is not expected that anything will be done toward regulating spelter prices.

Antimony.—Demand has not increased and the market has again become dull with the grades available a little lower at 15c. per lb., New York, duty paid, for early delivery.

Aluminum.—In a dull market No. 1 virgin metal, 98 to 99 per cent pure, is unchanged at 36c. to 38c. per lb., New York, for early delivery.

Old Metals.—The market is very dull. Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible (nominal)	23.50
Copper, heavy and wire (nominal)	23.50
Copper, light and bottoms	21.00 to 21.50
Brass, heavy	17.00 to 17.25
Brass, light	12.00 to 12.25
Heavy machine composition	23.75 to 24.25
No. 1 yellow rod brass turnings	14.25 to 14.50
No. 1 red brass or composition turnings	19.00 to 19.50
Lead, heavy	5.75
Lead, tea	4.50
Zinc	5.75

Chicago

DEC. 18 (*By Wire*).—There is considerable call for casting copper from foundries having Government orders. Tin is moving in small lots only. Lead has been fairly active. All the other metals are weak and dull. We quote copper in part carloads at 24.62c.; tin, 88c. to 95c.; lead, 6.50c. to 6.62½c.; spelter, 7.50c. to 7.62½c. Old lead pipe is quoted at 4.90c., tinfoil at 50c. and block tin at 55c., all in less than carload lots.

Imports of Ferroalloys and Their Ores to Be Controlled

The importation of the various ferroalloys and their ores, including chrome ore, cobalt, ferromanganese, manganese ore, molybdenum ore, titanium ore, tungsten ore and vanadium ore, is to come under the regulation of the War Trade Board. At a meeting in New York on Monday, Dec. 17, of nearly all the importers of these metals and minerals, at which was present Frederick B. Peterson, director of the Bureau of Imports of the War Trade Board, it was decided that the regulation of such imports would be placed in the control of the American Iron and Steel Institute, the arrangement being similar to that now in effect regarding tin imports and distribution. Details have not yet been worked out, but the object of the new plan is chiefly to secure co-operation in obtaining import licenses and thus facilitate the importation of these commodities.

The regular monthly meeting of the Pittsburgh Foundrymen's Association was held in the Fort Pitt Hotel, Pittsburgh, Monday evening, Dec. 17. There was a Christmas dinner, followed by a vaudeville entertainment. W. S. Diggs, chairman of the Pittsburgh 4-minute men, made a very stirring address on the subject of "Co-operation." A collection was taken amounting to $2,425.50 to aid the Permanent Blind Relief War Fund for Soldiers and Sailors.

The Great Northern Railway has awarded a contract to A. Guthrie & Co., Inc., 366 Jackson Street, St. Paul, Minn., for improvements costing about $1,000,000 in its ore docks at Allouez Bay, Superior, Wis.

The Reading Iron Co., Reading, Pa., has completed the relining and other improvements at its Keystone blast furnace, and plans to place the stack in operation about Jan. 1.

IRON AND INDUSTRIAL STOCKS

Market Shows No Strength—Government Advances Funds to Finance Bethlehem Munition Contracts

The general decline in the stock market continues and some industrial stocks touched lower values than they reached in the panic ten years ago. No market is available for securities, such as Great Britain found here in her period of financial adjustment to a war basis. Bond prices also have moved to lower levels.

Announcement has been made from Washington that $2,000,000 will be advanced the Bethlehem Steel Corporation on munition contracts to eliminate delay in securing necessary increased working capital from private sources. This action is considered timely. From now on it will doubtless be more generally a war policy, and its value in expediting war contracts and preventing a further tightening of an already depleted money market cannot be overestimated.

The range of prices on active iron and industrial stocks from Tuesday of last week to Wednesday of this week was as follows:

Allis Chalm. com.	15¼ - 16	Int. Har. Corp. com.	51 - 52
Allis Chalmers pf.	65 - 70	Lacka. Steel	71¼ - 79
Am. Can. com.	30½ - 35⅛	Lake Super. Corp.	10⅝ - 11
Am. Can pf.	88 - 90	Midvale Steel	40½ - 42
Am. Car & Fdry. com.	60½ - 64	Nat.-Acme	26 - 26¾
Am. Loco. com.	46⅞ - 50½	Nat. En. & Stm. com	32 - 34⅜
Am. Loco. pf.	94	N. Y. Air Brake.	99 -109
Am. Radi. com.	255	Nova Scotia Steel	60 - 61
Am. Ship com.	90 - 91½	Press. Steel com.	49 - 50½
Am. Steel Fdries.	50½ - 53	Press. Steel pf.	93 - 95
Bald. Loco. com.	50¼ - 54	Ry. Steel Spring com.	39½ - 40⅝
Bald. Loco. pf.	98	Ry. Steel Spring pf.	95¾
Beth. Steel com.	66¾ - 72⅞	Republic com.	69½ - 73
Beth. St., Cl. B.	66⅞ - 73½	Republic pf	92
Beth. Steel pf.	85	Sloss com.	34 - 35
Can. Car & Fdry. com.	15	Superior Steel	32 - 34
Can. Car. & Fdry. pf.	42	Superior Steel 1st pf.	96
Cent. Fdry. com.	26¼ - 28	Un. Alloy Steel	35 - 36
Cent. Fdry. pf.	38 - 40	U. S. Pipe com.	10⅛ - 11
Chic. Pneu. Tool.	39½ - 41	U. S. Pipe pf.	44
Colo. Fuel	30 - 32½	U. S. Steel com.	79⅞ - 85⅝
Cruc. Steel com.	46⅞ - 51	U. S. Steel pf.	102⅞ -106¾
Cruc. Steel pf.	86 - 87½	Va. I. C. & Coke.	48 - 50
Deere & Co. pf.	91½ - 95	Warwick	8 - 8½
Gen. Electric	118 -123½	Westingh. Elec.	33¾ - 36¾
Gt. No. Ore. Ct.	23⅛ - 24¾		
Gulf States Steel.	83 - 84		
Int. Har. of N. J. com.	103¼ -107½		

Wheel Company's Progress

The Sewell Cushion Wheel Co., Detroit, held a convention of its branch managers recently in the general offices of the new factory, which was completed last year. H. J. Sewell, president of the company, called attention to the fact that the first set of Sewell wheels was manufactured back in 1908. In 1909 the gross sales amounted to less than $1,000; 1910, $3,000; 1911, $11,000; 1912, $28,000; 1913, $72,000; 1914, $120,000; 1915, $198,000; 1916, $310,000, and the sales for 1917 will run over three-quarters of $1,000,000. Sewell wheels have been adopted and endorsed by some of the largest operators of trucks in the country, including the American Radiator Co., Bethlehem Steel Co., Chicago Telephone Co., Crane Co., Library Bureau, Liquid Carbonic Co. and Standard Oil Co. A banquet was given at the Detroit Athletic Club, and in addition to the branch managers, it was attended by H. J. Sewell, president; J. H. Hammes, vice-president; W. T. Sewell, treasurer; Ralph S. Moore, secretary; Arnold B. Cooper, director; Chas. Rider, director; Geo. L. Allen, factory manager; Fred B. Boylan, sales manager; James C. Sallee, advertising manager, and C. H. Shaw, credit manager.

Harbison-Walker Refractories Company's Annual Report

The fifteenth annual report for the year ended Sept. 30, 1917, of the Harbison-Walker Refractories Co., Farmers Bank Building, Pittsburgh, was sent to stockholders last week. President H. W. Croft in his report to the stockholders says in part:

"The abnormal conditions of business referred to in our letter of last year have not only carried through the present year, but in addition, our plants have operated at a largely increased capacity. The earnings as shown are after estimated income and excess war taxes have been deducted, and your officers feel under all the circumstances the showing made is satisfactory."

The balance sheet follows:

Assets

Property account		$28,142,802.00
Betterments, completed		2,075,071.78
Betterments, uncompleted		1,008,392.24
Deferred charges to future operations (Includes clay and ganister outfits ($320,016.95), advanced royalties, stripping, prospecting, uncompleted extraordinary repairs, etc.)		546,005.78
Current assets:		
Inventories	$1,586,882.51	
Accounts receivable	3,746,817.41	
Bills receivable	4,095.83	
Cash	2,575,919.32	
		7,913,715.07
Investment securities:		
Investments of reserves	1,925,806.42	
Other securities	788,322.62	
		2,714,129.04
Total assets		$42,400,115.91

Liabilities

Capital stock:		
Preferred (6 per cent cumulative)	$9,600,000.00	
Common	18,000,000.00	
		$27,600,000.00
Reserves:		
Clay, coal and ganister properties depletion fund	$251,275.00	
Sundry reserves	3,299,649.36	
		3,550,924.36
Current liabilities:		
Accounts payable	$983,339.51	
Pay rolls	248,776.81	
		1,232,116.32
Surplus		10,017,075.23
Total liabilities		$42,400,115.91

The annual meeting of stockholders of the company will be held in its general offices, Pittsburgh, Jan. 21, 1918.

Will Be Consolidated

Announcement has been made that the Pusey & Jones Shipbuilding Co., Wilmington, Del., and the Pennsylvania Shipbuilding Co. and the New Jersey Shipbuilding Co., both located at Gloucester, N. J., are to be consolidated. The new company will have $10,000,000 8 per cent cumulative preferred stock and the same amount of common stock. The three plants will continue operations. It is stated that the consolidation has been planned for the purpose of speeding up work for the Government.

Christoffer Hannevig, majority owner of all three concerns, will be the president. Associated with him will be Finn Hannevig, vice-president; Henry Lysholm, vice-president and general manager of the shipbuilding plants; H. E. Norbom, vice-president, treasurer and managing director; C. Stewart Lee, assistant managing director, and R. N. Bulowa, secretary.

Dividends

The American Brake Shoe & Foundry Co., quarterly, 1¾ per cent on the common, 2 per cent and extra 2 per cent on the preferred, all payable Dec. 31.

The Canadian Locomotive Co., quarterly, 1½ per cent on the common and 1¾ per cent on the preferred, payable Jan. 1.

The Empire Steel & Iron Co., 3 per cent and extra 5 per cent on account of accumulated dividends on the preferred, payable Jan. 2.

The Sloss-Sheffield Steel & Iron Co., 1¾ per cent on the preferred, payable Jan. 2.

The Standard Screw Co., quarterly, 6 per cent on the common and 3 per cent on the preferred A, payable Jan. 1.

The United Shoe Machinery Co., quarterly, 50c. on the common and 37½c. on the preferred, payable Jan. 5.

The Wheeling Steel & Iron Co., quarterly, 2 per cent and extra 2 per cent, payable Dec. 21.

To meet requirements of railroads for data upon which to fix priority of shipments, Joseph T. Ryerson & Son, Inc., Chicago, has adopted a questionnaire which is sent to all its customers along with its invoices, asking them to classify the material ordered, as (1) required on orders received direct from the Government, (2) for work required by the Government but not ordered by it direct, (3) required for use in manufacture of articles not included in two preceding classes.

Piez General Manager of Shipbuilding

Latest Reorganization of Shipping Board Results in Business Man Being Given Much More Power—Chairman Hurley Optimistic as Admiral Harris Retires

WASHINGTON, Dec. 18.—A sweeping investigation of the United States Shipping Board and Emergency Fleet Corporation was ordered by the Senate to-day as the result of the latest upheaval in that dual organization, following which Admiral Harris, general manager of the corporation, has tendered his resignation and Charles A. Piez, vice-president of the corporation, has been chosen to succeed him. The patience of Congress has been exhausted by the numerous squabbles that have occurred in the shipping board and that have prevented anything like a satisfactory speeding up of the shipbuilding program. The investigation ordered to-day will be made by the Senate Committee on Commerce and will be outlined at a preliminary meeting to be held this week. The resolution directs the committee to investigate the "plans and progress and all matters in connection with the building of merchant ships" by the shipping board and fleet corporation with a view to making remedial recommendations to Congress.

The latest revolution in the shipping board finally severs the relation between that organization and the Navy Department. When Admiral Capps retired, partly because of failing health, but also because of friction with other officials of the shipping board and the fleet corporation, Chairman Hurley suggested to the President that another naval officer be detailed to fill the vacancy. This action, it is now said, was taken for diplomatic reasons, and it is intimated that Mr. Hurley was even then convinced that an experienced business man must take hold of the fleet corporation in order that real progress might be made with the building of the big emergency fleet, the contracts for which now call for more than 8,000,000 tons deadweight.

The Admiral's Resignation

Admiral Harris' resignation was announced here this morning in newspaper publications evidently inspired by his friends. It was represented in these statements that he had "found it impossible to build ships because of the hesitation and vacillation of his superiors," and that although he entered upon his task with great enthusiasm, there have been "innumerable meetings of committees, interminable consideration and discussion, but no action." It was also said that Admiral Harris was held in check by red tape and that his "dynamic energy" was hampered by the "system of dual authority" by which the operations of the board and fleet corporation have been governed. It was added that "the resignation of Mr. Hurley as chairman would not be unexpected."

For the purpose of presenting the other side of the case and in his own defense Chairman Hurley to-day made a formal statement in which he gives his version of Admiral Harris' difficulties and declares that under the board and fleet corporation as now reorganized all the expectations of the Administration and of the public as to the rapid building of ships will be fully realized. Mr. Hurley's statement is as follows:

Chairman Hurley's Statement

"The Emergency Fleet Corporation was organized in the same form as other large and successful corporations. The chairman of the shipping board is the president of the fleet corporation, and there are two vice-presidents, Mr. Donald of the board and Mr. Piez, elected several weeks ago. There is a board of trustees which corresponds to the usual board of directors, and of which the president, vice-president and members of the shipping board are members. The organization is precisely the same as that of the usual corporation.

"In order to expedite the actual production of ships, the ground work of plans having been laid by previous managements, Mr. Piez, one of the most noted engineers and organizers in the country, was requested by me to effect a reorganization. This reorganization is nearly completed. Its success is assured by the fact that it derives its inspiration from the actual conditions in the shipyards of the country. Mr. Piez was head of our production committee which investigated conditions in the shipyards, spending considerable time in many of the representative plants.

"Admiral Harris, upon the retirement of Admiral Capps on Dec. 1, on account of ill health, was designated general manager. While the reorganization was in progress he suggested to me that the Emergency Fleet Corporation be moved to Philadelphia. I suggested that a matter of this kind, involving policy as well as possible legislative approval, would certainly have to be submitted to the board of trustees, as it would be submitted in any corporation to the board of directors. He also wanted to give his immediate approval to an expenditure of $12,000,000 for housing operations in connection with the shipyards. This being a departure from the corporation's function of shipbuilding, I felt that the trustees should pass upon it. Admiral Harris then expressed the opinion that his authority was to be limited and he would be able to render more service elsewhere. The board of trustees concurred in this judgment, feeling that their duty required careful consideration of projects apart from shipbuilding.

Tribute to Piez

"Mr. Piez' grasp upon the whole shipbuilding program has been so strong, and his knowledge of actual conditions in the yards so definite as a result of his study in the field, that the best results can be obtained by combining his functions as vice-president with those of general manager. He has been designated as general manager. Former Rear Admiral Bowles, whose practical shipbuilding experience was gained as president of the Fore River Shipbuilding Co., and who has for a long time been in actual charge of construction plans, is to be assigned an important part in the direction of affairs. James Heyworth has been placed in charge of wooden ship construction and Charles Day, another prominent engineer and production expert, is to be manager of the production department.

"Underlying the reorganization which has been completed was the desire to bring the fleet corporation closer to the shipyards. Mr. Day, for instance, served with Mr. Piez in the personal visits of the production committee to the shipyards, where actual construction conditions were ascertained. Mr. Day then went to England where he made an exhaustive investigation into the methods which prevail in the shipyards there. He has now returned and becomes one of the important factors in our speeding-up program.

Pleasing Prospect

"The result of the reorganization already is apparent in all the yards. Lloyd's has just made a report which has been carefully checked up and which shows that there is a better basis for optimism than there has been at any time since the emergency program was launched. The conditions on the Pacific Coast have so improved that records are being broken in the speed with which ships are being turned out. Admiral Bowles' reports show that construction work is progressing as fast as human labor can turn it out. The plans of last May have been translated into hulls on the shipways and ships on the seas. We are close to the point where the results of what has been done will be apparent to everyone. Admiral Bowles' carefully checked figures show 8,395,306 deadweight tons under construction and under contract."

War Problems Discussed with Editors of the Business Press

Editors of the leading business papers of the country to the number of 65 gathered at Washington in the New Willard Hotel on Thursday, Dec. 13, for the second conference of the year on business and economic issues growing out of the conduct of the war. The first conference held at the same place in May had for its keynote "The more effective use of the business energies of the country through a closer co-operation of the business press with the Government." At that time five Cabinet members and various other leaders in the war activities at Washington addressed the editors. The conference of last week was held in view of the important developments at Washington in the past six months and in the expectation that the men who are forming and carrying out the Government's war plans should by this time give a clearer idea of ways in which the business press could help the Government.

The principal speakers of the day were F. W. Taussig, chairman of the United States Tariff Commission; Eliot Wadsworth, vice-chairman American Red Cross; Dr. Harry A. Garfield, fuel administrator; Frederick A. Delano, member of the Federal Reserve Board; E. N. Hurley, chairman of the Shipping Board; J. D. A. Morrow, secretary of the National Coal Association; Senators Francis G. Newlands and Atlee Pomerene; W. E. Hall, United States Public Service Reserve; Dan C. Roper, commissioner in charge of collection of excess profits; A. W. Shaw, chairman commercial economic committee, Council of National Defense; Dr. Anna Howard Shaw, women's committee, Council of National Defense, and C. A. Richards, chief of bureau of exports.

Much light was thrown on the latest developments in the problems of fuel, labor, railroad transportation, shipping, finance, taxation and war relief.

Detroit Shell Co. Has Big Contracts

DETROIT, Dec. 18.—The Detroit Shell Co. has been organized by Detroit manufacturers with a capitalization of $2,000,000. Government shell orders amounting to $30,000,000 have been promised and more are to come later. John Kelsey, president Kelsey Wheel Co., has been elected head of the new company. It is expected that 10,000 men will be employed. The plant will be in operation as soon as machinery can be shipped into Detroit and installed.

E. G. Grace, president of the Bethlehem Steel Corporation, told the 500 guests of the Allentown, Pa., Chamber of Commerce at its banquet last Thursday night that the submarine destroyers which the Bethlehem Shipbuilding Corporation will build for the Government are more than all of the destroyers now in the world. Mr. Grace said he regarded the rapid construction of destroyers as the solution of the submarine menace. Mr. Grace said that of the entire ship construction of the United States, war vessels and merchantmen included, the companies of the Bethlehem Steel Corporation are bearing more than half of the burden. The Bethlehem plants now employ 30,000 men as compared with 9000 five years ago. Charles M. Schwab, who also spoke, said that the payroll of the Bethlehem plants is now $100,000,000 a year.

The publishers of *Lefax*, Lefax, Inc., Philadelphia, are now including a number of sheets on military subjects as a part of their loose-leaf data sheet service. The sheets so far issued consist of digests of Government publications on such subjects as the cleaning, care and operation of rifles, semaphore and other forms of signaling, etc.

Fire in the plant of the Michigan Limestone & Chemical Co., Buffalo, caused damage to machinery in one building to the extent of $10,000. Most of the machinery had been moved to the company's new plant or the damage would have been greater.

Lake Ore Shipments in 1917 Less Than in 1916

The final report from Lake Superior iron ore docks shows that the total movement of lake ores by water in the season just closed was 62,498,901 gross tons. This is a decrease from last year of 2,235,397 tons, or 3.45 per cent. Judged from the shipments of last year, the movement of ore by water, together with the all-rail shipments, which are not known until the close of the year, will probably make a total for 1917 of about 64,250,000 tons. The movement of ore by vessel in December this year was not as large as the extraordinary shipments last year. The total was 911,475 tons, or 74,425 tons less than in December, 1916—a decline of 16.06 per cent. The following table gives the shipments by ports for 1917 and the three preceding years:

Iron Ore Shipments from Upper Lake Ports—Gross Tons

Port	1917	1916	1915	1914
Escanaba	7,156,856	7,457,444	5,649,289	3,664,454
Marquette	3,207,145	3,858,092	3,099,589	1,755,726
Ashland	7,597,841	8,057,814	5,146,772	3,363,419
Superior	13,978,741	12,787,046	8,342,793	11,309,748
Duluth	20,567,419	21,837,949	15,437,419	6,318,291
Two Harbors	9,990,901	10,735,853	8,642,942	5,610,262
Total by lake	62,498,901	64,734,198	46,318,804	32,021,900
Total all rail	.....	1,924,268	953,947	707,826
Total shipments	.....	66,658,466	47,272,751	32,729,726

The shipments from Minnesota alone for the season—over 44,500,000 tons—were not far from the total season movement of 46,318,804 tons in 1915. The Great Northern ore dock is credited with 18.51 per cent of the total this year, against 17.13 per cent last year, while Duluth and Two Harbors contributed this year less of the total than last year by 0.83 per cent and 0.59 per cent respectively. The Marquette range shipped nearly 1 per cent less of the total this year than in 1916. The 1917 movement is next to the largest recorded, that of 49,070,478 tons in 1913 ranking third.

Shipbuilding Companies Consolidated

The Pusey & Jones Co., Wilmington, Del., which has a large shipyard at that city, has increased its capital stock from $1,250,000 to $20,000,000 and will take in the Pennsylvania Shipbuilding Co. and the New Jersey Shipbuilding Co., which have adjoining plants at Gloucester, N. J. The three companies are largely owned and controlled by Christoffer Hannevig, 139 Broadway, New York, a Norwegian capitalist. Mr. Hannevig will be president of the Pusey & Jones Co., H. E. Norbom, vice-president and general manager of the manufacturing department; Finn Hannevig, vice-president; Henry Lysholm, vice-president and manager of the shipbuilding department; R. B. Bullowa, secretary; Stewart Lee, assistant managing director. The number of employees at each of the three yards will soon be greatly increased to take care of Government shipbuilding contracts.

Anti-Publicity Order

CHICAGO, Dec. 19 (*By Wire*).—Manufacturers and their agents in Chicago have received the following relative to Government orders emanating from the general engineer supply depot, the notice being signed by Lieut. Col. W. H. Rose: "Hereafter no information whatever will be given to the public, without the prior consent of this office, relative to orders you are handling for the general engineer depot. These instructions must be transmitted to your employees and strict adherence thereto enforced by you."

The Virginia Chain Co. has nearly completed its new plant at Parkersburg, W. Va., and nearly all machinery has been purchased and installed. The plant is now about ready for operation, and the concern states it is ready to take on orders for hardware chain, proof coil chain, steel loading chain, crane and dredge chain, and all other kinds of welded chain. This concern is also figuring on making a patent anti-skid chain for use on automobile trucks, for which it expects a heavy demand.

PERSONAL

William M. Bailey has resigned his position as assistant to the president of the Midvale Steel & Ordnance Co., Philadelphia.

George Gorton, president Gorton Machine Co., Racine, Wis., has presented the First Baptist Church of Racine with a brick clubhouse and auditorium building erected at his expense at cost of approximately $65,000. The formal presentation ceremonies will be held on Christmas Day.

W. C. Swartley and John J. Regan, sales manager and superintendent, respectively, of the Tioga Steel & Iron Co., Philadelphia, have resigned to take effect Jan. 1. They will go into business for themselves, trading under the name of the Philadelphia Steel & Iron Co., with offices in the Commercial Trust Building. They will make a specialty of forgings and other iron and steel products.

L. W. Adams of Bethlehem, Pa., has been appointed general superintendent of the Nova Scotia Steel & Coal Co.'s plant at Trenton, N. S.

James G. Nixon, of the Cleveland office of Manning, Maxwell & Moore, Inc., has been commissioned as First Lieutenant of Infantry, Officers' Reserve Corps, and has been ordered to report to Fort Riley, Kan.

George L. Fairbank, of Fairbank & Co., Cleveland, iron ore dealers, and their traffic manager, have just completed an extensive trip over the different Lake Superior iron ranges.

W. A. Lownds, for several years assistant purchasing agent for the Fulton Iron Works, St. Louis, has resigned to become purchasing agent for the O'Neil Iron Works, Inc., Buffalo.

Samuel A. Benner, vice-president, Federal Export Corporation, 115 Broadway, New York, has sailed for Buenos Aires, Argentina. His visit will comprehend an investigation covering the possible future requirements of the southern republics in steel and he will also supervise the extension of the company's branch house system.

The Blaw-Knox Co., Pittsburgh, has closed its Philadelphia office for the present. O. B. Pulis, who had been in charge of this office, has been transferred to its San Francisco office, replacing Irving Burrows, who is going into Government service.

B. F. Affleck, president, Universal Portland Cement Co., Chicago, was re-elected president of the Portland Cement Association at its annual meeting at the Hotel Biltmore, New York, Dec. 12.

L. S. Love resigned as sales manager of Sherritt & Stoer Co., Philadelphia, to become general manager of The Machine Tool Engineering Co., Singer Building, New York.

George A. Rees has been appointed general purchasing agent of the Chicago Pneumatic Tool Co., with headquarters at 913 Fisher Building, Chicago, vice R. S. Baker, who has found it necessary to devote his entire time to his duties as auditor.

J. C. Bannister has been made a vice-president of the Walworth Mfg. Co., Boston, manufacturer of iron pipe fittings, valves, Stillson wrenches, etc. He has been connected with the manufacture of this type of product for 26 years, starting as foreman at the tapping department of the Haxtun Steam Heater Co., Kewanee, Ill., in 1891. He advanced successively to superintendent of pipe finishing mill and chief engineer. For three years he was superintendent of the Kewanee Boiler Co., and when the National Tube Co. took over the operation of Kewanee plant, he was made manager. The Walworth Mfg. Co. purchased the Kewanee works in August, 1917, but Mr. Bannister's headquarters will remain at Kewanee.

F. S. Rutherford, district sales agent at Denver, Col., for the Youngstown Sheet & Tube Co., has resigned to become a Y. M. C. A. secretary, and will sail for France shortly. Mr. Rutherford recently won the first prize of $1,000 for a war marching song offered by the New York *Herald*. The title of Mr. Rutherford's song is "Give Me a Kiss, Mirandy."

Chas. S. Ash, until recently employed by the Wire Wheel Corporation of America as its chief engineer and inspector, has resigned to accept a similar position with the National Wire Wheel Works, Inc., Geneva, N. Y., manufacturer of wire wheels for automobiles. Mr. Ash will have complete charge of the engineering and manufacturing parts of the business.

N. B. Payne has opened an office in the Havemeyer Building, 25 Church Street, New York, as an electric crane specialist. Mr. Payne was formerly associated with Manning, Maxwell & Moore, Inc., New York.

John E. Liggett, president of the Connecticut Brass & Mfg. Corporation, has resigned to become chairman of the board of directors. He is succeeded by Harry W. Goddard, former vice-president, as president.

L. B. Schofer, Reading, Pa., has been elected a director of the Reading Car Wheel Co., succeeding L. L. Trowbridge, deceased. J. B. Bowers has taken Mr. Trowbridge's position as superintendent.

W. J. A. London, whose paper on the small turbine situation read before the American Society of Mechanical Engineers at its annual meeting in New York was reviewed in THE IRON AGE, Dec. 13, is engineer of the Steam Motors Co., Inc., Springfield, Mass. The review gave his former connection with the steam turbine department of the General Electric Co., West Lynn, Mass.

L. E. Eisensmith, sales engineer of the American Blower Company at Columbus, Ohio, has been commissioned a first lieutenant in the Engineering Corps and will leave for service Jan. 5.

John M. Howett has opened an office at 34 Huffman Avenue, Dayton, Ohio, and will act as sales engineer for manufacturing firms in iron, steel and machinery lines.

J. McLachlan Clayton, managing director of Clantals, Ltd., Liverpool, England, and of Clayton, Olsburgh & Co., Rio de Janeiro, Brazil, recently sailed from Liverpool for New York. His headquarters while in New York will be with William H. Knox & Co., Inc., South Ferry Building. The object of the trip is to purchase for the Rio house.

Joseph G. Butler, Jr., Loses Art Collection

Joseph G. Butler, Jr., vice-president of the Brier Hill Steel Co., Youngstown, Ohio, lost a priceless collection of art treasures and mementoes of famous men, which he had spent almost a lifetime in collecting, in a fire which destroyed his home in Youngstown last week. The irony of the loss is in the fact that Mr. Butler was just completing, opposite his home, a fireproof museum, which was soon to house the treasures. The fire started from the attempt of a servant to thaw out frozen water pipes. It spread with such rapidity that the house was enveloped in flames within a few minutes. Many valuable works of art were burned, but more priceless were the letters to President McKinley, Mark A. Hanna, Horace Greeley and other prominent men, which Mr. Butler had carefully preserved.

Large Exports of Steel Rails

Steel rail exports in 1917 have been very large. The total for the first eight months of the year was 338,592 gross tons, as compared with 304,773 tons and 184,136 tons for the same period in 1916 and 1915 respectively. Of the total exports to Sept. 1, 1917, France has taken 84,058 tons; Russia in Europe, 51,887 tons; Canada, 37,593 tons; Japan, 35.928 tons; Russia in Asia, 34,233 tons, and Cuba, 26,908 tons. The monthly average of 42,324 tons to Sept. 1, 1917, compares with 38,380 tons per month in 1913, the pre-war record.

The Logansport Machine Co., Logansport, Ind., has increased its capital stock from $50,000 to $150,000, and is removing its business to a more commodious building at Fifth and High Streets.

OBITUARY

John L. Haines

John Locke Haines, for some years assistant to Willis L. King, vice-president of the Jones & Laughlin Steel Co., and himself a director of the company, died on Friday, Dec. 14, at Pittsburgh, after an illness of nearly a year. Early this year Mr. Haines had a nervous breakdown and in the summer went to Kingston, Mass., in an effort to regain his health. He returned to his home about two months ago in worse physical condition than when he went away, and it was known then that he could not recover. Mr. Haines was born in Saco, Me., May 16, 1866, and received his early education in the public schools of Portland, Me. At the age of 21 he entered the employ of the Tepperell Mfg. Co., at Biddeford, Me., manufacturer of cotton goods. Seven years later Mr. Haines went to Boston and for three years was connected with Wallace R. Morse & Co., commission merchants. He went to Pittsburgh in 1897 and entered the service of the Jones & Laughlin Steel Co. He was first employed in the structural sales department and two years later was put in charge of the order department. He was appointed to the position of assistant to the vice-president on Jan. 1, 1910. Mrs. Haines survives him.



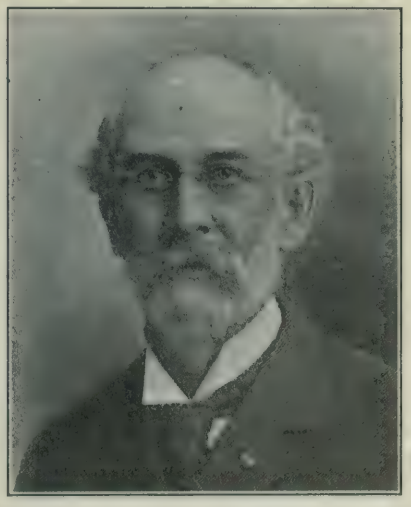
JOHN LOCKE HAINES

JOSEPH H. WOODWARD, president of the Woodward Iron Company, one of the active iron manufacturing companies in the Birmingham district, died Saturday, Dec. 15, after a lengthy illness. He was interested in banking and other enterprises in the district and was vice-president of the First National Bank of Birmingham. He was born in Wheeling, W. Va., Dec. 16, 1843, moved to the Birmingham district nearly 30 years ago with his brother and became interested immediately in the coal and iron industry as well as taking part in the upbuilding of Birmingham. His father before him was an iron manufacturer in West Virginia and interests are still held in that section of the country. The deceased is survived by his widow, one son, A. H. Woodward, chairman of the executive committee of the Woodward Iron Co. and director in the Atlanta, Birmingham & Atlantic Railroad, and two daughters, Mrs. Oscar W. Underwood, wife of United States Senator Oscar W. Underwood, and Mrs. Thomas W. Hopkins of this city.

Joseph Morgan

Joseph Morgan, for twenty-five years chief engineer of the Cambria Steel Co., died unexpectedly of heart failure at his home at Westmont, Johnstown, Pa., Dec. 9. He was born July 27, 1842, in Philadelphia, and was educated at Central High School, that city, subsequently receiving the degrees of bachelor and master of arts. Meanwhile while in the fourth year of his course he joined the steam engineering corps of the United States Navy, entering active service as third assistant engineer in October, 1861, at nineteen years of age. He was mentioned for faithful service on the Brooklyn in the New Orleans engagement under Admiral Farragut in April, 1862. He resigned from the Navy in January, 1866, and entered the service of the Phoenix Iron Co., Phoenixville, Pa., as draftsman. He was chief draftsman in 1868 and then became chief draftsman for the Edgemoor Iron Co. As such he served on the engineering board to report to the board of directors of what is now known as the Manhattan Elevated Railroad. On March 1, 1879, he went to Johnstown as draftsman for the Cambria Iron Co. and was made chief engineer in 1881. On Nov. 1, 1906, he was made consulting engineer of the Cambria Steel Co. He designed and superintended the building of various parts of these works, including six blast furnaces, Bessemer works, blooming mill, open hearth plant, rail mills, and various large mills of the Gautier plant. He was the consulting engineer in charge in 1913 of the building of the Quemahoning Dam, for Johnstown water supply purposes, and the Saltlick Dam.

In 1884 Mr. Morgan went abroad to examine gun and armor forgings, and in 1887 he was appointed a member of the United States Fortification Board. He was a director of the Citizens' Light, Heat & Power Co. and the Johnstown Water Co. and was interested in the Consumers' Gas Co. at the time of his death. He was a member of the American Society of Mechanical Engineers and the United States Naval Institute. Mrs. Morgan survives her husband with two sons and a daughter. His sons are John Eyre Morgan, Buffalo, and Robert Churchman Morgan, Philadelphia. His daughter is Ellen Eyre Morgan Marshall, wife of Stewart M. Marshall, a few years ago chief engineer of the Cambria Steel Co. and now associated with C. P. Perin in consulting engineering work in New York.



JOSEPH MORGAN

J. W. CREGAR, for many years connected with the sales department of the Niles-Bement-Pond Co., New

York, died suddenly Dec. 10 in Chicago while at the steering wheel of his automobile. The car collided with another, but was stopped before serious damage was done. Mr. Cregar at the time of his death was connected with the Chicago office of his company. He originally was New York manager for the Pratt & Whitney Co., after which he went to Philadelphia and established the J. W. Cregar Agency, which he conducted for several years. He then became manager of the miscellaneous department of the Niles-Bement-Pond Co., in Philadelphia, and about two years ago was transferred to Chicago. He served in the Spanish-American war as a member of Troop C, Sixth Cavalry. He was born in Philadelphia in 1864, and leaves a widow.

ROBERT DOUGLAS MEACHAM, a son of Daniel B. Meacham, of Rogers, Brown & Co., Cincinnati, died suddenly of acute appendicitis at Louisville, Ky., Dec. 15. He was 30 years old and had recently returned from France to recuperate from a year's service as an ambulance driver with the American Hospital Unit of the French Army. Before leaving for France he was traffic manager of Rogers, Brown & Co., with which firm he had been connected in different capacities since leaving college. He was a young man whose life was in every way admirable.

WILLIAM H. SHEPPARD, a retired wire work manufacturer and one of the organizers of the Wire Work Manufacturers' Association of New York and of the Wireworkers' Union, died Dec. 14 at his home in Brooklyn. Mr. Sheppard was a native of London, England, and in early life entered the employ of Joshua Horrocks, a Brooklyn wire work manufacturer, who died recently. Later for many years he was head of the firm of Sheppard & Stolp, owners of the Novelty Wire Works in Manhattan.

WILLIAM L. GUENTHER, vice-president of J. Jacob Shannon & Co., Philadelphia, dealers in mill, mine, railroad, builders' and contractors' supplies, died Saturday, Dec. 15, aged 47 years. He spent virtually all his business career with this firm, having been in its service about 27 years.

May Transport Labor—Short Day on Coast

SEATTLE, Dec. 11.—Special agents from the Government Department of Labor and the United States Shipping Board are investigating conditions in Puget Sound district, with a view to bringing 20,000 additional shipbuilders to the Pacific Coast to increase the output of the shipbuilding yards. The building program for the Seattle shipyards now calls for 57 steel steamships to be constructed by the plants now operating and 20 additional vessels by two concerns that are constructing plants and will soon be ready for laying keels. To complete this program thousands of additional skilled workmen will be needed and it is the plan of the United States Shipping Board to provide these workmen if possible. The labor shortage in the lumber industry has been a deterring factor in the shipbuilding work and it is planned to relieve this shortage as quickly as possible.

The Western Pine Manufacturers' Association in Spokane, Wash., has voted to establish the eight-hour day in all of its camps and mills, and so advised Secretary of Labor Wilson, who telegraphed President Wilson of the decision, expressing the belief that "the lumber industry of the Northwest in its entirety will soon adopt a policy which will be a unique contribution toward the effective execution of the war program." This is said to mean that the West Coast Lumber Manufacturers are likely to take a similar step, although this has not been voted on. If such action were taken, the labor problems in the camps and mills would be practically solved and would clear the way for carrying out the Government's gigantic airplane program and shipbuilding work planned.

The Newburgh Shipbuilding Corporation, Newburgh, N. Y., is planning the construction of about 1000 dwellings for employees engaged at its works.

Great Service Flag of the United States Steel Corporation

A service flag 34 x 54 ft. has been suspended across the street from the building at 71 Broadway, New York, occupied by the United States Steel Corporation, in honor of the 11,490 men, including 305 officers, all employees of the United States Steel Corporation, who are now in their country's service in the army and navy. There is nothing on the flag to indicate that it is connected in any way with the corporation. It was, of course, impossible to have 11,490 stars and so the figures 11490—6 ft. high and made of stars—representing that number of men, were placed upon the flag. Among the officers of the corporation are one colonel, Raynal C. Bolling, general solicitor, who is colonel in charge of the air service of the American Expeditionary Forces in France, and five majors, as follows: Bradley Dewey, American Sheet & Tin Plate Co., Sanitary Corps; Dr. S. B. King, American Sheet & Tin Plate Co., Base Hospital Corps; H. S. Durant, American Sheet & Tin Plate Co., Cantonment Division; Orville Benson, American Bridge Co., Engineers' Reserve Corps, and Dr. R. S. McKee, H. C. Frick Coke Co., Medical Corps. There is also one lieutenant, C. P. Crissey, United States Steel Products Co., lieutenant commander in the Navy. The Carnegie Steel Co. leads with 1984 men, and other companies having a large number are the American Steel & Wire Co., 1737; American Sheet & Tin Plate Co., 1417; National Tube Co., 1078; Illinois Steel Co., 1003; Tennessee Coal, Iron & Railroad Co., 911; American Bridge Co., 577.

To Discuss War Emergency Measures

Mobilizing the labor supply, legislative investigating commissions and labor conservation in war time are among the topics of the annual meeting of the American Association for Labor Legislation to be held at Philadelphia, at the Hotel Adelphia, Dec. 27, 28 and 29. The labor supply session is to be held Friday afternoon, 2.30 p. m., at the University of Pennsylvania Hospital, Thirty-sixth and Spruce Streets. Henry R. Seager, secretary U. S. Shipbuilding Labor Adjustment Board; M. B. Hammond, Ohio State University; E. V. Wilcox, U. S. Department of Agriculture; Charles B. Barnes, director New York State Bureau of Employment, and Morris L. Ernst, manager New York State Clearing House for Employment Offices, are among the speakers announced.

The labor conservation session is scheduled for Friday evening at 8 p. m. C. T. Clayton, United States Department of Labor, is to deliver an address on "Meeting Emergency Employment Demands," and V. Everitt Macy, chairman United States Shipbuilding Labor Adjustment Board, is to speak on "Labor Adjustment in the Shipbuilding Industry." Prof. Irving Fisher, Yale University, is president.

Penn Seaboard to Have Plate Mill

The Penn Seaboard Steel Corporation, Philadelphia, is completing arrangements for the equipment of one of its buildings as a plate rolling mill. The new mill will be a part of the Baldt plant of the corporation, located near New Castle, Del. This plant has a large open-hearth plant and has been furnishing ingots to the British Government. Upon the termination of that order, the steel-making capacity will be utilized to furnish ingots to the new plate mill. It is expected that the mill will be ready for operation in four or five months, and it probably will be utilized at first largely for the production of ship plates.

The Ohio Iron & Metal Co., Chicago, has opened a new office in Cleveland, in charge of B. L. Newman, as district manager. This company has for several years been represented in Cleveland by H. G. Stalnaker, who is now in charge of the Cleveland office of the Stalnaker Steel Co.

The Scovill Mfg. Co., Waterbury, Conn., is reported to be contemplating building a dormitory to house 500 women employees.

New Alloy of Copper and Aluminum for Bearings

A new alloy of copper and aluminum has been put on the market which shows some unusual properties. That it can be substituted successfully as bearings for the regular tin-bearing alloys is said to be established by recent tests by a large railroad. The alloy is called Dirigo and consists mainly of copper and aluminum. It can be cast, spun, drawn in wire, brazed and soldered with ordinary silver, and it is said to be capable of temper so as to be as hard as steel. A distinguishing feature is that certain compositions have a gold color, which has led to its incorporation in various utensils, ornaments and jewelry. Dirigo bronze is reported to have a tensile strength up to 106,000 lb. per sq. in., to resist salt water and to be highly resistant to acid. A test made by the Western Electric Co. on a brand drawn to hard wire, 0.008 in. in diameter, showed a tensile strength of 132,000 lb. per sq. in. The grade most suitable for bearings has a tensile strength of 71,000 lb. per sq. in. Another feature is its heat conductivity.

The method of making the alloy is not made public. Aluminum and copper are treated in the molten condition in the presence of other metals, most of which pass away. Production is carried on by the Hart Trading Co., Tribune Building, New York, which also conducts an export business in metals and other products.

Fatalities in Mines and Metallurgical Works

The summary statement of fatalities in the mineral industry of the United States for the year 1916 shows a gratifying decrease, according to statistics compiled by Albert H. Fay of the U. S. Bureau of Mines, Department of the Interior. The number of men employed in 1916 was 1,128,257, as compared with 1,067.929 in 1915 and the total number of fatalities in 1916 was 3224 as compared with 3076 in the previous year. The principal increase in men employed was in the metal mines and metallurgical works, while there was a slight decrease in the coal mines and quarries.

The fatality rate per 1000 men employed for the industry as a whole is 2.86 as compared with 2.88 in 1915, while the same figure equated to a 300-day basis is 3.37 as compared with 3.74 for 1915. The principal decreases, based on the 300-day basis, are as follows: Coal mines in 1916, 3.93 per 1000 300-day workers as compared with 4.44 in 1915; metal mines, 3.62 as compared with 3.89; ore-dressing plants, 1.41 as compared with 1.57; smelters, excluding iron blast furnaces, 0.73 as compared with 1.05; by-product coke ovens, 1.35 as compared with 1.75. Quarries and bee-hive coke ovens show slight increases.

Ship Plants to Lay First Keels

The American International Shipbuilding Corporation and the Submarine Boat Corporation, the Government subsidized ship assembling plants, will begin actual shipbuilding operations by Jan. 1. Chairman Edward N. Hurley of the Shipping Board will drive the first rivet in the first keel to be laid at the Port Newark Terminal yard of the Submarine Boat Corporation on Thursday of this week. The American International Shipbuilding Corporation expects to lay its first keel at the Hog Island plant by Jan. 1, and a keel will be laid about every three days thereafter until 50 have been laid.

The Hess Steel Co., Baltimore, unfurled a large American flag and a service flag containing 15 stars on Dec. 15. All the employees took part in the exercises, and addresses were made by Arthur V. Farr, sales manager; Erwin L. Malone, assistant sales manager, and Joseph McCord, traffic manager.

Princeton University, Princeton, N. J., has inaugurated a course in ordnance and gunnery, in charge of Lieutenant E. B. Nixon, U. S. N., supplementing its course in navigation and naval work.

Fifth National Foreign Trade Convention at Cincinnati

In issuing the call for the fifth national foreign trade convention, which will be held at the Hotel Gibson, Cincinnati, Feb. 7-9, 1918, Chairman James A. Farrell of the National Foreign Trade Council writes:

> American participation in the war against Germany has laid a new obligation upon the foreign trade enterprise of the United States, and at the same time presented it a new opportunity. To consider that obligation and that opportunity; to discuss what has been done by the different elements of foreign trade, and to give serious thought to the demands and the problems of the future, delegates from every part of the United States, representing all phases of commercial and civic development, will assemble for the three days' sessions at Cincinnati. * * *
>
> More than ever the foreign trade of the nation serves a vital national purpose in maintaining the gold reserve and sustaining the huge bulk of national credit upon which the necessities of war are making such enormous demands.

The theme of the convention will be "The Part of Foreign Trade in Winning the War." The topic of the opening session on Thursday, Feb. 7, will be "Foreign Trade Achievements Up to Date." On Thursday afternoon, "After-War Conditions of Foreign Trade" will be considered. Group sessions will be held, one of these being devoted to exports and imports control. It will be attended by representatives of the War Trade Board.

Coal Shortage at Baltimore

The coal shortage in Baltimore and vicinity is so acute that some of the plants have been compelled to curtail their operations and unless relief comes soon, it is feared that many of them will have to suspend operations entirely. One of the biggest industries which is feeling the pinch of the shortage is the Sparrows Point, Md., plant of the Bethlehem Steel Co. This plant already has cut down much of its work and will be compelled to further curtail unless relief is afforded.

The Bethlehem company and a large number of other concerns were closed for several hours a few days ago because the Consolidated Power Co., which supplies them with power, was unable to get coal. This concern now has a little, but it is feared that in a few days it will be out again and the same action will have to be resorted to. When the plants closed there were many complaints and a little fuel was received. But this will not last long.

Fabricated November Business at High Level

Following the 111,000 tons of structural steel work put under contract in October is a total of 138,500 tons for November. This is in accordance with the records of the Bridge Builders and Structural Society, as collected by George E. Gifford, 50 Church Street, New York, its secretary. According to these records the November engagements amounted to 77 per cent of the entire capacity of the bridge and structural shops of the country. This makes the total for the eleven months of the year 1,081,000 tons, or more than in all of 1913 or 1914. The November business, chiefly for Government work, is the largest this year.

The Erie Forge Co., Erie, Pa., gave a banquet Dec. 8 at the Lawrence Hotel in that city to representatives of the Day & Zimmerman Co., Philadelphia, consulting engineer, which placed contracts for the forge company's new plant, and representatives of 18 companies that have sub-contracts. About 150 were present. Robert F. Devine, president of the Forge company, acted as toastmaster, and a number of the guests, including naval officers and Julian Kennedy, Pittsburgh, were speakers.

The Austin Co., Cleveland, has established its Eastern headquarters at 217 Broadway, New York, to which it has removed its Bridgeport, Conn., office. L. D. Stauffer will be in charge of sales, H. B. Phillips of engineering and K. A. Britchard of construction.

NEW WAR COUNCIL

General Crozier Transferred—General Goethals Called into Active Service

WASHINGTON, Dec. 18.—A war council designed to oversee and co-ordinate all matters of supply of the armies in the field and the military relations between the armies and the War Department has been created by Secretary of War Baker. The council will consist of the Secretary of War, the assistant Secretary of War, the Chief of Staff, Maj. Gen. Henry G. Sharpe, Maj. Gen. Erasmus M. Weaver, Maj. Gen. William Crozier, and Maj. Gen. Enoch H. Crowder.

The functions of the council are set forth in the following statement issued by Secretary Baker:

The Council will act through the Chief of Staff and will be provided suitable accommodations and facilities for the transaction of its business. The work of the war council is of the highest importance and there will be added to the council from time to time general officers of large experience, so that it may constitute the main reliance of the department for the large planning and initiative necessary to make our support of the armies in the field most effective and helpful.

From time to time members of the council will be directed to spend in the theater of war the time necessary to make general observations and special studies for the information of the council, to the end that there may be constantly present with the council officers of distinction and ability who have had opportunity for personal observation in the theater of war.

All details as to the council are at the pleasure of the Secretary of War. While any officer is detailed to the council provision will be made to free him from administration duties and responsibilities.

The war council does not take over the specialized duties of the General Staff or the War College, but is intended to bring to the larger problems of the department both the experience and general training of the officers of most mature years and largest experience in the service.

While the officers composing the council will retain general supervision of the bureaus from which they are detailed, the active work thereof will be delegated to assistants. Secretary Baker announced that Maj. Gen. George W. Goethals had been recalled to active duty and would become acting quartermaster general, releasing Maj. Gen. Sharpe for service with the council. Major General Weaver will be relieved by Brig. Gen. Barrette, who becomes acting chief of coast artillery, and Maj. Gen. William Crozier by Brig. Gen. Charles Wheeler, who becomes acting chief of ordnance.

Government Takes Two Factories

The United States Government, which recently took over the plant of the General Vehicle Co., Long Island City, N. Y., at a reported valuation of $2,500,000, has also acquired title to the neighboring factory of the Stewart-Warner Speedometer Co., the latter building having been completed only a few months ago and never occupied. It is reported that Col. George Montgomery, now in command of the Frankford Arsenal, Philadelphia, will be in charge of the manufacturing operations at both plants. The buildings will be used for the manufacture of airplane engines and gas masks.

Records for Electric Furnace Lining

The Harrow Spring Co., Kalamazoo, Mich., states that for a period commencing Sept. 27, 1916, its 6-ton Heroult electric furnace, lined with standard silica brick above the slag line, had an average of 149 heats per lining and that the average roof record has been 132 heats. The best record on a lining was 172 heats and on a roof 169 heats. The output during this time has been largely alloy steels, including nickel, chrome-nickel and some vanadium, all under 0.30 per cent carbon. There has been also a large amount of plain high carbon steel.

The Vail-Rentchler Co., Hamilton, Ohio, whose increase in capital stock was recently noted, has plans under way for erecting a new factory building that will have a yearly capacity of 3000 farm tractors.

MANY PLANTS IDLE

Cleveland Suffers Severely on Account of Coal Shortage

A crisis in the coal situation in Cleveland was reached last Friday when the Cleveland Electric Illuminating Co., which supplies power to a large number of industrial companies, notified these consumers that their electrical power would be shut off the following morning. As these companies depend entirely on the service of the Illuminating Company for their power, their plants necessarily had to be shut down. The cutting off of power resulted in the entire suspension of operations in about 100 plants in the metal working field and the throwing of over 100,000 men in Cleveland out of work. Among those affected were the steel plants of the Upson Nut Co., Empire and Union Rolling Mill companies and a large number of plants engaged in shell and other Government work.

Through efforts of the city and State authorities and appeals to the fuel administrator in Washington, a liberal supply of coal was taken into Cleveland Sunday, a large portion of this coming from boats that had been loaded for shipment to upper Lake ports but had been tied up with their cargoes at Lake Erie ports owing to the sudden cold wave that put a stop to navigation. This coal supply enabled the Illuminating company to restore its supply of electrical current to all consumers Monday, so that plant operations were resumed, and there is apparently no danger of another shut down within the next few days.

The American Steel & Wire Co., which shut down its nine Cleveland plants Dec. 8 because of the scarcity of coal, after nine days' suspension resumed partial operations Monday in all its plants except the Consolidated and H. P. works. Two of its five blast furnaces, which had been banked nine days, were placed in operation, and it was planned to start the other three a day or two later.

Expansion of Manganese Ore Mining

The expansion in the mining of manganese ores since the war began is characterized as nothing less than remarkable by W. C. Phalen of the staff of Dr. Charles L. Parsons, head of the mining-technology division of the U. S. Bureau of Mines, who is quoted by the *Engineering and Mining Journal*. Mr. Phalen has visited every important manganese-producing region of the United States in the last year. During the last five months he has made a survey of the manganese resources of the West. While hundreds of holes have been opened and domestic production has been forced to a higher point than believed possible a few years ago, certain metallurgical problems must be solved to make available the large reserves of highly siliceous ores if the country is to become independent of foreign supplies. The large reserves of rhodocrosite in the Butte district in Montana and to a less extent in San Joaquin County, Cal., particularly impressed Mr. Phalen with the necessity of attempting in metallurgical practice to use these as well as large deposits of high silica manganese ore in certain of the Western States.

To Build Boiler Tube Mill

The International Steel Tube & Rolling Mills, Inc., a new corporation, of which C. H. Hopkins, 435 Guardian Building, Cleveland, is secretary and treasurer, has announced that it will build a new 50-ton lap-weld boiler tube mill between Lorain and Warren, Ohio. Plans will be ready soon. The plant is to be erected on a 100-acre site. About $400,000 will be spent for buildings and machinery.

The name of the Massachusetts Saw Works, Springfield, Mass., has been changed to the Victor Saw Works. The change is in name only, the management, organization and product remaining as heretofore. The name is changed to more closely identify it with the name of the product, Victor hack saw blades.

WAR PROBLEMS DISCUSSED

Chamber of Commerce Committees Hold Meeting in Washington

WASHINGTON, Dec. 18.—The concessions that must be made to the Government by the industries of the country to assist in the great drive now on to concentrate all resources upon the task of winning the war was the chief theme under discussion at the meeting of the war service committees of the Chamber of Commerce of the United States, held here on Dec. 12. The necessity for reducing the consumption of coal and the use of electrical power, a substantial reduction in the employment of the transportation facilities of the railroads, and the conservation of all products needed for food purposes were impressed upon the members of the conference by all the speakers, who included Director Gifford of the Council of National Defense, Chairman Willard of the War Industries Board, Fuel Administrator Garfield, Chairman Parker of the Priorities Committee, Clarence M. Woolley of the War Trade Board, and George N. Peek, chief of the new Bureau of Manufacturing Resources. It was made clear from the remarks of these speakers that, while the Government will pursue a very conservative policy in its treatment of so-called non-essential industries, it is expected that all manufacturing concerns which do not directly contribute to the prosecution of the war will reduce their consumption of coal, their utilization of transportation, and their consumption of materials which can be used for war purposes, even though the result is to substantially curtail output and reduce net earnings.

Not an Easy Task

"It is not going to be an easy task," Director Gifford said, "to organize industry in this country completely, but we believe we are going to do it effectively so that we may go ahead in the work of winning the war. It is obvious that some industries will be more essential than others, but it would be foolhardy to think that the time will not come when the so-called less essential industries may not be needed."

Mr. Gifford urged the representatives of all industries to speedily get into touch with the new industrial representative of the War Board, George N. Peek, who would at all times be ready with advice and assistance in indicating ways by which the less important industries from the war standpoint could co-operate in the great task now confronting the country.

Chairman Willard of the War Industries Board told the conference that a mistake has already been made in the development of the war program, a natural mistake which also was made in England. "We have," he said, "concentrated our orders too much in certain localities, and by so doing we have overdrawn on the available supply of electric power in some cases. Another result has been the bringing of workmen into localities where there has not been a sufficient preparation for housing and boarding, and there have also been introduced transportation difficulties that are most difficult to solve. It has, therefore, become very necessary that we should stop and consider, before placing any additional orders for munitions or war material, whether the placing of the order at that particular point is going to aggravate one of the problems I have just mentioned.

"The Council of National Defense has recently created a new department which we have placed in charge of Mr. Peek of Moline, Ill., one of whose chief functions will be to acquaint himself with the requirements of the Government so far as additional producing capacity is concerned and also to gather information showing where there are other plants whose activities may have been curtailed by the general war program, plants of such a character that they could be used to do some part of the particular work in mind.

"Now, I wish to impress upon you that we must all do anything and everything necessary to win the war. There can be no compromise on that question, and if to do that it were necessary to take everything in Pittsburgh or Philadelphia or Wilmington or Bridgeport, of course, we would do it and everything that went with it; but it seems to me that such a course is not necessary, and if it is not necessary, we ought not to do a single thing in our efforts to win the war which will cause unnecessary industrial disturbance or make more difficult than otherwise the adjustment that must come when peace arrives."

Fuel Troubles

Dr. Garfield, speaking for the Fuel Administration, said that there were two ways of dealing with the present situation. "One way," he said, "is to cut off from the list of industries those things which are least essential. The other is to prefer those which are most essential to the conduct of the war. From my angle of approach, the preferred consists of enterprises most likely to contribute immediately to the war; but that does not answer the question wholly. At one time we had before us a list made up by different people interested in different ways, and when we began analyzing it we did not need to spend more than one evening on it to be sure that any one of the industries, if cut off from fuel supply, would carry a much further injury to the public than we could well reckon."

George N. Peek, the industrial representative of the War Industries Board, said that he looked for hearty co-operation between the board and the manufacturers of the country. No industry, he said, would be classified as non-essential, but there were many non-essential portions of some industries—odd sizes and styles and unnecessary products—which might be cut down, while actually strengthening the industry and proving beneficial to the Government and the public at large. Mr. Peek said he desired personally to meet manufacturers having problems and promised to do everything possible to assist in their solution.

The conference finally adopted a resolution under which committees, representing the leading industries of the country, will be formed to serve in an advisory capacity to the war committee of the Chamber of Commerce. It is expected that the most important of these committees will establish headquarters in Washington and assist in advising the War Industries Board in the distribution of orders for war material, in the placing of priority orders, and in bringing about fuel and food conservation, etc. W. L. C.

Serious Coal Conditions

WORCESTER, MASS., Dec. 18.—The coal situation is extremely serious and no relief is in sight. The Fore River shipyard was obliged to lay off its night shift, but has secured 500 tons of coal from the Boston Navy Yard and has resumed night work. It has been announced that the Watertown Arsenal will have to curtail operations to-day if coal was not received. The New England Power Co., which supplies hydroelectric power for industries from Springfield, Vt., to Willimantic, Conn., and Providence, R. I., has been compelled to cut down its supply about one-sixth and has adopted a policy of shutting off power in whole sections of their field one day each week. Several of the most important factories in Worcester, Mass., w be closed all day Wednesday on this account. The company operates several steam plants and has a reciprocal agreement with others and the shortage of coal is responsible for the shortage of current. Unless relief is secured this week, many private power plants will be compelled to close down. The supply of domestic coal is equally insufficient and threatens to close many large boarding houses in the industrial centers, thereby affecting the labor situation somewhat.

The next meeting of the Philadelphia section of the Association of Iron and Steel Electrical Engineers will be held on Jan. 5, 1918. A paper entitled, "Electrically Operated Bridges" will be presented by J. C. Reed and Merwyn J. Hocker, electrical engineers of the Bethlehem Steel Co., Steelton, Pa. The paper will be illustrated with lantern slides.

Crozier Tells of Great Progress Made

(*Continued from page* 1474)

I think the cost to the Government where we have used this form of contract has been less than it would have been if bids had been submited in regular course, because the manufacturers would have been obliged to cover themselves by such large estimates against all risks that prices would have been higher. There have been some very prominent cases where manufacturers would not quote any figure at all. They simply would not take a contract. They had had their fingers burned in furnishing things to the allied governments and they would not consider a contract on a fixed price.

Manufacturing Rifles

Upon request by a member of the committee to cite a case in which the manufacturers refused to accept a contract on a fixed price, General Crozier stated that the Department had been unable to induce manufacturers to furnish rifles on that basis. He said:

They would not quote any price. They told us that any price they would be willing to mention would look so unreasonable that they did not want to have their names attached to it. Thus the rifle contracts were given on the basis of cost-plus 10 per cent for profit. This placing of contracts on the cost-plus basis required us to do something that we have never done before, and that was to go into the manufacturers' establishments and into their accounting departments and find out what their things were costing them. In the Ordnance Department we have taken a good deal of care to find what our things were costing us, but as regards the private manufacturers we have had no figures except as to what we have paid for their goods.

Now, to secure such figures we had to go into a number of establishments and this work necessitated the forming of a cost-accounting division in my office, which I proceeded to do very early in the war, securing as the head of it a member of a firm of chartered accountants. This man came to us, giving up a large salary many times what he gets as an officer with the rank of major, which is the highest I have been able to give to any of these officials.

President Allowed $35,000,000

Replying to a question, General Crozier said that about a month before the appropriation act of Oct. 6 was passed, the President allotted to the War Department about $35,000,000 of the $100,000,000 emergency fund appropriated by Congress in the spring of 1917. With this fund the bureau was enabled to place certain contracts which could not be placed until the money was actually in hand.

Continuing, General Crozier described to the committee an elaborate inventory of the manufacturers of the country capable of doing work for the Ordnance Bureau which resulted in the preparation of a card index covering practically every concern in position to take such war orders. This list was afterward carefully canvassed with copies of drawings and specifications of things that would be needed in large quantity and the replies received were filed and digested.

"We got some very valuable assistance from the General Munitions Board," said General Crozier, "in selecting establishments with which to place some of our large orders."

At this juncture, Chairman Chamberlain inquired whether the War Department had undertaken to avail itself of the experience of the British army in correcting mistakes previously made. General Crozier replied:

We have undertaken to inform ourselves as to what their experiences were, but some of the most radical things that they did in order to secure an output were things which required legislation and which, therefore, we have not availed ourselves of. We have endeavored to avoid such mistakes as they made in the beginning. For instance, there was a different appreciation at the outbreak of the European war of the relative importance of shrapnel and high explosive shells and that which developed soon after the war commenced. All the tables of supply of artillery munitions contemplated a very much larger appreciation of shrapnel as compared with shells than that which prevails now, and we learned that lesson from them and immediately changed our tables of supplies so that we have not made the mistake of issuing orders for a larger proportionate number of shrapnel than we should have.

Then there are certain things the British have endeavored to correct by legislation and which they have at least partially corrected, which thus far we have had no means of correcting. One of them has been the regulation of labor. We are kept back by the shifting of labor. There is in many of the establishments which are doing work for us a very rapid turnover of labor; that is to say, the men come and stay a short time and then other men must be secured to replace them. That is a very expensive process and one which is very hostile to efficiency. They solved that problem, or attempted to solve it, in England by enacting legislation to the effect that no workman should leave a munitions establishment—that is what is called a "control" establishment, which is one taken under the control of the Ministry of Munitions, not to operate it but to employ it in the manufacture of munitions. No workman is allowed to leave such an establishment without what is called a "leaving" certificate, and if he should do so, it is made an offense for any other person to employ him without the production of the required certificate from the establishment he had left.

Enticing Employees

In response to a question, General Crozier referred to the United States statute, now nearly 100 years old, making it an offense to entice an employee of an arsenal away from his work. This law, he said, had probably never been invoked and it was wholly inadequate to meet the situation referred to. Chairman Chamberlain asked whether there was any special reason for employees to leave the arsenals, and especially as to whether complaints as to wages or treatment had been received. General Crozier replied:

I am not referring particularly to men leaving the employment of the Government at the arsenals. Our real difficulties come because they leave the employ of private manufacturers doing the work of the Government to go to some other employment. The amount of work which is being done by the Ordnance Department now at private establishments is so great in comparison with that which is being done at arsenals that the arsenals have dropped back into the status of mere manufacturing laboratories to establish standards.

As to whether any steps have been taken to remedy the labor situation, General Crozier said that the Council of National Defense has recently created a division to investigate the labor problem and that in the Ordnance Bureau an industrial section had been established in the effort to formulate a remedy for existing difficulties. He continued:

One of the reasons for this rapid change of labor is the hearing that higher wages are paid somewhere else, and off the men go in search of better pay. The wages they are getting are oftentimes so high that they can very well afford to lose a few days in hunting for another place. Another difficulty is that the men are attracted in large numbers and by tempting offers to some place where they find there are no quarters in which to live, and after enduring a very great deal of discomfort, they travel on to some other place looking for better conditions. The housing question under the artificial conditions which have been created by the demand for labor in certain centers did not exist before and requires very careful consideration. We have gone so far as to examine the laws to ascertain whether our manufacturing appropriations are available for expenditures for erecting temporary dwellings for the employees of private establishments. At places where the Government has no buildings of its own, nothing of that kind has yet been done, but I think that some remedy for this situation will have to be found very soon.

I do not find it disclosed so far as we have gone that there is an actual shortage of labor in this country of the kind needed in munitions making, and I am doubtful whether there is such a shortage. We have not taken enough men into the military service as yet to create such a shortage. You doubtless realize what a difference there is between our situation and that of England. They have taken 40 per cent of their men—not 40 per cent of their men of military age, but 40 per cent of their total male population—into the army. We have not taken 5 per cent. They have had to bring some of their skilled workers back, but they have substituted others for them. With reference to skilled workers and their entering the military service, I am informed by members of the British Ministry of Munitions who have been close to the subject that if any man having mechanical skill is employed for any purpose in which that skill is not utilized, it is regarded as a waste which the country cannot afford. They say—and it has been the ex-

perience of other countries of such civilization as ours—that there is not enough skilled labor in the country to supply the munitions for such a war as we are in; that the supply is short and, therefore, that no skilled man should waste his skill. Of course, I refer to the kind of skill that is involved in munition making. We are to have a large repair establishment over in France, and as to the enlisted men it is contemplated that they will be worked to advantage there. That we are not now prepared to do in this country.

Capacity of Foreign Plants

Concerning the capacity of British munition manufacturers to do something more than supply the British army with munitions, General Crozier, in reply to a question, said that the British factories could produce a surplus of some things and this was also true of the French factories. He said:

Owing to the much more prominent place which artillery has taken in this war than was anticipated in the preparations for war in Europe, it has been necessary for both England and France to greatly increase the artillery manufacturing program. They have done that and they have provided all the original equipment of their expanded forces, and still the wastage is not sufficient to use the capacity which they have created. Therefore, we have offers from both England and France to manufacture artillery for us and we are taking advantage of it to a considerable extent. It is most fortunate for us, because it safeguards us to a very considerable extent from the consequences of our long neglect in this country.

"With the advantages that you have just spoken of," asked a member of the committee, "will the American army be able to sufficiently supply itself with artillery?"

"The indications are," answered General Crozier, "that we shall be able to do so with the assistance I have referred to and to do it promptly. We are getting from France under manufacture since the first of last August a very considerable supply of the two most important pieces of artillery that the armies are equipped with, the 75 mm. field gun, which is about 3 in. in caliber, and the 155 mm. howitzer, which is about 6 in. in caliber. They are making a number of those to supply all the troops that we are sending over and all we will be sending over for some months to come, which enables us to keep over on this side for training the large forces we have in cantonments, the artillery of our own manufacture which is most essential. We are very short of it over here and it is a God-send that we have been able to keep what we have. But we are not short on the other side and will not be short on the other side at all."

"How long before you will be able to catch up on this side?"

"We will be fairly well caught up in the most important things by next summer."

"Have you had occasion to engage Canadian manufacturers?"

"We have given some orders in Canada for the manufacture of artillery ammunition, but there is no manufacture of artillery itself in Canada."

Interested in Labor Questions

Members of the committee manifested much interest in the labor situation as described by General Crozier and recurred to it several times. Senator Weeks of Massachusetts said:

I have been at the navy yard and at these great shipbuilding plants and arsenals in Massachusetts and a great many private plants which manufacture for the Government where a serious question has been brought to my attention a great many times. There are numerous complaints, justifiable in my opinion, of the injustice that is resulting to the Government not only from private plants bidding against each other or against the Government, but even from two departments bidding against each other. As an example, a man employed at one of the arsenals was earning $900 a year and he was offered $900 more if he would go with a private contractor. Now, if that contractor had a contract based on cost-plus 10 per cent, of course that produces a gross injustice from the standpoint of the Government, and what I want to know is, do you know whether any effort is to be made to adjust this labor question so as to prevent such experiences as the one I have described?

General Crozier replied that the Council of National Defense was working on the subject and that he was personally developing the details of a plan which he would submit to the War Department at an early date, but which he would not care to discuss in public. He said:

I have had complaint after complaint from manufacturers doing work for the Government on the cost-plus basis that their men are being enticed away from them by other contractors working on the same basis but paying higher wages. Such contractors have no reason for keeping the general cost down; it is nothing to them what wages they pay, for the higher the cost the more the contractor gets. These contracts contain a stipulation giving the department the right to examine into the reasonableness of all expenditures, and I have in several instances called the attention of the contractors to the stipulation in the contracts and we have sent out a general circular to all the arsenal plants in which I call attention to the Government's right and give warning that it will certainly be exercised if this process is found to be a serious evil.

Every Moment Utilized

During the cross-examination to which General Crozier was subjected following his direct statement he repeated with renewed emphasis his original declaration that every moment of time, after Congress recognized the great emergency confronting the country, had been utilized in making preparations and emphasized the fact that there is a vast difference between the making of a single rifle, machine or field gun and the fitting up of the entire manufacturing capacity of the country for quantity production. He also made the point that at the time the United States became involved in the war the British and French governments, especially the British, were utilizing the existing capacity of the leading American manufacturers for material for their own armies and that it was the consensus of opinion among American military experts that it would be a serious blunder, from the standpoint of all the nations fighting Germany, to interrupt these deliveries of material needed by armies actually in the field in order to provide equipment for American troops who would not be in France in any considerable numbers for many months to come.

In their zeal to secure from General Crozier answers to their individual inquiries it frequently happened that several members of the committee asked questions simultaneously, which rendered it difficult for the witness to make satisfactory categorical answers. The stenographic report of the hearing reproduced in the daily papers in a more or less garbled form, therefore, gives a very incorrect impression of General Crozier's testimony, which was at all times direct and positive and wholly without evasion.

Replying to a question by Senator Hitchcock as to why the American troops in France are using French artillery, General Crozier said:

As to the necessity for our army to have a supply of French artillery, I would say that no appropriation that could possibly have been made at the time of the outbreak of the war could have had any effect worth mentioning with regard to the artillery situation. It is true that ordnance for the Allies was being manufactured in this country at the time we entered the war, but this machinery was not available for manufacturing ordnance for this country if we continued to manufacture for the Allies, and it was our policy to do as little as possible to interfere with production for our Allies because they were actually engaged in the war and in need of the material. We thought that it would be poor assistance in the war if we were to start in by depriving them of fighting material in order to have it ready for American troops who would not reach the theater of war in any considerable numbers for a long time to come. Starting with appropriations in April for the procurement of artillery, no one could hope to have artillery in any substantial quantity by December of the same year.

Declines to Comment

General Crozier declined to comment on the fact that the emergency appropriation of $100,000,000 given to the President at the outbreak of the war was not immediately used for the artillery purposes, saying that it was reserved "for certain particular purposes," making it clear that the allotment of these funds was a matter which in no way came within the jurisdiction of his bureau. He stated frankly, however, that some

time in August and before Congress had passed the appropriations for which estimates were submitted in June, he succeeded in securing $35,000,000 of the President's emergency fund in order to make certain contracts which could not legally be entered into until after the money was actually in the possession of the department. He called attention, however, to the fact that the sum allotted to the Ordnance Bureau in this connection was negligible, except for the technical purposes of meeting the requirements of the small contracts referred to, as it amounted to only one-thirtieth of the estimated needs of the Ordnance Bureau.

While General Crozier at all times sought to avoid criticizing either Congress or any branch of the Government, yet when members of the committee demanded to know why quantity production had not been obtained in a few months after the beginning of the war. his replies were very pointed.

"I am frank to say," said Senator Hitchcock, "that many army officers seem to hold the opinion that there is a great delay in the delivery of the necessary things that Congress thought it had provided for in advance. I think the committee should know the facts."

"There is no doubt about that," replied General Crozier. "There are many things that it provided for, but it did not provide for them in time. They should have been appropriated for and provided for some years ago. No one had a right to expect much in the way of available war material from any appropriation made so recently. There has not been enough time."

National Plant Closed

The committee then took up the subject of the manufacture of rifles, concerning which General Crozier said:

At the outbreak of the war we had in the United States and our various possessions in the hands of the army, the National Guard, and in the armories and storehouses, something like 700,000 rifles of the so-called Springfield rifle of the model of 1903. I do not believe it is claimed by anybody that this rifle has its superior in the world at the present time. Many of these rifles were in the Philippines and elsewhere, but about half a million were available. The year before the war, the two national armories were working at greatly reduced capacity and had been for several years. One of them had been closed for some time and the other was worked at not one-quarter its capacity.

"Why was that?" asked Senator Wadsworth.

"Because of lack of appropriations," replied General Crozier. To the question, "Was the appropriation decreased to such an extent as to cause one of the arsenals to stop manufacturing?" General Crozier replied:

Yes, indeed, sir. For several years along about 1906 the appropriations for the manufacture of small arms, rifles, pistols and swords ran about $1,700,000 per year. I do not recall the exact figure for the year immediately preceding the act of June 3, 1916, but before that it had gotten down as low as $200,000 a year.

Now, the capacity of the two Government factories, running full as at present with two shifts of ten hours each, which we think is the advantageous way to run them, and when we confine the output strictly to rifles and make no spare parts or pistols, is something like 1200 per day. Now you will see at once that an output of 1200 per day, when we actually attain it, would mean a long time in the arming with rifles of an army of a million men.

Under the act of Aug. 29, 1916, an appropriation was made sufficient to justify reopening the armory which had been closed and increasing the rate of manufacture of the rifles at the other armory. The orders were promptly given and the activities of those two armories were increased, but it must be remembered that resumption of manufacture on a considerable scale under such circumstances as existed at that time is a long process. The operatives had all gone away from the armory that was closed and many had left the other one to go into the employ of private small arms factories which were engaged on large orders for England and Russia, and many of the principal employees, the indispensable men, including superintendents and foremen, could not be gotten back, so that the reorganization was a slow process and the full capacity of these armories has been available for only a comparatively short time. It takes a long time to get together and train a force to operate a productive organization such as this.

Now, under these circumstances it was evident that the two national armories were nothing like a sufficient reliance for the supply of rifles; therefore, in advance of any legislation fixing the size of the force, I proceeded to see what could be done in the matter of rifles. I had surveyed the situation before and knew where to go. There were three private factories, the Winchester Repeating Arms Co. at New Haven, the Remington-Metallic Arms & Cartridge Co. at Ilion, N. Y., and the Remington Arms Co. at Eddystone, Del., which were making rifles for the British. There were also two large facories manufacturing rifles for the Russians. These three factories were turning out rifles of a modified Enfield pattern and the question at once arose as to whether we should give orders for the manufacture of those rifles for our forces or whether we should modify the rifles. There was no question but that we would have to use those three factories, for they were the only ones of necessary size engaged in the manufacture of arms.

Continuing, General Crozier described the adoption of the Enfield rifle, rechambered to fit Springfield ammunition in order to avoid the use of two kinds of cartridges. Some time was taken in makng the necessary changes, but durng this period the factories in question were working at full capacity turning out rifles for the British army, so that no time was lost from the standpont of the general result of rifle production.

Questions About Delays

Replying to a question by Senator Wadsworth as to whether the superiority of the modified Enfield rifle and the concentration on one kind of ammunition offset the delay incident to the change, General Crozier said:

"Of course, that depends on what the delay really is and as to its results. I wish to say to you that no United States soldier has been or will be delayed five minutes in reachng the field of war because of the absence of modern rifles. There have been compelling necessities which have limited the rate at which we could put our forces in action in the theater of the war. There has been and will be no delay for rifles, and while the British rifle is a good one, it is not as good as ours."

"Has there not been considerable delay in training troops in this country?" asked Senator Wadsworth.

"None that is going to interfere in the least."

"You think the scarcity of rifles has not delayed it?"

"I do not think it has amounted to anything at all."

"How much experience have these men had with these rifles before they go over?" asked Senator Hitchcock.

"Quite sufficient."

"Are there not hundreds of thousands without rifles?"

"No, sir; there are many, but not hundreds of thousands who have no rifles."

Discovery of the Bureau

General Crozier then described to the committee the discovery made by the Ordnance Bureau when the modified Enfield rifles began to be delivered that, owing to inadequate standardization of gages, there was only a slight degree of interchangeability between the rifles made in the three plants.

The three factories, he said, manufactured independently of each other and we found that the parts of the rifles could only be slightly used interchangeably. That, of course, is very undesirable. Parts of rifles are continually giving way in service, getting broken or lost, and the subject of spare parts is a manufacturing problem of the first importance. Now if we had three makes of modified Enfield rifles in the theater of war requiring three different sets of spare parts dependent upon the factory from which the rifles came, you can see what an unfortunate situation would have been produced. It therefore became necessary to make these rifles interchangeable, and that involved changes in drawings and in gages. Considering the magnitude of the task, I think those changes were made in a remarkably short time. We succeeded in having standardized rifles turned out in the month of August from one of the factories.

Now, with reference to what could be done with the troops in the meantime. We had on hand a very considerable proportion of the rifles necessary for arming the regular army and the National Guard using only the standard Springfield model of 1903. We know it would be necessary that the first troops sent abroad should be from those two contingents, and they have been. This gave us a certain

amount of time to prepare for equipping the National Army. There were for this purpose something like 160,000 Krag-Jorgensen rifles, which are very good rifles, not so good as the Springfield or the modified Enfield, but entirely serviceable. They were available for training the troops of the National Army and we had ready to ship as soon as the force was called out, and did ship before it had all reported, some 5000 of these Krag-Jorgensen rifles to each of the cantonments of the National Army. Those were followed in a few weeks by 2500 more and soon after by another 2500, so that there are now about 10,000 Krag-Jorgensen rifles at each one of the National Army cantonments. Inasmuch as there are only about 14,000 infantrymen in each division and a few cavalry and artillerymen armed with rifles, making their requirement about 18,000 rifles for each division, we now have in each cantonment practically one rifle for each two men, or ample for drilling purposes. In addition there are now on their way to cantonments 11,000 of the Enfields for each.

It is true that at first a number of the men in the cantonments did not have anything but wooden rifles. That was corrected promptly, however, and the shortage of rifles has not made and will not make any difference in the time in which an effective army of trained soldiers can be gotten to the theater of war, unless we greatly enlarge the army beyond what is now contemplated. Of course, some 10,000,000 men have been registered under the draft law. By a stroke of the pen those men can be called into the service, and by doing it with sufficient rapidity you can throw your supply of rifles or any other kind of equipment as far back as you like, but so far as the present plans for calling men in the service are concerned, there will be no delay in their effective use on account of rifles.

Plenty of Target Practice

General Crozier added that while it had not been deemed advisable to manufacture or use obsolete ammunition for target practice with the Krag-Jorgensen rifles, yet ample opportunity would be afforded the men in cantonments for target practice with the Enfield rifle and ammunition already shipped.

At this juncture it became apparent that many members of the committee were laboring under the misapprehension that the troops now in France had been taken from the cantonments after insufficient training and with practically no target practice.

"Is it not a fact," asked Chairman Chamberlain, "that many of these troops that were taken from the cantonments to be mobilized in France had to go without more than two or three weeks' training with guns?"

"The troops which thus far have gone to France," replied General Crozier, "and those which will for some time go are those of the regular army and the National Guard and they all have Springfield rifles and have had adequate opportunity for target practice."

"Do you mean to say," insisted the chairman, "that men are not being sent to France who have not had more than six weeks' training with ammunition and rifles at target practice and bayonet practice and all the exercises that go to make a soldier?"

"There are no troops being sent to France," replied General Crozier, "who have not had for some time the rifles they have been using. There has been some shortage of ammunition, but they have had target practice."

Referring to a statement made by General Crozier that certain of the rifle contractors permitted their organizations to "taper off" after completing their British contracts and before they were in position to begin the manufacture of rifles for the United States with the desired degree of interchangeability, Senator Weeks asked if there had not been "gross neglect on the part of someone in allowing the organization to become reduced, knowing that the United States was at war." General Crozier replied:

> To have kept the organizations at full strength would have necessitated carrying a large number of men on the payrolls with nothing to do and someone would have had to pay out a great deal of money for it. We did that to a certain extent and we have been very severely criticized for it. I am, however, perfectly willing to support that criticism. During the interval while the manufacture of the British rifle was being reduced to nothing and the manufacture of ours was beginning there were times when we were not able to keep employed the men who were at the factories, important men including inspectors and other classes of men who were indispensable to us, and we paid the necessary money to keep those men at the factories in order that the organizations should not be disintegrated. Everything of this sort has to be measured by what is advisable and in the light of the situation that we are now in, I am firmly of the opinion that if we had sacrificed any of the advantageous elements that we have retained for the sake of a more rapid delivery of rifles, we would have made a serious mistake.

Concerning the manner in which the modification of the Enfield rifle and all the associated problems were decided upon, General Crozier said that all the matters in question were determined at a conference between the Secretary of War, the chief of staff, the commander of the American Expeditionary Force, the chief of the War College division of the general staff, the commandant of marines, who had a force in the expedition, and himself. He also emphasized the fact that the decision to use the Springfield ammunition only had an important bearing upon the machine gun question for the reason that that gun uses the same ammunition as the rifle. This, he said, made it additionally important to employ only the one kind of ammunition.

Machine Guns Discussed

The committee then took up the subject of machine guns, General Crozier testifying that in placing orders for such guns in factories that had been making them for the British, it was necessary to modify their equipment in order that the guns turned out might fit the Springfield ammunition. Such delay, however, was compensated for by the fact that other factories which were making guns using our ammunition were enabled to proceed rapidly.

General Crozier gave some interesting details concerning the Government's plan for the production of machine guns, stating that the Lewis gun now being made by the Savage Arms Co. of Utica, N. Y., was being turned out at a maximum rate of 500 per month, while the Vickers gun was also being produced at the Colt factory in satisfactory quantities. A considerable number of Colt guns manufactured by the Marlin company have also been purchased and are being used for training purposes here. He admitted that a discussion of the relative merits of the Lewis and Vickers guns had caused some delay, but said some time was also consumed in testing the weapon finally adopted as the standard for service, the Browning gun, "the best gun in existence." The manufacture of the Browning gun, of both heavy and light types, both using the same ammunition, is now proceeding on a large scale.

General Crozier was subjected to a very severe cross-examination concerning the delays in the adoption of standard types of machine guns and especially as to why the United States had refused to adopt the Lewis gun, which appears to have made such an excellent record abroad. In explanation of the fact that the Lewis gun was not adopted early in the war preparations, General Crozier said that it was presented for test to several boards composed of officers representing various branches of the Department and including but a single officer of the Ordnance Bureau and was uniformly rejected, the rejection being based, in his opinion, upon the fact that the guns were lighter and not so well made in the factories in this country as in England. More recently, he said, the manufacture of the Lewis gun in the United States has been perfected to such an extent that it is now equal to the weapon as made in England and the department has purchased a large number.

Secretary of War Responsible

Concerning the delay in selecting a type of machine gun for quantity production, General Crozier said it grew out of the decision of the Department in the fall of 1916 to allow time for all machine gun inventors and manufacturers to perfect their guns and submit them for a competitive test in the spring of 1917.

At this point the following colloquy ensued:

The Chairman: The Ordnance Department then realizes the importance and the necessity of the machine guns?

General Crozier: Yes, sir.

The Chairman: Because they have been utilized generally along the French and German front?

General Crozier: Yes, sir.

The Chairman: And yet between the appropriations of 1916 and June, 1917, practically nothing was done toward construction. I still am not satisfied with the explanation you made about the delay.

General Crozier: Senator, what I shall have to say to you then is that I am not satisfied, either, and I was not satisfied at the time.

The Chairman: Who was responsible?

General Crozier: The Secretary of War.

The Chairman: Somebody is responsible, and I want to find out who.

General Crozier: The Secretary of War has to be responsible. That is to say, the program of treatment of the subject of machine guns, coming finally to the test of May, 1917, was a program which was adopted by the War Department; it was prescribed by the Secretary of War, who took a personal interest in the subject, and was not the program of the Ordnance Department.

Replying to questions by the committee, General Crozier described in detail the various machine guns now in use abroad and repeated his opinion that the Browning gun now under manufacture is the best machine gun yet devised.

"I think it is time," he said, "to say something which I have not told the committee before in reference to these machine guns. The number in our possession was so small and the possibility of manufacture in this country was so limited that when our troops went abroad we were fortunately able to make the same kind of an arrangement with the French Government with reference to the machine guns that we had made with reference to artillery, and we are getting from them quite a sufficient number of guns to arm our troops over there of the Hotchkiss type of heavy guns and the Chauchat type of light guns. We are also securing from the French ample supplies of French ammunition for use in those guns and we are also manufacturing the same kind of ammunition over here. This would appear to be a disadvantage, but the guns which the French will manufacture for us hereafter will use our own ammunition and in a short time the use of the French ammunition will be discontinued. Furthermore, some of these Chauchat guns have been sent over here and we are making ammunition for them and they are in the hands of our troops for training."

Replying to a question as to whether the Browning gun could be manufactured in the United States in sufficient quantity to equip the army, General Crozier said:

That gun was brought out by the Colt company, which owns the patents. Mr. Browning was in their employ when he invented it and it was developed at their expense. The Colt factory has been making preparations for its manufacture for some time. They are enlarging their factory at Hartford, Conn., and they have bought another factory from the New England Westinghouse company, which had been used for the manufacture of Russian rifles and which has considerable machinery available for making the machine guns, in addition to which the Winchester Arms Co. of New Haven is also preparing to manufacture the Browning gun, having a plant suitable for the purpose. Also the Remington-Union Metallic Cartridge Co. of Bridgeport is preparing to manufacture these guns, having a plant available. There is also a plant at Norwich, Conn., that used to belong to the Hopkins company, which has been taken over by the Marlin company, where they are now completing the manufacture of some Belgian rifles, and they also have in preparation two other plants where tools and fixtures are being made for the manufacture of the Browning gun. Finally, we are in negotiation for the manufacture of Browning guns in still another factory which is not yet free because it is engaged in manufacturing for the Allies, which takes up its capacity.

I would not have you gather that all our eggs are in one basket, even in reference to the Browning gun. We have the Vickers gun, which is being manufactured and in regard to which we are giving orders to occupy all the capacity which the Colt people have, and we have recently called upon them to increase it.

For an army of a million men we ought to have 70,000 or 80,000 machine guns of the light and heavy type combined. An infantry division as we have it organized is composed of about 20,000 troops with some 224 guns of the heavy type and something like 600 or 700 of the lighter type.

Concerning the Browning gun, General Crozier said that deliveries in quantity would be made in April and that in the meantime the army going to France would rely upon the French Chauchat gun and the Lewis gun.

Experience of European Nations

In conclusion, General Crozier, speaking of the experience of the European nations in getting ready for war, said:

"This past summer, for the first time, the French and English really got ready to supplement the initial equipment for the war and succeeded in obtaining a fair manufacturing capacity. They started in the summer of 1914 with nothing; neither an army nor its equipment. In 1915, they had an army without equipment; in 1916, an army only fairly equipped, and it was not until last spring that they obtained full equipment. This was true of both England and France. As for the Germans, they started out fully equipped; they had more than anybody else, but they have also increased both the number of machine guns and the amount of artillery, and particularly the amount of artillery ammunition. All the nations ran short of artillery ammunition the first autumn of the war. The French and English ran shorter than the Germans, and the English very much shorter than the French. The Germans had manufacturing organized so that they were able to make up the artillery shortage very much better in the winter of 1914-15 than the others did, but nevertheless they had to make up a shortage. They all underestimated the amount of artillery and artillery ammunition to be used in the war."

W. L. C.

LARGE TOOLS SCARCE

Government Assistance for Manufacturers Is Advocated

P. M. Brotherhood, vice-president of Manning, Maxwell & Moore, Inc., New York, in a letter addressed to Secretary of War Baker, Secretary of the Navy Daniels and the Council of National Defense, calls attention to the great scarcity of large machine tools, and points out that this scarcity will continue throughout the first half of 1918, at least, thereby greatly handicapping the war plans of the United States Government. Shipyards, navy yards and arsenals are the great sufferers from the shortage. Mr. Brotherhood advises the Government to consider a solution, and suggests financial aid for manufacturers who are in a position to make such equipment. He says in part:

We are afraid that unless some action is taken along the lines which we have indicated the Government will find very soon that they cannot get 25 per cent of what is needed. In fact, that is the condition to-day; we are unable to obtain or supply more than about 25 per cent of what is being called for, and the situation is not improving; and the result is that ridiculous prices are being paid for second-hand machines of very old, obsolete designs We have been producing and selling all kinds of machinery for over 30 years, and have never seen the situation so bad as it is to-day, and at a time when speed is most essential. Our own plant, the Putnam Machinery Company, at Fitchburg, Mass., is at the present time sold out until next August. Ninety-five per cent of the work is Government work. Our Shaw crane plant at Muskegon, Mich., is also about in the same condition. The outlook at this time for getting large tools is most decidedly discouraging. A great many of the Government contractors are up against it, being unable to get the machinery required. Other parties who could help out are discouraged, and are refraining from attempting to undertake contracts, knowing the difficulty they have had in getting the necessary machine tools

M. Braibant, who was formerly in the iron and steel business in Brussels, and recently has been importing British iron and steel goods into France, desires now to secure some connections with export merchants of iron and steel in New York, Philadelphia and Boston, the French government having taken over the importation of merchandise of the character which he has been undertaking. He is located at 28 Rue Pauquet, Paris (16), France.

Machinery Markets and News of the Works

WAR BUYING LARGE IN WEST

Chicago and Cleveland Markets Active

New Inquiry in the East Shows a Decided Falling Off, Partly Attributable to Approaching Holiday Period

Though the volume of new inquiry in New York and Philadelphia shows a decided falling off, which is attributed in some quarters to the approaching holidays and the coming of a new year, also to the fact that many war plants have satisfied their immediate requirements, new buying in the Central West, particularly in Cleveland, continues on a large scale.

The past week in Cleveland was one of the busiest of the year, both in the volume of business placed and in new inquiries received. The demand is principally for lathes, planers, radial drills, boring machines and milling machines in large sizes.

The Templars Motor Corporation, Cleveland, which has taken a shell contract, has placed orders for about 80 machines, mostly lathes, involving about $200,000. Dodge Brothers, Detroit, have been buying heavily for their new plant which will make recoil mechanisms for heavy guns. The Erie Forge Co., Erie, Pa., has placed additional orders. The Willys-Overland Co., Toledo, Ohio, is arranging to largely increase its facilities for Government work and will buy probably $500,000 worth of lathes, boring mills, planers and milling machines. The Morgan Engineering Co., Alliance, Ohio, which has taken a large order for gun carriages, is asking for about 100 lathes. Its requirements are said to total about 400 tools. A. R. Pribil, 602 American Trust Building, Cleveland, is organizing a company to make pressed steel connecting rods and pistons for automobiles and airplanes, and considerable machinery will be bought.

In Chicago, the Western Electric Co., St. Louis, has placed large orders for equipment to make 6-in. shells. The Standard Steel Car Co., Hammond, Ind., understood to have a large contract for howitzer mounts, has issued a large list. The Nash Motors Co., Kenosha, Wis., is buying against a small list.

Buying in Eastern markets is principally for such Government projects as the ordnance base depot in France, the arsenals at Watertown, Mass., and Watervliet, N. Y., and the new shops being built at the Washington Navy Yard. Companies making hydraulic and ball bearing jacks are inquiring for new equipment, it being probable that the Ordnance Department of the Army will soon award several contracts for jacks of one type or the other for use with heavy artillery. Valve manufacturers have been buying because of contracts received for supplying valves for submarine destroyers.

The labor situation is reported better in some sections. Two machine-tool plants in Cleveland have large stocks on hand and have released several hundred mechanics, who have gone to other machine-tool factories. One Cleveland company has augmented its force by 200 men from this source.

New York

NEW YORK, Dec. 18.

Machine-tool demand here is at the lowest ebb in several months. Not only are there few large inquiries from war plants, but the number of miscellaneous small-lot inquiries has shown a marked falling off in the past week. This decline in business is attributed partially to the fact that many of the large war plants have satisfied their requirements for the time being, and also to the approach of the holidays and the new year. Many companies are believed to be postponing purchases until after Jan. 1 for financial reasons.

Several dealers in Eastern territory are giving almost their whole time and the time of their salesmen to problems of transportation of the machines already on order. Some of them are glad of the present lull in buying to close up the year's affairs during the next two weeks.

The labor situation shows improvement. Two machine-tool manufacturers in the Cleveland district are reported to have large stocks of certain small-sized tools and have released many of their mechanics for work in other machine-tool plants, where they are more seriously needed to get out war orders. One company has increased its force by 200 men from this source.

The Stone & Webster Engineering Corporation continues to buy tools for the ordnance base depot to be built for the American army in France. The Washington Navy Yard is buying for its new shops and the Watertown and Watervliet arsenals continue to buy for their gun-making shops.

The Standard Thermometer Co., New York, has bought a few tools for work on a contract for gun sights. The Peerless Printing Press Co., Palmyra, N. Y., is reported to have received a similar contract.

The American Can Co. has not yet bought equipment for its Edgewater, N. J., plant for a recent shell contract. About 150 tools will be required.

Dodge Brothers, Detroit, have obtained more tools in New York for their new plant in Detroit to be devoted to the manufacture of recoil mechanisms for big guns. The tools they got were taken from export warehouses.

The Navy Department has given out several new contracts for the manufacture of valves for submarine destroyers, and the companies receiving such contracts have been buying a few tools. Contracts are about to be awarded by the Ordnance Department of the army for either hydraulic or ball bearing jacks for heavy guns. Companies making this equipment have been inquiring for tools.

The demand for cranes is smaller than for some time past. The Federal Shipbuilding Co. has closed for 10 cranes for its shops, a part of this order going to the Northern Engineering Co., Detroit. A list of 11 more shop cranes is still pending.

Machine-tool manufacturers are having some trouble in obtaining shipments of raw materials. The case is cited of a manufacturer whose shops are filled with A1 priority orders applying to Washington for an A1 priority certificate for the shipment of coal, steel, etc., needed in its plant. The certificate it received was A4. An appeal was again made to Washington, the company maintaining that it could not possibly keep up its shipments of machine tools as per schedule unless the Government gave it first classification on stocks of raw materials.

Louis Leavitt, 454 Driggs Ave., Brooklyn, operating a white lead works, has awarded contract for a three-story brick addition, 100 x 125 ft., to cost $70,000.

The United Metal Spinning Co., New York, has been incorporated, with a capital of $40,000, by J. F. Forrester, L. Seitz and W. O. Langley, 346 Broadway.

The Columbia Graphophone Co., Woolworth Building, New York, a West Virginia corporation, has reincorporated in Delaware with a capital of $30,000,000.

John Chatillon & Sons, 85 Cliff Street, New York, manufacturers of scales, etc., have increased their capital from $200,000 to $300,000.

The Washburn Wire Co., foot of 118th Street, New York,

has filed plans for rebuilding its five and nine-story factory building, recently destroyed by fire. The work will cost about $350,000.

The Eastern Tool & Machine Co., New York, has been incorporated, with a capital of $10,000, to manufacture tools. S. R. and E. F. Hills and C. A. Fisk, 656 Southern Boulevard, are the incorporators.

The Bureau of Yards and Docks, Navy Department, Washington, has awarded a contract for the erection of a ship construction building at the Brooklyn Navy Yard to cost $310,000. The Jarrett-Chambers Co., 30 East Forty-second Street, New York, is the contractor.

Arthur W. Liebers, Inc., has ben incorporated, with a capital of $25,000, to manufacture motors, engines, etc. M. M. Helfgot and Arthur W. Liebers, 1914 Bleecker Street, Brooklyn, are the incorporators.

Olsen & Maggraf, Inc., has been incorporated by C. W. Oschmann, O. C. Maggaff and A. C. Olsen, 216 Eighty-eighth Street, Brooklyn, with a capital of $10,000, to manufacture metal ceilings, etc.

The Hotchkiss Machine Co., New York, has been incorporated, with a capital of $25,000, to operate a machine shop. W. Grundhoefer and N. and S. H. Lewis, 15 West Sixtieth Street, are the incorporators.

Thomas Paulson & Son, Inc., 97 Second Avenue, Brooklyn, operating a brass foundry, is taking bids for a two-story extension 35 x 60 ft.

The Eastern Flexible Conduit Co., 41-59 Gardner Avenue, Brooklyn, manufacturer of flexible electrical conduits, etc., has increased its capital from $50,000 to $150,000.

The Larrabee-Deyo Motor Truck Co., 226 West Fifty-second Street, New York, has increased its capital from $80,000 to $300,000.

The Gas Engine & Power Co., 177th Street, New York, will build a blacksmith shop addition, 22 x 65 ft., for forging work.

The American Pipe Bending Machine Co. has been incorporated, with a capital of $10,000, by J. W. Ashton, G. W. Graham and H. Van Wyck, 1883 Southern Boulevard, Bronx.

The Utility Machine Appliance Co., New York, has been incorporated, with a capital of $10,000, to manufacture specialties. G. F. Woolston, R. J. Walsh and E. E. Haines, 45 West Thirty-fourth Street, are the incorporators.

The Government has taken over the plant of the General Vehicle Co., Starr Avenue, Long Island City, and will devote it to the manufacture of airplane motors. It has also taken over the plant of the Warner Speedometer Co., Jackson Avenue, Long Island City.

The American Fuel Machine Corporation, New York, has been incorporated in Delaware, with a capital of $500,000, to manufacture machinery for fuel handling, cutting, etc. George V. Reilly, Samuel B. Howard and Arthur W. Britton, 65 Cedar Street, New York, are the incorporators.

The S. Jackson Tube Co., Brooklyn, has been incorporated, with a capital of $150,000, to manufacture tubing, etc. E. E. and S. Jackson, 650 East Twenty-second Street, Brooklyn, are the principal incorporators.

The High Speed Steel Products Corporation, New York, has been incorporated, with a capital of $27,500, by A. F. McCabe, F. H. Butehorn and A. E. Moore, 37 Wall Street, to manufacture steel.

The Max Ams Machine Co., 372 Greenwich Street, New York, will erect a one-story brick machine shop, 42 x 140 ft., at Yonkers, N. Y., at a cost of $20,000.

The McIntosh & Seymour Corporation, 149 Broadway, New York, manufacturer of engines, with plant at Auburn, has filed notice of reorganization, with a capital of $2,310,000.

The Allen Cutlery Co., Newburgh, N. Y., has been incorporated with a capital of $20,000 by E. and H. M. Allen and A. J. Fowler, Newburgh, to manufacture cutlery.

The Sanford Motor Truck Co., 107 St. Marks Avenue, Syracuse, N. Y., has had plans prepared for a one-story factory on West Fayette Street, 80 ft. square.

The Roseville Engineering & Machine Co., Newark, N. J., has filed notice of organization to operate a works at 98 Thirteenth Avenue. John M. Okinanski, 17 Hill Street, and Charles Simon, 55 Fifth Street, head the company.

A one-story machine shop, 30 x 50 ft., will be erected on Boyden Street, Newark, N. J., by the Bonnell Motor Car Co., 520 Broad Street, in connection with its new automobile service station to be constructed at Sussex Avenue, Boyden and Sheffield streets, at a total estimated cost of $100,000.

The Universal Compound Co., 424 West Twenty-fifth Street, New York, manufacturer of roofing specialties, has acquired a four-story factory, 50 x 100 ft., at Mott Street and Passaic Avenue, Newark, N. J., for a new works.

The American Standard Metal Products Co., Jersey City, N. J., has been incorporated with a capital of $1,000,000 to manufacture metal goods. Howard Brooke, E. B. Cadwell and John H. Wynne, all of Jersey City, are the incorporators.

Improvements in the power plant at its works on Washington Street, Jersey City, N. J., will be made by the American Sugar Refining Co., at a cost of about $10,000

The Standard Electric Mfg. Co., Jersey City, N. J., has been incorporated with a capital of $200,000 by Jules E. Brand, H. A. Black and Walter T. Hilton, all of Jersey City.

The Armstrong Rubber Co., Washington Street, Hoboken, N. J., has increased its capital from $200,000 to $1,500,000.

John Campbell & Co., Newark, N. J., manufacturer of bookbinders' materials, will build a one-story machine shop, 25 x 80 ft., at its plant on Plum Point Lane.

Turton Brothers, Newark, N. J., have filed notice of organization to operate a works for steel die specialties at 44 Hill Street. William Turton, 15 Ninth Avenue, East Orange, heads the company.

The DeMeese Welding & Mfg. Co., Newark, N. J., has been incorporated with a capital of $25,000 by Frederick DeMeese and Samuel Wollman, Newark.

The August Buermann Mfg. Co., 220 Jelliff Avenue, Newark, N. J., manufacturer of hardware, will build a one-story addition to its foundry, 52 x 57 ft., to cost about $7,000.

Buffalo

BUFFALO, Dec. 17.

The Symington Forge Co., Rochester, will build a one-story machine shop, 175 x 342 ft., on University Avenue.

The Linde Air Products, 155 Chandler Street, Buffalo, has purchased a site, 230 x 370 ft., at the New York Central Railroad and Broadway, on which it will build a plant for the manufacture of oxygen.

Otto P. Weisswange, Inc., Mt. Vernon, N. Y., has been organized with a capital of $50,000 to manufacture precision thermometers and other scientific apparatus. M. Hertz, H. Weissman and E. K. Noll, 44 Court Street, Brooklyn, are among the incorporators.

The General Abrasives Co., Niagara Falls, N. Y., is building an addition to its plant on College Avenue.

The Willys-Morrow Co., Elmira, N. Y., John E. Willys, president, is having plans prepared for an assembling building, 120 x 212 ft., and a one-story testing building, 56 x 321 ft., to cost $60,000.

The Sanford Motor Truck Co., Syracuse, N. Y., J. F. Durston, president, is having plans drawn for a factory 80 x 80 ft. on West Fayette Street.

The Oldman Boiler Works, 36 Illinois Street, Buffalo, will build a two-story addition, 50 x 100 ft.

The National Wire Wheel Works, Geneva, N. Y., has increased its capital from $350,000 to $1,000,000.

New England

BOSTON, Dec. 17.

Little of news interest has occurred in the machine-tool industry of New England the past week. Orders continue to pour in from every quarter and local plants are adding a machine here and there to replace old machines or to balance up equipment. Priority has become almost meaningless, as nearly everything now ordered is on a priority basis. One good effect of this is that machine-tool plants are enabled to plan their production schedules to match their equipment and labor force and the net result is a greater output than would be possible if they were compelled to concentrate on one or two sizes or kinds of machines.

The Simonds Mfg. Co., Fitchburg, Mass., has awarded a contract for an addition, 73 x 180 ft., one story.

The Crompton & Knowles Loom Works, Providence, R. I., is building a one-story addition.

The Wholley Boiler Works, Providence, R. I., has been incorporated with authorized capital stock of $50,000.

The Osgood Bradley Car Co., Worcester, Mass., is to build a forge shop addition, 30 x 60 ft., one story.

The Nelson Rivet Co., Raynham, Mass., has been incorporated with authorized capital stock of $10,000. Arthur E. Nelson is president and Walter H. Nelson, Taunton, treasurer.

The Ludington Machine Co., Waterbury, Conn., has awarded contract for an addition, 42 x 112 ft., three stories.

The Franklin Foundry Co., Franklin, Mass., has been incorporated with authorized capital stock of $10,000. Carl E. Erickson is president and Patrick H. Gibbons, Hyde Park, treasurer.

The General Electric Co. is to build a one-story foundry at its Everett, Mass., plant at a cost of $35,000.

The F. A. Buck Co., Eastport, Me., is beginning the erection of a machine shop, 53 x 63 x 78 ft., and 57 x 78 ft., two stories. The work will not be completed until next summer.

The American Buckle Co., West Haven, Conn., is building an addition, 40 x 60 ft., two stories.

The S. H. Barnum Co., New Haven, Conn., has awarded contract for an addition to its foundry, 40 x 58 ft.

The Cushman Chuck Co., Hartford, Conn., is asking bids on an addition, 90 x 115 ft., one story.

The New Britain Machine Co., New Britain, Conn., has issued $250,000 additional stock, making outstanding stock $1,250,000.

The John Davenport Co., Stamford, Conn., contemplates the erection of a factory 90 x 300 ft. The new company will combine the Ross Engineering Co., Bridgeport, Conn., and the Steinmetz Electric Truck Co., Newark, N. J. The company will manufacture gasoline engines and electric trucks.

Landers, Frary & Clark, New Britain, Conn., have awarded contracts for two additions, 62 x 155 ft., three stories, and 32 x 82 ft., one story.

Philadelphia

PHILADELPHIA, Dec. 17.

The Lanston Monotype Machine Co., Twenty-fourth and Locust streets, Philadelphia, has filed plans for a one-story, concrete addition, to cost $20,000.

The Automatic Shell-Boring Munitions Co., Philadelphia, has been incorporated with a capital of $100,000 by Samuel Hough, Cyrus Hawkins and Russell H. Myers, Philadelphia.

The William Cramp & Sons Ship & Engine Building Co., Beach Street, Philadelphia, has awarded a contract for a one-story addition to its brass foundry at Adams and Thompson streets, 140 x 220 ft., to cost $40,000.

Hare & Chase, Inc., Philadelphia, has been incorporated in Delaware with a capital of $1,000,000 to manufacture automobiles and automobile specialties. F. R. Hansell, Philadelphia, and S. C. Seymour, Camden, N. J., are the incorporators.

The Bureau of Yards and Docks, Navy Department, Washington, has taken bids for one-story additions, 40 x 160 ft., and 25 x 48 ft., to its magazine works at Fort Mifflin, Pa.

The New York Shipbuilding Corporation, Camden, N. J., has had plans prepared for a one-story addition, 50 x 130 ft., for a galvanizing works. It is also planning for a one-story plate rolling mill.

Fire Dec. 14 destroyed a portion of the car barns and shop of the Trenton & Mercer County Traction Corporation, Trenton, N. J., on Lalor Street, with an estimated loss of $70,000.

The Horn & Brannen Mfg. Co., Trenton, N. J., has been incorporated with a capital of $60,000 by Henry Donohoe, Herman Corn and Frederick Pfeffer, all of Philadelphia, to manufacture gas and electric fixtures, etc.

The American Steel & Wire Co., Trenton, N. J., is building a one-story machine shop, 70 x 210 ft., and a wire rope shop, 170 x 310 ft.

The York Hardware & Brass Works, Wheatfield and Commerce streets, York, Pa., has acquired the former car shops of Billmeyer & Small, to be used for extending its operations, adding about 25,000 sq. ft. of floor area. It will be equipped as a bronze and aluminum foundry. It is said the extension will be put in operation early next year and will give employment to about 50 molders.

The Berks Engineering Co., Reading, Pa., operating a machine shop at Seventh and Chestnut streets, has increased its capital from $25,000 to $150,000.

Baltimore

BALTIMORE, Dec. 17.

The Bureau of Yards and Docks, Navy Department, Washington, has awarded contract for a one-story brass foundry, 107 x 300 ft., at the Washington Navy Yard to cost $255,000.

Fire Dec. 12 destroyed a portion of the projectile-loading plant of the Bethlehem Steel Co., at New Castle, Del., with loss reported at $75,000.

Fire Dec. 14 destroyed a section of the plant of the du Pont Powder Co., Newark, Del., with loss estimated at $100,000.

The American Shipbuilding Corporation, Alexandria, Va., has been incorporated with a capital of $10,000,000 by C. H. Livingston, 1249 Kenyon Street, N. W., Washington, president; B. W. Morse is vice-president.

The Huntington Steel Products Co., Huntington, W. Va., is reported considering the enlargement of its plant.

The Bartlett-Hayward Co., Scott and McHenry streets, Baltimore, will construct a one-story addition, 40 x 49 ft., to cost $8,000.

The Harlan branch of the Bethlehem Steel Co., Wilmington, Del., will build an additional shop at the foot of West Street to cost $4,000.

Chicago

CHICAGO, Dec. 17.

War business of considerable proportions has been placed or is pending, but the market has nevertheless shown a quieter trend the past week. In ordinary times dullness might well be expected about this time of the year. Some concern is shown over the extent to which collections are slowing up, this being especially true in the automobile industry. A feeling that resources should be conserved to the limit is general. Conflict in priority orders continues to occur, some of it due to the fact that the Army and Navy departments, in some instances, are after the same machines.

The Wagner Electric Co., St. Louis, has placed large orders for equipment required in the manufacture of 6-in. shells, the machines including many lathes of special design for shell work, on which delivery has been promised in 45 days.

The Standard Steel Car Co., Hammond, Ind., understood to have a contract for howitzer mounts, has issued a big list, and later on will want a still larger number of tools. Among its requirements are a number of vertical boring and turning mills, orders for some of which have been placed. Deliveries on this type of machine are in bad shape. With some makers, boring mills cannot be delivered until next summer or fall.

The Nash Motors Co., Kenosha, Wis., is buying against a small miscellaneous list.

James L. Sparks, brass founder, 320 West Grand Avenue, Chicago, has had plans prepared for a one-story brick brass foundry at 1723 Carroll Avenue, to cost $12,000.

The William Glader Machine Works, 210 Ann Street, Chicago, has awarded the contract for a one-story machine shop, with foundation and walls to carry two additional stories, at Ann and West Lake streets, Chicago, to cost $20,000.

The Abraham Lund Co., 19 South La Salle Street, Chicago, has been awarded the general contract for a one-story factory, 87 x 250 ft., to cost $30,000, in connection with a plant at Waller Avenue and Taylor Street, Chicago, for the Hughes Electric Heating Co., 5660 Taylor Street.

The Witherspoon Englar Co., 53 West Jackson Boulevard, Chicago, has the general contract for a five-story macaroni factory, 85 x 120 ft., to cost $500,000 with equipment, for the Armour Grain Co., Battle Creek, Mich. Hydraulic presses are used in the manufacture of macaroni.

Plans are to be prepared by Robert R. Cenek, architect, 105 South La Salle Street, Chicago, for a factory at Grand and Kildare avenues, for the Ocean Floating Co., 803 West Madison Street, Chicago.

The J. G. Redmond Millwork Co., Rockford, Ill., has been incorporated with a capital stock of $15,000 for the manufacture of planing-mill machinery. Among the incorporators is J. G. Redmond, who now operates a small factory in Rockford.

The Grand Rapids Airplane Co., Grand Rapids, Mich., has been organized to distribute wooden parts of aeroplanes and to operate a factory for building such parts as require special machinery. S. D. Young was elected president, F. S. Foote vice-president, and J. H. Hoult treasurer. Thirteen furniture manufacturers are stockholders in the company, the capital stock of which will be $200,000.

It is announced that the General Motors Co. will reopen its plant in Marquette, Mich., Jan. 1 and employ between 1000 and 1200 men. The plant, originally built for the Rainier Motor Car Co., has been idle for some time. It will be managed by George H. Hannum, also general manager of the Jackson-Church-Wilcox Co.

The Convertible Tractor Corporation, 1485 Marshall Avenue, St. Paul, Minn., is preparing plans for an addition,

50 x 115 ft., four stories. When completed it will increase its working force by about 150 men.

Milwaukee

MILWAUKEE, Dec. 17.

Orders for machine tools continue in large number, with no improvement looked for on deliveries. Bookings now in hand will occupy all available capacity for 12 months, and in some instances a year and a half.

A readjustment of labor now going on has created a much easier feeling than for many months. An official statement of local conditions is to the effect that the supply of mechanics, such as drill-press hands and punch-press operators, is rapidly becoming more adequate. There is a steady demand, however, for toolmakers, tool blacksmiths, drop-forge men, and all-around machinists, which is difficult to fill. The shortage of labor for outside work is especially acute, due largely to the time of year. The selective draft has worked much less hardship on metal-working shops than had been expected, and under the new system it is believed the shops will be protected to an even more adequate degree.

The Northwestern Motor Co., Eau Claire, Wis., manufacturer of heavy-duty gasoline engines, railroad tractors, maintenance cars, etc., is planning to erect a new plant estimated to cost about $75,000 with equipment. It is affiliated with the Northwestern Steel & Iron Co., Eau Claire. Kim Rosholt is president of both companies. The motor company is far behind on orders, especially for a 45-hp. gasoline railroad tractor, and needs increased facilities immediately.

The Modern Steel Treating Co., Milwaukee, has been incorporated, with a capital stock of $5,000, by George Haubert, president of the Crary Tool Co., 220 Becher Street. It will engage in heat-treating metals by a new process evolved by Mr. Haubert. G. Walter, Esau and Adam J. Eimermann are also incorporators.

The Sommers & Sons Co., Milwaukee, recently incorporated with an authorized capital stock of $100,000, will manufacture tanks and other containers from non-corrosive metal. Members of the Sommers Mfg. Co., Detroit, Mich., are promoting the new company. The former plant of the General Construction Co., Thirtieth and Galena streets, Milwaukee, which has been taken over, is being remodeled, and will be ready shortly after Jan. 1.

The Southern Wisconsin Foundry Co., Madison, Wis., will start work immediately upon the construction and equipment of a new foundry to replace the one destroyed by fire Dec. 1, with an estimated loss of $50,000. The company specializes in castings for machine tools. L. J. McGinnis is president and general manager.

The Badger Steel Roofing & Corrugating Co., LaCrosse, Wis., has changed its corporate style to the Badger Corrugating Co. E. N. Knothe is secretary.

The Minnesota Masterlock Co., Amery, Wis., has been incorporated, with a capital stock of $10,000, by W. T. Kennedy, F. E. Yates and I. G. Ogden, to manufacture automobile locks and similar devices.

The Iola Light, Power & Mfg. Co., Iola, Wis., has been incorporated, with a capital stock of $25,000, to conduct a hydroelectric and auxiliary steam-generating plant, saw and planing mill, and other industries. The incorporators are Edwin J., George, Bertha, and Erna Nehls.

The Christensen Machine Co., Racine, Wis., has increased its capital stock from $5,000 to $50,000, to provide for the extension of its shop and equipment.

The Monarch Auto Lock Co., Kenosha, Wis., has been incorporated, with a capital stock of $100,000, to manufacture locks and other safety devices for automobiles and motor vehicles. The incorporators are Frank R. Hancock, Ronald F. Hoffman and Hans J. Kroch.

The Thor Machine Works Co., Racine, Wis., has been incorporated with a capital stock of $20,000, by Knud F. Jacobson, Kai H. Studt and Andrew Astrey.

The John Lauson Mfg. Co., New Holstein, Wis., manufacturer of gasoline and oil engines and farm machinery, has increased its capital stock from $500,000 to $1,000,000, to develop its tractor manufacturing department.

The Silent Washer Mfg. Co., Clintonville, Wis., has completed its new plant and is transferring its machinery and equipment from the former factory at Appleton, Wis. G. W. Buttles is general manager.

The Porter Electric Line Co., Stebbinsville, Wis., has been incorporated, with a capital stock of $10,000, to develop water power at Stebbinsville and furnish current to rural districts within a radius of 10 miles. Fred Miller is president.

The A. George Schulz Co., 417 Clybourn Street, Milwaukee, manufacturer of paper boxes and box board, has purchased a site of 9 acres in West Allis for its proposed new manufacturing plant, estimated to cost $350,000. Work will probably not begin until the latter part of next year.

The Superior Shipbuilding Co., Superior, Wis., is adding three berths to its yards, making a total of seven. The company is now employing more than 800 men, and expects to increase this number to 1500 or 2000 within 60 or 90 days.

The Northwestern Ordnance Co., Madison, Wis., has practically completed its new machine shop and has commenced the installation of lathes and other machine tools required for the production of 4.7-in. field pieces for the Government. It is expected that operations will begin about Jan. 5. The shop adjoins the plant of the Gisholt Machine Co., which is financing the ordnance company.

The Wisconsin Duplex Auto Co., Clintonville, Wis., has completed the first models of its new 4-wheel-drive chassis in the plant of the Andrews Motor Mfg. Co., Milwaukee, and is contemplating locating its plant at Oshkosh. The company is capitalized at $500,000, and was organized by William A. Besserdich, one of the founders of the present Four Wheel Drive Auto Co., Clintonville.

Cleveland

CLEVELAND, Dec. 17.

The machinery market the past week has been one of the most active of the whole year in this territory, both in the volume of inquiry and in orders placed. A number of rounds lots of machines were purchased and numerous round-lot inquiries developed, all for Government work. The demand is principally for lathes, planers, radial drills and boring and milling machines in large sizes. The Templars Motor Corporation, Cleveland, has taken a shell contract and placed orders with local machinery houses for about 80 machines, mostly lathes, and involving about $200,000. Dodge Brothers, Detroit, who have been buying heavily for their Government plant to make recoil devices, have placed an additional order with a Cleveland machinery house for planers and lathes amounting to about $60,000. The Erie Forge Co., Erie, Pa., which has been a heavy buyer of late, has placed an order for seven 60 to 72-in. lathes. The Willys-Overland Co., Toledo, is arranging to largely increase its facilities for Government work, and has come out with several inquiries, probably aggregating $500,000 worth of lathes, boring mills, planers and milling machines. The Morgan Engineering Co., Alliance, Ohio, which recently took a large order for gun carriages, has finally placed contracts for extensive plant additions and is asking for about 100 lathes; also for radial drills, planers and boring and milling machines. It is reported that its total requirements for its new plant will be approximately 400 machine tools.

A. R. Pribil, formerly supervisor of the press department of the Westinghouse Electric & Mfg. Co., Pittsburgh, and others, are organizing a company which will establish a plant in Cleveland for the manufacture of pressed steel connecting rods and pistons for automobiles and airplanes. It is the intention to either lease the factory building or to erect a new plant. Considerable machinery will be required, such as toolroom equipment and punch presses. Mr. Pribil has opened a temporary office at 602 American Trust Building.

The Wellman-Seaver-Morgan Co., Cleveland, which is building an addition to its Akron plant, will erect a power house, a galvanizing building and a crane runway.

The Brown Hoisting Machinery Co., Cleveland, will enlarge its plant by the erection of a one-story shipping building, 52 x 182 ft. The contract has been placed with the Austin Co., Cleveland.

The Morgan Engineering Co., Alliance, Ohio, has placed a contract with the George A. Fuller Co. for seven buildings for a new gun carriage plant, to be ready for occupancy about April 1. These will include an erecting shop 90 x 1000 ft., and six machine shops, 50 x 150 ft., 90 x 250 ft., 50 x 350 ft., 90 x 475 ft., 50 x 560 ft., and 90 x 200 ft. The Bethlehem Steel Co. will fabricate the steel for the buildings. On the completion of these buildings it intends to build others that will be practically a duplication of them.

The Scott-Fetzer Co., Cleveland, has been incorporated with a capital stock of $100,000 and will succeed the G. H. Scott Machine Co., Noble Court, which has been conducted as a partnership by G. H. Scott and Carl Fetzer. Mr. Scott will be president, Mr. Fetzer vice-president and treasurer, and James Clark secretary. The company will occupy its new plant at West 114th Street and Locust Avenue about Jan. 1.

The International Steel Tube & Rolling Mills, Inc., Cleveland, which was organized about a year ago and ac-

quired a site in Warren, Ohio, to build a lap-weld mill for the manufacture of boiler tubes, expects to place contracts for its building within the next few weeks, but does not plan to purchase equipment for some time. C. H. Hopkins, 415 Guardian Building, Cleveland, is secretary and treasurer.

The National Malleable Casting Co., Cleveland, has placed contracts for the erection of a two-story $60,000 welfare building for its new malleable iron foundry.

The Willys-Overland Co., Toledo, Ohio, will place its plant in full operation after Jan. 1, according to announcement by John M. Willys, president. This company has been making airplane motors, 3-in. gun carriages and army trucks for the Government, and is understood to have taken enough additional Government orders that, with its production of pleasure cars, will keep the plant at full capacity.

The Glenn L. Martin Co., Cleveland, recently organized to build airplanes, has moved from the Guardian Building to 940 Chestnut Avenue, where it has opened engineering offices. It is negotiating for a plant site.

The Odenkirk Mfg. Co., Cleveland, maker of water heaters, has purchased a site adjoining its present plant at 6811 Superior Avenue for a factory addition.

The Doehler Die Casting Co. is operating its Toledo, Ohio, plant with a large night and day force on Government work. This plant is reported to have a Government order for 20,000,000 parts for hand grenades.

The Kenney Foundry Co., Mansfield, Ohio, placed its new plant in operation a few days ago. This is located in remodeled buildings formerly occupied by the Phoenix Electric Co. The foundry occupies a floor space 50 x 100 ft. The company will do a jobbing business in gray-iron castings. It was recently incorporated, and its officers are: Andrew Kass, president; Joseph Paule, vice-president; J. M. Cousins, treasurer, and H. D. Kenney, secretary and general manager. Mr. Kenney was until recently general manager of the Humphreys Mfg. Co., manufacturer of sink backs, etc., Mansfield, Ohio.

The Lima Rivet & Forge Co., Lima, Ohio, has been incorporated with a capital stock of $300,000 to manufacture a new design of rivet, invented by George B. Phillips, and to make forgings. A factory will probably be erected shortly. The incorporators include W. L. Russell, John M. Boose, H. S. Moulton and others.

A new brass foundry will be established in Warren, Ohio, in the former Day-Ward Co.'s plant by M. A. Garvey and L. J. Garvey of Sharon, Pa. Later it is the intention to erect a new plant. M. A. Garvey will be manager.

The new plant that is being erected in Orville, Ohio, by the Ohio Blower Co., Cleveland, is nearing completion, and it is expected that it will be placed in operation early in January. C. T. Klein will be manager.

The Woodard Machine Co., Wooster, Ohio, has shut down its foundry at Orville, Ohio, and is moving the equipment to Wooster, Ohio, where a new foundry will be placed in operation in a few days.

The Sandusky Foundry & Machine Co., Sandusky, Ohio, has acquired a site for a foundry addition adjoining its plant.

The Cornwall Mfg. Co., Cleveland, has increased its capital stock from $10,000 to $25,000 and will add to its equipment. It manufactures sheet metal specialties and operates a metal stamping department. R. W. Cornwall is president and J. P. McGinty is secretary.

Cincinnati

CINCINNATI, Dec. 17

The fuel shortage has caused many manufacturers considerable inconvenience, but no plants in Cincinnati have been compelled to close down. Metal-working firms in Hamilton and Dayton have probably been affected to a greater extent.

Inquiries for machine tools for Government contracts are sent out in a more systematic manner, machine tool makers only receiving a list of tools which they build, and only dealers getting the full specifications covering the needs of different firms. Lately no large lists have been reported, but a Detroit firm is said to be preparing one to be issued shortly. Jobbing foundries that make a specialty of machine tool castings have been able to keep going, but the coke supply is running so short that operations may be suspended at any moment.

The Willys-Overland Co., Toledo, Ohio, has leased a manufacturing building at Richmond and Carr streets, Cincinnati, which will be equipped as an assembling plant.

The Ohio Welding & Mfg. Co., Cincinnati, has removed its plant from 814 West Sixth Street to the building formerly occupied by the William E. Gang Co. in West End. Augustin Davis, Jr., is president.

The Liberty Machine Tool Co., Hamilton, Ohio, has been incorporated with $100,000 capital stock and will erect a plant in Lindenwald suburb for the manufacture of planing machines. The incorporators are Charles E. Heiser, A. Ballinger, Frank K. Vaughn, F. G. Mueller and A. R. McCann. Mr. McCann, who was formerly general superintendent of the Hamilton Machine Tool Co., will be general manager.

The Mosler Safe Co., Hamilton, Ohio, will erect an addition to its plant for which contract has been let to the Frank Vaughn Building Co.

The Dayton Bronze Bearing Co., Dayton, Ohio, has increased its capital stock from $10,000 to $30,000 and will erect an addition to its plant at 918 East Third Street.

The Recording & Computing Machines Co., Dayton, has acquired a site adjoining its plant on which it will erect an addition at an early date.

The Flufio Pump Co., Cincinnati, has acquired five acres at Blanchester, Ohio, on the main line of the Baltimore & Ohio Railroad, on which it is erecting a two-story machine shop and foundry. By March 1 the company plans to reach a production of 500 small centrifugal pumps per day, and by midsummer it expects to double this. H. E. Henry is in charge.

The Dietz Mfg. Co., Cincinnati, has acquired a building at 230 Findley Street, which it will equip for the manufacture of a patented dish washing machine. The present offices are at 120 Opera Place.

The Ideal Machine & Tool Company, Cincinnati, for the past 15 years builder of special machinery, tools, dies and precision gages, has purchased at bankruptcy sale, all tools and machinery belonging to the New World Mfg. Co., of Cincinnati. It has also installed some new machinery, doubling its capacity to meet the growing demand for its combination precision lathe and grinder recently put on the market.

Indianapolis

INDIANAPOLIS, Dec. 17.

The Davis Foundry Co., New Castle, Ind., has been incorporated, with a $40,000 capital stock, to do a general foundry and machine shop business. The directors are John G. Hey, Louis B. Patterson and William Davis.

Peck's Super Heat Co., Elkhart, Ind., has been incorporated, with $10,000 capital stock, to manufacture automobile accessories. The directors are Raymond G. Peck, H. J. Rife and Carl E. Mishler.

The Greencastle Cabinet Works, Greencastle, Ind., has been sold to Grafton Johnson, Greenwood, Ind., and James B. Nelson, Indianapolis. It employs 150 men. R. R. Cunningham has been made general manager.

The Indiana Truck Corporation, Marion, Ind., will enlarge its plant to complete a contract for 500 motor trucks for the Government.

The directors of the Mutual Truck Co., Sullivan, Ind., have elected the following officers: President, Robert Petrie; vice-president, Roy Anderson; second vice-president, J. B. Miller; secretary, Frank McCoy, Effingham, Ill. The company will establish a plant in Sullivan.

The Chamber of Commerce, Laporte, Ind., announces that the New York Blower Co.'s plant at Bucyrus, Ohio, will be moved to Laporte and consolidated with another to be moved from Chicago.

The Central South

LOUISVILLE, Dec. 17.

Transportation has been the dominating feature the past week, traffic lines in this section having been badly crippled by severe weather. Coal mine equipment is sold for delivery from seven to nine months. Repair parts for machines are more in demand and shops in position to undertake repair work are operating to capacity. Coal is scarce and many plants have been on the verge of suspension.

Fire destroyed the sawmill, planing and veneer mill departments of the Louisville Planing Mill Co., Louisville, with a loss of $65,000. The boilers and engine room were not damaged, but the wood-working equipment was lost.

The Roy C. Whayne Supply Co., Louisville, is in the market for a ½-yd. orange peel bucket in good condition.

A. T. Head, New York, and others are establishing an oil refinery at Rodimer, Ky., to have a daily capacity of 3000 bbl.

Fire destroyed the plant of the New Glasgow Flooring Co., Glasgow, Ky., operated by the J. O. Nessen Co., Chicago, with a loss of $80,000. Curtis Harvey, Glasgow, may be addressed.

The W. J. Oliver Co., Knoxville, Tenn., is making addi-

tions to its plant at a cost of $250,000 to manufacture 6-in. shells.

J. Ed. Guenther, Owensboro, Ky., implement dealer, is establishing a machinery exchange and is purchasing second-hand traction engine boilers, pumps and other machinery.

The Howard Shipyards & Dock Co., Jeffersonville, Ind., has reduced its capital stock from $800,000 to $400,000, and it is reported that it will build wooden ships. It has five yards on the Ohio River.

The Bates Mfg. Co., Lawrenceburg, Tenn., has been incorporated with capital stock of $25,000 by W. H. Bates, H. L. Kincaid, S. Kelly, W. A. Hatman and T. C. King to manufacture automobile supplies.

R. S. Byron, Hennen Building, New Orleans, La., is asking for prices on one 125-hp. and one 54-in. boiler, locomotive type.

The Reciprocating Tool Co., Louisville, has been incorporated with a capital of $10,000 by F. L. Robinson, James K. Jarvis and J. J. Roberts to manufacture electric tools.

The National Cast Iron Pipe & Foundry Co., Birmingham, Ala., has increased its capital from $350,000 to $500,000.

St. Louis

ST. LOUIS, Dec. 17.

The Littleton Brothers Co., Newport, Ark., are reported in the market for cotton gin and power plant equipment to replace that destroyed by fire with a loss of $12,500.

E. D. Hardin, Kensett, Ark., under a municipal franchise, will equip an electric light and power plant.

The Green Light & Power Co., Pleasant Hill, Mo., has been incorporated with a capital stock of $150,000 by L. K. Green, L. R. Green and others and will equip a plant.

Seminole, Okla., is in the market for about $5,000 worth of electric plant equipment.

The Simplex Spreader Mfg. Co., Kansas City, Mo., is in the market for equipment for a plant to manufacture special agricultural implements for power and horse drawn use.

The Nowata Reginning & Producing Co., Nowata, Okla., has been incorporated with a capital stock of $500,000 by Thomas E. Elliott, H. R. McGill and others, and is in the market for equipment.

The Iatt Lumber Co., Colfax, La., will rebuild its sawmill recently burned with a loss of $50,000 on equipment.

The Belfast Investment Co., Kansas City, Mo., W. S. Dickey and others interested, will equip a $50,000 hay compressing plant.

The Prock Mfg. Co., Erick, Okla., has been incorporated with a capital stock of $100,000 by John W. Heflin, F. F. Cain and others, and is in the market for metal-working machinery for the manufacture of yokes, etc.

The Louisiana Motor Car Co., Cedar Grove, La., has been organized with a capital stock of $100,000 by J. S. Richardson, A. B. Pickett and R. E. Murff, all of Shreveport, La., to manufacture automobiles, trucks and farm tractors.

The Valley Motor Car Co., Clarksdale, Miss., has been incorporated with a capital stock of $100,000 by its present owners and will enlarge its plant and add new equipment.

The Louisiana Shipbuilding Corporation, a reorganization of the Slidell Shipbuilding Co., Slidell, La., has been incorporated with a capital stock of $1,500,000, and will increase its facilities to meet Government contracts.

Madill, Okla., A. A. Kelley, mayor, will expend $65,000 on waterworks plant equipment, including considerable pumping machinery, etc.

The Excelsior Tool & Machine Co., engineer, founder and machinist, Thirtieth Street and Ridge Avenue, East St. Louis, Ill., plans to erect an addition to its foundry building and a two-story fireproof pattern shop, storehouse, stockroom and garage, and is seeking bids on building material. It is also planning to construct a large core oven, and will install a 10-ton and 2-ton electric crane. T. F. Philippi is president and manager.

The Akers Mfg. Co., Kansas City, Mo., has been incorporated with a capital of $30,000 to manufacture metal specialties, brass castings, etc. H. H. Akers, A. A. and L. A. Buxton, Kansas City, are the incorporators.

The Henry Weis Mfg. Co., Kansas City, has been incorporated in New Jersey with capital of $50,000 to manufacture metal goods. Henry Weis, Thomas H. Ridge and Robert Vance, Kansas City, are the incorporators.

Texas

AUSTIN, Dec. 15.

An increased demand for equipment for public utility plants is noted. A large amount of Government work which is also in progress throughout the State has added materially to the demand for small tools.

The Houston Shipbuilding Co., Houston, has leased a site on the ship channel for a plant. It will make a specialty of constructing ocean-going barges. Arthur Boyce, Dallas, is president.

The City Council, Mart, will install additional machinery in the municipal waterworks plant.

The San Augustine County Lumber Co., of Keltys, which has increased its capital stock from $200,000 to $450,000, will enlarge its mills by the installation of additional machinery.

The City Council, Nacodoches, will install new equipment in the electric light plant with a view of doubling its capacity.

The Fort Worth Power & Light Co., Fort Worth, has increased its capital stock from $3,860,000 to $4,360,000, and will install a new 23,000 hp. steam turbine generator and other equipment in its power plant.

Fred A. Thackery, Sackaton, and associates will install an irrigation pumping plant near Florence, Ariz.

The East Texas Utilities Co., Marshall, which was recently incorporated with a capital stock of $300,000, has taken over the electric light and power plants at Marshall, Jefferson and Longview, which it will enlarge and improve. The same interests have incorporated the West Texas Utilities Co. with a capital stock of $400,000, with principal offices at Abilene, and have taken over the electric light and power plants of Abilene, Baird and Hamlin, where additional machinery will also be installed.

Captain Neilson and associates, Orange, have purchased a site of 37 acres on the Sabine River, upon which they will construct a shipbuilding plant.

W. L. Spence of El Paso will build a sawmill near Alamogordo, N. M., with a daily capacity of 15,000 ft.

The Hoffman Oil & Refining Co., Wilmington, Del., which has a capital stock of $10,000,000, will establish offices in Houston and build a refinery for oil development operations in the Gulf coast fields.

The Port Arthur Cooperage Co., Port Arthur, will build a plant, to cost about $100,000, for the manufacture of barrels and kegs.

The Texas Motor Car Association, Cleburne, has under consideration the construction of a plant, to cost about $1,000,000, for the manufacture of automobiles. William Ginnuth, Temple, is first vice-president.

The Port Arthur Light & Power Co., Port Arthur, will install a water treating plant to cost about $16,000.

The Atlas Cabinet Co., Dallas, will build a plant at a cost of about $30,000 for the manufacture of cabinets.

California

SAN FRANCISCO, Dec. 11.

The Pacific Electric Railway Co., Pacific Electric Building, Los Angeles, is having plans prepared for a one-story repair works and car barn at San Bernardino, 100 x 190 ft.

The Safety Welding Apparatus Mfg. Co., Los Angeles, has been incorporated with a capital of $20,000 by G. B. Morgan, D. C. Roberts, L. S. Coen and M. A. Fleming.

The B. B. Bell Co., Los Angeles, has been incorporated with a capital of $30,000 by B. B. Bell, E. P. Bell and D. S. Collins, Los Angeles, to manufacture lighting fixtures, etc.

The Board of City Trustees, Anaheim, Cal., will receive bids up to 8 p. m., Dec. 27, for new machinery for the municipal electric plant, including a tandem cross-compound engine, an electric generator, exciter, boilers, pumps, etc. Edward B. Merritt is city clerk.

The World Aircraft & Development Co., San Diego, recently organized, has acquired a four-story building on Sixth Street for an airplane factory. Floyd Smith is president.

The San Diego Bay Shipbuilding Co., San Diego, has been incorporated with a capital of $1,500,000 to build and operate a yard on San Diego Bay. J. Burris Mitchell, F. A. Barnett and Leonard L. Jones are the incorporators.

The Crown City Sheet Metal Works, Pasadena, has filed notice of organization to operate a plant at 150 West Union Street. Homer H. Justice, 394 South Michigan Avenue, heads the company.

The Butters Chemical Works, Martinez, Cal., has commenced the erection of a plant. A furnace for ore reduc-

tion will be installed. The plant is estimated to cost about $500,000.

The Detroit Chassis Co., Detroit, Mich., is said to be considering the erection of a plant at Bakersfield, Cal., for the manufacture of trucks.

The Liberty Mfg. Co., Los Angeles, has been incorporated with a capital of $50,000 by Ralph H. Gibson, C. D. Pollock and Alva D. Blake to manufacture metal emblems, hatpins, etc.

The Pacific Northwest

PORTLAND, ORE., Dec. 11.

The labor situation in shipbuilding yards in the Columbia River and Puget Sound districts is no longer troublesome. Sufficient workmen are to be had in practically all lines, though there is no oversupply in skilled mechanics. A number of hulls of standard types for the United States Shipping Board have been completed, and the installation of boiler and machinery equipment is under way at several yards. The car shortage has not yet interfered with shipments of Government materials from the lumber mills, but complaints are made that there is a serious shortage of cars for ordinary manufacturing. The demand for spruce lumber has led to many extensions and a number of new mills are under way in Oregon, Washington and Alaska.

The Craig Lumber Co., Craig, Alaska, will install lumber milling equipment with a daily capacity of 50,000 ft. of spruce.

The Loggers' & Contractors' Machinery Co., Portland, has completed the erection of an addition, 60 x 100 ft., which will be equipped for repairing and rebuilding second-hand lumber mill and logging machinery.

Plans have been completed for the reconstruction of the Brown Lumber Co.'s mill at Cottage Grove, Ore., to cost $50,000. It will have a daily capacity of 75,000 ft. New equipment will be installed.

The Standifer Shipbuilding Co., Portland, has received contracts from the Government for the construction of 10 8800-ton steel vessels, to cost $16,000,000. It is reported that a site for an additional shipbuilding plant at Vancouver, Wash., has been secured.

The Erickson Shipbuilding Co., Seattle, has completed plans for a machine shop 106 ft. long, power house, blacksmith shop, boiler shop, foundry pattern shop and bolt shop, to cost $65,000. When completed the plant will cost about $500,000.

The Carnation Milk Products Co., Seattle, has completed plans for its new plant at Nampa, Idaho, to cost $175,000, which includes a three-story boiler house, 50 x 100 ft.

John L. Hall, Henry Building, Seattle, and E. L. Skeel have formed the Lake Washington Shipyards Co., which plans the construction of a plant at Houghton, on Lake Washington.

The Boeing Airplane Co., Seattle, has increased its capital stock from $100,000 to $500,000 to extend and improve its factory.

The Far West Sales Co., Albany, Ore., will erect a new plant, 40 x 160 ft., which will be the first of four units. It manufactures ladders, wheelbarrows, cedar chests and furniture specialties.

The Concrete Piling Co., formerly of Seward, Neb., plans the installation of a plant in Seattle to cost $250,000. W. B. Hester is chief engineer. Concrete and concrete sheet piling will be manufactured.

It is announced that the Norway-Pacific Construction & Dry Dock Co., Seattle, will construct a shipbuilding plant in Everett, Wash., at a cost of $1,500,000, which will employ 3500 men. Five shipways are planned and steel vessels of 9800-ton capacity will be built. M. G. Thomle is president.

Canada

TORONTO, Dec. 15.

Great activity in munitions manufacture is looked for throughout 1918. British renewal orders are being received for 4.5-in. and high explosive shells and shrapnel. The total amount of Imperial expenditures is placed at about $30,000,000 a month, and covers shipbuilding, munitions, etc. The money subscribed to the Victory Loan will benefit Canadian industries through the expenditure of approximately $410,000,000, which will be largely utilized for financing British and Canadian war contracts.

The Steel Company of Canada, Hamilton, Ont., is making extensions and improvements representing an outlay of $150,000.

The Canadian Machine Co., with offices at Nashua, N. H., and Boston, proposes to build a manufacturing plant at Maisonneuve, Que., and has asked the city council to guarantee debentures of the company to the extent of $250,000.

The Willy-Overland, Ltd., Weston Road, Toronto, contemplates the erection of a factory to cost $40,000.

The Holden Morgan Co., 579 Richmond Street, West, Toronto, is having plans prepared for the erection of a building to cost $4,000 to manufacture munitions.

Plans have been drawn for the erection of a new building for the Canadian Fairbanks-Morse, Ltd., 1383 Bloor Street, West, Toronto, to cost $4,500.

The Vulcan Iron Works, Ltd., Port Douglas, Winnipeg, will build an addition to its plant to cost $65,000, for which tenders are being received by Woodman & Cubbidge, architects, 302 Lindsay Building.

The Jackson Lewis Co., Ltd., Toronto, has been awarded contract for the erection of an addition to cost $30,000 to the factory of the Canadian Aeroplane Co., Ltd., Dufferin Street, Toronto.

The Exolon Co., Thorold, Ont., is preparing plans for the erection of an addition to cost $500,000. Kalmus, Comstock & Westcott are the engineers.

The International Business Machines Co., Ltd., Toronto, has been incorporated with a capital stock of $2,000,000 and will take over the plants of the International Time Recording Co., Toronto; Dayton Computing Scale Co. and the Hollerith Tabulating Machine Co., Montreal. These companies will be operated under one central management at Toronto, but the branch offices will be continued in every large city in Canada. It is also the intention of the company to develop an export trade, particularly to Australia, New Zealand, South Africa and South America. Thomas J. Watson is president and Frank E. Mutton, 158 Madison Avenue, vice-president. The sales managers are L. A. Davidson for the scale division and St. George Bond for the tabulator division. A new plant will be built in Toronto at an early date.

The (British) Young High-Velocity Carburetor Co., Ltd., Toronto, has been incorporated with a capital stock of $250,000, by Henry H. Davis, 10 Adelaide Street, East; Edward H. Brower, Lawrence A. Landriau and others, to manufacture carbureters, automobiles, accessories, machinery, etc.

The planing mill owned by Walker & Son., Berge Street, Rosthern, Sask., was destroyed by fire, with a loss of about $160,000. It will be rebuilt and new machinery and engines purchased.

M. J. O'Brien proposes to build an industrial plant at Arnprior, Ont., and develop waterpower on the Madawaska River, at an expenditure of about $3,000,000.

The Water Commissioners, Windsor, Ont., have decided to install at once two new powerful electric pumps on account of the shortage of fuel. The present steam installation will be retained for auxiliary purposes.

The Terminal Land Co., Fort William, Ont., has purchased the plant of the Conley Frog & Switch Co., Port Arthur, Ont., which was under construction at the time war broke out but was never completed. The new owners will finish the plant and equip it.

Government Purchases

WASHINGTON, Dec. 17.

Bids will be received by the Bureau of Yards and Docks, Navy Department, until Jan. 7 for furnishing and installing one 40-ton and two 10-ton overhead electric traveling bridge cranes and runway trolley wires on the runways in the extension to the machine shop building, 128, at the navy yard, New York. Drawing and specifications No. 2720 may be obtained from the bureau or from the commandant of the navy yard named.

Bids were received at the Bureau of Supplies and Accounts, Navy Department, Washington, Dec. 7, for furnishing material and supplies for the naval service as follows:

Schedule 2337½, Yards and Docks, Class 1, Mare Island—One hydraulic pump with motor—Bid 46, $18,500 and $18,050; 55, $10,300 and $9,625.

Schedule 2318½, Steam Engineering, Class 21, Brooklyn—Two horizontal boring, drilling and milling machines—Bid 10, $5,543.75; 21, $6,325; 31, $7,310 and $7,590; 62, $5,955.90. Class 22, Brooklyn—Two planers—Bid 31, $8,370 and $9,050; 54, $3,950. Class 23, Brooklyn—Two upright drilling machines—Bid 31, $1,045.

The names of the bidders and the numbers by which they are designated in the above list follow:

Bid 10, Defiance Machine Works, Defiance, Ohio; 21, Hill, Clark & Co., New York; 31, Niles-Bement-Pond Co., New York; 46, Edward J. Smith, New York; 55, Worthington Pump & Machinery Corporation, New York.

Hydraulic Forging Presses

(*Continued from page* 1480)

Tweddell, R. H.
On the application of direct-acting pressure intensifying apparatus to hydraulic pressure.
Proc. Inst. Mech. Engrs., 1878, pp. 45-66.

1880—Differential accumulator, (designed by K. Heinrich, Prague).
Dingler's Polytechn. Jour., 1880, v. 235, pp. 185-87, (plate 16, figs. 7-13).

1882—Tweddell, R. H.
On machine-tools and other labor-saving appliances, worked by hydraulic pressure.
Min. Proc. Inst. Civil Engrs., 1882, v. 73, part III, pp. 64-78; Appendix (plates 5, 6 and 7), pp. 79-82.

1884—A. Higginson's arrangement of hydraulic machine tools.
German patent 26435, class 47, Sept. 7, 1883.
Dingler's Polytechn. Jour., 1884, v. 252, pp. 313-14.
Jacques, Lieut. W. H.
The establishment of steel gun factories in the U. S.
Sir Joseph Whitworth's hydraulic forging press.
Proc. U. S. Naval Inst., 1884, v. X, No. 4, pp. 637-642, (plates XXVII-XXIX).

1886—Augström, C. A.
Om användning of hydrauliskt tryck sasom drifkraft för atskilliga i mekaniska verkstäder och för jernhandteringen begagnade arbetsmaskiner.
Jernkontorets Annaler 1886, pp. 442-74.
A 4000-ton hydraulic forging press.
Engineering (*London*), 1886, v. 41, p. 393.
C. Davy's hydraulic forging press, (Description of German patent 34273, May 3, 1885).
Dingler's Polytechn. Jour., 1886, v. 259, pp. 489-93, (plate 32, figs. 10-13).
Zeits. Vereins Deutsch. Ingen., 1886, v. XXX, no. 22, p. 487.
Miscellaneous machinery at the International Inventions Exhibition.
Engineering (*London*), 1885, Sept. 25, v. 60. pp. 284-35.
Breuer, Schumacher & Co.
Hydraulic forging press.
German patent 37917, May 21, 1886.
Neukirch, Fr. Bremen.
Hydraulic press and lifting machine.
German patent 36580, Class 58.
Zeits. Vereins deutsch, Ingen., 1886, v. XXX, p. 964.

1887—Higginson's forging press with pressure-water operation.
Industries, 1887, Dec. 16, v. III, p. 642.
Dingler's Polytechn. Jour., 1888, v. 267, pp. 342-43.
Boehme, E., Breslau.
Hydraulic differential accumulator.
German patent 38213, class 58.
Zeits. Vereins deutsch. Ing., 1887, v. XXXI, pp. 359-60.
Haniel & Lueg, Düsseldorf-Grafeuberg.
Hydraulic differential press.
German patent 39694, class 58.
Zeits. Vereins deutsch. Ingen., 1887, v. XXXI, p. 896.

1888—Hydraulic tube press, built by Messrs. Henry Bessemer & Co., Sheffield, Eng.
Engineering (*London*), 1888, Jan. 20, v. 45, p. 75
Hydraulically operated machine-tools (forging presses).
Zeits. Vereins deutsch. Ingen., 1888, v. XXXII, pp. 941-45.

1889—Gautier, Ferd.
Comparison of forging with the drop-hammer and the hydraulic press.
Bull. Soc. l'Industrie Minèrale, 1889, part III, pp. 839-849.
Sellers, Prof. C.
Hydraulic forging machines as compared with the action of the steam hammer.
Stevens Indicator, 1889, Jan., v. VI, pp. 1-14.
Trappen.
Hydraulic forging press.
German patent 53225, Dec. 14, 1889.

1891—Allen, W. D.
The forging press.
Jour. Iron & Steel Inst. (London), 1891, II, pp. 62-66 (plate XIII).
Engineering (*London*), 1891, v. 52, p. 416.
Stahl u. Eisen, 1891, v. XI, p. 895.
Angström, C. A.
Om nya konstruktioner af hydrauliska smidespressar.
Jernkontorets Annaler, 1891, pp. 463-84 (plates XVI and XVII).
The Prött and Seelhoff compressed air intensifier (accumulator) for hydraulically performed operations (German patent 43434, British patent 8329).
Stahl u. Eisen, 1891, Feb., v. XI, pp. 132-34.
Dingler's Polytechn. Jour., 1891, June 26, v. 280, pp. 289-291.
Demenge.
The 4000-ton press erected by the Compagnie des Forges de Chatillon-Commentry at the Saint-Jacques works, Montluçon.
Génie Civil, 1891, v. XX, pp. 65-71. (14 Figs.)

1892—Daelen, R. M.
High-pressure hydraulic presses in iron works.
Stahl u. Eisen, 1892, v. XII, pp. 155-172 (Illus.); (Transl.) Trans. Amer. Inst. Min. Engrs., 1892-93, v. XXI, pp. 321-345 (Illus.). (Abst.) Z. Vereins deutsche Ingenieure, 1892, v. XXXVI, p. 922.
Prakt. Maschinen-Konstrukteur, 1892, v. XXV, p. 93.
Dufour, C.
Memoir on forging presses.
Bull. Soc. l'Industrie Minérale, 1892, v. VI, pp. 1037-82. (Abst.) Jour. Iron & Steel Inst. (London), 1893, v. 54, No. II, pp. 455-456.
Min. Proc. Inst. Civil Engrs., 1892-1893, vol. 114, pp. 445-47.

1893—Angström, C. A.
Anordning och drift of hydrauliska smidespressar Jernkontorets Annaler, 1893, v. IV, pp. 212-244 (plates XIII, XIV, XV).
Hydraulic presses.
Dingler's Polytechn. Jour., 1893, Aug. 11, v. 289, pp 121-123.
Les presses à forger de Breuer, Schumacher et Cie (presses à course partielle variable).
Portefeuille écon. des machines, 1893, v. 38. p. 129.
Génie Civil, 1893, v. XXIII, p. 411.
Accumulators.
Pressure-water accumulator designed by W. Pagne-Gallway; the Berry accumulator; piston, the Selles accumulator, the Aiken pressure-water auxiliary accumulator or pressure transmitter (9 Figs.).
Dingler's Polytechn. Jour., 1893, v. 289, pp. 276-78.
The Pearson carwheel forging machine.
THE IRON AGE, 1893, Dec. 7, v. 52, pp. 1015-17.
Biggart, J. L.
The adaptation of hydraulic power in the manufacture of iron and steel.
West of Scotland Iron & Steel Assoc., 1893, Jan. 13, v. 1, pp. 60-73 (plates II-VI).
Davenport, R. W.
Production in the U. S. of heavy steel engine, gun and armor plate forgings.
Soc. Naval Architects & Naval Engrs., 1893, v. 1, pp. 70-89; discussion, pp. 89-90.
THE IRON AGE, 1893, Nov. 23, v. 52, pp. 926-27; 971
Gomez.
Forging presses.
Bull. Assoc. Ingenieurs sortis de l'Ecole de Liège, 1893.
(Abst.) Jour. Iron & Steel Inst. (London), 1893, v. 54, No. II, pp. 454-55.

1894—Hydraulic shear and forging press with intensifier (Breuer, Schumacher & Co.).
Revue Industrielle, 1894, v. XXV, pp. 334-35.
Maschinenbauer, 1894, v. XXIX, pp. 39-40.
Hydraulic shell plant.
(Constructed by Messrs. Fielding & Platt, Gloucester).
Engineering (*London*), 1894, Jan. 5, v. 57, p. 12.
The Breuer-Schumacher 1200-ton hydraulic forging press (constructed by Messrs. Greenwood & Batley, Ltd., Leeds, Eng.).
Engineering (*London*), 1894, v. 57, pp. 241-42.
Eng. Min. Jour., 1894, v. 94, p. 293.
Hydraulic forging press with increased final pressure for 350,000 kg. maximum pressure, provided with steam intensifier.
Glaser's Annalen f. Gewerbe und Bauwesen, 1894, Nov. 15, 35, pp. 194-195.
The Morgan 1000-ton forging press, with Blake intensifier. THE IRON AGE, 1894, v. 54, pp. 741-42 (3 Figs.)
Tweddell, R. H.
Forging by hydraulic pressure.
Min. Proc. Inst. Civil Engrs., 1894, Feb. 20, v. 117, pp. 1-24; discussion, pp. 25-40; correspondence, pp. 41.
(Abst.) Jour. Iron & Steel Inst., 1894, v. 45, No. 1, pp. 539-40.
Stahl u. Eisen, 1894, v. XIV, pp. 900-908.

1895—Recent forging presses.
Dingler's Polytech. Jour., 1895, v. 297, pp. 249-53.
Buch, J.
The replacement of the rolling mill by steam-hydraulic presses.
Stahl u. Eisen, 1895, Dec. 15, v. XV pp. 1143.
Jour. Iron & Steel Inst., 1896, v. 49, p. 437.

1896—The manufacture of rods of varying cross-section from Delta metal or other metals by hot pressing in a hydraulic press (Dick process).
Zeits. Vereins deuts. Ingen., 1896, Dec. 5, v. 40, No. 49, pp. 1434-36 (Illus.).
Fielding and Platt's double-powered hydraulic forging press.
Engineer (*London*), 1896, v. 81, p. 316 (Illus.).
Angström, C. A.
Notes on the construction of hydraulic welding presses.
Jernkontcrets Annaler, 1896, v. 51, pp. 23-45.
Jour. Iron & Steel Inst., 1896, v. 50, pp. 370-71.
A 1200-ton bossing and forging press (constructed by Fielding & Platt, Ltd., Gloucester).
Engineering (*London*), 1896, Aug. 28, v. 62, pp. 273-274.
Bull. Soc. d'Encouragement à l'Industrie Nationale, 1896, p. 1036.
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Notes on Davy forging presses.
Bull. Soc. de l'Industrie Minérale, 1896, v. X, pp. 589-599.
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Hollow steel forgings.
Trans. Amer. Soc. Mech. Engrs., 1896, May 19, v. XVII, pp. 359-371.
Uhland's Techn. Rundschau, 1897, v. V, p. 55.

1897—Machines for forging rolling, bending and drawing.
Dingler's Polytechn. Jour., 1897, v. 303, No. 1, pp. 11-12.
Vickers' Works at Sheffield—8000-ton hydraulic forging press.
Engineering (*London*), 1897, Nov. 5, v. 64, pp. 555-57.
Davenport, R. W.
Steel for marine engine forgings and shafting.
Cassier's Magazine, 1897, Aug., v. XII, pp. 513-530.
Ellington, E. B.
The transmission of power by water.
Engineer (*London*), 1897, v. 83, p. 535.
Engineering (*London*), 1897, v. 63, pp. 710 and 728.
Electrician, 1897, v. 39, pp. 148-49.
Meyer, B.
Steam-hydraulic presses in place of shingling hammers.
Stahl u. Eisen 1897 XVII, pp. 257-261 (1 illustr.).
(Abst.) J. Iron & Steel Inst. 1897, v. 51, p. 491.

1898—Gledhill armor-plate forging press.
Bull. Soc. d'Encour. pour l'Ind. Nat., 1898, v. 97, pp. 92-94.
Vickers 8000-ton forging press.

Génie Civil, 1898-99, v. XXXIV, pp. 184-85.
Oester. Zeits. f. Berg-u. Hüttenwesen, 1899, v. 47, pp. 160-61.
The construction of modern wire-wound ordnance. No. III: Hydraulic forging press engines, Southgate Engineering Co., Ltd., 3000-ton hydraulic forging plant.
Engineering (London), 1898, v. 85, pp. 100-102.
The Watson-Stillman 500-ton hydraulic press.
THE IRON AGE, 1898, Jan. 27, v. 61, p. 11.
Hydraulic forging, designed by A. Borsig, Berlin.
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THE IRON AGE

New York, December 27, 1917

ESTABLISHED 1855 VOL. 100: No. 26

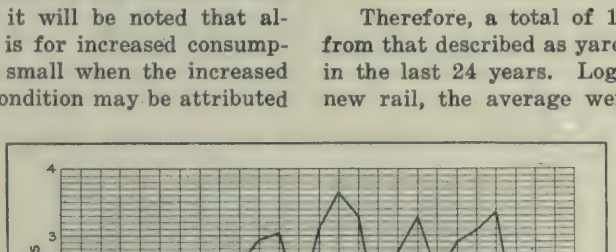
A Shortage of 10,000,000 Tons of Rails

Consumption Figures, After Allowing for Main Line and Siding Extensions, Regarded as Indicating Too Little Rail Renewing

BY C. W. GENNET, JR.†

THE production of steel rails in the United States has been a subject very largely neglected, since the war has attracted attention to other more necessary steel products. The accompanying table, compiled from statistics of the American Iron and Steel Institute, the reports of the Interstate Commerce Commission and the United States Department of Commerce, affords an interesting comparison of the production and consumption of rails in the United States since 1893.

While the tonnages shown include rails of the girder and other types for street railroad purposes, the consumption of standard section rails for regular steam railroad use is undoubtedly closely approximated by the figures given. This consumption is also shown in the accompanying diagram, and it will be noted that although the general tendency is for increased consumption the rate is surprisingly small when the increased mileage is considered. This condition may be attributed to two causes, namely, the generally heavier weight per yard of the section of rails rolled in succeeding years and the rapid growth of the use of open-hearth steel rails with a consequently longer life. Obviously the use of the heavier sections tends to prolong the life of rails, thus giving a decreasing rate of consumption, other things being equal. At the same time open-hearth steel rails, which have now for several years been produced in considerably greater amounts than Bessemer steel rails, admittedly afford a longer life, so that a decreasing rate of consumption might be likewise anticipated.



Annual Domestic Consumption of Rails for 24 Years

Notwithstanding these matters the question remains as to whether rails are being produced in the quantities demanded by the increased mileage and traffic of the railroads, and to this an answer can be indicated by further consideration of the statistics.

The Commerce Commission's reports show the mileage made up as follows for the fiscal years given:

	1893	1916	Increase
Single track	169,780	259,210	89,430
Second, third and fourth track	11,633	33,863	22,231
Yard track and sidings	40,451	101,869	61,418

Therefore, a total of 111,661 miles of track, apart from that described as yards and sidings, has been built in the last 24 years. Logically this would require all new rail, the average weight of which was probably close to 85 lb. per yd., so that roughly 14,900,000 tons of new rail has been necessary for this extension to the main track mileage. Yard track and sidings are generally built of old released main line rail and the increase of 61,418 miles in this class of track represents with fair accuracy the length of new rail necessary to take its place. This at 85 lb. per yd. would require 8,000,000 tons. Thus for

PRODUCTION AND CONSUMPTION OF RAILS AND TOTAL RAILROAD MILEAGE IN THE UNITED STATES

Year	Tonnage rolled	Tonnage imported	Tonnage exported	Tonnage approximately consumed	Total mileage*	Year	Tonnage rolled	Tonnage imported	Tonnage exported	Tonnage approximately consumed	Total mileage*
1893	1,136,458	2,888	19,876	1,119,470	221,863	1905	3,375,929	17,278	295,023	3,098,184	306,796
1894	1,021,772	300	13,556	1,008,516	229,795	1906	3,977,887	4,943	328,036	3,654,794	317,083
1895	1,306,135	1,447	15,599	1,291,983	233,275	1907	3,633,654	3,752	338,906	3,298,500	327,975
1896	1,122,010	7,796	73,131	1,056,675	239,140	1908	1,921,015	1,719	196,510	1,726,224	333,645
1897	1,647,892	415	148,221	1,500,086	242,013	1909	3,023,845	1,542	299,540	2,725,847	342,351
1898	1,981,241	200	301,903	1,679,538	245,333	1910	3,636,031	7,861	353,180	3,290,712	351,766
1899	2,272,700	2,134	277,714	1,997,120	250,142	1911	2,822,790	3,414	420,874	2,405,330	362,824
1900	2,385,682	1,448	361,619	2,025,511	258,784	1912	3,327,915	3,780	446,473	2,885,222	371,237
1901	2,874,639	1,905	318,956	2,557,588	265,352	1913	3,502,780	10,408	460,553	3,052,635	379,508
1902	2,947,933	63,522	67,666	2,943,789	274,195	1914	3,502,780	22,571	174,680	3,350,671	387,208
1903	2,992,477	95,555	30,837	3,057,195	283,821	1915	1,945,095	78,525	391,379	1,632,241	391,141
1904	2,284,711	37,776	416,250	1,906,237	297,073	1916	2,204,203	26,299	540,349	1,690,153	394,944
						Total	60,847,574	397,478	6,290,831	54,954,221	
						Av.	2,535,315	16,561	262,118	2,298,759	304,469

*Tonnage items are totals for calendar years, the mileage is for the years ending June 30, and includes all classes of track.

†Robert W. Hunt & Co., Chicago.

the 24 years' record there has been, in round numbers,

	Tons
Total approximately consumed	54,900,000
Required for extensions of main tracks	14,900,000
Required for replacements	8,000,000
Total	22,900,000
Amount available for renewals	32,000,000

A few of the leading trunk line railroads count on replacing 10 per cent of their mileage each year with new rail. Others, including many of the western and southern lines, have a yearly rail renewal program calling for a less amount of new rail, so that probably 6 per cent represents a liberal factor to serve as the average of common railroad practice and especially so since such would mean that the average life of rails was over 16 years.

Going back then to the Commerce Commission's records of main track mileage it will be found that 6 per cent of the total mileage on which rails should have been renewed amounts to 322,000. If the renewals were made in 85-lb. section (a very generous assumption) there would be required a total of 42,000,000 tons. Apparently, therefore, a shortage of approximately 10,000,000 tons of rail now exists on the railroads in order to bring them up to a prime physical condition, for as above shown only 32,000,000 tons have been available for renewals in the time stated.

Such a conclusion may seem like an exaggeration of facts. But in 1912 a special committee on relations of railroad operation to legislation brought out the fact that 63,000 miles of main line track was laid with rails of 75 lb. and lighter sections. No doubt much of this should have been replaced long ago. Replacing all of it in 85-lb. rail would have required 8,300,000 tons, but the consumption since 1912 has only been 9,600,000 tons and considering that the renewal of other or heavier rail must have been continued since 1912 as before, it is readily seen that a very large amount of light rail is now in service that should be replaced. Probably, therefore, the above estimated shortage of 10,000,000 tons is a conservative one after all, particularly in view of the high standard of maintenance necessary to enable the railroads to transport economically the tremendous volume of traffic desired.

With speculation rife as to business conditions after the war it seems justifiable to predict a large demand for rails and consequent large production when peace is finally declared. Although statistics of rail production in other countries are not available it is almost certain that the United States has practically supplied the world with rails for over three years. In that time Russia has taken 500,000 tons, France probably 200,000 and Italy and other countries more. Peaceful conditions will require much rehabilitation of railroad maintenance in the war stricken countries before even a normal resumption of other business can be attempted and rails and accessories for this rebuilding will most likely be drawn from our market. Likewise, American railroads, regardless of ownership, eventually will be bound to become large rail purchasers so that the future for rails should not be overlooked entirely in the present press for other products.

Hanging in the entrance of the main office to the Republic Iron & Steel Co., Youngstown, Ohio, is a service flag that shows that 345 employees of this company are in active war service and training camps at present, and this number will likely be largely increased.

The Adamson Machine Co., Akron, Ohio, which recently absorbed the Akron Steel Casting Co., has started a new 10-ton open-hearth furnace which will add approximately 25 tons a day of such castings to its present converter output.

Heat Transmission Through Roofing

Under certain conditions, where extremes of temperature are to be avoided, the heat-insulating property of a roof is as important as its strength and durability according to an article by Dr. W. M. Thornton, Armstrong College, Newcastle-on-Tyne, England, which appeared in *Engineering*, London, Oct. 19, and from which the following abstracts have been taken:

The heat insulating value of roofing material depends more upon the nature of its surface than upon its thermal conductivity. A sheet of galvanized iron on which the crystal surfaces of the alloy were fresh and bright was tested. Such a surface is practically a mirror, and only 111 British thermal units were transmitted through per 100 sq. ft. per hour. When the exposed side of this material was blackened, the rate of transmission increased so that half as much more heat passed through. When the inside was blackened, more than double the amount of heat passed through per hour, and when both sides were blackened 581 B.t.u. per hour was transmitted.

These results were also confirmed by tests on corrugated iron taken from actual roofs. Old galvanized iron allows more heat to pass through it than glass does. The slates were found to be good insulators, but are referred to as a heavy roofing material. Deal boarding covered with asphalted felt, though thick, is not so heavy as Welsh slate, and is considered one of the best insulators. In this case, its poor conductivity is evidently not negligible.

Heat Transmitted Through Roofing Material

Material	B.t.u. Per 100 Sq. Ft. Per Hr.	Thickness, In.	Weight, Lb. Per Sq. Ft.
Bright galvanized iron sheet	111	0.040	1.60
Galvanized iron, blackened below	168	0.040	1.60
Galvanized iron, blackened above	385	0.040	1.60
Galvanized iron, blackened above and below	581	0.040	1.60
Galvanized corrugated iron after one month's exposure to the weather	310	0.033	1.28
Galvanized corrugated iron after one year's exposure	422	0.033	1.28
Galvanized corrugated iron painted black above	472	0.033	1.28
Roofing glass, serrated	453	0.220	2.25
Welsh slate	337	0.170	2.90
Westmoreland slate	248	0.250	4.80
⅞-in. T. G. deal covered with asphalted felt	124	1.000	2.60

The National Physical Laboratory, England, reports that air spaces in roofing materials may be advantageous. A satisfactory means of obtaining this is to lay corrugated asbestos-cement plates on the thinnest asphalted felt or other light sheet material, supported by the roof frames. Where heat insulation and lightness are of the first importance, a strong and efficient roofing can be made in this way at a reasonable cost.

An Industrial Lift Truck for Heavy Loads

The Lewis-Shepard Co., 48 Binford Street, Boston, has developed a new type of industrial lift truck. This is designed for heavier duty than the two which were illustrated in THE IRON AGE, May 4, 1916, and Oct. 18, 1917, which had maximum capacities of 5500 and 2500 lb. respectively. The new truck, which is capable of elevating a load of 8000 lb. a distance of 3 in., has all of the standard features of the line, such as the universal joint that provides a free lifting and steering handle and enables the load to be elevated with the handle of the truck turned to one side. A release check controlled by a pedestal located on the front of the truck is provided for lowering the load. The new truck is made in 10 models, five having wheels 7 in. in diameter, while those of the other five trucks are 10 in. This recent addition brings the line of trucks made by the company up to 34 different models divided between four types.

The Dayton Electrical Mfg. Co., Dayton, Ohio, has been incorporated with $125,000 capital stock. The company's plant has been operating under a receivership for the past few months. H. G. Catrow is president.

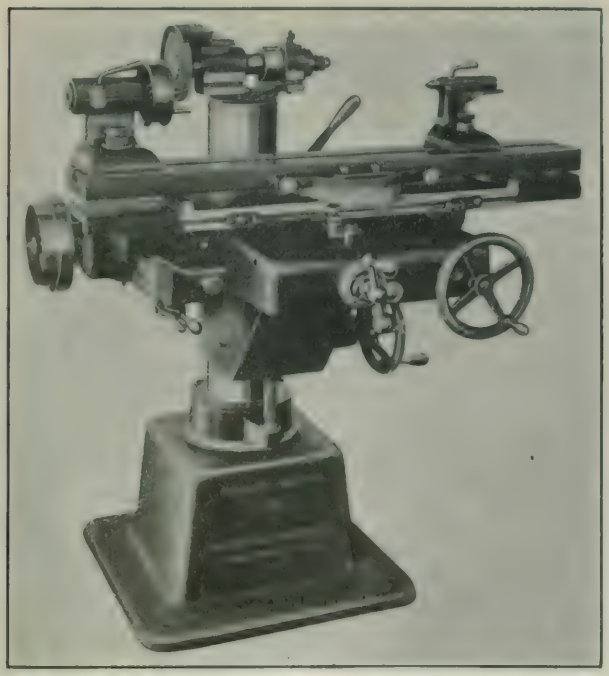
Automatic Feed Tool Grinding Machine

An automatic type of feed mechanism has been developed by the Wilmarth & Morman Co., Grand Rapids, Mich., for attachment to its universal cutter and tool grinding machine. It is arranged so that it can be attached to machines of this type for which hand feed is provided with but little work. A gearbox containing all of the mechanism is provided and enables eight table speeds ranging from 12 to 75 in. per min. to be obtained from a single self-contained unit.

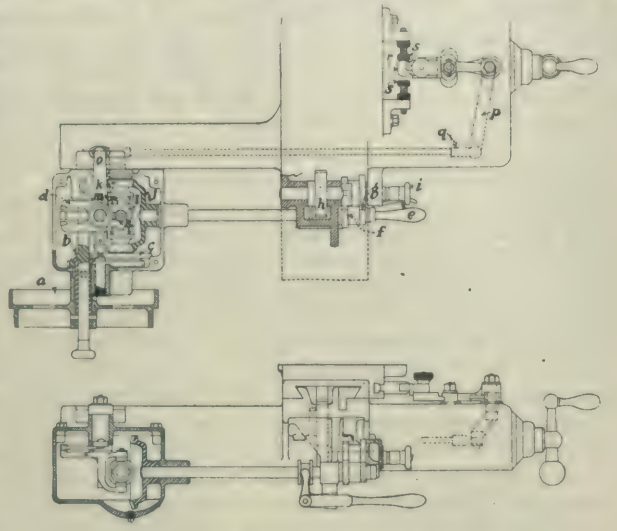
The gearbox is attached to the saddle on a pad at the rear and is driven from the main countershaft by a two-step cone pulley *a*. One speed is provided by the sliding pinion shaft *b* engaging with the two-step gear *c*. By sliding the shaft out of engagement with this gear and engaging the key of the gear *d* the second speed is obtained. Two other speeds are secured from a nest of gears by the movement of the starting lever *e*. This lever is engaged to the sliding shaft with a key working through a slot and is thrown into engagement with the two clutch gears *f* and *g*. The lever is held in position by a plunger actuated by a spring. The clutch pinions are spaced by a collar which permits a neutral position to be obtained in which all of the mechanism is entirely disengaged from the table. The movement of this starting lever provides the third and fourth speeds for the table and the remaining four are obtained by shifting the belt to the other step of the driving pulley *a*. The starting lever *e* can also be employed for stopping the table.

The motion of the table is obtained through a small pinion meshing with an idler gear *h* that in turn engages with the rack secured to the table. The pinion shaft *i* is arranged so as to make it possible to disengage the idler gear *h* from the table and thus throw out the power feed. When this has been done the table can be operated by the handwheel at the front of the saddle or by the lever at the rear without employing any of the power feed mechanism that drives the table.

The gearbox contains a bevel gear *j*, two bevel clutch pinions *k* and the clutch *l* which can be brought in engagement with the teeth on the clutch pinions. The motion is reversed by the engagement of the clutch with the pinion on either one side or the other. The clutch is secured to a shaft which runs through the gears and has a bronze bushing *m* which is double splined. The clutch is free to be engaged with either of the bevel clutch pinions *k* by the lever *n*. This is operated by a bell crank *o* which is connected to a second bell crank *p* by the rod *q*. The lever *r* which in turn is operated from the table by the dogs *s* provides for the automatic operation of the feed. These dogs are carried in a T-slot in front of the table and are adjustable to bring the work into the correct position with relation to the grinding wheel. In this way it is possible for the operator to vary the length of the stroke as may be desired at will.



A Gearbox Attached to the Saddle on a Pad at the Rear Provides Eight Table Speeds Ranging from 12 to 75 In. Per Min.



Details of the Automatic Feed Mechanism

Equipment and Operation of Traveling Cranes

In a paper on the "Mechanical Safeguarding of Traveling Cranes," presented at the recent congress of the National Safety Council by J. C. Smith, safety director, Inland Steel Co., Indiana Harbor, Ind., it was emphasized that the tendency on the part of the purchasing agent was to keep down the cost of the equipment at the sacrifice of the safety features. He pointed out that while the cost of cranes was greater than formerly profits resulting from their use had also increased and it was more economical to buy a safe modern crane than to purchase one of the old type which the factory inspector might order guarded at a time when it was needed. In the Inland plant it was the practice to get cranes with all the safety features incorporated in the design, as the chief engineer believed from experience that such a crane was the most efficient from an operating standpoint. Safe, easy means of access and safety features, he said, as a general proposition encourage frequent inspection and lubrication, which means few delays and breakdowns.

After a résumé of the specifications of various crane purchasers, Mr. Smith went on to show that most overhead traveling crane accidents occurred in connection with operation and were not due to the lack of safety devices. He pointed out that it was just as important to have safe men to fill the positions of crane operator and hooker as to specify that a crane should be equipped with safety devices. He gave as the qualifications for a crane operator a mechanical turn of mind, quickness in thought and movement coupled with caution and carefulness, agility, keen vision and an even temper. Crane operators should be young and active and hot metal cranemen require at least years of experience before undertaking this class of work. He condemned the practice of employing cranes to move cars as well as the making of side pulls except where absolutely necessary. The operator should not run more than two motors at one time and when handling molten metal only one motor should be operated. The crane hooker should exercise care to avoid accidents and should never ride on any burden being carried by a crane. The hooker should watch the load being carried by the crane or suspended in the air and keep out from under it at all times. When loads are carried by cranes it was the duty of the hooker to warn the men on the floor to get out of the way.

Methods to Improve Plant Fuel Economy

The Case of Purchased Power—Boiler Room Equipment, Steam Traps and Heating Mains —Practical Suggestions on Boiler Practice

BY S. J. H. WHITE

THERE are many hundreds of cases in cities, where central station power and heat will prove cheaper than if generated by a private plant. The writer considers such cases as legitimate central station business. But factories so located that heat and live steam as well as power cannot be purchased from central stations, especially those requiring steam for manufacturing purposes during the entire year, are not legitimate central station business. Business secured by the central station from such factories can only result in loss to the consumer, dissatisfied customers to the central station, and a waste of fuel. Assuming that a factory purchasing power from a central station can operate its steam plant for steam and heat, on the same quantity of coal that would be required if generating its own power, the amount of coal the central station consumes in producing the power sold to such a factory will be wasted.

The writer is a former central station man of 20 years' experience as manager of central stations and knows both sides of the question, central station power versus isolated plants. He has had two and one-half years' experience with an isolated plant and four years with purchased power in a certain factory. The ratio of costs was decidedly over two to one in favor of the isolated plant, and 15 per cent fixed charges on the power plant was included in the costs of operating the isolated plant. The coal consumption, in the plant referred to, per boiler horsepower-hour with the isolated plant averaged, for two and one-half years, 6.16 lb., while with the boiler plant used for heat and steam generation only, the coal consumed per boiler horsepower-hour averaged, for four years, 7.74 lb. of coal. During the heating season the steam and heating plant only averages an evaporation of about 4 lb. of steam per pound of coal, running to 7 or 8 lb. in severe weather when the boilers carry a good stiff overload. During the summer, when steam is used for manufacturing purposes only, the boiler averages only about 1 lb. of steam per pound of coal.

The load in summer is about 30 hp.; hence, if a power unit were installed in this particular plant, a load of not less than 150 to 160 hp. (sufficient power to drive the machinery) could be carried without a material, if any, increase in coal consumption, as the boiler would under such conditions evaporate 6 to 8 lb. of water per pound of coal throughout the year, and conserve at least the amount of coal the central station is now consuming to produce the power sold. The boilers in question are wasting at least the difference between 6.16 lb. and 7.74 lb. of coal per boiler hp.-hr., or 20.4 per cent of the coal consumption. The conservation of 20.4 per cent of the coal consumption in only 2000 factories like the one under discussion would amount to 834,224 tons of coal, almost one million tons per year. Add to this saving the amount conserved by central stations now furnishing power and we would conserve 1,000,000 tons.

A certain factory plant recently investigated by the writer, with a view of reducing the coal consumption, is an unusually expensive plant to heat successfully. The officers of the company owning the above plant, as frequently happens, put more confidence in the smooth talk of a central station solicitor from the nearest city than in their own engineer's arguments and figures, and decided to purchase electric power in preference to producing it themselves by a private plant. The private power plant would have cost about $20,000. Taking the central station agent's figures of 15 per cent as the basis for the fixed charges, the latter would amount to $3,000 per year. Yet the factory had to invest $10,000 in a heating and steam plant, and the fixed charges on same must be paid just as on a power plant (the same boilers used for heating could be used for power); so the factory must pay $1,500 per year, after all, on fixed charges. The demand charge was fixed at about $1,200 per year, an unusually low figure. This $1,200 demand charge paid to the central station, plus the $1,500 fixed charges on the heating and steam plant makes a total of $2,700 per year. Where did the central station prove its generosity and save the factory $3,000 per year as promised on fixed charges?

Power Plant Equipment

There are any number of private plants operating at excessive costs, with tremendous waste in fuel, which need complete overhauling and proper management. Many have the poorest, cheapest equipment, and under such circumstances cannot be made to operate economically. Such plants should be shut down by the Government if the owners refuse to make the necessary improvements. The best machinery on the market is none too good; cheap machinery is always a bad investment. Cheap help also will prove expensive, no matter when you use it, but do not attempt to use cheap help in the boiler or engine rooms.

A feed water heater at a cost of $7.50 per horsepower may heat the water to 150 deg. Fahr. while one at $10 or $15 per horse power will heat the feed water to 212 deg. Fahr. The difference in price will be paid back to you in coal saved in less than one year. An engine can be bought for say $2,500 which will consume 28 to 30 lb. of steam per horsepower-hour, while another engine costing $3,000 will consume only 20 lb. of steam. If you are buying your equipment to use only a few months perhaps the cheap engine might do, but remember you expect to run this engine 20 or 30 years, so the savings for that number of years will run into many hundreds or thousands of dollars. A boiler can be purchased at $10 per horse power, say, which at best will only make 5 or 6 lb. of steam per pound of coal, while another type costing $15 to $20, say, per horsepower will produce 8 or 9 lb. of steam per pound of coal.

Exhaust Steam Mains and Traps

There are any quantity of steam traps on the market, some of them good, others better, and lots of them worse. Not very definite information, we admit, but the point is this: Whichever make you buy you are likely to wish you had bought another make within two years' time. Recent trap troubles

in a certain plant resulted in the installation of 15 new high-pressure traps with a resultant saving of 1500 lb. of coal per day, and a very decided improvement in the operation of steam-consuming devices. Watch those traps of yours, they may be automatic in operation, but they certainly will waste a lot of steam if you neglect them too long.

The customary scheme of running large low-pressure heating mains from boiler house to buildings is the only thing which can be done when using exhaust steam for heating. Great care should be used, however, to insulate such mains to prevent heat radiation losses as far as possible. Whenever buildings are to be heated by live steam, such a scheme of mains is dead wrong. Instead run high-pressure mains from boiler house to the buildings, placing reducing valves as near the inside low-pressure heating main as possible, and you will save considerable coal.

A certain factory-heating system was designed and installed, entirely contrary to the company engineer's recommendation, by a consulting engineer who had more theoretical than practical training, and up to the time the company engineer was permitted to remodel it, it had been impossible to heat the extreme ends of the building, while the central portions were uncomfortably hot. The company engineer is now feeding the inside heating main at two points from the high-pressure steam main, using two small reducing valves, and has cut out the large low-pressure underground main completely from boiler house to the main buildings. The result is a saving of not less than 20 per cent of coal, and the building is uniformly heated. The boilers are not seriously taxed in cold weather as formerly, and the employees in some departments have no complaint of being cold as they formerly had almost constantly. So far, the engineer referred to has been unable to persuade the company to insulate the heating mains, branches and risers.

Some Practical Suggestions

You should insulate your heating and steam pipes, by all means. It will pay large dividends on the investment.

Where coal shows a tendency to clinker, the use of steam jets directly under the grates, and arranged to blow straight up into the fuel bed, will result in much easier firing, fewer clinkers, less ash, fewer cleanings of fires, and naturally a decrease in coal consumption.

The ideal method of firing boilers, of course, is by the use of mechanical stokers. At the normal price of coal, the writer seldom advised mechanical stokers in plants under 500 hp. boiler rating, but with coal at present prices he has revised his minimum to 200 hp. rating. Shaking or rocking grates are such a decided improvement over stationary grates, they should be used in all furnaces where mechanical stokers are not installed on account of first cost.

Gas analysis is unquestionably a valuable means of locating and reducing losses of combustion. The instruments are not expensive, are easily understood and operated, and should be furnished engineers of all steam plants by the owners. After several gas tests in connection with draft gage readings, a fireman should be able to maintain high CO_2 percentages by watching his draft gage. The draft gage seems to the writer almost as important as a steam gage (of course ignoring the safety feature of the latter) it costs but little more than a steam gage, and there is no excuse for any plant to be without one. Yet there are comparatively few in use. It will save enough coal in a week to pay for itself, if used properly.

Another thing every plant should have, but few have, is an automatic damper regulator. Unfortunately a good regulator costs from $100 to $150, and business managers are unable to see their necessity when they know the plant has got along without one for a number of years. That is a poor argument, of course, but the engineer is up against the real thing when he tries to get his company to buy one of these coal savers. The high cost of coal, the necessity to conserve coal, may now result in arousing the business management to listen to these practical requests, to furnish the equipment necessary to conserve coal.

Much more can be stated on methods to adopt to conserve coal. Weigh your coal as you use it, meter your feed water, weigh your ash, read your output meters, record the hours heat, steam and power are used daily, keep all the records you can, and compare the results daily. If your firemen only secured an evaporation of 5 lb. to-day, make him try for six to-morrow, and if he does not get it, find out why and remove the causes, so he will get 7 lb. the next day.

Business Policy Obstructs Progress

Probably 90 per cent of the works engineers in charge of factory power and heating departments in this country have had similar experiences in having practically all plans for improvement in steam plant efficiency, with consequent reduction in coal consumption, almost completely blocked. Where these plans call for large expenditures or are impracticable, there are excuses for the company's refusal to carry out the plans possibly; but generally these plans are not expensive and are entirely practical. If carried out to completion they would give excellent results, and pay handsome returns on any investments made. Not infrequently the carrying out completely of these plans will result in a saving of coal sufficient to offset the increased cost of coal per ton, or possibly even more.

Multiple Force Feed Lubricator for Bearings

A force feed lubricator of either the single or multiple type has been developed by the Inter-State Machine Products Co., Inc., Rochester, N. Y. It is designed for supplying oil to the valves, cylinders and bearings of pumps, air compressors, engines and similar units. The special feature of the lubricator is the pumping unit, which is locked to the cover at three points and may be removed with its individual cover without disturbing its adjustment or removing any other part of the lubricator. Each unit is actuated by the cam on the mainshaft, which in turn is driven by a roller clutch or a worm gear drive. Each pump unit can be adjusted to deliver from 1 to 16 drops per stroke by regulating the adjusting nut on the outside of the lubricator case, the number of strokes depending, of course, on the speed of the engine or other source of power. A large sight feed is provided near the adjusting nut to show the rate at which the oil is being pumped. A gage glass on the corner of the tank indicates the amount of oil in the reservoir. If desired the oil can can be pumped by hand without disturbing the adjustment.

The St. Louis Aircraft Corporation, formed by officers of the St. Louis Car Co. and the Huttig Sash & Door Co., St. Louis, will undertake the construction and equipment of airplanes for the United States Government, utilizing the two plants mentioned for the work involved. Messrs. Alfred J. Siegel of the Huttig company and E. B. Meissner of the St. Louis Car Co. are the chief officers of the new concern which plans to turn out about 200 airplanes per month.

Industrial Housing Problems*

Labor Shortage Forcing Manufacturers to Build—Housing Essentials—Dwellings for Skilled and Unskilled Workmen

BY LESLIE H. ALLEN

DURING the past two or three years employers of labor in all of our big industrial centers have experienced such great difficulty in getting and keeping employees that much attention has been focussed upon the employment situation. In view of the probability that it will not change for four or five years after the close of the war, the manufacturer is faced with the very serious problem of how best to compete in the labor market for his needs, with the knowledge that housing is an important factor in which he will get no help from local investors as in former years.

The Effect of Bad Housing on Industry

Apart from any consideration of this subject from the humanitarian or sentimental side, the industrial employer is beginning to realize the tremendous importance of housing conditions in their relation to production. The output of a plant is seriously affected by the prevalence of sickness, so often caused by unsanitary surroundings of the workman's house and overcrowding inside. The interest of the employer in the health of the employee is being shown in better sanitary accommodations in the factory, the provision of rest rooms, hospitals, recreation parks, club rooms, etc. In so doing he has recognized the importance to his plant of happy, healthy employees. The provision of decent houses for them is but a short step further.

Building for Skilled and Unskilled Workmen

When the manufacturer has decided to build, he is faced with the problem of selecting the type of house. It must first be recognized that we have two classes of workmen to be considered: (1) The unskilled workmen, mostly foreigners or negroes, uneducated, unused to American houses and American standards of living, earning a very low wage, and (2) the skilled men, mechanics, machinists, etc., earning a higher wage, mostly Americans, living according to American standards, demanding more and willing to pay more for the comforts that the foreigner does not consider essential. The result of a failure to distinguish these two classes is that at the present time nearly all the houses built are American houses for skilled workmen, and the need for better houses for unskilled labor has remained unsatisfied, resulting in overcrowding, getting worse and worse. Here and there, as in Philadelphia and Washington, a most excellent attempt has been made to solve the problem of housing the unskilled, low-paid workman. Such examples have not been copied, and only serve to show up more sharply the mistakes of other cities.

Housing Essentials

The essentials of a modern city house may be summarized as follows:

Watertight roof, walls and floors.
Bedroom for parents.
Bedroom for male children.
Bedroom for female children.
Living-room for cooking, eating and general day use.
Private toilet-room with sanitary water closet and sewer connection.
Suitable heating arrangements.
Running water supply fit for drinking.
Uninterrupted daylight and ventilation through windows in every room.
Sink in kitchen, with running water and waste.

Further additions required by the American workman and his family and practically always considered necessary by them:

Cellars.
Closets.
Bathtub with running water.
Window screens.
Separate parlor.

Desirable improvements which usually are added to the workingman's house:

Porches and piazzas.
Lavatory bowl.
Hot-water supply to bath and bowl.
Window shades and blinds.
Dining room separate from parlor or kitchen.
Electric lighting or gas piping.
Wall paper.
Laundry tubs.

Need for Economy

Any attempt such as the above to divide essentials from luxuries must come in for a good deal of criticism, as there is bound to be a difference of opinion upon the details of such a list. The classifications suggested will at least serve to indicate the lines upon which the planning of a house should be studied in view of the need for strict economy in designing and building necessary to bring buildings down to a cost that will be remunerative.

It is generally agreed by economists that the workingman cannot afford to pay more than one-quarter of his monthly wage in rent. This means that the man earning an average of $12.50 a week cannot afford to pay more than $150 per annum. Assuming that a housing operation ought to pay at least 10 per cent gross per year, this gives $1,500 for purchase of lot with sewer and street improvements and the building of a house. At the present time a four-room house of good construction cannot be built for this money and it is therefore necessary to plan with the very strictest economy.

Many of the workmen whose homes we wish to build have come from countries where four walls and a roof are considered a sufficient shelter from the elements to make a home. Although we do want to see them housed in a better manner than this, yet it is not necessary to give them a six-room house, large cellar, furnace heat with running hot water, laundry tubs, lavatory bowls, picture moldings, and all the other comforts and luxuries that are required by higher-paid workmen. We should give him a house that will not harbor vermin, that will not be damp or unhealthy, a house in which every room has a proper amount of light and ventilation and direct sunlight, and that has decent privacy in its sanitary accommodations and sufficient bedrooms for the sexes to sleep apart.

Types of Workmen's Houses

The various types of houses now in use by industrial workers are:

Single houses of five to seven rooms.
Two-family houses of four to seven rooms.
Terrace or row houses of four rooms and up.
Apartment houses or tenements, two rooms and up.
Boarding houses for single men.
Hotels.

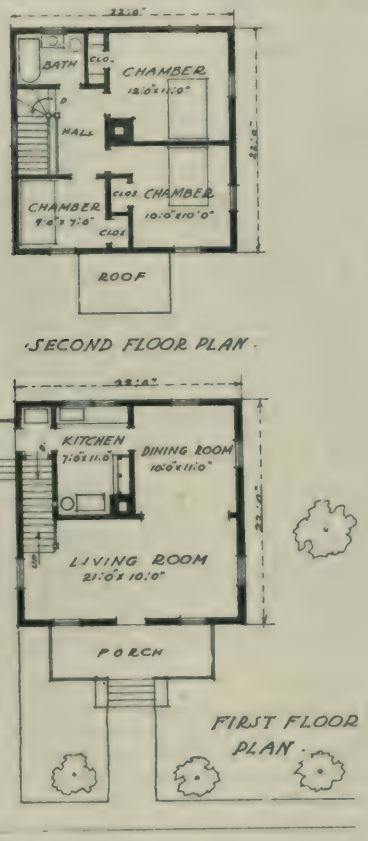
The single house is the ideal residence for the American family, but is beyond the means of the low-paid unskilled workman. A single house with five or six rooms with 3000 sq. ft. of land cannot be built for less than $3,000 except in the cheapest kind of frame construction, and even at this price it would call for a

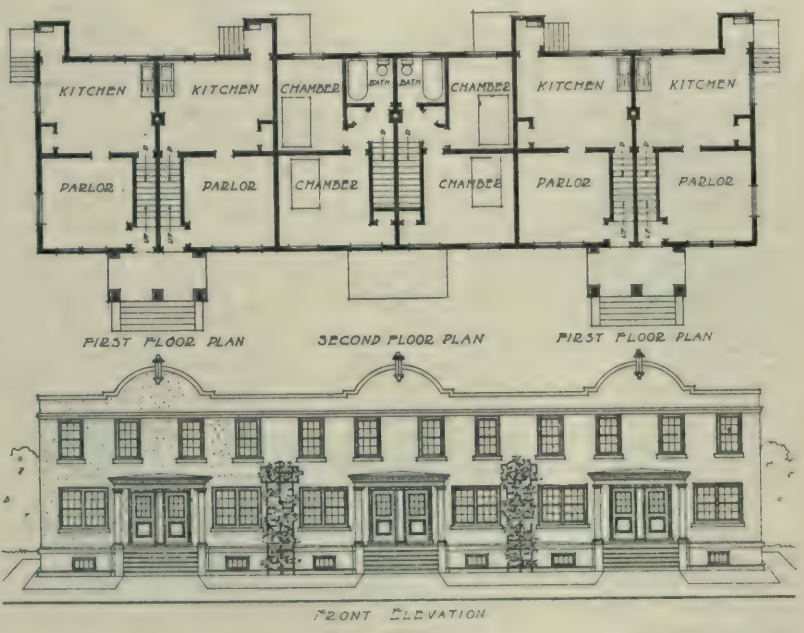
*From a paper presented at the convention of the National Housing Association in Chicago, Ill. The author is with the Aberthaw Construction Co., Boston, Mass.

higher rental than he can afford to pay. For higher-paid men in the plant the single house is very desirable.

The two-family house is often built for workers who wish to purchase their home. Though not suitable for the unskilled worker, they are quite attractive to higher-paid men who like to buy a two-family house so that the rental received from one-half of the house will help to pay the carrying charges and amortization of the whole house. In some cases these are built side by side with a party wall and in other cases one tenement is built above the other. The first-named is preferable, as there is more privacy.

One of the of the most successful houses for the unskilled worker is that known as the "Philadelphia" type of house, of which many thousands have been built in Philadelphia, Washington, and other large cities. The typical four-room Philadelphia house is two rooms deep and has a living-room and kitchen downstairs, two bedrooms and bath upstairs. It is built in long rows or terraces with party walls in between. These can be built on as narrow a frontage as 13 ft. 6 in. (a 15-ft. frontage is desirable) on a lot of 900 sq. ft. The cost of both land and building is much lower than the preceding type. Houses built when prices were normal





Representative Types of Homes for Workingmen. The single house, as shown at the left, is commonly provided for the skilled and high-paid industrial workman, and is constructed with as many conveniences as his purchasing power and customary standard of living call for. For the unskilled low-paid worker the terrace or row houses of four rooms with a decent minimum of air space and sanitary arrangements, as shown above, is a practical and economical dwelling

have been rented for as low as $12 a month and have shown a fair profit.

The building of houses in terraces is comparatively new in this country except in Philadelphia, although it is very common in European countries. It allows for a very little land per house unless the lots are very deep, but is desirable in many other ways. Each family has a direct entrance from the street without any common hallway and is not interfered with by other tenants overhead. The cost of heating the house is less owing to there being fewer outside walls. In a house two rooms deep each room has a proper amount of light and ventilation, and these houses have proved very successful wherever they have been used.

A recent variation of this type of house is the three-room two-family terrace house with one family on each floor. These are generally in demand by married couples without children.

The multiple dwelling or tenement house, housing from ten to fifty or more families, is undesirable from many points of view, and yet in crowded cities where land values are high is practically the only solution.

Apartments of all sizes can be provided, the most common arrangements being three rooms (kitchen, living-room and bedroom) or four rooms (kitchen, living-room and two bedrooms). Each apartment should have its own private toilet and its own water supply.

There is always some demand in a large manufacturing center for small apartment-houses of two or three rooms with bath, etc., for married couples without children. They are not so desirable as homes for the workingman, and yet there are some mechanics who prefer them just as so many well-to-do people in our cities are content with and prefer this class of dwelling.

In rural districts many mills have built small boarding houses large enough to take care of from eight to a dozen boarders. The advantages of a small boarding house are that one man and his wife can run them, and the mill has no further responsibility. The men also prefer this sort of lodging to big company houses. The big disadvantage is that it is difficult to exercise any supervision over this sort of boarding house, and they may be misused or overcrowded. This far outweighs its advantages.

The good points of the boarding house for fifty to sixty men are that one efficient married couple with three servants can run the place without difficulty. A higher type of tenant is required to handle a proposition of this kind, but they can be secured fairly readily. It is easier to arrange for proper inspection and supervision, as in most cases, these are run as "company houses." A boarding house for more than sixty is too big a proposition to be handled this way, and would have to be run like a hotel.

The Manufacturers' Local Needs

The industrial manager at this point may well stop in bewilderment, not knowing how to proceed next, what size and type of house he needs to choose from this list being quite a puzzle. On this point it is impossible for any expert to offer advice until his local needs are accurately determined, and to do this the only safe way is to institute a careful survey of the housing conditions and needs of his locality.

Suiting the House to the Needs of the Occupant

There should be in every home enough bedrooms for the parents and the children of either sex to sleep apart. A good-sized bedroom should be provided for parents (and infant children) and two smaller bedrooms, large enough to accommodate two persons each for the other children. All families, of course, are not of the same

size, and some larger and smaller houses will be needed; but as a rule it will be found that the larger demand is for the four-room, five-room and six-room houses. Where houses are built to sell, however, the six-room house is as a rule the smallest that one can count upon selling without difficulty.

The size of the bedroom should be sufficient to give at least 400 cu. ft. of air space per min. All bedrooms should open onto a hall and not into each other or into a living room. The toilet room must be planned so that it opens directly off the stairs.

Next, there must be provided at least one living room of not less than 135 sq. ft., for working, eating, washing, and general use. Separate dining rooms and separate parlors add much to the expense of the house and it is not always possible to provide them for the unskilled laborer. What the foreigner needs is one large kitchen. It is the habit of most foreigners and of many Americans to live in this room, and it should be large and well-lighted and ventilated. It is found that where three living rooms are provided, two of them are invariably used as bedrooms for lodgers.

Some comment will naturally be made on the suggested omission of the cellar. We are told that the family needs a cellar for the storage of coal and canned fruit, and that it costs no more to build it than to leave it out. In investigating the contents of laborers' cellars the writer has never found large supplies of food or fuel. The laborer is too poor to buy more than two or three hundred pounds of coal at a time, and never lays in stocks of food in advance; instead of this we usually find in his cellar a miscellaneous assortment of most unsanitary rubbish and junk, which constitutes a serious fire menace. Statistics show that over 80 per cent of dwelling-house fires start in the cellar in such rubbish. The argument that it costs no more is nearly true where sand and gravel soils are encountered, but in clay or other hard digging the extra cost of digging the cellar mounts up considerably. Cellars are not needed for furnaces where the tenant cannot afford the fuel for them but derives his heat from his kitchen stove.

Costs of Different Types of Houses Compared with Ordinary Frame Construction

Wood framing, inside wood lathed and plastered, outside rough boarded and clapboarded and painted	102%
Wood framing, inside wood lathed and plastered, outside wire lathed and stuccoed	108½%
6-in. concrete wall, inside furred and lathed and plastered, outside rubbed smooth	112%
6-in. concrete wall, inside furred and lathed and plastered, outside stuccoed	116%
8-in. hollow tile, inside plastered direct, outside stuccoed	111%
8-in. brick wall, inside furred and lathed and plastered	115½%
Wood framing, veneered with 4-in. brick, inside lathed and plastered	113%

In houses of this class the tenant usually furnishes his own stove, and as his stove has no hot-water front, a system of hot-water piping is of no use to him. Some owners prefer to install the stove with water front and hot-water piping in spite of the increased cost of the house, but all these things help to put up the cost and the resultant rent to a figure higher than the tenant can afford. For the same reasons washbowls in the bathroom, and laundry tubs, though useful, are not necessities. There should, however, be an enameled iron sink in the kitchen, and a bathtub should be provided even if the tenant has not learned how to use it. There should be a proper supply of running water, pure, and fit for drinking, and a water closet connected with the sewer, and a cast-iron enameled bath.

Materials of Construction

Although no exact cost data can be given at the present time on the common building material, the following figures are given in order to indicate the relative costs of these materials based on present prices. As prices do not vary consistently, these figures may not hold good for very long. In certain localities where clay for tile making is abundant the prices of tile would be cheap and would indicate that this is the cheapest material to use. In other places where there is a good gravel supply right on the ground the relative cost of concrete would be reduced.

Assuming the cheapest construction, a wood framing, wood lathed and plastered on the inside and rough boarded and shingled on the outside, as standard or 100 per cent, the relative costs of various types of houses would be as given in the accompanying table.

The chief roofing materials in use at the present time are wood shingles, asphalted felt shingles, asbestos shingles, slate, tile, "ready" roofings, tar and gravel built-up roofings and tin roofings, the last three being used for flat roofs.

The cedar shingle, while still in common use, is slowly giving place to other materials. Many cities have legislated against it, and as the asphalted felt shingle, which is a good deal more fireproof, can be put on for about the same price, it is coming into general use. The asbestos shingle costs about twice as much, and is not so commonly used, although it makes a more permanent roofing.

The cost of tile and slate roofing is so much higher than the above that they have to be left out of consideration in workmen's houses.

The flat roof covered with a five-ply built-up tar and gravel roofing is considerably cheaper than any of the preceding, but its appearance is generally objected to. Various types of ready roofing are used as substitutes for built-up roofs, but, on account of the difficulty in making good water-tight joints they have not come into general favor. The tin covered roof is being used less and less. It is more expensive than the built-up roof and requires frequent repainting and maintenance.

Wood lath and plastering continue to be the customary method of finishing walls and ceilings. Plaster board covered with a finish coat costs very little more, and where speed is essential can be put on and dried out much more quickly. The various wall boards and composition boards offered as substitutes for plastering are not satisfactory for industrial houses. The cost per square foot is low, but the waste in cutting is very great unless specially ordered, and the result is not so permanent.

Interior woodwork is best stained and varnished and not painted, as it is less easily soiled.

Wall papers add nothing to the comfort or health of the tenant, but do add to the rent he has to pay, besides proving a harborage for vermin. Kitchen and bathroom walls are best painted with lead and oil, while many owners leave all others rooms bare or tint them with cold water paint.

Architectural Design

No laws or limitations as to style can be laid down. The designer of the workman's house is usually working under very strict limits of cost. It is his duty first of all to plan for the comfort, safety and health of the tenant, and if after this is done he has still some money left for architectural adornment, the money spent in this way is money well expended.

In planning a house the square plan bounded by straight lines is the cheapest and most economical. As the plan changes from square to oblong, the ratio of walls to floor space increases, and with it the cost. Any departure from the right angle means increased labor and waste of material in cutting.

No applied architectural ornament can equal the beauty or permanence of a careful planting of trees, shrubs and vines. The plainest of houses suitably planted with quick-growing vines on permanent trellises, and with good shade trees in front will look far better than the most ornate building elevation and cost much less.

Layout of Streets and Lots

The monotony of straight rows can be avoided by houses set at varying distances from the frontage line, and the appearance of the street improved.

In laying out the street line it will generally be found that the streets which follow contours of the ground, provided these are not too irregular, give a

more pleasing effect, and in many cases save large sums of money.

No general rule can be laid down as to the size of the lot that should be given the worker. In some sections the English scheme of gardening in "allotments" has been tried successfully. In such cases the houses are built on very small lots of land and a reservation of several acres is provided for gardening. This is fenced in and cut up into small allotments and let out in small sections to those who wish to take care of gardens. A garden properly cultivated is a very beneficial thing, but a lot of land which is allowed to become the dumping ground of dirt and refuse is of no benefit to anybody, but rather the reverse.

In city developments it will probably be found best to give very little land to the tenant, but to use the land that otherwise would have been allowed him in the maintenance of parks and playgrounds for children and allotments for gardening.

Selling and Renting Houses

When the houses are built a most important problem presents itself for consideration in the decision as to whether the houses are to be sold to the workingmen or rented them. No general answer can be given to this question, but a brief statement of the pros and cons can here be given.

If the houses are sold to the workmen, there is the objection that if the workmen are fired or leave of their own accord they still retain the house though it is wanted for other workmen; also that if they can sell at a profit, the increment in value which has been put into the house by the presence of the plant goes to the workman, who has not earned it. On the other hand the workman buying his own home and paying for it by installments has to make himself a steady and efficient worker in order to keep up his payments. There are usually more applications to purchase than there are houses to sell. Therefore the purchasers can be selected from those that are the most likely to remain with the company. The difficulty of firing men is not a pressing one, as the manufacturer's problem to-day is rather how to hold his men than how to fire them. The employment manager is being kept busy finding new places for men who do not fit in one corner of the plant rather than let them be fired in the old way.

Where houses are rented the owner has more control over them, and can evict tenants who leave his employ. He has, however, the difficulty in strike times of taking care of his property, which otherwise would not concern him.

Labor leaders object to the immobility of labor caused by men owning their homes.

The tendency seems to be to-day toward the selling of the houses, and several interesting purchase schemes have been evolved by manufacturers.

Supervision

If a housing project is to be really successful, too much emphasis cannot be laid on the strict and careful supervision and education of the tenants. Overcrowding and the lodger evil must be prevented by proper restrictions in the leasing or selling of the property, and a welfare worker or district nurse or friendly rent collector should make periodical inspections for the purpose of seeing that the premises are being kept clean and that the tenants are living decently. It is not essential that this worker be engaged directly by the owner of the houses. In many cases it is far better if the local municipal league or other local organization can be subsidized to take care of these activities.

A welfare worker can often accomplish a great deal in the way of educating the foreigner along sanitary and decent housekeeping lines.

An interesting experiment which is about to be tried is the establishment of a "probationer's" block on the outskirts of a new industrial town. To this block are admitted tenants of negro or foreign birth, and their housekeeping is supervised by a resident superintendent. They are taught American cooking, laundry work, etc., in a welfare building, and when they have proved themselves to be good tenants and agreeable neighbors they are permitted to occupy houses in other parts of the town. This experiment will be watched with a good deal of interest.

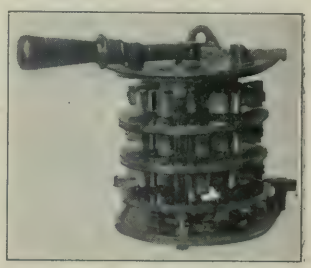
Conclusion

In this article the writer has endeavored to touch upon the many problems that are still being studied by those who have the welfare of the workmen and the manufacturer at heart. It cannot be stated that any of these problems have yet been finally and satisfactorily solved. All that it is hoped to accomplish in this article is to set forth clearly the main problems in a desire to assist the manufacturer starting a housing venture to form a correct judgment for himself.

Drum Reversing Switch for Machine Tools

For operating the driving motors of machine tools and wood-working machinery where it is necessary to reverse the direction of the rotation the Westinghouse Electric Mfg. Co., East Pittsburgh, Pa., has brought out a small reversing switch of the drum type. The switch is made for use on either direct or alternating current circuits and its small size enables it to be mounted directly on the machines.

The back of the switch is formed by a terminal board of heavy micarta with the stationary contacts mounted on the front. The movable contact segments are mounted on cast brass brackets which are thoroughly insulated from the revolving shaft to which they are clamped. Phosphor bronze springs are provided on the movable segments to secure good contact, copper shunts being provided for their protection. Adjacent sets of contacts are separated by asbestos lumber barriers which are relied upon to prevent cross-arcing. A sheet steel cover lined with asbestos and held in place by two ring latches protects the live parts and at the same time can be removed readily to inspect or renew the contacts.



Arcing between Adjacent Rows of Contacts of a New Reversing Switch of the Drum Type for Machine Tools Is Prevented by Barriers of Asbestos Lumber

When the controllers are intended for operation on alternating-current circuits or on direct-current circuits without dynamic braking, only three positions are provided for forward and reverse operation and a neutral point. For the former class of service the motor is connected directly across the line. Where dynamic braking is employed in connection with direct-current motors, two additional drifting positions are provided on either side of the central off and braking one. The switch may be used with automatic starters for shunt and compound wound motors and with the latter where a heavy series winding for tailstock and cross-rail service is provided the motor can be connected directly to the line, either with or without resistance permanently connected in series with the armature. If it is desired to use remote mechanical control of the switches for any reason an extended shaft permitting of either gear or chain and sprocket operation can be supplied for both types.

The Goulds Mfg. Co., Seneca Falls, N. Y., manufacturer of pumps, will put into effect beginning Jan. 1, 1918, a bonus system whereby all hourly, piece work and salaried employees rated at $40 a week or under, will receive quarterly, a bonus of 10 per cent on their total salary for the previous three months. This bonus is contingent upon a stipulated amount of time being put in at actual work during the year, and is aimed to encourage full-time work.

The French Purchasing Commission announces that it has removed its offices from 10 Bridge Street to the American Express Building, 65 Broadway, New York.

Economies in Burning Blast-Furnace Gas

Data from Steel-Plant Boiler Room Practice and Tests—Characteristics of Various Burners and Means to Better Boiler Efficiency

METHODS of burning blast-furnace gas under boilers were discussed some months ago before the Engineers' Society of Western Pennsylvania. Data from tests and from operating practices of various steel plants showing efficiencies, stack temperatures, flue-gas compositions, etc., were given. A discussion of gas burners by Herman C. Siebert, experimental engineer, Duquesne Works, Carnegie Steel Co., Duquesne, Pa., included the characteristics of various types and indicated, by data from tests on each, conditions for best economy and a co-ordinate influence of gas pressure, air supply and design on this.

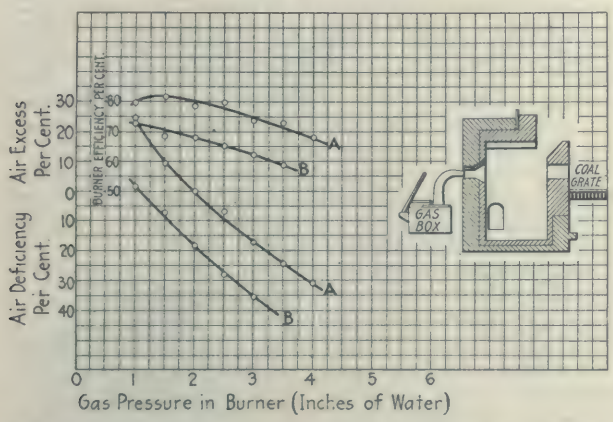


Fig. 1—Burner Efficiencies and Air Aspirating Characteristics of Kennedy Blast-Furnace Gas Burners. Curves *A* were obtained when the air openings around the burner nozzle were wide open and curves *B* when these were partly closed. Gas pressures at which no excess air was found were 2 in. of water for the former condition and 1 in. for the latter

Economies in Practice.

Frank E. Leahy gave operating characteristics of the boiler plant at the blast furnaces of the National Works, National Tube Co., McKeesport, Pa., where he is steam and hydraulic engineer. The blast-furnace plant at the National Works consists of four furnaces and 17 stoves. The gas from three furnaces is passed through Brassert dry cleaners and the gas from the fourth receives no dry cleaning but passes into the same main as the dry cleaned gas. An approximate heat balance of the gas found in useful work figured from the monthly report shows: Boilers, 58.26 per cent; stoves, 26.21; gas engines, 2.87, and unaccounted for 12.66 per cent.

The boiler plant has 11,600 boiler h.p. of Babcock & Wilcox and Aultman & Taylor boilers located in two houses designated A and B. Each boiler is equipped with two stationary burners of the common box type, overhead construction, with a Wilson bell valve, to control the supply of gas to the burners. The burners are set central in the box and placed to give the maximum aspirating effect with about 0.05 in. of water suction in the firebox.

During the month of October, 1916, the following practice was obtained:

	Boiler House A	Boiler House B
Boiler capacity in operation, boiler h.p.	6,436	4,245
Capacity developed boiler h.p.	7,778	5,217
Rating developed by capacity in operation, per cent	118.5	120.7
High rate of evaporation for four consecutive hours, per cent	122.7	148.8

No coal is fired under these boilers but in case of shortage of gas, steam is supplied from a coal-fired boiler house to take care of such periods. Over a month the equivalent of 1200 to 1400 boiler h.p. is required from this source to maintain operation. During delays due to castings, etc., draft is at times completely checked, which enables maintenance of a temperature in the fire box sufficient to ignite the gas when it is available.

A test on one of the gas-fired boilers in boiler house B burning furnace gas was made by A. N. Diehl in 1915.

The following is a summary of the results:

Rating developed, per cent	155
Maximum efficiency, per cent	75.0
Minimum efficiency, per cent	70.0
Average efficiency, per cent	72.3

This test was run on a boiler in service and operated by the regular fireman so as to get the results under actual operating conditions.

Suggesting that conditions met with in tests made by him six years ago on blast-furnace boilers using both clean and unclean gas are probably representative of those encountered by master mechanics and boiler foremen in many present-day plants, F. H. Wilcox, Bureau of Mines, Pittsburgh, described the results of these tests and the difficulties to which attempted improvements led, concluding that it was virtually impossible for the average blast-furnace boiler force to control combustion with the ordinary type of burner and in addition regulate the draft and keep the settings in fair shape.

The tests were made on 250-h.p. Babcock & Wilcox boilers each equipped with two Kennedy type gooseneck burners with a gas inlet area of about 185 sq. in. The openings about the burners, into the combustion chamber, had been closed up with sheet iron fitted closely about the burner castings, which allowed insufficient air to enter with the gas. Also the boiler settings were full of leaks. The first four or five tests were made with the boilers as they stood and, he said, gave consistently bad results running from 48 to 54 per cent

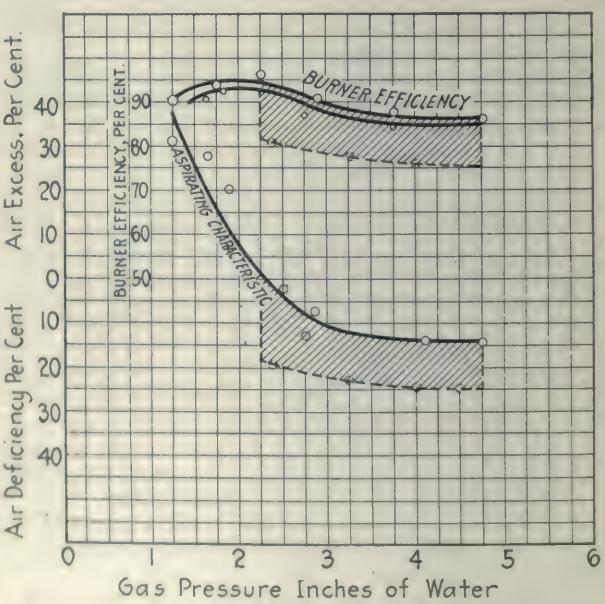


Fig. 2—The Upper Full-Line Efficiency Curve is for the Weidlien Gas Burner, the Other Being for the Fraser Burner. The aspirating characteristic curves of the two coincide. Characteristics of the Weidlien burner were obtained with the primary air ports 3 in. open and the secondary air ports wide open. Those for the Fraser burner were obtained with the primary air ports wide open and the secondary air ports closed. The shaded areas show the decrease in efficiency and air supply occurring when the secondary air ports of the Weidlien burner were closed. Characteristics of the Kling and Bradshaw burners are similar to these

efficiency, with losses due to incomplete combustion as high as 20 per cent. The sheet iron was removed and all leaks were plugged with fire clay, asbestos rope and cement. The result, however, of work with uncleaned gas proved that consistently high efficiencies could not be obtained. As high as 70 per cent on an 8-hr. test was obtained, but average efficiency of boiler and burner using rough gas was about 58 per cent.

He found that with boilers in use for three or four weeks clean gas gave 64 per cent efficiency while unclean gas gave 58 per cent. Results were also more easily duplicated using clean gas. However, he found that after operating charges for cleaning were properly made a net loss of 4 cents per ton of iron was entailed using clean gas.

J. A. Knesche, steam engineer and engineer of tests, National Tube Co., Wheeling, W. Va., stated that a well-managed boiler house where the boilers are fired with blast-furnace gas the average monthly analysis for the entire boiler plant should be CO_2, 20 per cent or more; O_2, 2 per cent or less; CO, no trace and stack gas temperature at full rating 600 deg. Fahr. or less. This he held will give an efficiency of 70 per cent or more.

Mixed Coal and Gas Firing.

Conditions for coal firing and gas firing are so essentially different, according to S. G. Brigel, secretary, Huessener Engineering Co., Oliver Building, Pittsburgh, that they should not be mixed in the same furnace. Comparative analyses of the straight gas firing and mixed coal and gas firing, using Parsons blowers, have shown that an analysis of 24 per cent CO_2, 0.2 per cent O_2 and no CO was instantly changed when mixed firing was resorted to into 16 per cent CO_2 with varying amounts of oxygen, and of unburnt CO ranging up to 5 per cent. In the case of insufficient gas, he said it will pay to shut a number of boilers off gas and put them on coal firing.

With unclean furnace gas he held it uneconomical to go over 150 per cent rating, as above this he said it is difficult to keep the boiler clean from dust or scale during operation. Where unclean gas is used, no boiler should be allowed to run longer than 30 days without cleaning.

Gas-Burner Characteristics.

Herman C. Siebert gave charts of results obtained from a number of experiments with various burners used in connection with different boilers at the Duquesne Works of the Carnegie Steel Co. The common type of burner as applied at this plant, he said, is in use in most blast-furnace plants and is shown in Fig. 1. An auxiliary bridge wall in the furnace and a coal grate between it and the main bridge wall is used in connection with this burner at the Duquesne Works. Also, a metal screen permits varying the air opening between boiler and burner. Its characteristics as determined are shown in the figure, which indicates that the proper amount of air is aspirated at a pressure of 2 in.

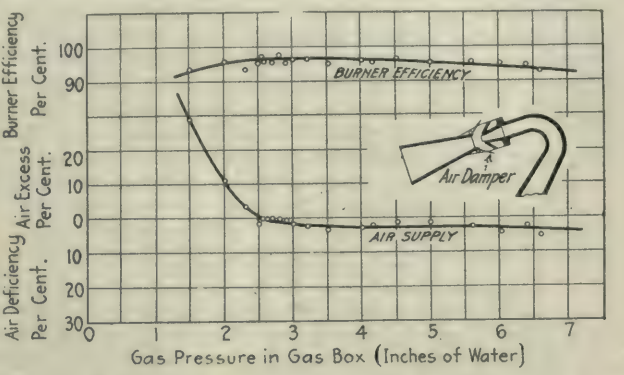


Fig. 3—This Efficiency Curve of the Burner Shown Was Obtained by Regulating the Air Supply so that for any Gas Pressure a Proper Mixture of Gas and Air Was Obtained. The air dampers were adjusted until gas analyses showed that the desired amount of air was being aspirated. Aspirating a quantity of air proper for any gas pressure is seen to be a matter of proper air-port area

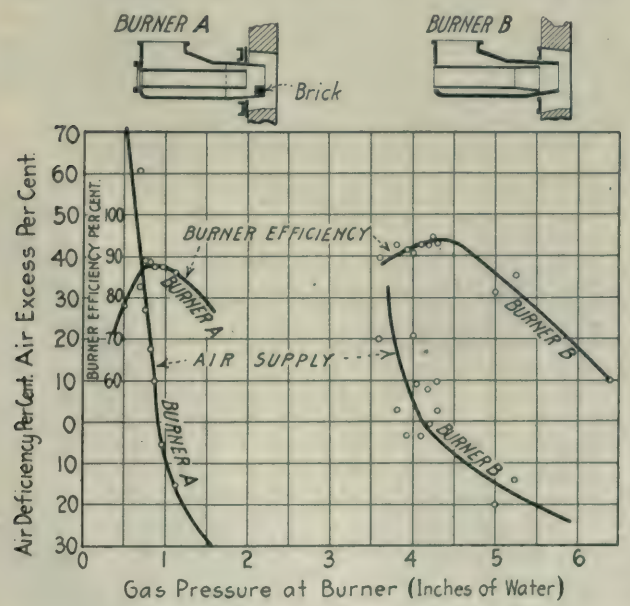


Fig. 4—Burner A Is Limited to a Low Gas Pressure because of Its Large Gas-Port Area, while Burner B with a Smaller Gas Port Is Properly Operated at a Considerably Higher Pressure. The temperature of combustion for burner A was 1500 deg. Fahr. and for burner B 1970 deg. and the ratios of the loads developed by each to the boiler's rated capacity were respectively 90 per cent and 157 per cent. The net areas of the air and the gas ports of burner A were respectively 7.52 and 4.8 sq. ft. and those for burner B were 5.54 and 1.17 sq. ft. The secondary air ports of A were open during the tests and their area was included in the port area while those of burner B were closed and so their area was not included

when the screen is open and at 1 in. when it is closed. He pointed out that at all other gas pressures the air supply is positive or negative in amount of excess.

Characteristics for certain types of aspirating burners, such as the Bradshaw, Kling, Weidlien and Fraser, shown in Fig 2, he said, are similar to those of this burner except that it aspirates the proper amount of air at a different gas pressure. The feature of aspirating the proper quantity of air at any gas pressure, he held, is merely a question of proper port area.

In Fig. 3 he shows the characteristics of the burner shown, which he explained indicates what can be accomplished in the way of air supply if the port area is large enough and is varied to suit different gas pressures. In this case the air supply was controlled by gas analyses taken from the combustion chamber and the port area varied accordingly.

In Fig. 4 he shows characteristics of the burners shown. He explained that burner A was limited to a low gas pressure on account of the large gas-port area, while burner B, with a smaller gas-port, could be operated at a higher pressure. The temperature of combustion for burner A was 1500 deg. Fahr. and for burner B 1970 deg. Fahr. The boiler ratings developed were 90 and 157 per cent respectively (90 per cent rating having been developed by burner A as used originally, i. e., before gas-port area was reduced, as shown by cross-section lines in figure). The draft in the air pipes of burner A was 0.2 and in burner B 0.75 in. of water. Four burners supplied an 823-h.p. Stirling boiler.

He made some experiments on the mixing burner shown in Fig. 5. An explosive mixture which left the nozzle at a velocity greater than the ignition velocity was burned. This type of burner installed on a Babcock & Wilcox boiler developed 270 per cent of the boiler's rated capacity. The maximum efficiency was about 68 per cent, the average being 64 to 65 per cent.

With this burner temperatures of combustion were developed up to 2250 deg. Fahr. with both large and small chambers. The gas pressure was anywhere from 2 to 8 in. of water. For a high gas pressure he introduced a relatively large amount of air, and for low gas pressure he throttled the air, always to suit the conditions of best combustion as indicated by the analyses in the combustion chamber. The air pressure was 3 in. at the fan. At the burner it was about 2½ in. Normal pressure varying from 1 in. to 1½ in. was obtained in the mixing chamber of the burner. The stack draft in the combustion chamber was small, never more than 0.10 in. of water. No difficulty was experienced with

flue dust, but every 24 hr. a fireman put in the regular steam nozzle and blew out the dust as best he could.

Mr. Brigel said that when he runs a gas fired boiler equipped with Bradshaw burners he always seals the boilers against all air and relies on primary air only. He has found that air infiltration, say a foot below the burner, in the front of the combustion chamber proved detrimental, frequently reducing the combustion temperature to such an extent that incomplete combustion took place with an excess of oxygen. Two boilers, one equipped with a burner working only with secondary air, the other with a burner working only with primary air, he said were tested side by side after they had been adjusted so that both showed 22 per cent CO_2, 1.0 per cent oxygen and no CO in the combustion chamber. Three successive tests showed that change of gas pressure in the boiler utilizing only primary air reduced the CO_2 to 19 per cent, without any CO, while in the boiler working with secondary air CO_2 as low as 17 per cent, with 6 per cent CO, was obtained. He has found that as a rule a suction of 0.20 in. of water takes care of all fluctuations in gas pressure within reason.

Effect of Dirty Tubes.

H. C. Cronemeyer, engineering department, Jones & Laughlin Steel Co., Woodlawn, Pa., cited the results of a 48-hr. observation on a vertical water-tube boiler, during which hourly readings were taken of the temperature of the escaping gases to determine the influence of soot. For the first 24 hr. there was an approximately uniform rise of about 6 deg. Fahr. per hr. After that the temperature fluctuated over a range of about 60 deg. Fahr. as the accumulations of dust dropped off and built up again. The temperature at the end of the 48-hr. period was 160 deg. Fahr. higher than when the observations commenced with clean tubes. He has knowledge of a case where the gradual building up of dust against a drum caused a small movement toward one side during every heating up after a shutdown. The cumulative effect of this he believes would have pushed the drum off of its support, had not this condition been discovered during alterations on the setting.

Influence of Boiler Design.

By building a curtain wall across the combustion chamber, compelling the flame to travel downward before rising again among the tubes thereby increasing the length of travel and time for combustion, a 400-h.p. boiler he said was operated at 145 per cent rating at good efficiency. With dirty gas this introduced a disagreeable complication as the flue dust carried by the gas fused on the walls of the combustion chamber. He favors a three-pass boiler to a two-pass one and knows of an instance where the temperature of the stack gases from a two-pass vertical boiler was reduced 85 deg. Fahr. by the insertion of three tiers of cast-iron horizontal baffles in the second pass, which caused the gases to zig zag across the tubes and lengthened the time of contact. A boiler fired with dirty gas, he believes, should be taken out of service for cleaning about every 12 to 15 days.

Mr. Brigel held that boiler design has a decided influence on efficiency. He has run a number of tests on Babcock & Wilcox, Rust and Stirling boilers and concludes that from a gas firing point of view the Babcock & Wilcox boiler is the best heat absorber and allows the highest overload without undue loss of efficiency. The Rust and Stirling boilers appear to have approximately the same capacity for heat absorption, but he prefers the Rust boiler, since the one large baffle in the Rust boiler, he said, is more substantially built and more easily kept in repair than the three baffles in the Stirling boiler.

Running Stirling boilers on loads varying from 130 to 160 per cent he has found stack temperatures for complete combustion with low excess of air of between 600 and 650 deg. Fahr. and in the case of Rust boilers, similar temperatures. On the other hand, a large number of figures taken during regular operation on over 100 Babcock & Wilcox boilers fired by gas exclusively showed stack temperatures ranging from 530 deg. Fahr. to 600 deg. Fahr. for an average load of 165 per cent. With good combustion conditions and airtight boiler settings, the stack temperatures were for all three types of boilers in the neighborhood of 500 deg. Fahr. for loads between 90 and 100 per cent.

Mr. Knesche said that he has recently conducted tests on Stirling boilers rated at 282 boiler h.p. using blast-furnace gas. Two of the boilers had vertically descending baffle arches built in at the ends of the regular furnace arches and the others did not have these arches. The purpose of the tests was to determine whether the arches improved economy. The baffle arches were built of brick about 5 ft. back from the gas burners and they descended toward the center of the arch a distance of 23 in. from the inside of the furnace arch.

Not long after the gas had been lighted the interior of the furnace became almost incandescent in glow and the heat he believes would have melted the grate bars had they been in place. The whole of the combustion chamber was a mass of turbulent and partially reverberating flames and the heat within it was so intense that the inside of the unlined ash pit and firing doors remained in a state of bright red heat during the entire duration of the test.

The two boilers fitted with baffle arches are designated group B, the others group A. During the test the ash pit doors and the firing doors were sealed with fire clay and the air necessary for the combustion entered the combustion chamber through a large annular air-port surrounding each gas burner. The nozzle opening of each burner was 3 11/16 in., and the gas entered each boiler through 10 of these burners.

Test to Determine Effect of Baffle Arches

Duration	5 hr. 44 min.
Total feedwater to groups A and B	56,300 gal.
Steam per hour from group B	19,550 lb.
Gas pressure	3.51 in. H_2O
Draft pressure	.03 in. H_2O
Steam gage pressure, group A	156 lb.
Steam gage pressure, group B	133 lb.
Feedwater temperature	194 deg. Fahr.
Capacity developed, group A	93.08 per cent
Capacity developed, group B	106.99 per cent

Flue Gas Analyses (Group B)

	Boiler No. 11	Boiler No. 12
CO_2 per cent	14.35	11.30
CO per cent	Zero	Zero
O_2 per cent	11.30	9.35
Stack temperature deg. Fahr.	714	747

The side and rear walls of the boiler setting he said were practically new at the time of making the test, but the front wall underneath a cast iron boiler front, and therefore invisible unless inspected from within, contained holes through which he believes air must have entered in large volumes.

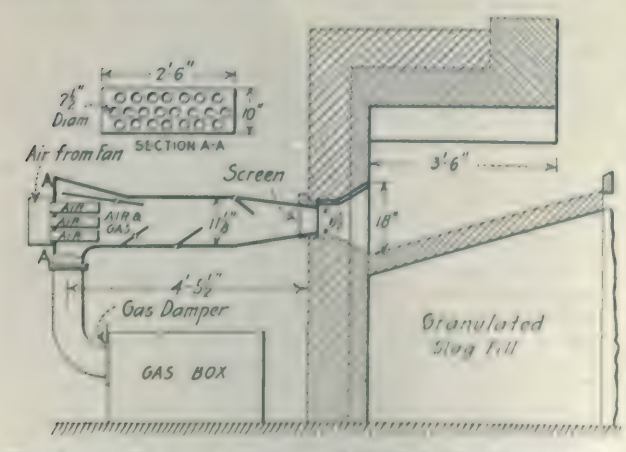


Fig. 5—An Explosive Mixture which Left the Nozzle at a Velocity Greater than Ignition Velocity Was Burned in this Burner, 270 Per Cent of the Boiler's Rated Capacity Being Developed

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The Keasby & Mattison Co., Ambler, Pa., has commenced the construction of a series of 200 six-room dwellings for employees. A first block of 49 houses is now in course of erection and work will soon be inaugurated upon a second allotment of 35 homes.

Mill Employees' Lunchrooms

In a paper read before the iron and steel section of the recent congress of the National Safety Council, J. P. Eib, supervisor of safety and labor at the Joliet works of the Illinois Steel Co., Joliet, Ill., described the growth of this phase of the welfare work at that plant from 1911, when a committee was appointed to work out the details of installing a small lunch counter. This was installed on Jan. 1, 1912, as an experiment to see whether it would stop noon hour drinking among the employees. It had a capacity to serve about 500 men per day and within a few weeks from two to three times that number were being accommodated.

A new building 30 x 400 ft. was erected that year to house a lunchroom which was conducted on the cafeteria plan. The seating capacity is 132 and between 11 a.m. and 12.30 p.m. there is an average daily attendance of over 400, with approximately 2000 employees patronizing the restaurant every 24 hr. While the lunchroom is not run for profit, the end is to make it self-sustaining, the profit on the sale of cigars, tobacco, candy, ice cream, soft drinks and other so-called luxuries at retail prices giving a profit which helps to offset the loss on the basic articles of the menu. The experience at Joliet was so successful that three plant lunchrooms are now in operation at the South Works, Chicago, and one is under construction at the Gary plant.

In discussing the advantages of washrooms and change-houses, Mr. Eib pointed out that they tended to prevent disease, promote self-respect and loyalty and made factory work attractive. The buildings should be located in convenient places and it is desirable to install the washroom in the same building as the locker room, and the two should be separated by a partition. The buildings should be open to outside light and air and should be of fire-resisting construction, and the floor should be of concrete or non-absorbent material, a slope being provided toward the drain. This preferably should be located under the plumbing fixtures, as in this way the water will run toward and not away from the fixture, thus materially improving the appearance of the room. He recommended that the men of necessity wash their hands and faces from a flowing stream and the number of faucets should not be less than one to every six of the maximum number of employees of a single turn. The lockers should be of steel not less than 12 x 16 in. in plan and should be at least 4 in. above the floor. The shower baths should be separated by partitions and the number should not be less than one to every 25 employees, based upon the maximum number employed on a single turn. It was his experience that the failure of the men to use washing facilities was largely due to crude, antiquated and uninviting facilities and that the men would use a clean room with warm water and adequate facilities if it were provided.

The Plague of Committees

In response to numerous requests, the British Board of Trade Intelligence Department has published a list of "*some* of the ministries, departments, commissions, and committees which have been established since the beginning of the war to deal with matters affecting trade." The London *Economist* says: "The list is an appalling one. It comprises approximately 140 committees, six commissions, four ministries, 16 departments, three advisory boards, three ordinary boards, two executives, two panels, one registry, one commissioner, and one clearing-house. We say approximately, because the Board of Trade Intelligence Department itself says that the list is only 'some of the committees, etc.,' and new ones are probably being set up every other day. The publication of this list is long overdue. The need for it has for some time been very keenly felt, and doubtless many traders have, like ourselves, endeavored to keep a more or less complete list for their own convenience and reference, but despite the utmost care and alertness, it is doubtful if the list of any private individual approaches the enormous proportions of that just published by the Board of Trade. Moreover, it is probable that had such a list been in existence from an early date and kept thoroughly revised and up to date, many of the committees, etc., which have been appointed would not have been appointed; but in the absence of such a list it was not clearly known what bodies were already in existence, and so, with the cropping up of any new matter to be dealt with, a new committee was immediately appointed, irrespective of the fact that an existing committee, or sub-committee of same, would have been quite competent to deal with the matter.

"This is abundantly illustrated by a careful analysis of this extraordinary list. In regard to shipping alone there are about 25 committees. In addition to a Diverted Cargoes Committee, there is also a Delay in Unloading Cargoes Committee and a Tonnage Priority Committee. The ordinary lay and unofficial mind might be permitted to wonder why one committee should not have sufficed to deal with cargoes: if necessary, sub-committees could have been appointed. The same might be said in scores of other cases."

Removing Countersunk Rivets Rapidly

An interesting application of a pneumatic device made by the Rivet Cutting Gun Co., 220 East Second Street, Cincinnati, is its use for punching out countersunk rivets from the bottom and sides of ships. This



Countersunk Rivets Are Removed Rapidly by Punching Through Them Instead of Digging Out the Head

pneumatic tool, which was illustrated in THE IRON AGE, March 15, 1917, is operated by three men and consists of an elongated cylinder in which there is a piston mounted on slides.

The tool was originally developed for cutting off rivet heads, after which the rivets can be backed out with a single blow. Where the rivet has countersunk heads the back-out bar is placed against the head and the latter punched through, the bar being carried in a cup-shaped casting provided at the end of the cylinder. The shank of this bar passes through the casting and projects into the lower end of the cylinder. In this way it is emphasized that the rivet can be removed in one-tenth the time it takes to dig the countersunk head out of the rivet. The output of a crew of three men with one of these tools is said to be as great as a gang four times as large equipped with cutting bars and sledges. The number of rivets that can be cut per minute varies from 14 having a diameter of ⅞ in. to four that are 1¼ in. in diameter.

The Chemical Steel Co., whose recent formation was noted in THE IRON AGE, has selected a site near Granite City in Illinois, opposite St. Louis, for the construction and equipment of its plant in which Illinois coal will be, by a new process, converted into coke. Other plans of the company include chemical plants, a blast furnace and dye plants.

Inefficiency in the Boiler Room

In a paper read before the American Society of Mechanical Engineers at its annual meeting in New York, Dec. 5, David M. Myers, consulting engineer, Griggs & Myers, New York, urged that educational propaganda be carried on extending to men who run boiler plants information on proper operating methods. Considerable saving in fuel, ordinarily wasted through inefficiency, he believes eventually would be saved in this way.

Preventable waste of fuel in the boiler furnace of one steel mill which he investigated amounted to 40,000 tons per year. This was a comparatively modern plant. The efficiency of boilers and furnaces in a 14-day test was 55 per cent. The load factor was unusually favorable to high efficiency and could readily be raised to 70 per cent or over. In one hand-fired plant the evaporation was raised from 6 to 9 lb. in a few days of instruction and continuously kept close to this higher mark with the help of coal and water measurements which were inaugurated. The saving, he emphasized, was due exclusively to instruction and consequent better operation.

Six hundred million tons of coal were mined in the United States last year, and he predicted that 700,000,000 tons will be mined this year. Of this quantity he estimates 67 per cent, or 469,000,000 tons, will be burned for steam-making purposes on land, assuming the same percentage consumption for steam production as existed in the year 1915. The saving or wasting of one-quarter of this coal, that is, over 117,000,000 tons, depends upon the efficiency with which we operate our boiler furnaces. In 16 years of concentrated study in the investigation and improvement of steam and fuel conditions in factory power plants, he has never visited a plant of this class where a saving in coal of at least 10 to 12 per cent could not easily be made. Hundreds of boiler plants, he said, operate at no greater than 58.07 per cent efficiency and he believes it a comparatively simple matter to bring them up to an efficiency of 70 per cent or higher, a saving of over 17 per cent of the coal. It is his opinion that the average saving of 10.65 per cent, corresponding to 1,000,000 fifty-ton carloads per year, is a conservative estimate of what can be accomplished by a well-directed and properly organized movement in the direction he proposes.

Will Make Naval Guns

The Poole Engineering & Machine Co. of Baltimore is having a 100 x 500 ft. building constructed of steel frame and brick for the manufacture of 4-in. naval guns for the Government, and deliveries are expected to begin in May. The plant will employ about 350 men and the capacity will be three guns every two days. The equipment has been contracted for and is expected to be delivered shortly. However, the company is in the market for planers and both vertical and horizontal boring mills. The new building will cost about $500,000 and is being constructed by the H. B. Watts Co., Garrett Building. W. H. Emery is the architect and the G. E. Painter Co. the engineer. S. Proctor Brady is president of the Poole Company and Robert P. Allison the general manager.

Notification has been received in St. Louis that the United States Shipping Board has allotted the sum of $3,500,000 for the construction of 24 barges and four tow boats to be utilized in river traffic between St. Louis and St. Paul, for the purpose of transporting coal north and iron ore south from the Minnesota and other northern mines to the blast furnace in operation at St. Louis. In order that the barges and towboats may be built at St. Louis, the St. Louis Chamber of Commerce members have undertaken the formation of a corporation of about $3,500,000 capital.

The offices of Gannestad & Jacobsen, engineers, have been removed from the Benedum-Trees Building to new and larger quarters at 1103-1106 B. F. Jones Building, Third Avenue and Rose Street, Pittsburgh.

Oxy-Acetylene Cast-Iron Welds

Opinions that oxy-acetylene welds are hard and brittle and cannot be machined, also, that in cast iron they have no particular strength are erroneous according to a paper presented by Stuart Plumley, Davis-Bournonville Co., Boston, before the American Foundrymen's Association at its annual meeting Sept. 25. These opinions, he said, result from use of poor filling rods and of a variety of apparatus which on the whole is improperly designed and constructed.

For iron castings the parts should be prepared by cutting away the edges to be welded to an angle of 45 deg. on each side to permit the operator to start at the bottom of the broken section. It is, also, usually best to place the casting in a rough brick enclosure so the heat may be properly confined. Silicon in cast iron tends to promote the formation of graphite making the iron soft. Manganese and sulphur on the other hand have the opposite effect. Cast-iron welding rods, therefore, should be high in silicon and the grade of iron used must be the best. The rod must be cast in a heated metal mold in such manner that it is free from sand and is not chilled on the surface. Use of welding rods low in silicon and high in manganese and sulphur tends to produce white or chilled iron, containing no graphitic carbon, making the weld intensely hard. The manufacture of good welding rods cannot be carried out in the ordinary foundry, as the iron is not suitable for the purpose. Use of a small quantity of flux is, also, effective.

The cast-iron leg of a steam hammer was broken completely off and repaired by welding. The break occurred on a Tuesday morning. On Tuesday afternoon preparation of the casting began. It was necessary to chip or "V" the break clear around the leg. Welding was started on the following Friday and completed on Saturday night. The hammer was assembled Monday morning and put in operation the following Wednesday morning. It has been working day and night since the break was repaired. The repair required in all 16 ft. of welding in cast iron ranging from 2 to 3 in. thick; 2000 cu. ft. of oxygen and about 1800 cu. ft. of acetylene were consumed. The welding required the services of four men, each relieving the other. The break was inclosed in a rough brick furnace and the heat was confined and the temperature maintained uniformly. Preheating was accomplished with large fuel-oil burners.

Stock List of Conveying-Machinery Parts

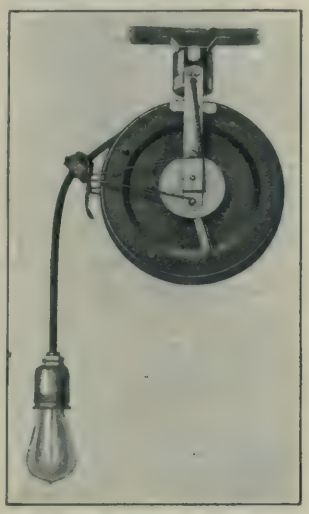
The Jeffrey Mfg. Co. Columbus, Ohio, has begun the publication of a semi-monthly stock list covering its line of elevating, conveying and power transmission machinery. The available amounts of chains and attachments for elevators and conveyors, malleable iron and steel elevator buckets, belt and spiral conveyors and fittings, take-ups, bearings, hangers, pulleys, etc., are given together with the approximate shipping dates for the various lines. References are made to the pages in the company's latest catalog on which the different equipment is illustrated and described. The sizes which are recommended for all new equipment and for replacements and repairs where possible are indicated in heavy type with a view to enabling the purchaser to secure prompt shipment as well as eliminating the extra cost that is necessary when special equipment has to be manufactured.

The Kansas, Colorado & Oklahoma Railroad was sold under foreclosure at Scott City, Kan., Saturday, Dec. 15, to the Hyman-Michaels Co. of Chicago for $318,000, an unprecedented price for a road which is to be torn up and resold as second-hand material. The road is about 50 miles long, running east from Scott City, and was sold under the order of court to meet its indebtedness. The sale included 50 miles of 70 lb. steel rails, standard section; two locomotives, three flat cars, two box cars, two coaches, 80 acres of land and 500 town lots. The right of way reverts to the farmers and others originally granting it to the railroad, which was a financial failure.

Automatic Drop Light Extension Reel

An automatic electric drop light extension reel is being made by the Cincinnati Specialty Mfg. Co., Powers and Sylvan streets, Cincinnati. A swivel joint is provided that enables one to walk in any direction with the lamp. The cord furnished with the outfit is 25 ft. long and is automatically wound over the pulley by a spring inside the pulley.

The reel is automatically stopped at any point by allowing the line to drop back slowly so that the automatic catch drops over a pin that locks the pulley. The cord is released from the catch, or lock, by pulling it forward and letting it be drawn back by a spring. Ordinarily the reel is attached to the ceiling with screws and a connection made to the line wires in the usual manner, or it is attached to the outlet box, for which a special cover is furnished, when the conduit system of wiring is used. The electric current passes in at the reel head, where brush connections are used in order not to interfere with the operation of the swivel joint.

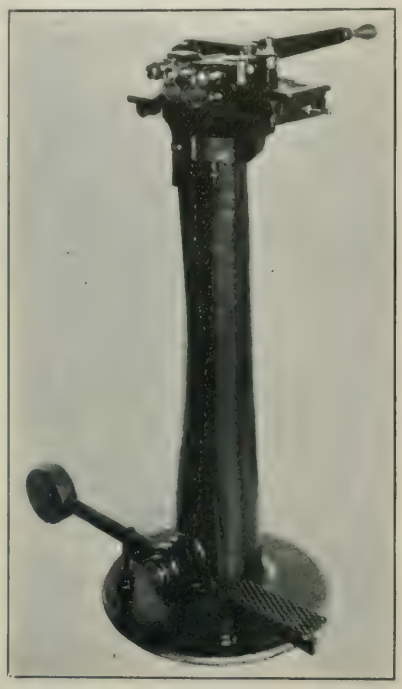


A Spring Actuated Automatic Reel Enables an Ordinary Electric Drop Light to Be Used Within a Radius of 25 Ft. of the Outlet and at the Same Time Keeps the Cord Clear of the Floor

The pulley disk is of black enameled metal and the other parts are of polished nickel. The manufacturer claims that this device is especially useful in a garage or shop, as it enables repairs to be made on machines without having to place them at any particular spot. A strong wire guard is fitted over the globe.

Graduating Machine for Circular Work

The line of marking machines developed by the Noble & Westbrook Mfg. Co., Hartford, Conn., has been increased by a special machine for marking the graduations and figures on circular and semi-circular metal parts. Among the work which it is designed to do is the graduating of compound rests for lathes and for performing various other operations of a similar nature on steel products.



Compound Rests for Lathes and Other Forms of Semi-Circular and Circular Work Can Be Marked by a Recently Developed Special Graduating Machine

The die which does the graduating is held in a holder and is keyed to a shaft which runs in bronze bearings provided with a collar adjustment. Cut gears are employed to hold the work in place with relation to the die. The work and the die are brought in contact by a lever actuated by the operator's foot and a cam. The latter is adjustable so that it is possible to regulate the depth of the impression to 0.01 in., thus giving an even and accurate impression, one piece being produced at each turn of the handle.

Crane and Chain Practice

The covering of all gears on traveling cranes as well as the providing of ample platforms with railings and toe-boards and the installation of bumpers and rail stops to prevent running over the rail ends were recommended in a paper presented by G. A. Orth, chief adjuster, claim and safety department, American Car & Foundry Co., St. Louis, at the recent convention of the National Safety Council. He stated that the trains of gears should be protected and guarded to prevent gears, which become broken or loose from defective or loose keys, from falling on the men below, and the bearings should be rebabbitted and aligned to prevent them from wearing out of mesh, as wear is the cause of accidents when the teeth get the load and strain on their points. The lining and rods on the band brake should be examined regularly, and he considered that dynamic braking used in connection with a holding brake was the most desirable and safest method of controlling a descending load. Traveling cranes should be inspected regularly and frequently to counteract the effect of wear and tear, collisions, neglected lubrication and to keep the diameter of the track wheels the same so that they will travel in parallel lines on their tracks. The use of safety appliances on these cranes will enable men to work under them and be free from any feeling of danger, and thus the amount of work secured from them would be increased. In concluding the paper, Mr. Orth recommended that the standards based on the specifications of the United States Steel Corporation be adopted for overhead traveling cranes.

A patent (U. S. 1,247,606) has been awarded to Milton A. Smith of Vandergrift, Pa., which provides a method of tapping open-hearth furnaces so as to prevent the slag from mixing with the metal as it flows from the furnace into the ladle.

Peerless Truck and Motor Report

The ten months report of the Peerless Truck & Motor Corporation, Cleveland, for the period ended Oct. 31, shows net profits of $1,992,413, equal to approximately $10 a share. This is at the annual rate of about $12 a share. The company's consolidated balance sheet discloses an excellent current asset position. Of the total current assets of $8,583,520, cash in the bank is represented by $2,450,904. Current liabilities are $1,557,262, leaving a net working capital of $7,026,258. This does not inclued the $2,500,000 received in payment for the company's Long Island plant, sold recently to the Government. This sum added to the working capital provides the company with excess current assets of $9,526,258. Such an amount would permit the company to pay off its $5,000,000 of notes and there would still remain $4,526,258, equal to $22.60 a share. The stock is now selling around $11 a share. Gross sales for the period were $17,013,113 as compared to sales $16,621,038 for the entire 12 months of 1916. A surplus of $5,415,334 was reported.

David A. Wright, 566 Washington Boulevard, Chicago, has purchased the right to manufacture the triple geared engine lathes formerly built by George B. Fifeld, Dexter, Me. The lathes are built in a standard pattern for ordinary shop work in seven sizes with swings of from 34 to 96 in. and in four sizes which range from 36 to 60 in. for heavy duty manufacturing. Cone pulley, geared head single pulley or motor drive can be furnished for all sizes of each type.

Fuel supplies in Michigan have reached such a low ebb that State Fuel Administrator W. K. Prudden has asked manufacturers to suspend operations from midnight Dec. 25 until midnight Dec. 29. Exceptions are factories making munitions for prompt shipment.

Large Powers Conferred on the President

Recent Taking Over of Plants by the Government Arouses Much Interest in Provisions of the Various Laws—Labor More Kindly Treated than Capital

WASHINGTON, Dec. 24.—Plans now being developed by several bureaus of the Government, including the Federal Trade Commission and the Food and Fuel Administrations, looking to an extension of price-fixing, are causing much concern to manufacturers and merchants throughout the country and many inquiries are being received here concerning the authority of executive officials to commandeer products needed for war purposes. Reports are steadily becoming more frequent of the taking over by the Government of large manufacturing establishments or their full output and there is naturally much interest as to how far the Government can go under existing legislation in the extension of its commandeering operations.

The general scope of the Lever food, feed and fuel law appears to be fairly well understood. This statute, though far less comprehensive than the Senate bill covering the same ground, which was afterward abandoned in favor of the House measure, unquestionably clothes the Fuel Administration with unlimited power to regulate the price of fuel and its distribution for Government needs, for private industry and for domestic purposes. The only omission made in the draft of the fuel section of the Lever bill was that of authority to fix wages and to require miners to stick to their tasks. The inability of the Fuel Administration to regulate these matters, however, has operated to nullify its authority with respect to the fixing of prices. Mine operators in both the bituminous and anthracite fields have found themselves, since the first schedule of coal prices was promulgated, in a position where threatened strikes forced them to raise wages to a point that eliminated all profit, and upon appeal to the Fuel Administrator at Washington they have secured price advances that have absorbed the wage increases demanded by the operatives. It has thus been made perfectly clear that, in default of any power to require the miners to work at a scale fixed by the Government, the question of maximum production, which is the vital one, is beyond the control of the Fuel Administration, and the miners at any time may force an increase in the price of coal by demanding more wages under threat of a strike.

Seek Favor of Labor

The desire of the average public man, especially if he is a member of the Senate or House, to "stand well with labor" is clearly reflected in the marked difference in the treatment of labor and capital in the commandeering legislation enacted during the past 18 months. In no case has the Government sought to require labor to keep to its job, and several measures, proposing that where commandeered manufacturing plants were taken over by the Government all the employees thereof should be drafted into the Federal service and required to work, have been unceremoniously rejected by the committees having jurisdiction of the subject. The House Naval Committee, especially, has been particularly sensitive on this point, and at the last session refused to consider a carefully drawn measure supported by some of the most farsighted men in Congress which would have clothed the Secretary of the Navy with power to keep together the organizations of any manufacturing establishments commandeered for naval construction purposes.

The treatment of manufacturers in the commandeering legislation has been in marked contrast with that of labor. In addition to the Lever bill, three drastic laws worked out with comprehensive detail have been enacted, providing not only for the commandeering of manufacturing plants, but imposing upon the individual owners thereof, or upon the responsible officials of the owning corporations, the duty of meeting the requirements of the Government under heavy penalties of fine and imprisonment. The fact that the constitutionality of these statutes has never been tested is probably the finest tribute that could be paid to the patriotism of the manufacturers of the country who in no instance thus far have refused to co-operate heartily with the Government in the effort to obtain material at the earliest possible moment. The attitude of the manufacturers is in marked contrast with that of the labor leaders who, as the obvious result of a general understanding, are meeting all talk of labor conscription with thinly veiled threats.

First Commandeering Law

The first commandeering statute enacted by the Government in contemplation of the existing war was contained in the so-called National Defense Act approved by the President June 3, 1916. Section 120 of this act provides as follows:

> The President, in time of war or when war is imminent, is empowered, through the head of any department of the Government, in addition to the present authorized methods of purchase or procurement, to place an order with any individual, firm, association, company, corporation, or organized manufacturing industry for such product or material as may be required, and which is of the nature and kind usually produced or capable of being produced by such individual, firm, company, association, corporation, or organized manufacturing industry.
>
> Compliance with all such orders for products or material shall be obligatory on any individual, firm, association, company, corporation, or organized manufacturing industry or the responsible head or heads thereof and shall take precedence over all other orders and contracts theretofore placed with such individual, firm, company, association, corporation, or organized manufacturing industry, and any individual, firm, association, company, corporation, or organized manufacturing industry or the responsible head or heads thereof owning or operating any plant equipped for the manufacture of arms or ammunition, or parts of ammunition, or any necessary supplies or equipment for the Army, and any individual, firm, association, company, corporation, or organized manufacturing industry or the responsible head or heads thereof owning or operating any manufacturing plant, which, in the opinion of the Secretary of War shall be capable of being readily transformed into a plant for the manufacture of arms or ammunitions, or parts thereof, or other necessary supplies or equipment, who shall refuse to give to the United States such preference in the matter of the execution of orders, or who shall refuse to manufacture the kind, quantity, or quality, of arms or ammunition, or the parts thereof, or any necessary supplies or equipment, as ordered by the Secretary of War, or who shall refuse to furnish such arms, ammunitions, or parts of ammunition, or other supplies or equipment, at a reasonable price as determined by the Secretary of War, then, and in either such case, the President, through the head of any department of the Government, in addition to the present authorized methods of purchase or procurement herein provided for, is hereby authorized to take immediate possession of any such plant or plants, and through the Ordnance Department of the United States Army, to manufacture therein in time of war, or when war shall be imminent, such product or material as may be required, and any individual, firm, company, association, or corporation, or organized manufacturing industry, or the responsible head or heads thereof, failing to comply with the provisions of this section shall be deemed guilty of a felony, and upon conviction shall be punished by imprisonment for not more than three years and by a fine not exceeding $50,000.
>
> The compensation to be paid to any individual, firm, company, association, corporation, or organized manufacturing industry for its products or material, or as rental for use of any manufacturing plant while used by the United States, shall be fair and just.
>
> The President is hereby authorized, in his discretion, to appoint a Board of Mobilization of Industries Essential for Military Preparedness, nonpartisan in character, and to take all necessary steps to provide for such clerical assistance as

he may deem necessary to organize and co-ordinate the work hereinbefore described.

Conscription of Executives

Although the terms of this act have not been tested, law officers of the Government express the opinion that the term "failing to comply with the provisions of this section" would cover the refusal of any person holding an important executive or managerial post in any of the plants referred to, whether he was financially interested in the establishment or not. If this view of the law is sound, it amounts to the conscription of executives, managers, superintendents, etc., under penalties that would deprive recalcitrants of comfortable fortunes. The indignation that the enactment of a similar statute with regard to labor would arouse among its present leaders may well be left to the imagination.

The second commandeering statute enacted by Congress is found in the provision of the Naval Appropriation Act of May 4, 1917, which carried a naval emergency fund of $115,000,000. It was carefully stipulated that the word "person," as used in the commandeering section, should include "any individual, trustee, firm, association, company or corporation," and the provision was drawn with great care to avoid the suggestion, as the result of ambiguity or otherwise, that it should apply to labor; in fact, it was in connection with this statute that the House Naval Committee refused to incorporate a labor conscription provision. The commandeering section of this act provides as follows:

That in time of war, or of national emergency arising prior to March 1, 1918, to be determined by the President by proclamation, the President is hereby authorized and empowered, in addition to all other existing provisions of law:

First. Within the limits of the amounts appropriated therefor, to place an order with any person for such ships or war material as the necessities of the Government, to be determined by the President, may require and which are of the nature, kind, and quantity usually produced or capable of being produced by such person. Compliance with all such orders shall be obligatory on any person to whom such order is given, and such order shall take precedence over all other orders and contracts theretofore placed with such person. If any person owning, leasing, or operating any factory equipped for the building or production of ships or war materials for the Navy shall refuse or fail to give to the United States such preference in the execution of such an order, or shall refuse to build, supply, furnish or manufacture the kind, quantity, or quality of ships or war materials so ordered at such reasonable price as shall be determined by the President, the President may take immediate possession of any factory of such person, or of any part thereof without taking possession of the entire factory, and may use the same at such times and in such manner as he may consider necessary or expedient.

Second. Within the limit of the amounts appropriated therefor, to modify or cancel any existing contract for the building, production, or purchase of ships or war material; and if any contractor shall refuse or fail to comply with the contract as so modified, the President may take immediate possession of any factory of such contractor, or any part thereof without taking possession of the entire factory, and may use the same at such times and in such manner as he may consider necessary or expedient.

Third. To require the owner or occupier of any factory in which ships or war material are built or produced to place at the disposal of the United States the whole or any part of the output of such factory, and, within the limit of the amounts appropriated therefor, to deliver such output or parts thereof in such quantities and at such times as may be specified in the order at such reasonable price as shall be determined by the President.

Fourth. To requisition and take over for use or operation by the Government any factory, or any part thereof without taking possession of the entire factory, whether the United States has or has not any contract or agreement with the owner or occupier of such factory.

That all authority granted to the President in this paragraph, to be exercised in time of national emergency, shall cease on March 1, 1918.

Method of Compensating

For the first time in connection with the Naval Appropriation Act above quoted it was provided that whenever the United States should commandeer a factory or any ships or war material it should make compensation "as determined by the President," and that if the amount so determined should prove unsatisfactory to the person entitled to receive the same, such person should be paid 50 per cent of the amount tendered and should be entitled to sue in the United States Court of Claims for any remaining compensation alleged to be due. The unfairness of relegating a manufacturer to the tedious routine of the Court of Claims for more than 50 per cent of the amount of his damage was frankly acknowledged by Congress in subsequent legislation in which the amount of the initial payment was raised from 50 to 75 per cent.

The Latest Provision

The latest provision authorizing the Government to requisition plants or material is found in the so-called Urgent Deficiency act of June 15, 1917, which carried a huge appropriation for the United States Shipping Board. This provision vested in the board power not only to take over private shipyards but all vessels building therein and to assume all contracts covering such construction. This law, while more comprehensive than the other statutes quoted, is less drastic in the treatment of the parties in interest, and under its provision the Government has taken over nearly 3,000,000 tons of vessels building in American shipyards. Certain ships constructed for foreign account have been released as the result of negotiations through the State Department, and others have been delivered to the parties ordering them upon condition that they would be operated in accordance with the wishes of the shipping board. So far as is known, no owner has thus far been obliged to appeal to the courts for adequate compensation, although it is understood that a number of contracts are still the subject of negotiation.

Generally speaking, the war powers of the President as exemplified in the commandeering statutes here described are practically limitless. That they will be still further defined by additional price-fixing legislation is regarded as highly probable, and already, in addition to the Pomerene steel control bill now pending in the Senate, there is under advisement in several bureaus of the Government a project covering a long list of manufactured goods much more comprehensive than the ordinary category of "necessaries of life."

W. L. C.

Quoting for Business in the Far East

The attention of THE IRON AGE has been called to the importance of American export houses quoting to firms in the Orient c.i.f. The Eastern Trading Co., Tientsin, China, writes:

"On many occasions, we have had to refuse business because America would only quote ex works or f.a.s. We understand the position of export houses in America and although their books overflow with orders we think it is a shortsighted policy not to make the most of their opportunity.

"When domestic requirements are filled, surplus products must find a market abroad in the future and we know that Chinese dealers will give their business to suppliers from whom they bought in pre-war days. American houses write about the difficulties of quoting c.i.f., but the difficulty is easily overcome. English houses send us price lists with c.i.f. quotations based on the current rates of freight, etc., and when we cable for a firm price, they recast the figures and quote. War risk is included in the quotation at a flat of five guineas per cent increase or decrease for our account. The chief reason why merchants in the Far East insist on c.i.f. quotations is the difficulty of exchange and unless we knew the c.i.f. cost, business would be almost impossible. Rate of exchange fluctuates with the price of silver and you are probably aware of the ups and downs during the past year or so. We might mention that those firms which sent a representative to China during the last year or so now always quote c.i.f. American suppliers usually require sight or 30-day sight drafts while English houses are willing to draw on us at four months' sight."

Judge Gary Announces Additional Prices

Cast-Iron Pipe, Steel Castings and Other Products Included — Recommendations as to Various Grades of Old Material

JUDGE E. H. GARY, as chairman of the Committee on Steel and Steel Products of the American Iron and Steel Institute, has issued a statement naming prices on angle bars, tie plates, track spikes, track bolts, cast-iron water pipe, steel castings, rail steel bars, cut nails, forging ingots, splice joints for light rails, cast-steel slugs for projectiles, extra for forging bars, and recommendations on scrap, also differentials on pig iron, with phosphorus over 0.04. The statement follows:

"Referring to the statements of the chairman of the Committee on Steel and Steel Products of the American Iron & Steel Institute dated Nov. 13 and Nov. 20, 1917, recommending prices for certain steel products to be adopted as maximum prices, to take effect immediately, to apply to the requirements of the United States Government, to the war requirements of the Allies and for domestic consumption within the United States, the committee now makes similar recommendation to the iron and steel industry in respect of the prices below stated.

"The committee also recommends to the industry that the additional extras and differentials below stated be adopted, to take effect immediately.

"The committee expresses the hope that there will be no hesitancy in accepting the recommendations."

Rolled Steel Angle Splice Bars for Standard Sections

Steel "Tee" Rails, 50 lb. per yd. and heavier.

Base—25 gross tons or more, standard sections, which do not involve new roll equipment, per 100 lb., f.o.b. makers' mill..... $3.25

Less than 25 gross tons, subject to special arrangement.

Extras for quality, per 100 lb.

		Extras per 100 lb. for workmanship in addition to extras for quality		
		Hot Annealing	Work-ing	Oil Quench-ing
Low carbon, open hearth or Bessemer	Base	$.10	$.10	$.20
Medium carbon, open hearth or Bessemer	$.05	.10	.10	.20
High carbon, open hearth or Bessemer	.10	.10	.10	.20
Extra high carbon, open hearth	.15	.10	.10	.20

Extras for Special Analysis

	Per 100 Lb.
For sulphur specified in Bessemer steel .075 or higher	$.05
For sulphur specified in open hearth .06 maximum	.05
For sulphur specified in open hearth .05 maximum	.10
For phosphorus specified in open hearth .03 maximum	.045

These prices do not apply to patented angle splice bars and joints, which will be subject to special negotiation.

Rolled Tie Plates

Base—All sizes and weights, iron or steel, or single shoulder type, for use with standard tee rail sections, per 100 lb., f.o.b. maker's mill, $3.25.

These prices do not apply to other types of rolled tie plates which will be subject to special negotiation.

Forging Bars

Finished bars ordered for forging purposes 25c. extra.

Full bar extras, as shown above, apply in addition to this extra.

Note.—To be added to standard classification of extras on steel bars at end of sub-division headed "Other Bar Mill Products."

Iron Spikes

Base, per 100 lb., f.o.b. cars, Pittsburgh..... $4.50

Base size and quantity, and quantity differential as given above for steel spikes.

Extras for size, as above, to apply.

Standard Railroad Track Spikes

Steel spikes—Base—9/16 in. x 4½ in. and heavier, 200 kegs (200 lb. each) or more, per 100 lb., f.o.b. cars, Pittsburgh..... $3.90

Less than 200 kegs—$1 per 100 lb. extra.

Extras as follows:

Size	Per 100 Lb.	Size	Per 100 Lb.
⅝ x 6½ in.	Base	7/16 x 4½ in.	$.25
6 in.	Base	4 in.	.25
5½ in.	Base	3½ in.	.25
9/16 x 6 in.	Base	⅜ x 4½ in.	.40
5½ in.	Base	4 in.	.40
5 in.	Base	3½ in.	.40
4½ in.	Base	3 in.	.40
½ x 5 in.	$.15	2½ in.	.65
4½ in.	.15	5/16 x 3½ in.	.95
4 in.	.15	3 in.	.95
3½ in.	.15	2½ in.	.95
3 in.	.15	2 in.	1.30
		Reverse Point	.25

Standard Railroad Track Bolts

Base—Standard button head, oval neck, 3½ in. and longer by ¾ in and larger, with United States standard square nuts and rolled threads, 200 kegs (200 lb. each) or more, per 100 lb., f.o.b. cars, Pittsburgh..... $4.90

Less than 200 kegs—$1 per 100 lb. extra.

Extras as follows:

Diameter	Length	Per 100 Lb. Square Nut	Per 100 Lb. Hexagon Nut
1¼ in to ¾ in.	3½ in.	Base	$.30
	3¼ in.	$.20	.40
	3 in.	.30	.50
	2¾ in.	.40	.60
⅝ in.	3½ in.	.30	.55
	3¼ in.	.35	.60
	3 in.	.40	.65
	2¾ in.	.50	.75
	2½ in.	.60	.85
	2¼ in.	.75	1.00
9/16 in. and ½ in.	3 in.	.85	1.30
	2¾ in.	1.00	1.45
	2½ in.	1.15	1.60
	2¼ in.	1.20	1.75
	2 in.	1.35	1.90
	1¾ in.	1.55	2.10
	1½ in.	1.65	2.25
7/16 in.	2½ in.	1.55	2.00
	2¼ in.	1.75	2.20
	2 in.	1.95	2.40
	1¾ in.	2.15	2.60
	1½ in.	2.35	2.80
⅜ in.	2¼ in.	2.40	2.95
	2 in.	2.65	3.20
	1¾ in.	2.90	3.45
	1½ in.	3.15	3.70

Bolts with cut threads.....$.10 per 100 lb.
Bolts with square recessed nuts..... .10 per 100 lb.
Bolts with "Ideal" square recessed nuts..... .15 per 100 lb.

Rail Steel Bars

(Rolled from Old Steel Rails)

Base price, per 100 lb., f.o.b. maker's mill..... $3.00

Extras as follows:

For Size

Rounds, squares and flats, including deformed bars and twisted squares take regular steel bar extras.

1 in. x 1 in. x ⅛ in. and larger angles, channels, flats and cultivator beams..... Base

U-bars, regular channels, harrow I bars, diamonds, triangulars, 1½ in. x 1½ in. x 3/16 in. and larger tees, ¾ in. x ¾ in. x ⅛ in. and heavier, 1 in. x ⅝ in. x ⅛ in. and heavier angles—per 100 lb..... $0.10

1 in. x 1 in. x 3/16 in. to 1¼ in. x 1¼ in. x 3/16 in. tees, per 100 lb..... .20

For Cutting to Length

No extra charge for lengths 24 in. and over; under 24 in. subject to negotiation.

These prices do not apply to special sections which will be subject to special negotiation.

Forging Ingots

Basic or acid open-hearth steel

	Per Gross Ton
Base, up to and including 36-in. diameter, with carbon not over 0.25 cast in chilled molds, f.o.b. makers' works	$73.00

With following extras:

For size

Over 36-in. diameter to and including 50-in. diameter, add to base price	$4.00
Over 50-in. diameter to and including 60-in. diameter, add to base price	8.00

For carbon

Over 0.25 to and including 0.60 carbon, add to base price	$1.00
Over 0.60 carbon, add to base price	2.00
For sand-cast ingots, add	10.00

Dimensions of hexagonal or octagonal ingots to be measured over flats.

These prices do not apply to ingots in which nickel or other alloys are specified, which will be subject to special negotiation.

Splice Joints Complete for Light Rails

Section	Price Per Complete Joint	Section	Price Per Complete Joint
8 lb.	$.16	30 lb.	$.45
10 lb.	.20	35 lb.	.52
12 lb.	.25	30 lb. angle bars	.60
14 lb.	.25	35 lb. angle bars	.66
16 lb.	.30	40 lb. angle bars	.85
20 lb.	.31	45 lb. angle bars	1.00
25 lb.	.38		

Cast Iron Water Pipe

Base—Standard cast iron bell and spigot pipe, 6 in. and larger, class "B" or heavier. Per net ton of 2000 lb. without penalty:

$49.00 f.o.b. Birmingham, Ala.
$55.35 f.o.b. New York.
$54.35 f.o.b. Chicago.

Differentials as follows:

3 in.	$10.00 over base
4 in.	3.00 over base
Class A or gas pipe	1.00 additional

Recommendations in Regard to Prices of Scrap Iron and Steel

No. 1. No. 1 heavy melting scrap.

The maximum price of $30 per gross ton, f.o.b. consumer's works, shall apply to all grades of iron or steel scrap to be melted, which normally sold at or under the price of No. 1 heavy melting steel scrap, including malleable cast scrap of all kinds, and cast iron scrap of all kinds, including iron car wheels.

A special charge of not to exceed $3 per gross ton may be paid for cutting heavy melting scrap to sizes 18 in. and under in length.

Parties operating acid open-hearth furnaces, or crucibles, converters or electric furnaces making tool steel or steel castings, may pay a maximum of $10 per gross ton over the base price of heavy melting scrap, for scrap guaranteed not to exceed 0.04 in phosphorus and 0.04 in sulphur. Such parties may also pay a differential of not to exceed $5 over the base price of heavy melting scrap for low phosphorus material not guaranteed as to analysis.

No. 2. Steel rails 56 lb. per yd. and heavier, 5 ft. and over in length, suitable for rerolling purposes, may be purchased at a differential of not more than $5 over the base price of heavy melting steel scrap, provided the purchaser currently operates mills for rerolling such rails.

No. 3. Parties operating mills rerolling old locomotive tires, axles, arch bars, transoms, shafting or similar rerolling material, shall not pay more than $47.50 per gross ton (the base price of 4 x 4-in. rerolling billets) for such material delivered at their works.

No. 4. No. 1 railroad wrought scrap.

The maximum price of $35 per gross ton, f.o.b. consumer's works, applies to all scrap used by iron rolling mills which normally sold at or under the price of No. 1 railroad wrought scrap, and includes yard scrap, track scrap, short wrought, busheling, wrought iron or soft steel pipe or similar material normally used by bar iron manufacturers.

The term "busheling" scrap used in this ruling means scrap suitable for busheling furnaces.

No. 5. Cast iron borings and machine shop turnings.

The maximum price of $20 per gross ton, f.o.b. consumer's works, applies only to turnings and borings used for remanufacture into iron or steel products.

No. 6. Parties operating chemical plants, or plants for purposes other than the remanufacture into iron and steel products may pay a differential of not to exceed $5 above the base price.

Parties employing recognized scrap dealers or brokers to purchase scrap for them may pay such dealer or broker a commission for such service, not to exceed 3½ per cent of the actual delivered price of the materials so purchased.

Steel Casting Prices

Column Bases, Bridge Blocks and Shoes

$7 to $7.75 per 100 lb., depending on weight of castings and quantity required from one pattern.

Add $2 each for test bars in excess of two bars per heat.

Boiler Castings and Fittings

(Light Section) $13.65 to $41.50 per 100 lb., depending on weight of castings required.

(Heavy Section) $11.60 to $35.80 per 100 lb., depending on weight of castings required.

Flange Castings

$10.55 to $28.75 per 100 lb., depending on weight of castings and quantity required from one pattern.

Engine Castings

$8.40 to $35.55 per 100 lb., depending on weight of castings required and intricacy of design.

Add ½c. per lb. if over 0.40 carbon is specified.

Old Style Anchor Castings

$10.60 to $17.85 per 100 lb., depending on weight of castings required.

Add ½c. per lb. for chemical or physical test. Other tests to be paid for by customer.

Propeller Wheels

$11.10 to $35.90 per 100 lb., depending on weight of castings required.

Cement Mill Castings

$9.20 to $21.30 per 100 lb., depending on weight of castings required and intricacy of design.

Gears, Pinions, Segments, Racks, Worms, Worm Wheels, Sprockets, Sheaves and Pulleys

$8.05 to $30.20 per 100 lb., depending on weight of castings and quantity required from one pattern.

Add ½c. per lb. if carbon over 0.40 is specified.

Add ½c. per lb. if physical test is specified.

Add for alloys, the usual extras.

Crane Castings

$8.95 to $31.85 per 100 lb., depending on weight of castings required and intricacy of design.

Mine and Industrial Car Castings

$8.20 to $21.70 per 100 lb., depending on weight, intricacy of design and quantity required from one pattern.

Mine and Industrial Car Wheels

$7.70 to $11.35 per 100 lb., depending on weight, intricacy of design and quantity required from one pattern.

Freight Car Castings of Standard American Design

$7.95 to $22.75 per 100 lb., depending on weight, intricacy of design and quantity required from one pattern. Patterns to be furnished free of charge, *by the foundry*, when more than 500 castings are ordered from each pattern at one time.

Freight Car Castings of Foreign Design

$10.95 to $20.60 per 100 lb., depending on weight and intricacy of design. Patterns to be furnished free of charge, *by the foundry*, when more than 500 castings are ordered from each pattern at one time.

Miscellaneous Railroad and Locomotive Castings

Driving Wheel Centers: $7.70 per 100 lb.

Engine Frames: Under 2000 lb., each $11.20 per 100 lb.; over 2000 lb., each $8.20 per 100 lb.

Miscellaneous Railroad Castings

$8.70 to $19.70 per 100 lb., depending on weight of castings required and intricacy of design.

Rail or Step Joint Castings

$10.50 per 100 lb.

Refractory and Brick Yard Castings

$10.75 to $29.85 per 100 lb., depending on weight of castings required and intricacy of design.

Jaw and Gyratory Crusher Castings

$7.55 to $31.45 per 100 lb., depending on weight of castings required and intricacy of design.

For jaw crusher frames made in one piece and gyratory crushing housings, add 20 per cent to these prices.

Road and Mining Machinery Castings

$8.15 to $34.50 per 100 lb., depending on weight of castings required and intricacy of design.

Extras for Alloy Steel

Nickel Steel: When 2½ per cent to 3½ per cent nickel is specified, add 3.50c. per lb.

Vanadium Steel: When approximately 0.18 per cent vanadium is specified, add 2.50c. per lb.

Chrome Steel: When approximately 1 per cent chromium is specified, add 1.50c. per lb.

Chrome Nickel Steel: When approximately 1 per cent chromium and 2 per cent nickel is specified, add 4c. per lb.

Chrome Vanadium Steel: When approximately 1 per cent

(*Continued on page* 1564)

ESTABLISHED 1855

THE IRON AGE

EDITORS:

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Published Every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

Owned by the United Publishers Corporation, 243 West 39th Street, New York. H. M. Swetland, *Pres.* Chas. G. Phillips, *Vice-Pres.* W. H. Taylor, *Treas.* A. C. Pearson, *Secy.*

BRANCH OFFICES—Chicago: Otis Bldg. Pittsburgh: Park Bldg. Boston: Equitable Bldg. Philadelphia: Real Estate Trust Bldg. Cleveland: Guardian Bldg. Cincinnati: Mercantile Library Bldg. San Francisco: 320 Market Street.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

Car and Locomotive Building

A significant fact illustrating the unusual alignment of affairs in the iron and steel trade in 1917 is the very small volume of buying of rolling stock by the railroads in a year in which iron and steel was pushed to the limit. Domestic roads ordered only about 50,000 freight cars during the year, and nearly all of these were purchased in the first half. At the beginning of the year, however, there were orders for about 50,000 cars for domestic roads, so that if all orders had been completed within the year there would have been about 100,000 furnished. This was less than half the number furnished in the three best years of freight car building and represents less than normal replacement requirements, for there are about 2,500,000 freight cars in service, and they do not have an average life of anything like 25 years. The old wooden cars have been depreciating rapidly, while it has been developed in the past few years that the early dreams of great longevity for all-steel cars have not been borne out in actual experience, there being no hope that the average steel freight car will last a quarter century. The railroads accordingly have been losing in effective car equipment during the past year, although the traffic demands upon them have greatly increased.

While the car shops received orders for only about 50,000 freight cars from domestic roads this year, they received orders for a larger number from other sources. Excluding Russian orders tentatively placed in October, but since held in abeyance, the export orders of the year amounted to about 40,000 cars. In addition to this the United States Government ordered about 25,000 cars for its railroad operations in France, making a total of about 115,000 freight cars booked by shops in the United States during the year. Even this total was much below the average, counting the good years with the bad.

Locomotive orders placed during the year made a somewhat more substantial showing, as they totaled nearly 6000. The count, however, is more impressive than the tractive effort or weight involved, as about 1000 are narrow-gage gasoline engines for the Government's operations in France. Maximum locomotive output in recent years has been about 5000, but there is capacity for building a larger number, and with large orders for a single type, as in the case with the Government orders, the output could be swelled well above 6000. Locomotives ordered by domestic roads in 1917 totaled a trifle over 2000. Export orders, excluding Russian orders, now held up, made a total of 1700.

The American railroad in France is to be a double track road of about 400 miles, with numerous spurs, and, according to the orders thus far placed, this road will have in service nearly 25,000 freight cars, together with 980 standard locomotives, the remaining equipment being for use on narrow gage track behind the trenches.

The important fact at present with regard to locomotive building is that with standardized methods of construction, locomotives can be turned out more rapidly than ever before, and with the powers possessed by the Government a large number can be built for domestic roads in a very few months merely by arranging the necessary financing. With respect to freight cars, the situation is not so clear. It is not certain the railroads would need very many more cars if they were properly supplied with motive power. A canvass a few weeks ago indicated that there would be some steel plates available for car building after the full requirements of the shipbuilding program were taken care of. The suggested plan of building merchant ships by the conveyor system, such as is followed in the assembling of automobiles, might consume a larger tonnage of plates than was contemplated, but the plan was made public only this week.

Judge Prouty's Words of Caution

Charles A. Prouty, who for several years has been director of the Bureau of Valuation of the Interstate Commerce Commission, after having served a number of years as a member of that commission, did some very plain and sensible talking a few nights ago at a meeting of the Railway Men's Improvement Society in New York. Although a man of progressive ideas, Judge Prouty, who is an able lawyer, established a reputation for fairness during the long period of service as a member of the commission. He is a believer in reasonable regula-

tion of railroads. In the speech referred to, he attributed the present lamentably poor service of the railroads to a large extent to the indifference of railroad employees. The inefficiency which always prevails when there are more jobs than men, as has been noted in many industries to a very unusual extent during the past two years, has extended to transportation, and it is perfectly plain that if the railroads are to do their full part in winning the war the men must be impressed by the importance of their doing their utmost in their daily tasks. There is, as Judge Prouty said, too much of the spirit of every one "wanting to put on a uniform, get a gun and shoot some one." The fact is that there is just as strong a demand for ununiformed patriots as for those who are now or expect to be engaged in the more spectacular work of the war.

In analyzing the causes of the present railroad demoralization, Judge Prouty urged the importance of more co-ordination and described the conflicting efforts of the Food Administration, the Fuel Administration and the War Department, all insisting upon receiving the best service. He might have painted a picture of the ridiculous piling up of priority orders and preferential priority orders and other kinds of orders intended to help win the war, but in fact causing endless trouble. How all the difficulties are to be straightened out is, of course, the great problem. Judge Prouty expressed the opinion that it would be madness, if Government operation is decided upon, to attempt at this time any reorganization of the operating forces of the railroads, and he certainly is right on that point. It might, of course, be necessary to have a representative of the Government as the supreme authority in operating the railroads, but the masses of the railroad men should be merely transferred from the payroll of the carrier to that of the Government, if the Government assumes control. But Judge Prouty asserts—and in this opinion he will be generally supported — that the Government should not assume control unless it is absolutely necessary to do so. As to wages, he believes the question should be left for decision by the President. This has already been done by the railroad companies. The question is, will the employees be willing to leave their cause also with the President? Up to the present time they have not promised to do so.

At a time when radicals are urging extreme measures, it will be fortunate for the nation if men of the wisdom of Judge Prouty are listened to by those in high authority at Washington, especially by the President, who is expected to take some kind of definite action in regard to the railroads after the holidays.

Coal Famine May Be More Acute

In the effort to prevent a decrease in the production of coal, the Fuel Administration at Washington has induced the officials of the United Mine Workers of America to appeal to their members not to take more than two days off from work during the Christmas holidays. The custom heretofore has been to take eight days, including Christmas and New Year's day. Coal operators throughout the country have advised the Fuel Administrator that they will co-operate heartily in the effort to keep the mines running as steadily as possible. The appeal of the United Mine Workers' officials to the men, which has been telegraphed to the various locals throughout the mining districts, says in part:

The United States is in the grip of a coal famine. Recent snows and excessive cold weather have depleted the coal bins throughout the country. Never before has a coal shortage been so acute. Industries are being forced to close for the lack of fuel; street and electric signs are being turned out to save coal. Motive power of the railroads has practically broken down. Insufficient car supply makes it necessary that every empty car be loaded as quickly as possible. Therefore, out of consideration for the public need we are calling on the United Mine Workers of America to take only two holidays, Christmas and New Year's. Our patriotic duty demands that this be done. It will be a service the people of the Nation will appreciate. We earnestly urge local presidents, secretaries, and mine committees everywhere to see that this holiday request is fulfilled.

Washington dispatches of the past few days point to a more acute shortage of fuel in January and February unless there is a revision of the priority system, a curtailment of production of non-essentials to a degree that has not been entertained thus far and a better co-ordination of their transportations on the part of Government executives. It is argued that the railroads are now in large measure subject to Government orders and that the Government in assuming administration should be in position to remedy conditions of which the public is seriously complaining. The coal situation which the Government must meet is thus summarized in one Washington dispatch:

The transportation experts say that out of every hundred cars hauled by a railroad 35 should carry coal. Twelve of these must carry coal to be used by the railroads, the 23 remaining being needed for industries. If the 23 cars are not shipped the time is not far distant when many factories must close for want of coal, which would automatically cut shipments of raw material and finished products. It happens that the railroads following out the priorities order of the Government have been shipping at a rate very much below 35 coal cars to every hundred, but no matter how much coal was left on sidings the railroads have been forced to ship 12 cars of coal in every hundred for their own use. . . . To-day the railroads are being offered 50 per cent more freight than they can handle. In other words, the demand is 150 per cent of capacity. Of this 150 per cent almost 120 per cent is listed under Judge Lovett's priority order No. 5 as coming ahead of coal for factory or domestic consumption.

It is evident that consumption must be reduced in some directions if the country is to get through the winter without a serious handicap on industries whose production must be kept at high point. A factor which no amount of Government contriving can remedy is the poor quality of coal now being delivered for industrial uses, and this applies also to coke. More tons of such coal as is now being shipped are required to raise the same amount of steam and more tons than ever of coke must be charged into the blast furnace in order to get the same yield of pig iron. Probably the most difficult feature of the situation is the way in which priority orders negative the directions of the Fuel Adminis-

tration. No matter how many orders are given to the mines to send coal to certain sections, the coal will not go because the railroads cannot violate the priority orders of the Government. It would seem that further concentration of authority is an imperative step.

If the premises stated in the first article in this issue are correct, the rail mills of the country have three years' work ahead of them, even if no main lines or sidings be extended or new roads projected. The 10,000,000 tons put forward in the calculation as measuring the extent of lighter rail lines needing replacement is reckoned on the basis of 6 per cent of mileage being a fair if not low estimate of the average amount which needs to be renewed annually to maintain satisfactory condition of roadbed. The total apparent need of some 40,000,000 tons for this purpose over a period of 24 years and a supply against this of some 30,000,000 tons indicates that replacement has averaged only 4½ instead of 6 per cent. It is admitted that the additions from year to year of heavier rails meeting the more exacting specifications of the last decade tend to reduce the replacement factor; but when some of the Eastern roads find that renewals amount to 10 per cent, the analysis leaves it difficult to avoid the conclusion that railroad demand should be fully as great a factor as our contributor contends.

Shortage of Locomotives in Pacific Coast States

The demand for railroad equipment, especially for locomotives and parts, is becoming acute on the Pacific Coast. The San Francisco representative of a prominent locomotive builder states that locomotive deliveries to roads on the Pacific cannot be made under a year or eighteen months. The Southern Pacific Railway maintains works for building cars and locomotives in Sacramento and Los Angeles, but nearly all the castings must be brought from the East. This is because foundries on the coast do not possess the necessary facilities for making castings used in locomotive parts. These finished castings are as hard to obtain from eastern foundries as the finished locomotives are from the locomotive makers. Large orders have been placed, consequently, for rough castings of such parts, and they will be finished at local shops. Even on these rough castings deliveries are not guaranteed under four months.

It is stated that some of the eastern locomotive builders have locomotives partly built and cannot obtain the necessary steel to complete them except after long delays. The situation is explained by the statement that all the available locomotives have been shipped to Europe to help in the prosecution of the war. It is certain that many western locomotives have been withdrawn for use in the eastern part of the United States, and the railroads on the Pacific Coast are having a hard time to maintain their former service.

The manufacturers' conservation committee on power and fuel, representing the Chamber of Commerce and the Employers' Association of Pittsburgh, with A. L. Humphrey, chairman of the executive committee, has appointed a committee on surveys, comprising William G. Costin, H. C. Graham and S. S. Wales. This committee is already actively at work making a tour of the Pittsburgh district with a view of securing information as to the unused power facilities, the further development of those now in use, and what can be done to conserve the power developed.

New Scrap Prices Explained

A member of the American Iron and Steel Institute sub-committee on scrap makes the following explanation of the recommendations in regard to old material which have been adopted:

"No. 1 heavy melting steel may bring a price of $31 per gross ton at any consuming mill in the United States, but not over this price. There is a special dispensation given in case of specification steel scrap whereby $33.00 may be paid for material which must be prepared especially, and which must be selected—in other words, what is called special scrap, where, for instance, a charging box is particularly small, or where a mill does not want to use shoveling scrap, or where a mill uses shoveling scrap—the maximum price of $33.00 gross ton may be paid by a consuming mill delivered the mill.

"Regarding low phosphorus scrap, up to $40.00 gross ton may be paid, but not exceeding this price on material guaranteed not over 0.04 in phosphorus and sulphur. In case of springs, couplers and knuckles, and other scrap which is used by cast-steel manufacturers, or crucible manufacturers, where material is used for special purposes—on this particular high-grade material, and also including low-phosphorus scrap which is not guaranteed by the seller to be not under 0.04 in phosphorus and sulphur, the stipulated price is to be $35.00 gross ton maximum.

"The price on rerolling rails is $35.00 gross ton at any consuming mill in the United States, it being distinctly understood that only rerolling manufacturers may use these rails. The price of $47.50 gross ton delivered to any and all consuming mills may be paid for such material as locomotive tires, axles, arch bars, transoms, shafting and such rerolling mill material.

"On No. 1 railroad wrought the maximum price is $35.00 gross ton, and this shall not be exceeded by any consuming mill, delivered mill, on such commodities as short wrought scrap, track scrap, busheling, pipe and similar material. Cast-iron borings and wrought iron and soft steel machine-shop turnings, loaded separately, shall not exceed the price of $20.00 gross ton maximum delivered any consuming mill. Borings or turnings which are used by chemical works exclusively, and not by mills which would manufacture this commodity into any iron or steel product, may be allowed to pay an excess of $5.00 gross ton above the price of $20.00 gross ton fixed as a maximum for rerolling mill consumption.

"It is strictly understood and agreed that on each and every item where material prior to the state of war, and during normal conditions, has sold under the price of No. 1 heavy melting steel, or under low-phosphorus scrap, or rerolling rails, or wrought scrap, or whatever it may be, the maximum price as specified shall not be exceeded under any condition. In other words, this is making various groups. It is also agreed and understood that the commission of 3½ per cent may be paid at the mill of consumption to such scrap dealers, or brokers, who may be delegated by a particular mill to buy specific lots of scrap for it, but it is not an obligation, as it is the will of the consuming mill to pay this, if it desires to do so.

"Do not forget that the price of car wheels, the price of any kind of cast iron, and price of any kind of malleable scrap, may be up to the $30.00 gross ton, the maximum price of steel, but not over it."

The Brooks Works of the American Locomotive Co., Dunkirk, N. Y., have recently received an order for 250 locomotives and will commence construction work on the new engines early in January. The order is said to aggregate about $7,000,000. The local plant is now completing an order of 85 locomotives for Russian railways.

The Carpenter Steel Co., Reading, Pa., has arranged for the painting of a service flag on the side of one of its buildings, containing 165 stars, the number of employees of the company now in the Government service.

STEEL PRICES UNCHANGED

War Industries Board's Recommendation to the President

WASHINGTON, Dec. 24.—The War Industries Board, after a protracted conference with members of the Federal Trade Commission, has recommended to the President the indefinite extension after Jan. 1 of the schedule of controlled prices for iron and steel promulgated last September. The cost findings of the commission, covering the operations of the iron and steel industry up to Oct. 31, were transmitted to the board Dec. 21, and on the following day were explained in detail to the members of the board by Trade Commissioner Davies. The findings showed important advances in costs, which mounted steadily throughout the summer, but Commissioner Davies based no recommendation upon the cost exhibits, taking the position that the function of the trade commission is merely to ascertain facts and to leave it for the War Industries Board to adopt its own policies in its recommendations to the President.

In deciding to recommend the continuance of the September schedule and the prices in accord with it announced in later weeks, the War Industries Board was largely moved by suggestions made by the steel manufacturers at their conference with the board and with the trade commissioners held here a fortnight ago. At that time the steel men took the position that, irrespective of the desirability of making certain minor changes in the schedule of controlled prices, it was important in the interest of the entire industry to maintain the existing schedule, which has operated as a stabilizer in all manufacturing districts, and to give assurance to that effect as soon as possible. It is expected that the President will issue a proclamation in the course of a few days formally extending the operation of the September schedule. Whether the extension will be made indefinite is not known, but it is believed that within the next 90 days certain readjustments will be made.

W. L. C.

Government Takes Over Ship Plants

Following the merger of the Pennsylvania Shipbuilding Co. and the New Jersey Shipbuilding Co., both of Gloucester City, N. J., and the Pusey & Jones Shipbuilding Co., Wilmington, Del., the Government has assumed control of the Gloucester City works, effective Dec. 17. Employees have been given the opportunity of signing for a six months' period, with increase wage of 50 cents per day and draft exempt. The bonus system which has been operative will be abolished, and employees placed upon a similar basis as those employed at the Government navy yards. It is said that the Government has taken over the plants on the basis of time plus material plus 10 per cent profit. The plant of the New Jersey Shipbuilding Co., now in course of construction, will be rushed to completion. The Pennsylvania Shipbuilding Co. works have been giving employment to upward of 3000 hands, and it is expected that this number will be rapidly increased.

The Pattern Makers' Association of the Pittsburgh district has demanded, effective Jan. 1, 80 cents per hr. in manufacturing shops and 90 cents per hr. in jobbing shops. The executive committee of the Employers' Association of Pittsburgh has unanimously decided that these increases are unwarranted, and that the present rate of wage be maintained, and no answer be made to the demand. The jobbing shops in the Pittsburgh district have unanimously concurred in this action. The concerns named below have recently joined the Employers' Association of Pittsburgh as follows: Sigwart & Rolston Machinery Works, Chas. E. Dixon & Son, and Iron City Products Co., all of Pittsburgh.

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The Accident Hazards of Sheet Mills

In discussing a paper on "Safe Practices in Sheet Mills" presented at the recent congress of the National Safety Council, J. M. Woltz, safety director Youngstown Sheet & Tube Co., Youngstown, Ohio, stated that as a result of their experience fingers were the part of the body most likely to meet with an accident. These injuries were divided into cuts, bruises, burns and crushes and were followed by the forearm with cuts, burns and bruises. Cramps, he stated, although they could hardly be classed as accidents, were one of the most serious hazards of sheet mill operation. A solution of this last problem was educating the employee to see the need of right care of the body, the use of proper food and drink. In an accompanying table the number of accidents occurring from Jan. 1, 1915, to June 30, 1917, are tabulated, according to the parts of the body, together with the number of days lost. The marked reduction in the number of cramp cases in 1916 over 1915 was due in part to the reduced operating force, but was also brought about by the installation of a set of grates in the standing on the catcher side of each pair of rolls that permitted a stream of cool air under low pressure, to flow upward continuously. Medical examination before employment also was a contributing factor in the reduction, since it prevented the employment of men unable to stand the work. Other hazards that had to be corrected were piling sheet bars and finished sheets too high and accidents in the handling and transportation of sheets and sheet bars. These last have been solved by the introduction of improved cradles or hooks for crane operations and tractors for trucks.

	No. of Accidents			No. of Days Lost		
			6 M'ths of			6 M'ths of
Part	1915	1916	1917	1915	1916	1917
Eye	983	524	225	95	159	63
Fingers	577	429	220	301	529	350
Forearm	231	150	54	228	169	103
Hand	116	102	43	78	183	22
Thumb	115	95	32	114	82	0
Wrist	113	71	35	90	142	16
Foot	59	51	34	99	229	265
Toe	54	44	17	222	255	16
Cramps	305	89	24	65	166	22
Back	18	24	12	319	208	33
Thigh	22	32	25	165	124	35

Witnesses Agree on Important Points

Senate Committee Finds General Approval of Remodeling the Lee-Enfield Rifle—Rapid Progress Being Made at Various Plants—Causes for Delays Discussed

WASHINGTON, Dec. 24.—Highly interesting details of the great problem of the Ordnance Bureau, viewed from the manufacturing standpoint, have been developed in the course of the investigation by the Senate Military Committee which, so far as this branch of the War Department is concerned, was completed during the past week. The testimony of five high officials of the leading ordnance manufacturing concerns, each of them an expert, is unanimous upon the point that the Ordnance Bureau acted wisely in causing the Lee-Enfield rifle to be remodeled to fit the Springfield ammunition; that this ammunition is far superior to the British, having a velocity 50 per cent greater and a proportionately flatter trajectory; and that the Browning machine gun finally adopted as the leading type for the arming of the American forces is the best weapon of its kind ever invented. The Ordnance Bureau was sharply criticised by one of the manufacturers because, before it had an available appropriation, it gave no encouragement to his company to begin the manufacture of a machine gun since found undesirable for trench work, and a sixth witness repeated to the committee charges published sometime ago by a technical journal that, pending the standardization of the Enfield rifles ordered for the United States, certain employees of one of the plants were practically idle although still under pay. The witnesses examined included Henry S. Kimball, president of the Remington Metallic Arms Co.; Lewis Stoddard, vice-president of the Marlin-Rockwell Corporation; J. E. Otterson, vice-president and general manager of the Winchester Repeating Arms Co.; B. M. W. Hanson, vice-president of the Colt Arms Co., and Fred. H. Colvin, editor of the *American Machinist*.

The State of Preparedness

The net results of the inquiry into the operations of the Ordnance Bureau have shown a state of preparedness far greater than was believed at the outset as to heavy artillery, machine guns, rifles and ammunition and the salient fact has been fully developed that the producers of all this material are now building up to maximum capacity at a very rapid rate. The witnesses were substantially agreed that the manufacture of ordnance material of all kinds is a process slow in the inception and that to have provided adequate supplies for the arming of a large force during the first few months following the entrance of the United States into the war would have involved the placing of orders for the preliminary work, if not for actual production, long before Congress authorized the making of contracts. There was substantial agreement among the witnesses concerning the delays resulting from the re-chambering of the Enfield rifle to fit the United States ammunition and because of the decision of the Ordnance Bureau to secure a higher percentage of interchangeability in the parts of the rifle, but Mr. Otterson, who gave the committee the clearest statement of this transaction which it has yet been able to secure, frankly admitted that while, from a manufacturing standpoint, he did not consider the increased interchangeability secured worth the time lost, nevertheless, the decision of the matter "should rest on the judgment of a military man and not on the judgment of a manufacturer."

Remington Rifle Contract

President Kimball of the Remington Metallic Arms Co. told the committee about the contract for rifles which his company had entered into with the Ordnance Bureau. The number of rifles assigned to his company was stated by the witness, but at the direction of Chairman Chamberlain was stricken from the record as confidential military information. Before taking on the American contract the Remington company had made 400,000 rifles for the English Government and had a capacity of 3000 per day. Inasmuch, however, as the approved model of the Lee-Enfield rifle adopted by the Ordnance Bureau differed from the English rifle in caliber and in certain other respects it became necessary after completing the company's British contract to change its gages, dies and machinery in order to make the American rifle. It was also necessary, Mr. Kimball said, to modify the gages and certain other devices to standardize the output of the Remington company with that of the two other concerns also making Lee-Enfield rifles for the Ordnance Bureau.

The English contract for rifles was not completed until July 21 and although the Ordnance Department began negotiations for the modified Lee-Enfield rifle in April, soon after war was declared, it was not possible to begin the work of changing the equipment until July and deliveries could not be begun until October. The Remington company, Mr. Kimball said, hesitated to enter into a contract in advance of an appropriation by Congress which was not made until June 15, about two months after the Ordnance Bureau began negotiations.

"I do not wish," said Mr. Kimball, "to give the impression that there was delay in making the contracts themselves, as it was a very active operation from April up until July to determine the character of the rifle. It was due to necessary deliberation between the manufacturers themselves and the Ordnance Department that these matters of design were not settled earlier and I do not think they could have been settled much earlier than was actually done."

Replying to Senator Hitchcock Mr. Kimball said that if the Ordnance Bureau had decided to go on manufacturing the Lee-Enfield rifle for the United States on the same plans and specifications that had been used for the British Government deliveries naturally would have been begun earlier and would have been practically continuous from the time of the completion of the British contract. The results, however, would not have been as satisfactory for the reason that the British rifle uses an ammunition different from that of the American Lee-Enfield and the Springfield which has a much higher velocity and a lower trajectory.

At this juncture, Vice-President Tyler of the Remington company explained to the committee the difference between the English and American Enfield rifles.

Given Greater Range

Answering a question by Senator Hitchcock, Mr. Tyler said that the American ammunition gave the modified Lee-Enfield rifle a much greater range than the English rifle, the gain being from 500 to 800 yards. The increased velocity gave a lower trajectory and much greater shocking power.

"Is it conceded, then," asked Senator Wadsworth, "that the modified Enfield rifle that you are now making for the United States Government is a better rifle than you are making for the British Government?"

"I believe it is, without any question," replied Mr. Tyler.

"So that the only question left to be decided is whether the change was actually worth while in view of the emergency?"

"I think the change was decidedly advisable."

At this juncture, Senator Wadsworth submitted to Mr. Kimball a long carefully formulated question. He said:

"As preliminary to my question let me state, what I think must be conceded to be an axiom in the war,

namely, that the fewer complications with respect to interchangeability of supplies the better for the Army, and conceding that the French, British and American armies, so far as it is humanly possible, should be considered one army for the purpose of getting the maximum efficiency, and also conceding that, due to the fact that England and France had to go to war on a moment's notice with a good deal of their equipment already standardized and adopted, it was therefore impossible for them to make any essential changes in order to establish uniformity, would it have been possible for us, having in view this war for two and a half years with the handicaps of that very lack of uniformity well displayed and perfectly apparent—would it have been possible for us to have made plans and preparations reasonably in advance of the war, so that if we were called into it we would have gone into it with small arms using ammunition uniform either with the British or French and thus have avoided adding still further to the complications?"

"If your policy of preparedness had been started early enough it would have been possible," replied Mr. Kimball.

"Would it have been possible from Feb. 17, 1917?"

"No, sir."

"Would it have been possible from Aug. 29, 1916?"

"No, sir."

The committee took up the subject of machine guns.

Browning Gun Tests

"Are you familiar with the Browning gun as it behaved in tests?"

"We had our representative see that gun in tests," answered Mr. Kimball, "and he considered it the finest gun he had ever seen. He witnessed a complete test for accuracy and stability and functioning; also the sand test and all of the prescribed tests by the department. By the sand test I mean burying it in sand and then starting it into operation, making it free itself. It is a very severe test in the operation of a gun and we understand from our representative that the results were remarkable under those conditions.

"This is a brand new patent," suggested Senator McKellar, "and the gun has never been used in any warfare?"

"That is true," responded Mr. Kimball, "but Mr. Browning is probably the most remarkable gun-maker in the world. We are using his designs in sporting guns at this moment and we have never found Mr. Browning to fail in any gun he puts into our hands as a finished article."

"Is that the general opinion among all manufacturers?"

"I think that is the opinion of every gun manufacturer in the world."

The next witness heard by the committee was Lewis Stoddard, vice-president of the Marlin-Rockwell Corporation of New Haven, Conn. Mr. Stoddard said his company, in addition to its plant at New Haven, had recently acquired another plant known as the Hopkins & Allen plant at Norwich. At the present time the New Haven establishment had a contract for a large number of aircraft guns of a type designed in the plant but had previously delivered several thousand improved Colt machine guns of the lever type.

"During the first week in May, we presented for test two guns at Springfield and shortly after we received an order for 2500 guns. In the meantime we had been obliged to keep our factory going so we had simply taken a gamble on making the guns without any orders. We made 2650 guns for Russia which we had no order for and then when Russia looked like a pretty poor customer we started in making guns for the United States."

"What was the reason they were dissatisfied with your make?" asked Senator Hitchcock.

"I do not know; they bought 2500, but that was all they wanted. We ran over 400 guns that are left in the factory now. They do not want them. They are using our guns around the training camps."

Marlin Aircraft Gun

"Your testimony to-day is the first intimation," said Senator Wadsworth, "that the committee has received that another type of gun than the Vickers and Browning and Lewis has been ordered by the War Department in large quantities. I refer to the Marlin aircraft gun."

"Yes, we have a contract for a large number from the Army and a smaller number from the Navy. The Aircraft Board wanted to make the contract with us and I understood that all our negotiations were to be carried on with that board, but suddenly it was switched over to the Ordnance Department."

J. E. Otterson, vice-president and general manager of the Winchester Repeating Arms Co., told the committee about the contract which his company had received for 225,000 Lee-Enfield rifles rechambered to shoot Springfield ammunition. Since this contract was let, the company has received an order for an additional 100,000 and is also manufacturing light Browning machine guns and ammunition for both rifles and Colt automatic pistols.

Winchester's Work on Rifles

"On April 23 I issued orders to the shops of the Winchester company to proceed with the manufacture of 10,000 rifles," said Mr. Otterson, "but this was done on our own responsibility and without any contract or order or any statement that we would get an order. On May 9 the sample rifles of the respective manufacturers were submitted to the commanding officer of the Springfield arsenal for test and they functioned properly and were held to be satisfactory with one or two minor criticisms applying to each rifle. On May 11 the contract form and specification had been agreed to as between the parties concerned and the contracts were ready for execution. On May 16 on the basis of the existing understanding we issued instructions to the shops of the Winchester company to proceed to manufacture these rifles and to build up to maximum capacity as rapidly as possible. On May 24, we received written instructions from Gen. Crozier to the effect that the War Department intended placing an order with us for 225,000 rifles."

An Editor's Criticism

Fred H. Colvin, editor of the *American Machinist*, repeated to the committee the criticisms heretofore made in that publication directed against the officers of the Ordnance Bureau for imposing what he declared were too rigid rifle specifications, especially in the matter of interchangeability. The requirements for interchangeability of parts, he said, delayed production three months during the past summer and while this matter was under consideration one private factory retained on its payroll a considerable number of men employed on a cost-plus-profit contract who played checkers while waiting for work held up. Mr. Colvin also made a general criticism of Government arsenal methods, declaring that the Springfield arsenal has some machinery that is 50 years old.

Vice-president B. M. W. Hanson, of the Colt Arms Co., Hartford, Conn., said the United States arsenals compare very favorably with foreign government establishments and American private factories. The chief difficulty experienced by the executives of the United States arsenals was the big labor turnover. Skilled workmen were constantly leaving the arsenals, thereby reducing their efficiency.

Mr. Hanson expressed the opinion that the production of rifles for the American army had been greatly increased by the adoption of the modified Enfield, which is now much superior to the rifles of the Allies and at least equal to those of Germany. American ammunition, also he said, was superior to that of the Allies.

Taking up the subject of the manufacture of machine guns, Mr. Hanson said the American producers had had practically no encouragement from the United States Government, most of their orders coming from abroad. Answering questions by Senator Wadsworth, he said that if machine guns had been promptly ordered when the Government went into the war, General Pershing's machine gun units would not be required to use French arms and ammunition. W. L. C.

Iron and Steel Markets

STEEL PRICES UNCHANGED

War Industries Board So Recommends to the President

More New Prices from the Producers' Committee —Further Scramble for Pig Iron

In the closing days of 1917 the steel trade has the satisfaction of knowing that it will enter the new year free from the fear that present price schedules may be overturned. The War Industries Board, after a conference on Saturday with the Federal Trade Commission, has recommended to the President the indefinite extension after Jan. 1 of the prices promulgated late in September and those built upon them in the past three months.

It is expected that the President will issue a proclamation shortly, extending the operation of the present schedule. Whether a definite period will be named remains to be seen, but it is believed that some readjustments will come within the next ninety days.

Recent rumors of a sentiment in a part of the Federal Trade Commission in favor of some reduction in pig iron led to a meeting of merchant producers in New York Dec. 20, at which a committee was appointed to present the case of the smaller furnaces. It was urged that a reduction in price would cause some of them to close down and only aggravate the existing famine in pig iron.

The manufacturers' committee on steel and steel products made an important announcement of additional prices this week, putting forging ingots at $73 per ton, splice bars and tie plates at 3.25c. per pound, rail steel bars at 3c., steel spikes at 3.90c., iron spikes at 4.50c., track bolts at 4.90c. and cut nails at $4 per keg, and fixing schedules on steel castings and cast-iron pipe. Some of the above products had been gradually adjusting themselves to the new market basis, so that the formal announcement meant no abrupt change. On cast-iron pipe the official $49, Birmingham, and $55.35, New York, for 6-in. pipe are but fractionally below the recent market.

The committee's action on old material is an attempt to cope with one of the most difficult problems in the trade. In view of the development that with a fixed price railroads and other sellers would deal with consumers direct in order to get the maximum, the committee recommends a commission of not to exceed 3½ per cent to recognized scrap dealers or brokers. Various forms of scrap not regulated heretofore are added to the official list.

The precedent of a quiet holiday week in pig iron is broken, as the real effect of the fuel shortage is brought home to consumers. Steel production has been kept up this year by drawing on pig-iron stocks. Now that these are gone there is a scramble for iron that would by this time have sent prices skyward but for Government regulation. It is estimated that Central Western steel companies would now be buying fully 250,000 tons of basic iron to make up their shortages if it could be had.

In Chicago and the Middle West there is active inquiry for basic, foundry and malleable irons. Steel companies are seeking merchant iron as their own furnace outputs are cut down, and some foundry firms having Government contracts are facing the necessity of calling on the Government to provide them with pig iron. This would mean that iron already sold would be requisitioned, and that some foundries turning out less essential products would go without. The fuel shortage has already gone to the point of curtailing the output of a number of foundries. The situation simply represents the gradual tightening of the lines in the absorption of iron and steel for war needs.

In the past week the steel plants of the Steel Corporation at Pittsburgh and in the two Valleys made about an 85 per cent output. Independent companies ran at from 50 to 75 per cent of capacity. As an offset to the coke and coal shortage, some plants at Pittsburgh and Youngstown will be idle all of this week for repairs and stock taking. Chicago reports the fuel situation unrelieved and causing much anxiety.

Pittsburgh

PITTSBURGH, Dec. 24.

The mild weather of the past week or more has helped to relieve the railroad congestion to some extent, but the situation is still very far from being satisfactory. The coal supply is also slightly better, due to efforts of the committee on fuel and the operating committee of the eastern railroads to move coal more promptly, and some plants that were very short of coal in the first part of last week were able to run nearly full in the latter part of the week. One thing that is going to help the railroads and the coal situation is the fact that some steel plants in the Youngstown and Pittsburgh districts will probably be idle all this week for absolutely necessary repairs and for stock taking. A shut down of a considerable number of plants for a week would certainly do much to help the situation in cars and coal supply, as it would give the railroads a chance to move the thousands of loaded cars now lying in the different railroad yards. It is said that last week the steel plants of the Steel Corporation made about an 85 per cent output of steel ingots, but some of the independent plants, notably in the Youngstown district, were not able to operate to more than 50 to 75 per cent of capacity. There are still a considerable number of blast furnaces banked in the Pittsburgh and Youngstown districts for lack of coke, and the great scarcity in supply of open-hearth scrap is also commencing to affect operations of open-hearth steel plants, as some concerns are running short of scrap and find it impossible to get shipments in fast enough to meet their needs. The chances now are that the output of steel until after the first of the year will be very much under normal capacity. With the contemplated shut down, shortage in cars and coal, and also in pig iron, the output of the steel mills is certain to be restricted over the next ten days fully 25 per cent, and it may run 50 per cent. In the meantime, the amount

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Dec. 24, 1917.	Dec. 19, 1917.	Nov. 21, 1917.	Dec. 27, 1916.
No. 2 X, Philadelphia...	$34.25	$34.25	$34.25	$29.50
No. 2, Valley furnace...	33.00	33.00	33.00	31.00
No. 2 Southern, Cin'ti...	35.90	35.90	35.90	25.90
No. 2, Birmingham, Ala.	33.00	33.00	33.00	23.00
No. 2, furnace, Chicago*.	33.00	33.00	33.00	30.00
Basic, del'd, eastern Pa..	33.75	33.75	33.75	30.00
Basic, Valley furnace....	33.00	33.00	33.00	30.00
Bessemer, Pittsburgh....	37.25	37.25	37.25	35.95
Malleable Bess., Ch'go*..	35.50	33.50	33.50	30.00
Gray forge, Pittsburgh..	32.75	32.75	32.75	29.95
L. S. charcoal, Chicago..	37.50	37.50	37.50	31.75
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	....	....	....	$38.00
O.-h. rails, heavy, at mill	....	....	....	40.00
Bess. billets, Pittsburgh.	$47.50	$47.50	$47.50	60.00
O.-h. billets, Pittsburgh.	47.50	47.50	47.50	60.00
O.-h. sheet bars, P'gh....	51.00	51.00	51.00	60.00
Forging billets, base, P'gh	60.00	60.00	60.00	80.00
O.-h. billets, Phila.....	47.50	47.50	....	60.00
Wire rods, Pittsburgh....	57.00	57.00	57.00	70.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	3.685	3.685	3.685	3.159
Iron bars, Pittsburgh....	3.50	3.50	3.50	3.25
Iron bars, Chicago.....	3.50	3.50	3.50	3.00
Steel bars, Pittsburgh...	2.90	2.90	2.90	3.00
Steel bars, New York....	3.095	3.095	3.095	3.169
Tank plates, Pittsburgh..	3.25	3.25	3.25	4.25
Tank plates, New York..	3.445	3.445	...	4.419
Beams, etc., Pittsburgh..	3.00	3.00	3.00	3.25
Beams, etc., New York..	3.195	3.195	3.195	3.419
Skelp, grooved steel, P'gh	2.90	2.90	2.90	2.85
Skelp, sheared steel, P'gh	3.25	3.25	3.25	3.00
Steel hoops, Pittsburgh..	3.50	3.50	3.50	3.25

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Dec. 24, 1917. Cents.	Dec. 19, 1917. Cents.	Nov. 21, 1917. Cents.	Dec. 27, 1916. Cents.
Sheets, black, No. 28, P'gh	5.00	5.00	5.00	4.50
Sheets, galv., No. 28, P'gh	6.25	6.25	6.25	6.25
Wire nails, Pittsburgh...	3.50	3.50	3.50	3.00
Cut nails, Pittsburgh....	*4.00*	4.50	...	2.95
Fence wire, base, P'gh..	3.25	3.25	3.25	2.95
Barb wire, galv., P'gh...	4.35	4.35	4.35	3.85
Old Material, Per Gross Ton:				
Iron rails, Chicago.....	$37.00	$37.00	$35.00	$27.00
Iron rails, Philadelphia..	38.00	38.00	38.00	28.00
Carwheels, Chicago	**33.00**	31.50	30.00	20.00
Carwheels, Philadelphia..	*30.00*	34.00	33.00	22.00
Heavy steel scrap, P'gh..	30.00	30.00	29.00	24.00
Heavy steel scrap, Phila.	**29.00**	28.00	26.00	23.00
Heavy steel scrap, Ch'go	28.50	28.50	28.00	21.50
No. 1 cast, Pittsburgh...	30.00	30.00	26.00	21.00
No. 1 cast, Philadelphia..	*30.00*	31.00	31.00	21.00
No. 1 cast, Ch'go net ton)	**25.50**	24.50	23.00	15.50
No. 1 RR. wrot, Phila....	35.00	35.00	35.00	27.00
No. 1 RR. wrot, Ch'go (net)	31.25	31.25	31.00	23.50
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	$6.00	$6.00	$6.00	$9.50
Furnace coke, future....	6.00	6.00	6.00	4.50
Foundry coke, prompt...	7.00	7.00	7.00	10.00
Foundry coke, future....	7.00	7.00	7.00	6.00
Metals,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York..	23.50	23.50	23.50	31.00
Electrolytic copper, N. Y.	23.50	23.50	23.50	31.00
Spelter, St. Louis.....	**7.75**	7.50	7.75	9.50
Spelter, New York.....	**8.00**	7.75	8.00	9.75
Lead, St. Louis.....	**6.35**	6.25	6.37½	7.30
Lead, New York.....	**6.50**	6.40	6.50	7.50
Tin, New York.....	85.50	85.50	77.00	40 87½
Antimony (Asiatic), N. Y.	15.00	15.00	13.75	14.00
Tin plate, 100-lb.-box, P'gh.	$7.75	$7.75	$7.75	$7.00

of new business being placed in iron and steel products is very light. Consumers will put off as much as possible the making of new purchases until after the first of the year, and in addition to this it is very hard to find material of any kind that consumers can get for prompt delivery. It is practically impossible to buy pig iron or semi-finished steel, and it is also very hard to get coke. The shortage in supply of pig iron is seriously restricting output at all the plants of the Steel Corporation, and at many independent steel plants as well. The different sub-committees on steel products of the American Iron and Steel Institute have recently named prices on some additional finished steel articles, and have also made rulings on other commodities, all of which are given elsewhere in this issue. The whole situation in the steel trade is likely to continue quiet until after the first of the year. The belief is strong here that no important changes in prices on pig iron, semi-finished steel and finished steel products will be made on Jan. 1, by the War Industries Board. Any revision in steel prices to a lower basis, would work great injury to the trade at this time, and this is probably recognized by those having to do with these matters.

Pig Iron.—The famine in pig iron that has existed in this district for several months shows no signs of abating. The new inquiry is not so active, but this no doubt comes from the fact that consumers found it impossible to pick up any iron and have simply retired from the market. The purchasing agent of one local steel company said recently that he was quite sure prices on Bessemer and basic iron would be close to $100 per ton now were it not for the Government control of the market. The idea has been advanced that the recent fixing of the price of $33 for pig iron brought about a large expansion in consumption, and that this is partly responsible for the present famine in the supply. Some fair-sized lots of No. 2 foundry and forge iron have recently been shipped into this market from the South. The Sharon Steel Hoop Co. has been in the market recently for basic iron for its open-hearth steel plant at Lowellville, Ohio, and in fact all of the steel companies here would buy any quantities of Bessemer and basic iron that could be had. We note sales of about 27,000 tons of Bessemer iron for delivery over the first half of next year at $36.30, Valley furnace, and 5000 tons of basic iron for the same delivery at $33, Valley furnace. We note sales of 9000 tons of broken ingot molds for delivery over first half of next year at $30 to $36 delivered to consumers in the Pittsburgh district. There are still 18 to 20 blast furnaces in the Pittsburgh, Youngstown and New Castle districts banked for lack of coke, and most of these will likely stay out until after the first of the year. Several consumers of foundry iron have been able recently to place contracts for their needs for first half of 1918 at the regular price of $34, Valley furnace.

We quote as follows: Basic pig iron, $33; Bessemer, $36.30; gray forge, $32; No. 2 foundry, $33; No. 3 foundry, $32.50, and malleable Bessemer, $33.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being 95c. per ton.

Billets and Sheet Bars.—There is nothing new to report in the local situation in semi-finished steel. A price of $73 per ton on forging ingots, Pittsburgh has been fixed by the Committee on Iron and Steel Products and approved by the War Industries Board. The Government demand for shell steel is steadily getting heavier and is taking very close to 90 per cent of the output of some of the larger open-hearth steel mills. Recently the Army Ordnance Department distributed additional orders for 400,000 tons of shell steel. None of the steel mills has any steel to sell in the shape of billets or sheet bars, but on the contrary all are running short of steel on account of the scarcity of pig iron and heavy melting scrap. As noted before, soft Bessemer steel is being used whenever possible in place of basic open-hearth.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $47.50, sheet bars $51, forging ingots $73, and forging billets $60 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Ferroalloys.—The new inquiry for alloys is very quiet, consumers evidently being covered over the next several months. We note a sale of 150 tons of 50 per cent ferrosilicon, equal deliveries in first half of next year,

at $170 per ton f.o.b. Pittsburgh. We quote 80 per cent domestic ferromanganese at $250, but on a firm offer this price might be shaded $5 to $10 per ton. We quote 18 to 22 per cent spiegeleisen at $65 to $70 delivered and 50 Bessemer ferrosilicon at $165 to $170 delivered.

We now quote 9 per cent Bessemer ferrosilicon at $54, 10 per cent $55, 11 per cent $58.30, 12 per cent $61.60. We quote 6 per cent silvery iron $40, 7 per cent $42, 8 per cent $44.50, 9 per cent $47, 10 per cent $50. Three dollars per gross ton advance for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, these furnaces having a uniform freight rate of $2 per gross ton, for delivery in the Pittsburgh district.

Structural Material.—It is said that within the past week the Government has placed 8000 to 10,000 tons of structural steel work, but details of these contracts are not given out. The Morgan Engineering Co., the Alliance, Ohio, company which recently placed 4000 tons of shapes with the Bethlehem Steel Co., will need about 3000 tons more for four or five new shops it intends to build. The McClintic-Marshall Co. has taken 950 tons for a crane runway at the Washington Navy Yard and the American Bridge Co. has taken 300 tons of bridge work for the Pennsylvania Railroad. Inquiries in the market include 1900 tons for a new steel bridge contemplated by the Brier Hill Steel Co. at Youngstown, Ohio; 1500 tons for a highway bridge for the City of Columbus, Ohio, and 900 tons for a municipal light plant at Cleveland. Local fabricators say that new inquiry aside from Government work is very quiet. We quote beams and channels up to 15 in. at 3c. at mill, the regular Government price. Local structural steel mills are filled up for some months.

Steel Rails.—Very little is being done in new light rails, but there is a fair inquiry for re-rolled rails. The Carnegie Steel Co. and the Cambria Steel Co. are reported to be filled up on standard sections and light rails for a year or more.

We quote cold-rolled strip steel at $6.50 per 100 lb., f.o.b. Pittsburgh, terms 30 days, less 2 per cent off for cash in 10 days, when sold in quantities of 300 lb. or more.

Plates.—The Emergency Fleet Corporation recently placed about 6000 tons of plates with a Youngstown, Ohio, mill to be shipped to the American Shipbuilding Co. Plate mills in the Youngstown district are furnishing large quantities of material to the Government and work is being rushed as fast as possible on the new plate mills being built by the Brier Hill Steel Co., and the Youngstown Sheet & Tube Co. These new plate mills will be large factors in the plate market in the early summer next year. The supply of plates for prompt shipment seems to be getting less, on account of the heavy increase in the demand for the plates from the Government. Steel car companies that are building cars on Government orders say they are not getting more than 40 to 50 per cent of the quantity of plates they should be receiving. We quote ¼-in. and heavier sheared plates at 3.25c. f.o.b. Pittsburgh, but local mills say they have practically none to sell for prompt delivery.

Sheets.—A good part of the output of the sheet mills on blue annealed and Bessemer black sheets is under contract for first half of next year, and on galvanized for first quarter. The Government demand for sheets is getting steadily heavier, and it is stated that this month the sub-committee on sheet steel has distributed among the mills orders for close to 50,000 tons of sheets of various grades for Government work. A very large part of this quantity of sheets is for shipment to France, for Government work that is going on in that country. It is expected that at any time the Government will issue an order stopping shipments of sheets to consumers that are not making products essential to carrying on the war. Prices on sheets are given in detail on page 1561.

Tin Plate.—There is nothing of interest to report in the tin plate trade. Most mills have practically their entire output sold for first half of 1918, while some mills have a good part of their output for second half of next year under contract. The Government is still buying fair-sized quantities of tin plate, its orders being distributed among the mills by the sub-committee on tin plate, and are rolled and shipped as promptly as possible. Some export shipments of tin plate are being made, but these are mostly on old contracts placed a year ago or more. There is a fairly good demand for stock items and several makers of tin plate say their stocks are lighter now than at any time for several years.

Iron and Steel Bars.—Recently heavy contracts for steel bars for delivery over first half of 1918 and some for delivery over all of next year have been placed by the implement makers, at the regular Government price of 2.90c. at mill, Pittsburgh. It is said, however, that these contracts contain a clause to the effect that at no time will the price of steel bars on these contracts be higher than the regular Government price. Specifications against contracts are reported to be coming in freely and it is said several of the smaller steel bar mills are in position to take orders for fairly prompt delivery. The Government has fixed a price on rail steel bars, rolled from old steel rails, of $3 per 100 lb. We quote steel bars rolled from billets at $2.90 and refined iron bars at $3.50 in carloads, f.o.b., Pittsburgh.

Wire Rods.—Makers continue to report quite an active demand for soft rods, and also for high-carbon rods. The export demand is also heavy, and several local makers are sending fairly heavy shipments of wire rods to Canada and also to France and Italy and the Orient. There have been several fair-sized sales lately of high-carbon rods at $75 to $85 per ton, at maker's mill, prices depending largely on the carbons. Local mills have about all the obligations on soft rods they can take care of in the next two or three months, and one mill is not seeking new orders. Prices on rods are very firm, and are given in detail on page 1561.

Wire Products.—The domestic demand for wire and wire nails is fairly heavy, while the Government demand is very active, and mills have their output well sold up over first quarter of next year. The demand for basic open-hearth steel is still abnormally heavy, and some wire mills that have both Bessemer and open-hearth steel plants are now using Bessemer steel to a large extent in their wire mills, desiring to conserve as much of their output of basic steel as they can to apply on Government orders. The export demand is active, and once in a while a Government permit is issued for foreign shipments of wire and wire nails to neutral countries. The demand from China and Japan, and also from India, for wire and wire nails has been good for some time. While some makers feel that the prices of $3.50 on wire nails, and $3.35 on basic wire are low, it is not believed there will be any change made in prices on wire products by the War Industries Board in the near future. Some mills are not pushing actively the manufacture of wire products, but are diverting as much of their steel as they can to the manufacture of other finished products on which profits are larger. Prices on wire and wire nails are very firm, and are given in detail on page 1561.

Nuts and Bolts.—Government buying is dominatng the entire situation in nuts and bolts, there being practically no new demand from the domestic trade. Every few days the Government puts out inquiries for very large quantities of bolts, which are wanted for as quick delivery as it is possible to get. A recent inquiry comes from the Jeffersonville Arsenal at Jeffersonville, Ind., and is for 40,000,000 bolts. It is not expected this large order will be placed for a week or two, and it is probable it will be divided among four or five makers. All the concerns making nuts and bolts report they are filled up on orders over the next two or three months, and that nearly 100 per cent of the new business being put on their books is for the Government, either on direct or indirect orders. The railroad congestion is holding up shipments to some extent, but delivery of steel by the mills is reported to be fairly good. No lower prices are being made on nuts and bolts than the Government discounts, which are given on page 1561.

Rivets.—A few days ago the International Shipbuilding Co. placed among three or four makers contracts for 4000 tons of rivets, and practically all of the new business being placed is coming from the Government on direct or indirect orders, the demand from domestic

consumers being light. There is some export demand, but makers are not figuring much on this, as they are filled up with Government business for several months. Prices are firm, and we quote structural rivets at $4.65, and cone-head boiler rivets at $4.75 per 100 lb., in carloads, f.o.b. Pittsburgh.

Hoops and Bands.—The new demand is only fair, as consumers are covered for some time ahead. The Government is a fairly heavy buyer of hoops and bands, and for prompt delivery. None of the mills in this district is in position to offer hoops and bands for early delivery, being filled up for some months. The Government prices on steel bands are 2.90c., extras as per the steel-bar card, and 3.50c. on steel hoops, f.o.b. Pittsburgh.

Shafting.—There is very little new buying by the general trade, 80 to 90 per cent of the new business being taken by the shafting makers, coming from the Government on direct or indirect orders. The demand for shafting from the automobile trade has been very dull for some time, but lately has shown a slight increase. Specifications against contracts are only fairly active. We quote cold-rolled shafting, in large and small lots, at 17 per cent off list, f.o.b. Pittsburgh.

Cold-Rolled Strip Steel.—Makers report the new demand from the domestic trade as being very quiet, but the Government is placing fairly heavy orders for cold-rolled strip steel, and there is also a good deal of export inquiry. The demand from the automobile trade is dull. Consumers are not showing much desire to contract ahead, as there is no incentive to do so, nor are the makers anxious to sell for delivery ahead, owing to the uncertainty as to what may be done with prices by the War Industries Board. It is not generally expected that prices on cold-rolled strip steel will be lowered, as the present price of 6.50c. per lb. is regarded as fair by both makers and consumers.

We quote cold-rolled strip steel at $6.50 per 100 lb., f.o.b. Pittsburgh, terms 30 days, less 2 per cent for cash in 10 days, when sold in quantities of 300 lb. or more.

Hot-Rolled Strip Steel.—Makers report the new demand quite active, and that the Government price is being firmly held. We quote hot-rolled strip steel at $4.50 per 100 lb., f.o.b. Pittsburgh.

Railroad Spikes.—The new demand for spikes from the railroads has been very dull for some time, but from jobbers is fairly active. Specifications against contracts placed some time ago by the railroads are coming in only at a fair rate. Standard railroad track bolts are quoted $4.90 per 100 lb.

Wrought Pipe.—It is expected that this week the Philadelphia Co. will distribute among four or five mills its order for about 20,000 tons of iron and steel tubular goods. The company will likely buy more largely this year of steel pipe than for some time owing to the great difficulty in getting iron pipe. The new demand for merchant iron and steel pipe is quiet, and this is also true of butt pipe, especially sizes used for building purposes. The Government is buying fairly large quantities of steel pipe right along, which the mills turn out and ship promptly. Local mills report they are well sold up over the next six months, and one leading mill is filled up over the entire year of 1918. Discounts on iron and steel pipe are given on page 1561.

Boiler Tubes.—Mills making iron and steel tubes, and also seamless-steel tubing, report they are filled up over the next six months or longer, and one leading maker is said to be filled up on steel tubes and also on seamless-steel tubing for about 18 months. Consumers desiring prompt delivery on either iron or steel tubes find it almost impossible to get the material. Some jobbers who have had in stock small quantities of iron and steel tubes have been able to get very high prices for them. Scrap dealers also once in a while pick up small lots of tubes on which they are able to make a nice turn. Discounts on iron and steel tubes are given on page 1561.

Coke.—Owing to the mild weather this week, the supply and also the movement of cars was some better, but is still very far short of being satisfactory, either to coke producers or blast furnaces. On several days the supply of cars was 60 to 70 per cent, but on two other days dropped below 50 per cent. None of the coke operators in any of the regions is able to make a full output of coke, due to scarcity of labor and cars for shipment. When a certain amount of coke piles up in the yard the only thing to do is to close down ovens until cars are secured to move it. The opinion is given here that before long the Federal Trade Commission will allow dealers in coke a commission of at least 25c. per ton for handling it. Very little coke is being sold for prompt shipment, as it is impossible to get it, and it is just as hard to get cars. A good many blast furnaces in the Pittsburgh and Youngstown districts are still banked owing to lack of coke. The Republic Iron & Steel Co. banked its Hannah furnace at Youngstown, Ohio, last week. We quote furnace coke at $6, foundry $7, and crushed coke from 1-in. size $7.30, all per net ton at oven. The *Connellsville Courier* gives the output of coke in the Upper and Lower Connellsville regions for the week ending Dec. 15 as 298,000 tons, a decrease from the previous week of over 9000 tons.

Old Material.—There is no improvement in the local scrap situation, either as regards supply of cars or ability of the dealers to get scrap. Local dealers say they could readily sell very large quantities of scrap at full Government prices if they were able to get it, and also to get cars in which to ship it. There has just come from the subcommittee on scrap iron of the American Iron and Steel Institute some important announcements in regard to prices and rulings on scrap, given elsewhere in this issue. Dealers quote for delivery in Pittsburgh, and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$30.00
No. 1 foundry cast	30.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa., and Pittsburgh	38.00 to 39.00
Hydraulic compressed sheet scrap	26.00 to 27.00
Bundled sheet scrap, sides and ends, f.o.b. consumer's mill, Pittsburgh district	24.00 to 25.00
Bundled sheet stamping scrap	21.00 to 22.00
No. 1 railroad malleable stock	37.00 to 38.00
Railroad grate bars	19.00 to 20.00
Low phosphorus melting stock	38.00 to 40.00
Iron car axles	42.00 to 43.00
Steel car axles	43.00 to 44.00
Locomotive axles, steel	51.00 to 52.00
No. 1 busheling scrap	19.00 to 20.00
Machine shop turnings	20.00
Cast-iron wheels	30.00
Rolled steel wheels	36.00 to 37.00
*Sheet bar crop ends	37.00 to 38.00
Cast-iron borings	20.00
No. 1 railroad wrought scrap	35.00
Heavy steel axle turnings	25.00 to 26.00
Heavy breakable cast scrap	26.00 to 27.00

*Shipping point.

Philadelphia

PHILADELPHIA, Dec. 24.

Operating conditions among the eastern Pennsylvania steel mills and blast furnaces are the worst yet experienced. The plants of the Bethlehem Steel Co. and the Midvale Steel & Ordnance Co., which heretofore have been fairly free from serious difficulties, are now troubled by shortage of coal and coke, with production considerably reduced. Among the smaller mills, the situation is still more serious. The Lukens Steel Co. on Saturday had all of its open-hearth furnaces out, with no permanent relief in sight. Executives of the Alan Wood Iron & Steel Co. held a conference on Saturday with officials of the Fuel Administration and the serious conditions prevailing at that plant were pointed out. On Saturday, this company had one blast furnace banked and another about ready to go out and a three days' supply of coal was all that prevented a complete shut-down of all of the steel mills. The Eastern Steel Co.'s open-hearth furnaces are operating with reduced output due to shortage of gas coal. Several merchant blast furnaces are still banked. One of the Warwick furnaces has been banked for the third time in two months. Present troubles could be borne with fortitude by the iron and steel makers if there were any permanent form of relief in sight, but the Fuel Administration and the railroads seem to have broken down completely in their efforts to obtain sufficient coal and coke

supplies. Producers are inclined to trace the difficulty directly to railroad congestion, due to lack of motive power. Instances have been cited of cars of coal lying on sidetracks because of lack of locomotives with which to move them. A steel company, which has its own coal mines and own coke plants, has been unable to get enough cars to move the supplies so urgently needed. Unless the situation is soon greatly improved, the effectiveness of the war program will be seriously impaired by the great falling off in iron and steel production which is now becoming apparent. Some mills estimate that December production will be not much more than 50 to 75 per cent of capacity.

Pig Iron.—Sales of pig iron have come almost to a standstill, not because of any lack of buyers, but because furnace representatives have no more iron to sell for the periods in which it is most urgently needed—immediately and first quarter of 1918. There is an insistent call for prompt delivery, which cannot be met at all, with the exception of an occasional carload or 100-ton lot. With furnace output reduced, producers are not able to keep up with contracts and consequently are obliged to turn down nearly all of the inquiries for prompt iron. At the present rate of production, December deliveries will run in to January, so no encouragement has been given to consumers who want their first quarter deliveries anticipated. Many foundry consumers have come into the market so late that they could not obtain a supply for first quarter and have contracted for second quarter. How their first quarter requirements are to be met is a problem that is not yet solved and possibly for many will not be. With nearly all furnaces sold up for the first half, more interest is now being taken in second half buying and several contracts were placed last week for third quarter delivery. Steel makers are actually begging for iron, particularly basic. Priority orders from Washington are getting more frequent, but the Government authorities are not acting hastily in such matters, as steel makers, almost without exception, are on war work and consequently a priority order simply means taking iron away from one war contractor to give it to another. The shortage of iron is getting more acute. Nearly all furnaces have sold almost up to capacity production for the last quarter of this year and with production so seriously reduced, deliveries have gotten far behind. In selling for first quarter of next year, the furnace representatives have been more conservative. For example, an iron company whose capacity is 22,000 tons per month has sold not more than 18,000 tons per month for first quarter, but unless there is an improvement in the rate of production it will have difficulty in meeting its commitments even on that basis. A New Jersey manufacturer of plumbing supplies is in the market for 1000 tons of No. 2 X foundry and 1000 tons of No. 2 plain for delivery in the second half of 1918. We quote standard grades of iron at furnace, with the exception of Virginia iron, for which the delivered price is quoted:

Eastern Pennsylvania No. 1X	$34.50
Eastern Pennsylvania No. 2X	33.50
Eastern Pennsylvania No. 2 foundry	33.00
Virginia No. 2 X (including freight)	36.77
Virginia No. 2 foundry (including freight)	36.27
Basic	33.00
Gray forge	32.00
Bessemer	36.30
Standard low phosphorus	55.00
Low phosphorus (copper bearing)	50.00

Coke.—Two of the largest sellers of coke in this district are almost entirely sold up for 1918. It now develops that some very large consumers have not covered for their requirements. In most instances, such consumers have war contracts and have relied upon the Government to obtain coke for them when it was needed. A company which is 100 per cent engaged in ordnance work came into the market last week and found that it could not place its order. An appeal was made to Washington and a large coke seller received a request for priority shipment. Although this seller had been careful to sell his 1918 quota to consumers who have priority work, this case was cited as an example of the fact that Government officials can do little more than take care of each emergency to the best of their ability as it arises. The incident, if repeated many times, as it very likely will be, will mean deflection of large quantities of coke from those who have been farsighted and forehanded to those who have not covered their requirements but have relied on the Government to get a supply for them when needed. There is an urgent demand for coke for prompt delivery, but none is to be had. Occasionally a seller is able to help out a consumer with a carload, but such instances are becoming rarer. The coke situation is not improving, and, if anything, is gradually getting worse.

Ferroalloys.—Ferromanganese shows firmness and there are few, if any, quotations now below $250 per ton for any delivery. Several furnaces are banked. Spiegeleisen is also firmer and the $60 minimum quoted a week ago is disappearing. Sellers now hold for about $62 per ton at furnace.

Billets.—Billets are not to be had in this market. There is a good demand but steel mills have no surplus to offer. We quote $47.50 f.o.b. Pittsburgh for 4 x 4 rerolling billets.

Sheets.—There is no change in this market. A fair amount of business is being done, which would be larger if mills were willing to add to their commitments for first quarter, which under present operating difficulties they are loath to do. We quote No. 10 blue annealed sheets at 4.25c.; No. 28 black at 5c. and No. 28 galvanized at 6.25c., Pittsburgh.

Structural Material.—With large orders on hand for the Government and production curtailed, Eastern structural mills are finding it difficult to ship on existing contracts. Consumers, it appears, are having trouble in placing orders for next year, unless they can obtain priority orders from Washington. A Pennsylvania mill having a capacity of 18,000 tons per month has not shipped more than 14,000 tons in any month this year. Its record for November was slightly more than 11,000 tons and during the first three weeks of December, its total shipment of shapes was less than 7000 tons. Fabricated shops in this district are extremely busy on buildings for the Government and ship sections for the Emergency Fleet Corporation. We quote shapes at 3c., Pittsburgh.

Plates.—A Pennsylvania plate mill, confronted by rising costs of production and present operating difficulties, has refused to accept any more business either for the Government or for companies engaged on Government work on the basis of 3.25c., Pittsburgh. This company explains that the only way in which it was able to avoid a loss was by shipping a part of its output on private contracts placed some time ago at prices higher than that fixed by the Government. Lately, however, its output has been reduced and Government orders are absorbing practically all of the plates it can produce. This company has persistently contended for a higher price on plates. Its position is that it will lose money if it continues on the present basis. Specifications for shipyards are coming in freely. Emergency specifications from the Navy Department frequently come to the Pennsylvania mills because of their proximity to seaboard. We quote plates at 3.25c., Pittsburgh.

Iron and Steel Bars.—A little business is being done in bar iron, but practically nothing in steel bars. We quote bar iron at 3.50c., f.o.b. mill or Pittsburgh base, according to the location of the buyer, and steel bars at 2.90c., Pittsburgh.

Old Material.—The recommendations of the American Iron and Steel Institute (published elsewhere in this issue) are in the nature of a check on advancing prices of old material classifications which were not covered by the price agreement recently reached with the War Industries Board. In this market, steel rails for re-rolling, which have been selling at $38 to $40, delivered, must not be sold now for more than $35, a differential of $5 a ton over the price for No. 1 heavy melting steel being allowed, provided the purchaser is the owner of a mill for re-rolling such rails. Low phosphorus heavy melting steel, which has been selling at $36 to $38, can now be sold for as high as $40 if guaranteed to contain 0.04 per cent or less in phosphorus and sulphur. If not so guaranteed, the price

shall be $5 less. Old carwheels can not now sell for more than $30, delivered, though the current quotation last week was $34 to $36. No. 1 cast, which has been selling at $31 to $33, will be automatically reduced to $30 under the arrangement now agreed to. Railroad malleable, quoted at $30 to $32, will also be sold at not higher than $30. A $5 extra is allowed for cast borings (clean) when sold to chemical plants, gas houses or for purposes other than melting. A commission of 3½ per cent allowed to dealers and brokers is a concession to the larger handlers of scrap, who were gradually being forced out of business. It is difficult to foretell the effect of this new arrangement. Large consumers of scrap may decide to do their buying direct from producers and thus save the commission. On the other hand, the small dealer with a stock on hand may want to sell direct to the steel mills and thus obtain the maximum price, with the commission possibly added. Mills in the Pittsburgh district are anxious to buy steel scrap, but dealers in this market now find it more profitable to sell in eastern Pennsylvania, $29 to $30 being obtained from nearby mills. As not more than $30 can be obtained in Pittsburgh, dealers make a larger profit by selling their supply here, which has not been difficult to do. Pig iron scarcity is driving many mills into the market for scrap. We quote for delivery in eastern Pennsylvania as follows:

No. 1 heavy melting steel	$29.00 to $30.00
Steel rails, rerolling	35.00
Low phosphorus heavy melting	38.00 to 40.00
Low phosphorus (not guaranteed)	33.00 to 35.00
Old iron rails	38.00 to 40.00
Old carwheels	30.00
No. 1 railroad wrought	35.00
No. 1 yard wrought	33.00 to 35.00
No. 1 forge fire	23.00 to 24.00
Bundled sheets	23.00 to 24.00
No. 2 busheling	17.00 to 18.00
Steel turnings (for blast furnace use)	15.50 to 16.00
Machine shop turnings (for rolling mill use)	18.50 to 19.00
Cast borings (for blast furnace use)	15.50 to 16.00
Cast borings (clean)	20.00
No. 1 cast	30.00
Grate bars	21.50 to 22.50
Stove plate	22.00 to 23.00
Railroad malleable	30.00
Wrought iron and soft steel pipes and tubes (new specifications)	30.00 to 32.50

Buffalo

BUFFALO, Dec. 22.

Pig Iron.—Very brisk and eager demand prevails for all kinds of iron for nearby delivery for emergency uses, but the market is practically bare, with everything that is likely to be produced before July 1 booked up. Small lot business would command unprecedentedly high prices, did not Government restrictions prohibit acceptance of premiums. The situation is such with some melters that price cuts no figure, their only concern apparently being to secure iron at the earliest possible moment regardless of grade or cost. For third and fourth quarter delivery, as well as for first half, consumers are after all grades, foundry, malleable, basic and Bessemer, and inquiries for various tonnages are piling up. Furnaces, however, have very little untaken capacity on which they can safely promise delivery for the extended period. Coke conditions and the freight situation show no material improvement and continue to hamper furnace operation badly, though furnacemen hope for a better situation regarding fuel supply after the first of the year, if not complicated by adverse weather conditions. We continue previous price schedules, f.o.b. furnace, Buffalo, as follows:

No. 1 foundry	$34.50
No. 2 X	33.50
No. 2 foundry	32.50
Gray forge	32.00
Malleable	33.50
Basic	33.00
Lake Superior charcoal, f.o.b. Buffalo	39.75

Finished Iron and Steel.—It is understood there has been further buying of wire rods for use of Canadian mills, and that at least a portion of the material ordered will come to the States for shipment during the first quarter of 1918. There has also been considerable further inquiry from Canadian sources for shipbuilding material, aggregating quite a large tonnage, for delivery during the latter part of 1918 and extending into 1919.

Old Material.—The congested railroad situation prevents the development of what otherwise would be an exceedingly active market, with large total of transactions, notwithstanding the increasing scarcity which is becoming more and more apparent in almost all grades of scrap. This is particularly true of heavy melting steel. Embargoes are still in force at all the principal consuming points to which shipments are usually forwarded from the Buffalo district, which places a further limit upon the amount of business that can be transacted, aside from the tonnage called for by local consumers. The price of old car wheels shows a tendency to advance; but this has been checked by the new agreed price, $30. We quote dealers' asking price, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$29.00 to $30.00
Low phosphorus	40.00 to 42.00
No. 1 railroad wrought	34.00 to 35.00
No. 1 railroad and machinery cast	31.00 to 32.00
Iron axles	45.00
Steel axles	45.00
Carwheels	30.00 to 34.00
Railroad malleable	31.00 to 32.00
Machine shop turnings	18.00 to 18.50
Heavy axle turnings	26.00 to 27.00
Clean cast borings	19.00 to 20.00
Iron rails	37.00 to 38.00
Locomotive grate bars	20.00 to 21.00
Stove plate	22.00 to 23.00
Wrought pipe	26.00 to 27.00
No. 1 busheling scrap	26.00 to 27.00
No. 2 busheling scrap	17.00 to 18.00
Bundled sheet stamping scrap	19.00 to 20.00

Cleveland

CLEVELAND, OHIO, Dec. 24.

Iron Ore.—Now that the ore-shipping season has closed, shippers are taking more interest in ore for next season's delivery, and it is expected that representatives of some of the leading ore firms will be called to Washington within the next few days to discuss the price situation with representatives of the Government. While it was generally understood when this season's prices were reaffirmed for this year by the Government that the same prices would prevail during 1918, some ore firms feel that there should be an advance to cover the increased cost in mining that has come since prices were established a year ago. While some reservations have been made, buying for next year has been held back because of the uncertainty as to prices. We quote present prices as follows: Old range Bessemer, $5.95; old range non-Bessemer, $5.20; Mesaba Bessemer, $5.70; Mesaba non-Bessemer, $5.05.

Pig Iron.—Inquiry for basic, foundry and malleable iron for delivery during the first half continues plentiful. New inquiries are pending for several lots of basic iron aggregating 40,000 tons for the first half and second quarter. It is estimated that 250,000 tons of basic iron could be sold at the present time were it available. Cleveland producers have very little first half pig iron left, and consumers are finding it more difficult every day to place orders. It is predicted that before long some foundries doing Government work will find it necessary to ask the Government to secure pig iron for them and that will mean the requisitioning of iron already sold to other customers. Several sales of last half foundry iron were made during the week, including a 2500-ton lot to a northern Indiana melter. Several small-lot sales of Southern high silicon iron are also reported.

Bessemer	$37.25
Basic	33.30
Northern No. 2 foundry	33.30
Southern No. 2 foundry	37.00
Gray forge	32.30
Ohio silvery, 8 per cent silicon	46.12
Standard low phosphorus, Valley furnace	50.00

Coke.—Inquiry for foundry coke contracts has fallen off somewhat, but there is still considerable call from consumers, which brokers are unable to supply because many producers are taking on no additional tonnage. Shipments were better last week owing to improved weather conditions, but are still far from good, and many foundries have a very limited supply.

Finished Iron and Steel.—New inquiry is somewhat lighter, due probably to the holiday season. The 54,000 tons of steel for the 40 boats placed by the Government with the American Shipbuilding Co., has all been distributed, 9000 tons going to the United States Steel Corporation and the remainder to five or six independent mills. The 420 boilers, for which the Emergency Fleet Corporation recently inquired, have been placed with the leading water tube boiler interest. New plate inquiries are light. A Cleveland mill that has been selling at higher prices has now got down to the Government price on plates except for small lots, which it is quoting at 4c. to 4.25c. An Ohio manufacturer wants 2000 tons of blooms for motor truck parts. Some small miscellaneous inquiries are coming out for steel for Government work. The Willys-Overland Co., Toledo, is reported to have taken a large contract for light gun carriages. Manufacturers not working on Government contracts are uncertain about getting steel, and some have sent specifications to mills for their entire first quarter contracts, hoping that by getting in orders early they will secure deliveries. Hard steel bars are quoted at 3c. at mill which is expected to be named as the Government price. Some makers, particularly in the Central West, are complaining that this price is too low considering costs, but in spite of the reduced price some consumers are substituting lower priced soft steel bars as these can be secured for early delivery. We quote warehouse prices as follows: Steel bars, 4.03½c.; plates, 4.38½c.; structural material, 4.13½c.; No. 10 blue annealed sheets, 5.35c.; No. 28 black sheets, 6.35c.; No. 28 galvanized sheets, 7.60c.

Bolts, Nuts and Rivets.—Inquiry for bolts and nuts has quieted down considerably, owing doubtless to the fact that many consumers are deferring the placing of orders until after the first of the year. New inquiry for rivets is not active, but specifications in a large volume are beginning to come on the orders recently placed by the shipbuilding companies. We quote rivets at 4.65c., Pittsburgh, for structural, and 4.75c. for boiler rivets.

Old Material.—The demand for scrap is active, and the market is very firm. Dealers are still making no attempts to sell heavy melting steel scrap, having no inducement to do so, as they are unable to buy this grade lower than the Government price. This situation and other conditions have caused a scarcity in heavy melting steel scrap, and some consumers are substituting in its place hydraulic pressed-steel scrap. As a result, this grade has advanced. Many of the mills are in the market for scrap for delivery after the first of the year. Dealers quote f.o.b., Cleveland, as follows:

	Per Gross Ton	
Steel rails	$26.00 to	$27.00
Steel rails, rerolling	36.00 to	37.00
Steel rails, under 3 ft.	34.50 to	35.50
Iron rails	35.00 to	36.00
Steel car axles	45.00 to	46.00
Heavy melting steel		30.00
Cast borings	18.00 to	18.50
Iron and steel turnings and drillings	18.25 to	18.75
No. 1 railroad wrought	34.00 to	35.00
Hydraulic compressed steel scrap	26.00 to	27.00
Carwheels	26.50 to	27.50
Relaying rails, 50 lb. and over	50.00 to	60.00
Agricultural malleable	22.00 to	23.00
Railroad malleable	28.00 to	29.00
Steel axle turnings	23.00 to	24.00
Light bundled sheet scrap	20.00 to	20.50

	Per Net Ton	
Iron car axles	$44.00 to	$45.00
No. 1 busheling	24.00 to	25.00
No. 1 cast	24.50 to	25.00
Railroad grate bars	18.00 to	18.50
Stove plate	18.00 to	18.50

Cincinnati

CINCINNATI, Dec. 24.

Pig Iron.—A few scattered sales of Southern foundry iron have been made in southern Ohio and Indiana, but little of this iron is strictly No. 2. Occasionally a small lot of high silicon iron is made in the South, but it is sold almost immediately as soon as it appears. The holiday season has not cut off the inquiry for foundry iron, as is usual at this time of the year, and this is taken as an indication that many melters are short for a first half supply. The scarcity of Ohio silvery iron is due not only to the curtailment in production, but also to the unprecedented demand from the foundries which wish to use a higher percentage of scrap in their mixtures. No silvery iron is offered by any of the furnaces for nearby shipment and none is held by dealers. Railroad embargoes continue to give a great deal of trouble, but delayed shipments probably cause more annoyance. It is almost a common occurrence now for cars of iron from the Birmingham district to be delayed en route from three to four weeks. Based on freight rates of $2.90 Birmingham and $1.26 from Ironton, we quote f.o.b. Cincinnati as follows:

Southern coke, No. 2 foundry and 2 soft	$35.90
Southern Ohio coke, No. 2	34.26
Basic, Northern	34.26

Finished Material.—Jobbers report business as being very quiet and they do not look for any improvement until well along in January. Mill shipments are delayed, but so far warehouse stocks have not been depleted to such an extent that small urgent orders could not be filled promptly. Wire nails, which are unchanged at $4.10 per keg base, are not in demand, and orders from retailers are for very small quantities. The mill quotation on No. 28 black sheets is 5.18½c., and No. 28 galvanized sheets 6.43½c., f.o.b. cars Cincinnati or Newport, Ky. Store prices are as follows: Iron and steel bars, 4.08½c.; twisted bars, ¾ x 1¼-in., 4.23½c.; ⅝-in., 4.33½c.; ½-in., 4.43½c.; ⅜-in., 4.63½c, and ¼-in., 4.88½c. Structural shapes are 4.18½c.; plates, ¼in. and heavier, 4.43½c.; No. 10 blue annealed sheets, 5.43½c. Cold rolled shafting carries a 10 per cent discount from list.

Coke.—Both furnace and foundry coke cannot be bought for prompt shipment in any field. The oven operators are troubled more than ever on account of labor shortage, as many men have laid off for the holidays. Coupled with the reduced production, the car shortage is again becoming more serious after a slight improvement noted the first part of last week. An additional number of pig iron furnaces will be compelled to bank within the next few days unless there is some improvement in the supply of 48-hr. coke. The foundries are in little better shape, but supplies on hand are exceedingly limited. New River and Pocahontas operators are still unwilling or unable to take on future contracts, but some Connellsville and Wise County grades can be contracted for on extended deliveries.

Old Material.—Dealers are not endeavoring to make any sales. The local foundries are purchasing only small lots of cast scrap to fill immediate requirements. Shipments to Pittsburgh territory are still delayed very much, and in a number of cases cars have been lost en route for almost an indefinite period. No change in prices are quoted on any grade. The following are dealers' prices, f.o.b. cars, southern Ohio and Cincinnati:

	Per Gross Ton	
Bundled sheet scrap	$17.50 to	$18.00
Old iron rails	32.00 to	32.50
Relaying rails, 50 lb. and up	44.00 to	44.50
Rerolling steel rails	33.00 to	33.50
Heavy melting steel scrap	25.50 to	26.00
Steel rails for melting	24.50 to	25.00
Old carwheels	27.00 to	27.50

	Per Net Ton	
No. 1 railroad wrought	$29.00 to	$29.50
Cast borings	13.00 to	13.50
Steel turnings	13.00 to	13.50
Railroad cast	18.50 to	19.00
No. 1 machinery	25.00 to	25.50
Burnt scrap	14.00 to	14.50
Iron axles	40.00 to	40.50
Locomotive tires (smooth inside)	33.50 to	34.00
Pipes and flues	15.00 to	15.50
Malleable cast	19.50 to	20.00
Railroad tank and sheet	14.50 to	15.00

St. Louis

ST. LOUIS, Dec. 24.

Pig Iron.—The unsatisfied demand for pig iron continues as strong, even stronger than ever and with decreasing prospects of its being met. Sales continue to be made, it is true, but these are all of analyses off the standard run and the iron is taken by foundrymen

desperate for material. No representatives are in position to take any orders for other than specified quantities of such iron as the furnaces have on hand out of the usual analyses. The sales generally are for lots around 100 tons or less. Among the transactions of the week was one for 100 tons of spiegeleisen, for use in reducing the quantity of ferro-manganese needed by the user.

Coke.—Transactions in coke continue to be limited by the situation as to output and cars with the result that even old customers are being sold reduced quantities. The transactions of the week have been for small lots of 150 tons and downward. By-product coke is entirely out of the market.

Finished Iron and Steel.—In finished products, the situation shows no change from preceding reports. The last contract for standard section steel rails remaining unchanged has been adjusted to open-hearth at $2 advance and deliveries are promised in satisfactory time to the contracting railroads. Movement out of warehouse has been heavy as usual, governed only by the ability of the warehouses to supply the requirements. For stock out of warehouse, we quote as follows: Soft steel bars, 4.17c.; iron bars, 4.17c.; structural material, 4.27c.; tank plates, 4.52c.; No. 8 sheets, 5.47c.; No. 10 blue annealed sheets, 5.52c.; No. 28 black sheets, cold rolled, one pass, 6.52c.; No. 28 galvanized sheets, black sheet gage, 7.77c.

Old Material.—Inability to get scrap and also the shortage of cars have led to a stronger feeling in the old material market during the past week, although there has been very little actual business transacted. Dealers' generally are feeling better, though the readjustment to meet the Government price fixing is still something of a problem because of the unwillingness of holders of scrap to take less than Government figures and the ultimate consumer to pay more than that figure, leaving the dealer to make nothing. We quote dealer's prices, f.o.b. consumer's works, St. Louis industrial district, as follows:

	Per Gross Ton	
Old iron rails	$35.25 to	$35.75
Old steel rails, rerolling	36.75 to	37.25
Old steel rails, less than 3 feet	37.25 to	37.75
Relaying rails, standard section, subject to inspection	60.00 to	75.00
Old carwheels		30.00
No. 1 railroad heavy melting steel scrap	27.75 to	28.25
Heavy shoveling steel	26.25 to	26.75
Ordinary shoveling steel	25.25 to	25.75
Frogs, switches and guards cut apart	28.25 to	28.75
Ordinary bundled sheet scrap	19.25 to	19.75
Heavy axle and tire turnings	19.25 to	19.75
	Per Net Ton	
Iron angle bars	$34.75 to	$35.25
Steel angle bars	27.25 to	27.75
Iron car axles	43.50 to	44.00
Steel car axles	41.50 to	42.00
Wrought arch bars and transoms	38.25 to	38.75
No. 1 railroad wrought	31.25 to	31.75
No. 2 railroad wrought	29.75 to	30.25
Railroad springs	32.75 to	33.25
Steel couplers and knuckles	29.75 to	30.25
Locomotive tires, 42-in. and over, smooth inside	31.75 to	32.25
No. 1 dealers' forge	22.00 to	23.00
Cast iron borings	17.25 to	18.25
No. 1 busheling	23.75 to	24.25
No. 1 boilers, cut to sheets and rings	20.25 to	20.75
No. 1 cast scrap	23.75 to	24.25
Stove plate and light cast scrap	17.25 to	17.75
Railroad malleable	25.75 to	26.25
Agricultural malleable	21.75 to	22.25
Pipes and flues	21.25 to	21.75
Railroad sheet and tank scrap	19.75 to	20.25
Railroad grate bars	18.25 to	18.75
Machine shop turnings	17.25 to	17.75
Country mixed sheet scrap	18.75 to	19.25
Uncut mixed railroad scrap	21.25 to	21.75

Chicago

CHICAGO, Dec. 24.

The shortage of fuel is not relieved, and great anxiety is caused by the lessened production. The Steel Corporation is more than ever short of pig iron and is buying old material on an extensive scale, paying $30 for heavy melting and shoveling steel. Insufficient coke has caused the blowing out of one furnace at Gary and another at South Chicago. Two are banked at South Chicago and two at Joliet, making six which are idle. As to other furnaces, the management is holding its breath. Government orders continue heavy, more coming every day. The leading independent to-day received an order for 6000 tons of plates and shapes, mostly the former, from the American International Shipbuilding Corporation, ultimate delivery to be at Hog Island, Philadelphia, after leaving the hands of the fabricators. The same maker received an order to-day for 5000 tons of ship rivets for delivery in 1918 to the Emergency Fleet Corporation. Pig-iron inquiry for the last half is heavier. Bars and plates are moving in a small way at Government prices.

Pig Iron.—Instead of the usual holiday quiet, inquiry for pig iron was resumed with greater force than ever last week. It came from all directions, and not a few consumers wanted iron for last-half delivery. A producer of Southern iron has not yet sold for all of the last half, but has made a number of sales running into the third quarter. It is willing to sell for the last six months of the year, and this is the attitude of other makers, also. It is the opinion of the trade that the first of the year will bring an active demand for last half. In all cases, sales are based on the official price of $33, furnace. Consumers are taking all the Northern iron they can get, and inasmuch as this is mostly low in silicon, they want high silicon Southern iron to help out their mixtures, the call being for iron running 2.25 per cent silicon and higher. It is agreed that the pivotal thing in iron is the fuel supply, and that much depends on the extent to which the steel companies are obliged to seek iron outside of their own production. The present scarcity of fuel is so bad that even foundries have had to curtail their output. The largest Southern producer is practically the only seller in the South. Other makers are out of the market, being as nearly sold up for the first half as they dare to go in view of the uncertainty of coke supply. With the silveries the situation is unchanged, no offerings being made. Prices are unchanged, as follows:

Lake Superior charcoal, Nos. 2 to 5	$37.50
Lake Superior charcoal, No. 6 and Scotch	40.00
Northern coke foundry, No. 1	33.50
Northern coke foundry, No. 2	33.00
Northern coke foundry, No. 3	32.50
Northern high-phosphorus foundry	33.00
Southern coke No. 1 foundry and 1 soft	38.50
Southern coke No. 2 foundry	37.00
Malleable Bessemer	33.50
Basic	33.00
Low-phosphorus (copper free)	53.00
Silvery, 7 per cent	44.54

Ferroalloys.—Eighty per cent ferromanganese is active in small lots at $240 to $250.

Plates.—In a small way, plates are being sold principally by Eastern mills to non-war users. The large Western makers have their hands full in caring for Government needs and plates embraced the greater part of 6000 tons placed to-day with the leading independent by the American International Shipbuilding Company for delivery at Philadelphia after fabrication. Prices are unchanged. The warehouse quotation is 4.45c.

Bars.—Mild steel bars are being sold in fair quantities where the specifications are attractive. A few implement makers have inquired, but they are not in a hurry to buy. Makers of rail carbon bars have not received official word that 3c. is to be the price for their produce. The quotation has been around 3.25c. Bar iron is quiet and prices are unchanged.

We quote warehouse prices for Chicago delivery as follows: Soft steel bars, 4.10c.; bar iron, 4.10c.; reinforcing bars, 4.10c.; base, with 5c. extra for twisting sizes ½ in. and over and usual card extras for smaller sizes; shafting, list plus 10 per cent.

Shapes.—Few shapes are being sold except for war purposes. No new car business is reported. Unknown bidders will supply 404 tons to the Scherzer Rolling Lift Bridge Co. for a bascule bridge over Tonawanda Creek, Tonawanda, N. Y., and 182 tons for 50 portable-steel buildings for the Sinclair Refining Co. The Bethlehem Steel Bridge Corporation will furnish 180 tons in the form of a bridge at St. Louis for the Missouri Pacific Railroad. The Stupp Bros. Bridge & Iron Co. will supply 100 tons for an extension to a crane runway for the Curtiss & Co. Mfg. Co., St. Louis. Prices are unchanged.

Sheets.—The demand for export and domestic consumption is good. One maker is selling black, galvanized and blue annealed. Another mill is not quot-

ing on black and galvanized because it has oversold for the first quarter. Prices are unchanged.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 5.45c.; No. 28 black, 6.45c.; and No. 28 galvanized, 7.70c.

Cast-Iron Pipe.—It was announced, Dec. 22, that prices had been reduced $1.15 per ton, following a conference of the leading makers and representatives of the Government. Jackson, Mich., after revising its specifications, placed 167 tons with the United States Cast Iron Pipe & Foundry Co. On Jan. 4, Winnipeg, Man., as previous stated, will take bids on 4500 tons, and Madison, Wis., on 200 tons. Quincy, Ill., is inquiring tentatively on 400 tons.

Quotations per net ton, Chicago, are as follows: Water pipe, 4-in., $57.35; 6-in. and larger, $54.35, with $1 extra for Class A water pipe and gas pipe.

Wire Products.—There are plenty of orders, but production is disappointing. Prices are unchanged.

Nails, $3.50, Pittsburgh; plain fence wire, $3.25; painted barb wire, $3.65; galvanized barb wire, $4.35; polished staples, $3.65, and galvanized staples, $4.35.

Bolts and Nuts.—Business is good, but buying somewhat less active than ten days ago, largely because some consumers appear to believe that official prices may be lowered. Prices are unchanged.

Store prices are as follows: Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to ⅝ x 4 in., 37½ per cent off; larger sizes, 25-5; carriage bolts up to ⅝ x 6 in., 30-2½; larger sizes, 20; hot pressed nuts, square tapped, $1.05 off, and hexagon tapped, 85c. off per 100 lb.; coach or lag screws, gimlet points, square heads, 40 per cent off.

Old Material.—The Steel Corporation has been a heavy buyer of heavy melting and shoveling steel, paying $30 flat for all grades. The International Harvester Co. has bought heavily of cast scrap for delivery at Milwaukee. The market has been a little excited in the face of the good demand, offerings being under par. The railroad lists are small. Dealers are awaiting the official price announcement. Leading brokers regard favorably the recommendation that they receive 3½ per cent commission from buyers, that per cent being more than they are receiving on business they are putting through. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton	
Old iron rails	$37.00 to	$38.00
Relaying rails	50.00 to	55.00
Old carwheels	33.00 to	34.00
Old steel rails, rerolling	35.50 to	36.50
Old steel rails, less than 3 ft.	33.50 to	34.50
Heavy melting steel scrap		30.00
Frogs, switches and guards, cut apart		30.00
Shoveling steel	29.00 to	30.00
Steel axle turnings	24.00 to	25.00
	Per Net Ton	
Iron angles and splice bars	$36.50 to	$37.50
Iron arch bars and transoms	37.50 to	38.50
Steel angle bars	26.50 to	27.50
Iron car axles	45.00 to	46.00
Steel car axles	43.00 to	44.00
No. 1 railroad wrought		31.25
No. 2 railroad wrought	29.00 to	30.00
Cut forge	29.00 to	30.00
Pipes and flues	23.00 to	23.50
No. 1 busheling	25.00 to	25.50
No. 2 busheling	17.25 to	17.50
Steel knuckles and couplers	32.00 to	33.00
Coil springs	39.00 to	40.00
No. 1 boilers, cut to sheets and rings	19.00 to	20.00
Boiler punchings	31.50 to	32.50
Locomotive tires, smooth	33.50 to	34.50
Machine-shop turnings	17.00 to	17.50
Cast borings	16.50 to	17.00
No. 1 cast scrap	25.50 to	26.50
Stove plate and light cast scrap	20.50 to	21.00
Grate bars	20.00 to	21.00
Brake shoes	21.00 to	22.00
Railroad malleable	27.00 to	28.00
Agricultural malleable	24.00 to	25.00
Country mixed scrap	20.50 to	21.00

New York

NEW YORK, Dec. 24.

Pig Iron.—Inquiry for delivery the last half of next year is increasing in volume, but sellers are not disposed to take on business except from a few favored customers. The market is quiet, as it usually is during the holidays, but the demand is greater than the available supply. Some fear has been entertained that prices might be reduced by the Government. For early delivery we quote as follows:

No. 1 X	$35.25
No. 2 X	34.25
No. 2 Plain	33.75
No. 2 Southern (rail and water)	$38.75 to 39.25
No. 2 Southern (all rail)	39.15 to 39.65
No. 2 X Virginia	37.00 to 37.25

Ferroalloys.—The market for domestic ferromanganese is strong at $250, with sales of carload lots at this price in the past week. The 350 tons reported under inquiry last week has been closed at $245 for delivery in the first half. No decision is announced as to the 1200 tons additional that has been before the market. Demand in general has been of small proportions in the last few days. Spiegeleisen is unchanged at $60, furnace, and inquiry is still pending for 1800 tons. As illustrating general conditions it is interesting to note that one producer of spiegeleisen and ferromanganese is inquiring in the market for both of these products to fill contracts which it will be unable to complete itself. There is nothing to report in the 50 per cent ferrosilicon market.

Finished Iron and Steel.—On an export order of several hundred tons of plates a quotation of 7c. has been made. The Paris & Orleans Railroad has placed a 325-ton order in Cleveland, it is understood, for a little under 5c. at mill. In the lighter weights, plates are more easily obtained at 60 days' delivery. In other products similar deliveries can also be made, but business has been dull and export inquiries have not resulted in much business, largely for the reasons outlined in this column last week. We quote mill shipments of steel bars at 3.095c., New York; shapes 3.195c., plates 3.445c. and bar iron 3.695c., New York. Out of store prices are 1c. higher, and to all must be added 3 per cent of the freight charge for the transportation tax.

Old Material—The recommendations of the Government and dealers in regard to prices of old material will be received with keen interest by all scrap dealers. One of the most interesting features is the provision that recognized scrap dealers or brokers may be paid a commission not to exceed 3½ per cent on actual delivered prices of the metal purchased. This is regarded as a fair commission. Recently on account of the uncertainty as to commissions, conditions have been very unsatisfactory for both buyers and sellers. The recommendation placing rerolling rails at $35, or $5 over the base price of heavy melting steel, will result in sharp reductions, as this grade of scrap has been selling at from $38 to $39, New York. Old car wheels, which have been selling at $33 to $35, and in some cases even higher, will be reduced to about $31 as soon as the action in regard to prices becomes known. We quote prices of brokers as follows to New York producers and dealers, per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania	$26.00 to $26.50
Old steel rails (short lengths) or equivalent heavy steel scrap	26.00 to 26.50
Relaying rails	60.00 to 70.00
Rerolling rails	38.00 to 39.00
Iron and steel car axles	41.00 to 42.00
No. 1 railroad wrought	32.00 to 33.00
Wrought-iron track scrap	32.00 to 33.00
No. 1 yard wrought long	32.00 to 33.00
Light iron	9.00 to 10.00
Cast borings (clean)	17.50 to 18.00
Machine-shop turnings	17.50 to 18.00
Mixed borings and turnings	14.00 to 15.00
Wrought-iron pipe (1 in. minimum diameter), not under 2 ft. long	28.00 to 28.50

Dealers in New York and Brooklyn are quoting as follows to local foundries, per gross ton, but for delivery to cupola platforms of Brooklyn foundries about $3 more is quoted:

No. 1 machinery cast	$29.00 to $30.00
No. 1 heavy cast (column, building materials, etc.)	23.00 to 24.00
No. 2 cast (radiators, cast boilers, etc.)	23.00 to 24.00
Stove plate	20.00 to 21.00
Locomotive grate bars	20.00 to 21.00
Malleable cast (railroad)	29.00 to 30.00
Old carwheels	33.00 to 35.00

Cast-Iron Pipe.—The action of the Government and manufacturers in fixing a base of $55.35, f.o.b. New York, for 6-in. and larger, class B or heavier, cast-iron pipe, is regarded as fair and in line with recent nominal quotations. Lower prices have been made in case of sales to the Government. We quote the new prices: $55.35 New York, for 6-in. and heavier, and $58.35 for 4-in.; $65.35 for 3-in., and $1 additional for class A or gas pipe. It is expected that business will soon show improvement, as the delay in determining prices has had a depressing effect.

British Steel Market

Government Takes Control of Electric-Steel and Shell Discard Market—American Steel Quiet

(*By Cable*)

LONDON, ENG., Dec. 24.

Electric steel and shell discards have been taken under control by the Government. Closer supervision of Cleveland pig iron is expected. Hematite iron is urgently wanted. American semi-finished steel is in poor demand. Tin plates are firmer but quoted at 31s. 6d. basis including tin allowance. Ferromanganese is quiet with sellers asking $250 c.i.f. for forward shipment to North American Atlantic ports. We quote as follows:

Tin plates coke, 14 x 20; 112 sheets, 108 lb., f.o.b. Wales, 31s. 6d.
Ferromanganese $250 c.i.f. nominal for export to America.
Ferrosilicon, 50 per cent, c.i.f. £35 upward.
On other products control prices are as quoted in THE IRON AGE of July 19, p. 171.

(*By Mail*)

Advance in Tin Plate—The Pig-Iron Situation—Ferromanganese for America Higher

LONDON, ENGLAND, Dec. 4.—The situation remains uncertain pending the long-looked-for official announcement in regard to the procedure to be adopted to meet the increased cost of production. The cause of the delay is inexplicable as it is understood that all the facts have been discussed ad nauseam and that a solution was practically arrived at regarding a subsidy. Possibly some other decision may be in contemplation, and it is also suggested that the basic maximum prices of Cleveland and Lincolnshire foundry, forge and basic irons are about to be raised. Meantime Cleveland makers are already asking for the home trade an advance of 2s. 6d. at 95s. for No. 3 and 116s. 6d. f.o.b. for export to Allies. These quotations, of course, are subject to official sanction.

There is ample evidence of a steady expansion of the home outlet for pig iron, which is not surprising in view of the ever-growing war requirements, and a good deal of leeway has yet to be made up to keep pace with demands for steelmaking material. A much heavier run of applications for Cleveland common iron has come forward for the current month and there is some doubt whether these will be met in full, although there are considerable arrears arising from the short November deliveries due to the shortage of cars. Users are doubtless rather short of stock, but given better transport conditions a lot of iron will probably pass into their hands. The increased output of basic iron has only been possible by turning furnaces from Cleveland iron on to the former, and for this reason a closer supervision may have to be exercised over allocations of Cleveland iron. Exports to France have fallen off and clearances to Italy are hindered by tonnage scarcity. The domestic stringency in hematite is becoming more marked in spite of the more restricted demand from Allies.

Semi-finished steel is unchanged, the negotiation of orders outside of recognized war work being almost impossible, and the official quotation of Welsh bars and billets remains as before at £10 7s. 6d. delivered. Although the market in American material is still confined to small dimensions widely divergent prices have been recorded in wire rods arising from the big difference between the freight rates ruling for neutral tonnage and the comparatively low charges for Government room. Business was done recently down to £20 10s. and also up to £25 c.i.f. Liverpool. The terms now quoted are about £24, but the market is chiefly nominal.

Finished steel is quiet in spite of a ceaseless demand. Under present conditions works, whose chief anxiety is to get rid of arrears, seem content to await events. There is some grumbling at the extent to which the margin of profit to the mills has been whittled down through the substantially increased costs incurred in recent months. In fact some argue that a profit can only be secured by balancing one class of material against another. There is no end to the extension of Government work, and the output in shipbuilding and engineering easily beats all previous records. Current quotations for uncontrolled material are unchanged, but the tendency is strong. Bar iron mills are practically booked to the end of next quarter and in most cases are declining new orders.

Apart from the additional orders placed for tin plates recently for France, whose needs now seem satisfied, there has been no further special development in demand, although home consumers show more inclination to cover their needs where permit facilities are afforded. Quotations have risen on the constant advance in the price of tin, the full maximum terms asked to-day, basis 20 x 14 with tin at £293, being 31s. 3d. There has been, however, rather more competition for new orders just lately for December delivery arising not only from the lack of permits, but from delayed specifications against current contracts. Concessions are thus secured varying from 3d. to 9d. per box. Makers, however, insist on the full basis for forward contracts and are not anxious sellers.

Ferromanganese is virtually unchanged and there is very little stirring at present, but the terms recently quoted for Continental ports at about £60 f.o.b. for loose for forward shipment have been well sustained, with a small business done thereat and higher. The bids made lately for the American North Atlantic ports at about $250 and $260 c.i.f. for January-June have been declined, the few sellers in evidence asking $270. The price of £25 to the home trade is still awaiting a revision.

Patriotic Address of Associated Employers of Indianapolis

The Associated Employers of Indianapolis, Inc., has issued a holiday address, in part as follows:

Yule-tide of all seasons, is one of exceptionally good cheer. We extend to you our sincerest compliments and well wishes—Merry Christmas and Happy New Year.

This Christmas in particular should be serenely beautiful and sacredly inspiring. It should in every way be of the utmost significance to a free, enlightened and Christian people, living a righteous life and carrying on our peaceful vocations according to law, necessity and conscience.

"The Kid Has Gone To The Colors." Thousands upon thousands just like him—patriotic men and boys—have heard, heeded and answered their country's call. More will follow. There will be no cessation in our support of them. May they all return safely—and victoriously.

Let us who must stay at home think less about our personal rights and privileges and more of our duty. When we think of the great sacrifices the boys who have gone to the front are making for us and their and our country—let us face the New Year with renewed determination, hope, faith and optimism.

Let us continue to strive as a patriotic and united people, for a righteous peace on earth—freedom, justice and goodwill to humanity—that we may perpetuate our inalienable right to life, liberty and the pursuit of happiness, guaranteed to us under the laws of God and man, by the Constitution of the United States.

Let us in this grave period of war, in this great crisis for the supremacy of democracy over autocracy, be brave and strong, and glad and thankful for the divine guidance of the supreme power and holy influence which must eventually and finally determine our destiny.

Let us in this hour of national peril, and at this season of the year, firmly resolve to be ever considerate of our country's needs and of the rights of others. Let us not give a moment's heed to one thought that might attempt to interpose itself between our personal rights under normal conditions and our duty in the present crisis, for the issue involved is the life or death of our nation.

Let us help propagate the doctrine that "It matters not what a man claims as a reason for justifying the retarding or holding back of our war activities. We must stand on results. This Nation, if it is to do its full duty, must work as it never worked before. We must all stand together, and back with united effort the great enterprise in which we are now engaged."

The American Wood Working Machinery Co., New York, with present offices at 30 East Forty-second Street, has leased space on the eighteenth floor of the Equitable Trust Building, now being erected at Madison Avenue and Forty-fifth Street, dating from May 1, 1918, for new offices.

Metal Markets

The Week's Prices

Cents per pound for early delivery

	Copper, New York		Tin,	Lead		Spelter	
Dec.	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
19	23.50	23.50	85.50*	6.40	6.25	7.75	7.50
20	23.50	23.50	85.50*	6.45	6.30	7.75	7.50
21	23.50	23.50	85.50*	6.50	6.35	7.75	7.50
22	23.50	23.50	85.50*	6.50	6.35	7.75	7.50
24	23.50	23.50	85.50*	6.50	6.35	8.00	7.75

*Nominal.

The markets continue dull and featureless. Copper, in its controlled condition, offers no developments. Tin continues scarce and nominal at high prices. Lead is again firm but inactive. Spelter is a little stronger in tone but dull. Antimony is still lifeless.

New York

Copper.—There seems adequate ground for believing that there will be no change in the Government price of 23.50c. per lb. for all grades of copper for at least the first quarter. There appears to be no valid reason for a change up or down. It also seems certain that production will be entirely sufficient to meet all war and commercial needs for at least a few months. With these two prime factors apparently settled and with the market absolutely controlled as to sales and distribution by the Copper Producers' Committee, satisfaction pervades the industry at present. Sales are being made for prompt, early and first-quarter delivery at 23.50c. to large buyers and at 24.67½c. to small buyers, which are the quotations.

Tin.—The quietness which has pervaded the market in all positions and grades for some time still continues, with its scarcity pronounced and unrelieved. Probably sales of 50 tons a day of prompt and for future metal represents the average business the past week. Spot Straits is still practically unobtainable, and in the absence of any sales in this market we quote it nominal at 85c. to 86c. New York. There is distinct dissatisfaction in some quarters with the import license matter because of delays. It is causing financial loss and serious inconvenience. It has happened in more than one case that, because of such delays and after the greatest pains have been taken to comply with all details, the tin has gone into general stores because the import license arrived just too late. Arrivals to Dec. 21 inclusive have been 1225 tons, with 4400 tons reported afloat. The London market is still advancing the quotation for spot Straits on Dec. 21, having been £309 10s. or £4 10s. above that on Dec. 19.

Lead.—The tone of the market, which was a little easier a week ago, has turned firm again with quotations yesterday at 6.50c. New York, or 6.35c. St. Louis in the outside market, and with 6.25c. New York quoted by the leading producer. This firmness is not due to active demand, but to an unwillingness on the part of sellers, who are in a comfortable position so far as orders are concerned. Delays in transit are a disturbing factor. A fair amount of export business was put through early in the week, with more business being negotiated since.

Spelter.—It develops that the bids on 1000 tons of grade C spelter, asked for by the Government for delivery in the first half and submitted last Friday, Dec. 21, ranged from 7.87½c. to 8.60c., New York, the New Jersey Zinc Co. being the low bidder. These prices were higher than generally expected by the trade and have created a better tone, at least temporarily. As a result, while the market is very quiet, it is regarded as a little stronger at 7.75c., St. Louis, or 8c., New York, which was quoted on Monday for prime Western for early delivery, this being nearly the same as grade C. No sales at this level are, however, reported. Last Saturday bids were also received on 4000 tons of grade C for the army, but the details are not made public yet. The quotations for future delivery are from ⅛c. to ¼c. per lb. higher than for early delivery.

Antimony.—The market is dull and unchanged at 15c. per lb., duty paid, New York, for Chinese and Japanese grades.

Aluminum.—No. 1 virgin metal, 98 to 99 per cent pure, is unchanged at 36c. to 38c. New York, for early delivery, with the demand poor.

St. Louis

DEC. 24.—The nonferrous metals continue quiet and with little change in price. The close to-day was for car load lots: Lead, 6.50c.; spelter, 7.50c. In less than car load lots the prices are: Lead, 6.75c.; spelter, 8.25c.; tin, 90c.; copper, 25.12c.; Asiatic antimony, 18c. In the Joplin district the production continues to be hampered by the weather conditions, while the producers are disinclined to sell their ore at the prevailing prices. In consequence there is little or no activity. The basis range for zinc blende, 60 per cent metal, is $50 to $70 per ton, with the average for the week for the district $58 per ton. Calamine basis of 40 per cent metal, ranges from $32 to $37 per ton with the average for the week for the district $35 per ton. Lead continues steady basis of 80 per cent metal, at $75 per ton with the average for the week for the district at $74 per ton. We quote dealers' buying prices for miscellaneous scrap metals as follows: Light brass, 10c.; heavy yellow brass, 15c.; heavy red brass and light copper, 19.50c.; heavy copper and copper wire, 20c.; zinc, 5c.; lead, 5.50c.; tea lead, 5c.

Pulverized Coal to Replace Natural Gas

Owing to the great shortage of natural gas in Western Pennsylvania, Eastern Ohio and West Virginia, practically all the manufacturers in those districts have been advised by the companies supplying them with natural gas that after Jan. 1 the service will be discontinued. This has led to some of these concerns putting in plants for pulverizing coal, which will be used in the future for fuel. The Bonnot Co., Canton, Ohio, has contracts for the installation of coal pulverizing plants of the Holbeck system for various companies as follows, the pulverizers being accompanied by dryers and distribution systems:

McKeesport Sheet & Tin Plate Co., McKeesport, Pa. Two 5-ton pulverizers for 88 sheet and pair furnaces, 28 annealing ovens and 73 tin pots.

Phillips Sheet & Tin Plate Co., Clarksburg, W. Va. Four 1¼-ton pulverizers, serving 24 sheet and pair furnaces, 9 annealing ovens and 28 tin pots.

Mansfield Sheet & Tin Plate Co., Mansfield, Ohio. Two 1¼-ton pulverizers, serving 24 sheet and pair furnaces and 30 annealing ovens.

American Rolling Mill Co., Middletown, Ohio. Two 1¼-ton pulverizers, serving 8 sheet and pair furnaces and 13 annealing ovens.

Carnahan Tin Plate & Sheet Steel Co., Canton, Ohio. Two 1¼-ton pulverizers, serving 16 sheet and pair furnaces, 8 annealing ovens and 12 tin pots.

Heppenstall Knife & Forge Co., Pittsburgh. One 5-ton pulverizer for 14 forge furnaces and several boilers.

Hubbard & Co., Pittsburgh. Four 1¼-ton pulverizers, for 127 furnaces of different kinds.

Trumbull Steel Co., Warren, Ohio. Two 5-ton pulverizers, serving 62 sheet and pair furnaces, 15 annealing ovens, 31 tin pots and 8 galvanizing pots.

Pressed Steel Car Co., McKees Rocks, Pa. Two 5-ton pulverizers for approximately 106 different furnaces.

Liberty Steel Co., Warren, Ohio. Two 1¼-ton pulverizers, serving 8 sheet and pair furnaces, 8 annealing ovens and 12 tin pots.

Union Rolling Mill Co., Cleveland. Two 1¼-ton pulverizers for continuous billet heating and puddling furnaces.

Warwood Tool Co., Wheeling, W. Va. One 1¼-ton pulverizer, serving approximately 22 forge furnaces.

Verona Tool Co., Verona, Pa. One 1¼-ton pulverizer, serving a number of forge furnaces.

The Champion Tool Works, Cincinnati, whose plant was reported last week as having been taken over by the Greaves-Klusman Tool Co., Cincinnati, is moving to a new plant at Winton Place, near Cincinnati, and will increase its output of lathes. The old Champion plant will be used as an addition to the Greaves-Klusman plant.

The Grimes Molding Machine Co. will be the new corporate style of the Midland Machine Co., which has removed its plant and business from 813 West Jefferson Avenue, Detroit, to 1218 Hastings Street, Detroit, doubling the size of its former manufacturing plant.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on iron and steel articles, aside from wrought iron and steel pipe in carloads, per 100 lb., New York, 19.5c.; Philadelphia, 18.5c.; Boston, 21.5c.; Buffalo, 11.6c.; Cleveland, 13.5c.; Cincinnati, 18.5c.; Indianapolis, 20c; Chicago, 21.5c.; St. Louis, 27c.; Kansas City, 47c.; minimum carload, 36,000 lb.; St. Paul, 35.5c.; minimum carload, 36,000 lb.; Denver, 79c.; minimum carload, 36,000 lb.; Omaha, 47c.; minimum carload, 36,000 lb.; New Orleans, 30.7c.; Birmingham, 46c.; Pacific Coast, 75c.; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is 90c., minimum carload, 40,000 lb.; and 85c., minimum carload, 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 40c. per 100 lb., minimum carload 46,000 lb.; to Omaha 40c., minimum carload 46,000 lb.; to St. Paul 35.5c., minimum carload 46,000 lb.; Denver 79c., minimum carload 46,000 lb. *A 3 per cent transportation tax now applies.*

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in. angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 3c.

Wire Products

Wire nails, $3.50 base per keg; galvanized, 1-in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1-in., $2.50. Bright basic wire, $3.35 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.25; galvanized wire, $3.95; galvanized barb wire, and fence staples, $4.35; painted barb wire, $3.65; polished fence staples, $3.65; cement-coated nails, $3.40 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 47 per cent off list for carload lots, 46 per cent for 1000-rod lots, and 45 per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large rivets .....$4.65 base
7.15 in x 6 in. smaller and shorter rivets..45-10 per cent off list
Machine bolts h.p. nuts, ⅝ in. x 4 in.
Smaller and shorter, rolled threads.....50-10 per cent off list
Cut threads .....50-5 per cent off list
Larger and longer sizes.....40-10 per cent off list
Machine bolts, c.p.c. and t. nuts, ⅝ in. x 4 in.
Smaller and shorter.....40-10 per cent off list
Larger and longer.....35-5 per cent off list
Carriage bolts, ⅝ in. x 5 in.
Smaller and shorter, rolled threads.....50-5 per cent off list
Cut threads .....40-10-5 per cent off list
Larger and longer sizes.....40 per cent off list
Lag bolts .....50-10 per cent off list
Plow bolts, Nos. 1, 2, 3.....50 per cent off list
Hot pressed nuts, sq. blank.....2.50c. per lb. off list
Hot pressed nuts, hex., blank.....2.30c. per lb. off list
Hot pressed nuts, sq., tapped.....2.30c. per lb. off list
Hot pressed nuts, hex., tapped.....2.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank.....2.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped....2.00c. per lb. off list
Semi-finished hex. nuts.
⅝ in. and larger.....60-10-10 per cent off list
9/16 in. and smaller.....70-5 per cent off list
Stove bolts .....70-10 per cent off list
Stove bolts .....2½ per cent extra for bulk
Tire bolts .....50-10-5 per cent off list

The above discounts are from present lists now in effect. All prices carry standard extras.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $57; chain rods, $65; screw, rivet and bolt rods and other rods of that character, $65. A tentative differential of $10 per ton over soft rods for high carbon rods has been agreed upon.

Railroad Spikes and Track Bolts

Railroad spikes, 9/16 in. and larger, per 100 lb., $3.90, track bolts, $4.90. Boat spikes, $5.25 per 100 lb., f.o.b. Pittsburgh.

Terne Plate

Effective Nov. 7, prices on all sizes of terne plates are as follows: 8-lb. coating, 200 lb., $15 per package; 8-lb. coating, I. C., $15.30; 12-lb. coating, I. C., $16.75; 15-lb. coating, I. C., $17.75; 20-lb. coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.90c. for delivery late this year, and 4.50c. to 5c. from warehouse in small lots for prompt shipment. Refined iron bars, 3.50c. in carload and larger lots, f.o.b. mill.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card, as announced Nov. 5 by the Government on steel pipe, those on iron pipe being the same as quoted for some time:

Butt Weld

Steel			Iron		
Inches.	Black	Galv.	Inches.	Black	Galv.
⅛, ¼ and ⅜....	44	17½	⅛ and ¼	23	+4
½	48	33½	⅜	24	+3
¾ to 3.....	51	37½	½	28	10
			¾ to 1½.....	33	17

Lap Weld

2	44	31½	1¼	18	3
2½ to 6.....	47	34½	1½	25	11
7 to 12.....	44	30½	2	26	12
13 and 14.....	34½	..	2½ to 6.....	28	15
15	32	..	7 to 12	25	12

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜...	40	22½	⅛, ¼ and ⅜....	22	5
½	45	32½	½	27	14
¾ to 1½.....	49	36½	¾ to 1½.....	33	18
2 to 3.....	50	37½			

Lap Weld, extra strong, plain ends

2	42	30½	1¼	19	4
2½ to 4.....	45	33½	½	25	11
4½ to 6.....	44	32½	2	27	14
7 to 8.....	40	26½	2½ to 4.....	29	17
9 to 12.....	35	21½	4½ to 6.....	28	16
			7 to 8.....	20	8
			9 to 12.....	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh, announced Nov. 13, as agreed upon by manufacturers and the Government:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.....	.34	3½ to 4½ in.....	.12½
2½ to 3¼ in.....	.24	3 to 3¼ in.....	+ 5
2¼ in.	.17½	2½ to 2¾ in.....	+ 7½
1¾ to 2 in.....	.13	2 to 2¼ in.....	+22½
		1⅝ to 1⅞ in.....	+35

Standard Commercial Seamless—Cold Drawn or Hot Rolled

	Per Net Ton		Per Net Ton
1 in.	$340	1¾ in.	$220
1¼ in.	280	2 to 2½ in.....	190
1⅜ in.	270	2¾ to 3¾ in.....	180
1½ in.	220	4 in.	200
		4½ to 5 in.....	220

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net or 2 per cent discount in 10 days.

Blue Annealed—Bessemer	Cents per lb.
Nos. 3 to 5.....	4.20
Nos. 9 and 10.....	4.25
Nos. 11 and 12.....	4.30
Nos. 13 and 14.....	4.35
Nos. 15 and 16.....	4.45
Box Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21.....	4.80
Nos. 22 and 24.....	4.85
Nos. 25 and 26.....	4.90
No. 27	4.95
No. 28	5.00
No. 29	5.10
No. 30	5.20
Galvanized Black Sheet Gage—Bessemer	
Nos. 10 and 11.....	5.25
Nos. 12 and 14.....	5.35
Nos. 15 and 16.....	5.50
Nos. 17 to 21.....	5.65
Nos. 22 and 24.....	5.80
Nos. 25 and 26.....	5.95
No. 27	6.10
No. 28	6.25
No. 29	6.50
No. 30	6.75
Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16.....	4.80
Nos. 17 to 21.....	4.85
Nos. 22 to 24.....	4.90
Nos. 25 and 27.....	4.95
No. 28	5.00
No. 29	5.05
No. 30	5.05
Nos. 30½ and 31.....	5.10

PERSONAL

A. N. Martin has resigned as industrial agent of the Baltimore & Ohio Railroad, and on Jan. 1 will become general sales manager for the Fulflo Pump Co., Cincinnati, manufacturer of small centrifugal pumps for machine tools, grinding machines, automobile and aeroplane motors and air compressors.

James McNaughton has been elected president of the Eddystone Munitions Co., Eddystone, Pa., and Captain Walter Wilhelm vice-president. Charles J. Schlacks, general manager of the Remington Arms Co., has become chairman of the board of directors, retaining his position with the Remington Co.

Tampton Aubuchon, manager of the Louisville Industrial Foundation, will establish a bureau of the Louisville Industrial Foundation at Washington, and is assembling data from Louisville, Ky., manufacturers as to the Government contracts that they will be able to handle. Mr. Aubuchon will go to Washington about the first of the year to make arrangements for the plan.

Raymond G. Hutchinson, division engineer of the American Brass Co., Waterbury, Conn., has been appointed superintendent of the Buffalo plant of the company, formerly the Buffalo Copper & Brass Rolling Mill.

Frederick W. Nettleton, for the past eight years superintendent of the Waterbury Clock Co., Waterbury, Conn., has resigned to accept a position with the Bristol Brass Co., Bristol, Conn.

Charles H. Sparell, formerly secretary of the mercantile bureau of the Worcester Chamber of Commerce, has been made purchasing agent and traffic manager of the Spencer Wire Co., Worcester, Mass.

Stanley P. Stewart, mechanical engineer Stewart Boiler Works, Worcester, Mass., has been appointed assistant to the superintendent of the machinery division of the American International Shipbuilding Corporation, Philadelphia.

Joseph T. Martin, who has been connected with the Sparrows Point, Md., plant of the Bethlehem Steel Co. for about 24 years, has resigned to become general manager of the Hog Island Shipyards, Philadelphia, and has entered upon his new duties. Mr. Martin was superintendent of the plant at Sparrows Point. Before leaving he was tendered a banquet by his fellow workers and was presented a handsome grandfather's clock.

George Endicott, for the last two and one-half years mechanical engineer Morgan Spring Co., Worcester, Mass., has resigned to accept a position in the sales department of the Wickwire Steel Co., Buffalo. He will make his headquarters at Buffalo and assume his new duties Jan. 1.

W. H. Harman, who has been vice-president and general sales manager of the Southwark Foundry & Machine Co., Philadelphia, was elected recently president of the company to fill the vacancy caused by the election of Robert Radford to the chairmanship of the board of directors.

C. M. Carmichael, formerly assistant works manager in charge of the electric furnace department of the Anniston Steel Co., Anniston, Ala., and later with the British Forgings, Ltd., Toronto, Ont., as superintendent of the steel plant, has accepted the position of assistant works manager, Electro Metals Co., Welland, Ont.

J. C. Broadnax, who was connected with the electric furnace department of the Anniston Steel Co., Anniston, Ala., and more recently with the British Forgings, Ltd., Toronto, Ont., as assistant superintendent of the steel plant, has been appointed superintendent of the electric furnace department at the Watertown Arsenal, Watertown, Mass.

William A. Battey, who resigned as Eastern sales manager of the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., is succeeded by William C. Briggs, who for the past ten years was associated with him in the New York office as sales engineer. Robert T. Turner has joined the New York office sales force as export manager and sales engineer. He was connected with the export sales department of the Niles-Bement-Pond Co., New York. Mr. Battey has been vice-president of the Pennsylvania Crusher Co., Philadelphia, for some time, and found it necessary to devote his entire time to that company, which manufactures pulverizers, breakers and special crushing machinery for the by-product coke and other industries requiring reduction apparatus.

H. T. Whigham, representative of the United States Steel Products Co., in London, England, arrived in this country recently, and will remain until about Jan. 15, when he will sail for England again. Mr. Whigham makes a trip to the United States every year for the purpose of discussing business plans and policies with his company. He is a brother of William Whigham, vice-president and chief engineer of the Carnegie Steel Co., Pittsburgh.

Clarence H. Beach recently resigned from the sales department of the Midvale Steel & Ordnance Co. as sales engineer, and has accepted a position as district sales manager for the Central Steel Co., Massillon, Ohio, with offices in Chicago.

E. F. Lake, metallurgical engineer, formerly located in Detroit, Mich., has moved to 557 East Fiftieth Place, Chicago, and taken the position of assistant superintendent of the Rich Tool Co. The company is manufacturing one-piece valves from high-speed steel for airplane and automobile engines, and valves of high chromium steel similar to the so-called stainless steel.

Col. Millard F. Hunsiker, formerly of the Carnegie Steel Co., who has lived in London for nearly 20 years, arrived at an Atlantic port in this country Dec. 23. Col. Hunsiker was the projector of the Officers' Club in London, which for the past two months has been welcoming American officers arriving in England.

OBITUARY

CHARLES J. KLEIN, designing engineer, Cutler-Hammer Mfg. Co., Milwaukee, manufacturer of electric controlling devices, died suddenly of apoplexy in his apartment last week. He was 55 years of age and a native of New York. Mr. Klein went to the main plant in Milwaukee in 1908 after being associated with the New York plant for several years. He was closely identified with the perfection of all of the many inventions of controlling devices manufactured by the Cutler-Hammer company.

Cleveland Crane Annual Bonus Plan

As has been the custom for the past eight years, employees of the Cleveland Crane & Engineering Co., Wickliffe, Ohio, received checks from the company representing a share of the profits of the year distributed as a bonus for faithful service. This system is figured on the percentage basis. Three thousand hours have been taken as a year's work, and to each employee who has not been abent from work more than one day each month during the year 2 per cent of his yearly wages has been paid for each full year that he has been in the employ of the company. A man who has been with the company for the past eight years received 16 per cent of his yearly wages. Fifty per cent of all the employees received checks this year. A great number of the old employees' checks represent 20 per cent of their wages for this year.

The International Arms & Fuze Co., Inc., Bloomfield, N. J., is now employing about 25 girls for lathe work at its plant. The company is said to be planning to increase this number as soon as suitable female employees can be obtained.

IRON AND INDUSTRIAL STOCKS

Continued Liquidation Depresses the Market to Still Lower Levels

Values of stocks have fallen off still further. Industrials, while sharing in the continued drop, are much less affected than rails, and in a partial recovery that set in the latter part of the week they led in the upward tendency. For the most part, however, closing values Saturday were below the previous week's. It becomes increasingly difficult to fix the relation between prices and the values which they represent, each twist in the fortunes of war bringing its separate influence to further complicate the market.

The range of prices on active iron and industrial stocks from Tuesday of last week to Tuesday of this week was as follows:

Allis-Chalm. com.	15 - 17	Int. Har. Corp. com.	50½ - 51½
Allis-Chalmers pf.	68	Lackaw. Steel...	71¾ - 74½
Am. Can com...	33 - 35	Lake Supr. Corp.	10¼ - 11
Am. Can pf.	87 - 88	Midvale Steel ...	39½ 42½
Am. Car & Fdry. com.	60½ - 64¼	Nat.-Acme	25¼ - 26¼
Am. Car & Fdry. pf.	101 -102	Nat. Enam. & Stm. com.	34 - 35¾
Am. Loco. com..	46⅝ - 50⅞	N. Y. Air Brake.	104 -116
Am. Radiator com.	250	Nova Scotia Steel	59 - 65
Am. Ship com...	89 - 90	Pressed Sl. com.	49 - 54
Am. Steel Fdries.	51 - 55½	Pressed Steel pf.	95
Bald. Loco. com.	51½ - 57⅜	Ry. Steel Spring com.	40 - 41½
Bald. Loco. pf.	93	Ry. Steel Spring pf.	88½
Beth. Steel com.	66¼ - 71¾	Republic com. ..	70½ - 74⅞
Beth. Sl., Class B	66½ - 71¾	Republic pf.	89 - 90½
Beth. Steel pf...	94 - 95	Sloss com.	33½ - 35
Case (J. I.) pf.	75	Superior Steel ..	33 - 36⅜
Cent. Fdry. com.	25½ - 26	Transue-Williams.	39
Cent. Fdry. pf...	35 - 38	Un. Alloy Steel 1st pf.	34½ - 35½
Chic. Pneu. Tool.	40 - 41	U. S. Pipe com.	10
Colo. Fuel	30⅞ - 34	U. S. Pipe pf.	42½
Cruc. Steel com..	45¾ - 50¾	U. S. Steel com..	79½ - 85⅞
Cruc. Steel pf...	83 - 84¾	U. S. Steel pf...	102¾ -104⅞
Deere & Co. pf.	93	Va.-I. C. & Coke.	47 - 48
Gen. Electric ...	118¾ -124⅝	Westingh. Elec..	34 - 36¼
Gt. No. Ore. Cert.	23⅛ - 24¾		
Gulf States Steel.	85		
Int. Har. of N. J. com.	105 -110¼		

Industrial Finance

The American Screw Co., quarterly, 1¾ per cent, extra 5 per cent and supplementary 4 per cent, all payable Dec. 31.

The American Shipbuilding Co., 1¾ per cent and extra 2½ per cent on the common, and quarterly 1¾ per cent on the preferred, payable Feb. 1.

The Babcock & Wilcox Co., quarterly, 2 per cent, payable Jan. 3.

The Billings & Spencer Co., quarterly, 2 per cent and extra 3 per cent, payable Jan. 2.

The E. W. Bliss Co., quarterly, 1¼ per cent and extra 11¼ per cent on the common and quarterly 2 per cent on the preferred, payable Dec. 31.

The Brier Hill Steel Co., quarterly, 1½ per cent and extra 3½ per cent on the common, and quarterly 1¾ per cent on the preferred, payable Jan. 1.

The Canadian Crocker-Wheeler Co., quarterly, 1¾ per cent and bonus of 3 per cent on the preferred, and quarterly 1¾ per cent on the preferred, payable Dec. 31.

The Carbon Steel Co., quarterly, 2 per cent and extra 2 per cent on the common, payable Dec. 22, 4 per cent on the first preferred, payable in March and 6 per cent on the second preferred, payable in July.

The Colorado Fuel & Iron Co., quarterly, ¾ per cent on the common, payable Jan. 25.

The Colt's Patent Fire Arms Mfg. Co., quarterly, $3, payable in January.

The Fairbanks, Morse Co., quarterly, 3 per cent on the common, payable Dec. 31.

The Howe Scale Co., quarterly, 1 per cent on the common and 1¾ per cent on the preferred, payable Jan. 2.

The Ingersoll-Rand Co., 10 per cent, payable Dec. 28.

Manning, Maxwell & Moore, Inc., quarterly, 1½ per cent, payable Jan. 2.

The Nova Scotia Steel & Coal Co., quarterly, 2½ per cent on the common and 2 per cent on the preferred, payable Jan. 15.

The Ohio Iron & Steel Co., extra 20 per cent, payable Jan. 1.

The Otis Elevator Co., quarterly, 1¼ per cent on the common and 1½ per cent on the preferred, payable Jan. 15.

The Standard Coupler Co., 4 per cent on the preferred, payable Dec. 24.

The Superior Steel Co., quarterly, 1½ per cent on the common, payable Feb. 1.

The Transue & Williams Steel Forging Co., quarterly, $1.25, payable Jan. 10.

The Trumbull Steel Co., quarterly, 1½ per cent and extra 4 per cent on the common, and 1¾ per cent on the preferred, payable Jan. 1.

American Brake Shoe & Foundry Co. Report

Contracts have been placed with the American Brake Shoe & Foundry Co. by the United States Government for machining 750,000 howitzer shells of 155 millimeter caliber, according to the annual report. The Government is to furnish the forgings, and the company is now remodeling its shell plant to enable it to execute the order. Net income of the company in the year ended Sept. 30 last amounted to $3,232,242, an increase of $1,604,935 over the year before. The foundry business of the corporation was greater than ever before, both in tonnage and the value of shipments. The actual profits were, however, not as large as those of the previous year, owing to the great advance in the cost of raw material and labor. Profits from the machining of shells for the British Government helped to increase the total income. In all, the company delivered 570,000 shells to Great Britain.

William G. Pearce, president of the company, in his remarks to the stockholders, tells how the company took up war contract work for the United States Government as follows:

"Early in February, 1917, we offered the output of our shell plants at Erie, Pa., to the United States Government on such terms as the Government itself on examination should consider proper. Thereafter negotiations were carried on with the representatives of the Government, and on Aug. 24, 1917, a contract was made for 3000 155-mm. howitzers. In accordance with the terms of the contract, a plant was to be erected by us at Erie, Pa., adjoining our shell plants. The building is at this date practically completed and much of the machinery is already in place. The Government is to furnish the principal forgings, and the company is to supply the remaining material and machine and assemble the howitzers.

"On Oct. 30, 1917, an order was given the company by the United States Government for machining 750,000 155-mm. howitzer shells. The Government is to furnish the forgings, copper bands and base covers. The company is now remodeling its shell plant to enable it to execute this order.

"The contracts referred to are in the form known as cost plus fixed profit. At their termination the Government has the right to remove at its expense all increased facilities which the Government has paid for in connection with the howitzer contract, and such additional equipment as it has paid for in connection with the shell contract."

Industrial Finance

Stockholders of the Liberty Steel Co., Warren, Ohio, have approved a proposed increase of $150,000 in common stock, making an authorized capital stock of $650,000 in common and $250,000 in preferred. A bond issue of $150,000 to be underwritten by Warren banks has also been authorized.

The Madison County Trust Co. has been appointed receiver for the Spring Steel Fence & Wire Co., Anderson, Ind. The company had $160,000 capital stock. On account of inability to obtain wire for fence making, the plant was able to operate only at intervals.

In order to take care of its increased business in automobile wheels, the National Wire Wheel Works, Inc., Geneva, N. Y., has recently increased its capital from $350,000 to $1,000,000. Additional buildings will be erected and the capacity of the plant will be increased to 2000 wheels per day.

The Wickwire Steel Co., River Road, Buffalo, has increased its capital from $3,000,000 to $8,000,000.

The Indiana Steel Co., Gary, Ind., has filed notice of increase in its capital from $20,000,000 to $50,000,000.

The Bethlehem Steel Corporation, in its statement submitted to the New York Stock Exchange, reports net earnings of $43,524,804 for the ten months ended Oct. 31, as compared with $61,717,309 for the calendar year 1916, and $24,821,408 for 1915.

Judge Gary Announces Additional Prices

(*Continued from page 1543*)

chromium and 0.18 per cent vanadium is specified, add 4c. per lb.

Titanium Steel: When titanium is specified, add 1.50c. per lb.

Rolling Mill Steel Castings

The following prices for rolling mill castings are subject to discounts shown below:

0.25c. per lb. under 750 tons per year, 0.45c. per lb. 750-2000 tons per year, 0.65c. per lb. 2000-7500 tons per year, 0.75c. per lb. over 7500 tons per year; except that annealing boxes and annealing bottoms, charging boxes and charging box heads and ends are subject to a discount of only 0.25c. per lb. when total requirements amount to less than 7500 tons, and only 0.35c. per lb. when total requirements amount to more than 7500 tons.

Rolls, Unfinished: $7.70 to $11.80 per 100 lb., depending on weight of castings required.

Usual extras to be added for carbon over 0.50 and other alloys.

Pinions, Unfinished: $8.05 to $13.55 per 100 lb., depending on weight of castings required.

Usual extras to be added for carbon over 0.50 and other alloys.

Annealing Boxes and Pots: $8.35 to $10.40 per 100 lb., depending on thickness.

Add: ¼c. per lb. when steam test is specified.

Annealing Bottoms: $6.80 to $7.60 per 100 lb., depending on inside length.

Charging Boxes: $7.45 per 100 lb.

Charging Box Heads and Ends: $8.60 to $9.65 per 100 lb., depending on weight, quantity and amount of core work.

Rolling Mill and Steel Works Miscellaneous, Not Otherwise Specified

$7.70 to $20 per 100 lb., depending on weight and intricacy of design.

Add 20 per cent to these prices for hollow and disk table rollers and cylinders.

Add 1c. per lb. for all castings with water circulating pipes.

Add ¼c. per lb. if carbon over 0.40 is specified.

Add for alloys, the usual extras.

Coupling Boxes, Spindles, Roll Housings, Pinion Housings and Anvil Blocks

$7.35 to $20.05 per 100 lb., depending on weight of castings required.

Gears, Gear Blanks, Gear Segments, Racks, Worms, Worm Wheels, Sprockets, Sheaves and Pulleys

$8.30 to $30.45 per 100 lb., depending on weight of castings required and intricacy of design.

Add ½c. per lb. when over 0.40 carbon is specified or when chemical or physical test is required.

Railroad motor gears and machine molded gears not covered by these prices.

For alloys, add usual extras.

Bells, Hoppers, Hopper Extensions, Lip Rings, Tuyere Jackets, Hot Metal or Slag Pots and Rings

$8.55 per 100 lb.

Valve Bodies, Tuyere Stocks, Pipes, Nozzles and Saddles

$9.35 to $12.10 per 100 lb., depending on weight of castings required.

Hearth Jackets or Bosh Plates

$7.65 to $7.70 per 100 lb., depending on weight of castings required.

Miscellaneous Blast Furnace Castings

$7.70 to $20 per 100 lb., depending on weight of castings required.

Add 1c. per lb. for all castings with water circulating pipes.

Add ¼c. per lb. if carbon over 0.40 is specified.

Add for alloys, the usual extras.

The foregoing schedules cover the castings named therein, in the rough, f.o.b. makers' works, with published freight rate allowed to freight station of purchaser to all points in the United States within a line drawn from Boston, through Schenectady, Rochester and Niagara Falls, N. Y., Detroit, Duluth, Minn., St. Louis, Cincinnati, Washington, Cape May, N. J., and all Atlantic Ocean terminal points between Cape May and Boston. When delivery is made outside of boundary line freight is allowed only to boundary line.

Body and Truck Bolsters of Ordinary Design for Freight Cars

$87.50 to $176 per car set, depending on weight of each and quantity ordered.

Tender Truck Bolsters of Ordinary Design

$3.50 per 100 lb.

Truck Side Frames for Freight Cars

$118.50 to $218 per car set, depending on weight each and quantity ordered.

Tender Truck Side Frames

$51 to $71 per frame when of ordinary design and without special features.

These prices on bolsters and side frames cover the integral casting only, without any detachable parts and without any drilling or machine work. An extra charge will be made for patterns when less than 100 castings are ordered from any one pattern.

These prices cover delivery f.o.b. cars at works of manufacturer with freight allowed at carload rate, to point on railroad line nearest the manufacturer's foundry or to any car or locomotive building plant located north of the Ohio River, east of the Mississippi River and west of the Hudson River, including Bettendorf, Iowa, St. Louis and St. Charles, Mo., Huntington, W. Va., and Curtis Bay, Md.

Couplers

The price of M. C. B. standard type top operating freight car couplers, without uncoupling chains, 5 in. x 5 in. shanks, with 6½ in. butt ends, will be $32.25 per pair; 5 in. x 7 in. shanks, with 6½ in. butt ends, $39.05 per pair; with proportionately increased price for larger sizes and extra parts.

The price of the M. C. B. type "D" coupler of regular dimensions, shanks, not more than 21¼ in. long, fitted with 9 in. face, knuckles and without chains, 6 in. x 8 in. shanks, with 6½ in. butt ends, will be $51 per pair; for 5 in. x 7 in. shanks, with 6½ in. butt ends, $50.20 per pair; with proportionately increased prices for other dimensions and extra parts.

The price of passenger car couplers of old M. C. B. standard type, measuring not more than 4 ft. from pulling face of knuckle, when closed, to end of shank, 9 in. face knuckles, will be $28.50 each, with proportionately increased prices for other dimensions and extra parts.

Short shank, swing head locomotive couplers and special tender couplers, old M. C. B. standard type, fitted with 11 in. face knuckles and without uncoupling chains, $23.80 each; new M. C. B. standard type "D" short shank, swing head locomotive couplers and special tender couplers, fitted with 11 in. face knuckles and without uncoupling chains, $31.30 each; with proportionately increased prices for special designs and extra parts.

These prices cover delivery f.o.b. cars at works of manufacturer with freight allowed, at carload rate, to point on railroad line nearest manufacturer's coupler foundry, or to any car or locomotive building plant located north of the Ohio River, east of the Mississippi River, and west of the Hudson River, including Bettendorf, Iowa, St. Louis and St. Charles, Mo., Huntington, W. Va., and Curtis Bay, Md. If the freight rate is advanced during the period in which these prices are effective, the amount of such advance will be added to the prices as given.

ALL THE ABOVE PRICES APPLY ONLY TO STEEL CASTINGS OF THE GENERAL TYPE, DESIGN OR SPECIFICATION MENTIONED. PRICES FOR SPECIAL DESIGNS OR SPECIFICATIONS WILL BE SUBJECT TO NEGOTIATION.

Standard Steel Cut Nails

Base—20d to 60d per 100 lb., f.o.b. Pittsburgh, $4.

Extras as follows:

	Extra
Common, Fence and Sheathing	
20d to 60d	Base
10d to 16d	$.05
8d and 9d	.10
6d and 7d	.20
4d and 5d	.30
3d	.45
2d	.75
Casing, Box, Flooring and Finishing	
10d and larger	.15
8d and 9d	.25
6d and 7d	.35
4d and 5d	.50
3d	.70
2d	1.00
Fine Finishing	
3 in. and larger	.25
2½ in. and 2¾ in.	.35
2 in. and 2¼ in.	.45
1¾ in.	.65
1½ in.	.65
1¼ in.	.85
1 in.	1.15
Fine Nails	
4d	.50
3d	.75
2d	1.00
3d Light	1.25
Cut Spikes	
All sizes	.10
Light Barrel and Lining	
1 in.	.85
⅞ in.	1.00
¾ in.	1.20
Common Barrel and Roofing	
1½ in.	.30
1⅜ in.	.40
1¼ in.	.50
1⅛ in.	.60
1 in.	.70
⅞ in.	.85
¾ in.	1.00
Slating	
6d	.30
4d and 5d	.40
3d	.60
2d	.80
Clinch and Boat	
3 in. and larger	.45
2½ in. and 2¾ in.	.55
2 in. and 2¼ in.	.65
1⅝ in. and 1⅞ in.	.75
1¼ in.	.95
1 in.	1.15
⅞ in.	1.30
¾ in.	1.45
Cooper	
10d	.05
8d	.10
6d and 7d	.20
4d and 5d	.30
3d	.50

Tin and galvanized nails subject to special negotiation.

AS SECRETARY DANIELS VIEWS IT

He Says Great Progress Has Been Made in Spite of Delays

WASHINGTON, Dec. 24.—That naval preparedness has reached a very satisfactory status was the encouraging statement made by Secretary Daniels at the initial meeting of the House Committee on Naval Affairs, instructed to investigate the administration of the Navy in the conduct of the war. The Secretary does not claim that the advance has been steady or that as much has been accomplished as could be desired, but that upon the whole the results will be very gratifying to the country at large. The detailed progress made as described in the Secretary's statement to the committee will be of special interest to all manufacturers engaged in the production of war supplies.

"At the beginning of this conflict," said Secretary Daniels, "two potent weapons of war sprang suddenly into being, the airplane and the submarine. There were no provisions in the military textbooks of a dozen years ago for either. There were no facilities in this country for their construction in any considerable numbers, nor any well-defined tactics for defense against their attacks.

"It is gratifying to recall that the first forces of the United States to land in France for service against the enemy were the United States naval aeronautic detachments, and that the first naval ships of our country to be engaged in active war duty were the patrol boats guarding against possible submarine attack on our own coast, and our destroyers effectively searching and sinking German submarines off the shores of Europe.

"That our great ships of war and their auxiliaries should be found ready in time of need for any possible duty under old methods of warfare was something which the country had a right to expect as a matter of course. That we should be ready with such speed to meet the new conditions of warfare with such promptness and such efficiency is, I think, a matter of some congratulation.

Aeronautic Progress Slow

"In previous reports to Congress I have expressed very frankly my belief that our aeronautic progress was not satisfactory. As a new branch of naval activity using a new war machine for a new purpose, this was not to be wondered at. I was glad to report this year that the Aviation Division had made gratifying strides. In this, as in all other matters of supplies for the Navy, we have been hampered by a lack of manufacturing facilities even for our own needs. To this has been added the necessity of providing an enormous development in aviation lines for the Army. Continuing the policy of being, so far as possible, self-sustaining, we have erected our own airplane manufactory at Philadelphia. Within 90 days of the beginning of the work on the buildings, the keel of the first naval flying boat was laid. At this factory, in addition to relieving other manufacturers for Army work, we hope to be able to conduct experimental developments without clogging the wheels of production, and from a business point of view the figures that we will obtain as to costs of airplane construction will go far toward solving many difficult problems of the adjustment of prices of articles of which there have been up to very recently so few manufactured.

"The problem of patrol boats for our own coast was another novel and perplexing question. The use of many small boats, some of them less than 100 feet over all, as actually important vessels of war was not contemplated up to a very short time ago. The possibility of their creation as an organized force has been a very recent addition to naval strategy. A hurried survey of the situation revealed that there were not enough suitable private craft to meet the demands of the situation and we were forced at the very first prospect of actual hostilities, and before war was declared, to undertake the construction of hundreds of small boats. All up and down our coast small-craft shipyards have been busy with this work. Our own navy yards are taking care of all that they could possibly find room for, and while not all of these craft have gone forward with the speed to be desired, we feel that this situation has been met with all the expedition that it was possible to use.

Increase in Ships

"We now have over 1000 ships, as against 300 in commission two years ago.

"To man these ships required an increase in personnel. I hope you will learn in detail of the splendid work of our recruiting bureaus, which indeed in the early stages of the war were almost oversuccessful in that we received men so rapidly as to make even temporary arrangements for their accommodation an exceedingly puzzling matter. We have expanded tremendously our naval stations and increased the number.

"To put a fleet into being requires ships, guns, ammunition, men, and provisions for the men. Our own mercantile marine, unfortunately, unlike that of Great Britain, was not large enough to have created for its own purposes these enormous shipbuilding facilities which have made this particular problem comparatively easy for our allies. In fact, the shipbuilding resources of our country were so small as to make the carrying out of our new naval program impossible without additions to the private yards as well as to our navy yards themselves. From this you will understand the difficulties of enormously adding to this construction and at the same time affording every possible facility for the building of cargo-carrying vessels in undreamed of quantities.

"When new requirements of naval warfare made evident the necessity of building a very large number of additional destroyers, there was literally not a vacant ways to hold them in the country. Speed was everything, as indeed speed is to-day the greatest necessity of the war. Not only were there no ways for the ships, and in many cases no ground in the shipyards to build such ways, but there were not, to take one single instance, enough forge plants in the United States to forge their shafts and propelling machinery, without suspending the arming of our troops. You will learn later on more in detail as to how this problem has been met, of how keels are being laid to-day on ground that was a swamp land a few months ago, of how the finishing touches are being put on extensions to forge plants, which in some cases are as large or larger than the original plants themselves, of how every manufacturer who could make anything needed for a destroyer, always keeping in mind the imperative immediate needs of our sister military branch, has been set to work on this task.

Delays Are Admitted

"Of course, not everything has run with perfect smoothness; there have been delays. You cannot make a tremendous demand of this kind on a comparatively small industry without upsetting many things, without completely disorganizing the usual peaceful routine of business. It has not always been easy to get the necessity for speed, speed, speed into the heads of the contractors, but, on the whole, we think that we have done well. We hope that you will agree with us.

"New methods of contracting have been demanded and, fortunately, Congress in its wisdom gave the necessary latitude to speed up construction. For early construction ashore and to hasten construction of ships, it has been necessary in some instances to make contracts on a cost plus 10 per cent basis. Frankly, I do not like such contracts and never make them where it is possible to do otherwise. Of 496 contracts for work on shore, only 62 were on the percentage basis.

"This method is not perfect, nor has it been entirely satisfactory. There are many involved problems in cost accounting, and there will doubtless be many questions to be settled when the final bills are paid, but it has been our judgment that it was the only way to start immediate construction in emergencies which confronted

us. By this plan, shipbuilders are insured against financial loss, and the Government is assured against abnormal profits which would have to be added to the already heavy burdens which the war has placed upon every taxpayer of our country.

"To expand many private plants to more than double their original capacity is an order easy to give. For the manufacturer to find in war time the immediate capital necessary for this development has proved a hard matter. Congress has recognized this by a wise provision permitting us to advance the funds for this expansion work. We have tried to use this power most conservatively, but we have not hesitated to use it when it was the only way to get quick results. In no case, however, do I think you will find that such funds have been advanced without perfect security that the Government will eventually get its money's worth. Bonds have been required or the title to the machinery paid for with these funds has been retained by the Government until repayment is made."

Organizing Industries for War Work

The Merchants and Manufacturers' Association, Baltimore, Md., through its committee on manufactures, has started an organization of large and small plants, with the view of helping all of them in war work. It is pointed out by the committee that because of trade conditions the manufacturers should organize along well-defined lines. All factories, large and small, have been requested to send the following information to the association:

1. What the factory is making now.
2. Capacity of plant—that is, volume of output.
3. Suggestions as to what factory can make—other than to the normal product—in the form of complete commodities or as a "part" of some commodity manufactured in another plant.
4. Lines of work to which labor is adaptable by virtue of the skill and experience required in present factory.
5. Average number of employees in factory; capacity for quick deliveries.
6. Size of buildings and details as to machinery in factory.
7. Nature of raw material now in use.
8. Is raw material easily and quickly obtained?
9. Number of years in business.
10. Present capital of plant.

The committee says that it is more than likely that the Government, in the future awarding of war contracts, will deal with industries as a whole, rather than with industries considered locally or individually. For this reason, it is stated, it will be wise for the factories to organize themselves in industrial groups in order to be prepared to meet the new policy on the part of the Government.

It is further pointed out that small concerns should participate in the organization because they may secure contracts for the manufacture of parts which otherwise would be unobtainable.

"The Government, for war reasons," says a notice sent out by the committee, "is certain to enforce a system of priorities in the matter of fuel and raw material, which system is likely to place small factories at a disadvantage if they are not engaged directly in the fabrication of some specific 'war items.'"

The Austin Co., Cleveland, has recently taken the following additional contracts for industrial buildings: One story and basement building, 200 x 260 ft., for the Selden Motor Co., Rochester, N. Y., for the manufacture of trucks; $200,000 Government arsenal, 200 x 400 ft., at Fortieth and Butler streets, Pittsburgh, Pa.; four-story reinforced concrete structure, 80 x 140 ft., for the Liggett & Myers Tobacco Co., Huntington, W. Va., and a shipping building, 52 x 183 ft., for the Brown Hoisting Machinery Co., Cleveland. This company has just completed a building 100 x 117 ft., for the Dow Chemical Co., Midland, Mich., and is erecting the steel work for another building for the same company.

MANGANESE ORE IN 1917

Domestic Output May Reach 200,000 Tons in 1918—Low Grade Ore in Blast Furnaces

WASHINGTON, Dec. 24.—The great practical importance of the domestic output of manganese is now such that the U. S. Geological Survey is collecting statistics every three months. In a bulletin just issued it is stated that the canvass for the quarter ending October 31 has just been completed and shows a large increase in the number of shippers, as well as in the shipments of ore of each grade over those of the first six months of the year, which were slightly larger than those of the entire year 1916.

In 1916 only 26,996 gross tons of manganese ore was shipped by 55 operators, but in the first nine months of the present year 70,225 tons was shipped by 88 operators. The reports received by the Survey indicate that the shipments for the year will be about 122,275 tons, which will be nearly four times those for any preceding year. In September the production of high-grade ore was about 14,000 tons, and in November it was nearly 17,000 tons. The results of the inquiries made in most of the fields by the Survey indicate that the shipments in 1918 will be between 175,000 and 200,000 tons, sufficient to supply nearly one-third of the present demand of the steel industry. For about every 20,000 tons that can be produced in excess of the present domestic output it will be possible to release one ship that is now bringing ore from Brazil.

Manganiferous Ore for Spiegeleisen

Of manganiferous ores containing 15 to 40 per cent of manganese, 380,169 tons was shipped during the first nine months of 1917 by 58 operators against 176,130 tons shipped by 41 operators in the entire year of 1916. Most of this ore was used to make spiegeleisen. Of ores containing 5 to 15 per cent of manganese, 424,438 tons was shipped by 14 operators during the first nine months of 1917, against 372,673 tons shipped by 26 operators during the year 1916. A part of this ore was used to make spiegeleisen, and the remainder was smelted with iron ore to make high-manganese pig iron. The number of shippers given above does not include those of the Leadville district, Colo.

The great increase in the shipments of high-grade ore from Western States is noteworthy, particularly from Montana, Arizona, California, Utah, and Nevada. The prices now offered are causing prospectors in these States to search closely for ores, and many western mines are now shipping manganese ore that was left undisturbed in explorations made years ago. The Philipsburg district, in Montana, shipped about 7000 tons of high-grade ore during each month of the third quarter of 1917, and the Tombstone and Bisbee districts, in Arizona, are shipping large quantities of such ore. The rate of production of Virginia and Tennessee is increasing, but that of Arkansas and Georgia is not much larger than in 1916.

As recently as 1915 there was only a small market for ores containing less than 40 per cent of manganese, so that the large increase in shipments of low-grade ore during 1917 is striking. The production of these ores now appears to be limited more by the market than by the capacity of the mines.

The British Government has cancelled its contract with the New England Westinghouse Co., Springfield and Chicopee Falls, Mass., for 1,800,000 Moissen-Nagent rifles for Russia, due to the present unsettled conditions in Russia. The contract was about half filled. Officials have stated that negotiations are pending with the United States Government for a contract to make the new Browning machine gun, and officials are confident that an early order will be secured so that the working forces of the plants at Chicopee Falls and East Springfield will not disintegrate. The present force will be employed for some time longer completing Russian rifles now in process.

Machinery Markets and News of the Works

WAR BUYING STILL ACTIVE

Detroit Center of Latest Developments

Opinion Prevails Among Machine-Tool Men That Large Demands Will Come After First of New Year

With new machine-tool demand in the East quieter than for some months, the center of activity is now around Detroit and Cleveland, where many Government contracts are being placed. New England manufacturers are also coming into the market again for tools for Government work. A pronounced feature of the present situation is the number of so-called non-essential industries which are taking on war orders, automobile manufacturers, in particular, being called upon for various products, principally shells and airplane engines.

Machine-tool men believe that the present inquiry in Washington by the United States Senate will develop more efficient methods in Government departments, with the closing up of many war contracts now pending. It is expected that another avalanche of large lists for machine tools will come after the first of the new year. Machine-tool builders are wondering where all the tools are to come from. Deliveries on all tools needed for war work are in the worst condition yet known.

In the New York market there was no great activity last week, as compared with what the trade has been accustomed to expect in these times. A list of about 70 tools wanted for export to a munitions plant in France was issued by the Framerican Industrial Development Corporation, 44 Whitehall Street, New York. The International Arms & Fuze Co., Inc., Bloomfield, N. J., has taken a Government contract for detonators. The Watervliet Arsenal continues to buy. The Government is expected to buy soon for the General Vehicle Co. plant at Long Island City, which it recently purchased for an experimental station.

The Liberty Steel Products Co., Woolworth Building, will buy plate and angle shop equipment for the Foundation Co.'s shipyard. The Southern Shipbuilding Co., 17 Battery Place, will buy soon for its new shipyard at Charleston, S. C. The Chickasaw Shipbuilding Co., a subsidiary of the United States Steel Corporation, will buy equipment soon for its shipyard near Mobile, Ala. All of the fabricating for this plant will be done at Birmingham.

The magnitude of our war preparations is illustrated by the activity at the new Hammond, Ind., plant of the Standard Steel Car Co., where a hotel and 150 houses will be built to house workmen. This company has issued large lists of tools to be bought for making howitzer mounts. Orders will be placed largely in the East. It is understood this company's contract totals $60,000,000. Another large list will be issued by the Rock Island Arsenal if certain changes are made in recoil mechanisms for large guns. The newer design would require a number of arc-planing machines.

Several large war contracts have been placed with New England manufacturers. The S. A. Woods Machine Co., Boston, will make 2,000,000 trench mortar bombs and has purchased 40 turret lathes and several drilling machines. The American Steam Gauge & Valve Mfg. Co., Boston, has a contract for 2,000,000 detonators. The Amesbury Brass & Foundry Co., Amesbury, Mass., has Government contracts and is expected to buy tools. New England manufacturers of textile machinery are being urged to accept war contracts. The Howard & Bullough American Machine Co., Ltd., with plant at Pawtucket, R. I., will, it is reported, manufacture gun mounts. Other companies similarly equipped are expected to undertake war work and thus be rated as essential industries.

The Morgan Engineering Co., Alliance, Ohio, appears as the largest buyer of machine tools in the Cleveland market. Its list calls for about 200 lathes and other machines for work on a gun carriage order. The Templars Motor Corporation, Cleveland, is still buying equipment for machining 150,000 6-in. shells. A Canton, Ohio, company is in the market for 12 drilling machines.

Detroit is now the center of an important war activity. Motor companies, having decided to curtail automobile production, are quick to take up munition contracts. The newly organized Detroit Shell Co., with a capitalization of $2,000,000, has received shell contracts aggregating $30,000,000 and is soon to decide on a plant for manufacturing. Considerable new equipment will probably be purchased. The General Motors Corporation has taken a contract for 5000 Liberty motors, and this work will be distributed among the Cadillac, Northway, Buick and Chevrolet plants. The Harroun Motor Co., Detroit, has taken a large contract for 6-in. shells.

Prominent manufacturers of Cincinnati are co-operating in a plan to establish a large munitions plant in that city. Definite action is expected after the holidays. A tentative option has been taken on a plant now in operation.

New York

NEW YORK, Dec. 24.

A little better inquiry for small lots of machine tools was noted by dealers and factory representatives last week than during the preceding week. Large lists are scarce, though there are rumors in the market of impending inquiries which will reach good-sized proportions.

The opinion was expressed that the United States Senate inquiry into affairs in the War Department, Navy Department and Shipping Board will stir up increased activity, which should be reflected soon after the first of the new year in a renewal of large inquiries. The testimony of General Crozier that the Ordnance Department is still trying to place many large contracts was pointed to as an indication that machine-tool builders will have to meet another avalanche of orders within the near future.

There is a little more buying activity among shipbuilders. The Liberty Steel Products Co., Woolworth Building, New York, is in the market for plate and angle shop equipment for the Foundation Co. The list is not a large one. The Southern Shipbuilding Co., largely owned by Whittlesey & Whittlesey, 17 Battery Place, New York, will buy equipment shortly for its new plant at Charleston, S. C. The Chickasaw Shipbuilding Co., a subsidiary of the United States Steel Corporation, will soon begin to equip its plant near Mobile, Ala. All of the fabricating for this yard will be done at Birmingham, Ala., by the Tennessee Coal, Iron & Railroad Co.

The Watervliet Arsenal continues to buy, having closed last week for 18 grinders. It is expected in the trade that the Government will soon begin to buy for the General Vehicle Co. plant at Long Island City, which it recently purchased.

The Framerican Industrial Development Corporation, 44 Whitehall Street, New York, has issued a list of tools needed for a munition plant in France. About 70 tools, mostly milling machines, are wanted. The International Arms & Fuze Co., Inc., Bloomfield, N. J., has taken a detonator contract.

Machine-tool builders are giving almost their whole at-

tention to production and shipment as orders are almost taking care of themselves. Serious congestion of shipments from New England plants is reported. Many of these plants have orders for tools for England and France, shipments of which the railroads will not accept on account of present congestion at the seaboard.

A manufacturer of electric motors writes to THE IRON AGE stating that it has a large stock of motors on hand for immediate shipment and deliveries on types which are not in stock are to be had in periods ranging from 60 days to 28 weeks.

Complaint has been raised officially against the slow methods of various Government departments in meeting their bills, this having worked serious hardship to machine-tool builders and dealers. The National Supply & Machinery Dealers' Association is conducting an investigation among its members to determine just how serious the situation is. The matter will be brought to the attention of the War Industries Board, the Navy Department and the War Department to obtain, if possible, acceleration of payments.

V. Dauriac, 31 Rue de Lasseppe, Bordeaux, France, is in the market for machine tools, soft steel plates and soft round iron or steel. The machines he wants are listed as follows:

One lathe which can take a plate 1.2 m. length of the bed, useful length of gap 350 mms.

One shaper 400 mms. travel.

One gear cutting machine, greatest diameter 750 mms.

One bending machine 2 meters passage greatest thickness of the plate 3 mms.

15 to 20 automatic planers, minimum travel 1 m., up to X.

Ricardo Mateos Garcia, 92 Fuencarral, Madrid, Spain, has sent an inquiry to agents in this country for the following machines: A machine group for making brass screws with a maximum length of 30 mm., and maximum thickness of 4 mm., the group to be automatic and made up of a machine for making a head plain form or heavy round and one for splitting the head of the screws, that is to say, making the screw driver catch; an automatic machine for stamping pieces of a maximum diam. of 35 to 40 mm.; machine for stamping pieces of brass with a diam. not greater than 100 mm.; machine for pressing by hand and stamping small pieces. He is also interested in a complete plan for polishing and nickel-plating the above mentioned pieces. Correspondence should be in Spanish.

Buffalo

BUFFALO, Dec. 24.

The Sanford Motor Truck Co., 107 St. Marks Avenue, Syracuse, has awarded contract for a one-story plant on West Fayette Street to cost about $9,000.

The Buffalo Foundry & Machine Co., Fillmore Avenue, Buffalo, will build a one-story extension, 20 x 80 ft.

The Automatic Transportation Co., 2933 Main Street, Buffalo, is planning the construction of a two-story factory on Main Street to cost about $45,000.

The Foster Specialty Co., Buffalo, has leased a building at 87 Brayton Street, 70 x 80 ft., for a new brass foundry.

The Cutler Desk Co., 20 Churchill Street, Buffalo, will erect a two-story building, 50 x 150 ft., on Amherst Street, to cost about $20,000.

The Eastern Monolithic Casket Co., Buffalo, has acquired property at Downing Street and South Park Avenue as site for a waterproof casket factory to cost about $25,000. The company is also considering the establishment of other branch factories. William Hurley is president.

The Buffalo Engine Co., Buffalo, has acquired a two-story building with about 15,000 sq. ft. of floor space on Superior Street which it will equip.

The Erie Pump & Engineering Co., Erie, Pa., has been incorporated with a nominal capital of $5,000 to manufacture pumps, etc. W. N. Seitz, Erie, is the principal incorporator.

The Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., has increased its capital from $500,000 to $1,000,000.

The Gleason Works, University Avenue, Rochester, manufacturer of gears and gear-cutters, has filed plans for a one-story foundry addition, 73 x 80 ft., to cost $12,000.

The High Speed Hammer Co., Rochester, has been incorporated with a capital of $50,000 by L. D. Mahoney, F. W. Weeks and R. C. Schaefer.

The Carrib Service Mfg. Corporation, Rochester, has been incorporated by C. H. Schaumann, P. C. Birr and A. M. Weller with a capitalization of $50,000 to manufacture office supplies and appliances.

The Archbold Brady Co., Syracuse, N. Y., manufacturer of poles, has completed plans for a factory which it will erect on Greenway Avenue.

New England

BOSTON, Dec. 24.

The aggregate of machine tool purchases continues at the same high level of the last two months. The buying is very much scattered and is largely directly due to increased activity of munitions plants. The business of the tool shops is again becoming a feature of the market and the call for tool room sizes and kinds of machine tools is eating into the stocks on hand.

Labor is scarcer than ever and the unrest of the past months has greatly decreased. The coal shortage is acute, but some measure of relief is expected immediately and the campaign for coal conservation is taking substantial form. In many places there will be an extended shutdown over the holidays, which will mean a considerable saving.

The General Electric Co. is to build two factories, 67 x 340 ft., two stories, and 23 x 59 ft., one story, and a two-story office building, 60 x 140 ft, at its River works, Lynn, Mass.

The Framingham Foundries, Boston, has been incorporated with authorized capital stock of $350,000. Fisher H. Nesmith is president and Alexander G. Grant, 84 State Street, treasurer.

The Osgood Bradley Car Co., Worcester, Mass., is erecting a two-story office building, 40 x 55 ft.

The Deane Machine Co., Fitchburg, Mass., has been incorporated with authorized capital stock of $50,000. John M. Graves is president and Alfred P. Cate, 470 Main Street, treasurer.

The Sterling Motor Car Co., Brockton, Mass., is having plans drawn for a one and two-story addition, 100 x 100 ft.

The Liberty Shipbuilding Co., Boston, has been incorporated with authorized capital stock of $500,000. William J. McDonald is president and Max Shoolman, 372 Chestnut Hill, treasurer.

The Gile Marine Engine Co., Congress Street, Boston, is erecting an office building at its plant on Middlesex Avenue, Somerville.

The Liberty Screw Co., Worcester, Mass., has been incorporated with authorized capital stock of $10,000. A. J. Booth is president and Walter C. Rice, treasurer.

The East Deering Foundry Co., Portland, Me., has been incorporated with authorized capital stock of $10,000. George R. Thomas is president and Charles E. Noyes, treasurer.

The Greenfield Tap & Die Co., Greenfield, Mass., is moving its offices from the old quarters in the Wells Brothers and the Wiley & Russell divisions to its new office building on Sanderson Street. A new restaurant and stores building will also soon be put into use.

The American Tool Co., Meriden, Conn., has been incorporated with authorized capital stock of $10,000 by Harry Parker, Harry C. Weston and Ernest A. Winkel. It will begin business with $2,525.

The Brown-Wales Co., Boston, steel and steel products, contemplates the erection of a machine shop.

George A. Leighton, Manchester, N. H., has awarded a contract for a one-story addition, 58 x 80 ft., to his foundry.

The Warren F. Fraser Co., Westboro, Mass., has awarded a contract for an addition. The company is very busy on grinding machines.

Philadelphia

PHILADELPHIA, Dec. 24.

The machine shop to be erected by the Philadelphia & Reading Railroad at its Erie Avenue yards in Philadelphia will be steel, brick and reinforced concrete, one story, 156 x 216 ft. A 16-stall engine house will also be constructed. The structures will cost about $323,500.

Maris Brothers, Fifty-sixth Street and Gray's Avenue, Philadelphia, manufacturers of machinery, will soon commence the erection of a one-story machine shop addition, 30 x 40 ft., to cost $10,000.

The Navy Department, Washington, has completed a new plant at the Philadelphia Navy Yard for the manufacture of airplanes. It covers about 3 acres and has cost $1,000,000. A call has been issued for 2000 skilled workmen for initial activities. The plant will include machine work, coppersmithing, sheet-metal working, pattern making, welding, tubing, wire working and joinery.

The Hulton Printing Processing & Dyeing Co., 3851 Frankford Avenue, Philadelphia, will build a one-story machine shop, 68 x 140 ft., at Valetta and Coral streets.

The Bureau of Yards and Docks, Navy Department, Washington, has awarded contract for a one-story ammunition box repair plant at Fort Mifflin, Philadelphia, to cost $50,000.

A one-story power house to cost about $10,000 will be constructed by the Wallace Co., Philadelphia, at Island Road and Eighty-first Street.

The Merchant & Evans Co., 517 Arch Street, Philadelphia, manufacturer of brass and bronze products, cornices, ventilators, etc., has filed plans for an addition to its machine shop at 2025 Washington Avenue, to cost $18,500.

The Philadelphia & Reading Railroad, Philadelphia, is taking bids for a power house at Skillman, N. J. Samuel T. Wagner is engineer.

The New York Shipbuilding Co., Camden, N. J., has awarded contract to Fraser, Brace & Co., 1328 Broadway, New York, for a two-story brick and steel machine shop, 78 x 200 ft., to cost $30,000.

The Blaisdell Pencil Co., Camden, N. J., has been incorporated with a capital of $500,000 to manufacture pencils, etc. Charles Kropp, Trenton; F. A. Cigal, Little Falls, N. J., and Stuart H. Heist, Center Square, Pa., are the incorporators.

The Skillman Co., Trenton, has been incorporated with a capital of $125,000 to manufacture hardware. William C. Wherry, Jacob Bohnenberger and John C. Shuster are the incorporators.

The Lycoming Foundry & Machine Co., Oliver and High streets, Williamsport, Pa., manufacturer of gas and gasoline engines, etc., is negotiating for property to permit the construction of a foundry addition at its works.

Peter Frey, State Street, Wilkes-Barre, Pa., has had plans prepared for a one-story forge and blacksmith works, 40 x 80 ft.. on State Street.

The Wilmot Engineering Co., Hazleton, Pa., manufacturer of iron and steel castings, coal mining machinery, breakers, etc., has had plans prepared for additions to its plant at White Haven, to include a machine shop, pattern shop and power station. George W. Wilmot is president.

The foundry and iron works of the William F. Remppis Co., Spruce and Mifflin streets, Reading, Pa., on property 100 x 400 ft.. has been acquired by Ferdinand Thun for $33,000. Mr. Thun and associates have recently incorporated the William F. Remppis Iron Works with capital of $50,000, and propose to operate the plant. William F. Remppis and Lambert A. Rehr, Reading, are also interested in the new company.

The Champion Blower & Forge Co., Harrisburg Avenue and Charlotte Street, Lancaster, Pa., has filed plans for an extension to its assembling works, 50 x 100 ft.

The Belmont Motors Corporation, Harrisburg, Pa., is planning for the erection of a new plant at Lewistown. The local board of trade is arranging for a site. G. G. Gochnaur is president.

The Jeansville Iron Works, Hazleton, Pa., will soon commence the erection of another extension to its plant.

The proposed new carbon works at Scranton, Pa., of the National Carbon Co., Cleveland, will be located on North Washington Avenue, and is expected at the start to give employment to about 50 hands.

Baltimore

BALTIMORE, Dec. 24.

The Mann Shipbuilding Co., Light Street, Baltimore, is having plans prepared for a shipbuilding plant on Curtis Bay to cost about $100,000. W. B. Mann is president.

The Henry Smith & Sons Co., East German Street, Baltimore, has acquired a site, 170 x 245 ft., at Donaldson, Race and Clarkson streets for extensions to its shipbuilding plant.

The T. A. Gillespie Loading Co., Dover, Del., has been incorporated with a capital of $2,000,000 to operate a machine shop and foundry business. L. B. Phillips and J. B. Bailey, Dover, are the incorporators.

The Penn-Seaboard Steel Corporation, New Castle, Del., has completed plans for a one-story foundry, 90 x 380 ft.. to cost $100,000. Headquarters of the company are in the Franklin Building, Philadelphia.

The Bureau of Yards and Docks, Navy Department, Washington, has taken bids for a five-story optical shop at the Washington Navy Yard.

The Atlantic Coast Line Railroad, Wilmington, N. C., has commenced the erection of an engine repair shop to cost about $10,000.

The International Navigation Co., Wilmington, N. C., has acquired about 600 acres of property on the Cape Fear River for a new shipbuilding plant. W. H. Garland is president.

The Southern Shipbuilding Co., Mt. Pleasant, S. C., recently incorporated, is planning the construction of a plant to specialize in the building of steel freighters up to 7500 tons capacity. H. N. Whittelsey is president and W. E. Allen, vice-president.

Chicago

CHICAGO, Dec. 24.

The Standard Steel Car Co., which recently placed orders for tools to be delivered to its Hammond, Ind., plant, is in the market for a much larger number, most of which will be placed in the East. The company's war order is said to total $60,000,000. It will build a hotel and 150 houses to accommodate additional employees. Another large list will probably be forthcoming from the Rock Island Arsenal if it is determined to make certain changes in recoil mechanisms. The newer design, if adopted, will require a number of arc-planing machines.

Deliveries on tools in demand for war purposes are worse than they have been at any time heretofore, and an ordinary industrial buyer cannot place one order. On the other hand, small machines of various kinds, especially lathes, are easily obtainable for immediate shipment.

The shortage of coal, especially in Michigan, has caused several metal-working plants to go on shorter hours. Several companies in Muskegon which depend for power on a public service company have been unable to get sufficient current because the electric company could not get enough coal. Several of these plants have war orders, but have had to curtail operations, some going on a 7-hr. day. It is probable that the situation will soon be relieved by the diversion of coal from non-essential to essential manufacturers.

The International Shipbuilding Co., Orange, Tex., has placed an order with the Abell-Howe Co., Chicago, for seven 3-ton hoists with a lift of 60 ft., making 10 placed with that company.

E. I. du Pont de Nemours & Co. have taken over land having a frontage of 639 ft. on the north branch of the Chicago River, and it is understood that a four-story fireproof factory will be erected at an early date. The product of the plant has not been announced, but there is talk of making dyes.

J. L. Carnegie & Son, 189 West Madison Street, Chicago, have been awarded the general contract for a one-story factory, 125 x 152 ft., 48 x 148 ft. and 25 x 75 ft. at Fulton and Leavitte streets for George P. Nichols & Brother, manufacturers of railroad machinery, now at 614 South Canal Street. The new plant will cost about $50,000.

The Dakota Sales Co. has been organized in Bismarck, N. D., with a capital stock of $25,000 to manufacture grain cleaning machinery. with offices and a factory in the building formerly occupied by the Capital Motor Co., Bismarck. The directors are C. Williams, H. L. Stegner and C. C. Putnam.

The Liberty System Co., Edwardsville, Ill., will establish a factory for the manufacture of automatic accounting machines and will temporarily occupy the building of the Elder Mfg. Co. The company is headed by Samuel F. Lloyd, auditor of the N. O. Nelson Co., Edwardsville.

The Indiana Air-Craft & Mfg. Co., Indianapolis, has been incorporated to manufacture airplanes and automobiles. The directors are Lewis Wallace, George H. Cottrell, A. B. Jennings, Joseph T. Markey and Albert D. Johnson.

The machine shop of the Graver Tank Works, East Chicago, Ind., was destroyed by fire Dec. 15, causing a loss of $50,000. The plant was working on Government shipbuilding contracts.

Milwaukee

MILWAUKEE, Dec. 24.

The demand for machine-tools the past week or 10 days has shown considerable acceleration. While no large lists have come to light, it is known that many shop-owners are looking for small lots to enable them to handle sub-contracts for which their existing equipment is only partly suitable. The aggregate of such requirements is quite formidable.

Manufacturers of machine-tools, especially milling machines, continue to receive orders in large numbers and pressure upon their facilities increases from day to day. The urgency of demand is also very strong, but no relief in deliveries is looked for.

Although the high cost of equipment has long discouraged the development of electric light and power plant projects, both steam and hydroelectric, one contract of unusual size for equipment for a large hydroelectric installation in Wisconsin was placed the past week.

The Wisconsin Duplex Automobile Co., Clintonville, Wis., will locate its plant at Oshkosh, Wis. Details have not been completed, but the company will build a factory and shop group if no suitable buildings are available.

The Jackson Milling Co., Stevens Point, Wis., owned by the Mead-Witter Co., Grand Rapids, Wis., has awarded a contract to the Allis-Chalmers Mfg. Co., Milwaukee, for the equipment required for a new hydroelectric plant on the

Wisconsin River at Stevens Point, to cost about $500,000 complete. The equipment will consist of six 950-hp. vertical open-flue hydraulic turbines, direct-connected to six 800 kva., 60-cycle, alternating current motors with governors, and two 200-kw. motor-generator sets.

The Hoehne Machine Works, Kaukauna, Wis., has been incorporated with a capital stock of $35,000 to succeed to the partnership of the same name formerly known as Hoehne & Knitter, founders and machinists, Kaukauna. The officers are: President, Fred Hoehne; vice-president, Herman Hoehne; secretary and treasurer, W. M. Hoehne.

The Young Patent Hoist Co., Milwaukee, manufacturer of hoisting devices for motor truck dump bodies and other purposes, has moved its plant from Clinton and Virginia streets to 35 Twenty-fifth Street, where greatly enlarged facilities are available and the output will be materially increased. Edward R. Bacon is general manager.

The Reliance Motor Truck Co., Racine, Wis., has engaged A. Arthur Guilbert, architect, Racine, to prepare plans for its new plant at Appleton, Wis., to be erected early in 1918. Details have been modified to provide for a larger initial unit, which will be 75 x 300 ft., one-story, with sawtooth roof of reinforced concrete, steel and brick construction. Bids will be taken about Jan. 15 and it is hoped to have the plant ready for operations within 60 or 70 days thereafter. Considerable equipment is being purchased. Ira L. Miller is president and Charles H. Piggins, general manager.

The Highway Trailer Co., Edgerton, Wis., has leased a building adjoining its plant in order to provide capacity for the execution of a Government contract for army trailers and airplane transportation trucks. No considerable amount of new equipment will be purchased, although the company is buying small lists from time to time. James W. Menhall is president.

The Girnan & Sons Co., Eau Claire, Wis., vehicle manufacturer, is planning to build a new factory, garage and machine-shop, 45 x 75 x 150 ft., two stories, costing about $25,000.

The W. S. Seaman Co., 480 Virginia Street, Milwaukee, manufacturer of automobile bodies, telephone booths, etc., has increased its capital stock from $50,000 to $100,000 to accommodate the growth of its business. A branch factory recently was established at 233-257 Clinton Street. Irving Seaman is secretary.

The Electric Farm & Lighting Power Co., Antigo, Wis., has been incorporated with a capital stock of $25,000 to manufacture individual or isolated light and power plants and systems and other electrical equipment. The incorporators are R. P. Brown, John H. Walechka and J. T. Brown.

The Wisconsin Aluminum Foundry Co., Manitowoc, Wis., has received a proposition from the Advancement Association, Rice Lake, Wis., to establish a branch plant in that city. The Wisconsin company has been overcrowded for some time and is contemplating additions. Two large contracts for castings have just been booked which will require overtime operations for four to five months.

The United States Gearshift Co., Eau Claire, Wis., which recently awarded contracts for the erection of a four story machine shop and foundry, 65 x 80 ft., has engaged Edward Hutchens, 866 Superior Street, Milwaukee, as consulting mechanical and structural engineer. Specifications for equipment are now being completed. L. A. Laursen is secretary and general manager.

The Horizontal Hydraulic Hoist & Body Co., Milwaukee, has been incorporated with a capital stock of $50,000 by Edward R. Bacon, Benjamin A. Rees and Charles F. Millmann to manufacture hydraulic hoisting devices and complete dump bodies for motor trucks. Details will be announced later.

Detroit

DETROIT, Dec. 24.

The demand for machine tools is unusually strong. Practically all orders are directly or indirectly for the manufacture of munitions. High-grade machines especially of the heavier variety are consequently being ordered in large numbers. This demand is so great that deliveries are placed from three to five months ahead and dealers anticipate no improvement until it abates. Many of the larger factories face a shutdown due to lack of coal. The Ford Motor Co. has been working on a day to day basis. Temporary alleviation of the situation resulted from the receipt of several hundred carloads of coal the latter part of last week, but the condition is still very serious. The large manufacturers are badly handicapped by the impossibility of securing expert workmen.

The Detroit Shell Co., Detroit, Mich., which was recently incorporated with a capital stock of $2,000,000 to make shells, has acquired the plant of the Springfield Body Co., and is expected to place orders for shell making equipment shortly. John Kelsey of the Kelsey Wheel Co., is president and several other men associated with the Detroit automobile industry are interested.

The Ford Tractor Co. is working on an order of 6000 to 7000 tractors for England, and it is stated France has been notified that it can be furnished with 12,000. Tests are being made and indications are that the plant will be running to capacity constantly.

The Marquette Motor Works, Saginaw, Mich., which has been idle for years, will be opened about Jan. 1 by the General Motors Co. with a working force of between 1000 and 1500 for turning out war material. Much special machinery will be required to re-equip it and workmen are now preparing to install machinery.

The Industrial Works, Bay City, Mich., is spending about $50,000 for additions and improvements in its plant to take care of Government orders for cranes, including an addition to the foundry.

The plant of the Fulton Mfg. Co., Bay City, Mich., which recently failed, has been purchased by W. F. Jennison, who plans to re-open and continue it as a wood-working shop.

The W. J. Baird Machinery Co., Detroit, has moved from 56 Jefferson Avenue to a building on the corner of Jefferson and Brush Streets.

The Detroit Furniture Mfg. Co., Detroit, suffered a loss of about $20,000 by fire last week.

The Kolby Wheel Co. of Utah, manufacturer of a resilient wheel with air cushion at the hub, will locate in Detroit as soon as a desirable place is found. Ernest Hall is interested in the company and has been largely instrumental in inducing the officials to move to Detroit.

The Michigan Drop Forge Co., Pontiac, Mich., has increased its capitalization to take on Government work.

The Truman M. Smith Machine Co., Grand Rapids, Mich., has been incorporated with a capital stock of $60,000. The incorporators are T. M. Smith, Jr., I. Preston Rice and Gerald McCoy.

The Grand Rapids Salvage Co., Grand Rapids, has acquired a building at 33 and 35 Market Avenue, which it will convert into a factory for making truck bodies, paper balers, and fabricating steel.

Cleveland

CLEVELAND, Dec. 24.

New inquiry for machine tools is plentiful, and only a slight falling off on account of the holiday season is noted. Definite lists have appeared from the Morgan Engineering Co., Alliance, Ohio, which will purchase approximately 200 lathes and other machines for gun carriages. The Templars Motor Corporation, Cleveland, is still buying equipment for machining 150,000 6-in. shells for the Government and is now asking for 24 or 26-in. lathes. Orders for machines in lots of four or five for Government work are fairly numerous. An order for four boring mills was taken the past week by a local machinery house. A Canton company is in the market for 12 drilling machines.

The American Multigraph Co., Cleveland, has placed a contract for the erection of a one-story addition, 45 x 60 ft. It is working on munitions for the Government.

The Elliott Electric Co., Cleveland, contemplates building an addition to its plant for the manufacture of electrical devices.

The Northern Fire Appliance Co., Cleveland, has placed a contract for the erection of a factory, 50 x 100 ft., on East 152nd Street.

The Kain & Aunger Co., Cleveland, has been incorporated with a capital stock of $10,000 by Robert Kain, E. F. Aunger, E. H. Aunger and others to engage in sheet metal work. It succeeds to the business of the Ohio Sheet Metal Works and has recently moved into a new plant at 1364 East Thirty-fourth Street, where it occupies two floors, 45 x 80 ft.

The Mather Spring Co., Toledo, Ohio, has awarded a contract for the erection of an addition.

The Lake Erie Dry Dock & Engineering Co., Sandusky, Ohio, is reported to have taken a Government order for 10 boats, each 261 ft. in length, which will necessitate the purchase of considerable equipment.

The Lima Rivet & Forge Co., Lima, Ohio, recently incorporated, has acquired a four-acre site and is having plans prepared for a factory. It is stated that approximately $40,000 will be spent in erecting the plant.

The Hydro-Carbon Wickless Burner Co., Fostoria, Ohio, has been incorporated with a capital stock of $1,000,000 to manufacture a new type of wickless burner for use with kerosene. Henry J. Sommers is president; W. F. Steele, vice-president, and E. C. Pfiel, secretary and treasurer. It is reported that the company will establish factories in different cities.

The Chamber of Commerce, Marion, Ohio, has closed negotiations with Richard Lau, Buffalo, N. Y., to establish a brass and bronze foundry in that city.

The New London Commercial Body Co., New London, Ohio, has been incorporated with a capital stock of $30,000 to build automobile bodies. C. O. Harmon, Cleveland, is president, and T. O. Albaugh, temporary secretary.

The Ohio Foundry Co., Bucyrus, Ohio, will build two extensions to its plant for office purposes.

The Cambridge Foundry & Machine Co., Cambridge, Ohio, which recently took over the Cambridge Machine Co., has been incorporated with a capital stock of $50,000, and will shortly begin the erection of a two-story extension, 50 x 87 ft. In addition to this the present plant will be enlarged to double the floor space.

Cincinnati

CINCINNATI, Dec. 24.

A plan to establish a munitions plant in Cincinnati for finishing shells is under serious consideration. Prominent manufacturers are interested in the project and definite action is expected soon after the holidays. It is said that the proposition has reached the point where a tentative option has been taken on a plant now in operation, and if the program is carried out new machinery will have to be installed.

Machine tools are so scarce that dealers have practically confined their efforts to doing business with plants having Government contracts. Heretofore only new machines were requisitioned, but attention has now been given to second-hand tools, the supply of which is limited. Jobbing foundries have not yet been compelled to shut down on account of a coke shortage and as a consequence machine tool castings are being received on contract time.

The D. T. Williams Valve Co., Cincinnati, has purchased the plant of the Queen City Brass & Iron Co. ,on Spring Grove Avenue, and will add equipment to increase its output of engineering specialties.

The Champion Tool Works Co., Cincinnati, lathe maker, expects to have its new plant at Winton Place in full operation within the next 30 days. All equipment has been purchased.

The Watkins Motor Co., Cincinnati, recently organized, has leased quarters at 826 West Sixth Street, and will manufacture electric motors.

The Shepard Lathe Co., Cincinnati, has completed the removal of its plant from 207 East Sixth Street to a building at Canal and Jackson streets.

The Superior Foundry Co., Hamilton, Ohio, has been incorporated with $50,000 capital stock by A. D. Stucky, C. E. Freeman, F. G. Traber and others. The company has been operating a plant under a partnership arrangemtnt and will install equipment to increase its output of gray iron castings.

The Manufacturers' Production Co., Dayton, Ohio, is reported to have acquired the plant of the Stevens Mfg. Co., which it is equipping to fill a Government contract.

The Columbus Iron & Steel Co., Columbus, Ohio, is building an addition to its plant for storage purposes.

The Simplex Machine Tool Co., Columbus, recently received a large order for lathes, and is adding equipment to its shop.

The Indiana Truck Co., Marion, Ind., is having plans prepared for an addition to its plant.

The Central South

LOUISVILLE, Dec. 24.

Nothing in the way of a holiday lull has developed in this market and manufacturers are operating to capacity. Motors are moving briskly, early deliveries of which are more available than any other line. One of the largest local boiler and machinery companies is booked full for a year and is taking no new business. Weather conditions have slowed down outside work. A somewhat better labor supply is noted. Coal is again more easily obtained.

The Dawson Lumber Co., Louisville, has been incorporated with capital stock of $30,000 by John L. and Robert S. Dawson and John W. Kitchen, and will establish a mill.

Fire destroyed the plant of the Leonard Brush & Woodenware Co., Louisville, with a loss of $40,000. It is endeavoring to re-establish a factory in a new location.

The Roy C. Whayne Supply Co., Louisville, is in the market for: Three three-phase, 25 or 60 cycle, 2200 or 440 volt, motor-driven air compressors of 300 to 500 cu. ft. capacity per min.; five slack line cable electrically operated excavators, 400 to 800 ft. span; twenty, 1 or 2-yd. V-shaped dump cars; fifteen, ½ to 1-yd. concrete mixers, three-phase, 25 or 60 cycle, 2200 or 440 volt; fifteen Bucyrus or Marion drag-line, 80 to 150-ft. booms, electric preferred; 200 12-yd. air dump cars, standard gage; fifty, 4 and 6-yd. dump cars, 36-in. gage; five each, Keystone, Star and Cyclone drills; twenty 40 to 70-ton standard gage locomotives; 10 16-ton dinkey 36-in. gage and heavier; ten 4, 6 and 8-in. discharge centrifugal pumps for 50-ft. head, direct connected, and five 60-ton Bucyrus or Marion steam shovels. Electric motors of the following horsepower are also wanted for 60 or 25-cycle, 2200 and 440-volt current: 15 to 25-hp., slow speed, squirrel cage; 100 to 300-hp., high speed, squirrel cage; 200 to 300-hp., 450 to 600 r.p.m., slip-ring type; 75 to 100-hp. 600 to 900 r.p.m.

Fire destroyed the plant of the Jackson Light & Ice Co., Jackson, Ky., with a loss of several thousand dollars. The boilers alone were undamaged.

The Utility Gas Coal Co., Pineville, Ky., is developing 200 acres of coal land and is asking for prices on equipment including an electric-driven fan and electric hoists.

Fire Dec. 20 destroyed the cotton gin plant of the Hale Cotton Gin Co., with a loss of $8000. The machinery was destroyed.

B. L. Sylar, James Building, Chattanooga, Tenn., is asking for prices on a coal-stripping steam shovel, 70 to 80-ft. boom.

The Harriman Mine Car Mfg. Co., Harriman, Tenn., has been purchased by J. N., Joseph and William Baker and others, who propose to make additions to increase the capacity.

The Palace Garage & Sales Co., Knoxville, Tenn., is re-equipping a building at 703 South Gay Street for automobile repairs and will install a machine shop to manufacture small parts.

The M. A. Sweeney Shipyards & Foundry Co., Jeffersonville, Ind., is relocating following the collapse of a part of its building on East Market Street. The company is executing a Government contract for field ranges.

St. Louis

ST. LOUIS, Mo., Dec. 24.

The Farmers' Gin Co., Soper, Okla., L. A. Bateman, D. T. Jones and others interested, is in the market for about $15,000 worth of cotton compress equipment.

The Rex Stove Co., Fort Smith, Ark., has been incorporated with a capital stock of $100,000 by Wilson J. Henry, W. J. Echols and others to make stoves.

John W. Meeks and others, Pocahontas, Ark., have organized to equip a plant to manufacture hay presses.

The Laclede Gas Light Co., St. Louis, will equip a $400,000 plant to repair meters and motor cars, etc.

The C. L. Gray Lumber Co., Meridian, Miss., has increased its capital by $200,000 and will add to its milling equipment.

The plant of the Blackwell Mill & Elevator Co., Blackwell, Okla., was destroyed by fire with a loss of about $50,000 to machinery, which will be replaced at once.

The Merrimac Veneer Co., Byram, Miss., has been organized with $50,000 capital by Frank and Robert Morrison and Thomas McCase and is in the market for veneer making equipment.

The Maryville Electric Light & Power Co., Maryville, Mo., has acquired the plant at Grant City, Mo., which it will remodel.

St. Joseph, Mo., is in the market for about $31,000 worth of new machinery for its electric light and power plant.

The Akers Mfg. Co., Kansas City, Mo., has been incorporated with a capital stock of $30,000 by H. H. Akers, A. A. Buxton and L. A. Buxton to manufacture brass, iron and other castings.

The American Die Mold Co., St. Louis, has been incorporated with a capital stock of $50,000 by G. Howard Thompson, W. C. Siebens and others to manufacture die molds.

William Gilbert, Fulton, Mo., will equip a foundry and machine shop at Ada, Okla., and is in the market for the machinery.

The Visible Pump Co., Oklahoma City, Okla., has been organized by Orville Knight and J. B. Pickens, Drumright, Okla., to manufacture pumps.

The Am-I Oil & Refining Co., Oklahoma City, Okla., capital $400,000, G. R. Mesker and others interested, will equip a refinery, and is taking bids on machinery.

John W. Hogan, Tulsa, Okla., will build an oil refinery at Shawnee, Okla., at a cost of $300,000.

The Columbus Lumber Co., Columbus, Miss., D. F. McCullough manager, will expend about $70,000 for new equipment, including boilers, engines, machinery, locomotives, etc.

The Miami Zinc & Lead Syndicate, Inc., Miami, Okla., capital $5,000,000, E. D. Nix, W. H. Logan and others interested, has acquired the St. Louis Mining & Smelting plant

and will expend about $5,000,000 on several mills, a new smelter plant, etc.

Pawhuska, Okla., is in the market for about $20,000 worth of pumping station equipment.

The Excelsior Tool & Machine Co., East St. Louis, Ill., is in the market for core ovens, electric cranes and other heavy equipment.

The Blackstone Consolidated Coal Co., Okmulgee, Okla, W. H. Wigton manager, is in the market for hoisting and haulage engines, conveyors, scales and other equipment.

The Nichols Pump & Well Co., Stuttgart, Ark., has been incorporated with a capital of $50,000 to manufacture pumping machinery. J. P. Nichols and H. C. Hollis are the principal incorporators.

Texas

AUSTIN, Dec. 22.

The recent action of the Mexican Government in issuing a decree placing almost prohibitive duties on iron and steel and machinery has almost put a stop to that branch of export trade which is felt particularly by dealers in San Antonio and El Paso.

The Givens Union Gin Co., Givens, will construct a cotton gin. J. H. Hodges is a stockholder.

The Phoenix Mills, Phoenix, Ariz., will build a reinforced concrete grain elevator to cost $31,000.

The Southwest Cotton Co., Glendale, Ariz., will construct several new cotton gins at points in the Salt River valley at a total cost of about $250,000.

The Arizona Egyptian Cotton Co. will build several cotton gins in the Salt River valley adjacent to Phoenix, Ariz.

It is announced that the plant of the Texas Motor Car Co. which is being organized with a capital stock of $2,000,000 will probably be located at Dallas. It has $1,000,000 of capital paid in with which to begin operations. The assembling plant will have a floor space of more than 250,000 sq. ft., and the minimum output, it is stated, will be 6,000 automobiles a year. J. C. Vernon is president.

The Pierce Oil Corporation, recently granted a Texas charter, will make its headquarters in Dallas. It has a capital stock of $33,000,000 and has taken over the two refineries, pipe lines and other holdings of the Pierce-Fordyce Association in Texas. It is authoritatively announced that the company will double the capacity of its refinery at Fort Worth and will make additions to its plant at Texas City. It is also considering plans for another refinery which will probably be located at Houston.

The International Marine Iron Works, Houston, has a contract with the International Shipbuilding Co. for marine engines and other machinery amounting to $2,500,000. It is stated that the ships which the International Shipbuilding Co. is constructing at Gulfport and Pascagoula, Miss., and Orange, Tex., will be brought to Houston to be equipped. The International Marine Iron Works has also obtained a contract for 88 propeller wheels for the Government, which involves an expenditure of about $150,000. F. C. Johnstone is vice-president and general manager.

The Uvalde Electric & Ice Co., Uvalde, will install additional machinery in its plant to provide power for irrigation pumps and industrial plants.

The Marfa Electric & Ice Co., Marfa, will install additional machinery in its electric light and power plant. It has also been granted a franchise to supply the city with water and will sink a number of wells and install pumps.

California

SAN FRANCISCO, Dec. 18

Facing a serious shortage of railroad motive power and rolling stock on the Pacific coast, some representatives of machinery houses are declining to guarantee deliveries, even to the Government. They say that they will deliver to the railroad at the point of manufacture if specified dates are guaranteed by them, but they take the stand that the Government must assume the responsibility of getting shipments through to the point where it needs them. Those who have taken this stand have lost some Government contracts, but they have saved themselves much trouble and possible penalty for failure to deliver. The demand for large tools, especially those made necessary by the inauguration of so many new shipbuilding plants, is still heavy. These tools are coming in under Government orders, and, as most of them were ordered months ago, they are arriving in good time.

The shipbuilding industry is constantly expanding, and, in the main, new machinery which is constantly being ordered, is either for these companies or for foundries or machine shops which will make ships' parts.

Among the makers of ships' parts is the Joshua Hendy Iron Works, San Francisco. Within the past six months it has more than doubled its capacity. It has a subsidiary contract from a shipbuilding company for building many of the parts of 12 steel ships, and is now working two overlapping shifts, making a 22-hr. day. All the foundries about San Francisco Bay are busy, as well as the machine shops. The great trouble has been to obtain and keep sufficient help. It is predicted that they will be forced to raise wages to a parity with the shipbuilders, about 35 per cent over 1916 payrolls.

New shipbuilding plants are being established about the Bay and old ones are being enlarged, and the same story is told of other parts of the State. The Hanlon Dry Dock & Shipbuilding Co., Oakland, has acquired a large acreage adjacent to its present yard and will install machinery to handle steel as well as wooden ships. Keels of two steel ships were laid in the last week. The recommendation of Alameda as the site for an additional navy yard on the Pacific coast will mean the purchase of considerable machinery, and it is understood that the Union Construction Co., which recently closed a contract for 48 acres of tideland with the city of Oakland, will have its plans ready in a short time for financing its project. Reports from San Diego state that the U. S. Steel Shipbuilding Corporation has closed a contract for ten vessels and is buying machinery in Chicago. From Anaheim comes the report that H. S. Duncan and Leon Figheroa, both of New York City, have offered to establish a $3,000,000 plant for shipbuilding at Anaheim if the city will alter the channel now under construction.

John F. Craig, Long Beach, has purchased the plant and Government contracts of the California Shipbuilding Co., a plant which was established by him and sold to the California Shipbuilding Co. two years ago. A new company will be incorporated for $1,000,000. Lloyd Swayne of the shipbuilding firm of Swayne & Hoyt, San Francisco, will be associated with him.

Charles C. Moore & Co., San Francisco, have just closed a contract with the Government for two large naval oil stations, one at Pearl Harbor, Hawaii, and the other near Bremerton, Wash. It is understood that the contract price was $1,000,000 and the time limit nine months.

The new company which has taken over the firm of Baker & Hamilton and the Pacific Hardware & Steel Co., San Francisco, has been named the Baker, Hamilton & Pacific Co. It is capitalized at $4,250,000 and will enter the hardware trade of the Orient, Australia, etc.

The Standard Engine Co., Oakland, is erecting a building, 50 x 325 ft., in which will be installed a 43-in. lathe and some smaller automatic tools, doubling the capacity of its plant.

The Samson Sieve-Grip Traction Co., San Francisco, announces that it has withdrawn for the present from the manufacture of marine engines and will confine all its work to making tractors.

The San Diego Bay Shipbuilding Co., San Diego, has been incorporated with a capital of $1,500,000 by W. J. Strachan, Karl F. Enper, J. Burris Mitchel, F. A. Barnett and Leonard L. Jones.

The Scandia Gas Engine Co., Oakland, is about to build a shop, 90 x 300 ft. The equipment, ordered some time ago, will include a 30-ton traveling crane and four lathes from 42-in. to 66-in. swing, and will cost approximately $50,000. Its output will be doubled.

The Schultheiss Co., San Diego, manufacturer of brass bronze and cast-iron fittings, is having plans prepared for a new plant at Bell Station, near Los Angeles, which will consist of a machine shop, 50 x 100 ft.; foundry, 100 x 200 ft; core shop, 50 x 100 ft.; pattern shop, 20 x 30 ft.—all one story—and finishing works, 50 x 100 ft., office and storage building. I. H. Seehorn, 328 Clay Street, Los Angeles, is the architect.

The Occidental Fuel & Machine Co., Los Angeles, has been incorporated with a capital of $75,000 to manufacture fuel machinery. W. A. Hudson, Los Angeles, and J. W. Clark, Alhambra, are the incorporators.

The Schaefer Mfg. Co., 1237 South Figueroa Street, Los Angeles, has been organized to manufacture sheet-metal automobile specialties. Arthur E. Schaefer, 1744 West Forty-second Street, is president.

The Standard Oil Co., Bakersfield, will build a new machine shop at its works at McKittrick.

The Long Beach Shipbuilding Co., Long Beach, Cal., has been incorporated with a capital of $1,000,000. John F. Craig, James G. Craig, Thomas R. Merrell and Lloyd Swayne are the incorporators.

The Sierra & San Francisco Power Co., Modesto, Cal., will make extensions and improvements at its power plant to cost about $25,000.

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